NEW YORK STATE
ENERGY ASSURANCE PLAN

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NOTICE

ABSTRACT

The purpose of the Energy Assurance Plan (EAP) is to develop a reasonable, effective and actionable Plan that will enhance state government Energy Assurance capabilities, energy reliability and identify new opportunities for enhanced assurance through technology. The EAP is intended to help State Energy Officials communicate and coordinate with energy stakeholders on energy disruptions and to prepare for potential disturbances. It provides a resource for State Energy Officials and other governmental stakeholders to understand the highly integrated and interdependent nature of the energy industry, the roles and responsibilities of regional organizations and designated State agencies, in the execution of effective pre-emergency mitigation, emergency response and restoration. The NYS EAP is part of the ongoing effort at the federal, state and local levels to enhance energy resiliency in New York. It also aligns with the National Association of State Energy Officials (NASEO) Energy Assurance Guidelines and references made available by the Department of Energy's (DOE) Office of Electricity Delivery & Energy Reliability (OE). Unlike a general state energy plan, the EAP provides background while helping stakeholders and responders to understand inter-relatedness of energy systems and become acquainted with the processes for mitigation and restoration. The EAP contains information about major energy sectors, interdependencies, vulnerabilities and the consequences of disruptions. It summarizes information about how energy stakeholders address energy disruptions and shortages and suggests mitigation measures beyond those addressed by the energy industry that New York might apply to various types and levels of supply disruptions.

NYS Energy Assurance Plan

NYSERDA

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I. Executive Summary

This Energy Assurance Plan (EAP) represents ongoing work that the New York State Energy Research and Development Authority (NYSERDA) is performing to develop a reasonable, effective, and actionable plan designed to meet the requirements of enhancing State government Energy Assurance capabilities and improving energy resiliency.

The objective is to create a document that expands New York's Energy Assurance planning efforts by identifying and incorporating response actions for existing and new energy portfolios as well as new technologies such as smart grid. This effort may also help create sustainable jobs and build in-house State and local government Energy Assurance expertise. This Plan is also written to build better regional Energy Assurance capability and thus help New York State to coordinate and communicate with other States on energy security, reliability, and emergency response issues.

To support this work, NYSERDA engaged SAIC Energy, Environment & Infrastructure, LLC as a consultant and partnered with various New York State agencies, local governments, private companies, and other States to develop an EAP that will meet the federal American Recovery and Reinvestment Act of 2009 (ARRA) requirements of this initiative. In alignment with the original Project Management Plan dated February 1 2010, this EAP reflects a scope of work that includes the following activities:

Creates and enhances existing in-house expertise within NYSERDA and other State agencies on Energy Assurance planning and resiliency.

- Includes new technology affecting energy resiliency such as smart grid applications
- Reviews vulnerabilities, critical infrastructure interdependencies, cybersecurity, energy supply systems, energy data analysis, and communications.
- Develops an EAP that incorporates response actions used by energy providers so that all stakeholders will understand better the interoperability of energy shortage mitigation, response, and restoration.
- Examines and suggests appropriate procedures and practices that may later be appended to the New York State Energy Plan (NY SEP) as appropriate. This includes the review and formalization of energy risk management strategies, and policies and procedures that identify, mitigate and respond to energy supply disruptions.
- Includes a mechanism for tracking the duration, response, restoration, and recovery time of energy supply disruption events.
- Trains appropriate NYSERDA and other State agency staff on energy infrastructure and supply systems including the content and execution of the EAP.
- Actionable recommendations directly resulting from a managed energy emergency exercise to evaluate the effectiveness of New York's Energy Assurance Plan

This EAP reflects the admonition contained in the National Association of State Energy Officials (NASEO) *State Energy Assurance Guidelines*[1] that an EAP should be an on-going process with many activities and consistent stakeholder involvement that continues after receipt of the final written Plan. NYSERDA is already working to engage other State agencies such as the New York State Department of Public Service (DPS), New York Independent System Operator (NYISO), New York State Corporation Commission (SCC) and the New York Office of Emergency Management (OEM).

[1] National Association of State Energy Officials (NASEO), *State Energy Assurance Guidelines*, Version 3.1, December 2009, http://www.naseo.org/eaguidelines/.

Throughout the structuring of the EAP, NYSERDA has sought to enhance communications and coordination in the face of an energy disruption and to enhance the awareness of potential energy shortages. NYSERDA has focused on understanding monitoring, response, and recovery steps taken by energy stakeholders during energy disruptions. This provides an adequate perspective for the State because, ultimately, it is the energy stakeholders that are in charge of addressing the energy disruptions.

1.1 Summary of Sections, Content, and Purpose

Table 1-2 presents a summary of the sections of this report, their content, and purpose, including major conclusions.

Table 1-2. Summary of Sections, Content, and Purpose

Section	Content Summary	Primary Focus/Conclusions
II – Introduction and Purpose	Continuity from older plans to this EAP	Points to implications of fuel and system interoperability and context of the assurance and reliability goals of the EAP.
III-Actionable Recommendations	Recommendations from Table-Top Exercise (TTX) held November 11, 2011, in Uniondale, New York The NYSERDA Energy Assurance Plan TTX simulated a realistic and plausible emergency. It was a facilitated discussion in which participants focused on key elements of their area of Energy Assurance and knowledge of market fundamentals and dynamics in order to validate content and identify areas for improvement Strengths and weaknesses relating to New York State participant TTX actions: an extensive discussion about issues and implications of smart grid applications for New York.	Summary of Areas for Improvement: Highlights of participant-identified areas for improvement and additional discussion during the TTX: More formal information sharing prior to emergencies Coordination and information pertaining to the region's petroleum suppliers; especially in areas of emergency, storage, and interruptible natural gas customers Explaining market dynamics to customers otherwise confused and alarmed by shortage-driven price volatility Enhancing energy leaders' ability to reach out to New England to share information Statewide coordination among energy stakeholders Examining economic dynamics of supply-related pricing, fuel exchange, and consequences of potential price imbalance
IV. State Summary Energy Profile 2010	An overview of energy in New York State to familiarize a reader with the central State planning instruments relating to Energy	Energy supply and consumption are mutually dependent. Market dynamics affect both sides of the equation, which directly impact energy delivery to the

Section	Content Summary	Primary Focus/Conclusions
	Assurance.	citizens of the State. This section briefly describes how natural gas, electricity, and petroleum products are interrelated and makes the point that retail pricing has a tendency to reflect the reality of energy interoperability and availability, especially during periods of stress on the energy system. Such stress may lead to shortage, which, in turn, creates price risk for many energy users.
V. Vulnerability and Risk Assessment (VRA) (Volume 1)	Introduces the concept of risk assessment for determining mitigation and reaction to supply issues. In order to assess criticality of energy assets, four areas of highlighted: High-risk Assets (i.e. energy supply, production and distribution infrastructure) High-impact assets (e.g. key assets that relate to many lesser assets) High-redundancy assets (e.g., assets that are backed up or duplicated by similar infrastructure) High-frequency assets (e.g., assets that have experienced multiple problems in the past).	Volume 1 is composed primarily of an energy asset inventory highlighting the major energy components within the State. These include electricity transmission and generating assets, natural gas transportation (pipelines), storage, and local distribution assets, and petroleum product supply points such as transportation pipelines and waterborne supply, distribution pipelines, product terminals, trucking, storage, and sales outlets. Supply, demand, and consumption issues are also examined and described as they relate in increasing or reducing risk.
VI. Guide to Energy Emergency Response in New York	Also called an "Action Pull Out." A guide for emergency or shortage responders who require rapid and readily accessible information about the various stages of a shortage so that they may better understand the nature of a problem and how to respond to it. This guide provides direct access to Stakeholders, Responsibilities and Contacts and the Emergency Public Information Annex prepared as part of the NYS Energy Emergency Plan of 2009.	The Action Pull Out can help State responders identify the proximate cause and nature of a shortage, what to expect from various suggested scenarios, and steps for rapid response The Pull Out also provides guidance about whom to contact among energy providers, energy provider associations, and State agencies likely to have a role in a shortage or emergency response and protocols for communicating with the general public and media. Several suggestions are made for enhancing public relations during an

Section	Content Summary	Primary Focus/Conclusions
	Authorities, protocols and responsibilities for managing public relations during an energy shortage or related emergency. It includes immediate response steps as well as specific public relations information steps pertaining to each major energy type. State public information systems are also described featuring the Joint Information Center (JIC).	energy shortage or emergency. Highlights among these are: Pre-event Planning Increase public awareness of potential hazards and how to deal with them Illustrate local emergency response capabilities Develop working relationships with the media that will disseminate emergency information to the public Maintain updated personnel contact lists Identify back-up communication resources Attend public information officer (PIO) or emergency preparedness meetings and training Event Activity (as managed by the Joint Information Center (JIC)) Provide a central location for media to obtain information, eliminate conflicting reports, and reduce rumors Establish press briefing protocols and location Arrange scheduling Obtain and disseminate accurate energy information Prepare papers and materials for media use Maintain event status information (e.g., damage, restoration times, resources) and verify Monitor media and issue updates Coordinate with State agencies and energy provider stakeholders Work with federal agencies (e.g., U.S. Department of Homeland Security (DHS), U.S. Department of Energy (DOE), Federal Emergency Management Agency (FEMA))
Appendices		

Section	Content Summary	Primary Focus/Conclusions
IX. A – Vulnerability and Risk Assessment (VRA) Volume II	Also titled Volume II – *Supplemental Asset Inventory Database and Decision Annex.* Designed to help NYSERDA prepare analyses and evaluations pertaining to Energy Assurance and reliability during non-emergency periods when long-range planning is likely to occur.	
X. B- Disruption Tracking	The Disruption Tracking Process, required by the DOE within ARRA guidelines, designed to help NYSERDA and other State agencies track essential energy supply, distribution, and consumption data during a supply shortage or related emergency.	
XI C – New York State Energy Markets	In-depth description of energy markets for electricity, natural gas, and petroleum products so that (especially during non-emergency periods) NYSERDA, other State agency staff, and energy supply and distribution stakeholders can better understand and assess the principal energy systems, markets, and interrelationships within New York State and its multi-State regional area. Specific energy systems described in this Appendix are: A. Electricity B. Natural Gas C. Petroleum D. Coal E. Energy Efficiency Renewables F. Smart Grid and Cybersecurity Appendix E – Previous New York State Energy Emergency Plan(s), included by reference for additional response information and measures as appropriate	
XII -- D New York State Energy Emergency Plan	An Integrated Resource Plan Specifying Actions to be taken in the Event of an Energy or Fuel Supply Emergency 2011, Included by reference	
XIII – E Protecting Critical Infrastructure	Information acquired from the DHS and included by reference	
XIV – F List of Acronyms and Equivalents	Items for the reader's rapid reference.	
XV. – G New York State Energy Assurance Intrastate Tabletop Exercise, After Action Report, 2/17/2012	The New York State Energy and Research Development Authority (NYSERDA) Energy Assurance Plan (EAP) Tabletop Exercise (TTX) to provide participants the opportunity to evaluate the New York State Energy Assurance Plan (EAP) in response to an energy emergency or disruption. Through discussion during the TTX, participants had the opportunity to demonstrate their current capabilities, which provided insight into strengths	

Section	Content Summary	Primary Focus/Conclusions
	and areas for improvement in energy emergency response. To demonstrate the energy capabilities, NYSERDA and the EPT invited several energy and support agencies to participate in the TTX.	

II. Introduction and Purpose

The purpose of the Energy Assurance Plans is to develop a reasonable, effective and actionable Plan that will meet the requirements of enhancing state government Energy Assurance capabilities, energy reliability and new opportunities for enhanced assurance through technology. The Plan is intended to help State Energy Officials communicate and coordinate with energy stakeholders on energy disruptions and to prepare for potential disturbances. It provides a resource for State Energy Officials and other governmental stakeholders to understand the highly integrated and interdependent nature of the energy industry, the roles and responsibilities of regional organizations and designated State agencies, in the execution of effective pre-emergency mitigation, emergency response and restoration.

2.1 Energy Assurance Plan

This Energy Assurance Plan (EAP) is part of the ongoing effort at the federal, state and local levels to enhance energy resiliency in New York. It also aligns with the National Association of State Energy Officials (NASEO) Energy Assurance Guidelines and references made available by the Department of Energy's (DOE) Office of Electricity Delivery & Energy Reliability (OE).

More, this EAP, in accordance with recommendations from the NASEO Energy Assurance Guidelines, is designed to sustain continuity. It not only builds upon previous New York State energy emergency plans (e.g., the New York State Energy Emergency Plan 2009), but also acknowledges that such plans change continuously. Even as this plan is being completed, a new State Energy Plan (SEP) is emerging that will add new data, and address State energy policy issues that directly affect Energy Assurance and reliability.

This plan will not duplicate the new SEP even though it contains similar extensive background material. Unlike a general state energy plan, the EAP provides background while helping stakeholders and responders to understand inter-relatedness of energy systems and become acquainted with the processes for mitigation and restoration.

The EAP contains information about major energy sectors, interdependencies, vulnerabilities and the consequences of disruptions. It summarizes information about how energy stakeholders address energy disruptions and shortages and suggests mitigation measures beyond those addressed by the energy industry that New York might apply to various types and levels of supply disruptions.

2.2 Organization of the Document

The document is organized in the following Sections:

- Section III: Actionable Recommendations: This section contains observations and recommendations made as a result of the conduct of research, meetings with industry stakeholders and authorities, extensive conversations with NYSERDA and a Table Top Exercise (NYS EAP TTX) conducted on 11/3/2011.
- Section IV: New York State Energy Profile 2010. This section offers a rapid, high level view of the energy markets, consumption profiles and an aggregate understanding of what "energy" means for New York State (NYS) and it is intended to address one basic question: Why is energy relevant to NYS? It is written to familiarize the reader who is not an expert in energy, and serves as an introduction to the Energy Assurance Plan (EAP).
- Section V: Vulnerability Analysis. This section discusses how to identify and evaluate critical energy assets. Critical assets are those to be understood to significantly constrain energy resiliency if they are disrupted;

- Section VI: Guide to Energy Emergency Response in New York. This section describes in detail the electric, petroleum, natural gas, energy efficiency, renewable sources of supply and market infrastructures to better understand capacities, throughputs, dependencies and historical issues. It provides a perspective of these sectors and an understanding of disruption plans to address specific vulnerabilities. It also addresses emerging technology (such as smart grid and energy efficiency) and vulnerabilities (such as Cybersecurity). Also includes Emergency Public Information (EPI) annex to NYS Energy Emergency. The purpose of this annex is to establish policies and operational procedures for disseminating official information and instructions to the people of New York State through all available communications media before, during, and after an energy-related emergency or disaster in any location of the State in support of State response and recovery operations. Plan
- Appendices A-G: The appendices contains research and analyses conducted specifically in the development of the NYS Energy Assurance Plan, with references to documents, studies and analyses conducted by various responsible energy stakeholders throughout the State of New York. These references are not necessarily included in the appendix but contain foundational material for a full understanding of the energy markets, infrastructure protection plans, methodology for ranking asset vulnerability and risk assessment;

2.3 Alignment with NASEO's Guidelines

The outline was adapted from the National Association of State Energy Officials (NASEO)'s proposed guidelines according to **Error! Reference source not found.**.

Table 2-1. Alignment with NASEO's Guidelines

NASEO EAP Suggested Outline	New York's EAP Outline
Executive Summary	Section I
Introduction and Purpose	Section II
State Energy Profile	Section IV
Actionable Recommendations, Stakeholders, Responsibilities and Contacts and Emergency Public Information Protocol	Section III, Section IV
Vulnerability and Risk Analysis	Section V (VRA Vol. #1) and Appendix B
Management Decision Process	Section VI and Section VII
Stakeholders, Contacts and Legal Authorities	Section IV
Asset Inventory	Appendix B
Disruption Tracking	Appendix C
Market Analyses	Appendix D (subsections A through G)
Energy Emergency Response Plans	Appendix D (by reference)
Protecting Critical Assets	Appendix E (by reference) {http://www.dhs.gov/xlibrary/assets/cipac/cipac-annual-2011.pdf}

III. Actionable Recommendations

3.1 Overview

The following observations and recommendations are made as a result of research; meetings with industry stakeholders and authorities, extensive conversations with NYSERDA, and a table-top exercise (NYS EAP TTX) conducted on November 3, 2011.[2] Specifically and of greatest value was the TTX, where NYSERDA and SAIC encouraged utility providers, State and local agencies, and energy leads to identify strengths and areas for improvement in the State's Energy Assurance preparedness and to brainstorm possible solutions to energy emergency issues. TTX Participants identified the following characteristics of the New York energy market:

- The exercise allowed utility providers, State and local agencies, and energy leaders to identify gaps in their emergency response and brainstorm ways to close the gaps.
- Proposed natural gas pipelines will increase capacity in the region in the coming years, if approved.
- Natural gas pipeline and distribution companies already have a process for information sharing that they can utilize during an emergency.
- Petroleum-sector participants clearly articulated which regulations would affect their ability to operate in an emergency environment and knew how to request waivers from those regulations.
- Early in the discussion, New York City Office of Emergency Management (NYC-OEM) discussed the importance of reaching out to critical facilities about any potential energy shortage.
- State and local agencies identified the agency and persons that should assume command of response and recovery for an energy incident and outlined the relationship between New York City, surrounding counties, and New York State.
- Participants were in general agreement on the need of formal information sharing among energy sectors before an identified potential disruption.
- The region needs a formal forum for inter-sector cooperation.
- Energy leaders in the region currently have limited ability to reach out to New England to share information.
- Coordination is necessary so that public safety warming centers are not treated as interruptible natural gas service customers.
- Petroleum sector coordination is currently conducted by internal polling based on personal relationships.
- The New York State Department of Public Service (DPS) takes an active role in communicating with regulated utilities; but statewide coordination among energy stakeholders could be strengthened.
- In the current market, the oil industry is at a competitive disadvantage given the cost of oil compared to natural gas. As a result, fuel oil becomes the fuel of last resort and its supply is market based.

[2] Appendix H: New York State Energy Assurance, Intrastate Tabletop Exercise, After Action Report, Report submitted February 17, 2012.

- The petroleum industry has an entire class of non-traditional customers that are only customers for a few days or weeks each year when the interruptible natural gas "class of service" operating rules are enforced and customers are forced off natural gas. In response, these customers switch to backup petroleum fuels to continue their operations. This generally occurs during the coldest times of the year when traditional oil customers are already experiencing their highest demand, and further strains the petroleum fuel distribution and delivery system.
- Current storage and delivery infrastructure, as well as physical access to product, may not be adequate to meet peak demand; fuel shortages may affect the ability to provide routine and emergency services in the downstate New York area.
- Not all participants were familiar with the requirements for curtailing natural gas service to maintain system pressure.
- As the cost of supplying petroleum increases during periods of peak demand, the costs will be passed to the consumers, which could be confused with price gouging.
- Days-on-hand oil requirements are of limited effectiveness when the ability to execute supply delivery contracts is hampered by the overall scenario (i.e. cold weather both increases oil demand and interferes with logistics of obtaining supply).
- Electricity providers identified that the regulations limiting liquid fuel holding tanks at newer generation plants are a major impediment to maintaining service in an emergency.
- There is a hierarchy of building types and uses that are required to implement a switch to an alternate fuel source within the interruptible natural gas service rate class (e.g. electric generators, critical health care providers, etc.). All interruptible gas customers have their service curtailed when temperatures fall below fifteen degrees Fahrenheit.
- System controllers scale back electric imports into the NYC area and require in-city generators to ramp up an equal amount if they anticipate a winter storm. Percentage reductions are dependent on the storm forecast. This condition also occurs during winter months in anticipation of severe icing conditions that can, in combination with high transmission flows allow lines to sag below acceptable limits.

3.2 Recommendations

3.2.1 Natural Gas

1. Follow-up survey on interruptible natural gas activity during winter
    - Purpose: to determine the impact of interruptible natural gas supply on customers in terms of
    - Firm volumes made available to full-contract customers
    - Historically, the length of time, the frequency of interruptions by geographic location, and a summary of the impacts in each region where interruptions have occurred
    - Alternate fuels used by interruptible customers, if known, and the estimated energy (MMBtu) displaced by those fuels
    - The extent to which natural gas and non-natural gas consumers have taken or intend to take energy efficiency steps to reduce gas or alternate-fuel consumption during interruption
    - Share results and coordinate as appropriate with regional heating oil wholesale and retail dealers and associations
2. Enhance public information knowledge base
    - Purpose: to discern the extent to which the public is aware of natural gas issues

- Educate the public about the potential supply and economic impacts of a natural gas interruption
- Address the stability (continuity) of natural gas supplies
- Reinforce the impacts to the system and other critical customers when interruptible customers fail to curtail
- Communicate the effects on all gas customers and the local economy should natural gas supply pressures drop below acceptable levels

3. Natural gas for electricity vs. heat - follow-up (cross reference to Electricity #3, below)
   - Purpose: to track the efficacy of the NYISO and (as applicable, ISO-NE) efforts to balance use of natural gas for electricity generation with natural gas for home and commercial heating
   - Follow up with ISOs to determine steps taken to secure sufficient gas during the peak winter season
   - Determine the nature of impacts, if any, on up- and down-state NY gas customers and cross check with alternate-fuel issues in the event of interruption
4. Coordination review
   - Purpose: to maintain coordinated mitigation and response capability between DPS and NYSERDA
   - Coordinate and facilitate at least one annual half- to full-day meeting to discuss energy reliability for natural gas
   - Evaluate ongoing mitigation and response planning, especially concerning measures suggested in this EAP for informing the public and providing energy efficiency measures that drastically reduce consumption during emergencies
5. Maintain open communications with LDCs
   - Purpose: to provide linkage between NYSERDA and the State's LDCs to enhance resiliency and energy emergency communications
   - Set up industry liaison as a duty among NYSERDA program managers
   - Develop and maintain a contacts and responsibilities list of LDCs' operational-level technical and communications management to help maintain open and confidential communications with NYSERDA staff on matters pertaining the LDC operations, reliability, and emergency response capabilities

3.2.2 Electricity

1. Conduct a follow-up between DPS and NYISO on the results of the survey on annual load growth variables
   - Purpose: to determine actual impacts of:
   - Potential transmission constraints
   - Interruption time
   - Alternate energy used to offset growth
   - Provide a summary of impact (ideally, over time) between major State electricity consumption areas
2. Enhance public information knowledge base
   - Purpose: to discern whether nor not public is aware of electricity issues

- In terms of potential supply and economic impact of interruption
- In terms of stability (continuity) of generation fuel supply
- Whether or not consumers take any energy efficiency steps to reduce electricity or alternate-fuel consumption during interruption

3. Natural gas for electricity vs. heat - follow-up (cross reference to Natural Gas #3, above)
   - Purpose: to track efficacy of NYISO (and, as appropriate, ISO-NE) efforts to balance use of natural gas for electricity generation with natural gas for home and commercial heating
   - Follow up with ISOs to determine steps taken to secure sufficient gas during the peak winter season
   - Determine the nature of impacts, if any, on up- and down-State NY gas customers; cross check with alternate-fuel issues in the event of interruption

4 Coordination Review
   - Purpose: to maintain coordinated mitigation and response capability between DPS and NYSERDA
   - Coordinate a minimum of annual half- to full-day meeting to discuss energy reliability for electricity generation and transmission
   - Evaluate ongoing mitigation and response planning, especially concerning measures suggested in this EAP for informing the public and providing energy efficiency measures that drastically reduce consumption during emergencies

5. Maintain open communications with EDCs and NYISO
   - Purpose: to provide linkage between NYSERDA and electricity delivery companies (EDCs) and between NYSERDA and NYISO to enhance resiliency and energy emergency communications
   - Set up industry liaison as a duty among NYSERDA program managers
   - Keep and maintain a list of operational-level technical and communications management staff at EDCs to help maintain open and confidential communications with NYSERDA staff on matters pertaining the EDC operations, reliability, and emergency response capabilities
   - Develop and carry out regular contact with appropriate NYISO liaisons on matters pertaining to reliability

3.2.3 Petroleum Products

1. Enhance public information knowledge base
   - Purpose: to discern market impacts and inform the Governor and the public:
   - In terms of potential supply and economic impact of petroleum product supply interruption
   - In terms of stability (continuity) of various seasonal fuel supplies (e.g., summer/winter gasoline blend requirements)
   - Whether or not consumers take energy efficiency steps to reduce petroleum product use or move to alternate-fuel consumption during periods of high price volatility
   - Provide summary of impact (ideally, over time) between major State consumption areas

2. Enhance coordination and communication among petroleum stakeholders
   - Purpose: to complement NYSERDA's role as the primary State agency involved as liaison to and working with the State's petroleum industry

- Maintain open, reliable communications among State and industry stakeholders
- Organize regular meetings or conferences with petroleum stakeholders
- Coordinate with State (and regional within the State) liquid fuel industry associations to arrange annual meetings to review and discuss topics of mutual interest
- Invite individual company stakeholders (e.g., refinery, production, pipeline, terminals, regional marketers, storage)
- Develop mutually-determined agendas for discussion and problem solving
- Consider topics such as
    - Follow-up to Actionable Recommendations contained in TTX After-Action Report
    - Impact of public policy and regulation on maintaining supply, distribution, and overall energy delivery reliability
    - Coordination and communications during periods of supply shortage or other system issues
    - Impact of refinery changes on State petroleum distribution and sales
    - Potential impacts on local supply constraints or congestion
    - Storage capacity
    - Alternate energy sources (e.g., converting customers to natural gas)
    - Pipeline and/or shipping requirements, constraints, and operational issues
    - Inter-fuel supply and demand issues (e.g., seasonal issues pertaining to interruptible natural gas customers)
- Broaden community of potential petroleum industry stakeholders by inviting representatives from agencies outside of the State petroleum industry such as: U.S. Coast Guard; federal pipeline community; environmental regulatory community; New York State regional entities and local governments; transportation and highway officials; port authorities; U.S. Department of Energy (DOE)
- Invite petroleum association representatives to various additional energy seminars, meetings, or other information exchanges sponsored by NYSERDA
- Coordinate with petroleum product industry associations or individual companies for regular meetings at industry facilities to enhance perspective and broaden communications

3. External coordination
    - Purpose: to maintain coordinated mitigation and response capability between DOE, neighboring States, regional entities, and NYSERDA on petroleum issues
    - Coordinate a minimum of annual one half- to full-day meeting to discuss national and regional energy issues affecting the New York State petroleum market
    - Evaluate ongoing mitigation and response planning, especially concerning measures suggested in this EAP for informing the public and providing energy efficiency measures that drastically reduce consumption during emergencies

IV. State Energy Profile 2010

4.1 Overview

The purpose of this section is to provide an overview of what "energy" means for New York State (NYS) and it is intended to address one basic question: Why is energy relevant to NYS? It is written to familiarize the reader who is not an expert in energy, and serves, in part, as an introduction to the NYS Energy Assurance Plan (EAP).

This chapter complements and draws from other core documents and agency resources that the reader is encouraged to consult. These include the following:

- New York State Energy Plan.[3] Article 6 of the State's Energy Law establishes the State Energy Planning Board and calls on that Board to complete a State Energy Plan every four years. As of the writing of this report, the most recent version is the 2009 New York State Energy Plan and the next one is to be released by March 15, 2013.
- NYSERDA's Strategic Plan.[4] The 2010 three-year strategic plan, *Toward a Clean Energy Future: A Three-Year Strategic Outlook 2010 - 2013*, presented an overview of and outlook for NYSERDA's programs and services that are helping put the State on a path toward greater energy self-sufficiency, improved energy efficiency, smart economic growth, and a cleaner environment. NYSERDA continues to update strategic plans.
- U.S. Energy Information Administration's State Energy Profiles.[5] EIA provides updated individual State Energy Profiles that present key facts and statistics about energy markets and industries. Many of the statistics in the profiles are updated simultaneously with data updates on the EIA web site.
- U.S Department of Energy, Office of Electricity Delivery & Energy Reliability (DOE/OE).[6] OE applies DOE's technical expertise toward ensuring the security, resiliency and survivability of key energy assets and critical energy infrastructure at home and abroad. OE provides much of this information through its proprietary ISER network.
- U.S. Department of Homeland Security's "Energy Sector: Critical Infrastructure and Key Resources."[7] This website gathers reports and real-time information associated with the DHS perspective on the energy sector and links to other useful agencies.
- New York State Public Service Commission (PSC).[8] PSC serves as the overarching Regulator in the State and centralizes information reported by utilities.

The intent of this chapter is to offer the reader a balanced understanding of energy that can later be applied to understand the resiliency issues further presented in the EAP. For the purpose of this chapter, the term "energy" is used generically to include electricity, natural gas, petroleum products, and coal. The

[3] http://www.nysenergyplan.com/.

[4] NYSERDA, *Toward a Clean Energy Future: A Three-Year Strategic Outlook 2010-2013*, June 2010, http://www.nyserda.ny.gov/~/media/Files/Publications/NYSERDA/2010-strategic-plan.ashx?sc_database=web.

[5] EIA, State Energy Profiles, New York, http://www.eia.gov/state/state-energy-profiles.cfm?sid=NY.

[6] http://energy.gov/oe/office-electricity-delivery-and-energy-reliability.

[7] DHS, "Energy Sector: Critical Infrastructure," http://www.dhs.gov/files/energy-sector.

[8] New York State Department of Public Service, New York State Public Service Commission, http://www.dps.ny.gov/.

current chapter focuses on building the common knowledge to help the State energy staff communicate and coordinate in an energy emergency. It also provides useful information for pre-event monitoring.

Figure 4-1 shows the locations of New York State's most important energy assets, including supply, transportation routes, and electric generation plants.

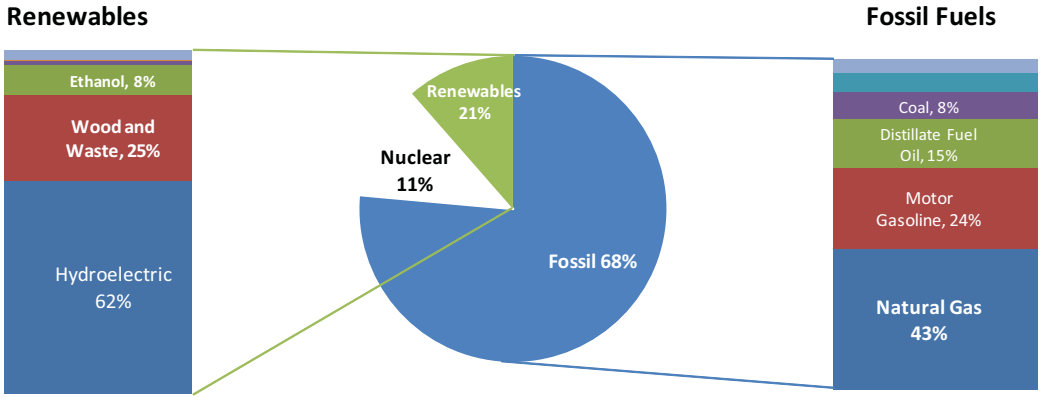
Figure 4-1. NYS Supply and Resource Map

Source: EIA, State Energy Profiles, New York http://www.eia.gov/state/state-energy-profiles.cfm?sid=NY

4.2 Consumption Overview

New York's energy consumption is dominated by fossil fuels, particularly natural gas, motor gasoline, and distillate fuel oil[9] (Figure 4-2). Nuclear energy continues to play a significant role, especially as a base-load electricity supply source.

Figure 4-2. EIA (2008) NYS Energy Consumption by Source



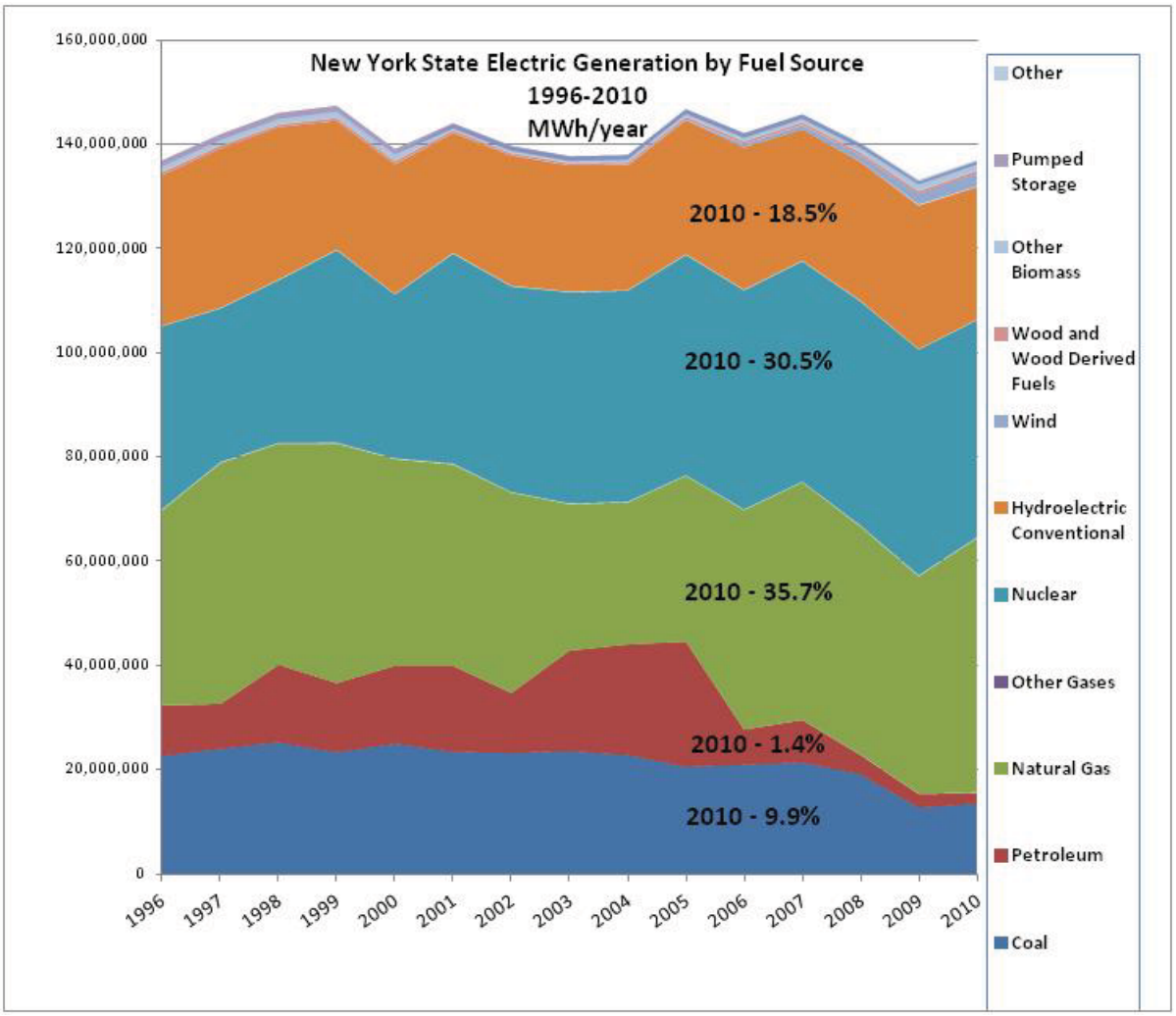
Source: SAIC calculations using data from EIA State Energy Data System (SEDS), Table C2, Energy Consumption Estimates for Major Energy Sources in Physical Units, 2009, Released June 29, 2012. http://www.eia.gov/state/seds/hf.jsp?incfile=sep_sum/plain_html/sum_use_tot.html.

The use of natural gas in New York has doubled since 1960, while most other fossil fuels have remained fairly constant in their share of total energy consumption, especially since the early 1970s (Figure 4-3). The exception has been residual fuel oil[10] whose importance has decreased to approximately a quarter of the role it had in the 1960s. The absolute amount of residual fuel oil consumption has followed a very similar pattern as the share of the percentage, with total consumption peaking at approximately 4,500 trillion Btu in 1973. The commercial and residential sectors lead State energy demand, while the transportation sector is also a major consumer (Figure 4-4).

[9] Measured in terms of total Btu consumed in 2008.

[10] Broadly speaking, fuel oil is any liquid petroleum product that is burned in a furnace or boiler for the generation of heat or used in an engine for the generation of power. Fuel oil is classified into six classes, numbered 1 through 6, according to its boiling point, composition and purpose: No. 1 and No. 2 (diesel or heating oil) and No. 3 fuel oil are variously referred to as distillate fuel oils and are rarely used; No. 4 fuel oil is usually a blend of distillate and residual fuel oils, such as No. 2 and No. 6; No. 5 and No. 6 fuel oil are called residual fuel oils (RFO) or heavy fuel oils.

Figure 4-3. NYS Energy Consumption for Electricity Generation by Source (1996-2010)



Source: SAIC calculations using data from EIA SEDS, Table C9, Electric Power Sector Consumption Estimates, 2010, Released: June 29, 2012, http://www.eia.gov/state/seds/hf.jsp?incfile=sep_sum/plain_html/sum_btu_eu.html.

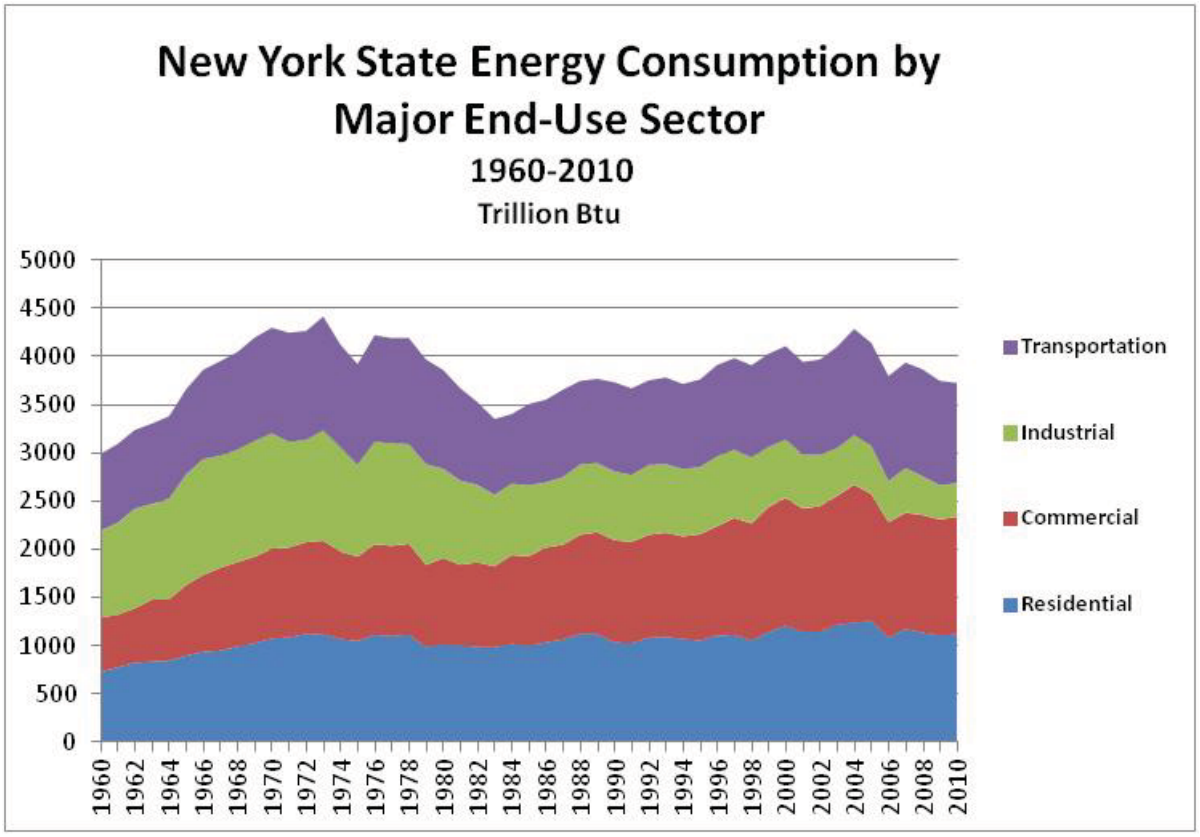
New York's energy consumption is among the highest in the United States but its energy intensity [11] and expenditures per person are amongst the lowest. Although energy intensity does not depict a casual relationship between energy and economic growth, in general, low energy intensity is analogous to high energy efficiency. In the case of NYS, energy intensity is significantly less than the average in the United States and continues to improve. Energy intensity is closely linked with the State's economic base and reflects the growing importance of the service economy (less energy intensive than industrial economies) and the degree of development, but should be used with caution.

Figure 4-4 shows the changing ratios of consumption in the State and shows how consumption from the industrial sector has decreased to almost a third of what it was in 1960, while that of the commercial

[11] EIA defines energy intensity as "A ratio of energy consumption to another metric, typically national gross domestic product in the case of a country's energy intensity." and goes on to say, "Sector-specific intensities may refer to energy consumption per household, per unit of commercial floor space, per dollar value industrial shipment, or another metric indicative of a sector. Improvements in energy intensity include energy efficiency and conservation as well as structural factors not related to technology or behavior."

sector has more than doubled over the same time period. The figure also shows that consumption for transportation and residential has remained fairly steady.

Figure 4-4. NYS Energy Consumption by End Use, 1960-2010



Source: SAIC calculations from EIA SEDS, "New York, Consumption Estimates, 1960-2010," Tables CT4, CT5, CT6, and CT7, Released June 29, 2012, http://www.eia.gov/state/seds/seds-states.cfm?q_state_a=NY&q_state=New York#undefined

In 2010, New York's 4.3 million residential customers used about 1.198 billion cubic feet (Bcf) of natural gas or 33 percent of total statewide gas use. The State's 394,000 commercial customers used about 292 Bcf or 25 percent of total natural gas use. Natural gas consumption in the residential and commercial sectors in New York represents a larger proportion of total consumption than overall U.S. consumption for those sectors (21 and 13 percent, respectively). The primary use of natural gas in New York for residential and small commercial customers is for space heating and is highly weather sensitive. The State's natural gas market is winter peaking with over 70 percent of residential and 60 percent of commercial natural gas consumption occurring in the five winter months (November through March).

4.3 Supply Overview

New York has minor reserves of oil and conventional natural gas, found primarily in the far western part of the State near Lake Erie (see Figure 4-1, above). The Marcellus Shale formation, which contains potentially vast reserves of unconventional shale gas, extends into the lower portion of the State. The State also possesses considerable renewable energy potential. Several powerful rivers, including the Niagara and the Hudson, provide New York with some of the greatest hydropower resources in the Nation, and New York's Catskill and Adirondack mountains offer substantial wind power potential. In addition, parts of New York are densely forested, allowing for potential fuel wood harvesting.

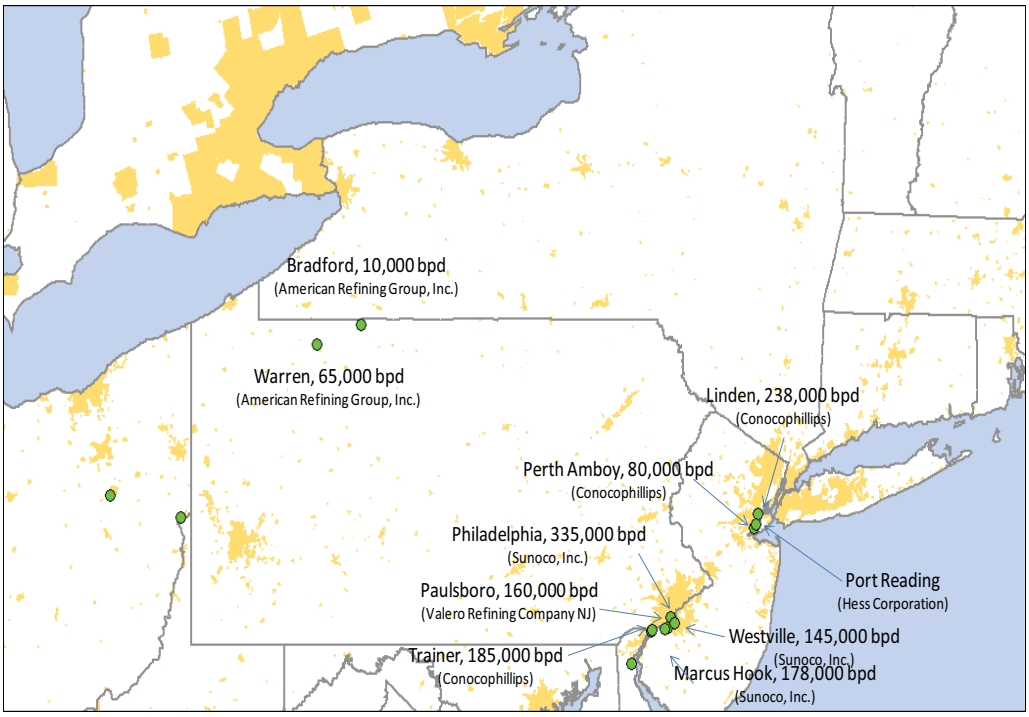
Highlights of the State's supply structure include:

- The New York Harbor area between New York and New Jersey has a petroleum bulk terminal storage capacity of over 75 million barrels, making it the largest petroleum product hub in the Northeast.
- New York produces more hydroelectric power than any other State east of the Rocky Mountains.
- The 2,353-megawatt Robert Moses Niagara plant, harnessing power from the Niagara River, is one of the largest hydroelectric facilities in the world.

4.3.1 Petroleum

New York's petroleum products are supplied by refineries located in New Jersey and Pennsylvania (Figure 4-5), transported from the Gulf Coast primarily via the Colonial Pipeline system, and imported from sources principally in Canada, the Caribbean, South America, North Africa, and Europe.

Figure 4-5. Oil Refineries Supplying NYS



Source: SAIC calculations on refining capacity using data and maps from Ventyx®/ABB

New York Harbor acts as a central distribution center for the region, and many of the petroleum products delivered to the Harbor are redistributed to smaller ports where they supply local demand. In particular, the Hudson River, which meets the Atlantic Ocean in New York Harbor, provides a major inland water route for petroleum product barges supplying eastern New York and parts of western New England. On the other side of the State, western New York product markets are primarily supplied from Canada at the Port of Buffalo, and via the Buckeye and Sunoco pipeline systems from Pennsylvania and the Midwest. The TEPPCO pipeline system from the Gulf Coast delivers mostly propane to upstate markets.

The petroleum refinery system supporting New York State (and the U.S. Northeast) is a dynamic system. Refinery margins are sensitive to a variety of supply and price fluctuations and hence refinery ownership and operation is fluid. New York petroleum supply is influenced by product received from refineries in

Pennsylvania and recent changes in refinery ownership indicate continued sales to the New York Market from these facilities. As of late July 2012, EIA stated that:

- A joint venture between the Carlyle Group and Sunoco is expected to sustain the Sunoco Philadelphia refinery
- Delta Airlines purchased the Trainer refinery with a restart targeted for the third quarter of 2012
- Petroleum product flow into the Northeast from the Midwest has increased
- Capacity for waterborne crude oil supply into Philadelphia has increased
- In addition, Sunoco Logistics' Eagle Point Terminal in New Jersey became operational thus increasing product flow into western New York[12]

As in many northeastern urban areas, New York City and the surrounding metropolitan areas require reformulated gasoline blended with ethanol, and the New York Harbor area is the primary Northeast distribution hub for ethanol supplies. Ports located on the New Jersey side of New York Harbor receive ethanol rail shipments from the Midwest and marine imports from Brazil and the Caribbean, and then redistribute these supplies to markets throughout the Northeast. Another large ethanol storage facility serving the Northeast is located in Albany, New York. A proposed pipeline would transport up to 10 million gallons of ethanol per day from production facilities in Iowa, Illinois, Minnesota, and South Dakota to terminals in Pittsburgh, Philadelphia, and the New York Harbor.

New York, along with much of the Northeast, is vulnerable to distillate fuel oil shortages and price spikes during the winter months due to high demand for home heating. For example, one-third of New York households use fuel oil as their primary energy source for home heating. In January and February 2000, distillate fuel oil prices in the Northeast rose sharply when extreme winter weather increased demand unexpectedly and hindered the arrival of new supply. Frozen rivers and high winds slowed the docking and unloading of barges and tankers. In July 2000, in order to reduce the risk of future shortages, the President directed DOE to establish the Northeast Heating Oil Reserve. The Reserve gives Northeast consumers adequate supplies for about 10 days, the time required for ships to carry heating oil from the Gulf of Mexico to New York Harbor. The Reserve's storage terminals are located at Perth Amboy, New Jersey, and Groton and New Haven, Connecticut. [13]

4.3.2 Natural Gas

The State has approximately 4.7 million natural gas customers served by eleven local distribution companies (LDCs). The LDC natural gas franchise territories branch out from the more densely populated areas of New York. There are many rural areas in the State that do not have natural gas service because it is not economically practical to extend gas mains into areas with limited load.

LDCs sell natural gas to their customers by contracts that specify either firm or interruptible delivery. Customers may also choose to purchase the commodity from the LDC or from another provider. Firm deliveries are generally provided to residential and small commercial and industrial customers that do not have alternative fuel burning capability. Lower priced interruptible delivery service is not guaranteed and

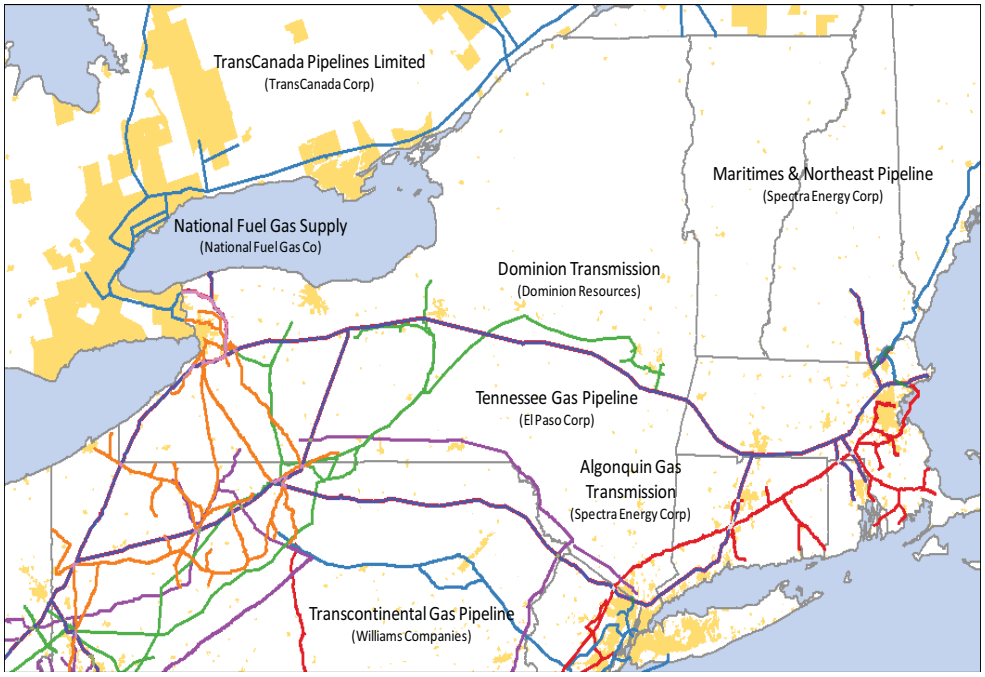
[12] EIA, *This Week in Petroleum,* July 25, 2012, "Update of the Status of East Coast Refineries." http://www.eia.gov/oog/info/twip/twiparch/120725/twippprint.html. Check EIA State Energy Data sites for ongoing updates.

[13] EIA, State Energy Profiles, New York, http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=NY, Analysis, Last Updated October 2009.

is used by larger customers, e.g., some apartment buildings, commercial and industrial customers that have alternate fuel supplies. [14]

Although western New York produces a small amount of natural gas, the vast majority of the State's natural gas supply is currently brought in via pipeline from other States and Canada (Figure 4-6). [15] The Transcontinental and Tennessee Gas Transmission pipelines from the Gulf Coast and the Iroquois pipeline from Canada link up with local gas distribution networks that supply the New York City metropolitan area and Long Island. Numerous other gas transmission systems branch in from Pennsylvania and Canada to feed other parts of the State.

Figure 4-6. Generalized Natural Gas Pipelines Supplying NYS



Source: Data and maps from Ventyx®/ABB

New York has moderate natural gas storage capacity, developed principally from depleted natural gas fields in the Appalachian Basin in western New York. These storage sites, along with those in Pennsylvania, Ohio, and West Virginia, are important for supplying the Northeast region, particularly during the peak demand winter season. New York's residential, commercial, and electric power sectors all consume large amounts of natural gas. To meet New York and Connecticut's growing demand for natural gas, particularly for electric power generation, an offshore liquefied natural gas (LNG) import terminal with a capacity of 2 Bcf per day has been proposed in federal waters on the Outer Continental Shelf south of Long Island, 25 miles away from New York Harbor.

Natural gas storage plays a significant role in meeting the State's weather-sensitive gas needs. Approximately 35 to 40 percent of LDCs' winter gas requirements are met through gas withdrawn from storage facilities, primarily depleted gas wells, located in Pennsylvania and western New York.[19] Using storage facilities that are close to market is generally an economic way to meet seasonal demands. The alternative would be to build additional, costly, pipeline capacity all the way back to the gas production

[14] From the 2009 State Energy Program.

[15] This and following data are derived or quoted from EIA, SEDS, *State Energy Profile,* http://www.eia.gov/state/.

areas. Some LDCs also maintain peaking supplies such as LNG or propane plants within their service territories that are critical to meeting gas demand on peak winter days.[16]

The Marcellus Shale is an unconventional gas reservoir found throughout the Allegheny Plateau region of the northern Appalachian Basin of North America. In the United States, the Marcellus shale runs across the Southern Tier and Finger Lakes regions of New York, in northern and western Pennsylvania, eastern Ohio, through western Maryland, and throughout most of West Virginia extending across the State line into extreme western Virginia. The Marcellus bedrock in eastern Pennsylvania extends across the Delaware River into extreme western New Jersey. It also exists in the subsurface of a small portion of Kentucky and Tennessee. Below Lake Erie, it can be found crossing the border into Canada, where it stretches between Port Stanley and Long Point to St. Thomas in southern Ontario.

Estimates of technically-recoverable gas in Marcellus Shale formation vary depending on the metric used. The following information from Penn State University illustrates the variability of these predictions: [17]

- In 2009, DOE's National Energy Technology Laboratory (NETL) estimated the Marcellus Shale's *original gas-in-place* to be approximately 1,500 trillion cubic feet (Tcf).
- In 2009, a Penn State geologist estimated the Marcellus shale has a 50 percent probability of ultimately yielding 489 Tcf, which is considered technically *recoverable reserves*.
- In April 2011, EIA reported *technically recoverable reserves* of approximately 400 Tcf.
- In August 2011, the United States Geological Survey (USGS) reported that the Marcellus Shale contained an estimated mean value of 84.2 Tcf of *undiscovered technically recoverable reserves*.
- In January 2012, EIA stated Marcellus contains 141 Tcf of natural gas classified as *unproved technically recoverable reserves* in its 2012 Annual Energy Outlook (early release version dated January 23, 2012).

4.3.3 Coal, Electricity, and Renewables

Unlike many States, New York does not rely heavily on any one fuel for electricity generation. Natural gas and nuclear power from New York's four nuclear plants are the principal generation fuels. In 2010, natural gas provided 35.7 percent and nuclear accounted for 30.5 percent of the State's power. Hydroelectricity accounted for 18.5 percent and coal accounted for nearly 10 percent of the power generated in the State. The State's mix of electricity generation sources also includes petroleum and wind. [18] New York also has major electricity connections into neighboring States and Canada, as shown in Figure 4-7.

In response to improved and more stringent environmental regulations, in recent years generators have increased the use of natural gas in place of oil and coal. The industry is primarily composed of investor-owned utilities (IOUs), governmental utilities, generation companies, transmission-only companies, and energy service companies (ESCOs).

Wholesale electricity sales and transmission services are regulated by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act, whereas retail sales of energy and the accompanying

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[16] 2009 New York State Energy Plan, http://www.nysenergyplan.com/final/New_York_State_Energy_Plan_VolumeI.pdf.

17 Penn State University, College of Agricultural Sciences, Penn State Extension, "How Much Natural Gas Can the Marcellus Shale Produce?" February 5, 2012, http://extension.psu.edu/naturalgas/news/2012/how-much-natural-gas-can-the-marcellus-shale-produce.

18 EIA, State Energy System, Table C9. Electric Power Sector Consumption Estimates, 2009, Released June 29, 2012, http://www.eia.gov/state/seds/hf.jsp?incfile=sep_sum/plain_html/sum_btu_eu.html/.

service over local distribution lines (to the extent that they are owned by the IOUs) are regulated by the PSC under the Public Service Law (PSL). Independent power producers are subject to lightened regulatory requirements by the PSC, which has also fostered the development of ESCOs that may provide energy to retail end-use customers as an alternative to energy supplied by an IOU.

The municipally-owned utilities, rural electric cooperatives, and public power authorities serve retail customers and some own generation or transmission and distribution (T&D) facilities. The public power authorities are subject only to limited regulation by the PSC, such as approvals for major transmission facilities. While the public power authorities are generally exempt from FERC jurisdiction, they have voluntarily agreed to participate in the NYISO-administered markets and are thus subject to the terms of the NYISO tariff. Municipally-owned electric utilities that take their entire electric generation supply from NYPA fall outside the PSC's ratemaking jurisdiction, while those utilities that receive supplemental power from sources other than NYPA are regulated by the PSC. The State's four rural electric cooperatives are exempt from PSC jurisdiction by virtue of Section 67 of the New York Rural Electric Cooperative Law. Municipally owned utilities, rural electric cooperatives, and public power authorities typically oversee and take responsibility for their own infrastructure needs.

In New York, electricity generally flows east from the Niagara Falls area and then south to New York City and Long Island, due to the supply and demand dynamics within the State. About 40 percent of the State's electric generating capacity is located in the New York City and Long Island area while the area's peak demand was 50 percent of statewide demand in 2008, and average end-use consumer load was about 47 percent of statewide load. Additionally, the higher operating costs associated with generating electricity in the downstate regions makes it more cost-effective to import electric power much of the time. The majority of the State's base load units are located in upstate New York, further supporting the direction of energy flow. [19]

New York is a major hydroelectric power producer, and its hydroelectric generation is the highest of any State east of the Rocky Mountains. When New York's Robert Moses Niagara plant opened near the Niagara River in 1961, it was the largest hydroelectric generation facility in the world. Today, the 2,353-megawatt power plant is still New York's largest electricity generator. Non-hydroelectric renewable energy sources contribute only minimally to the State's power grid, although New York is one of the Nation's top generators of electricity from municipal solid waste and landfill gas. As of 2008, New York ranked among the top 10 States in photovoltaic solar power capacity and had become a substantial producer of wind energy by doubling its wind energy capacity between 2006 and 2008. In September 2004, the New York PSC adopted a renewable portfolio standard requiring 24 percent of the State's electricity to be generated from renewable sources by 2013. [20]

Within the United States and Canada are four major electric interconnections subdivided into control areas to assure safe, reliable and dependable electric service.[21] These areas must be continuously monitored and controlled. Unlike most other States, New York is a control area by itself and the New York Independent System Operator (NYISO) is the designated operator for bulk power system operations within the area. The New York Control Area (NYCA) is divided into 11 zones (referred to as interfaces).

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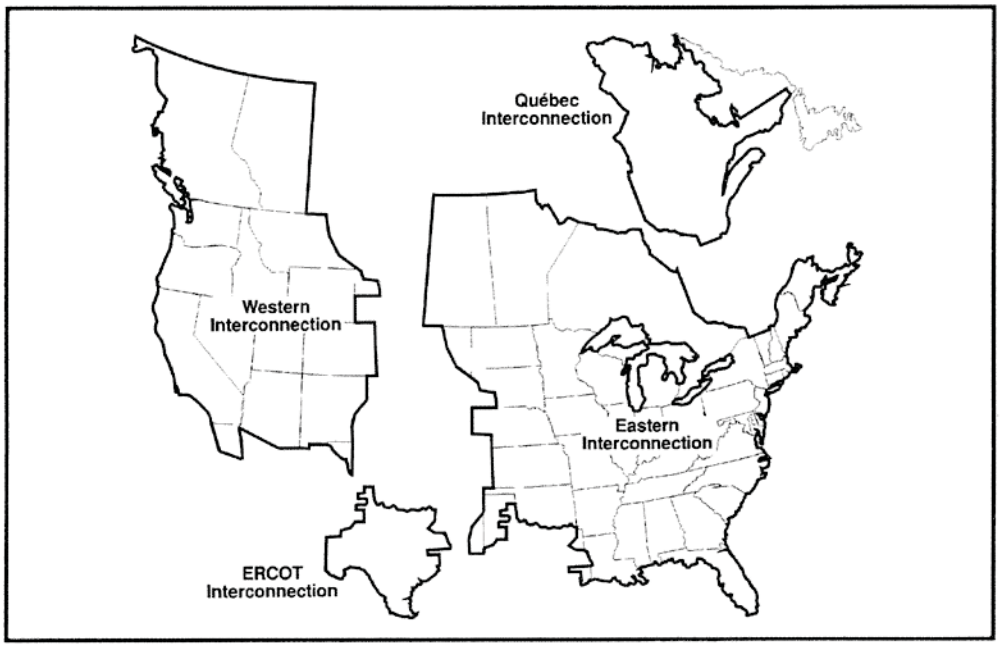
[19] From the 2009 New York State Energy Plan.

[20] EIA, State Energy Profiles, New York, Analysis, October 2009, http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=NY.

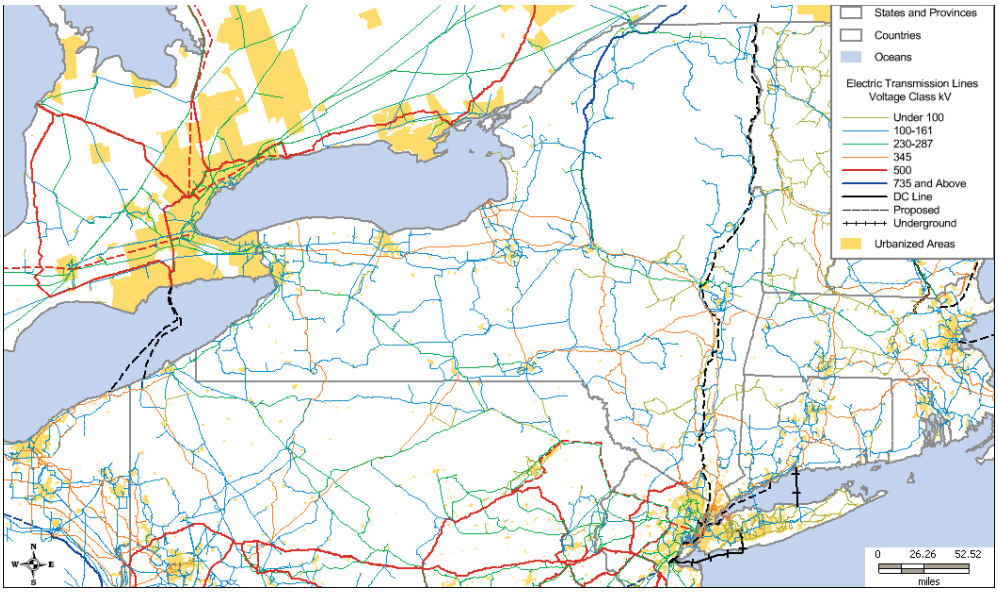
[21] As defined by the National Wind Coordinating Collaborative, "Electric power system in which operators match loads to resources within the system, maintain scheduled interchange between control areas, maintain frequency within reasonable limits, and provide sufficient generation capacity to maintain operating reserves." (http://www.nationalwind.org/issues/transmissionglossary.aspx). A copy of the Federal Energy Regulatory Commission's control areas by region can be found at: http://www.ferc.gov/eventcalendar/Files/20030904103952-ctrlareg.pdf.

Figure 4-7. US and Canadian Interconnections



Source: NERC, http://www.nerc.com/docs/docs/pubs/Control-Area-Concepts-and-Obligations.pdf

Figure 4-8. Electric Transmission in and around New York by Voltage Class



Source: data and maps from Ventyx®/ABB

The average New York household consumes about one-half the electricity of the average U.S. household, largely because few use electricity as their primary energy source for home heating and because demand for air-conditioning is low during the typically mild summer months. [22]

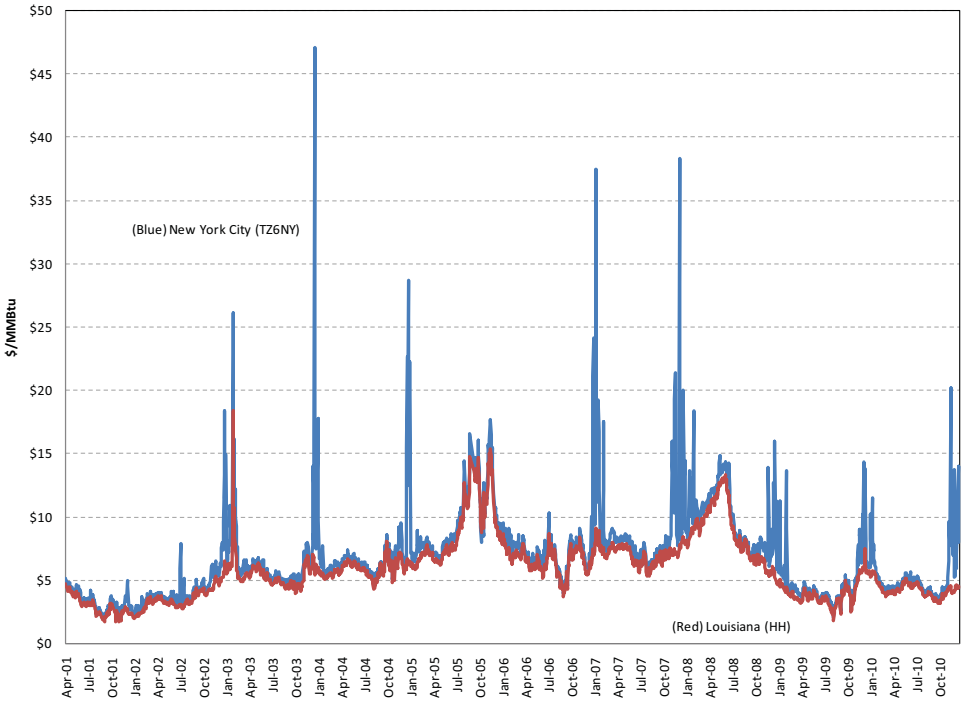
4.4 Prices

4.4.1 Natural Gas

One of the most effective ways to describe the natural gas market is by examining its pricing. This is, arguably, more efficacious for gas than the other energy sources because the gas market is relatively less complex than either electricity or petroleum markets. The natural gas market price paid by customers is composed of three major components: the wellhead price paid to the producer, interstate gas pipeline transportation costs, and the LDC delivery charge. Spot natural gas commodity [23] prices have shown an increasing trend with a high degree of volatility over the past 10 years. Natural gas commodity prices have ranged from approximately $2 per MMBtu in early 1999 to spikes as high as $47 per MMBtu in recent years.

Prices delivered to New York City include the price of the commodity plus the cost to transport the gas from the Gulf of Mexico (typically a point in Louisiana) to a common delivery point in New York City (often called the City Gate). As Figure 4-9 shows, the prices delivered to New York City tend to be far more volatile. Even though we have not recently seen prices as high as in 2003, New York City prices continue to demonstrate volatility.

Figure 4-9. Spot Natural Gas Prices in New York City and Louisiana



[22] EIA, State Energy Profiles, New York, Analysis, October 2009, http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=NY.

[23] Spot prices refer to prices negotiated for the next day, weekend, or extended weekend. Natural gas "commodity" price is measured in Louisiana (the Henry Hub (HH) pricing point). It differs from a price delivered, such as Transco Zone 6 New York (TZ6NY) that includes the cost of delivery to New York City.

Source: SAIC calculations using data from Ventyx® and the Intercontinental Exchange. See also NYSERDA, Monthly Average Price of Natural Gas- Residential, http://www.nyserda.ny.gov/Page-Sections/Energy-Prices-Supplies-and-Weather-Data/Natural-Gas/Monthly-Average-Price-of-Natural-Gas-Residential.aspx and EIA, Natural Gas: New York Price of Natural Gas Delivered to Residential Consumers, http://www.eia.gov/dnav/ng/hist/n3010ny3m.htm.

Figure 4-10 tabulates the historical percentiles for commodity prices in Louisiana and for delivered prices in New York City. This table is meant only to provide a sense of how "expensive" or "within range" prices are at a particular point in time. It uses two sets of data to establish "normal."

Figure 4-10. Louisiana and New York City Price Percentiles of Spot Natural Gas Prices, 2001-2010

	2001 through 2010		*2005 through 2010*	
	New York City	***Louisiana***	***New York City***	***Louisiana***
1%	***$2.248***	***$2.103***	***$2.786***	***$2.103***
5%	***$3.023***	***$2.766***	***$3.665***	***$2.766***
10%	***$3.540***	***$3.202***	***$4.242***	***$3.202***
20%	***$4.286***	***$3.822***	***$5.063***	***$3.822***
30%	***$4.920***	***$4.342***	***$5.752***	***$4.342***
40%	***$5.535***	***$4.842***	***$6.414***	***$4.842***
50%	***$6.179***	***$5.362***	***$7.102***	***$5.362***
60%	***$6.898***	***$5.937***	***$7.864***	***$5.937***
70%	***$7.760***	***$6.621***	***$8.770***	***$6.621***
80%	***$8.907***	***$7.522***	***$9.964***	***$7.522***
90%	***$10.784***	***$8.978***	***$11.892***	***$8.978***
95%	***$12.628***	***$10.391***	***$13.764***	***$10.391***
99%	***$16.981***	***$13.669***	***$18.104***	***$13.669***

Source: SAIC calculations using data from Ventyx® and the Intercontinental Exchange.

One of the most significant impacts to prices during the last 10 years was caused by hurricanes Katrina and Rita in 2005. As the storms made their way through the Gulf of Mexico, they damaged oil and gas production platforms, refineries, and processing plants, which resulted in prices jumping to unprecedented levels ($18.10/MMBtu for the commodity in November 2005). The two datasets included in Figure 4-10 depicts this "break" (prior/post Katrina and Rita) and reflects a frame of mind that price patterns have changed since 2005.

Prior to Katrina and Rita, prices tended to follow a somewhat more predictable pattern, increasing in the winter when demand increased and dropping during the summer months when demand lessened. Prices exhibited volatility until the spring of 2006when they returned to the approximate levels of the pre-hurricane period of 2003 to 2005, averaging $7/MMBtu. More recent data will show that the introduction of shale gas into the market has pushed 2011-2012 prices even lower. This could change, however, as shale gas is shut in as prices drift lower or finds more markets, including exports, to support continued production.

Retail prices include the commodity cost of natural gas and the pipeline and LDC delivery charges. Since the commodity price makes up a significant portion of the customer's delivered price (typically in excess of 70 percent), retail prices have exhibited a pattern of growth and volatility similar to that of the wholesale price.

V. Vulnerability and Risk Assessment, Volume 1

5.1 Overview

The New York State Energy Assurance Plan (EAP) provides the State's energy stakeholders with a guide to understanding the impact of major energy disruptions and response. It contains information about major energy sectors, their interdependencies, their vulnerabilities, and the consequences of disruption. Further, it conveys information about how energy providers plan for and manage supply shortages and disruptions.

The Vulnerability and Risk Analysis (VRA) provides a high-level overview of the energy infrastructure (electricity, natural gas, and petroleum) and supplements information in the body of the EAP by analyzing key energy infrastructures. It also identifies assets that dominate particular markets or geographic areas whose loss would have profound consequences. The VRA consists of a two-part assessment that provides more detail and technical analysis than is found in the general sections of the EAP:

- Section 1: Vulnerability and Risk Assessment – Volume 1 - Energy Asset Inventory and Assessment
- Section 2: Vulnerability and Risk Assessment – Volume 2 – Methodology Section 1, the Energy Asset Inventory, is the foundation for Section 2, Vulnerability and Risk Assessment. Section 1 provides a description of the energy infrastructure and documents the role of the individual assets. This narrative focuses on individual elements of the energy supply system for each major fuel. In addition, it examines how an asset is related to similar assets and, in some circumstances, to other energy or fuel portfolios. Historic energy flow data between assets, such as gas flow between major points on a natural gas pipeline, are also collected. For this report, over 2,000 energy asset and data points were identified to evaluate the impact and interrelationship of energy assets across the State. The sources of information for this report are publicly available data from commercial data vendors.

Section 2, the Vulnerability and Risk Assessment, *specifically* assesses energy assets, and through analysis and evaluation of associated risks, provides insight into significant consequences of disruption. The analysis in Section 2 utilizes known information sources, various in-State infrastructure assessments, and historical patterns of energy disruption. The assets identified in Section 1 form the basis for a prioritization of all identified assets using the following steps:

- Evaluating and ranking energy assets by criticality
- Identifying the most significant assets
- Rating/ranking the most critical assets

Screening criteria were used to rank energy assets and to categorize them into groups of similar criticality. These criteria are not mutually exclusive because the concepts behind criteria are not mutually exclusive (such is the case of impact and redundancy where an asset with little redundancy will likely have a great impact). This step allows responders to focus on the associated consequences of disruption according to four criteria:

High-Risk Assets – Those assets with the greatest vulnerability to disruption or loss in function. High-Risk Assets are characterized by aspects such as market dominance, relative capacity, number and sensitivity of customers served, strategic location, seasonal vulnerability, degree of redundancy, and historical evidence of disruption.

High-Impact Assets – The consequence of a disruption or loss in function to these assets would result in significant negative consequences to the State or a specific State-bounded geographic area.

High-Redundancy Assets – Assets that benefit from the availability of alternative or replacement energy assets, supplies, or procedures that could reduce or shorten an energy disruption and ameliorate the consequences.

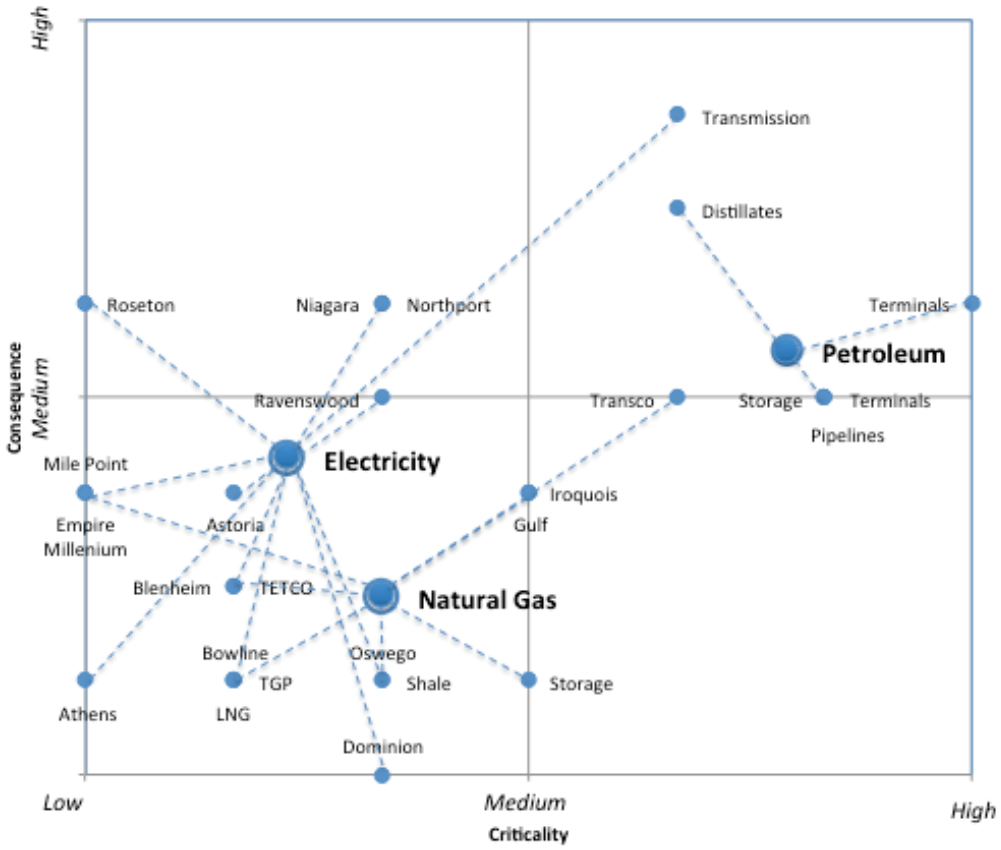
High-Frequency Assets – Assets or combinations of assets to which past events have occurred with high frequency as evidenced by publicly available records.

5.2 Projected Results – VRA Ranking Score

Based on the methodology summarized above, and further detailed in the body of this document, the results of the VRA are outlined below by sector, sub-sector, and asset. Figure 5-1 shows an example of the critical asset ranking, and provides an overview of criticality based upon the consequences of disruption or loss of function. The values portrayed in this figure are a combination of the screening criteria and then grouped by averaging the score by energy sector. For instance, the average vulnerability for distillates, terminals, pipelines, and storage specific to the petroleum sector are averaged and identified as "petroleum." The principles pertaining to the assets placed in each quadrant are fully detailed in the body of the VRA.

The VRA ranking score is based on an algorithm describing the degree to which an asset is critical to the economy, public safety and security in the State, and its direct and indirect consequence to the energy system(s) if it were disrupted or lost function. It is important to note that this VRA score does not reflect the likelihood of a particular type of disruption to any particular asset, or the ability to protect an asset from a disruption or loss of function. For example, the loss of a section of Transcontinental Gas Pipeline would have major consequences given its high market dominance and large served-customer base in New York City, but its criticality ranks low due to its historical record of high reliability.

Figure 5-1. NYS Energy Sector VRA Scores



Source: Energy Information Administration

5.3 Introduction and Purpose

This document represents a critical component of Energy Assurance planning for the State of New York. The results and the supporting materials presented in this analysis can form the basis for enhanced resiliency strategies.

5.3.1 New York State Energy Assurance Planning

The New York State Energy Research and Development Authority (NYSERDA) is tasked with improving the State's energy supply and demand profile through the reduction of energy consumption, promoting the use of renewable energy sources and protecting the environment. NYSERDA analyzes and develops policies and programs that ensure adequate, diverse energy supplies at a reasonable cost with a minimal impact on the environment. Examples of these programs include the following:

- Financing energy-related projects that reduce costs for ratepayers and energy education and training programs
- Conducting multifaceted energy and environmental research by developing programs to meet New York State's diverse economic needs
- Making energy more affordable for residential and income-eligible households
- Helping industries, schools, hospitals, municipalities, not-for-profits, and the residential sector including income-eligible residents, implement energy efficiency measures

- Providing energy analysis and planning to guide decisions made by major energy stakeholders in the private and public sectors.

In the past decade, legislative initiatives, market trends, and economic and technological forces have substantially changed the energy landscape. For example, innovations in advanced metering and smart grid technologies offer opportunities to transform the current utility/customer relationship to one of communication and coordination and to affect energy usage patterns during periods of short supply and increased costs. Customer acceptance and enthusiasm for demand-side resources and renewable energy reflects changing customer attitudes toward energy choice and control.

The New York State Energy Plan (SEP) 2009 and the upcoming 2013 SEP contain information about energy markets in the State. Instead of trying to replicate that information in this EAP, the authors encourage responders to examine prior SEPs (2002 and 2009) and the ongoing development of the 2013 version by visiting http://www.nysenergyplan.com/index.html. For the purposes of this EAP, the descriptive nature of the energy infrastructure in the State relies on the 2009 SEP.

New York State (NYS) recognized the need to enhance its Energy Assurance practices to reflect emerging issues and options. NYS also planned to update response procedures and actions that incorporate efficiency and sound industry operating practices. To support a strong and effective Energy Assurance program, NYS sought to establish an effective energy emergency communication, coordination, and information flow system for State officials and energy stakeholders. In doing so, NYS officials will be better informed and better prepared to respond to future energy emergencies.

5.3.2 Asset Inventory Methodology

The asset inventory is the foundation for risk assessment. It focuses on the physical elements of the energy supply system for each major fuel or energy source. In addition to identifying the physical assets, this effort looks at the use of one asset as related to the use of others, such as how the natural gas pipeline system is related to the petroleum or electric systems. Thus, in addition to pipeline assets, the historic energy flow data between assets, such as gas flow between major points on a natural gas pipeline, was also collected. For this study, over 2,000 energy assets and data points were identified and developed into a relational database for use by NYERDA to evaluate the impact and interrelationship of energy assets across the State.

This information provides metrics for defining a baseline of use and for estimating the impact of system failure at any given moment for any given asset. For example, understanding the ongoing normal operational and seasonal parameters of natural gas flows from an interstate pipeline to a city gate (transfer point from supply to distribution) can enable responders to assess the risk associated with a sudden reduction in supply to that city gate.

Flow data for electricity and petroleum products were also collected and provide a similar opportunity to define a baseline when estimating the risk associated with a particular event. Using such data, NYSERDA could, for example, examine the data across previous Decembers when an interruption is anticipated or has been reported in the current December. Similarly, if a shortage takes place during the summer driving season, flow data for applicable months from interstate petroleum pipelines to terminals can reveal the depth and risk of a reported motor fuel interruption.

For the identification of energy assets in New York, the methodology included the following:

- Query the major commercial and public databases
- Leverage NYSERDA knowledge and data
- Interface with other New York agencies through NYSERDA
- Meet with industry and energy experts

5.4 Data Sources

5.4.1 Electricity

The electricity industry is highly organized and centralized both in terms of asset information and real-world operations. The New York Independent System Operator (NYISO) operates the bulk generation and transmission grid in real time and has detailed procedures for responding to all types of contingencies in the bulk generation and transmission markets. NYISO also produces a variety of reports, databases, studies, and forecasts that describe the electric generation and transmission infrastructure.

The Energy Information Administration (EIA) of the U.S. Department of Energy (DOE) collects extensive data about electricity sector assets and industry operations. EIA databases were queried for consumption data on a customer class basis, and Energy Velocity, a commercial database, provided asset data as well as proprietary research for regional operations.

This study concentrated on the reliability and resiliency of electric generation and transmission. By intent, the study did not inventory the local electric utilities' distribution-level assets, such as substations or distribution wires.

5.4.2 Natural Gas

The primary sources for the identification of natural gas assets included EIA, the Federal Energy Regulatory Commission (FERC), the U.S. Department of Transportation (DOT), and Energy Velocity. Liquefied natural gas (LNG) terminal data and natural gas flow rates were obtained through Energy Velocity, and natural gas consumption data were obtained from EIA. The Northeast Gas Association provided additional data.

5.4.3 Petroleum Products

EIA reports the aggregate petroleum product consumption by product type for the State. Data on the location and capacity of terminals are available from the commercial Oil Price Information Service (OPIS). For the terminals located at ports, delivery quantity data are available from the U.S. Army Corps of Engineers. Additional data were available from the terminal operators, the State Fire Marshal, and the New York State Department of Conservation (DEC).

5.4.4 Ventyx®

Information gathered through Velocity Suite® which is a product of Ventyx® (an ABB company) is used extensively throughout this report, and is referred to as "Ventyx®" for convenience. Ventyx® that aggregates information from many sources and is broadly used by energy professionals to research information pertinent to the energy industry. The data sources are varied but largely aggregate publicly available information as reported by different agencies. The original source of the information queried is publicly available unless otherwise stated. Instead of simply querying the information, the Ventyx® application transforms, summarizes, and adds value to the data. Some of the elements from this database are as follows:

Fuels: Monthly fossil fuel purchases, generation and consumption by fuel type, coal production and transportation, regulated financial data for gas utilities and pipeline companies, SEC financials, gas retail sales volume and revenue, gas storage, transportation rates, daily delivered volume, and market price data

Power: Regulated financial data (such as revenue and purchases of fuel), SEC financial data, retail and wholesale power volumes and dollars, existing and future generating capacity, power station production costs, operation statistics for companies and plants, and market price data

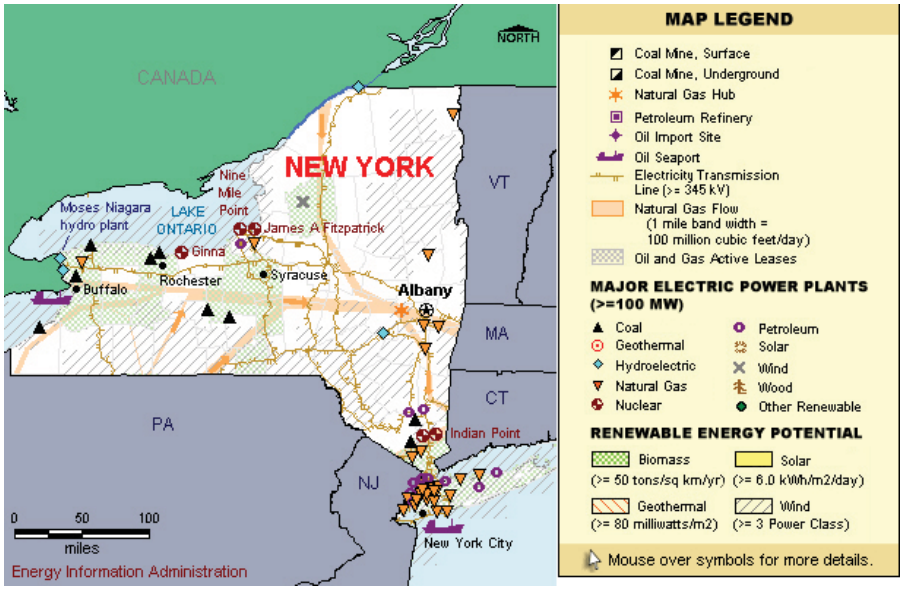
Market Operations: Estimated fuel quantities, fixed and variable costs for each unit, capacity blocks and associated heat rates, Corporation (NERC) Generator Availability Data Set (GADS) outage and reliability data, historic hourly loads, 10-year load forecasts, unit ramp rates, emissions control technology, and O&M expenses

5.5 Volume 1: Energy Asset Inventory

5.5.1 New York State Energy Market

This section provides a summary understanding of energy in NYS including the impact and importance of dominant assets and their interdependencies (see Figure 5-2). Although this view is only a partial perspective of the importance of particular assets in the State, it provides a starting point to indicate how the State relies on a particular source of energy and its assets. The analysis identifies the interaction among various energy sources. For example, natural gas and the entire associated infrastructure for generating electricity via natural gas are critical components of energy in the State. Motor gasoline and power generation from hydro sources are important sources as well.

Figure 5-2. EIA State Energy Map[24]



Source: EIA, State Energy Profiles, New York, http://www.eia.gov/state/state-energy-profiles.cfm?sid=NY

5.5.2 Overview of New York Energy Reserves and Consumption

New York has minor reserves of oil and conventional natural gas, found primarily in the far western part of the State near Lake Erie. The natural gas bearing Marcellus Shale formation extends into the Southern Tier and Western regions of the State.

Although New York's fossil fuel resources are limited, the State possesses considerable renewable energy potential. Several powerful rivers, including the Niagara and the Hudson, provide some of the largest hydropower resources in the Nation. The State produces more hydroelectric power than any other State

[24] EIA, State Energy Profiles, New York, http://www.eia.gov/state/state-energy-profiles.cfm?sid=NY.

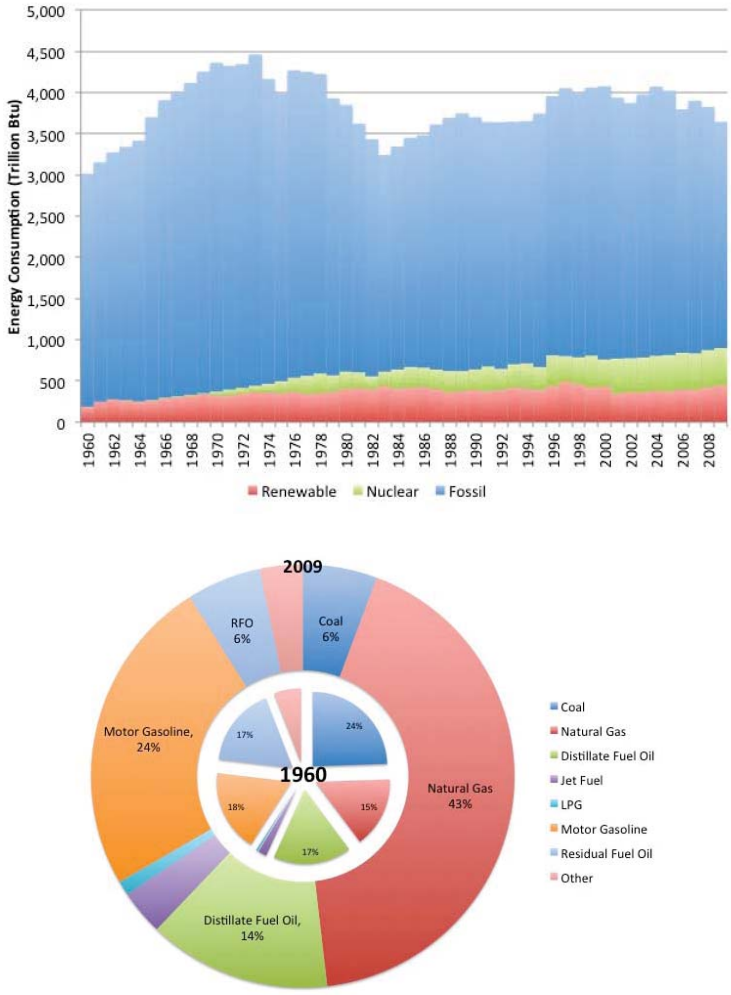
east of the Rocky Mountains. The 2,353-MW Robert Moses Niagara plant, harnessing power from the Niagara River, is one of the largest hydroelectric facilities in the world.

New York's Catskill and Adirondack mountains offer substantial potential for wind power. Parts of New York have dense forest, allowing for potential wood fuel harvesting.

Energy intensity and per capita energy consumption in New York are among the lowest in the U.S. due in part to the region's widely used mass transportation systems in the New York City area. The commercial and residential sectors lead State-wide energy demand; the transportation sector is a major consumer of petroleum products.

Consumption of energy in New York is dominated by fossil fuels; from 1960 through 2009 the concentration of fossil fuels evolved from a focus on distillate fuel oil and coal to natural gas and motor gasoline (Figure 5-3). Total energy consumption in the same period increased by 27 percent, but fossil fuel consumption decreased almost three percent. Most of the growth in energy consumption came from a different mix in fossil fuels (natural gas growing significantly) and renewable sources (61 percent of all renewables come from hydroelectric power and 24 percent come from wood and waste). The average New York household consumes about one-half the electricity of the average U.S. household, largely because few use electricity as their primary energy source for home heating and because demand for air-conditioning is low during the typically mild summer months.

Figure 5-3. Primary NY Energy Consumption Estimates, Selected Years, 1960-2009



Source: EIA, State Energy Data System, http://www.eia.gov/state/seds/hf.jsp?incfile=sep_use/total/use_tot_Nycb.html&mstate=New%20York, with additional calculations from SAIC

The New York Harbor, located between New York and New Jersey, has a petroleum bulk terminal storage capacity of over 75 million barrels, making it the largest petroleum product hub in the Northeast.

5.5.3 New York Electricity Ownership and Operations

Industry Ownership

New York is one of the five largest States in terms of nuclear capacity and generation, accounting for approximately 5 percent of the national totals. Nuclear power from New York's four nuclear plants accounts for less than 13 percent of New York's electric capacity, but it produces nearly 30 percent of the State's electricity (Table 5-2). Unlike many States, New York does not rely heavily on one fuel for electricity generation. Nuclear power and natural gas are the leading generation fuels, each typically accounting for about three-tenths of State generation. Hydroelectricity, coal, and petroleum each account for a substantial share of the power generated in the State, as well. New York also imports electricity from neighboring States and Canada.

The electricity industry in New York is primarily composed of investor-owned utilities, governmental utilities, generation companies, transmission-only companies, and energy service companies (ESCOs). The previously vertically integrated investor-owned utilities (IOUs) have since divested the majority of their generation assets while retaining most of their transmission and distribution delivery systems as well as customer service functions. The purchasers of those generation assets, known as independent power producers (IPPs), now serve as the primary generation suppliers in the State. Governmental-owned utilities include the New York Power Authority (NYPA), the Long Island Power Authority (LIPA), municipally-owned electric utilities, and rural electric cooperatives. In general, the generation suppliers engage in wholesale sales (i.e., sales for resale) of energy, ancillary services, and capacity through competitive markets administered by the New York Independent System Operator (NYISO). Transmission-only businesses, energy service companies, and both IOUs and governmental utilities provide a variety of other retail services to customers.

5.5.4 Fuel for Electricity Generation

The fuel mix for generation has changed over the years. Driven by more stringent environmental regulations, commodity prices, and new technology, generators have increased the use of natural gas in place of oil and coal. Notwithstanding environmental benefits, the State still needs to safeguard against over dependency on one resource for generating electricity. Fuel supply disruptions or other factors can pose reliability risks and/or cause significantly increased price levels and price volatility. It is important to continue safe operations of all generation resources to support the State's energy, environmental, and economic objectives. Similarly, there is value in the continued availability of dual-fuel generation capability (i.e., natural gas/oil), especially in the New York City area where a concentration of interruptible natural gas customers provides capacity relief for firm customers during certain winter conditions (e.g., strong peak demand or seasonal shortage). In order to maintain diversity, it is also prudent for State suppliers to continually evaluate and develop advanced coal technologies. Table 5-1 illustrates electricity consumption in New York State from 1990 to 2009.

Table 5-1. New York State Electricity Consumption 1990-2009 (Million Kilowatt-hours)

Category	1990	2000	2005	2006	2007	2008	2009
Supply							
Generation							
Electric Utilities	128,655	73,188	39,963	41,599	40,248	38,170	35,771
Independent Power Producers	2,433	40,757	90,252	86,965	91,333	89,612	86,856
Combined Heat and Power, Electric	1,262	21,188	14,475	11,624	12,388	10,722	8,866
Electric Power Sector Generation Subtotal	**132,350**	**135,132**	**144,690**	**140,187**	**143,969**	**138,504**	**131,494**
Combined Heat and Power, Commercial	178	620	672	727	663	664	546
Combined Heat and Power, Industrial	2,818	2,327	1,525	1,351	1,246	1,154	1,111
Industrial and Commercial Generation Subtotal	**2,996**	**2,947**	**2,197**	**2,078**	**1,909**	**1,818**	**1,657**
Total Net Generation	**135,346**	**138,079**	**146,887**	**142,265**	**145,879**	**140,322**	**133,151**
Total International Imports	**3,802**	**10,663**	**10,717**	**12,495**	**14,366**	**16,678**	**11,254**
Total Supply	**139,148**	**148,742**	**157,605**	**154,761**	**160,245**	**157,000**	**144,405**
Disposition							
Retail Sales							
Full Service Providers	129,324	124,508	93,237	86,258	86,299	81,636	77,326
Energy-Only Providers	-	17,519	56,673	55,136	61,622	62,120	62,432
Facility Direct Retail Sales[1]	-	-	238	844	256	296	276
Total Electric Industry Retail Sales	**129,324**	**142,027**	**150,148**	**142,238**	**148,178**	**144,053**	**140,034**
Direct Use	**2,739**	**4,328**	**3,803**	**1,718**	**1,595R**	**1,787R**	**1,567**
Total International Exports	**3,090**	**2,000**	**3,437R**	**2,510**	**3,078**	**3,361**	**1,459**
Estimated Losses	**9,689**	**10,108**	**12,009R**	**6,700**	**8,994R**	**8,649R**	**8,951**
Net Interstate Trade[2]	**-5,694**	**-9,721**	**-11,792R**	**1,595**	**-1,600R**	**-851R**	**-7,606**
Total Disposition	**139,148R**	**148,742R**	**157,605R**	**154,761R**	**160,245R**	**157,000R**	**144,405**
Net Trade Index (ratio)[3]	**0.96**	**0.94**	**0.93**	**1.01**	**0.99R**	**0.99R**	**0.95**

[1]Facility Direct Retail Sales are electricity sales from non utility power producers which reported electricity sales to a retail customer.
[2]Net Interstate Trade = Total Supply - (Total Electric Industry Retail Sales + Direct Use + Total International Exports (if applies) + Estimated Losses).
[3]Net Trade Index is the sum of Total Supply / (Total Disposition - Net Interstate Trade).
R = Revised.
- (dash) = Data not available.
Notes: Totals may not equal sum of components because of independent rounding. Estimated Losses are reported at the utility level, and then allocated to States based on the utility`s retail sales by State. Reported losses may include electricity unaccounted for by the utility. Direct use is commercial or industrial use of electricity that (1) is self-generated (2) is produced by either the same entity that consumes the power or an affiliate, and (3) is used in direct support of a service or industrial process
Sources: U.S. Energy Information Administration, Form EIA-923, "Power Plant Operations Report" and predecessor forms. U.S. Energy Information Administration, Form EIA-860, "Annual Electric Generator Report." U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report." DOE, Office of Electricity

5.5.5 Other Issues

Various failures led to major electricity outages affecting New York in 1965, 1977, and 2003. The August 2003 blackout was the most severe blackout in North American history, affecting an estimated 55 million people in the U.S. Northeast and eastern Canada. For safety reasons, nuclear power plants are required by federal law to shut down if back-up power systems fail, and all four of New York's nuclear power plants were forced offline during the 2003 incident. As a result, almost the entire State lost power.

New York has taken steps to encourage the conservation of electricity-generating fuels. The Public Service Commission (PSC) established an Energy Efficiency Portfolio Standard (EEPS) designed to reduce energy use in New York State by 15 percent from what it otherwise would have been by 2015 (also called the "15-by-15 energy efficiency goal")[25]. In his 2009 State of the State address, New York Governor Paterson announced New York's "45 by 15" clean energy goal that challenges the State to meet 45 percent of its electricity needs by 2015 through increased energy efficiency and renewable energy. This goal combines the PSC's "15-by-15" EEPS initiative goal with a goal of simultaneously meeting 30 percent of the State's electricity supply needs through renewable resources by 2015.

5.5.6 Alternative Power Generation

When New York's Robert Moses Niagara plant opened near the Niagara River in 1961, it was the largest hydroelectric generation facility in the world. Today, the 2,353-MW power plant is still New York's largest electricity generator. Non-hydroelectric renewable energy sources contribute only minimally to the State's power grid, although New York is one of the Nation's top generators of electricity from municipal solid waste and landfill gas. As of 2008, New York ranked among the top 10 States in photovoltaic solar power capacity and had become a substantial producer of wind energy by doubling its wind energy

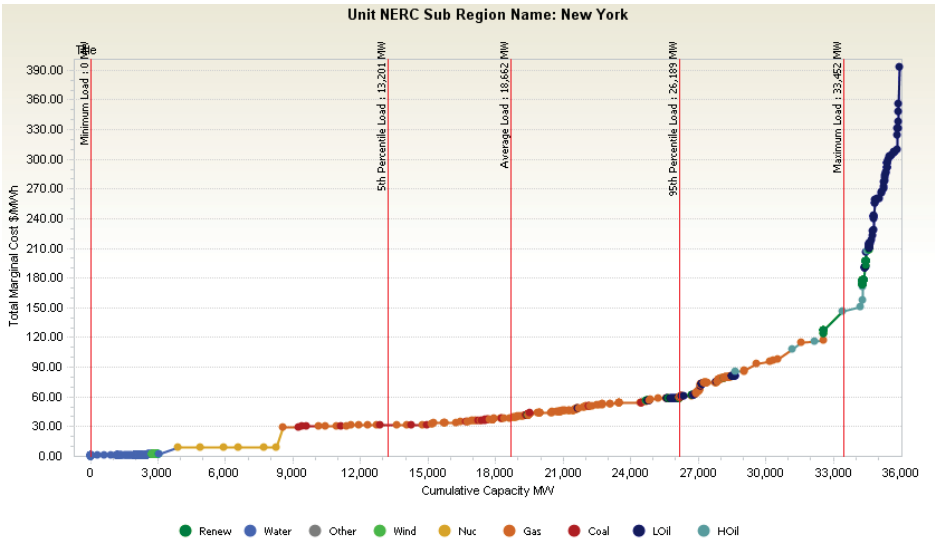
[25] http://www.nysenergyplan.com/final/Energy_Infrastructure_IB.pdf.

capacity between 2006 and 2008. In September 2004, the New York Public Service Commission adopted a renewable portfolio standard requiring 24 percent of the State's electricity to be generated from renewable sources by 2013.

5.5.7 Generation Asset Evaluation

Generation of electricity is dominated by water, nuclear, and natural gas. When analyzed according the capacity-adjusted marginal cost of how each plant contributes to the supply curve, several assets stand out and merit special attention given their obvious contribution to Energy Assurance (as they are first to dispatch and make the largest contribution to the dispatch). The largest generators are the ones that have the strongest contribution to the supply curve since they represent the lowest marginal cost supply to the system. Figure 5-4 illustrates the State's energy power curve. Table 5-2 focuses on summer capacity and net generation, two common data sets essential to evaluating State generation patterns. The remainder of this section focuses on the largest of these assets and their basic operating characteristics.

Figure 5-4. New York State Energy Supply Curve



Source: Ventyx®

Table 5-2. New York Total Electric Power Industry, Summer Capacity and Net Generation, by Energy Source, 2008

New York Total Electric Power Industry, Summer Capacity and Net Generation, by Energy Source, 2008

Primary Energy Source	Summer Capacity (MW)	Share of State Total (Percent)	Net Generation (Thousand MWh)	Share of State Total (Percent)
Nuclear	**5,264**	**13.6**	**43,209**	**30.8**
Coal	2,899	7.5	19,154	13.7
Hydro and Pumped Storage	5,596	14.5	26,051	18.6
Natural Gas	16,554	42.8	43,856	31.3
Other[1]	-	-	987	0.7
Other Renewable[1]	1,134	2.9	3,319	2.4
Petroleum	7,273	18.8	3,745	2.7
Total	**38,720**	**100.0**	**140,322**	**100.0**

[1]Municipal Solid Waste net generation is allocated according to the biogenic and non-biogenic components of the fuel; however, all Municipal Solid Waste summer capacity is classified as Renewable.
- = No data reported.
Notes: Totals may not equal sum of components due to independent rounding.
Other: Blast furnace gas, propane gas, other manufactured and waste gases derived from fossil fuels, non-biogenic municipal solid waste, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, tire-derived fuel, and miscellaneous technologies.
Other Renewable: Wood, black liquor, other wood waste, biogenic municipal solid waste, landfill gas, sludge waste, agriculture byproducts, other biomass, geothermal, solar thermal, photovoltaic energy, and wind.
Sources: Form EIA-860, "Annual Electric Generator Report," and Form EIA-923, "Power Plant Operations Report."

Source: Energy Information Administration

Robert Moses Niagara

The Robert Moses Niagara Hydroelectric Power Station is a hydroelectric power station in Lewiston, New York near Niagara Falls. The plant is operated by NYPA and diverts water from Niagara River above Niagara Falls and returns the water into the lower portion of the river near Lake Ontario. It utilizes 13 generators with a total installed capacity of 2,353 MW. The plant is located directly opposite to the Sir Adam Beck Hydroelectric Power Stations in Ontario, Canada.

The Niagara project. It is the largest electricity producer in New York State, generating 2.4 million kW – enough power to light 24 million 100-watt bulbs at once. This low-cost electricity saves the State's residents and businesses hundreds of millions of dollars each year.

The Niagara project is located about 4 ½ miles downstream from the Falls and consists of two main facilities: the Robert Moses Niagara Power Plant, with 13 turbines, and the Lewiston Pump-Generating Plant, with 12 pump-turbines. In between the two plants is a fore-bay capable of holding about 740 million gallons of water; behind the Lewiston plant, a 1,900-acre reservoir holds additional supplies of water.

At night, when electricity demand is low, the Lewiston units operate as pumps, transporting water from the fore-bay up to the plant's reservoir. During the daytime, when electricity use peaks, the Lewiston pumps are reversed and become generators, similar to those at the Moses plant.

Ravenswood Generating Station

Ravenswood Generating Station (Ravenswood), located in Long Island City, is a 2,296-MW plant that consists of 21 units employing steam turbine, combined cycle, and combustion turbine technology. Although natural gas is the primary fuel source, boilers for units 10, 20, and 30 are gas/oil fired, and produce electricity twice through the use of waste steam exhausted after the primary generation, increasing production and efficiency. No significant levels of oil use has been recorded since 2004. It is owned and operated by TransCanada, and the nearest natural gas price point is Transco Z6 NY.

Units 10 and 20 each have a single controlled circulation, dual furnace, balanced draft Combustion Engineering boiler, and a cross-compound General Electric turbine generator. Each unit is rated at 385 MW. Two identical controlled circulation, balanced draft, divided furnace boilers by Combustion Engineering and an Allis Chalmers/Westinghouse cross-compound turbine generator produce a total of 981 MW of power in Unit 30.

The boilers in Units 10, 20, and 30 are all capable of burning both No. 6 fuel and natural gas, which enables TransCanada to generate electricity with the most economic fuel mix to meet system demands. Combined cycle technology was added to the Ravenswood station with the installation of Unit 40 in 2004. Unit 40 consists of a General Electric 7FA combustion turbine generator with an ALSTOM steam turbine generator, a Kawasaki heat recovery system generator, and an air-cooled condenser. Unit 40, a 250-MW unit, burns both natural gas and kerosene. The combined cycle technology used in Unit 40 yields an operating efficiency that is 50 percent higher than that of conventional steam technology. Multiple combustion turbines are utilized in a simple cycle configuration to meet peak system demand.

Nine Mile Point Nuclear Station

Located in Oswego County, Nine Mile Point Nuclear Station is operated by Constellation Energy Nuclear Group (CENG), a joint venture between Exelon and Électricité de France (EDF) Group that owns 100 percent of Unit 1 and 82 percent of Unit 2. LIPA owns the other 18 percent of Unit 2. Exelon owns 50.01 percent of CENG, and is a leading supplier of energy products and services to wholesale and retail electric and natural gas customers. EDF owns the other 49.99 percent of CENG, and is developing

strategies in North America for nuclear energy, renewables, and trading. [26] On October 31, 2006, the licenses for Units 1 and 2 were extended by 20 years. Nine Mile Point Unit 2 is a newer model BWR that uses a Mark II containment design. The cooling system draws water from Lake Ontario. Unit 2 relies on a 543 foot high natural draft-cooling tower (Table 5-3).

Table 5-3. Nine Mile Point Nuclear Station Profile

Unit	Summer Capacity (MW)	Net Generation (Thousand MWh)	Summer Capacity Factor (Percent)	Type	Commercial Operation Date	License Expiration Date
1	621	5,347	98.3	BWR	12/1/1969	8/22/2029
2	1,143	9,041	90.3	BWR	3/11/1988	10/31/2046
	1,764	**14,388**	**93.1**			

Data for 2008
BWR = Boiling Water Reactor.
Notes: Totals may not equal sum of components due to independent rounding.
Sources: Form EIA-860, "Annual Electric Generator Report," and Form EIA-923, "Power Plant Operations Report."

Source: Energy Information Administration. BWR: Boiling Water Reactor. Reports from the Nuclear Regulatory Commission (NRC) on this plant can be found at http://www.nrc.gov/info-finder/reactor/nmp2.html.

CNEG has established procedures to advise the public in the unlikely event of a plant emergency. These procedures cover emergency planning, and communicating with the Public and Emergency Planning Zone.

Oswego Harbor Power

Oswego Generating Station is located on 93 acres along the south shore of Lake Ontario, and can generate up to 1,635 MW of electricity, enough to support over 1.3 million homes. NRG Energy (NRG) acquired the station from Niagara Mohawk Power in October 1999. The facility consists of two large steam generators that are primarily oil-fueled. Unit 5 was built in 1975 and Unit 6 in 1979. Both are currently operating as peaking units and sell power to the New York Independent System Operator (NYISO) capacity market.

Northport

The Northport Power Station is a natural gas and conventional oil electric power generating station located on the north shore of Long Island, at Waterside Avenue and Eatons Neck Road in Northport. The facility was built by the Long Island Lighting Company (LILCO) in 1967. In August 2007, the Northport Power Station became part of National Grid USA as part of their purchase of KeySpan Energy. The plant's electric output is distributed via LIPA. Northport is the largest oil-fired electric generating station on the East Coast.

Northport power station is National Grid's largest power station and its largest single source of greenhouse gas emissions. Its four 375-MW turbine generators produce a major portion of Long Island's annual electric generation. As is the case with many fossil fuel generating plants in the United States, these generators were built in the 1960s and 1970s and have been significantly updated to reduce emissions. The focal point of the reduction efforts is the more efficient Dense Pack™ steam turbine unit, manufactured by General Electric. The new turbine contains nine rows of blades instead of the conventional seven. The extra rows provide greater mechanical energy from the same amount of steam, which creates more electricity from the same amount of fuel. The end result is a more efficient process and fewer carbon emissions per kilowatt-hour generated.

[26] Constellation Energy merged with Exelon in 2012. The role of EDF group in this merger and the continuity of the CENG may change as merger dynamics progress.

Astoria Generating Station

Astoria Generating Company, L.P. owns and operates power generation facilities with a total capacity of over 2,100 MW in New York City. This subsidiary sells energy and capacity into the NYISO market, representing generation sufficient to serve approximately 20 percent of the overall load in the in State. Astoria Generating Company, L.P., is a wholly owned subsidiary of US Power Generating Company.

Astoria Generating Station is a 1,280-MW fuel oil and natural gas plant located in Astoria, in the Queens borough of New York City, bounded by the East River and Luyster Creek. Astoria's dispatch level is intermediate. The plant is part of a larger complex that covers approximately 300 acres. Most of the complex is used for utility purposes, including power generation, indoor storage, oil storage, liquefied natural gas storage, vehicle storage and servicing, and office space.

On September 2, 2011, Astoria Generating Company announced plans for a potential restructuring as the value of capacity pricing in July, August, and September 2011 dropped approximately 50 percent.

Roseton Generating Station

Roseton Generating Station is a 1,200-MW gas/oil peaking unit operated by Dynegy, Inc. (Dynegy) and located in the town of Newburgh. The facility operates under a long-term lease arrangement and the site is adjacent to the Danskammer facility (also owned by Dynegy) with which it shares common resources such as fuel handling, a docking terminal, personnel, and systems.

Since April 2005, the plant's operations have been opposed by environmental advocates, especially in the form of groups challenging the Best Technology Available determination for the operation of cooling water intake structures in connecting with point source thermal discharge. The plant is now operating sporadically at partial capacity. Public records gathered from filings to the U.S. Environmental Protection Agency (EPA)'s continuous emissions monitors report no generation between end of January 2011 and this draft report.

Bowline Point

Bowline Point is a 1,139-MW natural gas- and oil-fired steam electric generating facility sited along the Hudson River in the Town of Haverstraw, and owned by GenOn. The power plant has two steam generating units that became operational in 1972 (Unit 1) and 1974 (Unit 2). Even though the steam turbine can be fired with either gas or oil, the aggregate use of the plant has diminished since 2005 and it has operated largely by using natural gas.

Bowline Generating Station is operating on a State Pollutant Discharge Elimination System (SPDES) permit that expired in 1992. Bowline Generating Station employs a once-through cooling system that is responsible for entraining 127 million fish eggs and larvae each year, and impinging another 30,000 adult and juvenile fish. As a result of lawsuits brought by Riverkeeper (a New York-based clean water advocate organization), the New York State Department of Environmental Conservation (DEC) issued new draft permits for four existing power plants on the Hudson River, including Bowline, between 2003and 2005. The permit for Bowline calls for the installation of a seasonal coarse barrier net, variable speed pumps, and a fine mesh barrier net, but not closed-cycle cooling. A final permit has not been issued.

Athens Generating Unit

Athens Generating is a 1,080-MW combined cycle generating facility located in the town of Athens, 30 miles south of Albany, in Greene County. The facility houses three Siemens 501G combustion turbine generators (CC1, CC2, and CC3). These generators are powered by natural gas combined cycle technology that provides efficiency nearly double that of older power plants. Athens Generating sells its electricity competitively and is strategically positioned to boost electric reliability in the Mid-Hudson Valley, southeastern New York, and New York City regions. Athens Generating is owned by New Athens

Generating Company, LLC, and is managed by Competitive Power Ventures of Silver Spring, Maryland. Plant operations are managed by North American Energy Services located in Issaquah, Washington.

Blenheim-Gilboa

Blenheim-Gilboa Pumped Storage Power Project generates more than one million kW of electricity in peak demand periods by drawing water from Schoharie Creek and recycling it between two reservoirs. It is operated by NYPA and serves two vital functions: it saves money for New York consumers by providing low-cost electricity during peak demand, and it stores water for emergency power production. If necessary, this project can be up and running within two minutes. It can substitute quickly if another plant or line suddenly goes out of service.

Each of the reservoirs – one atop Brown Mountain, the other at its foot – holds five billion gallons of water. When the facility is generating power, the water cascades down a concrete shaft that's five times taller than Niagara Falls. When it is not generating electricity – usually at night or over the weekend – the facility reverses the process and pumps the water back up the shaft for storage.

The system allows the operator to "go with the flow in addressing the daily variance in Statewide electricity demand. NYPA can generate power when it is needed – generally in the late afternoon or early evening – and it can store the water when the power is not needed. The electricity Blenheim-Gilboa uses to return water to its upper reservoir is inexpensive surplus power made available during low-demand periods. The cost of this power is cheaper than the electricity the project replaces during peak-demand periods the following day.

At Blenheim-Gilboa, NYPA generates electricity at the powerhouse, a concrete structure that sits at the base of Brown Mountain on the banks of the lower reservoir. More than three-quarters of the facility is underground.

A $135-million, four-year program to modernize and extend the life of the Blenheim-Gilboa project was completed in May 2010. As part of the program, one of project's four turbine-generator units was taken out of service each fall for approximately eight months. Most of the units' mechanical and electrical components were replaced with repairs made to virtually all other parts. Upon completion of the project, each of the four units had a generating capacity of 290 MW, providing an overall project generating capacity of 1,160 MW.

5.6 Overview of NYS Electricity Transmission[27]

As noted elsewhere, the FERC-designated Regional Transmission Organization (RTO) for New York is the New York Independent Service Operator (NYISO). NYISO employs over 400 people and occupies two locations in the Albany area. NYISO administers New York's competitive wholesale electricity markets, conducting comprehensive planning for the State's electric power system and advancing the technological infrastructure of the electric system serving the State. The NYISO mission, in collaboration with all stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability.
- Operating open, fair, and competitive wholesale electricity markets.
- Planning the power system for the future.
- Providing factual information to policy makers, stakeholders, and investors in the power system.

[27] This section borrows from the 2011 NYISO Emergency Operations Manual, http://www.nyiso.com/public/webdocs/documents/manuals/operations/em_op_mnl.pdf.

Under the terms of the NYISO Agreement, the NYISO/Transmission Owners Agreement, and the NYISO/New York State Reliability Council (NYSRC) Agreement, NYISO has the authority and responsibility to direct the operation of the New York State Power System in order to maintain system reliability. Power systems are vulnerable to a loss of generating equipment, transmission facilities, or unexpected load changes. These disturbances may be of, or develop into, a magnitude sufficient to affect the reliable operation of the New York Control Area (NYCA). Severe system disturbances generally result in critically loaded transmission facilities, critical frequency deviations, high or low voltage conditions, or stability problems.

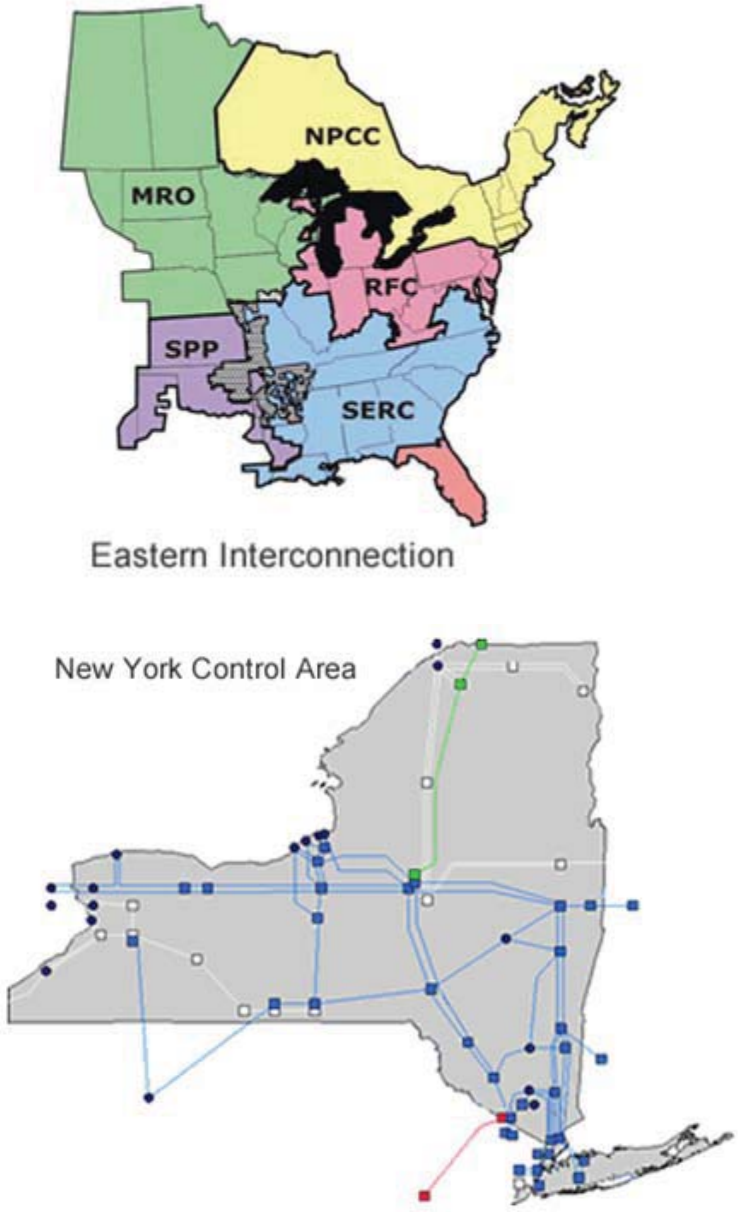
NERC Reliability Standards provide NERC Registered Entities with the authority to take actions for mitigating system operating limits and interconnection reliability operating limits. Transmission owners must disconnect their affected facility if conditions such as an overload, an abnormal voltage, or reactive condition persists. When doing so, the transmission owner must notify the NYISO and all neighboring transmission owners impacted by a disconnection prior to switching, if time permits, or immediately after switching. NYISO maintains the safety and short-term reliability of the NYS transmission system in accordance with reliability rules and with the NYISO/NYSRC (Reliability Council) Agreement and the NYISO/TO (Transmission Operator) Agreement.

Reliable operation of the bulk power system requires constant vigilance. Power typically flows from northern and western New York to the population centers in the southeastern part of the State. However, sufficient transmission capacity is not always available to move power where needed, creating congestion on the system. In addition, New York State is a regional power hub, located at the crossroads of a robust and busy power exchange. The mix of power supply resources available to serve New York electricity demands is varied and the balance of those resources is different for each region of the State.

MRO	Mid Western Reliability Organization
NPCC	Northeast Power Coordinating Council
RFC	Reliability First Corporation
SERC	SERC Reliability Corporation
SPC	Southwest Power Pool

NYISO maintains strict compliance with the rules set forth by NERC, the Northeast Power Coordinating Council (NPCC), and the NYSRC. It is also responsible for the NYCA, which is part of the Eastern Interconnection, a vast area of interconnected power systems that cover most of the eastern United States and Canada (Figure 5-5). A major concern for the Interconnect (also known as a grid) is matching the electric frequency of transmitted power so that connecting systems are electrically compatible. This is accomplished by constantly maintaining a balance between generation and load (at a frequency of 60 hertz (Hz)). Grid operations also involve “securing” the system, or managing power flows to avoid damaging equipment. This is accomplished by ensuring that voltage on each transmission line is maintained within appropriate operational limits.

Figure 5-5. Eastern Interconnection/New York Control Area



Source: NYISO

The NYISO 2011 Emergency Operations Manual addresses NYISO's and other market participants' actions under emergency conditions. In cases where NYISO judges that the market cannot provide needed services within established criteria, supplemental electricity is drawn from other generators that can provide the most expeditious relief. NYISO restores the NYS power system to normal operation as soon as possible following any situations where emergency actions have been taken.

5.7 Overview of Natural Gas

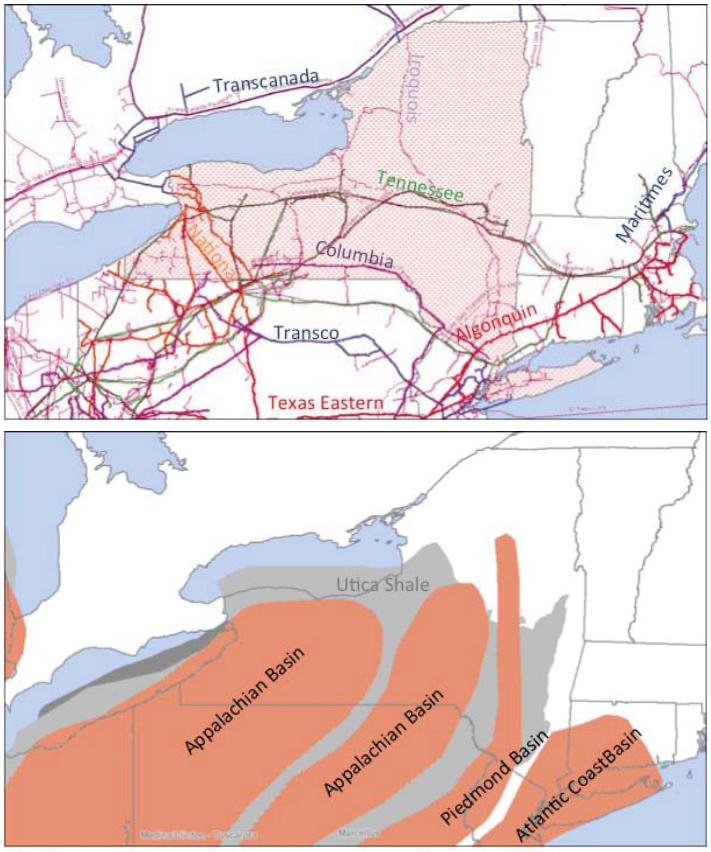
New York currently uses approximately 1,200 billion cubic feet (Bcf) of natural gas per year, making it the fourth largest gas consuming State in the Nation. Although western New York produces natural gas,

over 95 percent of New York's natural gas supply still is brought in via pipeline from other States – principally in the U.S. Gulf Coast region – and Canada. The Transcontinental and Tennessee Gas Transmission pipelines (Transco and TGP, respectively) from the Gulf Coast and the Iroquois pipeline from Canada link up with local gas distribution networks that supply the New York City metropolitan area and Long Island. Numerous other gas transmission systems branch in from Pennsylvania and Canada to feed other parts of the State.

5.7.1 New York Natural Gas Transportation in Depth

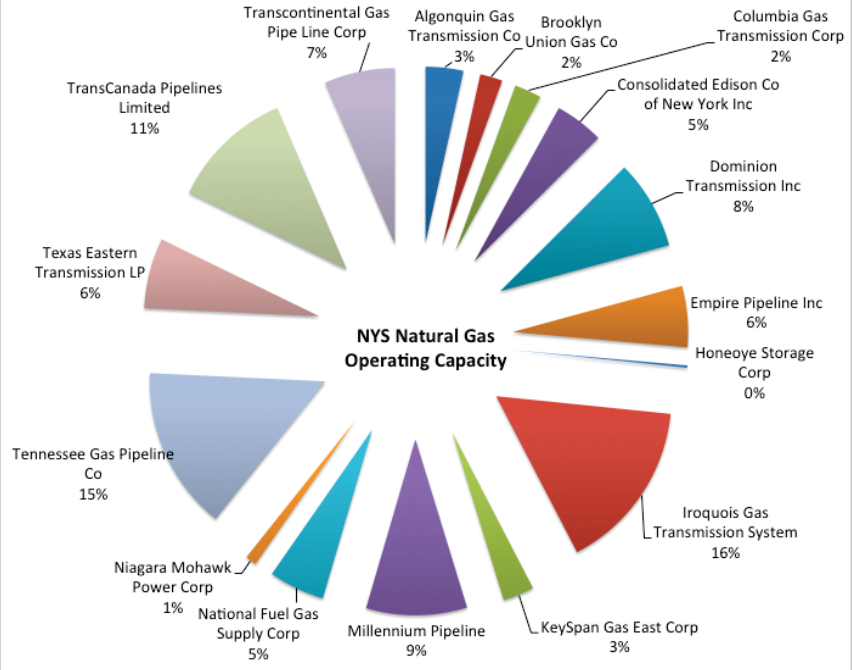
According to figures compiled by Ventyx®, there are at least sixteen natural gas pipelines delivering natural gas to New York State (Figure 5-6). Figure 5-7 provides further information about State pipeline operating gas capacity.

Figure 5-6. Natural Gas Pipelines and Basins in New York State



Source: Ventyx® using data from individual company Bulletin Board Systems (BBS) and additional calculations from SAIC

Figure 5-7. Natural Gas Pipelines and Holding Companies Delivering Gas to and in New York State



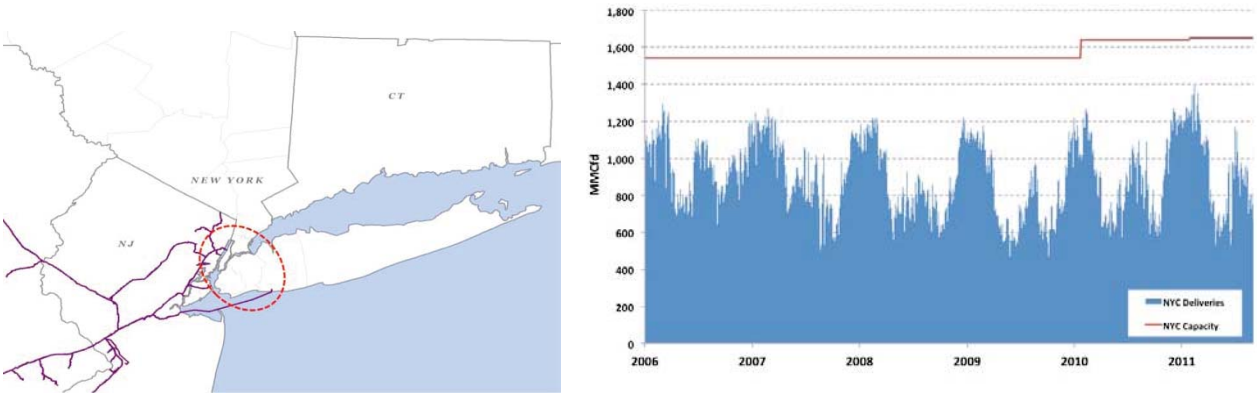
Holding Company/Pipeline	Operating Capacity (Bcf)
Consolidated Edison Inc	**1.14**
Consolidated Edison Co of New York Inc	1.14
Dominion Resources Inc	**2.09**
Dominion Transmission Inc	2.09
El Paso Corp	**3.81**
Tennessee Gas Pipeline Co	3.81
National Fuel Gas Co	**2.73**
Empire Pipeline Inc	1.42
National Fuel Gas Supply Corp	1.31
National Grid Plc	**1.57**
Brooklyn Union Gas Co	0.52
Honeoye Storage Corp	0.06
KeySpan Gas East Corp	0.73
Niagara Mohawk Power Corp	0.26
NiSource Inc	**2.99**
Columbia Gas Transmission Corp	0.63
Millennium Pipeline	2.36
Spectra Energy Corp	**2.52**
Algonquin Gas Transmission Co	0.88
Texas Eastern Transmission LP	1.64
TransCanada Corp	**6.86**
Iroquois Gas Transmission System	3.99
TransCanada Pipelines Limited	2.86
Williams Companies Inc (The)	**1.65**
Transcontinental Gas Pipe Line Corp	1.65
Total	**25.36**

Source: New York State Energy Plan 2002
www.nysenergyplan.com/2002stateenergyplan-documents/sepsection3-5.pdf
www.nysenergyplan.com/2002stateenergyplan-documents/sepsection3-5.pdf

5.7.2 Transco

Transco (Figure 5-8) has traditionally received most of the gas it ultimately delivers to the New York City area from the Gulf Coast region. However, as U.S. natural gas production continues to grow in shale formations, this pipeline with a capacity of approximately 2.7 Bcf per day (Bcf/d) will be increasingly used as a supply source. Previously, this pipeline transport natural gas in and out of storage. While Transco reports having 1.65 Bcf of capacity into the NYC market, peak deliveries have only reached 1.4 Bcf/d suggesting that 250 million cubic feet per day (MMcf/d) of this capacity is difficult to utilize.

Figure 5-8. Transco Natural Gas Pipeline Deliveries to New York City

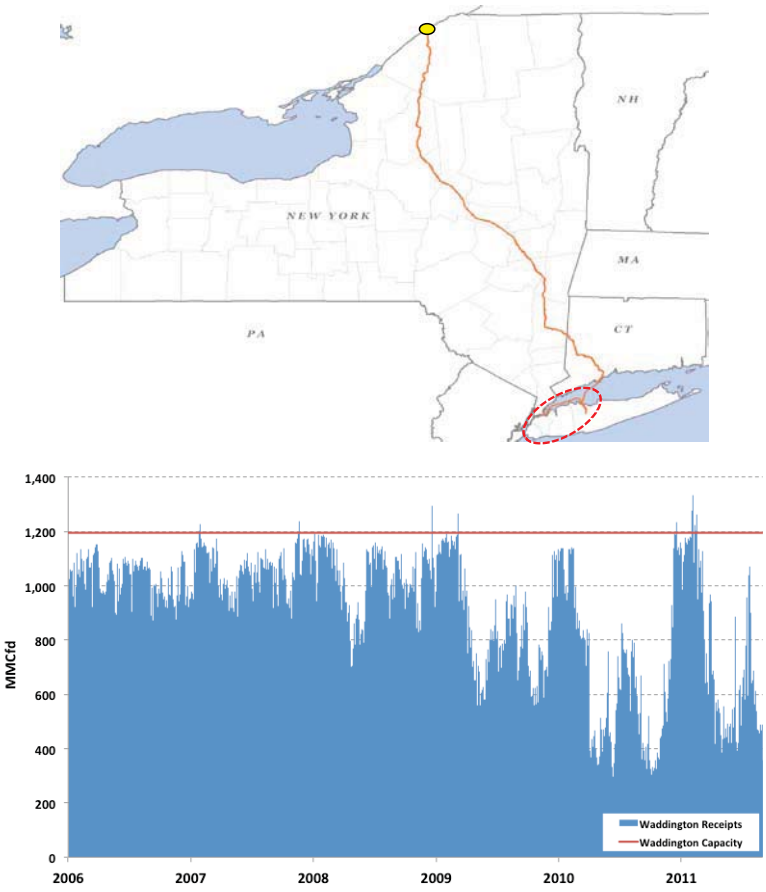


Source: Ventyx® using data from individual company Bulletin Board Systems (BBS) and additional calculations from SAIC

5.7.3 Iroquois

Iroquois (Figure 5-9) has historically received most of the gas it delivers from the TransCanada Pipeline at Waddington, New York, where pipeline capacity is approximately 1,200 Bcf/d. Iroquois also has several large pipeline interconnections in southern New York and Connecticut, which creates additional flexibility in the system. It has interconnections with Tennessee Gas Pipeline (500 MMcf/d), Dominion (300 MMcf/d), and Algonquin (300 MMcf/d). New LNG imports and shale gas production have penetrated the region and the pipeline receives more gas from these sources, making receipts from TransCanada at Waddington more seasonal. The pipeline capacity into the NYC market is approximately 860 MMcf/d and primarily serves the Con Edison and National Grid electric utilities.

Figure 5-9. Iroquois Natural Gas Pipeline Deliveries to New York State

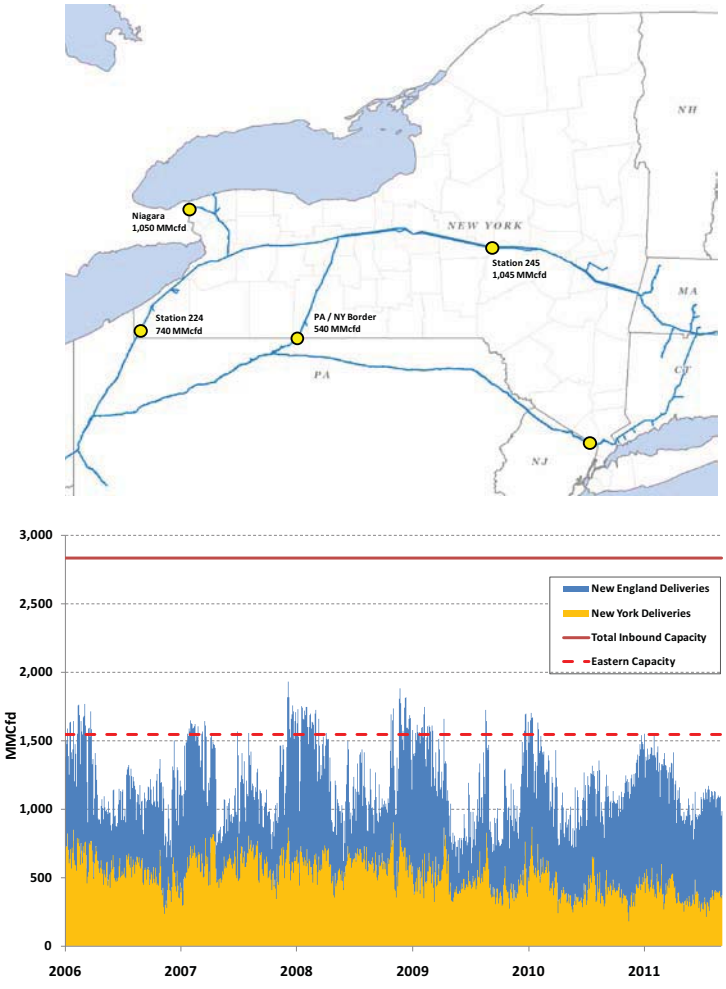


Source: Ventyx® using data from individual company Bulletin Board Systems (BBS) and additional calculations from SAIC

5.7.4 Tennessee Gas Pipeline (TGP)

Owned by El Paso Corporation, TGP provides approximately 3.81 Bcf of natural gas transportation from the Gulf of Mexico into New York State (Figure 5-10). TGP has an extensive footprint in New York and New England and enters the State at four separate locations with a total inbound capacity of 2.83 Bcf/d (Billion cubic feet per day) .While this appears to be an excess amount of capacity, most of it is confined to the less populated western portion of the State. Unlike the Transco and Iroquois pipelines, some of the TGP capacity ultimately ends up exiting the State to serve seasonal needs in Massachusetts. Pipeline capacity capable of serving the more populated eastern portion of the State is about 1.545 Bcf/d. The net delivery into the State for the past five years has been between 450 and 650 MMcf/d. The pipeline also has several injection points throughout the Marcellus Shale formation. TGP is currently in the process of adding 300 MMcf/d of incremental capacity on its 300 leg from eastern Pennsylvania through northern New Jersey and into White Plains. Figure 1: TGP Pipeline Deliveries to New York State

Figure 5-10. Tennessee Gas Pipeline

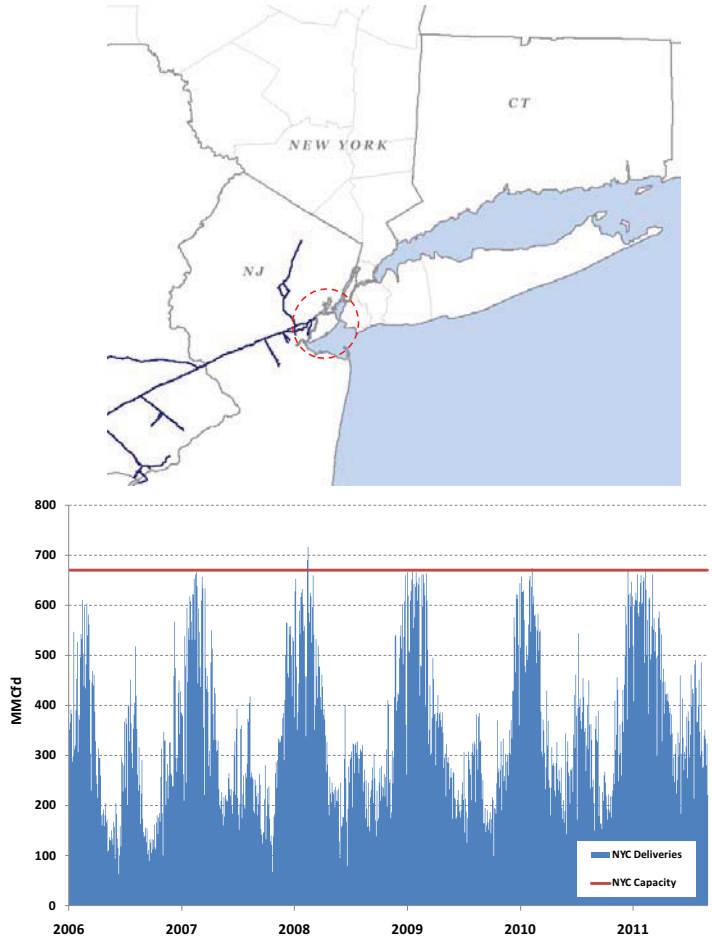


Source: Ventyx®

5.7.5 Texas Eastern Transmission (TETCO)

TETCO has a single delivery point in the New York City area to the Brooklyn Union Gas (Figure 5-11) Because Brooklyn Union Gas participates in physical gas swaps with other local utilities in New York City, end users of other utilities could ultimately consume gas delivered by TETCO to Brooklyn Union Gas. Capacity on TETCO into New York City is approximately 670 MMcf/d (million cubic feet per day). Deliveries are routinely at capacity during the peak of the winter season.

Figure 5-11. TETCO Pipeline Deliveries to New York State

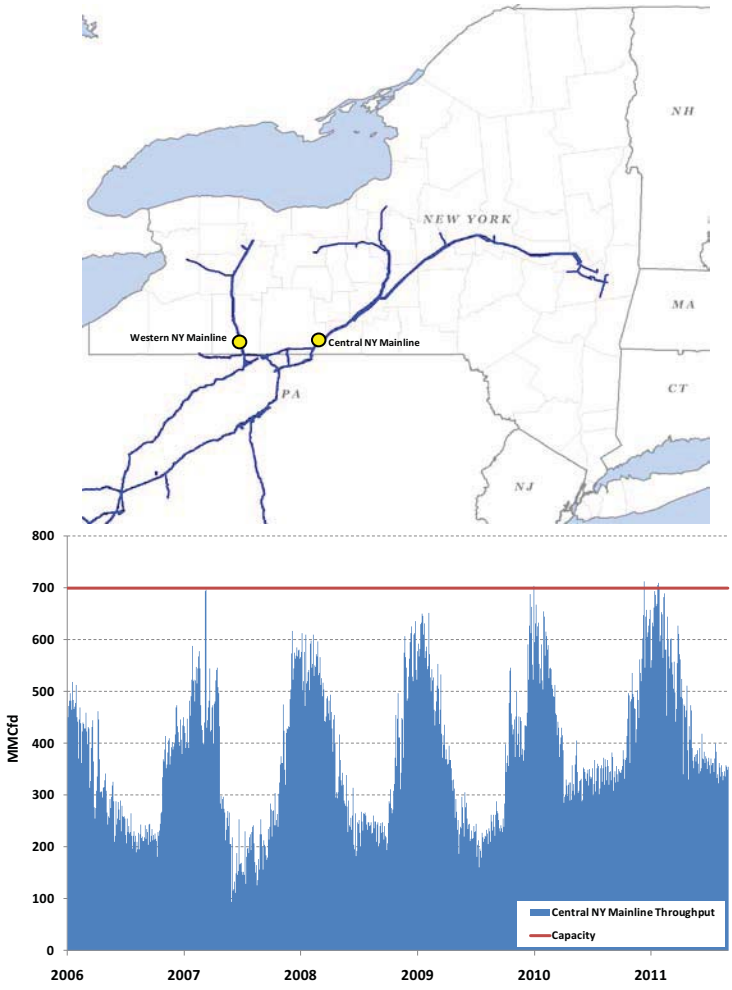


Source: Ventyx®

5.7.6 Dominion Gas Transmission (Dominion)

Dominion Gas Transmission has two pipeline segments in the State (Figure 5-12). The western mainline has traditionally served as a supply-dominated conduit that has moved gas from interconnections with the Tennessee Gas Pipeline in western New York into the Dominion system. As production increased in Pennsylvania, this line started moving gas north during the winter months. The Central New York Mainline is a consumption-dominated part of the Dominion system that moves gas from south to north. The largest consumer on this part of the Dominion system is the Mohawk Power Plant. The Central New York Mainline has an interconnection with Iroquois Gas Transmission in eastern New York. As production in Pennsylvania increased, throughput from Pennsylvania to New York grew as well, while receipts from Iroquois have decreased.

Figure 5-12. Dominion Gas Transmission Pipeline Deliveries to New York State

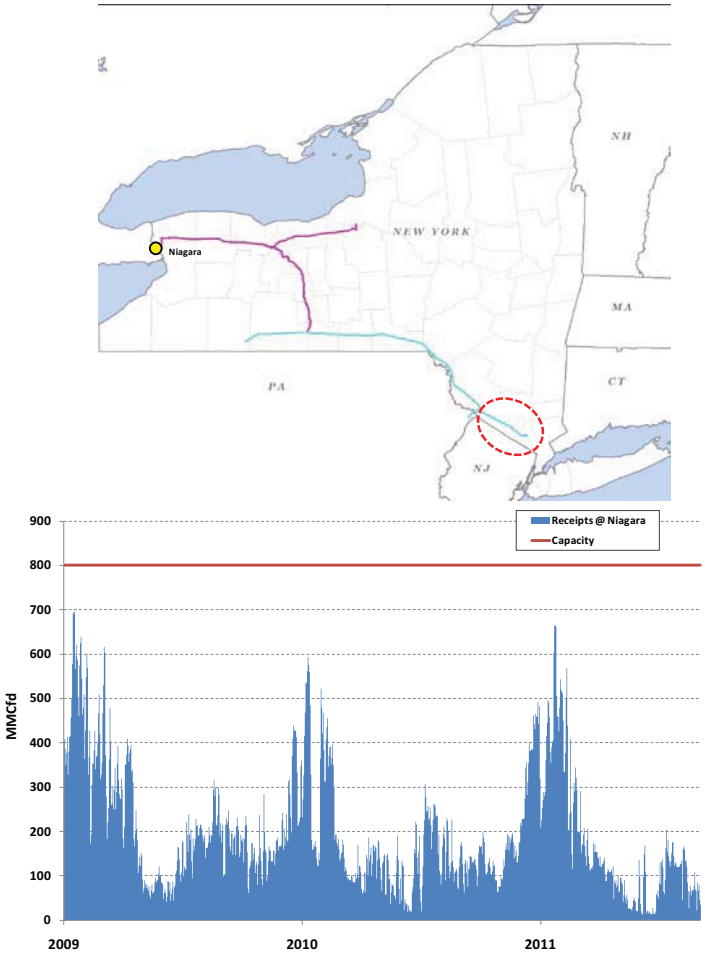


Source: Ventyx®

5.7.7 The Empire and Millennium Pipelines

The Empire and Millennium pipelines are two separately owned and operated systems that represent major transmission assets that can bring gas into the State (Figure 5-13). The Empire Pipeline can receive up to 800 MMcf/d of gas at the Niagara Hub. Millennium moves gas from central New York into downstream markets in Orange and Rockland counties. Millennium is expandable by up to 1 Bcf/d through compression expansions and may become a target for producers seeking to move additional supplies to market. Because Millennium does not penetrate the premium New York City market, however, it is not clear how attractive capacity expansions on this system will be to shippers.

Figure 5-13. Empire and Millennium Pipelines Deliveries to New York State

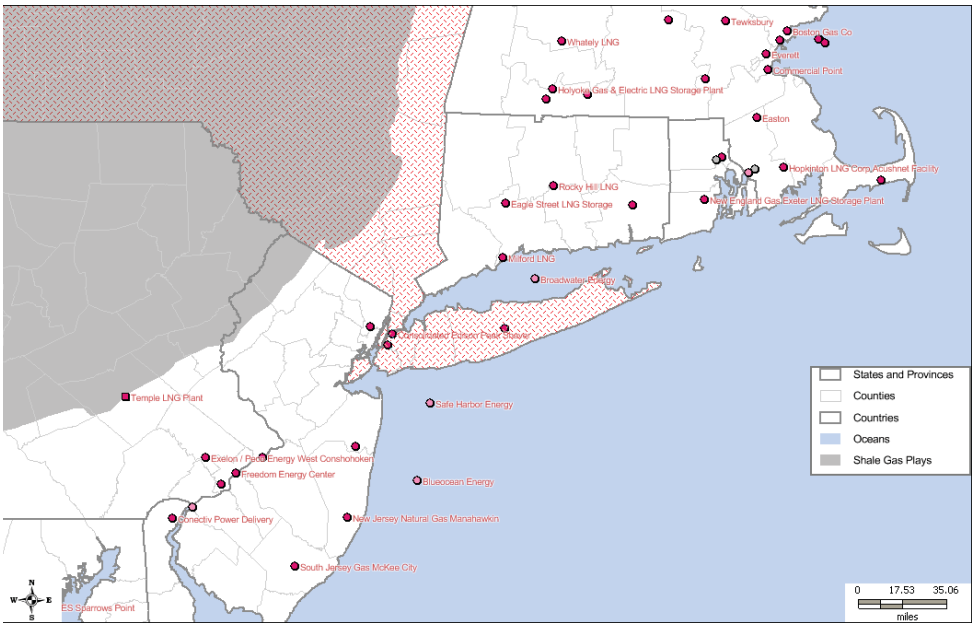


Source: Ventyx®

5.8 Liquefied Natural Gas

New York's residential, commercial, and electric power sectors all consume large amounts of natural gas. To meet the New York (and neighboring Connecticut) growing demand for natural gas, particularly for electric power generation, an offshore liquefied natural gas (LNG) import terminal owned by Liberty Natural Gas LNG with a capacity of 2 Bcf/d has been proposed in waters on the Outer Continental Shelf south of Long Island, 25 miles away from New York Harbor. As of April 2012, that application has since been withdrawn due to unfavorable economics. Figure 5-14 shows the location of various LNG assets in and around NYS.

Figure 5-14. LNG Assets Near NYS



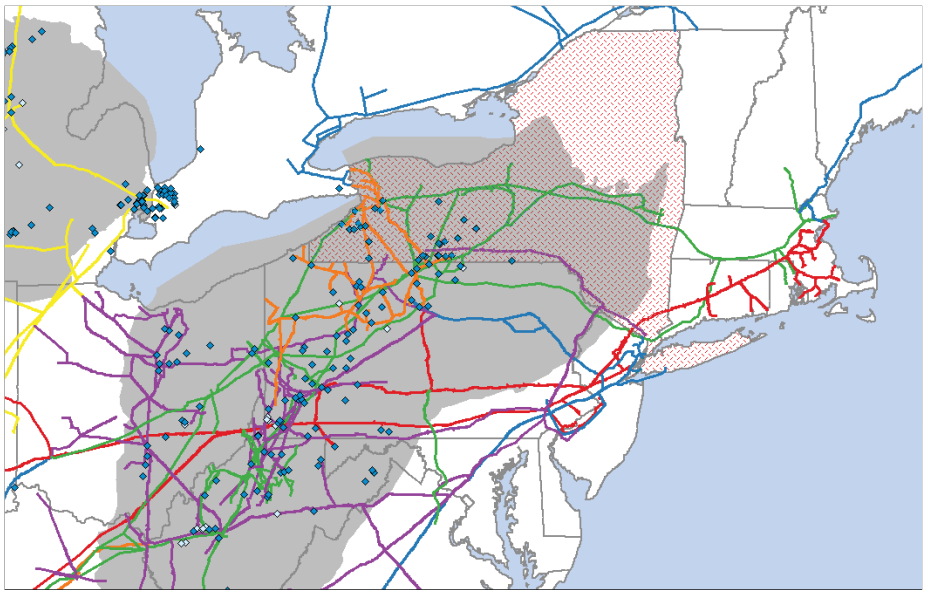
Source: Ventyx®. Diamonds represent individual storage facilities (mostly depleted fields). Shaded area represents shale gas plays

5.9 Natural Gas Storage

New York has moderate natural gas storage capacity, developed principally from depleted natural gas fields in the Appalachian Basin in western New York. These storage sites, along with those in Pennsylvania, Ohio, and West Virginia, are important for supplying the Northeast region of the United States, particularly during the peak demand winter season. The trend towards natural gas-fired electric generation has increased demand for natural gas during the summer months.

Natural gas storage plays a significant role in meeting the State's weather-sensitive gas needs. LDCs access interstate pipeline and independently owned storage facilities located at different points along the interstate pipeline system in the natural gas production and market areas (Figure 5-15). Approximately 35 to 40 percent of LDC winter gas requirements are met through gas withdrawn from storage facilities in and near NYS. These fields have total working gas storage capacity of about 490 Bcf.

Figure 5-15. Natural Gas Storage, Pipelines, and Shale Gas Plays in and Near NYS



Source: Ventyx®. Diamonds represent individual storage facilities (mostly depleted fields). Shaded area represents shale gas plays.

The shale gas reservoirs near New York State increasingly contribute to a stable supply of seasonal short-term natural gas. This includes, at differing depths, the Marcellus, Devonian, and Utica Shale plays.

5.10 Issues Pertaining to Shale Gas

The Marcellus Shale formation in the Appalachian region is attracting attention as a significant new source of natural gas production. Estimated natural gas reserves for the Marcellus Shale formation are very large and it is expected that the region will become a major natural gas production area in the United States. In New York, the Marcellus Shale formation is located in much of the Southern Tier stretching from Chautauqua and Erie counties in the west to the counties of Sullivan, Ulster, Greene, and Albany in the east. Recent estimates of Marcellus Shale formation gas from the U.S. Geological Survey and EIA run from a high of 419 TCF of recoverable natural gas reserves to a low of 262 TCF.[28] While hydraulic fracturing is not new to natural gas development, there are environmental concerns with respect to the effects of fracturing on water supplies, and disposal and contamination issues related to the chemical composition of the fluids used in the fracturing process. New York has a well established regulatory program to oversee oil and gas drilling administered by the Department of Environmental Conservation (DEC). There are regulations governing well permitting, drilling operations, and well-site restoration when drilling is completed.

To assess the potential environmental concerns related to the development of the Marcellus Shale formation in New York, *The Revised Draft Supplemental Generic Environmental Impact Statement* (SGEIS) was released September 7, 2011. A *Socio-economic Impact Analysis Report* was also prepared in support of the SGEIS.[29]

[28] Energy Information Administration, "Natural Gas," http://www.eia.gov/naturalgas/, and "What is shale gas and why is it important?" http://www.eia.gov/energy_in_brief/about_shale_gas.cfm.

[29] http://www.dec.ny.gov/energy/46288.html.

5.11 Petroleum

Most of the data in is section is quoted or taken directly from the 2009 New York State Energy Plan, *Petroleum Assessment, September 2009*. Several direct quotes are referenced in footnotes. These data have been summarized here to assist with vulnerability and risk analyses. The data are scheduled for updating in the 2013 New York State Energy Plan.

New York is a major consumer of petroleum fuels such as motor gasoline, home heating oil, diesel fuel, propane, and residual fuel oil. According to EIA, the State is the fifth largest petroleum fuel market in the United States, exceeded only by Texas, California, Florida, and Louisiana. In 2007, total statewide expenditures on all petroleum fuels by all economic sectors equaled $32.6 billion. The transportation sector accounted for $24.6 billion, or 75 percent of the total. As crude oil prices escalated, petroleum product expenditures increased by $15.0 billion, or 89 percent, from 2003 to 2007.

Energy companies supply refined petroleum products to the State through an extensive distribution system. The Port of New York, with large petroleum storage terminals located on both the New York and New Jersey sides of the harbor, is an important component of this system. These deep water terminals receive a steady flow of refined petroleum products and crude oil from domestic and foreign sources.

New York also receives petroleum products from several pipeline systems that connect terminals located throughout the State to the major refining centers along the U.S. Gulf and East Coasts. Crude oil is also delivered into the New York Harbor area and is used by refineries located in the Mid-Atlantic region to produce refined products. Once refined fuels arrive at New York terminals, or are produced at the regional refineries, they are distributed by pipeline, barge, and truck transport to smaller coastal and inland terminals for further distribution to users. New York's petroleum products are supplied by refineries located in Delaware, New Jersey, and Pennsylvania; the Colonial Pipeline system from the Gulf Coast; and foreign imports that principally originate in Canada, the Caribbean, and South America. Some product is received from North Africa and Europe as well. Located in both New York and New Jersey, the New York Harbor area has a petroleum bulk terminal storage capacity of over 75 million barrels, making it the largest and most important petroleum product hub in the Northeast.

The Hudson River, which meets the Atlantic Ocean in New York Harbor, provides a major inland water route for petroleum product barges supplying eastern New York and parts of western New England. On the other side of the State, western New York product markets are primarily supplied from Canada at the Port of Buffalo and via the Buckeye and Sunoco pipeline systems from Pennsylvania and the Midwest. The TEPPCO pipeline system from the Gulf Coast delivers mostly propane to upstate markets.

The 2009 *State Energy Plan* concluded that adequate supplies of petroleum fuels will reach New York into the next decade or more. Nevertheless, storage capacity and infrastructure component capabilities must be monitored and reassessed on a regular basis as fuel types and blends evolve, supply sources change, and demand patterns change to meet user needs.

As in many northeastern urban areas, New York City and the surrounding metropolitan areas require reformulated gasoline (RFG) blended with ethanol. The New York Harbor area is the primary Northeast distribution hub for ethanol supplies. Ports located on the New Jersey side of New York Harbor receive ethanol rail shipments from the Midwest and marine imports from Brazil and the Caribbean, and then redistribute these supplies to markets throughout the Northeast. A large ethanol storage facility also serving the Northeast is located in Albany. A proposed ethanol pipeline would transport up to 10 million gallons of ethanol per day from production facilities in Iowa, Illinois, Minnesota, and South Dakota to terminals in Pittsburgh, Philadelphia, and the New York Harbor.

In spite of its robust supply facilities, New York is vulnerable to distillate fuel oil shortages and accompanying price volatility during the winter months due to demand for home heating oil. One-third of New York households use this oil as their primary energy source for heating. In January and February 2000, distillate fuel oil prices in the Northeast rose sharply when extreme winter weather hindered the

arrival of fresh supply. The New York City area is especially vulnerable to winter supply risk when rivers freeze or high winds slow the docking and unloading of barges and tankers. In July 2000, the U. S. President directed the DOE to establish the Northeast Heating Oil Reserve in order to reduce the risk of potential petroleum product shortage in the Northeast.

5.11.1 Petroleum Storage

Petroleum storage terminal facilities face many of the same environmental, land use, and economic pressures that affect the refining sector. Operators note the high costs associated with meeting petroleum assessment environmental regulations, insurance costs, greater carrying costs associated with holding higher priced petroleum products, and the lack of market incentives to build new facilities as impediments to adding storage capacity in the State. Beginning in 2007, the amount of New York State storage capacity dedicated to distillate fuels increased. In certain parts of the State, including Long Island, the petroleum distribution industry responded to market signals and added tank capacity to meet demand.[30]

During the 1994 to 2008 period, total New York storage capacity for all petroleum products declined from 2.74 billion gallons to 2.28 billion gallons, a decline of 462 million gallons (MMgal), or 16.9 percent.[31] Total capacity has held relatively steady at about 2.4 billion gallons since 2004. Within this capacity range, individual fuel storage capacities have changed as the distribution industry makes adjustments in response to consumer demand, changing fuel types, specifications, and blends, including biofuels.

This grouping of fuels is presented together because it is relatively easy for terminal operators to convert tanks to hold one petroleum product fuel or another depending on demand or as market events dictate. The total State storage capacity for all these fuels has fallen from 993 MMgal in 1994 to 847 MMgal in 2008, a decline of 146 MMgal, or 14.7 percent. However, over the same period, statewide demand for all these fuels increased 3.6 percent. This indicates that while terminal capacity is being used more efficiently to meet normal everyday demand, there may be less capacity available to meet atypical demand surges by the heating and electric generation sectors during periods of colder than normal temperatures. This can create marketplace supply uncertainty and contribute to greater short-term price volatility. In effect, consumers are becoming more dependent on the ability of the petroleum transport industry (tugboats, barges, pipelines, tankers, and trucks) to resupply the remaining terminals and distribute the various fuels during peak demand periods.

Of all the distillate fuels, home heating oil has the highest demand. It is primarily used by the residential sector for space heating and hot water, but it may also be used by the electric generation sector as a secondary backup fuel by dual-fuel facilities and in peaking turbines. In New York, operational storage capacity of home heating oil declined from 794 MMgal in 1994 to a low of 558 MMgal by 2006. Since the 2006 capacity low, storage has increased to 602 MMgal in 2008. Even with this recent increase, there is still an overall reduction in capacity of 192 MMgal, or 24.2 percent, from the 1994 peak.[32]

Kerosene is an important fuel used to meet heating needs and as a blending agent to prevent cold temperature gelling in both diesel fuel and home heating oil. This fuel can also be used as a secondary backup fuel by many dual-fuel electricity generating facilities that use natural gas as their primary fuel. It may also be used in peaking turbines. Statewide storage capacity of this fuel has fallen from 151 MMgal in 1994 to 93 MMgal in 2008, a decrease of 58 MMgal, or 38.4 percent.

[30] 2009 New York Energy Plan

[31] 2009 New York Energy Plan

[32] 2009 New York Energy Plan

Diesel fuel is primarily used by the transportation sector and may also be used in heating applications and for electric generation. Diesel fuel, like gasoline, has steady, daily, supply/demand fundamentals. For that reason, diesel fuel requires less storage capacity than heating oil to maintain adequate supply because demand is relatively constant and predictable. In New York, storage capacity of diesel fuel increased steadily from 49 MMgal in 1994 to 127 MMgal by 2000, a gain of 78 MMgal, or 159 percent. A significant decline in capacity occurred in 2001 as the total statewide volume decreased to 99 MMgal, a fall of 28 MMgal, or 22 percent. Since 2001, capacity has remained relatively steady, and in 2008 equaled 100 MMgal, 27 MMgal less than the 2000 peak. [33]

Jet fuel capacity data have only been available from the DEC data files since 2006. Prior to that year, these capacities were included in one of the other distillate fuels. In 2008, total State capacity equaled 48.6 MMgal, an increase of 13.5 MMgal, or 38.5 percent, over 2006, the initial year of data availability. Most of the jet fuel storage capacity is located at airport facilities, particularly the large downstate airports. Only a limited number of petroleum distribution terminals have any jet fuel capacity, and what they do have is generally dedicated to local airport service. Jet fuel may also be used as a backup fuel to natural gas by the electric generation sector.

Statewide motor gasoline and residual fuel storage capacities indicate the same declining capacity trend discussed for distillate fuels. Between 1994 and 2008, gasoline capacity fell from 571 MMgal to 372 MMgal, a drop of 199 MMgal, or 34.9 percent. Again, while capacity declined, demand for gasoline during the 1994 to 2007 period increased from 5.4 billion gallons to 5.8 billion gallons, a gain of 7.4 percent. The addition of 37 MMgal of ethanol and ethanol blended gasoline capacity has, in effect, expanded gasoline supply. Ethanol is a required ingredient in the blending of the RFG used in the downstate area. Additionally, ethanol is beginning to be added on an optional basis by some distributors to conventional gasoline used in the upstate area. It is expected that additional ethanol storage capacity will be added in the coming years; it is not known whether this will involve new tanks or simply the conversion of existing gasoline tanks into ethanol storage

Residual fuel oil, a fuel primarily used by the electricity generation sector and in large industrial, commercial, and residential boilers, saw statewide capacity decline from the 1994 peak of 981 MMgal to 755 MMgal in 2008, a reduction of 226 MMgal, or 23 percent. From the 1960s to the late 1970s, the New York electric generation sector was dominated by residual fuel powered capacity. By the 1970s, however, concern about environmental emissions and oil dependency stimulated the conversion of generation capacity away from residual fuel to natural gas. In response to this lower demand, the terminal industry has eliminated large amounts of residual fuel storage capacity.

Table 5-4 lists the petroleum terminals located in the State of New York

Table 5-4. Petroleum Terminals Located in New York

Allied Aviation Service of New York Fuel Facility, Bldg #42 Flushing NY 11371
Allied New York Services Inc. Bldg. #90 (JFK Intl. Airport) Jamaica NY 11430
Bayside Fuel Oil Depot Corp. 1100 Grand Street Brooklyn NY 11211
Bayside Fuel Oil Depot Corp. 1776 Shore Parkway Brooklyn NY 11214
Bayside Fuel Oil Depot Corp. 537 Smith Street Brooklyn NY 11231

[33] 2009 New York Energy Plan

Table 5-4. Petroleum Terminals Located in New York

Bayside Fuel Oil Depot Corp. One North 12th Street Brooklyn NY 11211
BP Products North America Inc 125 Apollo St. Brooklyn NY 11222
Buckeye Albany Terminal LLC 301 Normanskill St. Albany NY 12202
Buckeye Terminals, LLC - Binghamton 3301 Old Vestal Rd Vestal NY 13850
Buckeye Terminals, LLC - Brewerton 777 River Road - Cty Rd 37 Brewerton NY 13029
Buckeye Terminals, LLC - Buffalo 625 Elk St. Buffalo NY 14210
Buckeye Terminals, LLC - Geneva 459 W. River Road Geneva NY 14456
Buckeye Terminals, LLC - Marcy 9586 River Road Marcy NY 13403
Buckeye Terminals, LLC - Rochester 754 Brooks Ave. Rochester NY 14619
Buckeye Terminals, LLC - Rochester II 675 Brooks Avenue Rochester NY 14619
Buckeye Terminals, LLC - Utica 37 Wurz Avenue Utica NY 13502
Buckeye Terminals, LLC - Vestal 3113 Shippers Rd. Vestal NY 13851
Carbo Industries, Inc. 1 Bay Blvd Lawrence NY 11559
Castle North Terminals, Inc. 11 River Street Sleepy Hollow NY 10591
Castle Port Morris Terminals 939 E. 138th St. Bronx NY 10454
CITGO - Glenmont 495 River Road Glenmont NY 12077
CITGO - Vestal 3212 Old Vestal Road Vestal NY 13850
ConocoPhillips PL - Riverhead 212 Sound Shore Road Riverhead NY 11901
Fred M. Schildwachter & Sons 1400 Ferris Place Bronx NY 10461
Getty Terminals - Bronx 4301 Boston Post Road Bronx NY 10466
Getty Terminals - Long Island 30-23 Greenpoint Ave. Long Island City NY 11101
Getty Terminals - Rensselaer 49 Riverside Avenue Rensselaer NY 12144-0151
Global Commander Terminal One Commander Square Oyster Bay NY 11771
Global Companies LLC 1096 River Rd. New Windsor NY 12553

Table 5-4. Petroleum Terminals Located in New York

Global Companies LLC 1184 River Road New Windsor NY 12553
Global Companies LLC 1254 River Road New Windsor NY 12553
Global Companies LLC 1281 River Road New Windsor NY 12551
Global Companies LLC 464 Doughty Blvd Inwood NY 11696
Global Companies LLC 50 Church Street Albany NY 12202
Global Companies LLC Shore & Glenwood Rd Glenwood Landing NY 11547
Griffith Energy Inc. - Big Flats 3351 St. Rt. 352 Big Flats NY 14814
Griffith Energy Inc. - Rochester 335 McKee Rd Rochester NY 14611
Heritagenergy Inc. 1 Delaware Ave. Kingston NY 12401
Hess - Bronx 1040 East 149th Street Bronx NY 10455
Hess - Brooklyn 722 Court Street Brooklyn NY 11231
Hess - Rensselaer 367 American Oil Rd. Rensselaer NY 12144
Hess - Rochester Lyell 1975 Lyell Avenue Rochester NY 14606
Hess - Roseton 924 River Road Newburgh NY 12550
Hess - Warners 6700 Herman Rd. Warners NY 13164
IPT, LLC End of Riverside Extension Rennselaer NY 12144
Kingston Oil Supply - Catskill End Lower Main St. Catskill NY 12414
Kingston Oil Supply - Port Ewen 15 North Broadway Port Ewen NY 12466
Lefferts Oil Terminal, Inc. 31-70 College Point Blvd Flushing NY 11354
Meenan Oil Co .- Poughkeepsie 99 Prospect St. Poughkeepsie NY 12601
Meenan Oil Co. - Peekskill 26 Bayview Drive Cortland Manor NY 10567
Metro Terminals Brooklyn 498 Kingsland Avenue Brooklyn NY 11222
Motiva Enterprises LLC 25 Paidge Ave. Brooklyn NY 11222
Motiva Enterprises LLC 74 East Avenue Lawrence NY 11559

Table 5-4. Petroleum Terminals Located in New York

New Hamburg Terminal Corp. Point Street New Hamburg NY 12590
Noco Energy Corp. 700 Grand Island Blvd. Tonawanda NY 14151-0086
Northville Industries Corp - Holtsville 586 Union Ave. Holtsville NY 11742
Petroleum Fuel & Terminal - Albany 54 Riverside Avenue Rensselaer NY 12144
Petroleum Fuel & Terminal - Glenmont Route 144 552 River Road Glenmont NY 12077
Petroleum Fuel & Terminal - Green Island 1 Osgood Ave. Green Island NY 12183
Petroleum Fuel and Terminal 1935 Lyell Avenue Rochester NY 14606
Sprague Energy Corp. - Mt. Vernon 40 Canal St. Mount Vernon NY 10550
Sprague Energy Corp. - Oceanside 7 Hampton Road Oceanside NY 11572
Sprague Energy Corp. - Rensselaer 540 Riverside Avenue Rensselaer NY 12144
Stratus Petroleum Corp. - Baldwinsville 7431 Hillside Road Baldwinsville NY 13027
Sunoco Partners Marketing & Terminals LP 1840 Lyell Avenue Rochester NY 14606
Sunoco Partners Marketing & Terminals LP 3733 River Road Tonawanda NY 14150
Superior Plus Energy Services LLC - Marcy 9678 River Road, Rt. 49 Marcy NY 13403
Supreme Energy Inc LLC 7437 Hillside Road Baldwinsville NY 13027
The Energy Conservation Group LLC 119-02 23rd Ave. College Point NY 11356
TransMontaigne - Rensselaer 58 Riverside Avenue Rensselaer NY 12144
United Refining Co. - Rochester 1075 Chili Avenue Rochester NY 14624
United Refining Co. - Tonawanda 4545 River Road Tonawanda NY 14150
Westmore Fuel Co., Inc. 2 Purdy Ave Port Chester NY 10573

Source: U.S. Treasury, Internal Revenue Service, Approved Terminals 10-31-10

5.11.2 Petroleum Production

New York's first commercial oil well began production in 1865 and statewide production peaked in 1882 at 6.8 million barrels per year. This initial oil boom was short-lived, and by 1893 production was down to 1.0 million barrels per year. New York's second oil boom occurred with the advent of water flooding, the first enhanced oil recovery technique. This technique led to a second peak of 5.4 million barrels in 1943. The Bass Island Trend in Chautauqua County, brought on line in 1981, was the last major oil discovery in

New York.[34] Today, New York's oil production comes from two distinct regions: 1) the historic areas of Allegany, Cattaraugus, and Steuben counties, and 2) the Bass Island Trend in Chautauqua County.

According to EIA, New York ranked 25th out of 31 oil producing States in 2007. Oil production in 2007 totaled 387,000 barrels, about 0.1 percent of annual statewide petroleum product demand.

Even after 144 years of production, the remaining reserves are substantial. In an extensive geological study of New York's resource base completed in the 1980s, original oil-in-place was estimated at 1.118 billion barrels. Cumulative production through 2007 totaled approximately 246 million barrels. This represents an estimated recovery rate of approximately 22 percent. Primary production can usually recover a maximum of 30 percent, with another 15 percent possible from enhanced oil recovery methods. Using a 45 percent maximum recovery factor, total New York production from primary and enhanced methods may total 600 million barrels with 355 million barrels yet to be recovered.

Due to the improved business conditions, higher crude oil prices, and the development of better recovery techniques, there is renewed interest in applying technologies such as enhanced oil recovery and horizontal drilling to New York's oil fields. Should the current high crude oil price trend hold, it is possible production may continue to trend upward for some time.

5.11.3 Refined Products

Demand for distillate fuel usually outstrips the production capacity of domestic refineries during the winter heating season. It is during these periods that inventories and product imports become critical supply enhancements. During the winter period of October 2002 through March 2003, the demand over production spread averaged 445,000 barrels per day (b/d), the largest differential of the study period. By the winter season of October 2006 to March 2007, the spread had decreased to 283,000 b/d, a decline of 172,000 b/d, or 38 percent. This reduction was the result of the U.S. refining industry increasing the production of distillate fuels and a series of warmer-than-normal winters limiting the demand for heating oil. For the winter season October 2007 to March 2008, one of the warmest winters in many years, the spread was only 41,000 b/d, 91 percent less than the 2002 to 2003 heating season. Late 2008 data show the first sustained period of significant U.S. distillate fuel production capacity in excess of demand. Reasons for this include reduced domestic demand, particularly for on-road diesel fuel, caused by lower economic activity, increased domestic production capacity;, and higher foreign demand for diesel fuel.[35]

New York is a major user of distillate fuel, accounting for 5.1 percent of total U.S. distillate fuel demand in 2007. The three distillate fuels (#1 kerosene, #2 heating oil and #4 heating oil) are utilized in each of the economic sectors of the State, and represent approximately 28 percent of total petroleum fuel used in New York in 2007. The residential and transportation sectors account for the greatest percent share of consumption of distillate fuel in the State in 2007, 39.6 percent and 35.3 percent, respectively. Home heating oil use in the residential sector is particularly important in New York State with an estimated 2.3 million households, representing about one-third of the New York housing stock, using home heating oil and kerosene to heat.

5.11.4 Petroleum Pipelines

No petroleum refineries remain in NYS. All of New York's crude oil is trucked to refineries in Pennsylvania and West Virginia, with most going to the American Refining Group refinery in Bradford, Pennsylvania. New York crude oil is used in the manufacture of a range of products, including motor vehicle fuel, home heating oil, lubricating oil, and other specialty lubricants.

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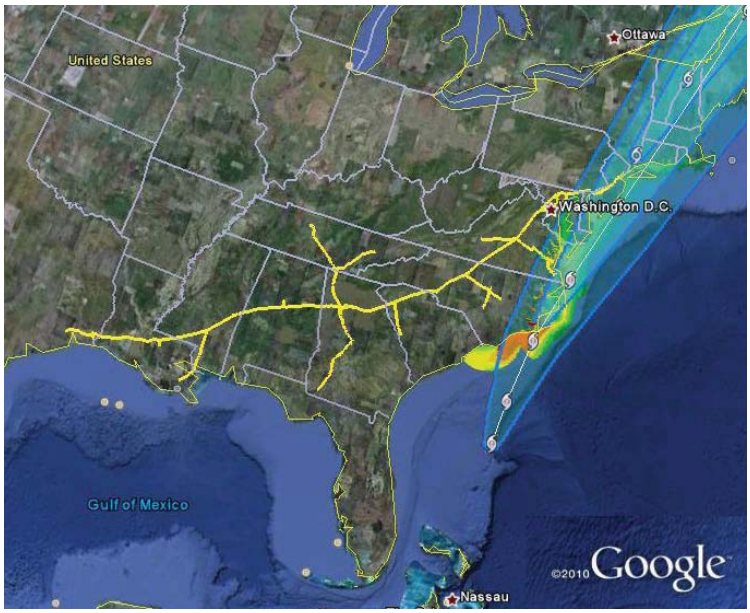
[34] 2009 New York Energy Plan

[35] 2009 New York Energy Plan

5.11.4.1 Colonial Pipeline

Colonial Pipeline Co. is an interstate common carrier of petroleum products owned by ConocoPhillips Pipe Line Company, IFM Colonial Pipeline, Keats Pipeline Investors LP, Koch Capital Investments Company, LLC, and Shell Pipeline Company LP. Each day, it delivers an average of 100 million gallons of gasoline, kerosene, home heating oils, diesel fuels, and national defense fuels (jet fuels) to shipper terminals in 12 States and the District of Columbia. The 5,519-mile Colonial system transports these fuels primarily from refineries in Texas, Louisiana, Mississippi, and Alabama to 267 marketing terminals serving communities across the South and Eastern United States. (Figure 5-16)

Figure 5-16. Colonial Pipeline System



Source: Colonial Pipeline

Colonial has active product codes for 38 different grades of gasoline—including RFG—and multiple vapor pressures for each grade; seven grades of kerosene (including two for military); 16 grades of home heating oil and diesel fuel (including diesel fuel marine for the U.S. Navy and light cycle oil); and one grade of transmix (a motor gasoline-diesel mix). Of the 62 codes, 29 are for fungible products (can be co-mingled) and 33 are for products that must be shipped on a segregated basis.

It generally takes from 14 to 24 days for a batch to get from Houston, Texas to the New York Harbor, with 18.5 days the average time. Product is kept separate in the pipeline by sequencing it in batches. Different product batches are pushed through the system abutting each other (Figure 5-17). The stream is always in turbulent flow condition, which minimizes mixing. Products are sequenced to permit most interfaces to be downgraded—for example, from premium gasoline to regular gasoline. Interfaces where gasoline and distillates mix, referred to as transmix, are sold for re-refining.

Figure 5-17. Petroleum Product Sequencing

Source: Colonial Pipeline, http://www.colpipe.com/ab_faq.asp

VI. Guide to Energy Emergency Response in New York

6.1 Overview

This section describes the critical phases of energy emergency response, as well as specific actions that may be taken during each phase, preparation for each phase. It references the *New York State Energy Emergency Plan: An Integrated Resource Plan Specifying Actions to be taken in the Event of an Energy or Fuel Supply Emergency, 2011,*[36] that has developed strategies for responding to supply disruptions or fuel emergencies to ensure that such actions are appropriate and responsive to meeting critical public needs.

Effective response is more than reacting to individual events as they occur. Rather, it involves an ongoing cycle of preparation, monitoring, communication, assessment, recovery, re-assessment, and the incorporation of lessons learned into preparation for future events. It depends on cooperation among energy market participants and government agencies to facilitate response efforts during disruptive events.

This section of the EAP covers:

- **6.2 The four phases of energy emergency response**, as identified by National Association of State Energy Officials (NASEO)
- **6.3 Energy Assurance tasks and resources,** as well as suggestions on which State or private sector stakeholders might be most appropriate for assuming responsibility for each task
- **6.4 Energy shortage levels and suggested responses,** including conditions and probable impacts observed by responding agencies, along with suggested stakeholder response steps that are specifically appropriate to each level of energy shortage
- **6.5 Stakeholders, Responsibilities and Contacts**
- **6.6 Public Information and Communication Protocols** and associated steps to be taken by various agencies during an energy emergency

The goal of this section is to highlight the specific energy emergency response measures that the State of New York may take, with an emphasis on matching the appropriate responses to different conditions.

6.2 Four Phases of Response

The NASEO Energy Assurance Guidelines outline the basic elements of an energy emergency response. Figure 6-1, below, suggests a planning process that may help guide State officials in their effort to ameliorate an energy shortage.

The four-phase schematic is meant to help stakeholders gain a larger perspective before responding to a problem. It is a basic guide to action, and if followed, will provide a sense of direction that enables energy emergency responders to move forward in an orderly manner.

Just as energy emergency response can be organized into phases, energy emergencies themselves can be categorized into different levels of severity. These are addressed later in this section, under Shortage Levels and Suggested Responses. These levels are based on experience and are meant to be suggestive; the percentages of shortage are really approximations. Responders are cautioned to remember that

[36] New York State Energy Emergency Plan: An Integrated Resource Plan Specifying Actions to be taken in the Event of an Energy or Fuel Supply Emergency, 2011.

managing an energy shortage is as much an art as a science. Furthermore, the intensity of an energy emergency may vary by area within the State and by fuel. For example, natural gas delivery may be interrupted while petroleum product sales are normal; Albany may experience a problem while Manhattan enjoys business as usual.

Figure 6-1. Four Phases of Energy Emergency Response

6.2.1 Phase 1

Questions relating to monitoring markets and alerting stakeholders:

- What is the nature/cause of the problem?
- How extensive is the problem?
- What is the estimated duration of the problem?
- Who is affected, where and how?
- Who needs to be informed?

Looking for answers to these questions:

- Link to energy stakeholders for ready answers. For example:
    - Electric problem: Department of Public Service (DPS), New York Independent Service Operator (NYISO), Independent Power Producer New York (IPPNY) or affected utilities (see Appendix D section A)
    - Natural Gas problem: DPS, Northeast Gas Association (NGA), or affected utilities
    - Petroleum products problem: NYSERDA, Petroleum trade associations, including Empire State Petroleum Association (ESPA), New York Oil Heat Association (NYOHA),

Oil Heat Institute of Long Island (OHILI), New York Petroleum Council (NYPC), New York Propane Gas Association (NYPGA)

- Informing others is a judgment call. It is suggested that if the problem is minor, the cognizant State agency responding (often NYSERDA) should monitor the problem. If the situation worsens, consider informing State Office of Emergency Management (SOEM) and others, such as local jurisdictions, adjacent utilities, and energy stakeholder associations, as appropriate. If the situation appears to so warrant, consult with SOEM about informing the Governor's office.

6.2.2 Phase 2

Mechanisms relating to assessing vulnerability and determining action:

- Discuss depth of issue with stakeholders as appropriate.
- Determine whether or not the energy issue is likely to:
  - Be contained quickly
  - Spread
  - Affect which end users
- Identify possible impacts:
  - Assess what impact may (or will) fall on end users.
  - Ascertain from utilities what degree of impact to expect, ranging from "inconvenience" to "danger to life and property."
  - Cross check with other energy forms and other critical systems (e.g., fresh water, food supply, telecommunications) to ascertain potential interactive impacts.
- Determine what, if any, actions are appropriate and who undertakes them. Examples include:
  - Energy industry-level action such as response and repair crews.
  - Behind-the-scenes action such as mutual aid agreements and assistance via DPS.
  - Public-level actions that may be advisable (public information and requests for conservation) or required (public assistance, emergency medical, congregant care, energy rationing measures).

6.2.3 Phase 3

Questions and suggestions for recommending and taking action:

Working with stakeholders referenced above, determine:

- How quickly can actions be implemented?
- How effective are actions taken?
- What is the appropriate legal authority for any actions taken?
- What are the limitations in the legal authority?
- What voluntary actions can be taken first?
- If mandatory actions are required, how quickly must they be phased in?
- Which mandatory actions are to be phased in first? (Least to greatest is recommended.)
- Check suggested New York voluntary and mandatory measures and coordinate with SOEM and other agencies as noted in the suggestions.
- Ask whether the best action may be no action at all.

6.2.4 Phase 4

Review the following in coordination with SOEM and affected energy companies:

- Status of pre-emergency information.
- Rapidity and accuracy of assessment.
- Appropriateness of recommended actions.
- Effectiveness of actions taken.
- Did the actions matter or did the problem solve itself?
- Were essential stakeholders left out of the loop?
- Did the stakeholders appreciate what was done?
- How did the public react?
- What should be changed, eliminated, improved in a future event?

6.3 Energy Assurance Tasks and Resources

Table 6-1 provides a quick reference for various levels of Energy Assurance activity. These are broken down into mitigation, preparedness, response, recovery, and resources. The table also suggests agency and stakeholder responsibilities for each set of tasks.

Table 6-1. Mitigation, Preparedness, Response, Recovery, and Resources

Mitigation Task	Resource **Primary** Secondary
Identify areas where public education programs detailing energy-related issues are needed.	**DPS** **NYSERDA**
Assist SOEM (and energy companies if mutually acceptable) with public information regarding energy supplies.	**DPS** **NYSERDA** Public Information
Provide guidance in regard to energy supply, demand, and conservation information.	**DPS** **NYSERDA** Utilities NYISO Petroleum Trade Associations NGA

Preparedness Task	Resource **Primary** Secondary
Assist in determination of State and federal energy regulations.	**DPS** **NYSERDA** SOEM

Preparedness Task	**Resource** **Primary** Secondary
Discuss and agree upon procedures for notifying IOU, Electric Cooperatives, New York State Rural Electric Cooperative Association (NYSRECA), and the Municipal Electric Utilities Association of New York (MEUA) in case of disrupted energy services.	**DPS** **NYISO** NYSRECA MEUA
Establish and maintain a coordination link with non-regulated power generators to ensure activities and operations are coordinated during emergencies.	**DPS** **NYISO** NYSERDA Industry control area operators.
Assist in developing and maintaining a list of critical petroleum bulk fuels and energy infrastructure facilities affecting New York (pipelines, refineries, terminals, product trucking).	**NYSERDA** **Petroleum Associations** State Energy Assurance Plan Department of Homeland Security and Emergency Management (DHSES)
Develop list of petroleum bulk fuel providers and transporters to facilitate acquisition of fuel in the event of infrastructure outage or closure.	**NYSERDA** **Petroleum Associations** State Energy Assurance Plan Petroleum Industry DHSES
Understand existing ESF-12 procedures for energy providers to contact SOEM if a significant energy service disruption occurs (e.g., a loss of 10 percent service or loss of power to 1,000 or more customers).	**DPS** **SOEM** **NYISO** NYSERDA NGA Petroleum Associations Utilities, NYSRECA, MEUA

Response Task	Resource **Primary** Secondary
Work with NYSERDA, DPS, SOEM to provide updates of energy situation impacts to the Governor and citizens. Assess scope, magnitude, and extent of energy impact.	**SOEM** **DPS** **NYSERDA** Utilities, NYSRECA, MEUA NYISO Petroleum Associations NGA
In case of disruptions in the communications system, coordinate with New York ESF-15 – External Communications, to establish backup communication system as required.	**SOEM** **DPS** **NYSERDA** Utilities, NYSRECA, MEUA NYISO Petroleum Associations NGA
Determine whether waivers are needed for normally prohibited discharges, when energy resources are necessary for a time-critical action, and acceptable sources are unavailable in necessary amounts.	**DPS** **NYSERDA** **DEC**
Consult utility emergency response plans for priorities in the re-establishment of energy to affected areas, based on emergency response and hazard mitigation needs.	**DPS** Utilities Emergency Operating Plans
Work with petroleum sector associations to advise State about priorities and issues concerning fuel deliveries.	**NYSERDA** Petroleum Associations
Provide guidance in regard to energy supply, demand, and conservation information.	**DPS** **NYSERDA** Utilities Petroleum Associations NGA
Assess energy situations through communication with officials in other regions and States.	**DPS** **NYSERDA** SOEM

Recovery Task	Resource **Primary** Secondary
Assist SOEM as needed in the determination of State and federal energy regulations.	**DPS** **NYSERDA** State Energy Assurance Plan.

Recovery Task	Resource **Primary** Secondary
Utilize DPS data, Energy Information Administration (EIA data, and New York energy stakeholder data as available to provide guidance in regard to energy supply, demand, and conservation information.	**DPS** **NYSERDA** **EIA** Utilities, NYSRECA, MEUA Petroleum Associations NGA
Coordinate with DPS on monitoring procedures for restoring electricity and natural gas.	**DPS** **Utilities, NYSRECA, MEUA** Emergency Operating Plans
Coordinate with petroleum associations on the progress of the petroleum supply and distribution companies on procedures of liquid and gas providers in affected area(s).	**NYISO** **NGA** **NYSERDA** State Energy Assurance Plan Petroleum Associations

6.4 Energy Shortage Levels and Suggested Responses

This section provides a quick reference for assessing an energy shortage. Such shortages could include electricity outages, natural gas supply reductions, or unavailability of petroleum and related products. The spectrum of shortages is covered from threats that call for monitoring, to mild shortage conditions, to the most severe levels. Action steps are suggested, with the understanding that actual circumstances will need to be considered against the conditions and impacts described in the following tables, Tables 6-2 through 6-9.

6.4.1 Shortage Level 1 – Monitor and Alert

There is no discernible shortage in the State, but shortages are possible or exist elsewhere. No specific level is identified. External conditions such as weather, conflicts abroad, or reports of increased demand in foreign and domestic markets may alert officials to increase monitoring.

Table 6-2. Level 1 – Monitor and Alert

Conditions (one or more may apply)	Probable Impacts Observed
Severe cold weather in any region affecting New York may cause local supply problems.	Petroleum fuel prices may begin to rise at both the retail and wholesale levels. Natural gas prices may also rise in parallel with petroleum products.
Reports of shortages in other parts of the United States or reports of natural, terror, or political disruptions in oil-producing countries may affect petroleum and petroleum product prices on the New York Mercantile Exchange (NYMEX.	State wholesale marketing companies and retailers may experience temporary supply difficulties evidenced by price increases or waiting times at terminal supply racks.
Local prices may move up rapidly in response to spot market prices or speculation on commodity markets.	Some gasoline stations will experience greater than normal buying as motorists attempt to secure the current lowest price (especially during the summer driving season).

6.4.1.1 Expected Response Steps

Monitor and alert is ordinarily an ongoing activity and creates a baseline for normal operations against which shortage can be measured.

Table 6-3. Level 1 Response Steps

State Agencies	Energy Stakeholders
Monitor supply and demand. DPS monitors regulated electric and natural gas utilities. Municipal utility and electric cooperative governing agencies/boards/associations monitor respective utilities and cooperatives. NYSERDA monitors all EIA petroleum fuel supply/demand indicators and petroleum fuel prices though the State Heating Oil and Propane Program (SHOPP[37], AAA[38], and OPIS[39] survey organizations. Petroleum associations monitor activity – often on anecdotal basis.	Monitor supply and demand and report any incidents to designated authority: Electric: NYISO and NERC report as they deem appropriate. Natural gas: NGA, LDCs, and municipal gas companies report as appropriate. Petroleum: No reporting expected. Some jobbers and dealers will contact State associations. State officials at NYSERDA are most likely to learn about petroleum shortages early from discussions with various petroleum trade associations and individual companies.

Electric and natural gas providers monitor supply and demand in real time through electronic means. Most small and moderate electric and natural gas outages are not reported in real time, and petroleum marketers will manage spot shortages by quietly finding alternate terminals for supply. The DPS monitors electricity and natural gas (as it affects electric generation) on a regular basis, including reports from regulated electric and natural gas providers, while rural cooperatives report to their governing boards. Municipal companies keep their city and town leaders informed. NYISO also monitors power generation and transmission in New York. The goal is to detect the impact of minor outages and shifts in power use on a real-time basis. They are prepared to react and advise in the event of lost generation. NYSERDA depends on weekly and monthly information provided through EIA, and monitors State agencies, professional associations, and others for State data.

[37] DOE State Heating Oil and Propane Program; https://www.cfda.gov/?s=program&mode=form&tab=step1&id=d9c34ffbdaf94481a40e8d7d7a826a22.

38 Automobile Association of American ; Daily Fuel Gauge Report; http://fuelgaugereport.aaa.com/?redirectto=http://fuelgaugereport.opisnet.com/index.asp.

39 Oil Price Information Service; http://www.opisretail.com/.

6.4.2 Shortage Level 2 – Mild Shortage

Keeping in mind that most mild shortages are part of the ongoing and fluctuating nature of an often volatile energy market, this is the stage when State officials will want to be on guard and ready to advise the Governor in the event that a mild shortage matures to a moderate level.

NASEO suggests that a mild shortage would be observed when there is a 5 to 10 percent reduction in petroleum supply for a week or more, or a 5 to 10 percent reduction in natural gas nominations for interstate pipelines for up to two weeks. *The key to discerning the true level of shortage is in predicting how long any shortage will continue*. A supply interruption may indeed be dramatic, but energy providers may be able to fix the problem quickly or find alternatives. Similar situations can occur in the electricity sector where the sudden loss of a transmission or local distribution line is quickly remedied.

It is unlikely that a shortage at this level would cause an emergency to be declared; unless there is strong evidence that the State will soon experience serious problems. It may also be difficult to react to a mild shortage unless energy stakeholders ask for help.

Timing is critical when trying to forecast the depth and duration of a shortage. A determination that would require any level of emergency mobilization would have to be preceded by an examination of the State's supply and demand outlook for the short and long term. For example, a mild shortage in heating fuel at the end of winter or in early spring may be managed expeditiously because warm weather is anticipated. On the other hand, a mild shortage of gasoline in the spring may trigger additional monitoring and calls for voluntary conservation in anticipation of summer driving. Foreign petroleum fuel markets would also be monitored for clues to future demand.

A number of proprietary information services (see footnotes above) can aid this process. In addition, NASEO and the National Council of State Legislators coordinate with the Department of Energy, Office of Electricity Delivery and Energy Reliability (DOE/OE) to sponsor semi-annual fuel outlook conferences each spring and fall. Information about these meetings can be found at the NASEO website[40] by clicking on the link above.

[40] http://www.oe.netl.doe.gov/EnergyOutlookConferences.aspx.

Table 6-4. Level 2 – Mild Shortage

Conditions (in addition to previous phase; one or more may apply)	Probable Impacts Observed	Media/Public Reaction
DOE/EIA, the American Petroleum Institute (API), or other sources report a decrease in the availability of product (e.g., from Middle East, South America, domestic refineries). The NY petroleum trade associations learn from members that terminal rack waiting time has increased.	Some jobbers report supply and delivery problems or related issues (e.g. extended rack wait time). Deliveries may be temporarily extended beyond routine hours. Tighter market conditions indicated the potential for upward pressure on prices or price volatility.	National news may report events indicating that particular energy supplies will be delivered short of expected volume. Stories about energy may be featured in the media. Media may institute "gasoline watch" features on regular news segments.
Spot prices increase rapidly. National and regional oil companies (prime suppliers) may begin to hold jobbers to specific contract volumes versus buy-as-needed.	Some retail dealers are uncertain about product availability and question information received from prime suppliers.	Media may feature reports about higher prices.
Strong draw on natural gas supply may occur. LDCs may begin to seek additional supply sources.	Gas distribution companies may curtail interruptible contract customers. Natural gas spot prices increase.	Media reaction is minimal. Articles may appear in the business section about higher natural gas prices.
Some New York generating facilities may strain to meet high regional demand. A local generating plant may have to be shut down temporarily. Electric lines may be out of service due to localized damage.	Electric utilities may institute peak hour load management steps. Wholesale electricity prices rise due to temporary imbalances between supply and demand.	A few news reports are likely, most in newspaper business sections.
Some problems with energy delivery systems are observed such as refinery outages, transportation (truck or barge), product terminals, pipelines or sudden decreases to tertiary (consumer-level) storage.	Government assistance in removing retail driver hour limitations may be sought. NYS DOT alerted of potential supply issues.	News stories, mainly features, are likely.
Petroleum dealers report increased pressure on their ability to deliver fuel as a combination of increased demand and resupply constraints begins to develop.	Some customers call dealers to top off home storage tanks. Dealers complain to trade associations about increased cost of rack waiting time or other shortage-related delays.	News stories, mainly features, possible. Some inquiries may be received by government and non-profit agencies.

6.4.2.1 Expected Response Steps

During this phase, New York officials and energy providers may take some or all of the following steps:

Table 6-5. Level 2 Response Steps

State Agencies	Energy Stakeholders
Jurisdictional authorities receive information from the IOUs and NYISO if an electric capacity deficiency emergency is anticipated. Ordinarily, utilities and petroleum dealers will provide seamless work-around for mild shortages so that the public does not notice them.	NYISO may identify areas in need and request load management or start-up of alternate power sources.
Government officials may discuss whether or not the situation warrants a public information campaign designed to refresh consumer knowledge about ways to reduce energy demand.	LDCs may warn authorities of potential supply problems. Ordinarily, gas providers, just like electric and petroleum suppliers, will seek alternative supply sources and the public will be unaware of any disturbance. If local distribution companies believe a shortage may worsen, they will contact appropriate authorities.
Public authorities may be asked to assist energy suppliers in explaining temporary shortage conditions to consumers.	Energy supply and distribution companies and energy industry trade associations may be contacted to obtain advance information about distribution issues, prices, and supply factors.
If the Governor chooses to declare an emergency, additional monitoring may be implemented as specified energy providers are required to disclose information on a proprietary basis.	Energy supply and distribution companies and energy industry trade associations may be contacted to obtain advance information about distribution issues, prices, and supply factors.

6.4.3 Shortage Level 3 – Moderate Shortage

The suggested level of deficiency for identifying a moderate shortage is a 10 to 15 percent reduction in petroleum products for three weeks or more, or a 10 to 15 percent reduction in natural gas supply nominations for interstate pipelines. Other conditions may include storm damage to electric transmission or distribution infrastructure, or electric power that has been cut off, affecting large numbers of customers from 72 hours to a week. Inside the city gate (the point at which gas moves from the pipeline to local distribution lines); curtailment may expand beyond interruptible contract customers to firm commercial residential customers. Petroleum emergencies could include a major disruption of the pipelines serving the State, major outages at refineries, or even a long-term product loss from foreign crude and off-shore refined product suppliers. Monitoring and analytical precautions for this step are the same as noted for a Level 2 – Mild Shortage.

Table 6-6. Level 3 – Moderate Shortage

Conditions (in addition to previous phase; one or more may apply)	Probable Impacts Observed	Media/Public Reaction
Petroleum product imports to the State or region drop 10 to 15 percent below base period (e.g. previous year or specified period; check EIA weekly *This Week in Petroleum*).[41] Contract allocations for a growing number of petroleum retailers are reduced.	Jobbers report difficulty in obtaining or delivering enough supply to satisfy customers in spite of travel to distant terminals. Queuing at wholesale loading racks increases significantly beyond occasional market anomalies.	News reports about shortage appear on regional and national broadcasts. Federal and State officials are interviewed.
Local weather or storms in other regions result in problems that lead to temporary curtailment of electricity in New York (check National Weather Service or local area weather reports).	Wholesale prices jump as many transportation companies add a "fuel charge" to their usual price.	DOE or other federal agencies and energy companies publicly confirm shortage.
Oil product prices rise steadily and level off temporarily before rising again. Prices for key fuels rise at a rate of 15+ percent or more per week (see EIA *This Week in Petroleum*, above, or DOE SHOPP program during winter season and AAA retail surveys).	Spot-supplied retail dealers have difficulty meeting contract obligations. Driver hours increase as terminals increasingly distant from the State are tapped for product. State driver hours are extended. DOT maintains oversight.	Energy shortage in affected area is highlighted on national news. Media fuel-watch programming occurs. News media begin to use the words "energy crisis." Accusations about price gouging are possible. Attorney General may become involved.
Natural gas demand increases. Heavy draw on storage is projected; alternate supply sources, if available, are tapped. If the shortage is due to a natural gas pipeline disruption, local consumers may lose service until the appropriate repairs are made.	Industrial and commercial interruptible gas customers experience extended curtailment. This in turn places growing demand on heating oil and propane as backup fuels. Supply volumes may not be available as companies work to meet demand by traditional customers.	News media increase the number of feature stories about shortage. Fuel companies and others will advise consumers to reduce demand and may seek voluntary temperature controls for business and industry.
Interstate generation capacity is severely strained by wide area severe weather (cold, heat, or storm), transmission loss, or other disruption to customers.	Utilities may curtail load leading to brownouts and threat of blackouts. High energy prices may force some small businesses to close temporarily.	Public starts losing patience with mild inconvenience. Some reports of economic impact published, mainly regarding retail commerce.

[41] Energy Information Administration, *This Week in Petroleum*, http://www.eia.gov/oog/info/twip/twip.asp.

Conditions (in addition to previous phase; one or more may apply)	Probable Impacts Observed	Media/Public Reaction
Sudden or planned reduction in refinery capacity due to economic decisions (long-term) or incident (short-term e.g., fire, explosion, equipment failure, or man-made incident).	Petroleum product prices associated with refinery runs spike. Product delivery to terminals slows, causing increasing truck waiting time or long-distance product search by terminal operators.	Media may publish or broadcast news stories on the event. Media analysts will attempt to explain and may proffer restoration time. Petroleum companies may issue statements but generally will be reticent to publicize extensively.
Growing numbers of low-income customers have difficulty paying for fuel.	Requests for Federal Low-Income Home Energy Assistance Program increases and government agencies receive calls from individual households for help. OTDA[42] maintains oversight.	News media begin to cover energy problems several times a week. Low-income advocates demand help. Volunteer programs accelerate.

6.4.3.1 Expected Response Steps

Before a Level 4 emergency is reached, officials will know that the entire State is highly vulnerable and the risk of economic loss is high. There will also be a strong likelihood of consequent harm to the health and welfare of people living in the State. The political risk of taking action may be lower than it would be in a mild shortage situation, but decisions will be no less difficult. During this phase, New York officials and energy providers may take all or some of the steps detailed in Table 6-7.

Table 6-7. Level 3 Response Steps

State Agencies	Energy Stakeholders
Authorities continue to receive information from the IOUs and NYISO. Utilities and petroleum dealers will find it increasingly difficult to provide seamless work-around.	Electric utilities and LDCs will effect restoration of infrastructure as needed. Municipals and electric cooperatives will activate mutual aid agreements as appropriate. NYISO may strongly encourage a reduction in electricity demand.
If an emergency is declared as noted above (under Mild Shortage), informational requirements as noted above take effect.	If NYISO is unable to divert sufficient supplies of electricity within the State (e.g., due to an increase in regional demand or a failure within the distribution system), area utilities may request DPS and SOEM help in calling for voluntary conservation measures.
NYSERDA will continue to analyze energy supply	LDC natural gas customers with interruptible

[42] http://otda.ny.gov/programs/heap/.

State Agencies	Energy Stakeholders
(especially petroleum products) and evaluate appropriate alternative courses of action.	service contracts will be cut off. This class of customer will need to switch to their alternate fuel source. Fuel availability may affect petroleum suppliers. Electric utilities may institute voltage reductions if demand cannot be met with existing supply.
DPS, in consultation with others and acting through SOEM, may ask the public to implement voluntary conservation measures in order to reduce demand for affected energy sources. The Governor may also call for reduction in energy use.	If NYISO determines that rolling blackouts are necessary, New York electric utilities members would respond. There may not be time to warn customers, although the industry generally tries to provide advance warning.
Others (e.g., local government) may make recommendations to the Governor, in coordination with SOEM and in consultation with NYSERDA, about implementing mandatory conservation measures.	If a pipeline loss occurs, LDC will shut off the gas lines to affected areas until repairs are completed.
If energy customers require assistance in locating alternate fuels, DPS/SOEM may request NYSERDA assistance in working with energy stakeholders to attempt to locate such alternatives.	Local natural gas companies may do one or more of the following: Request emergency gas from unaffected pipeline suppliers. Increase spot market purchases. Curtail service to interruptible customers. Augment supplies with LNG and propane. Request non-interruptible contract customers that have fuel switching capabilities to use their alternate fuel source. Request customer conservation. Adjust gas pressures as needed. Shut off distribution pipeline sections, remaining as sensitive as possible to the needs of critical facilities.
Petroleum problems may be compounded if the moderate shortage is due to a sustained increase in demand from other areas of the country or international markets. If there is a shortage of crude oil, the federal government could release crude oil from the Strategic Petroleum Reserve (SPR). Loss of refinery operations or delay in supply may compound the supply issue.	State petroleum distribution companies will seek fuel from terminals outside of the State as necessary. If the action of increasing out-of-State travel is required, companies may petition Federal Motor Carrier Safety Administration regulators to seek State assistance requesting driver-hour waivers.

State Agencies	Energy Stakeholders
SPR relief is not immediate because it takes several weeks for bids to be managed and crude to move to and through refineries. However, anticipated relief of SPR crude may dampen market speculation.	Propane and heating oil dealers may deliver partial loads to their customers rather than top off tanks (short fills).
The State Emergency Operation Center (EOC) managed by OEM may be activated. EOCs in appropriate county and municipal jurisdictions may also be activated.	Retail motor gasoline stations may curtail hours of operation.

6.4.4 Shortage Level 4 – Severe Shortage

The suggested level of loss for severe shortage is in the range of 20 to 30 percent or more in petroleum products, natural gas, or electricity for more than two weeks. Events observed might include severe reductions in natural gas nominations, widespread electricity outages extending for several weeks, and the inability of the petroleum industry to re-supply local distributors. In such an instance, NYSERDA (as the agency monitoring petroleum conditions) and/or DPS (monitoring utilities), would be expected to consult on a continuing basis together with emergency managers at SOEM and industry representatives, in order to determine when to recommend that the Governor declare an energy emergency. The determination may be based on the suggested levels of loss as recommended in this plan or by other indications such as requests from various components of the energy industry including electric utilities, local distribution companies, petroleum product associations, and representatives of various economic sectors of the State. Officials should keep in mind that if a severe shortage is discerned suddenly (versus as a result of steady progression through levels of loss), events may move rapidly.

Table 6-8. Level 4 – Severe Shortage

Conditions (in addition to previous phase; one or more may apply)	Probable Impacts Observed	Media/Public Reaction
Regional and State fuel dislocation is brought on by large-scale storms, extended, widespread winter cold, strong demand, resupply and distribution delays, embargo, or terrorist acts.	During peak driving seasons, gasoline stations curtail operating hours and motorists may queue to purchase available fuel regardless of price. Lack of courtesy in queues may produce altercations. Heating fuel customers experience higher prices and concerns about supply availability.	State government may be criticized for not acting (or not acting quickly enough). Public safety agencies such as the New York State Police or local jurisdiction police may be called upon to protect energy suppliers such as motor gasoline outlets.

Conditions (in addition to previous phase; one or more may apply)	Probable Impacts Observed	Media/Public Reaction
Retail energy prices continue to rise.	Customers (including government jurisdictions) who obtain spot-market-based fuel may not be able to buy product. During winter months, non-contract, will-call distillate customers have serious difficulty locating heating oil regardless of price.	Fuel issues are reported regularly by the media; rumors are abundant. Media attention may turn from price to the extent of shortage. Accusations of price gouging are likely.
Local product inventory is extremely low or exhausted. Energy product deliveries through the Port of New York may be interrupted or overseas shipments may be curtailed, held-up, diverted, or otherwise reduced. Heavy ice conditions may slow barge operations	Petroleum fuel hoarding is observed. Consumers constantly top up automotive fuel tanks. Prices rise. Interruptible natural gas service customers have difficulty securing backup fuel supplies.	Officials from regulated and non-regulated energy companies are called upon to explain the shortage.
Retail motor fuel and heating fuel dealers receive an accelerating lower percentage of their normal contract allocation and have difficulty maintaining contract delivery volumes.	Suppliers sharply reduce allocations to dealers and dealers are “swamped” managing customer inquiries. Spot-market-dependent service stations may receive no allocation and will have extreme difficulty locating spot-market motor fuel. This may lead to curtailing hours of operation or closing. Suppliers seek additional volumes at distant terminals. Interstate driver hour limits must be addressed.	The public and media may misunderstand the reduction of hours or closure of non-contract service stations and assume that the region is “out of fuel. (Some consumption is reduced as users turn to alternatives, go without, or experience price induced conservation)
Shortages are generally regional in scope, but possibly broader.	State agencies are called on to provide relief through SOEM. State government may hasten efforts to coordinate interstate mitigation activity.	The public is willing to tolerate mandatory intervention measures such as odd/even gasoline purchase days. Citizens will respond to calls for voluntary conservation such as car-pooling or reliance on mass transit and may modify their consumption habits for the duration of the short fall.

Conditions (in addition to previous phase; one or more may apply)	Probable Impacts Observed	Media/Public Reaction
Firm natural gas contract supplies fall well below normal.	Industrial customers face ongoing higher fuel cost. Commercial customer activity may be curtailed. More small businesses close. Some residential customers are displaced from homes in cold weather.	Increasing economic impact is noted. Media covers the issue daily. The public may demand mandatory temperature control measures for commercial and government facilities. Energy companies may be criticized by public authorities.
Loss of electricity can lead to pump failure in water and sewage treatment facilities, as well as loss of retail pumps for motor gasoline.	If the disruption occurs during the winter heating months, governments may need to open heated shelters and take other measures to protect public health, welfare, and safety. During summer, cooling shelters are an option.	Media will follow events and critical editorials and op-ed columns can be expected.
Taxi and mass transit fares may increase to cover the rising fuel costs.	Tourism and discretionary shopping suffers.	Negative impact on economy is noted in the media.
Long-term power problems due to weather, fuel prices, lack of fuel, or infrastructure failure follow.	Rolling brownouts and/or blackouts occur.	Media attention is constant. Economic impact is widespread.
Significant assistance may not be enough to help low-income families obtain fuel.	Economic dislocation occurs.	The danger to vulnerable citizens is featured in the media.

6.4.4.1 Expected Response Steps

Table 6-9. Level 4 Response Steps

State Agencies	Energy Stakeholders
If the Governor declares an energy emergency, SOEM will most likely activate the EOC. Local jurisdiction EOC may also be activated.	All affected energy providers will continue to seek alternate sources for each energy form. Examples of supply sources are: natural gas pipelines, additional power generation, distant petroleum product terminals, and the petroleum spot market jobbers as appropriate.

State Agencies	Energy Stakeholders
NYSERDA and DPS will continue to monitor and analyze energy supply and may evaluate appropriate alternative courses of action including voluntary and mandatory measures.	If NYISO is unable to divert sufficient electricity capacity (e.g., due to increased demand or a distribution system failure), electric utilities may request government assistance calling for additional voluntary as well as mandatory conservation measures.
Health care institutions and some commercial operations may need to switch to standby generators. Home-based generators may also be activated.	Rolling blackouts, especially during peak demand periods, are likely. Rolling blackouts may occur without warning and affect significant regions. Rolling blackouts, if instituted, are likely to last for up to two hours in affected geographic areas.
Individuals using electric-powered home medical devices may be affected. The New York State Department of Health may wish to release seasonal advisories urging such users to secure power backup or alternate sources of energy. State, county, and municipal offices of aging, human services, social services, and low-income heating programs should be prepared to receive and process multiple requests for assistance.	Electricity and natural gas customers may be asked to manage thermostat settings appropriate for the season. Consumers may be asked to reduce hot water temperatures and use. Utilities may seek government assistance in promulgating conservation requests.
Residential, commercial, industrial, and government sectors can expect to be actively involved in energy conservation measures.	Commercial and industrial users might also decide to limit operating hours. Limiting hours of operation may make it difficult to meet customer needs, schedules, and deadlines, which in turn may decrease revenue. Enterprises might wish to restrict their use of electric lighting for advertising, which could decrease business.
Depending upon the estimated duration of an emergency, government may decide to reduce operating hours and suspend some activities until energy supplies are restored.	Energy providers may be required to: Activate industry-recognized contingency measures. Maintain close contact with SOEM/EOC. Submit information and reports to SOEM/EOC.

State Agencies	Energy Stakeholders
Mandatory measures may be imposed by government if increasing prices do not "clear" the market (balance supply and demand). These include response measures suggested in the Energy Assurance Plan. Examples are: odd/even motor fuel purchase rules, prohibition against vehicle tank topping, and other measures meant to control queues and prevent contention at retail outlets.	Energy providers may be required to: Carry out and monitor government-imposed contingency measures. Place personnel at the EOC. Submit information and reports to SOEM - EOC.
NYSERDA, in coordination with SOEM and DPS, may: Submit proposed executive actions to the Governor. Assist in the implementation of gubernatorial actions. Notify neighboring State governments. Coordinate activities with NYISO, other State governments, DOE/OE, and other agencies.	All energy providers will continue to monitor and repair infrastructure as necessary.
Other State agencies may be required to assist as requested.	Adjoining states; Massachusetts, Connecticut, Pennsylvania, Vermont and New Jersey

6.5 Stakeholders, Responsibilities, and Contacts

6.5.1 Primary Powers and Authority

6.5.1.1 Introduction

New York's Energy Assurance authority is derived primarily from the following State statutes. Energy Law § 5-117 authorizes the Governor to declare an energy or fuel supply emergency for a period of up to six months and grants the office numerous supplemental powers during the emergency to protect the public's health and welfare. Upon the declaration of the emergency, the New York State Energy Research and Development Authority (NYSERDA) is also granted supplemental authority, including the power to allocate available supplies of energy and energy resources. With specific regard to liquid fossil fuel supply shortages affecting the State, NYSERDA possesses the authority to activate a fuel set-aside system, pursuant to Article 10 of the Energy Law. Finally, Executive Law Article 2-B provides broad Energy Assurance authority, granting the Governor the power to declare a disaster emergency, establishing the State Disaster Preparedness Commission (DPC), requiring the publication of a State Comprehensive Emergency Management Plan, and establishing procedures for the protection of critical infrastructure, among other things.

6.5.1.2 Fuel and Energy Shortage State of Emergency – Governor's Authority

Article 2, Section 11 of the Executive Law empowers the Governor to declare a fuel and energy shortage state of emergency for a period of up to one year if a determination is made that "there exists or impends an energy or fuel supply shortage of a dimension which endangers the public health or safety" of all or a part of the State. § 11(2). The Governor may limit the state of emergency to any geographical region of the State or to a particular type of energy or fuel. The term energy is defined to mean electricity while fuel encompasses coal, petroleum products such as residual fuel oil, gasoline, kerosene, propane, diesel fuel and other distillates, and gases, including natural gas, LNG and synthetic natural gas.

The declaration of an energy emergency empowers the Governor with the authority to:

- "allocate available supplies of energy or fuel among areas, uses or persons"
- "impose restrictions on non-essential uses of fuel and energy"
- "waive state and local environmental protection requirements" for a period of up to 15 days.

The Governor is additionally empowered to promulgate rules and regulations prior to the declaration of an emergency which will become of force and effect upon the declaration of the emergency. These powers also include penalty for violation under §11(6)(a).

6.5.1.3 Fuel and Energy Shortage State of Emergency – Authority of NYSERDA

Upon the declaration by the Governor of a fuel or energy shortage state of emergency, NYSERDA is empowered with special authority to manage the emergency, including the power to:

- Allocate available supplies of energy and energy resources among areas, users, and persons, giving "priority to energy and energy resources use essential to public health and safety" and allocating the remainder equitably to avoid undue hardship. Energy Law, § 5-117.
- "Impose restrictions on any wasteful, inefficient, or non-essential use of energy or energy resources, and the promotion of such uses."
- "Waive state and local environmental protection requirements to the extent necessary for emergency use of energy resources" for a period not to exceed 30 days (with one additional 30-day waiver granted for "good cause."

Additional relevant sections:

- Section 5-117(2) clarifies that NYSERDA's authority is in addition to and not in limitation of any of the emergency powers vested in the Governor.
- Section 5-117(3) authorizes NYSERDA to supersede any emergency power previously vested in any other State agency when exercising the powers enumerated in Sections 5-117(1) and (2).
- Section 5-117(4) provides that no declaration of an energy or fuel emergency shall be effective for a period in excess of six months, absent Congressional action for an extension[43]. Section 5-119 provides for a civil penalty of $1,000 for each offense or three times the profit received from each violation, whichever is greater.

6.5.1.4 Fuel Set-Aside

In order to ensure that adequate supplies of fuel are available, the Fuel Set-Aside Act was passed to ameliorate the hardship imposed by any severe fuel disruption. Energy Law § 10-101 *et seq*.

Section 10-105(1) authorizes NYSERDA to establish a fuel set-aside for liquid fossil fuels, defined as heating oil, light and heavy diesel oil, motor gasoline, methanol, propane, butane, residual fuel oils, kerosene and aviation fuels. The rules and regulations must direct prime suppliers to set aside a percentage (not exceeding three percent) of the monthly volume of liquid fossil fuels which prime suppliers intend to sell into the State's distribution system for consumption within the State.

As described in the 2009 State EEP, if the set-aside were implemented, "priority uses would generally include those uses supporting public health and safety, such as medical care and law enforcement." Additionally, "NYSERDA would work with local county energy coordinators through the State Office of Emergency Management (SOEM), to implement the program in a rapid and effective manner." Civil penalties for violation are also included.

6.5.1.5 Federal Reference

The Fuel Set-Aside Act references the federal Emergency Petroleum Allocation Act of 1973, as amended by the Energy Policy and Conservation Act of 1975, and provides that New York's fuel-set aside program is in place only in the event that the federal government is terminated or fails to implement its program. Since the federal set-aside system no longer exits, the creation of any set-aside resides entirely with the State.

6.5.1.6 Article 2-B

The New York State Legislature promulgated State Executive Law, Article 2-B in 1979. That law provides for a wide range of possible State responses and mitigation measures that can be taken regarding State and local natural and man-made disasters. According to the New York State Office of Emergency Management website, Article 2-B

- Created the State Disaster Preparedness Commission (DPC)
- Shifted emphasis from Civil Defense to all-hazards preparedness activities and missions

[43] Note that Executive Law, Article 2, § 11(2) provides that the declaration of fuel and energy emergency will not exceed one year.

- Assigned responsibility for off-site radiological emergency preparedness for commercial nuclear power plants
- Created State Emergency Assistance Program in 1993, which provides reimbursement to eligible municipalities for public damages from natural disaster

6.5.1.7 Governor's Declaration of a Disaster Emergency

Executive Law Article 2-B § 28 empowers the Governor to declare a disaster emergency after determining that a disaster has occurred or is imminent for which local governments are unable to respond adequately. The declaration, issued through executive order, must describe the disaster and the affected area, and the order lasts no more than six months. The Governor is additionally authorized to (i) direct all State agencies to provide assistance under the coordination of the DPC (§ 29), (ii) temporarily suspend provisions of State statutes, local laws, ordinances, orders, rules or regulations for a period no more than 30 days (§ 29-a).

6.5.1.8 The DPC and the Comprehensive State Emergency Management Plan

Executive Law, Article 2-B § 21 creates the State Disaster Preparedness Commission (DPC) (described in the Stakeholder section below) and requires that the DPC prepare and revise a Comprehensive State Emergency Management Plan (CEMP), direct State disaster operations and coordinate with local government operations, and coordinate federal, State and private recovery efforts.

As described in the State's 2009 CEMP, the goal of the document (or collection of documents) is to provide general strategic guidance and an organizational structure of New York State agencies during emergency response and short-term recovery operations. The CEMP is published in three distinct, but interconnected volumes, which are:

- Volume 1: All-Hazard Mitigation Plan
- Volume 2: Response and Short-Term Recovery
- Volume 3: Long-Term Recovery Plan

In addition to the volumes listed above, the CEMP is supported by functional annexes, each of which identifies the individual and collective actions of selected State agencies and State Functional Branches in applying their collective resources to all hazards. For example, the 2009 State EEP is an annex to the CEMP.

Section 21 additionally empowers the DPC to:

- Request and obtain from any state or local officer or agency any information necessary to the DPC regarding the exercise of its responsibilities. § 21(3)(b)
- Create a temporary organization in the disaster area to provide for integration and coordination of federal, State, municipal and private agencies, following a declaration of a State disaster. § 21(3)(f)
- Assist in the coordination of federal recovery efforts. § 21(3)(g)
- Develop public service announcements for distribution to media informing the public how to prepare and respond to disasters. § 21(3)(j)

6.5.1.9 Emergency Management Assistance Compact

The Emergency Management Assistance Compact (EMAC) is a multi-state mutual-aid agreement that facilitates the rapid sharing of equipment, personnel and other resources among states in response to a natural or man-made disaster emergency. EMAC response is coordinated by the National Emergency Management Association. Currently, all U.S. states, the District of Columbia, U.S. Virgin Islands, Puerto

Rico, and Guam are members of EMAC. New York's Executive Law Article 2-B § 29-g is the enabling legislation that adopted the standard language of the Compact and authorized the State to join EMAC.

6.5.1.10 Local Government Duties and Responsibilities Regarding Disaster Preparedness

Executive Law, Article 2-B § 20 provides that it is the policy of the State that "local government and emergency service organizations continue their essential role as the first line of defense in times of disaster," and that "local chief executives take an active and personal role in the development and implementation of disaster preparedness programs."

Section 23 authorizes local governments within the State of New York to prepare local comprehensive emergency management plans, which, like their State counterparts, should address (i) disaster prevention and mitigation, (ii) disaster response, and (iii) disaster recovery. Section 24 empowers the chief executive of any county, city, town or village to proclaim a local state of emergency and related orders that may provide for:

- The establishment of a curfew
- The designation of specific zones where the occupancy of buildings, or the ingress and egress of vehicles and persons may be prohibited or regulated
- The regulation and closing of places of amusement and assembly
- The limitation of the sale of certain products such as alcoholic beverages and flammable material
- The prohibition and control of the presence of persons on public streets and places
- The establishment of emergency shelters
- The suspension within any part or all of its territorial limits of any of its local laws, ordinances or regulations, subject to certain limitations, including a time limit of five days

Section 25 authorizes local governments to request and accept assistance from other political subdivisions as a result of a disaster emergency.

Section 29-e enables a municipality to apply to the DHSES for reimbursement of extraordinary and unanticipated repair and reconstruction costs, after the Governor has issued a declaration of significant economic distress for a municipality following a natural disaster.

6.5.1.11 Protection of Critical Infrastructure

6.5.1.11.1 Electricity

Executive Law § 713 empowers the Division of Homeland Security and Emergency Services (DHSES described in Section 6.5.2) to "conduct a review and analysis of measures being taken by the Public Service Commission" (The agency is also known by name of its staff arm, Department of Public Service – DPS) and other relevant agencies "to protect the security of critical infrastructure related to energy generation and transmission located within the State" and to report periodically to the Governor with recommendations. Section 713(2)(c) provides the Public Service Commission with the discretion to require that DHSES recommendations be implemented by any owner or operator of an energy generation or transmission facility.

6.5.1.11.2 Petroleum, Natural Gas and Other Fuels

Section 716 authorizes DHSES to conduct a review and analysis of measures being taken by any other agency of the State to "protect the security of critical infrastructure related to commercial aviation fuel, petroleum and natural gas transmission facilities and pipelines in this state which are not located upon the premises of a commercial airport" and to report to the Governor periodically with recommendations. Section 716(2)(c) provides the Public Service Commission with the discretion to require that DHSES

recommendations be implemented at an affected commercial aviation fuel, petroleum or natural gas transmission facility or pipeline.

6.5.1.12 Other State Authorities

6.5.1.12.1 Executive Orders regarding the National Incident Management System (NIMS)

As described in the 2009 State Comprehensive Emergency Management Plan, Governor Pataki issued Executive Order No. 26 in 1996, thereby establishing a New York State standard to coincide with the National Interagency Incident Management System (NIIMS) - Incident Command System (ICS) for a command and control system that will be utilized during emergency operations. In 2006, Governor Spitzer updated that Executive Order via Executive Order 26.1 in order to reflect changes to NIMS. The 2006 Order was continued by Governor Paterson's Executive Order No. 9.

See also, State of New York National Incident Management System (NIMS) 2009 Implementation Strategy.

6.5.1.13 Relevant Federal Authority

6.5.1.13.1 Federal Civil Defense Act of 1950

The Federal Civil Defense Act of 1950 established Federal Civil Defense policy during the 1950s and was originally intended to address the risks of a nuclear attack during the cold war. The Act continues to provide monetary assistance to states for preparedness activities.

6.5.1.13.2 Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1974

Signed into law November 23, 1988, the Stafford Act established the Federal Disaster Assistance policy and continues to provide monetary assistance to States for disaster recovery. This Act provides the statutory authority for most federal disaster response activities, especially as they relate to FEMA and FEMA programs.

6.5.1.13.3 Homeland Security Presidential Directive Number 5

In 2003, President Bush signed Homeland Security Presidential Directive Number 5, which directed the Secretary of Homeland Security to develop the NIMS. NIMS integrates effective practices in emergency preparedness and response into a comprehensive national framework for incident management.

6.5.1.13.4 Presidential Reorganization Plan # 3 of 1978

This plan created the Federal Emergency Management Agency (FEMA) and shifted emphasis from civil defense to all-hazards.

6.5.1.13.5 Homeland Security Presidential Directive 7 (HSPD-7)

HSPD-7 established national policy for enhancing critical infrastructure protection (CIP) by establishing a framework for the Department of Homeland Security's partners to identify, prioritize, and protect the critical infrastructure in their communities. The directive identified 17 critical infrastructure sectors and, for each sector, designated a federal Sector-Specific Agency (SSA) to lead protection and resilience-building programs and activities. Energy is listed as a critical infrastructure sector.

6.5.1.14 Other Relevant Authority

6.5.1.14.1 Restrictions on Hours Worked and Hours of Service

Labor Law § 167 places restrictions on the number of consecutive hours nurses may work, but subsection (3) provides that the limitations do not apply in the case of federal, state or county declarations of emergency.

Labor Law § 168 limits the number of hours of labor of certain State employees, but provides an exemption in the event of an "emergency endangering life or property."

Transportation Law § 214 provides that the provisions limiting drivers of motor trucks and motor buses to a certain number of hours of service "shall not apply nor shall hours of service accrue to incidental drivers engaged in the actual restoration or preservation of electric, water, telephone, gas or steam service during an emergency." In order for a corporation providing electric, water, telephone, gas or steam service to utilize this exemption, it must have filed a plan setting forth the procedures to be utilized during an emergency.

6.5.1.14.2 Power Plant, Transmission, Pipeline and Facility Siting Authority

Transmission Siting. The PSC has primary authority under State law for the siting of electric transmission facilities, pursuant to Public Service Law Article VII and regulations found at 16 NYCRR Subpart 85-2 *et seq*. Article VII authorizes the PSC to issue a single Certificate of Environmental Compatibility and Public Need as the only approval required under State law for the construction of "major" electric transmission facilities. In addition, developers must also work in concert with the interconnection process administered by the New York Independent System Operator, Inc. (NYISO). Note that the Environmental Policy Act of 2005 (EPACT) amended the Federal Power Act by providing FERC with authority over the construction or modification of electric transmission facilities under certain conditions, namely for proposed projects within a National Corridor designated by DOE. FERC's siting regulations are found at 18 C.F.R. Part 50 *et seq*.

Generating Facilities: Approvals for the construction of most types of electric generation facilities are within the jurisdiction of State and/or local agencies, in accordance with the State Environmental Quality Review Act (SEQRA), and its implementing regulations, found at 6 NYCRR Part 617 and 16 NYCRR Part 7. However, there is currently no single State forum to consider electric generation siting decisions. Therefore, approval for the construction of a generating facility may involve various agencies and laws, including:

- Certificate of Public Convenience and Necessity under PSL §68
- Water Quality Certifications
- State Pollutant Discharge Elimination Systems permits
- Air emissions permits under the Clean Air Act
- Review by the State Historic Preservation Office under §106 of the National Historic Preservation Act or under §14.09 of the New York State Historic Preservation Act
- Coastal zone Consistency Certification under the Coastal Zone Management Act

Hydroelectric Facilities: Pursuant to the FPA, FERC is authorized to permit and regulate the nation's non-federal hydroelectric power projects that affect navigable waters, occupy U.S. lands, use water or water power at a government dam, or affect the interests of interstate commerce.

Natural Gas Pipelines: FERC exercises jurisdiction over the siting of natural gas pipelines used in interstate commerce, in accordance with the Natural Gas Act (15 U.S.C. §717 et seq.) and the National Environmental Policy Act (NEPA). Notwithstanding FERC's authority, certain findings may be under the control of the State, such as a Water Quality Certification or a coastal zone Consistency Certification.

Natural gas pipelines operating in *intrastate* commerce are certified by the PSC under Article VII of the Public Service Law, which authorizes the issuance of a single certificate as the only approval required under State law. However, other approvals may be needed under federal law, such as a coastal zone Consistency Certification under the CZMA, or a wetlands permit under the CWA.

Natural Gas Storage Facilities and LNG Import Terminals: FERC has jurisdiction to approve the construction of natural gas storage facilities and liquefied natural gas (LNG) import terminals. However, a coastal zone Consistency Certification is typically required from the Department of State for LNG projects if they are located in the State's coastal zone or if they may have reasonably foreseeable effects on the State's coastal resources.

Oil and Gas Well Construction and Oil Storage Facilities: The New York Department of Environmental Conservation (DEC) has the jurisdiction to authorize the construction of wells for extracting oil and natural gas supplies, pursuant to Environmental Conservation Law Article 23. The DEC also authorizes the construction of major oil storage facilities, and liquefied petroleum gas pipelines, in accordance with the State Environmental Quality Review Act.

6.5.1.14 Regulated Energy Sources

6.5.1.14.1 Introduction

Electricity and natural gas are regulated in New York. Pursuant to Public Service Law sections 65 and 66, the PSC has broad regulatory authority to ensure the safe and adequate service of electricity and natural gas at just and reasonable charges, free from unjust discrimination or unreasonable preference. Given this authority, the PSC has assumed lead agency status for electric system and natural gas emergencies. In contrast, NYSERDA will assume the lead role for petroleum and coal supply emergencies. In either case, the State Office of Emergency Management (SOEM) will assume responsibility for the coordination of the State response, including the activation and operation of the State Emergency Coordination Center (SECC).

6.5.1.14.2 Electricity and Natural Gas

The PSC has broad regulatory authority over electricity and natural gas. Several of those regulatory powers are relevant to Energy Assurance. For example, in situations in which "the gas corporation supplying such area is unable and will be unable to secure or produce sufficient gas to meet the reasonable needs of its Customers," § 66-A provides the PSC with authority to determine allocation, in accordance with certain statutory guidelines, and to establish gas conservation measures.

In addition, Public Service Law § 66-2-a provides the PSC with the authority

> after an investigation and hearing . . . and upon a finding that as a result of a shortage of gas a public emergency exists . . . to order . . . a gas corporation to transfer and make available to any other gas corporation where a shortage of gas exists, for the duration of the emergency, any or all of such excess gas for which the transferring company shall receive just compensation.

Table 6-10 outlines some of the many other State statutes regarding regulation of natural gas and electric companies.

Table 6-10. NYS Statutes Regulating Natural Gas and Electric Companies

Section Number	Summarized Description
PBS § 30	State policy to provide gas, electric and steam service to residential customers without unreasonable qualifications or lengthy delays
PBS § 64	Broad applicability of article to gas and electric corporations
PBS § 65	Obligation to provide safe, adequate service at just and reasonable charge, without discrimination or preference
PBS § 65-B	Duty of gas and electric providers to provide service to persons receiving public assistance
PBS § 66	Delineation of PSC powers regarding gas and electric companies
PBS § 66-A	PSC authority to act when a gas company's supplies are insufficient to meet reasonable needs of existing customers
PBS § 66-C	Encouragement of alternate energy production facilities, co-generation facilities and other measures to conserve energy resources
PBS § 66-E	PSC monitoring of natural gas procurement contracts and practices for anti-competitive provisions or behavior
PBS § 66-F	Authority of PSC to compel the purchase of natural gas at the lowest available price
PBS § 66-G	Authority of PSC to require an electric corporation to enter into long-term contracts to purchase electricity produced from indigenous natural gas supplies
PBS § 68	PSC approval required for construction of a gas or electric plant
PBS § 69	PSC authorization required for issuance of stocks, bonds, mergers and consolidations
PBS § 69-A	PSC authorization required for reorganization of gas and electric corporations
PBS § 70	PSC approval required for transfer of franchise, system, or stocks
PBS § 71	PSC jurisdiction over certain complaints regarding quality and price of gas and electricity
PBS § 121	Requirement to obtain certificate of environmental compatibility and public need from PSC regarding the siting of major utility transmission facilities
PBS § 121-A	Requirement to file notice of intention to construct a fuel gas transmission line with PSC

6.5.1.14.3 Petroleum and Coal

The State's authority regarding petroleum and coal is not as extensive as its broad regulation of electric and gas companies. Nevertheless, the State still possesses significant authority over petroleum, and to a lesser degree, coal companies. For example, Energy Law § 5-117 grants the Governor the authority to declare a fuel and energy shortage emergency and to invoke the supplementary powers of the Governor's Office and NYSERDA discussed throughout this document. The term fuel is defined to include petroleum and coal. Additionally, the Set-Aside empowers the NYSERDA to allocate liquid fossil fuels, including refined petroleum products such as gasoline, heating oil and propane, during an emergency. Coal is not listed included as a liquid fossil fuel. Some of the significant State statutes governing petroleum and coal are presented in Table 6-11 below:

Table 6-11. NYS Statutes Regulating Petroleum and Coal

Section Number	Summarized Description
EXC § 716	DHSES authorized to conduct a review of critical infrastructure, including petroleum
ENG § 6-104	State Energy Plan required to include forecast of future petroleum and coal supply requirements and assessment of available supply
ENG § 10-101 et seq.	Fuel Set-Aside Act to address severe disruption from fuel shortage
ENG § 5-117	Authorizes Governor to declare a fuel and energy shortage emergency (including petroleum and coal) and invoke supplementary powers
PBS § 63-FF(1)	Grants PSC general supervisory authority over safety standards of certain liquid petroleum pipeline corporations
PBS § 63-FF(2)	Authorizes PSC to investigate the methods employed in transporting and furnishing liquid petroleum through the State
PBS § 63-FF(3)	Grants PSC authority to enter upon and inspect property, pipes, ducts etc. of corporations engaged in transportation of petroleum via pipeline
ENV § 15-0514	Defining petroleum as a hazardous substance and prohibiting the incompatible use of certain hazardous substances over primary groundwater recharge areas
ENV §§ 17-1013, 17-1015	Creating the State petroleum bulk storage advisory council and creating certain state petroleum bulk storage standards
BGS §§ 302, 303	Providing certain requirements regarding the storage of crude and refined petroleum

6.5.1.15 Emergency Regulation

The State's primary emergency regulation authority is derived from Energy Law § 5-117, which authorizes the Governor to declare an energy or fuel supply emergency and to activate certain

supplemental powers in the Governor's Office and NYSERDA. As described above, the State also possesses significant Energy Assurance authority from the fuel set-aside system, contained in Article 10 of the Energy Law, as well as the authority of the Governor to declare a disaster emergency and invoke additional disaster emergency powers, found in Executive Law Article 2-B. Excerpts from these laws are shown in Table 6-12, below.

Table 6-12. Excerpts from NYS Energy Law § 5-117, Declaring an Energy or Fuel Supply Emergency

Section	Provisions
EXC Art. 2 § 11(1)(a)	Definitions. "Energy" includes electricity, however generated.
§ 11(1)(b)	Definitions. "Fuel" includes coal, petroleum products and gases.
§ 11(1)(c)	Definitions. "Petroleum products" includes residual fuel oil, gasoline, kerosene, propane, butane, refined lubricating oils, diesel fuel, and other distillates, including number two fuel oil."
§ 11(1)(d)	Definitions. "Gases" includes "natural gas, liquefied natural gas and synthetic natural gas."
§ 11(2)	If the Governor finds that "there exists or impends and energy or fuel supply shortage of a dimension which endangers the public health or safety in all or any part of the State, the Governor may declare a fuel and energy shortage state of emergency." The state of emergency cannot last for more than one year and can be declared for any type of fuel and energy as well as to any geographical territory or part of the State.
§ 11(3)	The declaration of emergency empowers the Governor to: allocate available supplies of energy or fuel among areas, uses or persons. In allocating available supplies, the governor shall give priority to fuel and energy uses essential to the public health and safety and shall, thereafter, attempt to allocate the available supply equitably and in a manner designed to avoid undue hardship to particular fuel and energy users, classes of fuel and energy users and regions. impose restrictions on non-essential uses of fuel and energy; and waive State and local environmental protection requirements to the extent necessary for the emergency use of fuels not meeting such requirements; provided, however, that no such waiver may be for a period longer than fifteen days.
§ 11(4)	The Governor is authorized to promulgate rules and regulations regarding fuel and energy states of emergency, however, they will not go into effect until a declaration of emergency.
§ 11(5)	The powers of this section are in addition to and not in limitation of any other emergency powers vested in the Governor's Office or any other State agency. However, upon declaring an emergency, the Governor may supersede any other such emergency power.

Section	Provisions
§ 11(6)(a)	"Any person who violates any provision of any order, rule or regulation issued pursuant to this section shall be subject to a penalty" between $25 and $500 or three times the profit gained from the violation, whichever is greater. "An unintentional, technical violation" is not subject to penalty.
§ 11(6)(b)	A person committing a willful violation is guilty of a misdemeanor.
§ 11(7)	The State Attorney General is authorized to bring an action in the Supreme Court to enjoin a violation or imminent violation and seek other injunctive relief.
ENG § 5-117(1)	Upon the declaration of an energy or fuel emergency, the NYSERDA shall be authorized with the following additional powers and duties:
§ 5-117(a)	Allocate available supplies of energy or energy resources among areas, users, persons or categories of persons or users. In allocating available supplies, the commissioner shall give priority to energy and energy resources use essential to public health and safety, and shall thereafter attempt to allocate the remaining supply equitably and in a manner designed to avoid undue hardship.
§ 5-117(b)	Impose restrictions on any wasteful, inefficient, or non-essential use of energy or energy resources, and upon the promotion of such uses.
§ 5-117(c)	Waive state and local environmental protection requirements to the extent necessary for emergency use of energy resources not meeting such requirements for a period of not more than thirty days; provided, however, that an additional thirty days may be granted for good cause. Only one such waiver and one extension thereof may be granted any facility within any six month period.
§ 5-117(2)	The NYSERDA's supplemental powers are in addition to and not in limitation of any emergency power vested in the Governor's Office, which the Governor may delegate to the NYSERDA.
§ 5-117(3)	In exercising these supplemental powers, the NYSERDA "may supersede any emergency power heretofore vested in any other State agency."
§ 5-117(4)	Neither the declaration of emergency nor the supplemental powers described herein are effective for more than six months, absent an extension of time by each house of the legislature.
§ 5-119(1)	Violations of orders, rules or regulations stemming from these provisions are subject to a civil penalty of $1,000 for each violation or three times the profit gained from the violation, whichever is greater. For continuing violations, each day is considered a separate offense.

Section	Provisions
§§ 5-119(2), 5-119(3)	The State Attorney General may bring an action for civil penalty or injunctive relief, at NYSERDA's request.
EXC Art 2 § 28(1)	Whenever the Governor "finds that a disaster has occurred or may be imminent for which local governments are unable to respond adequately, he shall declare a disaster emergency by executive order."
§ 28(3)	The executive order describing the disaster and affected area shall remain in effect for no more than six months or until rescinded by the Governor.
§ 29	"The governor may direct any and all agencies of the State government to provide assistance under the coordination of the Disaster Preparedness Commission."
§ 29-a	Suspension of other laws. 1. Subject to the State Constitution, the Federal Constitution and federal statutes and regulations, and after seeking the advice of the Commission, the Governor may by executive order temporarily suspend specific provisions of any statute, local law, ordinance, or orders, rules or regulations, or parts thereof, of any agency during a state disaster emergency, if compliance with such provisions would prevent, hinder, or delay action necessary to cope with the disaster.
§ 29(2)(a)	No suspension shall last for more than 30 days, though upon reconsideration of the facts and circumstances, the Governor can extend the suspension for up to an additional 30 days.
§ 29(2)(b)	Any suspension must safeguard the health and welfare of the public and be reasonably necessary to the disaster effort.
§ 29(2)(c)	Any suspension order must "specify the statute, local law, ordinance, order, rule or regulation or part thereof to be suspended and the terms and conditions of the suspension
§ 29-E	New York State Emergency Assistance Program. The Governor may issue a declaration of significant economic distress following a natural disaster, allowing a municipality to apply for reimbursement "of extraordinary and unanticipated costs associated with the reconstruction or repair of public buildings, facilities or infrastructure."
ENG § 10-105(1)	The fuel set-aside system established pursuant to this article shall not go into effect in whole or in part except where the federal government terminates, suspends or fails to implement all or part of the federal petroleum allocation program
§ 10-105(2)(b)	The commissioner shall notify each prime supplier of the monthly fuel set-aside percentage, not exceeding three percent, applicable to each product subject to fuel set-aside. The commissioner may review and revise such

Section	Provisions
	percentages from time to time, as he deems appropriate.
§ 10-107(1)	Violations subject to civil penalty between $2,500 and $10,000 per violation.
§ 10-107(2), 10-107(3)	The State Attorney General may file suit against violators, at the request of the NYSERDA, to recover civil penalties or to seek injunctive relief.

6.5.1.16 Emergency Response and ESF-12

As provided in the DOE website, the Emergency Support Function 12 (ESF-12) is intended to facilitate the rapid and effective restoration of damaged energy systems and components. It provides a mechanism for the numerous agencies involved in the energy infrastructure to communicate effectively with each other, and restore pre-incident operations as rapidly and effectively as possible. The DOE's Office of Electricity Delivery and Energy Reliability (OE) is the lead agency in executing the ESF-12, in accordance with the National Response Framework. It serves a role as facilitator of communication, planner, and provider of technical assistance; however, it is not a first responder to energy emergencies. The ESP-12 outlines the specific roles and responsibilities of each relevant agency in the energy restoration process, including the areas of damage assessment, policy decisions, state, local, and private sector coordination, deployment of response teams, and damage mitigation assistance.

The ESF-12 is implemented when it is anticipated that a significant event will likely require federal assistance and/or in response to a significant event requiring federal assistance pursuant to a Presidential declaration of a major disaster or emergency. As provided in the 2009 NYS Energy Emergency Plan, when the ESF-12 is invoked, DOE is responsible for the following:

- Forecasting energy price, supply, and demand, and estimating system damage.
- Advising local authorities on energy restoration, assistance and supply priorities.
- Providing recovery coordination to affected parties.
- Providing regular incident situation reports.
- Providing a single point of access for Departmental assets and expertise.
- Serving as an information clearinghouse on recovery assistance, funding and emergency response resources and organizations for the energy sector.
- Assisting in the provision of temporary fuel supply.
- Recommending conservation actions.
- Reviewing requests to the National Communications System for Telecommunications Service Priority.

6.5.1.17 New York State Emergency Response Procedures and Management Plan

New York State follows an energy emergency response process that is similar to the ESF-12 utilized at the federal level. The State process is designed to encourage a flexible response to emergencies, providing a suite of options to ameliorate energy contingencies as they arise that become increasingly more intensive as an emergency grows more serious. The emergency options are not meant to constrain State agencies into a one-size-fits-all solution. A detailed description of the response options available to the State is found in several additional State reports, incorporated herein by reference, including: (i) The 2009 NYS Energy Emergency Plan (NYS EEP), (ii) The NYS Department of Public Service Emergency Plan,

and (iii) the NYS Comprehensive Emergency Management Plan, with particular reference to Volume 2, Response and Short-Term Recovery.

As described in the 2009 NYSEEP, New York's Energy Emergency Plan is based on a four-stage response hierarchy that generally elevates the level of response with the severity of the energy or fuel supply shortage or emergency.

- Stage I - Increased Monitoring - Conditions warrant increased monitoring of one or more portions of the energy supply and/or distribution system.
- Stage II - Market Coordination - There is active coordination between energy supply distribution systems and State agencies to moderate the effects of a potential emergency.
- Stage III - Public Action - The public is asked to take action to moderate the effects of a potential emergency.
- Stage IV - Emergency Declaration - The Governor declares an energy, or fuel supply, emergency. Broad emergency powers are granted to the Governor or the Governor's designee.

Each of these stages is discussed below with reference to the particular fuel or energy source for which an emergency exists, including petroleum, coal, electric power, natural gas, and nuclear power plants.

6.5.1.17.1 Petroleum Emergencies

NYSERDA is the lead State agency with regard to responding to liquid petroleum product emergencies that occur in New York or that occur outside the State but affect New York supplies. (Petroleum products include gasoline, heating oil, kerosene, diesel, propane, residual fuel, etc.) In the event of such an emergency, NYSERDA will activate the NYSERDA Energy Emergency Implementation Plan and support agencies will implement their internal emergency response plans as needed. Their activities will be coordinated by SOEM.

Stages of Petroleum Emergency

New York may initiate response actions to a petroleum emergency in the absence of federal initiatives or activation of ESF-12. The President of NYSERDA will determine the designation of pre-emergency stages I through III. Stage IV would be initiated by the Governor through the declaration of an energy or fuel supply emergency. The Governor is authorized to declare an emergency for the entire State or for a particular part or region. After the declaration, NYSERDA is authorized to activate the stand-by fuel set-aside program for liquid fossil fuels if it is determined that implementation of the program for one or more liquid fuels is necessary to prevent or alleviate energy hardships or shortages. The Governor's declaration and the supplementary emergency powers are effective for up to six months and then renewable only upon approval of the State Legislature.

The 2009 NYSEEP provides the following outline of potential response actions for each stage of a petroleum energy emergency:

- **Stage I - Increased Monitoring**
  - NYSERDA increases monitoring activities of weekly energy supply, demand, and price data by expanding fuels types, and level of detail. This includes data on production, imports, exports, and volumes supplied. As a result, staff may determine advanced indications of an impending petroleum and demand imbalance.
  - NYSERDA increases the frequency and the level of detail in selected published reports.
  - Update web page energy data more frequently.
- **Stage II - Market Coordination**

- NYSERDA formally contacts New York State petroleum industry trade organizations to alert them to the situation and requests they encourage their membership to make all effort to coordinate supply activities.
- If necessary, request NYS Department of Transportation (DOT) to grant waivers of Drivers Hours of Operation Regulations (HOS) to facilitate shipments and movements of gasoline as required.
- Encourage New York State human service agencies to coordinate appropriate State, County and federal assistance programs to assist low-income, handicapped, and elderly persons with their transportation needs as a result of the shortage.
- If appropriate, request a waiver for the Jones Act from the U.S. Department of Transportation. A waiver would allow non-U.S. flag tankers to operate between U.S. ports.
- Notify the State Emergency Management Office which may consider activation of a virtual Multi Agency Coordination (MAC) Group to address policy issues in the event the emergency progresses to Stage III or IV.

- **Stage III - Public Action**
  - Activities under this phase would increase as NYSERDA determines, through ongoing monitoring, that an energy supply problem is imminent.
  - The Governor's Office and other concerned State agencies would be advised.
  - NYSERDA would work with the New York State Department of Environmental Conservation (DEC) and other State agencies to call attention to the supply problem and guide steps or actions to reduce fuel demand and consumption.
  - NYSERDA would identify administrative resources that may be needed under an emergency scenario and would keep affected participants, the State Office of Emergency Management (SOEM), and the Governor's Office apprised of events.
  - SOEM may consider establishment of a more formal MAC Group.
  - SOEM may consider activation of any or all of the functional annexes of the State CEMP.
  - SOEM may consider activation of the State Emergency Coordination Center and JIC.
  - If fuel demand and consumption reduction efforts alone are not sufficient to mitigate the supply constraints, NYSERDA would contact DEC regarding DEC issuance of waivers for use of non-conforming fuels to prevent escalation of the emergency situation.
  - **Transportation Fuels (Gasoline and diesel)**
    - Request a reduction by the consuming public and State and local government employees in all non-essential travel.
    - Encourage carpooling efforts by the public.
    - Encourage the use of mass transportation systems within the State.
    - Request the strict enforcement of posted speed limits within the State.
    - Request all non-emergency governmental, commercial, and industrial facilities to operate on a limited hour basis or limited number of days per week.
  - **Distillate Fuels for Heating (Heating Oil, Kerosene, Diesel)**
    - Request all non-essential commercial, office, governmental and industrial operations to reduce their consumption.
    - Request all heating oil, kerosene, and diesel consumers to voluntarily curtail use.
    - Request residential sector to voluntarily lower temperatures.

- Request all non-emergency governmental, commercial, and industrial facilities to operate on a limited hour basis or limited number of days per week.
- Request all distillate fuel-using private office buildings, schools, and universities to reduce their thermostats settings for space and domestic hot water heating.
- Request curtailment of deliveries to non-essential users.
- Request Limit fill-ups to 50 percent of capacity on all residential and other essential deliveries where the intended use is for heating or hot water.
- Request restriction of temperatures in all non-essential buildings of commercial and governmental users to 65 degrees F during working hours and to facility maintenance levels during non-working hours.

o **Propane Fuel**

- Request all propane consumers to voluntarily curtail propane use.
- Request all non-essential commercial, office, governmental and industrial operations to reduce their consumption.
- Request curtailment of deliveries to non-essential users.
- Limit fill-ups to 50 percent of capacity on all residential and other essential deliveries where the intended use is for heating or hot water. Request all non-emergency governmental, commercial, and industrial facilities to operate on a limited hour basis or limited number of days per week.
- Request all propane-using private office buildings, schools, and universities to reduce their thermostats settings for space and domestic hot water heating.
- Request all second homeowners using propane in New York State to reduce their thermostatic settings at these homes to minimum property protection settings.
- Discontinue recreational uses of propane, such as heating of swimming pools, saunas, spas and ornamental fireplaces not used for heat.
- Discontinue filling portable 20-gallon or smaller propane cylinders unless the fuel will serve as the primary cooking fuel or has primary space heating application for a residence.
- Request industries with dual-fuel capability to convert from propane to the alternative fuel. Request curtailment of deliveries to non-essential users.
- Request limit on fill-ups to 50 percent of capacity on all residential and other essential deliveries where the intended use is for heating or hot water.
- Request restriction of temperatures in all non-essential buildings of commercial and governmental users to 65 degrees F during working hours and to facility maintenance levels during non-working hours.

- **Stage IV - Emergency Declaration**
  - If public health, safety, or the general welfare are believed to be jeopardized by an energy supply imbalance or emergency event, the Governor may declare an Energy Emergency.
  - Emergency response options would be implemented pursuant to orders issued by NYSERDA's President.
  - Enforcement would be based on Section 5-119 of the State Energy Law (and, as appropriate, portions of the Public Service Law), which imposes civil and criminal sanctions for violations.
  - If the President of NYSERDA finds sufficient energy hardships or shortages exist, the standby fuel set-aside program for liquid fossil fuels under Article 10 of the State Energy

Law and Part 7900 of 9NYCRR may be activated. Enforcement would be based on Section 10-107 of the State Energy Law.

- The following actions, or parts thereof, may be recommended in the event of a petroleum fuel supply shortfall.
  - Fuel Set-Aside Program to alleviate spot shortages and temporary hardships by allocating in-State supplies of petroleum products that are "set aside" from each prime supplier's available supply.
  - Minimum Motor Fuel Purchase Program to assist in the orderly distribution of supplies of motor fuel by discouraging "tank topping" and reducing the length of waiting lines at retail outlets.
  - Odd/Even Motor Fuel Purchase Program to assist the equitable and orderly distribution of motor fuel by reducing consumer visits to retail outlets. This measure involves retail sales of motor fuel based on vehicle license plate numbers and letters.
  - Petroleum Allocation Program to provide equitable distribution of scarce supplies among all classes of end-users upon delegation under federal allocation or price control programs during a severe petroleum shortage.
  - Impose restrictions on wasteful, inefficient, or nonessential uses of energy or energy resources. This may include ordering restrictions that were merely requested during a Stage III response.
  - Waive State and local environmental protection requirements for individual facilities for a period of 30-60 days during each six month period that the emergency is extant.
  - Implementation of some of the actions listed above, such as the fuel set-aside and allocation programs will require identification and determination of priority energy and fuel supply uses. NYSERDA will rely upon the appropriate State agencies to assist in this task. For example, priority medical needs are best determined by the Department of Health, school needs by the State Education department, etc.

6.5.1.17.2 Coal Emergencies

NYSERDA is the lead State agency with regard to responding to coal supply emergencies that occur in New York or that occur outside the State but affect New York supplies. In the event of such an emergency, NYSERDA will activate the NYSERDA Energy Emergency Implementation Plan and support agencies will implement their internal emergency response plans as needed. Their activities will be coordinated by SOEM.

The State's Energy Emergency Plan (NYSEEP) follows the same four-stage response hierarchy delineated in the petroleum emergency procedures, above. NYSERDA will conduct ongoing monitoring of developments that could lead to a coal supply disruption or shortage and, if circumstances demonstrate that a coal strike or disruption is likely, will implement the four-stage response hierarchy.

The 2009 NYSEEP provides the following outline of potential response actions for each stage of a coal supply emergency:

Stages I & II – Increased Monitoring and Market Coordination

NYSERDA would request relevant information from all suppliers, distributors, and direct purchasers. Coal producers would be contacted for information on production and delivery schedules as they affect New York. Supply and demand data would be studied to prepare for allocation or redistribution of

supplies. Electric generators would be surveyed to determine their stockpile levels, estimates of re-supply needs, and alternative supply options, if any.

Stage III – Public Action

If a problem in the supply or distribution of coal is identified by NYSERDA:

- The Governor's Office and other concerned State agencies would be advised.
- Media would be informed and encouraged to promote appropriate conservation measures to reduce demand, with care taken to avoid hoarding caused by premature public notice.
- NYSERDA would work with the DEC and other State agencies to call attention to the supply problem and guide steps or actions to reduce fuel demand and consumption.
- NYSERDA would contact or convene a meeting with the major suppliers and large end-users of coal, rail companies, and others to agree on procedures to be followed in the event of an emergency.
- Regular contact and consultation would occur with appropriate DOE regional officials.
- If fuel demand and consumption reduction efforts alone are not sufficient to mitigate the supply constraints, NYSERDA would contact DEC regarding DEC issuance of waivers for use of non-conforming fuels to prevent escalation of the emergency situation.
- Notify SOEM which may consider virtual MAC Group activation to address policy issues in the event the emergency progresses to Stage IV.

Stage IV – Emergency Declaration

In the event that a coal shortage continues to the point where emergency measures appear necessary, NYSERDA would recommend that the Governor declare an energy emergency.

NYSERDA would require all suppliers, distributors, and direct purchasers to report:

- Stocks in inventory and estimated number of days supply.
- Stocks in transit, expected transit time, and estimated number of days supply.
- Schedule of shipments for the next 30-day period and the following 30-day period.

NYSERDA would then implement emergency measures such as fuel switching and fuel allocation. NYSERDA may direct electric generators to immediately switch coal-fired plants to alternative fuel capability, wherever possible, to reduce coal-fired generation to a minimum. Coal supplies from these plants could then be reassigned to coal users without alternative fuel capability. Due consideration would be given to the amount of coal needed to protect the utility generating plants and the need to keep certain units operating to maintain electric supply system reliability.

The aim of an allocation program is to ensure adequate volumes of coal (to be determined by NYSERDA on a case-by-case basis) for priority end-users. NYSERDA would implement the following priority schedule for coal allocation, unless circumstances indicate otherwise:

- Medical, psychiatric, educational, and correctional facilities without alternative fuel capability.
- Other essential service facilities without alternative fuel capability.
- Residential structures without alternative fuel capability.
- All others, including electric generation.

By authorization of its President, NYSERDA would allocate coal supplies in response to applications for emergency assistance.13 Such allocation would be issued on behalf of end-users in the private sector and met by prime suppliers, similar to the liquid fossil fuel set-aside program described in Section 5.2.

In addition:

- SOEM may consider establishment of a more formal MAC Group.
- SOEM may consider activation of any or all of the functional annexes of the State CEMP.
- SOEM may consider activation of the State Emergency Coordination Center.

6.5.1.17.3 Electric System Emergencies

The DPS is the lead State agency with regard to responding to electric system emergencies.

In the event that an electric supply emergency occurs in the DPS will act as the lead State agency and activate the DPS Emergency Plan. Support agencies will implement their internal emergency response plans as needed and their activities will be coordinated by SOEM.

New York's 2009 NYS EEP outlines four types of electric system emergencies, including (i) system blackouts, (ii) distribution disruptions, (iii) supply shortages, and (iv) fuel constraints. Procedures for addressing the first three categories, as well as fuel constraint emergencies related to natural gas, are contained in the NYISO Emergency Operations Manual and the DPS Emergency Plan. Fuel constraint emergencies regarding petroleum and coal, however, may involve action by NYSERDA. For example, NYSERDA could recommend to the DEC that appropriate waivers be granted to certain electricity generators to allow the use of non-conforming fuels.

The 2009 NYSEEP provides the following outline of potential response actions for system blackouts, distribution disruptions, and supply shortage emergencies:

- Electric generators, NYISO, transmission owners, local distribution companies, and DPS would make determinations implementing appropriate response actions, as detailed in their respective emergency response plans. Activities under this phase would likely increase if DPS determines that loss of power is imminent. Constant review and reassessment of the situation would be carried out as long as the threat of emergency persists.
- If public health, safety, or general welfare were jeopardized by an electric system disruption, supply shortage, or actual blackout, the Governor may declare an emergency. Emergency response options would be based on DPS procedures, described in the DPS Emergency Plan.

The Emergency Plan provides the following actions regarding fuel constraint emergencies:

- In response to information indicating an impending fuel supply or air quality problem affecting fuel use, NYSERDA or DPS would work with generators or LDCs to evaluate the severity of the problem. The LDCs, generators, and NYSERDA or DPS then would make a determination implementing NYS EEP responses based on a mutual assessment of the situation.
- If public health, safety, or general welfare were jeopardized by a fuel supply problem, the Governor may declare an energy emergency.

In the event of an electric system emergency, DPS would pursue an incremental response pursuant to the four stages of emergency articulated for petroleum and coal. As with those plans, flexibility would be preserved to tailor State response actions to the needs of the situation. The 2009NYS EEP provides the following outline of potential response actions for each stage of an electric system emergency:

Stage I - Increased Monitoring

- Monitor approaching storms and plan accordingly.
- Monitor utility emergency operations.
- Monitor restoration activities on site, if needed.
- Prepare regular status reports.

- Conduct follow-up investigation.

Stage II – Market Coordination

- Maintain contact with NYISO.
- Activate Peak-Load Reduction Plan for State agencies and affiliates.
- The Peak-Load reduction program implements those provisions of Executive Order No.111 dealing with load reduction during peak demand periods at all State agencies and affiliated entities. The program shall be implemented within 60 minutes of DPS staff issuing a "Load Reduction Order" for State agencies to implement their peak load reduction plan and procedures. This program applies to all agencies and branches of State government, public benefit corporations, public authorities, community colleges, and leased spaces as listed in Appendix B of the NYSERDA Guidelines implementing Executive Order No. 111, entitled "Green and Clean."
- Notify the State Emergency Management Office which may consider activation of a virtual Multi Agency Coordination Group (MAC) to address policy issues in the event the emergency progresses to Stage III or IV.

Stage III – Public Action

- DPS Office of Consumer Services will provide consumer assistance with restoration of service and resolution of issues.
- Assist in developing State response and issue notices for voltage reduction, rolling blackouts, closures, etc.
- SOEM may consider a partial activation of the State Emergency Coordination Center (SECC).
- SOEM may consider establishment of a more formal MAC Group to address policy issues in the event the emergency progresses to Stage IV.
- SOEM may consider activating any or all of the functional annexes of the State CEMP.

Stage IV – Emergency Declaration

- Class III Catastrophic Event response by DPS would be activated, as specified in the DPS Emergency Plan.
- Assess duration and estimates of service restoration time.
- SOEM may consider a full activation of the SECC.

Coordination of State Agencies and Electric Utility Stakeholders

When an electric system emergency is declared, the lead agency is responsible for contacting and coordinating with other State agencies, such as NYSERDA, SOEM, DPS, and DEC. DPS is the lead agency for system blackouts, distribution disruptions, supply shortages, and fuel constraints involving natural gas. NYSERDA is the lead agency for fuel constraint emergencies involving petroleum and coal. Additionally, State agencies may coordinate with other stakeholders, such as NYISO and the Federal Energy Regulatory Commission (FERC), as needed, to address energy emergencies.

Each electric corporation is required pursuant to the Public Service Law, § 105, to file with the PSC an electric emergency plan that addresses storms and other causes of electric system emergencies and to update the plan annually. The plan must include elements such as emergency response training programs, service restoration procedures, policies and criteria regarding mutual aid with other utilities, and operating and emergency personnel contact lists. In addition to the utility emergency plans, the DPS maintains NYISO's operating procedures. As acknowledged in the NYSEEP, these plans and procedures form the foundation for responding to electric system emergencies.

6.5.1.17.4 Nuclear Power Plant Emergencies

The NYSEEP contains the following information regarding nuclear power plant emergencies:

A nuclear power plant emergency is defined as an event or series of events at a nuclear power plant that results in a licensee declaring one of four emergency classification levels (ECL). The ECLs can range in severity from extremely low level events that pose no threat to the public safety but which warrant an increased awareness on the part of plant and offsite personnel to degraded conditions that threaten public safety and for which some form of protective actions will likely be initiated. Any protective actions taken are intended to minimize the risk to the general public. In the event of a nuclear power plant emergency, the New York State Radiological Emergency Preparedness Plan will be implemented.

Impact of the loss of electric generation from one or more nuclear power plants to the State's electric system would be assessed by DPS as a potential electric system emergency in the same manner as any other electric system power supply loss.

6.5.1.17.5 Natural Gas Emergencies

The DPS is the lead State agency with regard to responding to natural gas emergencies that occur in the State. The PSC regulates the State's natural gas utilities, among other entities, and is charged with ensuring that the State's natural gas utilities provide adequate and safe service at just and reasonable rates.

In the event of such an emergency, DPS will act as the lead State agency and activate the DPS Emergency Plan. Support agencies will implement their internal emergency response plans as needed and their activities will be coordinated by SOEM.

In a natural gas emergency in which available natural gas supplies are unable to satisfy demand, the 2009 NYSEEP provides the following outline of potential response actions for each stage of a natural gas supply emergency:

Stage I – Increased Monitoring

- Establish and maintain communications with the affected utility or utilities and the Northeast Gas Association (NGA, a trade association composed of the 32 LDCs that provide natural gas to customers in Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont).
- Gather and report data on utility demand, supply, storage inventories, peaking capabilities and supplemental supplies during the emergency.
- Report on a regular basis to the Director of the DPS Office of Electric, Gas and Water and the Chairman of the PSC regarding the severity of the situation, remedial activity and the effectiveness of those actions.

Stage II – Market Coordination

- Each Local Distribution Company (LDC) or marketer operating within the State may be requested to identify the essential-service customers within its service territory. Essential service includes, as specifically determined by each LDC (or marketer), minimum gas requirements for the following uses:
- Houses, apartments, prisons, dormitories, day care centers, nursing homes, and hospitals.
- Essential food productions, processing, and distribution for basic human needs.
- Essential services such as medical, pharmaceutical, police, fire protection, sanitation, communication, water, snowplowing, sanding and traffic signal maintenance.
- Manufacturing products necessary on an immediate, short-term basis for protection of public health and safety.

- Determine the costs associated with obtaining additional emergency natural gas supply.
- Assist the affected utility or utilities and NGA Gas Supply Coordinator(s), when requested, in obtaining additional supplies of gas during the emergency.
- Notify the SOEM which may consider activation of a virtual MAC Group to address policy issues in the event the emergency progresses to Stage III or IV.

Stage III – Public Action

During periods of uncertain supply or emergencies that reduce gas supply, threatening loss or curtailment of service to non-interruptible customers, NGA implements its Standard Operating Procedures - Pooling of Gas Supply. The Standard Operating Procedures are divided into two sequential phases:

- Actions to be taken by a specific utility to bring supply and demand into balance.
- Coordinated actions to be taken by all LDCs in the region to correct a supply imbalance.

The Procedures, which establish specific steps to be followed in case of an emergency, are implemented on an upstate/downstate basis through gas supply coordinators for each region. The Gas Policy and Supply Section of the DPS Office of Electric, Gas and Water will gather data and report on utility demand, supply, storage inventories, peaking capabilities, and supplemental supplies during the emergency. Staff will also assist in preparing public appeals to help reduce consumption.

In addition, during a Stage III natural gas emergency:

- SOEM may consider establishment of a more formal MAC Group to address policy issues in the event the emergency progresses to Stage IV.
- SOEM may consider activating any or all of the functional annexes of the State CEMP.
- SOEM may consider partial activation of the SECC.

Stage IV – Emergency Declaration

Depending on the severity of the shortage and the degree to which essential service is threatened, one or more of the following actions may be taken:

- Curtailment of service to all large, non-essential commercial and industrial users by an amount sufficient to balance supply and demand.
- Curtailment of service to all non-essential industrial users to minimum levels required for plant protection.
- Curtailment of service to all non-essential commercial users to minimum levels required for plant protection.
- Complete interruption of service to large, non-essential commercial and industrial users.
- DPS Policy Section Staff will determine if curtailments instituted by the utility or utilities are proper;
- if they call for the closing of non-essential businesses.
- if they call for obtaining exemptions from requirements such as air quality standards and minimum temperature settings.
- DPS staff will aid essential businesses, such as hospitals and processors of perishable foodstuffs, in obtaining exemptions from curtailment to ensure the public welfare.
- DPS staff will maintain contact with DPS Gas Safety field personnel regarding the status of any needed repairs or proper steps to ensure curtailment compliance.
- SOEM may consider full activation of the SECC.

NGA will be asked to play an advisory role on questions of fuel substitution for emergency situations involving dual-fuel customers. NGA will also be asked to provide assessments of the impact government actions have on natural gas users.

Each LDC or marketer operating within the State may be requested to advise the essential-service customers within its service territory of actions to be taken during an emergency to minimize gas consumption while continuing to provide essential service.

6.5.1.18 Principal State Agency Contact Information

6.5.1.18.1 New York State Energy Research and Development Authority (NYSERDA)

New York State Energy Research and Development Authority
17 Columbia Circle
Albany, NY 12203
Phone: 518-862-1090
Fax: 518-862-1091
Website: www.nyserda.org

6.5.1.18.2 New York State Public Service Commission (PSC)

Secretary to the Commission
Hon. Jaclyn A. Brilling
New York State Public Service Commission
Empire State Plaza
Agency Building 3
Albany, NY 12223-1350
Phone: (518) 474-6530
Fax: (518) 486-6081
Email: secretary@dps.state.ny.us

Executive Office
Garry A. Brown, Chairman
Judith Lee, Executive Deputy
Phone: 518-473-4544

Utility Rates and Service
John Stewart, Director
Phone: 518-473-4544

Utility Security
John J. Sennett, Director
Phone: 518-473-0547

Office of Electric, Gas and Water
Tom Dvorsky, Director
Phone: 518-473-6080

6.5.1.18.3 New York State Division of Homeland Security and Emergency Services (DHSES)

Albany
NYS Division of Homeland Security and Emergency Services
1220 Washington Avenue
State Office Campus

Building 7A Suite 710
Albany, NY 12242
518-402-2227

New York City
NYS Division of Homeland Security and Emergency Services
633 Third Avenue
32nd Floor
New York, NY 10017
212-867-7060

Individual Offices, Albany:

Office of Counter Terrorism
1220 Washington Avenue
State Office Campus
Building 7A, Suite 710
Albany, NY 12242
518-402-2227
info@security.state.ny.us

Office of Cybersecurity
30 S. Pearl Street
Albany, NY 12207-3425
518-474-0865
info@cscic.state.ny.us

Office of Emergency Management
1220 Washington Avenue
Building 22, Suite 101
Albany, NY 12226-2251
518-292-2275
postmaster@dhses.ny.gov

6.5.1.18.4 State Emergency Coordination Center – (Staffed 24 Hrs) 518-292-2200

6.5.1.18.5 Preparedness / Operations Phone: (518) 292-2358

6.5.1.18.6 Regional Offices

Region I: 631-952-6322
OEMRegion1dl@dhses.ny.gov

Region II: 845-454-0430
OEMRegion2dl@dhses.ny.gov

Region III: 518-793-6646
OEMRegion3dl@dhses.ny.gov

Region IV: 315-438-8907
OEMRegion4dl@dhses.ny.gov

Region V: 315-331-4880
OEMRegion5dl@dhses.ny.gov

Office of Interoperable & Emergency Communications
1220 Washington Avenue
State Office Campus -Building 22
Albany, NY 12226-2251
518-322-4911
DHSESOIEC@dhses.ny.gov

State Fire Prevention and Control
99 Washington Avenue
Suite 500
Albany, NY 12210-2833
(518) 474-6746
fire@dos.state.ny.us

6.5.1.18.7 New York State Disaster Preparedness Commission (DPC)

Chairman
New York State Emergency Response Commission
1220 Washington Avenue, Building 22, Suite 101
Albany, NY 12226-2251
Phone: (518) 292-2366

6.5.1.18.8 Principal Federal Agency Contact Information

U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585
202-586-5000
Office of Electricity Delivery & Energy Reliability
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585
Phone: 202-586-1411
Fax: 202-586-1472
Email: OEwebmaster@hq.doe.gov

Federal Emergency Management Agency (FEMA)
Federal Emergency Management Agency
U.S. Department of Homeland Security
500 C Street SW, Washington, D.C. 20472
202- 646-2500

Disaster Assistance
800-621-FEMA (3362)

Region II (Serving New Jersey, New York, Puerto Rico and the US Virgin Islands)
Federal Region II
26 Federal Plaza
New York, NY 10278-0002
Telephone: 212- 680-3600

Divisions
Protection and National Preparedness Division, Jaime Forero, Director
Response Division, Dug Salley, Director
Recovery Division, Lawrence O'Reilly, Director
Mitigation Division, Timothy P. Crowley, Director
Caribbean Area Division, Alejandro De La Campa, Director
Mission Support Division, Mark Walters, Director

U.S. Environmental Protection Agency (EPA)
Headquarters
Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
202- 272-0167

Regional Addresses
Region II (Serving New Jersey, New York, Puerto Rico, and Virgin Islands)
Environmental Protection Agency
290 Broadway
New York, NY 10007-1866
212- 637-3000

Federal Energy Regulatory Commission (FERC)
Headquarters
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426
202-502-6088

Office of Electric Reliability (OER)
Joseph H. McClelland, Director
John Carlson, Deputy Director
202-502-8600

New York Regional Office
Peter R. Valeri, Regional Engineer
19 West 34th Street, Suite 400
New York, NY 10001-3006
212-273-5930
peter.valeri@ferc.gov

U.S. Department of Transportation
Headquarters
U.S. Department of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590
202-366-4000

Office of Pipeline Safety
Pipeline and Hazardous Material Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
East Building, 2nd Floor
Washington, DC 20590
202-366-4595

Maritime Administration
U.S. Department of Transportation
Maritime Administration
West Building
1200 New Jersey Avenue, SE
Washington, DC 20590
800-99-MARAD
800-996-2723

Federal Motor Carrier Safety Administration
United States Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590
800-832-5660

Service Center Information
Eastern Service Center (serving CT, DC, DE, MA, MD, ME, NJ, NH, NY, PA, PR, RI, VA, VT, WV)
802 Cromwell Park Drive, Suite N
Glen Burnie, MD 21061
443-703-2240 (phone)
443-703-2253 (fax)

Field Office Information
New York Division
Leo W. O'Brien Federal Building
Room 719
Clinton Avenue & North Pearl Street
Albany, NY 12207
518-431-4145 (phone)
518-431-4140 (fax)

6.5.1.18.9 Investor-Owned Electric Utilities

Central Hudson Gas & Electric Corporation
Mailing Address
Central Hudson Gas & Electric Corp.
284 South Avenue
Poughkeepsie, NY 12601

Other Office Locations
7964 Route 9W, Catskill, NY 12414
25 Central Hudson Way, Fishkill, NY 12524
2001 Route 9W, Lake Katrine, NY 12449

610 Little Britain Road, New Windsor, NY 12553

General Telephone Number
845-452-2000
Electric Interruption / Emergency
845-452-2700, or
800-527-2714
Natural Gas Odor
800-942-8274
Security Inquiries
Anthony Paul, Director of Security
Phone: 845-486-5393
E-mail: apaul@cenhud.com

Consolidated Edison Company of New York
4 Irving Place, 10 Floor, SW
New York, NY 10003-3502
Mailing Address
Con Edison
Cooper Station
P.O. Box 138
New York, NY 10276-0138

Electrical Emergencies: 800-75-CONED (800-752-6633)
Gas Emergencies: 800-75-CONED (800-752-6633).
Steam Emergencies: 800-75-CONED (800-752-6633)
Customer Service Issues: 800-75-CONED (800-752-6633)
E-mail Inquiries: customerservice@coned.com

Orange and Rockland Utilities, Inc. (O&R)
Mailing Address
Orange and Rockland Utilities, Inc.
One Blue Hill Plaza
Pearl River, NY 10965

24-Hour Emergency Telephone Numbers
Gas Hotline: 800-533-5325
Electric Hotline: 877-434-4100
Other Contact Information
Main Switchboard: 845-352-6000
Customer Assistance: 877-434-4100
Security Services: 845-577-3130

New York State Electric & Gas Corporation (NYSEG)
Mailing Addresses
Customer service
P.O. Box 5240
Binghamton, NY 13902-5240
Corporate Offices
Ithaca
1387 Dryden Road

Ithaca, NY 14850-8810
James A. Carrigg Center, Kirkwood
P.O. Box 5224
18 Link Drive
Kirkwood Industrial Park
Binghamton, NY 13902-5224
24-Hour Emergency Numbers
Electricity interruptions/emergencies 800-572-1131
Natural gas odors/emergencies 800-572-1121
Billing Inquiries, Information
800-572-1111

Rochester Gas and Electric Corporation (RG&E)
Corporate office / Customer Service Address
89 East Avenue
Rochester, NY 14649

24-Hour Emergency Numbers
Electricity interruptions/emergencies 800-743-1701
Natural gas odors/emergencies 800-743-1702
Customer service (billing inquiries, energy choice, etc.)
800-743-2110

Niagara Mohawk, d/b/a National Grid
Upstate New York Contact Information
Mail
National Grid
Customer Service Center
300 Erie Boulevard West
Syracuse, NY 13202-4250
Gas Emergency Phone: 800-892-2345
Electric Emergency or Outage Phone: 800-867-5222
Customer Service Phone: 800-642-4272

6.5.1.18.10 Principal Public Power Stakeholders

New York Power Authority
Principal Office
30 South Pearl Street
Albany, NY 12207-3425
Other Offices
123 Main Street
White Plains, NY 10601-3170
Corporate Switchboard
914-681-6200

Long Island Power Authority (LIPA)
Telephone Contacts
Electrical Emergencies: 800-490-0075 or 631-755-6900
Residential Customers: 800-490-0025 or 631-755-6000

Business Call Center: 800-966-4818 or 631-755-3417
Energy Efficiency Information: 800-692-2626
Additional Customer Services: 800-490-0025 or 631-755-6000

Municipal Electric Utilities Association of New York State (MEUA)
Mailing Address
Municipal Electric Utilities Association
6652 Hammersmith Drive
East Syracuse, NY 13057
315-453-7851 (phone)
315-453-7849 (fax)
info@meua.org

Table 6-13 shows the current MEUA members and their contact information.

Table 6-13. Current MEUA Members and Contact Information

Name	Address	Phone/Fax/Email
Bath Electric, Gas & Water Systems	South Avenue P.O. Box 310 Bath, NY 14810-0310	Phone: (607) 776-3072 Email: mcbenesh@begws.com
Borough of Park Ridge Elec. Dept.	53 Park Ave. Park Ridge, NJ 07656	Phone: (201) 391-2129
Fairport Municipal Commission	31 S. Main St. Fairport, NY 14450	Phone: (585) 223-9500 Email: mail@village.fairport.ny.us Website: www.village.fairport.ny.us
Ilion Light Department	Municipal Bldg. 49 Morgan St. Ilion, NY 13357	Phone: 315/895-7449 Email: ilion@ilionny.com Website: www.ilionny.com
Inc. Village of Philadelphia	56 Main St. Philadelphia, NY 13673	Phone: (315) 642-3452 Email: vphil@centralny.twcbc.com
Lake Placid Village, Inc.	2693 Main Street Lake Placid, NY 12946	Phone: (585) 523-2021 Email: electric1@lpvillage.org
Mohawk Municipal Commission	28 Columbia St. Mohawk, NY 13407	Phone: (315) 866-4170
Municipal Commission of Boonville	13169 State Rt. 12 Boonville, NY 13309	Phone: (315) 942-4461 Email: kstabb@prodigy.net
Penn Yan Municipal Utility Board	111 Elm St. Penn Yan, NY 14527	Phone: (315) 536-3374 Email: rosgood@villageofpennyan.com Website: www.villageofpennyan.com
Plattsburgh Municipal Lighting Dept.	Ste-1 6 Miller Street Plattsburgh, NY 12901	Phone: (518) 563-2200 Email: pmld_wjt@cityofplattsburgh-ny.gov
Salamanca Bd. of Public Util.	225 Wildwood Ave. Salamanca, NY 14779	Phone: (716) 945-3130 Email: bpuinfo@salmun.com Website: www.salmun.com
Skaneateles Electric Light Dept.	46 E. Genesee St. Skaneateles, NY 13152	Phone: (315) 685-5977 Email: bob.lotkowictz@gmail.com
Town of Massena Electric Dept.	71 E. Hatfield St. P.O. Box 209 Massena, NY 13662	Phone: (315) 764-0253 Email: amcmahon@massenaelectric.com Website: www.massenaelectric.com
Village of Akron	21 Main Street P.O. Box 180	Phone: (716) 542-2680

Name	Address	Phone/Fax/Email
	Akron, NY 14001	Email: bkowalik@akronvillage.us Website: www.erie.gov/akron
Village of Andover	4 S. Main Street P.O. Box 721 Andover, NY 14806	Phone: (607) 478-8455
Village of Angelica	21 Peacock Hill Rd. P.O. Box 158 Angelica, NY 14709	Phone: (585) 466-7431 Email: vangelica@stny.rr.com Website: www.angelica-ny.com
Village of Arcade	17 Church Street Arcade, NY 14009	Phone: (585) 492-1111 x113 Email: larrykilburn@villageofarcade.org Website: www.villageofarcade.org
Village of Bergen	11 North Lake Ave. P.O. Box 100 Bergen, NY 14416	Phone: (585) 494-1513 Email: cgale@villageofbergen.com Website: www.villageofbergen.com
Village of Brocton	13169 State Rt. 12 Boonville, NY 13309	Phone: (315) 942-4461 Email: kstabb@prodigy.net
Village of Castile	51 N. Main St. 120 N. Main St. Castile, NY 14427	Phone: (585) 493-2340 Email: vcastile@rochester.rr.com
Village of Churchville	23 E. Buffalo St. Churchville, NY 14428	Phone: (585) 293-3720 Email: sue@churchville.net Website: www.churchville.net
Village of Endicott	1009 E. Main St. Endicott, NY 13760	Phone: 607/757-2456 Email: endicottlight@stny.rr.com Website: http://endicottny.com/new.html
Village Of Frankfort Electric Dept.	110 Railroad St. Ste. 5 Frankfort, NY 13340	Phone: (315) 894-1238
Village of Greene	49 Genesee St. P.O. Box 207 Greene, NY 13778 County: Chenango	Phone: (607) 656-8311 Email: vofgreene@stny.rr.com
Village of Groton	143 Cortland St. P.O. Box 100 Groton, NY 13073	Phone: (607) 898-3966 Email: crankin55@grotonny.org Website: www.grotonny.org
Village of Hamilton	3 Broad Street P.O. Box 119 Hamilton, NY 13346	Phone: (315) 824-1111 Email: grahams@cnymail.com
Village of Holley	72 Public Square Holley, NY 14470	Phone: (585) 638-6587 Email: evillage1@rochester.rr.com
Village of Little Valley	Municipal Electric Dept.; 103 Little Valley, NY 14755	Phone: (716) 938-9151 Email: electric@localnet.com
Village of Marathon	18 Tannery St. P.O. Box 519 Marathon, NY 13803	Phone: (607) 849-6795 Email: marathonpower@stny.rr.com
Village of Mayville	P.O. Box 188 Mayville, NY 14757	Phone: (716) 753-2125 Email: mayville5@fairpoint.net Website: www.villageofmayville.com
Village of Richmondville	295 Main St. P.O. Box 493 Richmondville, NY 12149	Phone: (518) 294-7700 Email: ruillerpl@nycap.rr.com
Village of Rouses Point	139 Lake St. P.O. Box 185 Rouses Point, NY 12979	Phone: (518) 297-5502 Email: rousept@primelink1.net Website: www.rousespointny.com
Village of Silver Springs	43 N. Main St. P.O. Box 317 Silver Springs, NY 14550	Phone: (585) 493-2669 Email: vlgsilverspgs.yahoo.com

Name	Address	Phone/Fax/Email
Village of Solvay	1100 Woods Rd. Solvay, NY 13209	Phone: (315) 468-6229 Email: jmontone2@aol.com
Village of Spencerport	27 West Ave. Spencerport, NY 14559	Phone: (585) 352-6775 Email: omcintee@vil.spencerort.ny.us
Village of Springville	5 West Main Street PO Box 17 Springville, NY 14141-0017	Phone: (716) 592-3790 Email: Klux@villageofspringvilleny.com Website: http://villageofspringvilleny.com/
Village of Theresa	124 Commercial St. Theresa, NY 13691	Phone: (315) 628-4425 Email: Theresa@ridgeviewtel.us
Village of Tupper Lake	Municipal Elec. System 53 Park Street PO Box 1290 Tupper Lake, NY 12986	Phone: (518) 359-3341 Email: johnbouck@centralny.twcbc.com
Village of Watkins Glen	303 N. Franklin St. Watkins Glen, NY 14891	Phone: (607) 535-7935 Email: villageclerk@watkinsglen.us Website: www.watkinsglen.us
Village of Wellsville	156 N. Main St. Wellsville, NY 14895	Phone: (585) 593-1850 Website: www.wellsvilleny.com
Village of Westfield	23 Elm St. Westfield, NY 14787	Phone: (716) 326-4961 Email: vince@villageofwestfield.org

New York Municipal Power Agency (NYMPA)
6652 Hammersmith Drive
East Syracuse, NY 13057
Telephone: 315-453-1761
Fax: 315-453-7849
Email: information@nympa.org

Electric Utilities Listed by PSC as Subject to its Jurisdiction

The New York PSC provides the comprehensive list as shown in Table 6-14 of electric utilities with their respective contact information that fall within the PSC's regulatory authority.

Table 6-14. Electric Utilities Regulated by PSC

Name	Address	Phone/Fax/Email
Bath Electric, Gas & Water Systems	7-11 South Avenue P.O. Box 310 Bath, NY 14810-0310	(607) 776-3072 Fax: (607) 776-9092
Central Hudson Gas & Electric Corp.	284 South Avenue Poughkeepsie, NY 12601-4879	(845) 452-2700 or (800) 527-2714
City of Jamestown Board of Public Utilities	P.O. Box 700 Jamestown, NY 14702-0700	(716) 661-1670 Fax: (716) 661-1675
City of Plattsburgh Plattsburgh Municipal Lighting Department	STE-1, 6 Miller Street Plattsburgh, NY 12901-1887	(518) 563-2200 Fax: (518) 563-6690
City of Salamanca Salamanca Board of Public Utilities	225 Wildwood Avenue Salamanca, NY 14779-1547	(716) 945-3130 Fax: (716) 945-3490
Consolidated Edison Company of New York, Inc.	4 Irving Place New York, NY 10003	(212) 460-2386
Fishers Island Electric Corporation	P.O. Box E Fishers Island, NY 06390-0604	(631) 788-7251

Name	Address	Phone/Fax/Email
Inc. Village of Freeport Freeport Electric	46 North Ocean Freeport, NY 11520	(516) 377-2235 Fax: (516) 377-2359
Inc. Village of Philadelphia	56 Main Street Philadelphia, NY 13673-0070	(315) 642-3452 Fax: (315) 642-3321
National Grid	300 Erie Blvd. West Syracuse, NY 13202	(315) 474-1511
New York State Electric & Gas Corp.	P.O. Box 3287 Ithaca, NY 14852-3287	(607) 762-7200
Orange & Rockland Utilities, Inc	One Blue Hill Plaza Pearl River, NY 10965-3104	(845) 352-6000
Penn Yan Municipal Utilities Board Village of Penn Yan	P.O. Box 426 5 Maiden Lane Penn Yan, NY 14527	(315) 536-3015
Pennsylvania Electric Company	2800 Pottsville Pike P.O. Box 16001 Reading, PA 19640-0001	Customer Service (800) 545-7741 Emergency-Power Outages (800) 545-7738
Rochester Gas & Electric Corp.	89 East Avenue Rochester, NY 14649-0001	(716) 546-2700
Town of Massena Electric Department	71 East Hatfield St. P.O. Box 209 Massena, NY 13662-0209	
Village of Akron	21 Main St P.O. Box 180 Akron, NY 14001-0180	(716) 542-9636 Fax: (716) 542-5586
Village of Andover	4 S. Main Street P.O. Box 721 Andover, NY 14806-0721	(607) 478-8455 Fax: (607) 478-8928
Village of Angelica	79 Center Street P.O. Box 158 Angelica, NY 14709-0158	(716) 466-7431 Fax: (716) 466-3103
Village of Arcade	17 Church Street P.O. Box 188 Arcade, NY 14009	(716) 492-1111 Fax: (716) 496-7444
Village of Bergen	11 Buffalo Street Bergen, NY 14416-0100	(716) 492-1111 Fax: (716) 496-7444
Village of Boonville - Municipal Commission of Boonville	13169 State Road 12 Boonville, NY 13309-4943	(315) 942-4461 Fax: (315) 942-4462
Village of Brocton	34 West Main Street Brocton, NY 14716-0661	(716) 792-4160 Fax: (716) 792-4170
Village of Castile	Office: 51 North Main Street DPW: 120 North Main St. Castile, NY 14427-0515	(716) 493-5340 (Office) (716) 493-2340 (DPW) Fax: (716) 493-2063
Village of Churchville	22 South Main Street Churchville, NY 14428-0392	(716) 293-3720 (Office) (716) 293-3366 (DPW) Fax: (716) 293-2590 (Office) (716) 293-3693 (DPW)

Name	Address	Phone/Fax/Email
		Email: rtrinkl@aol.comemail
Village of Endicott	1009 E. Main Street Endicott, NY 13760-5290	(607) 757-2455 Fax: (607) 785-4509
Village of Frankfort Frankfort Power & Light	126 E. Orchard Street P.O. Box 188 Frankfort, NY 13340-0188	(315) 894-8811 Fax: (315) 894-0469
Village of Green Island	20 Clinton Street Green Island, NY 12183-1117	(518) 273-2201 Fax: (518) 273-2235
Village of Greene	49 Genesee Street Greene, NY 13778-0207	(607) 656-4500 Fax: (607) 656-7747
Village of Groton	108 Cortlandt Street P.O. Box 100 Groton, NY 13073-0100	(607) 898-3966 Fax: (607) 898-4177
Village of Hamilton	P.O. Box 119 Hamilton, NY 13346	(315) 824-1111 Fax: (315) 824-0922
Village of Holley	72 Public Square Holley, NY 14470	(716) 638-6367 Fax: (716) 638-7540
Village of Ilion Ilion Board of Light Commissioners	Municipal Bldg 49 Morgan Street Ilion, NY 13357-1714	(315) 895-7749
Village of Little Valley Municipal Electric Department	Little Valley, NY 14755-1253	(716) 938-9151 Fax: (716) 938-9154
Village of Mohawk Mohawk Municipal Commission	28 Columbia Street Mohawk, NY 13407-1322	(315) 866-4312 Fax: (315) 866-6659
Village of Richmondville	22 East Main Street P.O. Box 493 Richmondville, NY 12149-0493	(518) 294-6681
Village of Rockville Centre	One College Place Rockville Centre, NY 11571-0950	(516) 678-9300 Fax: (516) 678-9204
Village of Rouses Point	139 Lake Street P. O. Box 185 Rouses Point, NY 12979-0185	(518) 297-5502 Fax: (518) 297-3818
Village of Sherburne	15 West State Street P.O. Box 704 Sherburne, NY 13460-9423	(607) 674-2300 Fax: (607) 674-4149
Village of Silver Spring	43 N. Main Street P.O. Box 317 Silver Springs, NY 14550-0317	(716) 493-2500 Fax: (716) 493-5236
Village of Skaneateles Skaneateles Electric Light Department	46 E. Genesee Street Skaneateles, NY 13152	(315) 685-3440 Fax: (315) 685-0703
Village of Spencerport	27 West Avenue Spencerport, NY 14559-1345	(716) 352-4771 Fax: (716) 352-3484
Village of Springville Electric Systems	5 West Main Street P.O. Box 17 Springville, NY 14141	(716) 592-4936 Fax: (716) 592-3906
Village of Theresa	124 Commercial Street Theresa, NY 13691-0299	(315) 628-4425 Fax: (315) 628-4630

Name	Address	Phone/Fax/Email
Village of Wellsville	156 N. Main Street Wellsville, NY 14895-0591	(716) 593-4590 Utility Office (716) 593-1121 Village Clerk-Treasurer Fax: (716) 593-3938

6.5.1.18.11 Other Principal Electric Industry Stakeholders

New York Independent System Operator (NYISO)
Address
10 Krey Boulevard
Rensselaer, NY 12144
E-mail: market_services@nyiso.com
Fax: 518-356-7584
Phone: 518-356-6000

New York State Reliability Council, LLC (NYSRC)
Telephone: (315) 637-9002
P. Donald Raymond - Executive Secretary
p.raymond40@gmail.com

North American Electric Reliability Corporation (NERC)
116-390 Village Boulevard
Princeton, NJ 08540-5721

Washington Office
1120 G Street, N.W., Suite 990
Washington, DC 20005-3801
Telephone: 609-452-8060.
Fax: 609.452.9550 fax

6.5.1.18.12 Regulated LDCs: Natural Gas

Corning Natural Gas Corporation
Business and Mailing Address
Corning Natural Gas Corporation
330 W. William Street
P.O. Box 58
Corning, NY 14830
Telephone Numbers
Corning Area: 607-936-3755
Addison/Hammondsport Area: 800-834-2134
Nights, Saturdays, Sundays & Holidays: 607-936-3755
Emergencies: 607-936-3755
E-mail: custsvc@corninggas.com.

National Fuel Gas Distribution Corporation (NFGD)
Corporate Headquarters
6363 Main Street
Williamsville, NY 14221
(716) 857-7000

Buffalo, NY area: 716-686-6123
Erie, PA area: 814-871-8200
Outside Buffalo and Erie: 800-365-3234
24-Hour Gas Emergency: 800-444-3130

St. Lawrence Gas Company
Mailing Address
St. Lawrence Gas Company, Inc.
P.O. Box 270
Massena, NY 13662

Physical Address
St. Lawrence Gas Company, Inc.
33 Stearns St.
Massena, NY 13662
315-769-3511 [Massena, Madrid, Norfolk, Raymondville, Waddington]
315-322-5781 [Canton, Lisbon, Ogdensburg, Potsdam]
800-673-3301
General Information: amfrary@stlawrencegas.com

6.5.1.18.13 Natural Gas Utilities Listed by PSC as Subject to its Jurisdiction

The New York PSC provides the comprehensive list shown in Table 6-15 of LDCs with their respective contact information that fall within the PSC's regulatory authority.

Table 6-15. Natural Gas Utilities Regulated by PSC

Company	Address	Phone
Bath Electric, Gas & Water System	Drawer 310 Bath, NY 14810	(607) 776-3072
Central Hudson Gas & Electric Corporation	284 South Avenue Poughkeepsie, NY 12601	(845) 452-2000
Chautauqua Utilities, Inc.	8850 West Route 20, PO Box 100 Westfield, NY 14787	(716) 789-2022
Consolidated Edison Company of N Y, Inc.	4 Irving Place New York, NY 10003	(212) 460-4600
Corning Natural Gas Corporation	330 West William Street Corning, NY 14830	(607) 936-3755
Empire State Pipeline	6363 Main Street Williamsville, NY 14221	(716) 857-7536
Filmore Gas Company, Inc.	P.O. Box 181 Filmore, NY 14735	(585) 567-2272
KeySpan Energy Delivery (Long Island)	175 E. Old Country Road Hicksville, NY 11801	(631) 755-6650
KeySpan Energy Delivery (New York)	One MetroTech Center Brooklyn, NY 11201	(718) 403-2000
N.E.A. Cross of New York, Inc.	1405 Olde Road Clymer, NY 14724	(716) 355-2777
National Fuel Gas Distribution Corporation	6363 Main Street Williamsville, NY 14221	(716) 857-7000

Company	Address	Phone
New York State Electric & Gas Corporation	4500 Vestal Parkway East P.O. Box 3607 Binghamton, NY 13902	(607) 762-7200
Niagara Mohawk Power Corporation	300 Erie Boulevard West Syracuse, NY 13202	(315) 474-1511
Orange and Rockland Utilities, Inc.	One Blue Hill Plaza Pearl River, NY 10965	(845) 352-6000
Reserve Gas Company, Inc.	13441 Railroad Street Alden, NY 14004	(716) 937-9484
Rochester Gas & Electric Corporation	89 East Avenue Rochester, NY 14649	(716) 546-2700
St. Lawrence Gas Company, Inc.	33 Stearns St. Massena, NY 13662	(315) 769-3511
Valley Energy, Inc.	523 S. Keystone Ave. Syre, PA 18840	(570) 888-9664
Woodhull Municipal Gas Company	P.O. Box 13 Woodhull, NY 14898	(607) 458-5220

6.5.2 Stakeholders and Authorities

6.5.2.1 Introduction to Stakeholders and Authorities

This section contains a listing of the principal stakeholders involved in providing Energy Assurance to the citizens of New York. It also lists the principal energy companies and associations related to the delivery of natural gas and electricity within the state. Petroleum stakeholders are contained in Appendix C. This section describes the basic business and infrastructure profile of natural gas and electricity utilities but leaves discussion of how these activities relate to Energy Assurance and reliability to the appropriate sections addressing the natural gas and electricity sectors.

6.5.2.1.1 Principal State Agencies

New York State Energy Research and Development Authority (NYSERDA)

NYSERDA is a public benefit corporation created in 1975 pursuant to Article 8, Title 9 of the State Public Authorities Law through the reconstitution of the New York State Atomic and Space Development Authority. NYSERDA (http://www.nyserda.org/About/default.asp) originally focused exclusively on research and development with the goal of reducing the State's petroleum consumption. Today, however, NYSERDA's mission is to help New York meet its energy goals by reducing energy consumption, promoting the use of renewable energy sources, and protecting the environment. It seeks to develop a diversified energy supply portfolio, improve market mechanisms, and facilitate the introduction and adoption of advanced technologies that will help New Yorkers plan for and respond to uncertainties in the energy markets.

Regarding Energy Assurance, NYSERDA possesses supplementary powers that become active upon the Governor's declaration of a fuel or energy shortage state of emergency (Energy Law, § 5-117). Additionally, in order to ameliorate hardships imposed by any severe fuel disruption, NYSERDA is authorized to operate a fuel set-aside for liquid fossil fuels (Energy Law, § 10-101 *et seq*.) NYSERDA is responsible for maintaining and updating the State's Energy Emergency Plan which guides the State's response in the event that an energy or fuel supply emergency is declared. Additionally, NYSERDA staff participates in emergency preparedness and training programs and responds to the State Emergency

Operations Center when it is activated by OEM. NYSERDA Staff also take part in regional energy emergency workshops conducted under the direction of the Federal Emergency Management Agency (FEMA) or the U.S. Department of Energy.

The board (http://www.nyserda.org) which governs NYSERDA consists of 13 members, including the Commissioner of the Department of Transportation, the Commissioner of the Department of Environmental Conservation, the Chair of the Public Service Commission, and the Chair of the Power Authority of the State of New York, who serve *ex officio*. As required by statute, the remaining nine members are appointed by the Governor of the State of New York with the advice and consent of the Senate and include an engineer or research scientist, an economist, an environmentalist, a consumer advocate, an officer of a gas utility, an officer of an electric utility, and three at-large members.

The New York Public Service Commission (PSC)

As provided in its website, the PSC regulates the State's electric, gas, steam, telecommunications, and water utilities. It is charged with ensuring that adequate and safe service is provided at just and reasonable rates, free from unjust discrimination or unreasonable preference. Additionally, the PSC exercises jurisdiction over the siting of major gas and electric transmission facilities and has responsibility for ensuring the safety of natural gas and liquid petroleum pipelines.

The PSC consists of up to five members, each appointed by the Governor and confirmed by the State Senate for a term of six years. The Chairman of the PSC is designated by the Governor and serves as the chief executive officer of the Department

The Department of Public Service is the staff arm of the PSC and has a broad mandate to ensure that all New Yorkers have access to reliable and low-cost utility services.

With regard to Energy Assurance, the PSC possesses broad regulatory authority to ensure the safe and adequate service of electricity and natural gas and accordingly, it has assumed lead agency status for electric system and natural gas emergencies. (http://www.dps.state.ny.us/)

Division of Homeland Security and Emergency Services (DHSES)

DHSES (http://www.security.state.ny.us/) was created in 2010 through the consolidation of the offices of Homeland Security, State Emergency Management Office (OEM), Office of Fire Prevention and Control (OFPC), the Statewide Interoperability Program (SIPO), and Cyber Security and Critical Infrastructure Coordination (CSCIC). Each of these offices continues to exist within the DHSES, which acts as an umbrella organization. According to the Governor's office, this "consolidation will allow the State to operate a single, multi-purpose agency focused on first responders and public safety. Collectively, the new Division will be responsible for analysis, information sharing, physical and cybersecurity, disaster preparedness and relief, interoperable and emergency communications, fire safety, and emergency response."

Regarding Energy Assurance, it is noteworthy that Executive Law § 709(2)(j) directs DHSES to partner with local, State, and federal agencies as well as private organizations to assess the vulnerability of critical infrastructure to natural and man-made disasters, including critical infrastructure such as "nuclear facilities, power plants, telecommunications systems, mass transportation systems, public roadways, railways, bridges and tunnels" and to develop strategies to protect such infrastructure.

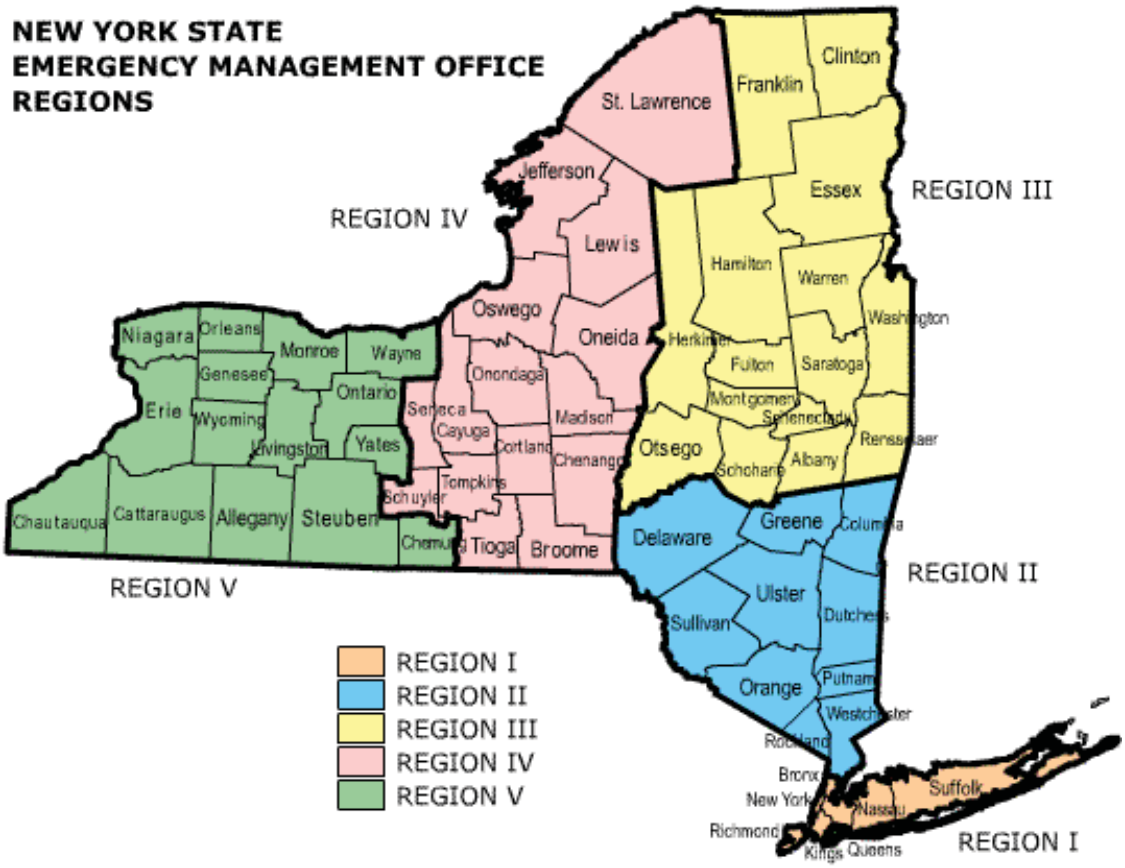
New York State Office of Emergency Management (OEM)/State Energy Management Office (OEM)

As provided in its website (http://www.OEM.state.ny.us/about/): "The mission of the New York State Office of Emergency Management (referred to alternatively as OEM or OEM) is to protect the lives and property of the citizens of New York State from threats posed by natural or man-made events." To that end, OEM coordinates all State response and initial recovery activities to support county and local government operations during an emergency. OEM also coordinates federal resources to support the

State's activities and serves as the staff arm of the Disaster Preparedness Commission (DPC). OEM is the focal point for all emergency management programs including maintaining the State Emergency Operations Center and administering federal disaster relief funds. Additionally, OEM is responsible for maintaining the State's Comprehensive Emergency Management Plan (CEMP).

OEM is an office within the DHSES. Figure 6-2 shows each of OEM's five regions, with corresponding contact information.

Figure 6-2. New York Emergency Management Regions



Source: http://www.OEM.state.ny.us/about/regionalMap.cfm

Office of Interoperable and Emergency Communication (OIEC)

According to § 717 of the Executive Law, OIEC (http://www.dhses.ny.gov/oiec/) is "the principal State agency for all interoperable and emergency communications issues" and must "oversee and direct the development coordination and implementation of policies, plans, standards, programs and services related to interoperable and emergency communications." The Office is part of the DHSES.

State Energy Planning Board

Article 6 § 102 of the Energy Law was passed in 2009 and statutorily established the State Energy Planning Board, directing the Board to publish a State Energy Plan on or before March 15, 2013. (The Planning Board was previously authorized by Executive Order No. 2 in 2008, which directed that the Board file a State Energy Plan in 2009).

According to the Board website (http://www.nysenergyplan.com/board.html), the goal of the planning process "is to map the State's energy future by showing how the State can ensure adequate supplies of

power, reduce demand through new technologies and energy efficiency, preserve the environment, reduce dependence on imported gas and oil, stimulate economic growth, and preserve the individual welfare of New York citizens and energy users."

The Energy Planning Board consists of the following.

- New York Department of State
- New York Empire State Development Corporation
- New York State Consumer Protection Board
- New York State Energy Research and Development Authority
- New York State Department of Public Service
- New York State Department of Environmental Conservation
- New York State Department of Health
- New York State Department of Labor
- New York State Department of Transportation
- New York State Office of Emergency Management
- Appointments by the Governor, Assembly, and Senate
- New York Independent System Operator (non-voting)

Disaster Preparedness Commission (DPC)

State Executive Law Article 2-B, § 21 statutorily established the DPC. Pursuant to that section, the DPC is required to prepare State disaster plans, direct State disaster operations, and coordinate those activities with local government operations, and coordinate federal, State, and private recovery efforts. The DPC also must submit an annual report that includes recommendations on ways to improve State and local capabilities regarding disaster emergencies. The DPC consists of the members shown in Table 6-16.

Table 6-16. DPC Members

• Agriculture and Markets, Department of	• Office for Technology
• American Red Cross	• Office of Children and Family Services
• Banking, Department of	• Office of Counter Terrorism
• Criminal Justice Services, Division of	• Office of Cyber Security
• Department of Correctional Services	• Office of Emergency Management
• Education Department	• Office of Interoperability and Emergency Communications
• Empire State Development Corporation	• Office of Parks, Recreation & Historic Preservation
• Energy Research and Development Authority	• Office of Victim Services
• Environmental Conservation, Department of	• Port Authority of NY and NJ
• Fire Prevention and Control, Office of	• Public Service Commission
• General Services, Office of	• State Police, Division of
• Health, Department of	• State, Department of
• Housing and Community Renewal, Division of	• Temporary and Disability Assistance, Office of
• Insurance Department	• Thruway Authority
• Labor, Department of	• Transportation, Department of
• Mental Health, Office of	

Table 6-16. DPC Members

• Metropolitan Transportation Authority	
• Military and Naval Affairs, Division of	
Source: http://www.OEM.state.ny.us/dpc/index.cfm	

6.5.2.1.2 Other Authorities

New York City Office of Emergency Management (OEM)

The New York City OEM ensures interagency coordination before, during, and after disasters or emergencies. Its mission includes planning, preparing for, and mitigating emergencies; educating the public on preparedness; coordinating and supporting responses to and recovery from emergencies; and collecting and disseminating critical information. OEM maintains a corps of emergency management personnel including responders, planners, watch commanders, and administrative and support staff to identify and respond to various hazards and assist federal, State, and city officials with emergency response. OEM's public information staff provides accurate, timely information to the public and media organizations. New York City's Citywide Incident Management System (CIMS) was established in 2004. CIMS establishes a formal command matrix and provides a protocol for governing how City agencies should respond to emergencies (New York State Energy Emergency Plan 2009, pp. 2-4).

6.5.2.1.3 Principal Federal Agencies

The U.S. Department of Energy (DOE)

According to DOE's website, its "overarching mission is to advance the national, economic, and energy security of the United States; to promote scientific and technological innovation in support of that mission; and to ensure the environmental cleanup of the national nuclear weapons complex."

DOE's Office of Electricity Delivery and Energy Reliability (OE)

With regard to Energy Assurance, OE takes a lead role in executing the ESF-12, in accordance with the National Response Framework. As provided in its mission statement, OE also leads national efforts to modernize the electric grid, enhance security and reliability of the energy infrastructure, and facilitate recovery from disruptions to energy supply.

Within OE, the Office of Infrastructure Security and Energy Restoration (ISER) is responsible for coordinating the protection of critical energy assets as well as assisting federal, State, and local governments in preparing for, responding to, and mitigating disruptions. OE acts through ISER in executing the ESF-12, in accordance with the National Response Framework.

The Federal Emergency Management Agency (FEMA)

FEMA is an agency of the United States Department of Homeland Security whose primary function is to coordinate the State and local response to a disaster that has overwhelmed State and local resources or capabilities. According to FEMA's website, the organization's mission "is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards."

The Environmental Protection Agency (EPA)

EPA's mission is to protect human health and the environment. With regard to Energy Assurance, the EPA may provide temporary waivers of a state's Clean Air Act implementation plan upon application by a state governor. For example, the EPA could allow a temporary adjustment of normal refinery operations to permit the importation or use of non-conforming, higher-sulfur petroleum products or coal, if it were shown that higher sulfur coal was more readily available during an emergency.

Federal Energy Regulatory Commission (FERC)

FERC is an independent agency that regulates the interstate transmission and wholesale sale of electricity, regulates the transmission and sale of natural gas for resale in interstate commerce, and regulates the LNG terminals and interstate natural gas pipelines as well as licensing hydropower projects. Additionally, it protects the reliability of the high voltage interstate transmission system through mandatory reliability standards.

As outlined in the New York State Energy Emergency Plan (2009), FERC's actions are significant regarding Energy Assurance because it may implement programs to curtail natural gas sales or shed load to low-priority customers; it may prohibit certain industrial uses of natural gas or order allocation of available supplies; or it may authorize the temporary connection or use of surplus electric transmission or generating facilities, among other measures to ensure reliability.

FERC Office of Electric Reliability (OER)

FERC's OER helps to protect and improve the reliability and security of the nation's bulk power system through regulatory oversight. It also oversees the development and review of mandatory reliability and security standards and oversees compliance therewith.

U.S. Department of Transportation (DOT)

The New York State Energy Emergency Plan (2009) provides the following regarding the U.S. DOT.

> "The U.S. DOT has several sub-agencies that may relate to an energy emergency. These include:
>
> Office of Pipeline Safety (OPS) - OPS rules apply to interstate and intrastate pipelines. Additionally, State regulations for natural gas generally reinforce the federal requirements.
>
> Federal Maritime Administration (FMA) - In the event that the State requires long distance waterborne fuel delivery (usually heating oil or motor gasoline) aboard an international shipping carrier not registered in the United States, a waiver from the federal act requiring the use of US-flagged vessels (Jones Act) would be sought through the FMA. U.S. DOE would assist with this.
>
> Federal Motor Carrier Safety Administration (FMCSA) - If the State receives a request to waive highway fuel transport driver hours in order to facilitate delivery during a shortage, it may be necessary to contact FMCSA."

6.5.2.1.4 Principal Energy Industry Stakeholders

Investor-Owned Utilities

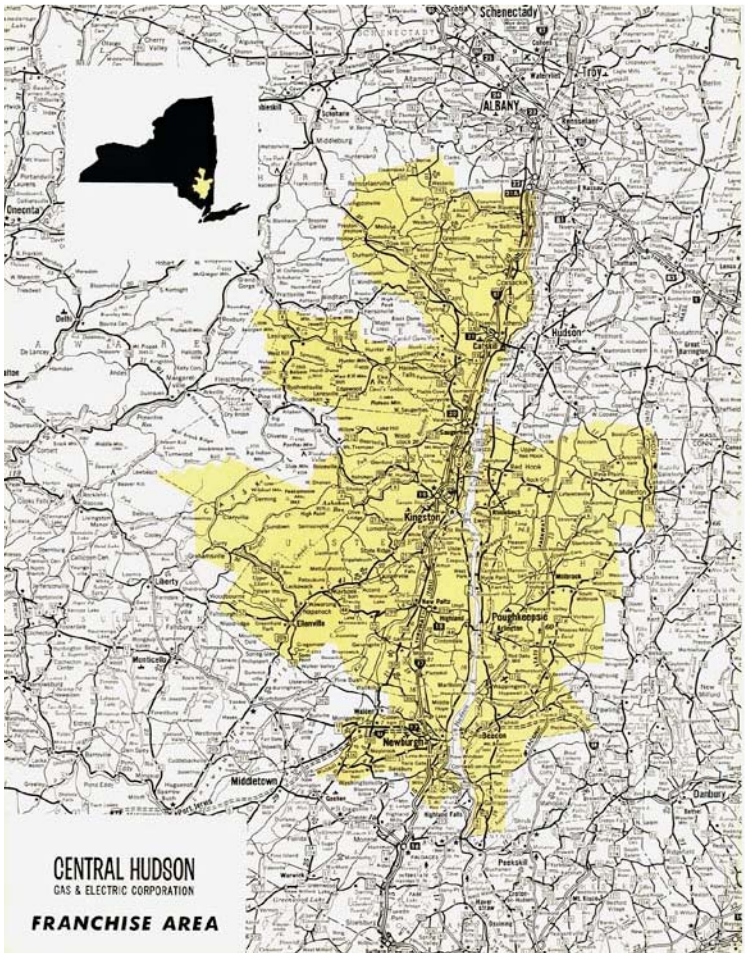
Six regulated investor-owned electric power companies serve New York. These are:

- Central Hudson Gas & Electric Corporation (Central Hudson)
- Consolidated Edison Company of New York, Inc. (Con Edison)
- Orange and Rockland Utilities, Inc. (O&R)
- New York State Electric & Gas Corporation (NYSEG)
- Rochester Gas and Electric Corporation (RG&E)
- Niagara Mohawk Power Corporation d/b/a National Grid

Central Hudson Gas & Electric Corporation (Central Hudson)

Central Hudson is an electric and gas transmission and distribution utility that serves approximately 300,000 electric customers and 74,000 natural gas customers in and around New York State's Mid-Hudson River Valley. The service territory extends from the suburbs of metropolitan New York City north to the Capital District at Albany, as depicted in the service territory shown in Figure 6-3.

Figure 6-3. Central Hudson Service Territory



Source: http://www.cenhud.com/

- Electric Transmission: Central Hudson owns and operates an electric transmission system consisting of 629 pole miles of line and an electric distribution system consisting of 8,078 pole miles of overhead lines and 1,371 trench miles of underground lines.
- Natural Gas: Central Hudson owns and operates approximately 163 miles of natural gas transmission pipelines and 1,163 miles of distribution pipelines, in addition to its customer service lines and meters. Central Hudson also owns two propane-air mixing facilities for emergency and peak-shaving purposes, one located in Poughkeepsie, New York, and the other in Newburgh, New York.

Consolidated Edison Company of New York, Inc. (Con Edison)

Con Edison, Inc. is a holding company incorporated in New York in 1997 that owns Con Edison and Orange and Rockland Utilities, Inc. (O&R). Con Edison, Inc. also owns competitive energy businesses, including Con Edison Solutions, a retail energy supply and services company, Con Edison Energy, a

wholesale energy supply company, and Con Edison Development, a company that participates in infrastructure projects. (Maps of the New York City area and the boroughs of New York City are contained in Section 6.5.3.)

Con Edison is a regulated utility that provides electric service in New York City (excluding a small area of Queens), and most of Westchester County. The company also provides natural gas service in Manhattan, the Bronx, and parts of Queens and Westchester. Additionally, Con Edison owns and operates the world's largest district steam system, providing steam service throughout Manhattan.

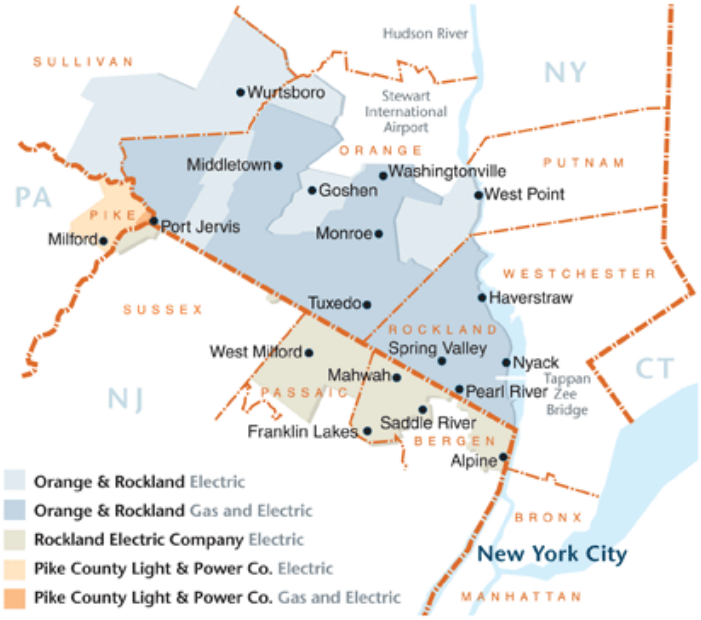
- Natural Gas: Con Edison's natural gas distribution system serves approximately 1.1 million gas customers in New York City and Westchester County in New York State. The company owns about 4,333 miles of gas mains as well as approximately 400,000 service pipes and it transports more than 200 million dekatherms of natural gas a year. Con Edison also owns a natural gas liquefaction facility and storage tank at its Astoria property in Queens, New York.
- Electric Service: Con Edison delivers electricity to approximately 3.3 million customers through 95,627 miles of underground distribution lines and 36,769 miles of overhead electric wires throughout a service territory that is about 660 square miles. As provided in its 2009 Annual Report, Con Edison delivered 56,667 million kW hours of electricity in 2009. Additionally, Con Edison owns (or jointly owns) 438 miles of overhead circuits operating at 138, 230, 345, and 500 kV as well as 727 miles of underground circuits operating at 69, 138, and 345 kV.
- Generating Facilities: Con Edison owns electric generating facilities located in Manhattan with an aggregate capacity of 706 MW. In accordance with the New York PSC's restructuring orders issued in the 1990s, Con Edison sold the majority of its electric generating facilities, with the exception of those that also produce steam for Con Edison's steam business.
  - 74th Street Station — Manhattan (cogeneration)
  - Ravenswood Station — Queens
  - 60th Street Station — Manhattan (cogeneration)
  - 59th Street Station — Manhattan (cogeneration)
  - East River Station — Manhattan (cogeneration)
  - Hudson Avenue Station — Brooklyn (cogeneration)
  - BNYCP Plant — Brooklyn Navy Yard Cogeneration Partners (cogeneration)
- Steam: Con Edison operates the largest steam distribution system in the United States. It produces and delivers over 23,000 MMlbs of steam annually to approximately 1,760 customers in parts of Manhattan. (A map of mid and lower Manhattan is found in Section 6.5.3.)

Orange and Rockland Utilities, Inc. (O&R)

O&R is a wholly owned subsidiary of Con Edison, Inc., and is an electric and gas utility headquartered in Pearl River, NY. O&R owns two utility subsidiaries: Rockland Electric Company and Pike County Light & Power Co., which operate in southeastern New York and adjacent portions of New Jersey and Pennsylvania. Together with its subsidiaries, O&R distributes electricity to more than 300,700 customers and delivers natural gas to 129,595 customers. Of the natural gas customers, 128,407 reside in New York, while the remaining 1,188 gas customers are in Pennsylvania. O&R also owns 554 miles of electric transmission lines, 5,460 miles of electric distribution lines, and more than 1,800 miles of gas pipeline. Its peak demand for electricity (reached on August 2, 2006) is 1,617 MW.

- Service Territory: O&R's service territory encompasses approximately 1,350 square miles as shown in Figure 6-4.**Error! Reference source not found.**

Figure 6-4. O&R Service Territory



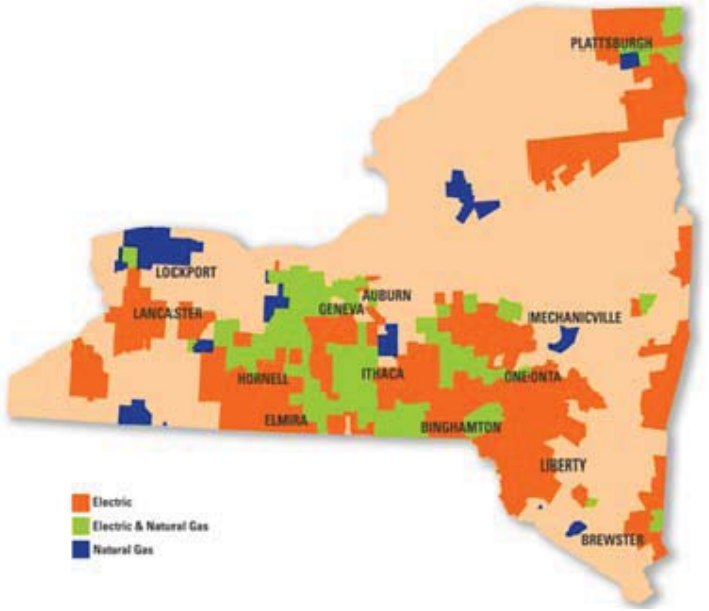
Source: http://www.oru.com/aboutoru/servicearea/index.html

New York State Electric & Gas Corporation (NYSEG)

NYSEG is an electric and gas corporation based in Rochester, New York. It is organized and exists pursuant to the Transportation Corporations Law of the State of New York and it is regulated by the New York PSC. Among other activities, NYSEG is engaged in the purchase, sale, and distribution of electricity and natural gas in its service area. The company serves approximately 872,000 electricity customers and 256,000 natural gas customers in upstate New York.

NYSEG (Figure 6-5) is a subsidiary of Iberdrola USA (formally known as Energy East Corporation), an energy services and delivery company doing business in the Northeast United States. As of September 16, 2008, Energy East Corporation became a wholly-owned subsidiary of Iberdrola, a corporation organized under the laws of Spain. Among other locations, Iberdrola operates in the states of New York, Connecticut, Massachusetts, Maine, and New Hampshire. Besides NYSEG, Iberdrola owns RG&E, Central Maine Power, and gas distributors Berkshire Gas, Southern Connecticut Gas, Connecticut Natural Gas, and Maine Natural Gas. Through NYSEG, RG&E, and Central Maine Power, Iberdrola owns 13,282 km (8,253 miles) of transmission lines and 102,819 km (8,253 miles) of distribution lines, reaching 1,843,000 customers in 2009, with a total consumption of 36,783 GWh.

Figure 6-5. NYSEG Service Territory

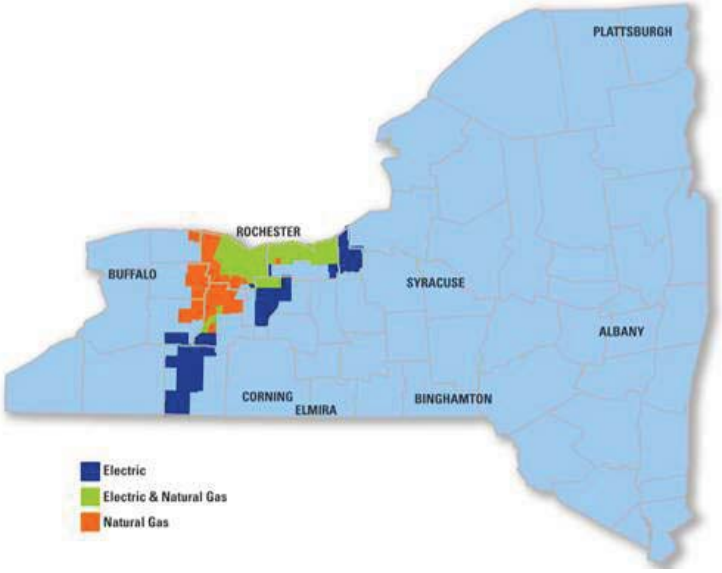


Source: http://www.nyseg.com/OurCompany/servicearea.html

Rochester Gas and Electric Corporation (RG&E)

RG&E is a gas and electric corporation which is organized and exists pursuant to the Transportation Corporations Law of the State of New York. It is a local distribution company regulated by the New York PSC. RG&E provides electricity to approximately 359,000 businesses and residential customers as well as to about 296,000 residents and businesses in a nine-county region in and around the city of Rochester in upstate New York. RG&E's service territory is shown in Figure 6-6. RG&E is a subsidiary of Iberdrola USA.

Figure 6-6. RG&E Service Territory



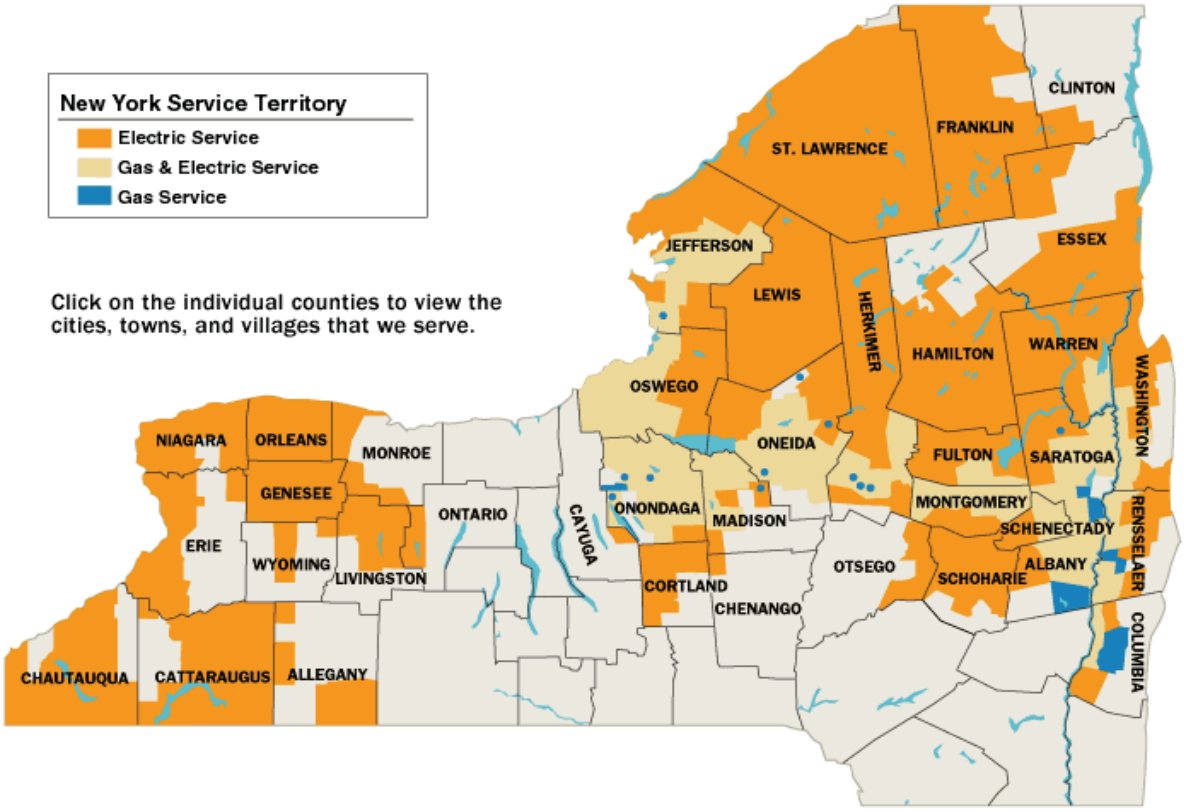
Source: http://www.rge.com/OurCompany/servicearea.html

Niagara Mohawk Power Corporation d/b/a National Grid

National Grid is a major international energy delivery company, incorporated under the laws of England and Wales. Within the U.S., the company delivers electricity to approximately 3.3 million customers throughout Massachusetts, New Hampshire, New York, and Rhode Island. It also manages the electricity network on Long Island under an agreement with the Long Island Power Authority (LIPA). Concerning electric generation, National Grid is the largest power producer in New York State. It owns 6,650 megawatts of electricity generation and provides power to over 1 million LIPA customers. The company is also the largest distributor of natural gas in the northeastern U.S., serving approximately 3.4 million customers in New York, Massachusetts, New Hampshire, and Rhode Island.

- Electricity Transmission: National Grid owns and operates approximately 8,600 miles of transmission spanning upstate New York, Massachusetts, Rhode Island, New Hampshire, and Vermont. The company's transmission system includes nearly 90 miles of underground cable and 524 substations. National Grid also owns and operates a direct current transmission line that is a key section of an interconnector between New England and Canada.
- New York Operations: Regarding National Grid's business operations in New York, National Grid provides electric service to approximately 1.5 million customers and natural gas service to about 540,000 customers in upstate New York. Its New York operations are based in Syracuse, New York. The company transmits electricity across 9,000 miles of high-voltage circuits and transports natural gas to over 3.4 million customers in New England and New York. See Figure 6-7.

Figure 6-7. National Grid's New York Service Territory



Source: https://www.nationalgridus.com/niagaramohawk/about_us/serviceterr_map.asp.

6.5.2.1.5 Principal Public Power Stakeholders

New York Power Authority (NYPA)

The NYPA is the largest State public power organization in the U.S. It is a corporate municipal instrumentality and a political subdivision of New York and operates pursuant to Title 1, Article 5 of the New York Public Authorities Law. As described in its website, NYPA generates, transmits, and sells electric power and energy principally at wholesale. Its customers include municipal and investor-owned utilities and rural electric cooperatives located throughout New York, high-load factor industries and other businesses, various public corporations located within the metropolitan area of New York City, including the City of New York, and certain out-of-state customers. Specifically, NYPA's customers include 51 municipal and cooperative electric systems, over 700 businesses and industrial customers, 115 government entities in New York City and Westchester County, and 47 municipal and 4 rural cooperative electric systems. The State's six investor-owned utilities and the Long Island Power Authority all purchase electricity from NYPA, which in turn sell to their customers, without profit. (http://www.nypa.gov/about.html) NYPA owns and operates 17 generating facilities and over 1,400 circuit-miles of transmission lines. Its generating plants include the following.

- Large Hydropower Facilities
  - St. Lawrence-Franklin D. Roosevelt Power Project, an 800 megawatt facility located in Massena on the St. Lawrence River
  - Niagara Power Project, a 2,441 megawatt facility on the Niagara River, Niagara County
  - Blenheim-Gilboa Pumped Storage Power Project, a 1,100 megawatt facility located in Blenheim and Gilboa, southwest of Albany
- Small Hydro Projects
  - Ashokan Project, Ulster County
  - Crescent Plant, Albany and Saratoga Counties
  - Gregory B. Jarvis Plant, Oneida County
  - Kensico Project, Westchester County
  - Vischer Ferry Plant, Saratoga and Schenectady Counties
- Fossil-Fueled Facilities
  - Richard M. Flynn Power Plant, a 135 megawatt facility located in Holtsville, Suffolk County
  - PowerNow! Small Power Plants, including six generation facilities in New York City and one in Brentwood, Long Island
  - 500-megawatt Combined-Cycle Power Plant, located in New York City, on the East River

Long Island Power Authority (LIPA)

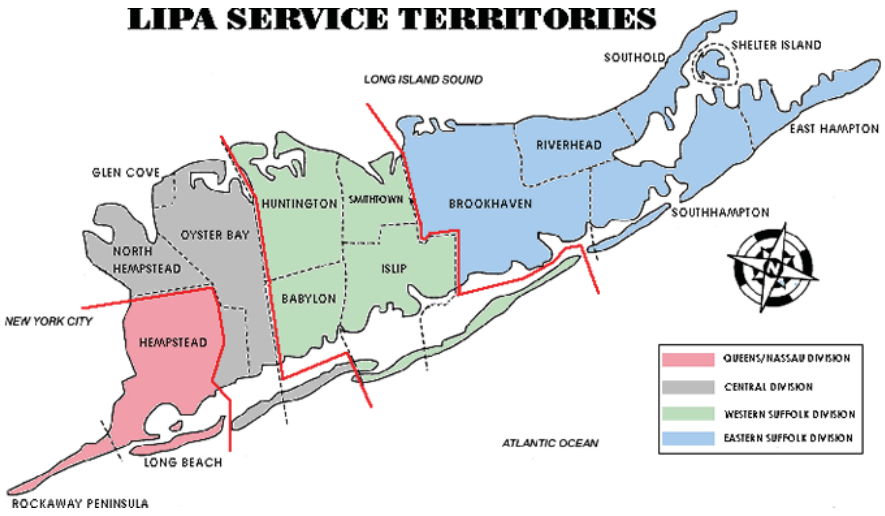
LIPA is a non-profit corporate municipal instrumentality and political subdivision of the State of New York. It owns and operates the transmission and distribution system on Long Island (Figure 6-8) and acts as the load-serving entity for the Long Island Transmission District. It provides electric service to approximately 1.1 million customers on Long Island. LIPA does not provide natural gas service.

Municipal Electric Utilities Association of New York State (MEUA)

MEUA (http://www.meua.org/) is a not-for-profit organization that was formed in 1930 in order to assure the efficient operation of publicly owned and operated electric systems. MEUA facilitates the production, distribution, conservation, and prudent use of electric power and energy for public service. As a public power organization, MEUA restricts its membership to municipal corporations, rural electric

corporations, and other organizations and individuals whose interests are compatible with the objects of the organizations. A list of all MEUA members with contact information is provided in Table 6-13.

Figure 6-8. LIPA Service Territory



Source: LIPA, http://www.lipower.org/images/about/service_map.gif

New York Municipal Power Agency (NYMPA)

Formed in 1996 pursuant to § 119 of the New York State General Municipal Law, NYMPA (http://nympa.org/) is a joint action agency comprised of 34 New York State municipal members. NYMPA facilitates the joint purchase and distribution of electricity to its member municipalities and their customers.

Other Electric Utilities within the New York PSC's Jurisdiction

Contact information for all electric utilities regulated by the PSC, including municipal utilities and rural electric cooperatives, is contained in the New York PSC website. That list has been reproduced in Appendix C.

Other Principal Electric Industry Stakeholders

The New York Independent System Operator (NYISO)

NYISO (http://www.nyiso.com/public/index.jsp) is an independent, not-for-profit organization that maintains functional control of (but does not own) the electric transmission system in New York State. It is responsible for the reliable operation of the State's nearly 11,000 miles of high-voltage transmission as well as the dispatch of over 500 electric power generators. Beyond operating New York's high voltage grid, NYISO also administers the energy, ancillary services, and capacity markets in the State.

NYISO's core responsibilities and functions include the following.

- Reliability: NYISO manages the efficient flow of power on New York's high-voltage transmission lines on a minute-to-minute basis, 24 hours a day.
- Markets: NYISO administers and monitors New York's multi-billion dollar wholesale electricity markets in daily and hourly auctions.
- Planning: NYISO conducts long-term assessments of the State's electricity resources and needs and evaluates the feasibility of projects proposed to meet those needs.

- Technology: NYISO facilitates the development of new technology to enhance the performance and efficiency of the power grid and electricity markets serving New York State.

New York State Reliability Council, LLC (NYSRC)

The NYSRC (http://www.nysrc.org/) is a not-for-profit organization whose mission is to promote and preserve the reliability of electric service on the New York State Power System by developing, maintaining, and updating reliability rules which must be complied with by NYISO and all entities engaging in electric transmission, ancillary services, energy, and power transactions on the New York State Power System.

The North American Electric Reliability Corporation (NERC)

As provided in its website, NERC (http://www.nerc.com/) is a non-government organization which has statutory responsibility to regulate bulk power system users, owners, and operators of the electric grid through the adoption and enforcement of mandatory and enforceable electric standards. NERC's mission is to ensure the reliability of the North American bulk power system and it has been certified by FERC as the electric reliability organization tasked with establishing and enforcing reliability standards for the bulk-power system.

Regulated Local Distribution Companies: Natural Gas

As provided in the New York State Energy Emergency Plan (2009), New York is the fourth largest gas-consuming state, using approximately 1,174 billion cubic feet of natural gas per year (using data for 2007). The approximately 4.43 million natural gas customers in the State can be broken down by volume into the following four sectors: (i) residential 33%, (ii) commercial/industrial 31%, (iii) power generation 35%, and (iv) transportation 1%. Those customers are served by the following gas local distribution companies (LDC).

- Central Hudson Gas & Electric Corporation (Central Hudson)
- Consolidated Edison Company of New York, Inc. (Con Edison)
- Orange & Rockland Utilities, Inc. (O&R)
- New York State Electric and Gas Corporation (NYSEG)
- Rochester Gas & Electric Corporation (RG&E)
- Niagara Mohawk Power Corporation d/b/a National Grid
- Corning Natural Gas Corporation (Corning)
- KeySpan Energy Delivery of New York (now part of National Grid)
- KeySpan Energy Delivery of Long Island (now part of National Grid)
- National Fuel Gas Distribution Corporation (NFGD)
- St. Lawrence Gas Company (St. Lawrence)

New York's LDCs utilize major interstate and intrastate pipeline systems for access to domestic and imported natural gas supplies. Those pipelines include Algonquin Gas Transmission Co. (AGT), Columbia Gas Transmission Corp. (Columbia), Dominion Transmission, Inc. (DTI), Empire State Pipeline Co. (Empire), Iroquois Gas Transmission System (IGTS), National Fuel Gas Supply Corp. (NFGS), North Country Pipeline, Tennessee Gas Pipeline Co. (Tennessee), Texas Eastern Pipeline Co. (TETCO), Transcontinental Gas Pipe Line Corp. (TRANSCO), and TransCanada Pipelines, Ltd. (TransCanada).

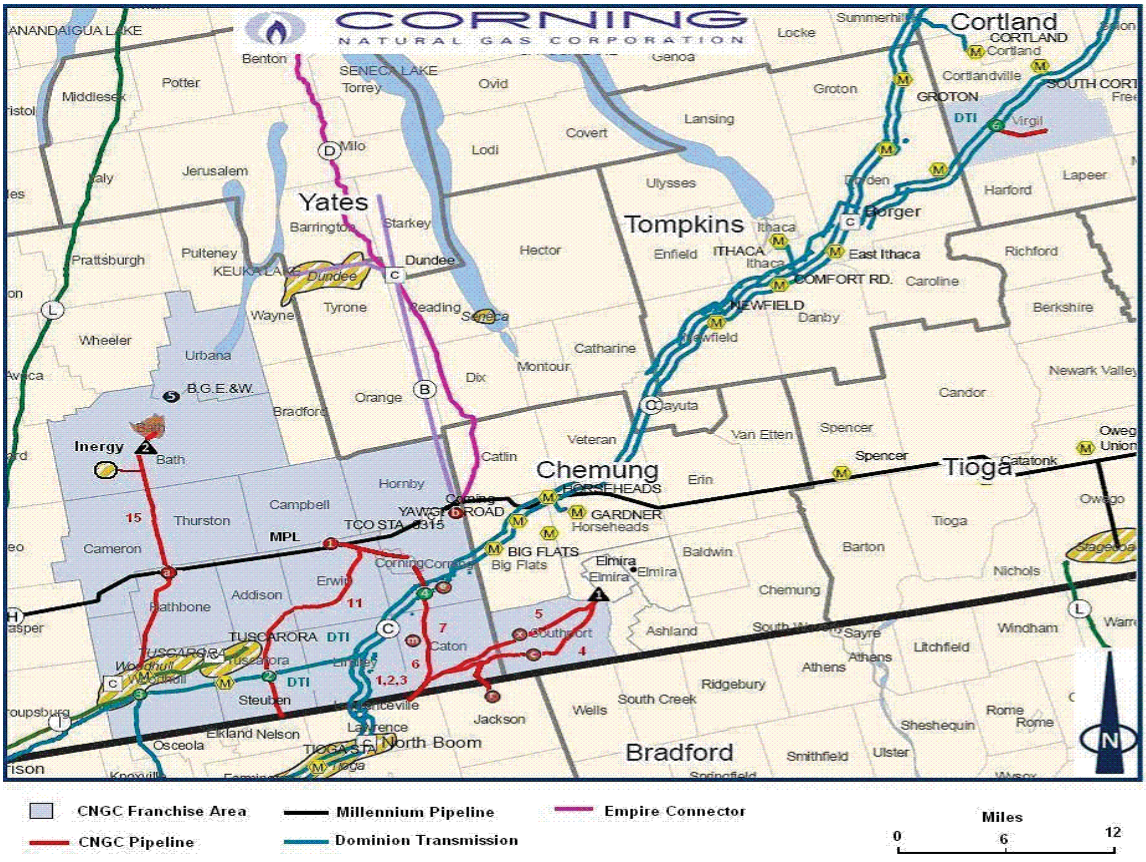
The LDCs not already described in Section 6.5.2.1.4, Investor-Owned Utilities, are described below.

Corning Natural Gas Corporation (Corning)

Corning is an investor-owned LDC, located in the Finger Lakes region of the Southern Tier of New York State. It provides natural gas, transportation, storage, and other unbundled energy services throughout a franchise service territory that encompasses 400 square miles, 15 townships, and 385 miles of pipeline (Figure 6-9). Corning distributes natural gas to nearly 15,000 customers in upstate New York. Corning also provides wholesale gas delivery services to NYSEG in Elmira, New York and to the Village of Bath, New York.

In addition to its role as a local gas utility, Corning is also an intrastate pipeline that moves significant volumes of gas to large industrial users and other utilities. In 2009, Corning completed a two-mile pipeline to connect its operations to the Marcellus Shale gas fields in Pennsylvania.

Figure 6-9. Corning Service Territory



Source: http://www.corninggas.com/index.asp?pageId=17

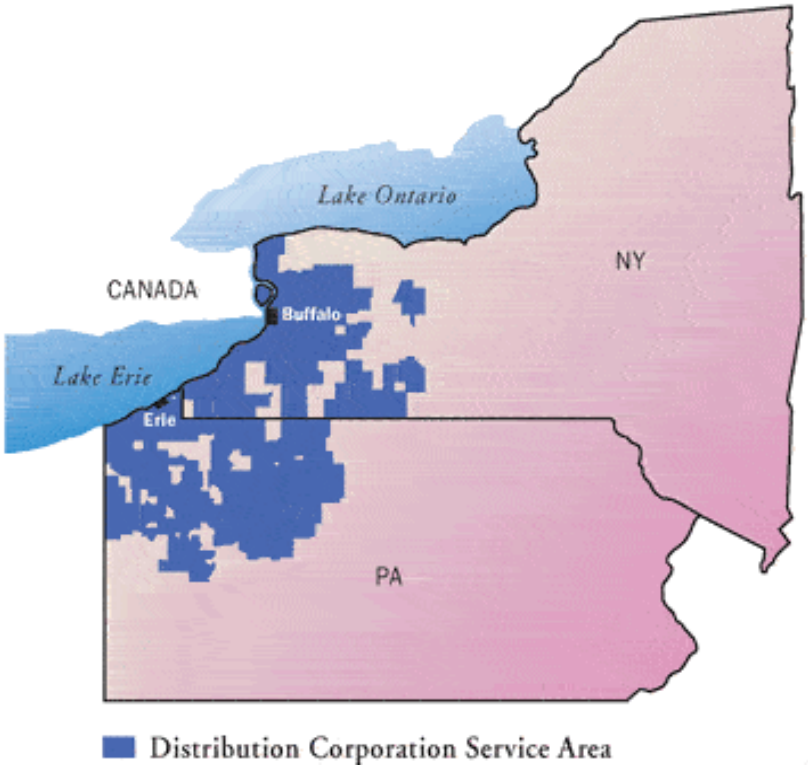
KeySpan Energy Delivery of New York and KeySpan Energy Delivery of Long Island

On August 24, 2007, KeySpan Energy Delivery completed its merger with National Grid. Subsequently, on May 1, 2008, KeySpan Energy Delivery changed its name to National Grid. National Grid is described in Section 6.5.2.1.4, Investor-Owned Utilities.

National Fuel Gas Distribution Corporation (NFGD)

NFGD, a subsidiary of National Fuel Gas Company, sells or transports natural gas to nearly 731,000 customers in western New York and northwestern Pennsylvania, including Buffalo, Niagara Falls, and Jamestown, New York and Erie and Sharon, Pennsylvania. See Figure 6-10.

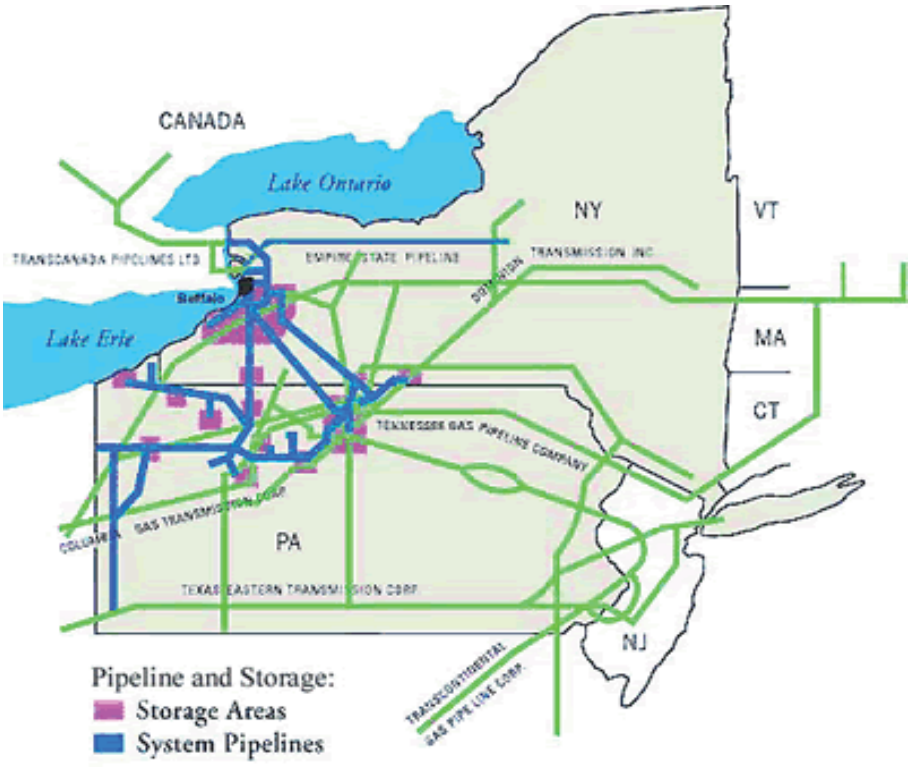
Figure 6-10. NFGD Service Territory



Source: http://www.nationalfuelgas.com/maps/utility.htm

National Fuel Gas Supply Corporation, also a subsidiary of National Fuel Gas Company, provides interstate natural gas transmission and storage through an integrated gas pipeline system that extends approximately 2,972 miles from southwestern Pennsylvania to the New York-Canadian border at the Niagara River. That gas pipeline system includes the Empire State Pipeline, a 157-mile natural gas transmission pipeline running from an interconnection with TransCanada Pipeline near Buffalo, NY to Syracuse, NY. A map of National Fuel Gas Supply Corporation's pipeline and storage facilities is shown in Figure 6-11.

Figure 6-11. NFGC Pipeline Map



Source: http://www.nationalfuelgas.com/maps/pipeline.htm

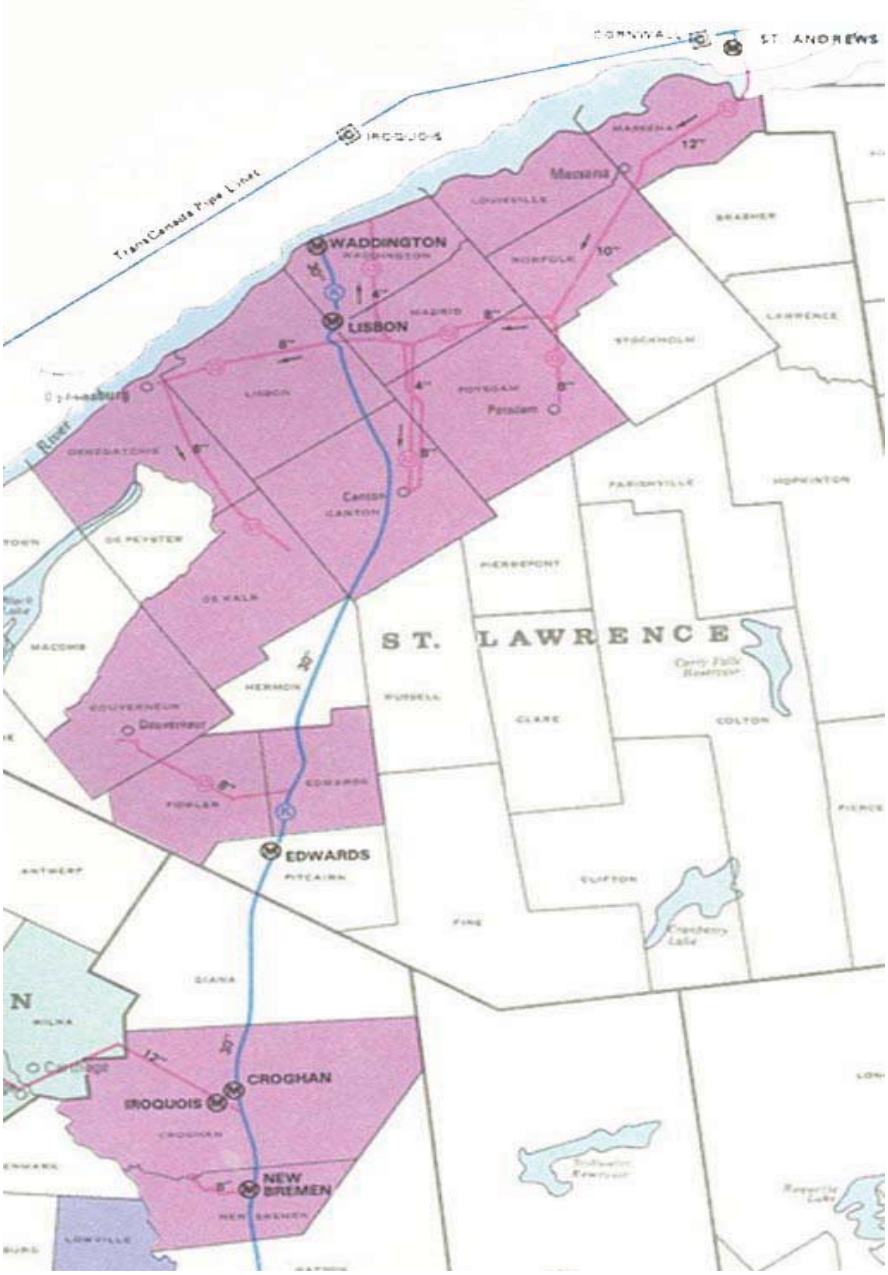
St. Lawrence Gas Company (St. Lawrence)

St. Lawrence is a public LDC that distributes natural gas to approximately 13,800 residential customers, 1,600 commercial customers, and 23 industrial customers within a 785-square mile service territory within New York State (Figure 6-12)The company is a wholly owned subsidiary of Enbridge Gas Distribution in Canada. St. Lawrence serves the cities and towns of Beaver Falls, Canton, Croghan, Gouverneur, Heuvelton, Lisbon, Madrid, Massena, New Bremen, Norfolk, Norwood, Ogdensburg, Potsdam, Raymondville, and Waddington. Additionally, St. Lawrence has the franchise rights to expand into another 11 municipalities.

Other Natural Gas Companies within the New York PSC's Jurisdiction

Contact information for all natural gas utilities regulated by the PSC is contained in the New York PSC website. That list has been reproduced in Appendix C.

Figure 6-12. St. Lawrence Service Territory



Source: http://www.stlawrencegas.com/about.shtml?page=territory

6.5.3 New York City Maps

Figures 6-13, New York City Boroughs, 6-14, New York City Area Map, and 6-15 Mid and Lower Manhattan are included for responder reference.

Figure 6-13. New York City Boroughs

New York's Five Boroughs at a Glance				
Jurisdiction		Population	Land Area	
Borough of	*County of*	*estimate for 1 July 2009*	*square miles*	*square km*
Manhattan	New York	1,629,054	23	59
The Bronx	Bronx	1,397,287	42	109
Brooklyn	Kings	2,567,098	71	183
Queens	Queens	2,306,712	109	283
Staten Island	Richmond	491,730	58	151
City of New York		8,391,881	303	786
State of New York		19,541,453	47,214	122,284
Source: United States Census Bureau[15][16][17]				

Figure 6-14. New York City Area Map

Figure 6-15. Mid and Lower Manhattan

6.5.4 Rebate Programs

State Rebate Program

- New York - Residential Energy Efficient Appliance Rebate Program
- NYSERDA - Anaerobic Digester Gas-to-Electricity Rebate and Performance Incentive
- NYSERDA - Energy $mart Commercial Lighting Program Incentives
- NYSERDA - Energy $mart Multifamily Performance Program
- NYSERDA - Energy $mart New Construction Program
- NYSERDA - Existing Facilities Program
- NYSERDA - Fuel Cell Rebate and Performance Incentive
- NYSERDA - Green Residential Building Program
- NYSERDA - Home Performance with Energy Star Homeowner Financing Incentive
- NYSERDA - Industrial and Process Efficiency Performance Incentives
- NYSERDA - On-Site Small Wind Incentive Program
- NYSERDA - PV Incentive Program
- NYSERDA - Solar Thermal Incentive Program

Utility Rebate Program

- Central Hudson Gas & Electric (Electric) - Commercial EE Program
- Central Hudson Gas & Electric (Electric) - Residential EE Rebate Program
- Central Hudson Gas & Electric (Gas) - Commercial EE Program
- Central Hudson Gas & Electric (Gas) - Residential EE Rebate Program
- ConEd (Natural Gas) - Residential EE Incentives Program
- ConEd - Business EE Incentives Program
- ConEd - Residential EE Incentives Program
- Long Island Power Authority - Commercial EE Rebate Program
- Long Island Power Authority - PV Rebate Program
- Long Island Power Authority - Residential EE Rebate Program
- Long Island Power Authority - Residential Solar Water Heating Rebate Program
- Long Island Power Authority - Wind Energy Rebate Program
- National Fuel (Gas) - Residential EE Rebates
- National Fuel (Gas) - Small Commercial Conservation Program
- National Grid (Electric) - Non-Residential EE Program (Upstate New York)
- National Grid (Gas) - Residential EE Rebate Programs (Metro New York)
- National Grid (Gas) - Residential EE Rebate Programs (Upstate New York)

- National Grid (Gas) - Commercial EE Rebate Programs (Metro New York)
- National Grid (Gas) - Commercial EE Rebate Programs (Upstate New York)
- NYSEG (Electric) - Commercial and Industrial Efficiency Program
- NYSEG (Electric) - Small Business Lighting Retrofit Program
- NYSEG (Gas) - Commercial and Industrial Efficiency Program
- Orange and Rockland Utilities - Residential Gas Efficiency Program
- RG&E (Electric) - Commercial and Industrial Efficiency Program
- RG&E (Electric) - Small Business Lighting Retrofit Program
- RG&E (Gas) - Commercial and Industrial Efficiency Program

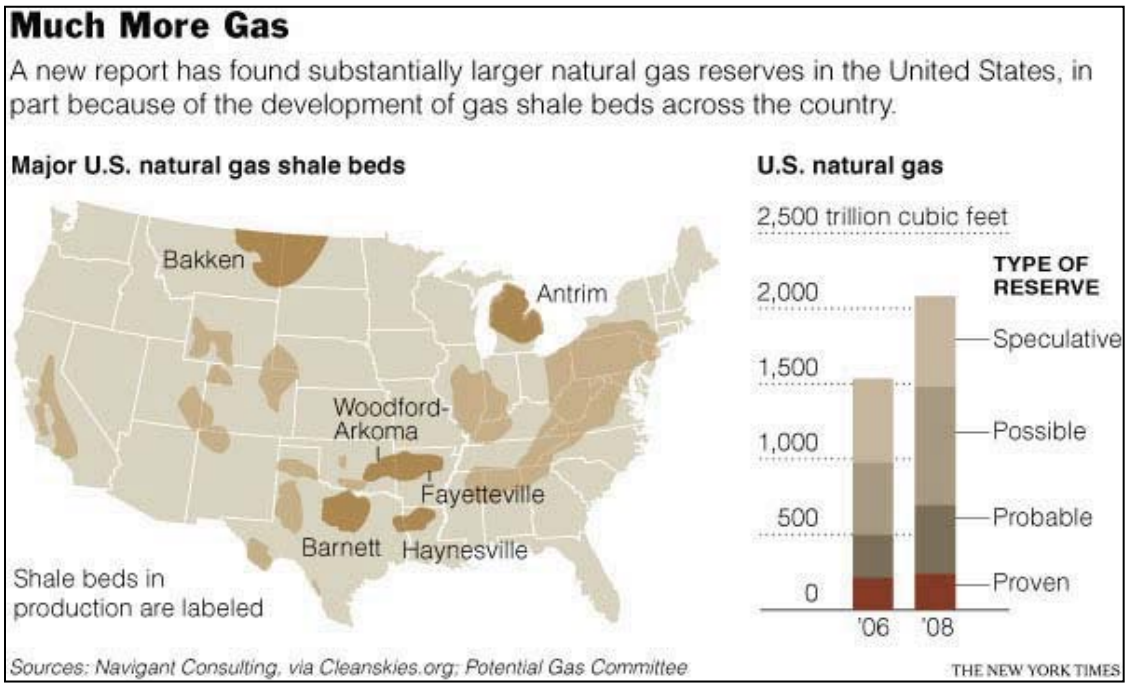
6.5.5 Gas Supplies

Shale Gas Potential for the United States

On June 18, 2009, the Potential Gas Committee released its assessment of the nation's natural gas resources and found that the United States possesses a total resource base of 1,836 trillion cubic feet, the largest reported increase in the 44-year history of the Potential Gas Committee. When added to the DOE's latest calculation of proved gas reserves (238 Tcf as of 2007), the United States has a total available future supply of 2,074 Tcf, or an estimated 100-year supply. Most of the increase in natural gas resources is attributable to reevaluation of shale gas formations in the Appalachian basin, the Mid-Continent, Gulf Coast, and Rocky Mountain areas. Indeed, of the 1,836 Tcf of total potential reserves, shale gas accounts for 616 Tcf, or 33 percent.

The New York Times recently reported on the amplified potential of the nation's major natural gas shale beds, which, in addition to Marcellus Shale located in the Appalachian area, includes Fayetteville in Arkansas, Antrim in Michigan, Bakken in North Dakota and Montana, Woodford-Arkhoma in Arkansas and Oklahoma, Haynesville in Louisiana and Texas and Barnett in Texas. The map depicted in that article is reproduced in Figure 6-16.

Figure 6-16. Potential of Gas Shale Beds



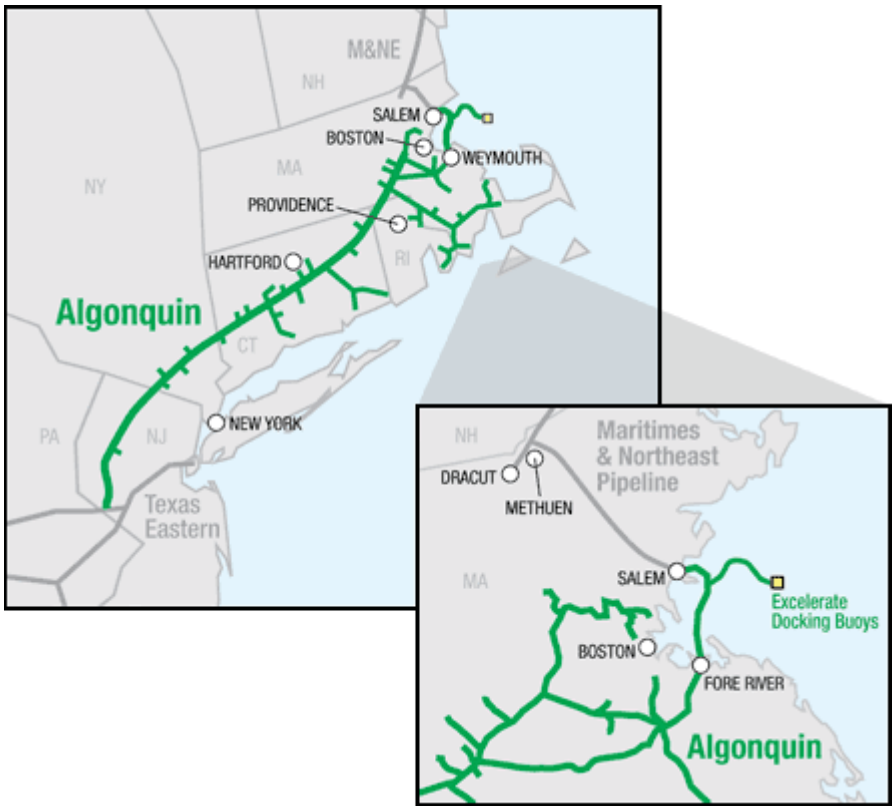
Source: http://www.nytimes.com/imagepages/2009/06/18/business/18gas.graf01.ready.html

Natural Gas Pipelines Supplying New York

Company-provided maps are used displayed where available.

Algonquin Gas Transmission Co. (Figure 6-17)
Spectra Energy Corp Headquarters
5400 Westheimer Court
Houston, TX 77056-5310
(713) 627-5400
Emergency
1-800-726-8383

Figure 6-17. Algonquin Natural Gas Pipeline



Source: http://www.spectraenergy.com/what_we_do/businesses/us/assets/algonquin/

Columbia Gas Transmission LLC, a NiSource company

NiSource Gas Transmission & Storage (Figure 6-18)
Commercial Center:
5151 San Felipe, Suite 2500
Houston, Texas 77056
713-267-4100

Emergency
Columbia Gas Transmission
800-835-7191

Figure 6-18. Columbia

Source: Source: http://www.ngts.com/about-ngts/columbia-gas-transmission-llc/

Dominion Companies

Dominion Cove Point LNG
2100 Cove Point Road
Lusby, Maryland 20657

Dominion Transmission Inc.
445 West Main Street
Clarksburg, WV 26301
304-627-3000

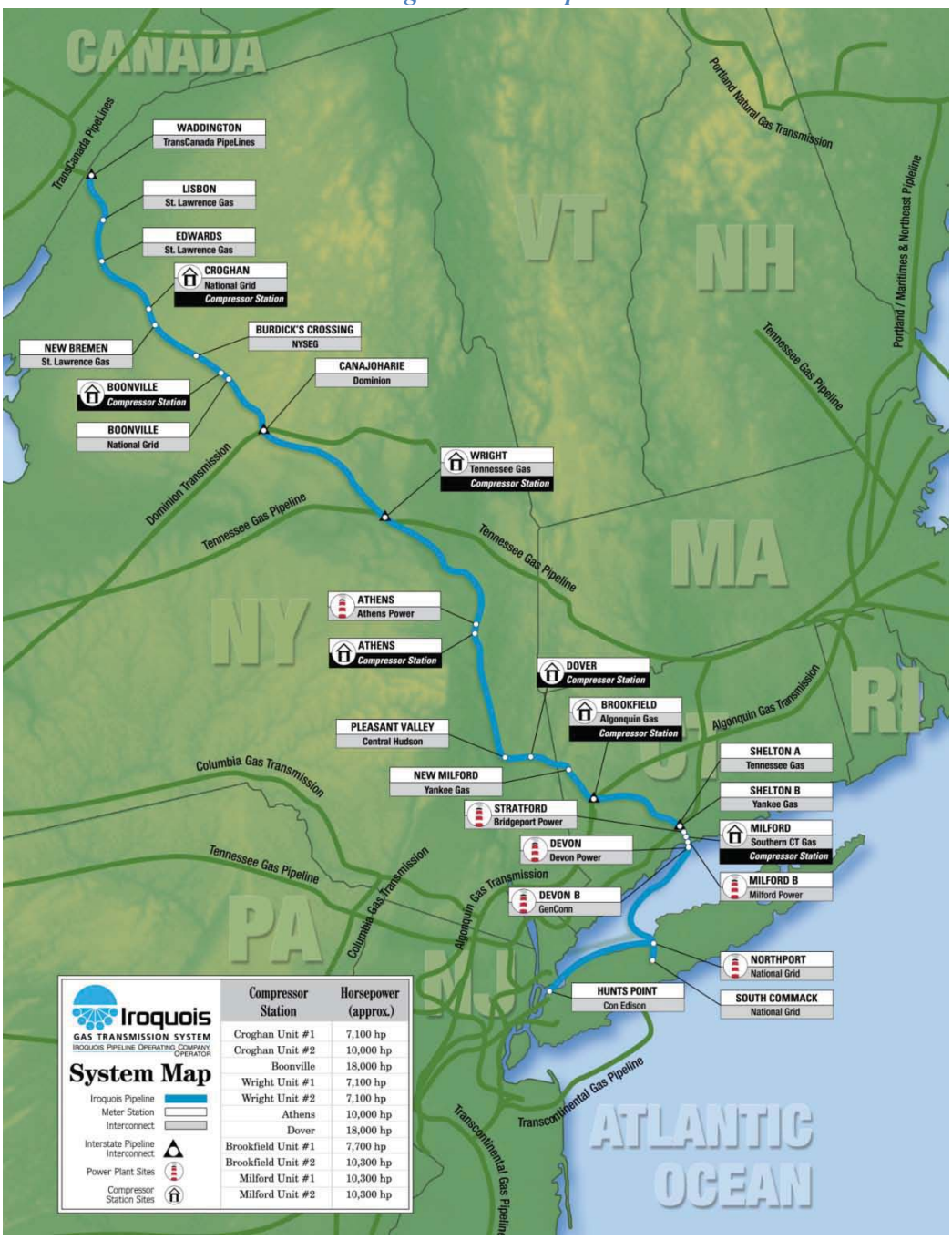
Empire State Pipeline Co. (A National Fuel Gas Company)

Mailing Address:
Empire Pipeline, Inc.
6363 Main Street, 1st Floor
Williamsville, NY 14221
Emergency telephone: 1-800-833-1843
For map, see National Fuel, below.

Iroquois Gas Transmission System (Figure 6-19)

One Corporate Drive
Suite 600
Shelton, CT 06484
Phone: 203-925-7200
Gas Emergencies: 800-888-3982
Non-Emergencies: 800-253-5152

Figure 6-19. Iroquois

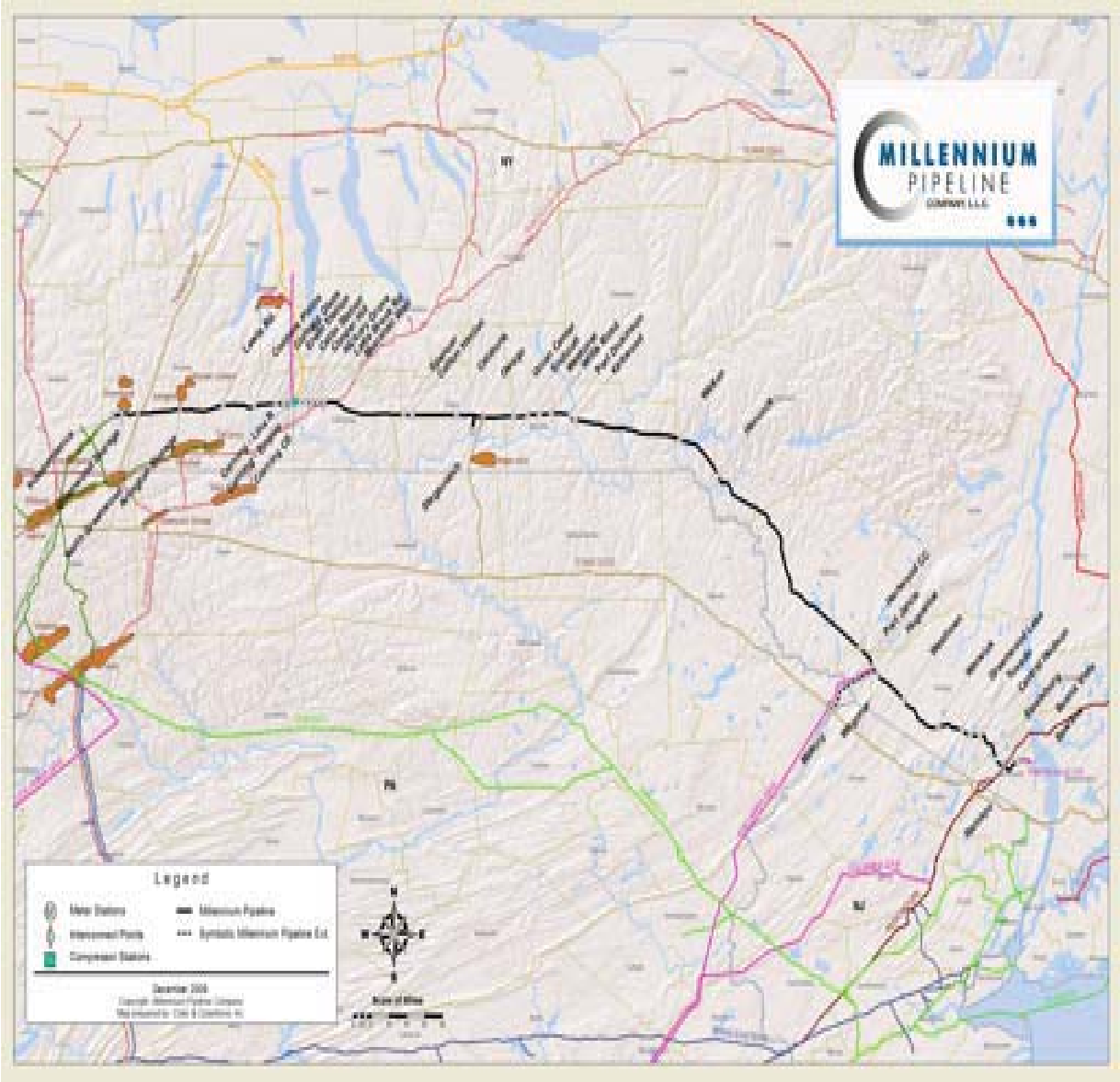


Source: http://www.iroquois.com/interactive-map.asp

Millennium Pipeline LLC (Figure 6-20)

Millennium Pipeline Company, LLC
One Blue Hill Plaza, 7th floor
P.O. Box 1565
Pearl River, NY 10965
Phone: 845.620.1300
Pipeline Emergencies: 800.835.7191
Right of Way/Easement Inquiries: 800.572.7515
E-Mail: info@millenniumpipeline.com

Figure 6-20. Millennium

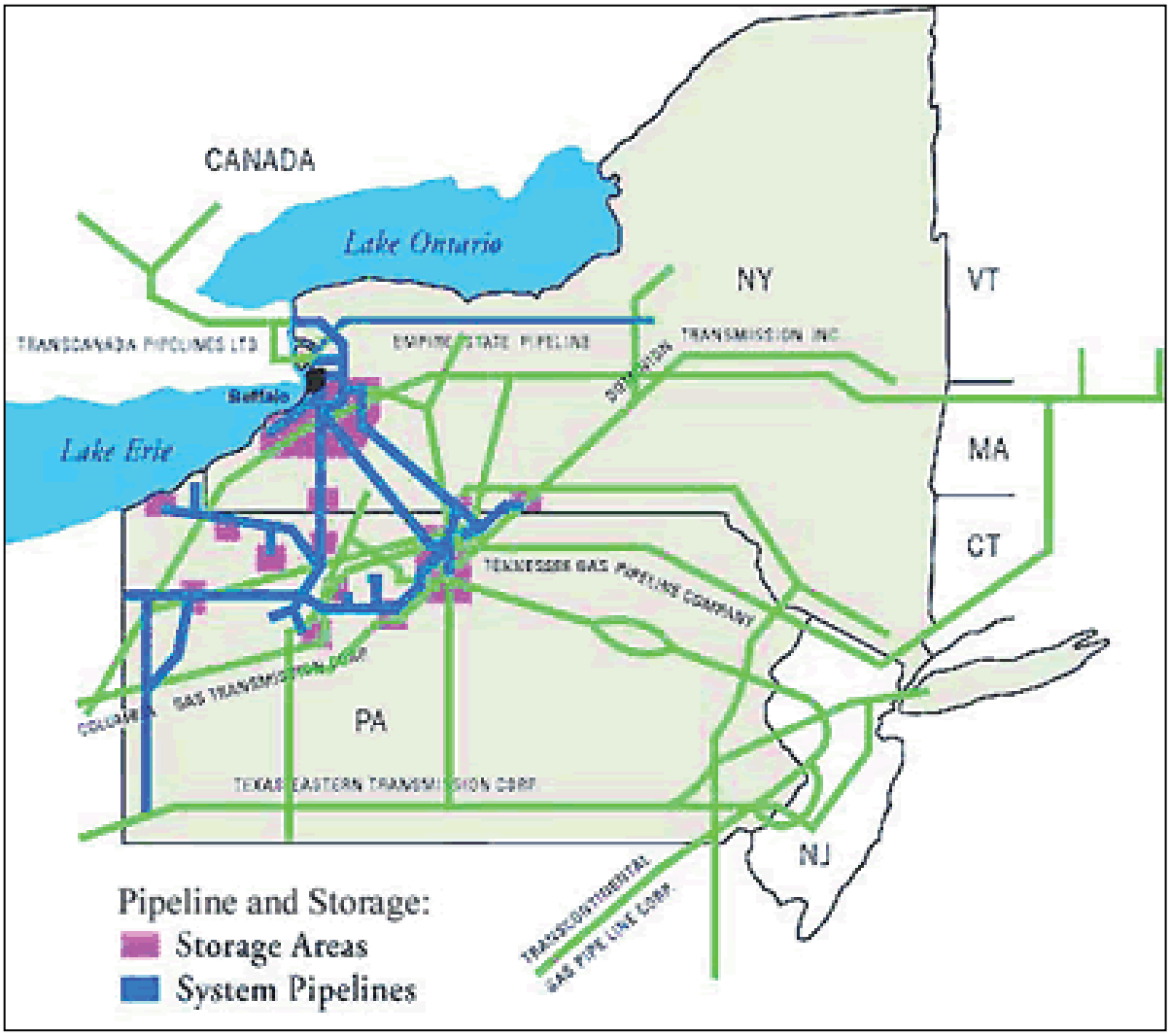


Source: http://www.millenniumpipeline.com/map.htm

National Fuel Gas Supply Corporation (Figure 6-21)

Corporate Headquarters
6363 Main Street
Williamsville, NY 14221
(716) 857-7000
Emergency: 1-800-833-1843

Figure 6-21. National Fuel Gas Supply Corporation

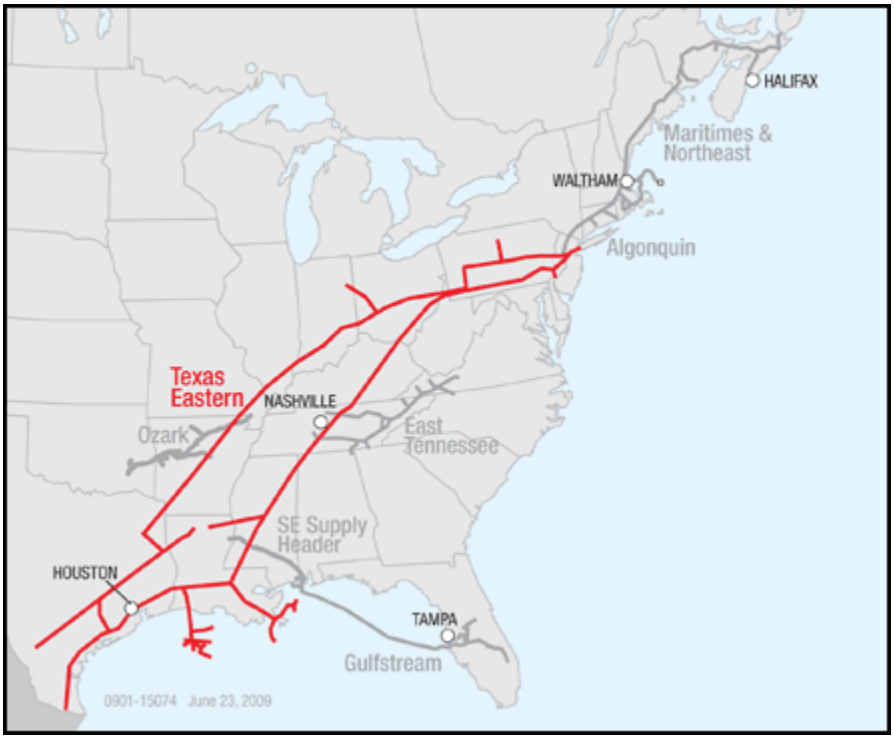


Source: http://www.nationalfuelgas.com/maps/pipeline.htm

Texas Eastern Pipeline Co. (Figure 6-22)

Spectra Energy Corp Headquarters
5400 Westheimer Court
Houston, TX 77056-5310
(713) 627-5400
Emergency:
1-800-231-7794

Figure 6-22. Texas Eastern Pipeline Co.



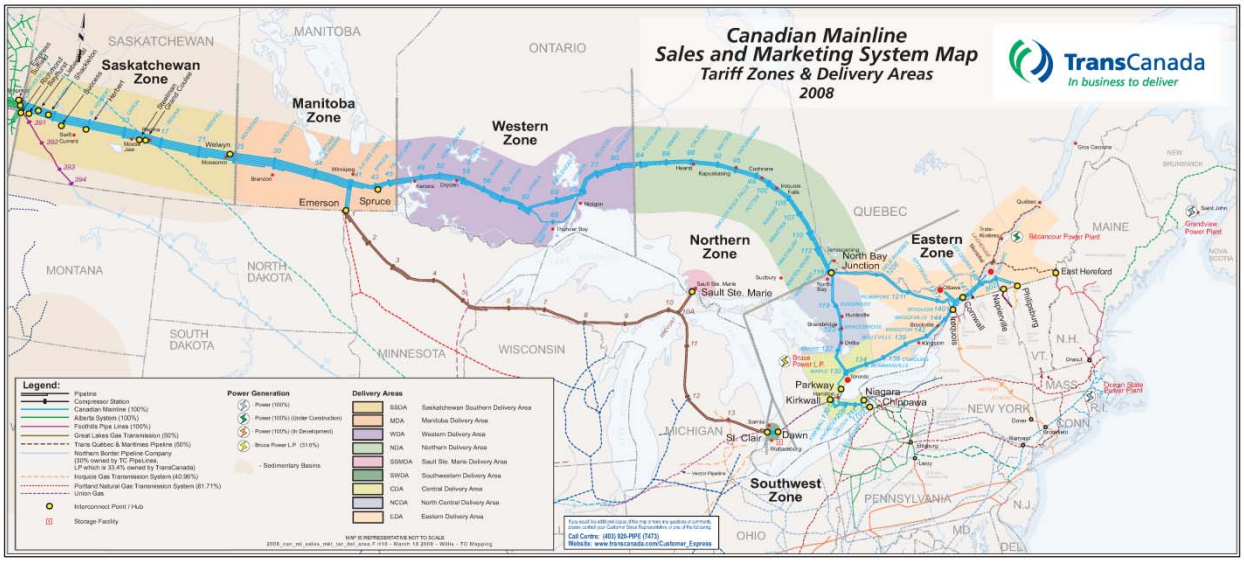
Source: http://www.spectraenergy.com/what_we_do/businesses/us/assets/texas_eastern/

TransCanada Pipeline Limited (Figure 6-23)

Head Office
TransCanada Corporation
450 - 1 Street SW
Calgary, Alberta, Canada
T2P 5H1
Telephone: 1.403.920.2000
Toll-free within North America: 1.800.661.3805
Fax: 1.403.920.2200
Emergencies: 1.888.982.7222

Canadian Mainline System Map (Part of the TransCanada Pipeline system)

Figure 6-23. TransCanada



Source:
http://www.transcanada.com/customerexpress/docs/ml_system_maps/mainline_sales_marketing.pdf

Transcontinental Gas Pipeline Co. (TRANSCO) (A Williams company) (Figure 6-24)

Charlottesville Division
345 Greenbrier Drive Charlottesville, VA 22901
434-973-4384
Fax: 434-964-2130
Emergencies
800-440-8475
800-231-1290

Figure 6-24. TRANSCO

Source: http://www.1line.williams.com/Transco/index.html

Natural Gas Storage, Northeast Region

According to the United States Energy Information Administration (EIA):

> "The States of Pennsylvania, New York and West Virginia are the key transit areas for gas deliveries within the Northeast region and include the major service territories of Dominion Transmission Company and Columbia Gas Transmission Company systems. These States also have the largest underground storage capacity in the region. Storage is essential as a supply backup and for balancing gas supplies on the pipelines operating in the region.
>
> "The largest storage operators in the Northeast are also three of the largest pipeline companies in the region. Columbia Gas Transmission Company operates 22 storage facilities (out of 110 within the region), with a working gas storage capacity of 138 Bcf (out of a total 796 Bcf). Although Dominion Transmission Company operates only 15, its facilities have the largest amount of working gas capacity in the region, 413 Bcf. National Fuel Gas Supply Company operates the largest number of storage facilities in the region, 31, but its storage fields are only capable of storing up to 106 Bcf of working gas.
>
> "(Note: The peak-day deliverability from LNG in the region, 5.1 Bcf per day, is 33 percent as large as the total daily deliverability from underground storage facilities. This backup capability is incorporated into the operations of the regional network and is used to meet the rapid increases in demand that can occur because of sudden temperature changes in the region. Three of the eight currently active LNG importing facilities in the U.S. are located in the Northeast Region, the Cove Point LNG Company facility, located on the eastern shore of Maryland, the Northeast Gateway LNG Terminal located 16 miles offshore of Massachusetts, and the DistriGas Company's Everett LNG facility located outside of Boston, Massachusetts.)"

Figure 6-25. Natural Gas Storage, Northeast Region

Northeast Region -- Underground Natural Gas Storage, by State and Reservoir Type, Close of 2007

Region/ State	Depleted Gas/Oil Fields			Aquifer Storage			Salt Cavern Storage			Total		
	Sites	Working Gas Capacity (Bcf)	Daily Withdrawal Capability (MMcf)	Sites	Working Gas Capacity (Bcf)	Daily Withdrawal Capability (MMcf)	Sites	Working Gas Capacity (Bcf)	Daily Withdrawal Capability (MMcf)	Sites	Working Gas Capacity (Bcf)	Daily Withdrawal Capability (MMcf)
Northeast Region												
Connecticut	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Delaware	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Maine	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Maryland	1	17	400	0	0	0	0	0	0	1	17	400
Massachusetts	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
New Hampshire	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
New Jersey	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
New York	23	116	1,696	0	0	0	1	1	145	24	117	1,841
Pennsylvania	50	406	8,615	0	0	0	0	0	0	50	406	8,615
Rhode Island	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Vermont	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Virginia	1	1	20	0	0	0	2	4	325	3	5	345
West Virginia	32	251	4,002	0	0	0	0	0	0	32	251	4,002
Total Sites	107	791	14,733	0	0	0	3	5	470	110	796	15,203
(Marginal Sites)[1]	(7)	(31)	(43)	(0)	(0)	(0)	(0)	(0)	(0)	(7)	(31)	(43)
Percent of U.S.	33	22	22	0	0	0	10	3	3	28	19	17

[1] **Marginal sites: very little or no activity reported during the 2007 calandar year. Marginal sites included in State/Regional total.**

Note: Bcf = Billion cubic feet. MMcf = Million cubic feet. States with no underground storage facilities are shown in *Italics*.

Source: Energy Information Administration, Gas Transportation Information System, December 2008.

Source: EIA Underground Natural Gas Storage, http://www.eia.doe.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/undrgrnd_storage.html

Code of Federal Regulations [Title 49, Volume 3]

[Revised as of October 1, 2009]

From the U.S. Government Printing Office via GPO Access [CITE: 49CFR192.615] [Page 94]

TITLE 49--TRANSPORTATION

CHAPTER I--PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION, DEPARTMENT OF TRANSPORTATION (CONTINUED)

PART 192_TRANSPORTATION OF NATURAL AND OTHER GAS BY PIPELINE: MINIMUM FEDERAL SAFETY STANDARDS--Table of Contents

Subpart L_ Operations; Sec. 192.615 Emergency plans.

Each operator shall establish written procedures to minimize the hazard resulting from a gas pipeline emergency. At a minimum, the procedures must provide for the following:

Receiving, identifying, and classifying notices of events which require immediate response by the operator.

Establishing and maintaining adequate means of communication with appropriate fire, police, and other public officials.

Prompt and effective response to a notice of each type of emergency, including the following:

Gas detected inside or near a building.

Fire located near or directly involving a pipeline facility.

Explosion occurring near or directly involving a pipeline facility.

Natural disaster.

The availability of personnel, equipment, tools, and materials, as needed at the scene of an emergency.

Actions directed toward protecting people first and then property.

Emergency shutdown and pressure reduction in any section of the operator's pipeline system necessary to minimize hazards to life or property.

Making safe any actual or potential hazard to life or property.

Notifying appropriate fire, police, and other public officials of gas pipeline emergencies and coordinating with them both planned responses and actual responses during an emergency.

Safely restoring any service outage.

Beginning action under Sec. 192.617, if applicable, as soon after the end of the emergency as possible.

Each operator shall:

Furnish its supervisors who are responsible for emergency action a copy of that portion of the latest edition of the emergency procedures established under paragraph (a) of this section as necessary for compliance with those procedures.

Train the appropriate operating personnel to assure that they are knowledgeable of the emergency procedures and verify that the training is effective.

Review employee activities to determine whether the procedures were effectively followed in each emergency.

Each operator shall establish and maintain liaison with appropriate fire, police, and other public officials to:

Learn the responsibility and resources of each government organization that may respond to a gas pipeline emergency;

Acquaint the officials with the operator's ability in responding to a gas pipeline emergency;

Identify the types of gas pipeline emergencies of which the operator notifies the officials; and

Plan how the operator and officials can engage in mutual assistance to minimize hazards to life or property.

[Amdt. 192-24, 41 FR 13587, Mar. 31, 1976, as amended by Amdt. 192-71, 59 FR 6585, Feb. 11, 1994]

6.5.7 Public Information and Communication Protocols

6.5.7.1 NEW YORK STATE ENERGY EMERGENCY PLAN, Annex: Emergency Public Information 44

Public Information and Emergency Communication Procedures

6.5.7.1.1 Purpose and Background

The purpose of this annex is to establish policies and operational procedures for disseminating official information and instructions to the people of New York State through all available communications media before, during, and after an energy-related emergency or disaster in any location of the State in support of State response and recovery operations. The agency responsible for this function must be capable of issuing emergency instructions; responding to the needs of the public, the media, and elected officials; and conducting media monitoring and public inquiry (rumor control) activities.

In this Sub-Section, operational protocols are highlighted in a multi-level number format while background information is rendered in conventional bullet format

6.5.7.1.2. Communications Protocols

Public Relations and Coordination

Energy shortages require public explanations. The first suggested response measure after monitoring is public information. Most small events are not reported in the media. However, any event can come to the media's attention regardless of how many customers are affected or the time it takes to restore the system. For example, a small event in New York City may be reported while a similar event elsewhere might be ignored. People will turn to the media for answers and the media may, in turn, query both company and State officials.

The public will expect energy companies and government to provide accurate information without exacerbating the situation. Most citizens can manage short-term outages and, although annoyed, will be patient. Over the years, most energy companies and governments have learned the value of being forthright when discussing energy interruptions. Lack of candor can turn public opinion against energy providers and government, thus diminishing cooperation during restoration.

Media Preparation

The keys to successful media relations are planning, preparation, and training. Maintaining updated information on normal energy consumption patterns is the first step toward accurate reporting. When a petroleum shortage occurs, NYSERDA may first contact affected energy-provider distribution associations in order to learn the causes and assess the situation. If an energy shortage develops slowly, State officials will have time to test and update communication protocols and check facts; if it develops rapidly, immediate action, based upon essential advanced preparation, occurs. Equally important, preparation permits government responders to coordinate with energy companies and other stakeholders, enhancing government's perspective and ability to assist as needed.

Coordinating Information

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[44] New York State Energy Emergency Plan: An Integrated Resource Plan Specifying Actions to be taken in the Event of an Energy or Fuel Supply Emergency, Prepared by: New York State Energy Research and Development Authority, December 2011; New York State Energy Assurance Plan, July 2012, Appendix E.

Regular staff training that includes practice in media relations is useful. This involves gathering data under pressure, analyzing rapidly, and conveying complex information effectively.

NYSERDA will work with the New York State Office of Emergency Management Office (NYS OEM) and others to brief senior State officials and perhaps reply directly to energy emergency questions from the media. Energy providers and associations also will respond to the media. The governor may choose to meet the media as well. OEM is prepared to coordinate these responses in order to avoid contradictory and confusing statements.

When preparing and coordinating public relations materials and protocols for an energy shortage, NYSERDA should anticipate that not all stakeholders will be equally prepared or sufficiently knowledgeable to speak about or provide advice on energy matters. It is always prudent to coordinate and cooperate in order to provide a timely and consistent message for the governor, to the general public, and neighboring States.

NYSERDA will take the lead in preparing communications for petroleum (and propane) shortages. The PSC has the lead for communications during electricity or natural gas shortages.

Planning Assumptions

The following assumptions provide guiding principles for planning communication actions to be undertaken between energy industry stakeholders and agencies of the federal, State, and local governments as required.

- Timely, accurate, and helpful information reduces public uncertainty, calms fears, and enhances emergency response and recovery measures.
- Speed of communication is critical. The first message disseminated sets the stage for all future comparisons. Speed of response is perceived as a reflection of the State's level of preparedness.
- Factual content is crucial. The public will want current information and recommendations for actions that will reduce risk.
- A sole source for official information must be established to ensure the coordinated consistency of essential emergency information to meet the needs of the public and the media.
- During and following disasters or emergencies, people both inside and outside the affected area will seek information concerning the situation.
- Upon the onset of a disaster, local public information officers will begin disseminating emergency information from local Emergency Operations Centers (EOCs).
- The news media will fill an active role in disseminating disaster information.
- An efficient and effective means of disseminating emergency information and instructions can be achieved by a cooperative program between government and the news media.

Policy

According to the New York State Comprehensive Emergency Management Plan (CEMP)[45], NYS OEM is the lead agency responsible for organization and mobilization of the Public Information function including management of the Joint Information Center (JIC) during emergencies. The CEMP stipulates that all public and emergency information relative to the response to a disaster and short-term recovery

[45] New York State Comprehensive Emergency Management Plan (CEMP) approved 2008. http://www.dhses.ny.gov/oem/mitigation/plan.cfm; Volume 2: Response and Short-Term Recovery, March 2012, http://www.dhses.ny.gov/planning/documents/NYS-CEMP-Vol.2-Mar-2012-3-levels.pdf; and Volume 3: Long Term Recovery Plan, March 2012, http://www.dhses.ny.gov/planning/documents/Vol.3-Long-Term-Recovery-3.2012.pdf.

will be released principally through the Governor's Communications Office (Press Office), the Public Information Office of the New York State Division of Homeland Security and Emergency Services (DHSES, of which NYS OEM is a component office), or the Public Information Office of the appropriate State agency as designated by the Press Office or the New York State Disaster Preparedness Commission (DPC). The DHSES Public Information Office will coordinate with concerned State and local agency Public Information Offices: those from the private sector, American Indian Tribal Governments (tribal governments), and voluntary and non-governmental organizations, and those representing federal agencies.

In accordance with the principles of the Incident Command System (ICS) and the National Incident Management System (NIMS),[46] the State Public Information Officer (PIO) reports directly to the Incident Commander or authorized designee and will be included in policy-level discussions. The Incident Commander (IC) or other appropriate officials will provide the State PIO and alternates with timely, accurate, and relevant information. Information to be released must be approved by the Chair of the DPC, Commissioner of DHSES, Director of NYS OEM, the EOC or IC, or authorized designee in coordination with the Press Office. In the event a Unified Command structure is adopted for the response to an incident, all members of the Unified Command (UC) must approve the release of information associated with the event.

In the event of a large-scale, multi-agency, multi-jurisdiction event, and with the approval of the Chair of the DPC, Commissioner of DHSES, Director of NYS OEM, or the EOC Manager, the State PIO may stand up a JIC to support dissemination of information through the Joint Information System (JIS). The State PIO or his/her designee shall review and coordinate all relative information releases and the JIC shall serve as the single dissemination point for all media releases in the incident. Other agencies wishing to release information to the public should coordinate through the JIC.

Once the State response organization is operational under the principles of the ICS and NIMS, key public information objectives should be submitted by the State PIO or JIC manager to the Planning Section for inclusion in each Incident Action Plan (IAP). Each shift in the JIC needs to develop a tactical information plan that will help PIOs stay focused on what needs to be tracked and/or accomplished during the subsequent shift.

6.5.7.1.3 Operations

Pre-event Planning

To prepare for emergency situations that may arise, the State PIO and alternates shall:

- Develop public education programs that increase public awareness of potential hazards and how to deal with them, and illustrate local emergency response capabilities; the focal State agency, as outlined in Volume Two of the CEMP,[47] will be the source and generator of this information
- Develop working relationships with the media that will disseminate emergency information to the public
- Maintain an updated list of State Agency PIOs; the State PIO will work with the Press Office to secure PIOs from other State agencies to support JIC activities as the situation requires
- Maintain an updated media list with call letters, contact names, addresses, fax and telephone numbers, and e-mail addresses
- Identify back-up communication resources in the event conventional methods fail

[46] http://www.fema.gov/emergency/nims/AboutNIMS.shtm.

[47] http://www.fema.gov/emergency/nims/AboutNIMS.shtm.

- Identify alternate facilities for an information center and a media facility
- Attend PIO or emergency preparedness meetings and training

State Emergency Operations Center (SEOC) Operations

Emergency Public Information efforts of the SEOC will focus on public health and safety issues. The goal is to keep the public informed of the general progress of events with accurate and timely information. This is to reassure the affected community or communities that the State is responding to the situation and that the public is being supplied with event-specific information, such as preparation, warning, emergency response, status of event, and human needs issues. Media monitoring and public inquiry (rumor control) will be a major aspect of the information program. All information and education efforts will rely heavily on qualified authorities and the cooperation of the media.

The State PIO will coordinate all SEOC emergency information activities and serve as the official point of contact for media during an emergency in conjunction with the Press Office. The State PIO or a designee will manage JIC operations during a multi-jurisdiction, multi-agency incident.

The State PIO may recommend deployment of additional PIOs to a forward location to support State (such as Incident Management Teams) and/or local response activities. Ideally, a JIC would be established by Incident/Unified Command near the scene of the incident or emergency. The Chair of the DPC, the Commissioner of DHSES, and the Director of NYS OEM or authorized designee will have final authority over such deployments. If no JIC is established near the incident scene, a State agency PIO(s) should be assigned to the Incident/Unified Command located at the scene.

To facilitate coordination among the response partners, the State PIO will activate the PIO Coordination Line connecting all participating response organizations (government, voluntary, private sector, and tribal governments). The purpose of the telephone line is to share information, support the "single source" concept, and coordinate the dissemination of vital information to the affected area(s). This telephone line will be functional during the operational hours of the JIC.

The toll-free telephone number of the Coordination Line is:

866-563-8443 or

66566 through SOEM's Voice over Internet Protocol (VOIP) system. The ID number is 38258.

To activate the PIO Coordination Line, an e-mail message must be sent to the State Warning Point Distribution Group by the State PIO or designee, reading as follows:

> "PIO needs a conference call on (*date*) at (*start time*). The call will be (*duration*) hours long and will require (*number of*) lines. The ID for this call will be 38258."

When a high-volume telephone call center is warranted to collect or disseminate public information, the State PIO shall coordinate the establishment of a New York State telephone hotline utilizing the New York State Department of Taxation and Finance Contact Center.

6.5.7.1.4 Information Dissemination

All possible avenues of communication will be used to disseminate emergency information. Oral communication may be conducted through media (press) conferences, briefings, tours and over the phone in response to media and public inquiries. Written communication will use NY-Alert, the New York State All-Hazards Alert and Notification web-based Portal, [48] as the principal means of dissemination.

[48] www.nyalert.gov.

NY-Alert is New York State's all-hazards alert and notification system. This web-based portal allows State agencies, county and local governments, emergency service agencies, and institutions of higher learning to provide emergency alerting information and private notifications to a defined audience, be it local, county, regional, or statewide.

The alerting portion of the NY-Alert portal uses many communications technologies to reach the public, including:

- Activation of the Emergency Alert System (EAS)
- Blast faxes—to all subscribers who requested this gateway
- Email message to media, business, and individual subscribers
- Really Simple Syndicate (RSS) feeds posted to the website, through which people with RSS readers will automatically receive information
- Text messages or Simple Message Service (SMS) via cell phones and pagers
- Postings to the NY-Alert website
- Press releases to targeted media generated from the NY-Alert portal
- Dial-out recorded messages to subscriber phone numbers

Media have pull-down access to all posted messages via the NY-Alert website.[49]

Distribution of Post-Disaster Life/Safety Information

Since mass media are frequently inoperative following natural events such as hurricanes, or snow or ice storms, the agencies represented in the JIC will disseminate critical post-event life safety information that disaster victims would need. This includes food safety information, how to ensure drinking water is safe, safe handling of debris, safety re-entry methods, not entering flood water, etc.

The JIC may employ personal delivery of life, safety, and emergency information to disaster victims post-event. The JIC will provide critical information to those most associated with disaster response – uniformed State and local law enforcement personnel, firefighters, EMS personnel, National Guard personnel, and NYS Department of Transportation and public works employees. These responders and others are visible symbols to disaster survivors. The strategy would put very basic (and possibly localized) health and safety literature into the hands of responders who are most readily recognized and located in disaster impact areas, and thus in a position to answer victims' questions.

Public Information Center / JIC

In the event of a major disaster or emergency with intense media interest, a JIC may be established by the State PIO in conjunction with other State, local, and federal agencies, non-government response organizations, voluntary organizations, and tribal governments, and in coordination with the Press Office. The purpose of the center would be to facilitate a one-voice response, serve as the clearinghouse for accurate and timely information, and enhance the dissemination of information essential to an effective emergency response.

The JIC will be equipped with communications equipment and necessary supplies, and will contain areas for:

- Media briefings
- Media work area
- Public information work area

[49] www.nyalert.gov.

- Facilities for inquiry functions

The JIC will be the sole source of official information. Ideally, a JIC will be established near the incident scene and supported by a JIC at or near the State Emergency Operations Center. If an incident JIC is not established, a PIO should be assigned to the Incident/ Unified Command. Other agencies and organizations can participate through the "virtual" realms (e.g., email, phone, or fax) when physical presence is impossible.

The JIC will:

- Provide a central location for the news media to obtain information, eliminate conflicting reports, and reduce rumors.
- Support the Incident JIC, if one is established near the scene of the incident.
- Include a press briefing area.
- Schedule and facilitate press conferences and briefings.
- Collect and disseminate accurate emergency information in a timely manner through all available media – print, electronic including web-based – and through "boots on the ground" teams.
- Prepare press releases, factsheets, scripts, backgrounders, and any other materials as required or needed.
- Collect information about damage, casualties, and general conditions from all available sources (State agencies, response organizations, local government, and the media), and verify the information before it is provided to the Incident Commander or authorized designee.
- Monitor media reports to verify accuracy and issue corrections as needed.
- Counteract any rumors from the media or public.
- Coordinate with NYS OEM Technology (Communications) Section personnel to ensure that both video and audio feeds from the multi-boxes in the SEOC and the PIO room can be delivered to the exterior receiver in front of Building 22 for participating media
- Coordinate personnel to escort media and visiting officials in the SEOC and/or disaster areas
- Oversee the key functions of media relations
- The JIC will conform with the Department of Homeland Security (DHS) Basic Guidance for Public Information Officers[50] under NIMS unless it conflicts with policies and procedures established by New York State.

Demobilizing the JIC

When operational activities begin to decline, public information functions will be transferred back to responsible jurisdictions and agencies. The decision to transition will be made by the IC/UC in consultation with the lead PIO and other Section Chiefs. The PIO shall implement the following measures in deactivating a JIC:

- Prepare a comprehensive deactivation news release for lead-agency headquarters approval and distribution
- Notify community, media, agency communications managers, and local officials about closing and provide regional contact information
- Provide casebooks to communication managers whose organizations will assume responsibility for ongoing information

[50] http://www.fema.gov/library/viewRecord.do?id=3095.

- Complete an after-action report and participate in evaluation discussions
- Return borrowed equipment and supplies
- Inventory equipment and supplies
- Replenish "Go Kits" as necessary

6.5.7.1.4 Additional New York State Information Tools

Emergency Alert System

The Emergency Alert System (EAS) enables State and local government officials, with voluntary cooperation by area broadcasters, to advise the public directly in the event of life-threatening emergencies. The NYSERDA President, the PSC Chairperson, and the Chairperson of the State Disaster Preparedness Commission (DPC), or designated representatives, decide jointly to activate the EAS in a life-threatening energy emergency. Agency communication directors (DC) coordinate development of the appropriate public message and the DPC Chairperson activates the EAS system.

NY-Alert, the New York State All-Hazards Alert and Notification web-based Portal,[51] offers one-stop shopping through which State and local governments can provide emergency information to a defined audience (local, county, regional, or statewide). OEM coordinates appropriate use of NY-Alert.

Energy Hotline/Public Inquiry/Media Monitoring

In an energy emergency, a toll-free Energy Hotline may be activated by the lead agency, which would establish hours, and provide staff and telephone lines as needed to respond to public inquiries. Information provided through the Hotline would come from EAS messages, press releases, and briefings provided by a designated representative of the JIC. Regular briefings would be held to keep Hotline staff prepared to respond to inquiries. The Energy Hotline would serve as a primary source of information to the general public. Important operational aspects of the Hotline include:

- The Hotline supervisor oversees monitoring of both broadcast and print media reports.
- A daily news clipping package would be compiled and circulated by the lead agency.
- Reports of inaccurate information would be brought to the attention of lead agency's DC or the appropriate representative at the JIC.
- Corrections would be made at press briefings, through press releases, through the Hotline, and/or by direct contact with the publishing station or publication.

Response Actions That May be Taken by State Authorities

Pursuant to Public Service Laws §65 and §66, the PSC has broad regulatory authority to ensure the safe and adequate service of electricity and natural gas at just and reasonable charges. Given this authority, the *PSC has assumed lead-agency status for electric system and natural gas emergencies and will activate the DPS Emergency Plan when an emergency arises or appears imminent.* NYSERDA will assume the lead role for petroleum and coal supply emergencies. In either case, the *State Emergency Management Office (OEM) will assume responsibility for the coordination of the State response, including the activation and operation of the State Emergency Coordination Center (SECC).* These government agencies will also coordinate with industry representatives such as the Northeast Gas Association (NGA) as well as affected LDCs, as needed.

[51] www.nyalert.gov.

6.5.8 Natural Gas

Communications and Public information

NYSERDA could become involved in a natural gas emergency either through the coordination efforts of the PSC or OEM, or directly by the Governor's directive as a result of the declaration of a fuel or energy state of emergency. In the event that NYSERDA were to become involved in assisting the Governor with public information related to natural gas shortage or interruption, the guidelines in Table 6-17 may be helpful.

Table 6-17. Potential Public Information Steps for State Government – Natural Gas

Phase	Suggested Response for NYSERDA
Early Warning Monitoring	• Review and reinforce communications within the State and ascertain that everyone understands their role, what can and cannot be said, and by whom • Work with the PSC (and the DPS) and OEM to keep the Governor's office apprised • Keep Governor's staff and legislative offices informed • Review or prepare graphic energy market presentations and other materials to explain consumption patterns and anomalies • Work with the PSC and OEM to provide helpful conservation and mitigation advice to the public • Continue to acquire supply and demand data • Coordinate with the PSC and OEM on media contacts in order to help reporters (especially newly assigned) understand basic energy facts and issues • Review weather forecasts often
Pre-Emergency Declaration Some Disruption	• Maintain information actions per above • Coordinate with the PSC and OEM to draft energy conservation recommendations if shortage is predicted to increase • Work with natural gas utilities on heating issues to provide media advisories on setting back thermostats, using cooking fuel wisely, checking heating equipment, and conserving hot water • Consider public meetings and use of the Internet as appropriate • Share State energy data with other States, National Association of State Energy Officials (NASEO), and DOE, as needed • Assist the Governor in making follow-up announcements to assure the public and to encourage continued cooperation and compliance • Estimate the probability and timing of greater shortage • Prepare briefings on possible supply and demand restraint measures should shortage intensify
Emergency Declared Statewide Disruption	• Maintain information actions per above • Assist the PSC and OEM with media briefings (sometimes in conjunction with energy stakeholder representatives) • Work with the PSC and OEM (in coordination/conjunction with the Governor's office or others) to announce enforcement actions, if any

6.5.9 Electricity

Communications and Public Information

Energy shortages require public explanations. The first suggested measure in responding to an energy incident after monitoring is public information. Most small events are not reported in the media.

However, any event can come to the media's attention regardless of how many customers are affected or the time it takes to restore the system. People will turn to the media for answers and the media may, in turn, query both company and State officials.

The public will expect Electricity Delivery Companies (EDCs) and government in New York to provide accurate information without exacerbating the situation. Most citizens can manage short-term outages and, although annoyed, will be patient. Over the years, most energy companies and governments have learned the value of being forthright when discussing energy interruptions. Lack of candor can turn public opinion against energy providers and government, thus diminishing cooperation during restoration.

Media Preparation

The keys to successful media relations are planning, preparation, and training. Maintaining updated information on normal energy consumption patterns is the first step toward accurate reporting. Equally important, preparation permits government responders to interpret what is learned from EDCs. This enhances government's perspective and ability to assist as needed.

A useful part of preparation for an energy emergency is regular staff training that includes practice in media relations. This involves gathering data under pressure, completing analyses rapidly, and conveying complex information effectively.

Preparing and coordinating public relations materials and protocols for an electricity outage are the same as for other energy forms. State officials should anticipate that not all stakeholders will be equally prepared or sufficiently knowledgeable to speak about or provide advice on energy matters. It is always prudent to coordinate and cooperate in order to provide a timely and consistent message for the Governor, to the general public, and neighboring States. The guidelines in Table 6-18 may be helpful.

The PSC is the lead State agency regarding electric emergencies and accordingly, it is the State agency designated to work with electric utilities in managing energy emergencies. New York utilities provide liaison with the PSC and meet required filing and regulatory mandates. It is unlikely that NYSERDA would become directly involved in electricity outage emergency management. However, its designated role in planning for, and coordinating among, stakeholders during energy emergencies does not rule out providing perspective as requested on electricity shortage matters. That is especially true given that NYSERDA is the lead State agency regarding petroleum and coal supply emergencies. Electric emergencies that result from coal or petroleum disruptions, for example, would likely require NYSERDA participation.

Table 6-18. Potential Public Information Steps for State Government – Electricity

Phase	Suggested Response (may be undertaken by NYSERDA or others)
Early Warning Monitoring	• Review and reinforce communications within the State and ascertain that everyone understands their role, what can and cannot be said, and by whom • Inform OEM and PSC if NYSERDA is aware of cross-cutting shortage impacts such as gasoline fuel pump or natural gas pipeline pump failure due to electricity outage • Work with PSC and OEM and inform the Governor's office • Keep Governor's staff and legislative offices informed • Review or prepare energy market presentations and other materials to explain consumption patterns and anomalies with special attention to graphic displays • Provide public relations officers with regular updates approved by PCC • Coordinate with the PSC and OEM on media contacts in order to help reporters (especially newly assigned) understand basic energy facts and issues • Review weather forecasts

Phase	Suggested Response (may be undertaken by NYSERDA or others)
Pre-Emergency Declaration Some Disruption	• Maintain information actions per above • Establish Joint Information Center (JIC) (on site or virtual), with cooperating and coordinating agencies including: • State Emergency Management Office (OEM) • Department of Public Service (DPS) • Department of Environmental Conservation (DEC) • Empire State Development (ESD) • Office of Temporary Disability Assistance (OTDA) • Consumer Protection Board (CPB) • New York State Department of Health (DOH). • Coordinate with JIC, PSC, OEM, and EDCs to draft energy conservation recommendations if shortage or disruption is predicted to increase • For heating issues, work in coordination with PSC and electric utilities to provide media advisories on setting back thermostats, using cooking fuel wisely, checking heating equipment, and conserving hot water • Consider public meetings and use of the Internet as appropriate • Share State energy data with distribution associations, other States, NASEO, and DOE as needed • Coordinate with PSC to estimate the probability and timing of greater shortage or disruption • Prepare briefings on possible supply and demand restraint measures should shortage or disruption intensify
Emergency Declared Statewide Disruption	• Maintain information actions per above • Assist JIC, PSC, and OEM with media briefings (sometimes in conjunction with energy stakeholder representatives) • Develop follow-up messages from Governor to assure public and to maintain compliance • PSC and OEM (in coordination/conjunction with the Governor's office or others) announces enforcement actions, if any

6.5.10 Petroleum

Communications and Public Information

If a petroleum emergency occurred, NYSERDA would serve as lead agency for petroleum (and coal) emergency response. NYSERDA is responsible for implementing appropriate emergency procedures, monitoring the overall fuel prices, the supply and demand situation, preparing potential corrective actions with major energy suppliers and issuing emergency orders and directives as necessary. In the event of a petroleum disruption, NYSERDA will operate a public relations center and maintain liaison with the media, local governments, petroleum supply and distribution associations and related stakeholders. The guidelines in Table 6-19 may be helpful.

Table 6-19. Public Relations Response Level – Petroleum

Phase	Suggested Response for NYSERDA
Early Warning Monitoring	• Review and reinforce communications within the State and ascertain that everyone understands their role, what can and cannot be said, and by whom • Work with OEM and inform the Governor's office • Keep Governor's staff and legislative offices informed • Review/prepare graphic energy market presentations and other materials to explain consumption patterns and anomalies • Provide OEM public relations officer with regular approved updates • Continue to acquire supply and demand data • Coordinate with the OEM on media contacts in order to help reporters (especially newly assigned) understand basic energy facts and issues • Review news and weather forecasts often • Counsel local governments to arrange credit with oil companies (especially major suppliers) well in advance of an anticipated shortfall, because companies may not approve such credit expeditiously

Pre-Emergency
 	
Disruption or Spot Shortage of Petroleum Products
	• Maintain information actions per above
	• Establish Joint Information Center (JIC) (on site or virtual)
	  • Agencies cooperating and coordinating include:
	  • OEM
	  • Department of Public Service (DPS)
	  • Department of Environmental Conservation (DEC)
	  • Empire State Development (ESD)
	  • Office of Temporary Disability Assistance (OTDA)
	  • Consumer Protection Board (CPB)
	  • New York State Department of Health (DOH).
	• Coordinate with JIC, and distribution industry associations to draft energy conservation recommendations if shortage is predicted to increase
	• For propane issues, work with New York Heating Oil Association (NYHOA) or New York Petroleum Gas Association (NYPGA) to provide media advisories on setting back thermostats, using cooking fuel wisely, checking heating equipment, and conserving hot water
	• For vehicle issues, provide driving tips in coordination with New York State Department of Transportation (NYSDOT), New York Department of Motor Vehicles (NYSDMV), New York Division of State Police (NYSP), NYHOA, NYPGA, and NYPC
	• Consider public meetings and use of the Internet as appropriate
	• Share State energy data with distribution industry associations, other States, NASEO, and DOE as needed
	• The Governor may make announcements to assure the public and to encourage continued cooperation and compliance
	• Estimate the probability and timing of a greater shortage
	• Prepare briefings on possible supply and demand restraint measures should shortage intensify

Phase	Suggested Response for NYSERDA
Emergency Declared Serious to Severe Shortage for Local Area, Statewide Disruption	• Maintain information actions per above • Assist JIC and OEM with media briefings (sometimes in conjunction with energy stakeholder representatives) • Develop additional follow-up messages for the Governor to assure public and to maintain ongoing compliance • OEM (in coordination/conjunction with JIC and the Governor's office or others) announces enforcement actions if any

VII. Appendix A – Vulnerability and Risk Assessment Volume II

7.1 Overview

The intent of the Vulnerability and Risk Assessment is to assess the energy infrastructure and identify key energy assets that have a direct bearing on Energy Assurance. This includes identifying critical infrastructure and key resources that are threatened with disruptions, bottlenecks, shortages, or inability to restore service quickly. It also includes assets that dominate a particular market or geographic area, whose loss would have significant consequences.

The analysis takes a broad view of known information sources, reviews various in-State infrastructure assessments, and analyzes the historical pattern of energy disruptions.

The VRA recognizes that the energy sector in NYS consists of assets that are connected through regional, national and international supply chains, infrastructures, and related networks. Because the chains and networks cross State and international borders, interstate and international coordination is a key factor in vulnerability management.

The VRA process follows a sequence of steps that begins with a comprehensive inventory of key energy infrastructure assets (Section 1), then orders those assets using various screening criteria for vulnerability and risk and, finally, prioritizes and rates the assets. Those that are identified as the most critical are further examined in terms of the State's ability to reduce risk, as well as to respond to emergencies. In simplest terms, the basic VRA approach is as follows:

- Create a complete detailed inventory of the energy infrastructure[52]
- Evaluate energy assets by measures of their criticality
- Identify the most significant assets
- Rate and rank the most critical assets

7.2 Methodology

Energy infrastructures exist in electric, natural gas, and petroleum markets and are highly interdependent, such that a loss, bottleneck, or disruption in one sector can have compounding impacts by curtailing supply in another energy sector. Natural gas-fueled electricity generation is dependent upon petroleum as a backup fuel if natural gas curtailment is initiated or supply is lost. A natural gas pipeline disruption would not only affect heating and industrial uses of gas, but also electric generation. Furthermore, a natural gas pipeline disruption could increase demand on petroleum delivery. Electricity loss could, in turn, disrupt such essential activities as communications, information, energy sector command and control systems, and transportation infrastructures.

In this analysis, an asset inventory is assembled and then screened for criticality and consequence using criteria described below. In simple terms, an asset is critical if it:

- Is strategically located
- Provides a significant role in energy supply
- Has limited redundancy

[52] See definition of terms on the following page

An asset is characterized as having a high consequence when its loss of use results in an energy supply disruption. To estimate the notion of loss, the type and number of customers impacted, the infrastructure interdependencies, and the cascading impacts of disruption are analyzed.

It is important to note that criticality and consequence, as used in this document, produce a two-dimensional VRA score. These two dimensions are not mutually exclusive because a critical asset will have a significant consequence, and a particular consequence will likely involve one or more critical assets.

7.3 Definition of Terms

- Critical Asset – A specific asset or set of infrastructure assets so vital that loss of use or function would have a debilitating impact on customers and industries. Lack of functional redundancy and difficulty of restoration increases the criticality of an asset.
- Emergency – Any abnormal system condition that requires immediate automatic or manual action to prevent or limit loss of energy asset function that would adversely affect the reliability of any NYS energy systems.
- Impact – The consequence and magnitude of loss or disruption, in terms of economic, social, and environmental effects. The duration of loss is an important aspect of impact.
- Risk Assessment – The determination of quantitative or qualitative risk related to a concrete situation and a recognized threat or hazard. Risk assessment requires calculations or expert judgment of two components of risk: the magnitude of the potential loss and the probability that the loss will occur.
- Sector – An energy market dedicated to the supply of one of the principle forms of commercial energy, such as electricity, natural gas, or petroleum.
- Significant Asset – An important asset or set of infrastructure assets that either serves a major portion of the market, has high strategic value, or meets some other high value need of the market or energy system.
- Sub-sector – A group of assets performing a critical infrastructure function in one of the energy sectors. As a general rule, sub-sectors for each energy source are composed of one or more of the following: production, transmission, and distribution.
- Vulnerability – The exposure of an infrastructure asset to damage or disruption by storm, supply problems, natural disaster, equipment failure, attack, or any other reason in a manner that reduces or destroys the ability of one or more sectors or sub-sectors to deliver energy resource to end users.

7.4 Screening Criteria

7.4.1 Consequence

For the purposes of this study, an applied set of criteria was developed to screen the inventory of energy infrastructure assets and identify the consequence of a disruption. These criteria are differentiated below and relate to the impact, regardless of the factors that create such a consequence. Although it is useful to understand fine detail, in the end it is solely the consequence of a failure or other disruption that defines an energy asset as having a high, medium, or low consequence. The criteria outlined below are not mutually exclusive. There is some overlap and not all are necessarily pertinent to each asset evaluated.

- Market Dominance/Relative Capacity – The asset or combination of assets is involved in a significant percent of the capacity in the particular sector or sub-sector (i.e. it has a dominant role in supplying a particular type of product in an energy market).
- Number of Customers Served – The asset or combination of assets provides a significant percent of the energy within a sector, or serves a dominant role in supplying a group of geographically defined customers.
- Sensitivity of Customer Segments – The asset or combination of assets provides sector energy to a group of customers deemed sensitive given the activities of these customers (such as electricity utilities), or their high geographic density (e.g., the Manhattan financial district). This criterion is less quantitative than others.
- Historical **Evidence of Disruption** – Assets or combination of assets with a record of recurrent energy disruptions that may presage further issues.

7.4.2 Criticality

Energy assets that serve a significant percentage of the market, or have high strategic value, are considered critical assets. For the purposes of this study, an applied set of criteria was developed to screen the inventory of energy infrastructure assets and identify individual levels of criticality. These criteria are differentiated below related to relative importance. The criteria outlined below are not mutually exclusive. There is some overlap and not all are necessarily pertinent to each asset evaluated.

- **Strategic Location** – The asset or combination of assets has a unique geographic characteristic to move, process, or produce a significant percent of the energy within the sector or sub-sector, or it plays a dominant role in the supply or delivery of energy for a locality.
- **Seasonal Vulnerability** – The asset or combination of assets may not have a significant annual level, but may have a high seasonal variability representing a significant percentage of the energy supply or delivery within the sector. Alternatively, it provides a dominant role in a specific energy type.
- **Degree of Redundancy** – The asset or combination of assets provides a significant percentage of the energy with limited or no existing functional redundancy. Alternatively, this can include assets located where no other replacement energy can be supplied.

The actual values associated with each of the screening criteria vary from asset to asset, but can generically be framed according to the following parameters:

- **Criticality**. The average of the following criteria
  - **Strategic location**
    - High: The asset is located in a highest density area (e.g., with more than 17,000 people per square kilometer (km^2), such as NYC) or provides a dominant regional role (such as Transco's pipeline bringing natural gas into NYC).
    - Medium: The asset is located in an area adjacent to, or brings energy to, an area with high population density (e.g., a density between 2,500 and 5,000 people/km2 such as Albany).
    - Low: The asset is located in a sparsely populated area (e.g., less than 100 people/km2) or has no delivery into high population density areas (such as the area south of Rochester).
  - **Seasonal and Regional Vulnerability**
    - High: The asset provides more than 20 percent of a particular product, or supplies more than 20 percent of an area during a specific season.
    - Medium: The asset provides more than 10 percent (but less than 20 percent) of a particular product or supplies more than 10 percent (but less than 20 percent) of an area during a specific season.

    - Low: The asset provides less than 10 percent of a particular product and supplies less than 10 percent of an area during a specific season.
  - **Degree of Redundancy**
    - High: The asset has no fuel-switching capabilities or has low ramp-up/down speeds (such as the Narrows Power Station).
    - Medium: The asset has limited fuel capabilities (less than 20 percent of its needs) or has limited operating capabilities (such as the Astoria Power Station).
    - Low: The asset has dual-fuel switching capabilities for at least 20 percent of needs or is configured in a modular way (such as Ravenswood Power Plant).
- **Consequence.** The average of the following criteria
  - **Market Dominance**
    - High: The asset provides more than 20 percent of the energy (or capacity) in the State or a particular region (such as the Transco natural gas pipeline).
    - Medium: The asset provides between 10 and 20 percent of energy (or capacity) in the State or a particular high-density region (such as the TETCO natural gas pipeline).
    - Low: The asset provides less than 10 percent of energy (or capacity) in the State or serves a low-density region (such as the Dominion natural gas pipeline).
  - **Number of Customers**
    - High: The asset directly or indirectly supplies more than 20 percent of the customers in the State or more than 50 percent of the customers in a particular area (such as the Transco natural gas pipeline).
    - Medium: The asset directly or indirectly supplies between 10 and 20 percent of the customers in the State or between 20 and 50 percent of the customers in a particular area (such as the Iroquois natural gas pipeline).
    - Low: The asset directly or indirectly supplies less than 10 percent of the customers in the State or less than 20 percent of the customers in a particular area (such as the Dominion natural gas pipeline).
  - **Sensitivity of Customer Segments**
    - High: The asset or combination of assets provides energy (or capacity) to a group of customers deemed sensitive given that such customers are located in a highly populated area or in an area with unusual geographic density (like the Transco natural gas pipeline).
    - Medium: The asset or combination of assets provides energy (or capacity) to a group of customers deemed sensitive given that such customers are located in a less populated area (like the Dominion natural gas pipeline).
    - Low: The asset or combination of assets provides energy (or capacity) to a group of customers who can become independent of that asset (e.g., utility with alternative fuel options).
  - **Historical Evidence of Disruption**
    - High: The asset has been reported to the National Response Center or similar publicly available information sources more than 10 times during the past five years.
    - Medium: The asset has been reported to the National Response Center or similar publicly available information sources less than 10 times during the past five years.
    - Low: No obvious reports on energy disruptions.

7.4.3 Additional Sources of Information

Established sources of information dedicated to measuring asset vulnerability may already be available to NYSERDA, or to other energy officials in NYS. Some of the obvious sources are:

- **The** States Fusion Centers – Part of the National Terrorism Advisory System, 53 the Fusion Centers are assigned to assist in formulating a strategic view of the threats facing the Nation, particularly as they relates to terrorism and other criminal activity. Since 2003, the New York State Intelligence Center (NYSIC) has supported the efficient, timely, and accurate exchange of information among its State law enforcement agencies. Available 24 hours a day, 7 days a week, the NYSIC augments law enforcement operations by acting as a centralized, comprehensive intelligence fusion center, specifically designed to coordinate the exchange of criminal intelligence on a statewide basis. Its central location helps pool the resources of the New York State Police and the New York State Office of Homeland Security, as well as other federal, State, and local law enforcement agencies in gathering law enforcement information and data. Agencies throughout New York are invited to provide information to NYSIC and to make requests for case assistance. They are also encouraged to contribute personnel to staff the center.
- Historical **Records** – NYSERDA can also produce an estimate of occurrence based on historical records. Aside from information from public media, it can find some of this information through ISERnet,[54] or directly by consulting the information reported to the Department of Energy under The Electric Emergency Incident and Disturbance Report (Form OE-417)[55] that collects information on electric incidents and emergencies.

7.4.4 Summary Results

The following represents the summary results of applying the VRA methodology outlined above to those assets deemed large enough to qualify for the VRA analysis. The combined score (VRA score) is the combination of both criticality and consequence.

The VRA score is not indicative of the vulnerability of the asset or group of assets, *per se*. For instance, in the case of electricity transmission, the criticality and consequence associated with the infrastructure is obviously large, but the capabilities deployed by NYISO are sufficiently significant to attenuate the likelihood of an occurrence.

7.4.4.1 Electricity

The VRA score for statewide electricity generation and transmission assets is estimated at 1.5 for criticality and 1.8 for consequence (Table 7-1, below), on a scale of 1 to 3, where 1 is a low risk and 3 is high (Figure 7-1). Transmission assets are assessed with a higher VRA score that highlights their importance and the consequences if they were not operational. Below is a breakdown of the scores by relevant assets and a brief explanation of the scoring. As noted in the methodology, this VRA score is not reflective of the vulnerability of the asset, *per se*; it simply highlights the importance and relevance to the system.

High scores for criticality and consequence for transmission are the result of considering transmission assets as a whole system and not individually. This is consistent with the NYISO operation of the transmission system as a grid where a single path has a dynamic contribution to the system. Examples of this analysis appear below.

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[53] U.S. Department of Homeland Security, National Terrorism Advisory System (NTAS), http://www.DHS.gov/alerts.

54 ISERnet is a secure web site established by the U.S. Department of Energy (DOE), Office of Electricity Delivery and Energy Reliability (OE), Infrastructure Security and Energy Restoration (ISER) Division as a communications environment to address energy emergencies and supply disruptions and share timely energy information. It is available at https://www.oe.netl.doe.gov/ISERNET/login.aspx.

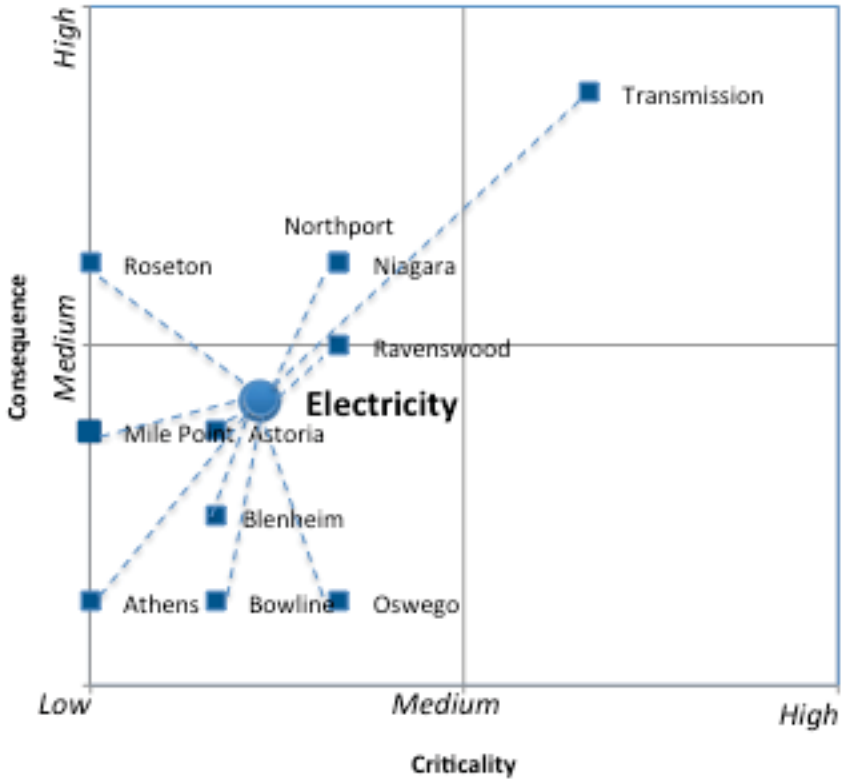
55 DOE/OE, Electric Disturbance Events (OE-417), http://www.oe.netl.doe.gov/oe417.aspx.

According to public records, the Northport plant has several reported disruptions over the past few years, most stemming from environmental issues and age of the plant. The plant was constructed in the 1960s and 1970s using now-outdated technologies. When Unit 4 was completed in 1977, it was among the last conventional oil-fired units built in the United States. The plant is exempt from Clean Air Act emissions standards because it was exempted when the law was passed. As a result of pollution and health concerns, some public officials [56] have been calling for plant modernization. The plant is also susceptible to flooding as demonstrated by the flooding caused by Hurricane Irene during the summer of 2011.

The Roseton facility has also been the target of environmental concerns. While the total output of this facility has declined substantially, it nevertheless represents a strong capacity supplier.

Some of the high scores in the "sensitivity to customers" category are related to high population density, high economic impact, or recent events surrounding the financial health of those assets (such as Astoria Generating Station in Astoria, Queens).

Figure 7-1. Electricity Aggregate VRA Score



Source: SAIC. Key: High=3; Medium=2; Low=1

[56] Including United States Senator Charles E. Schumer and Suffolk County Legislator Jon Cooper.

Table 7-1. Electricity Aggregate VRA Score

	Criticality: 1.5				Consequence: 1.8				
	AVG Criticality	Location	Seasonal	Redundancy	AVG Consequence	Dominance	Customers	Sensitivity	Historical
Generation	1.3	2	1	1	2.0	2	2	2	1
Niagara	1.7	3	1	1	1.7	3	3	2	1
Ravenswood	1.7	3	1	1	1.7	2	3	2	1
Mile Point	1.0	1	1	1	1.0	2	2	2	1
Oswego	1.7	1	2	2	1.7	2	1	1	1
Northport	1.7	2	1	2	1.7	1	2	3	3
Astoria	1.3	1	1	2	1.3	2	1	3	1
Roseton	1.0	1	1	1	1.0	2	1	3	3
Bowline	1.3	2	1	1	1.3	1	1	2	1
Athens	1.0	1	1	1	1.0	2	1	1	1
Blenheim	1.3	2	1	1	1.3	2	2	1	1
Transmission	2.3	3	3	1	2.3	3	3	3	2

Source: SAIC. Key: High=3; Medium=2; Low=1

7.4.4.2 Natural Gas

The VRA score for natural gas supply (i.e., source infrastructure or type of supply) is estimated at 1.7 for criticality and 1.5 for consequence (Table 7-2) on a scale of 1 to 3, where 1 is a low and 3 is high risk (Figure 7-2). Natural gas pipelines and the State's increased reliance on natural gas largely influence the score. Even though each score was already low as of 2012, they are likely to become smaller as nationwide shale gas production increases and pipeline capacity expands. Past reliance on natural gas supply from the Gulf Coast Region was estimated to be in excess of 70 percent.

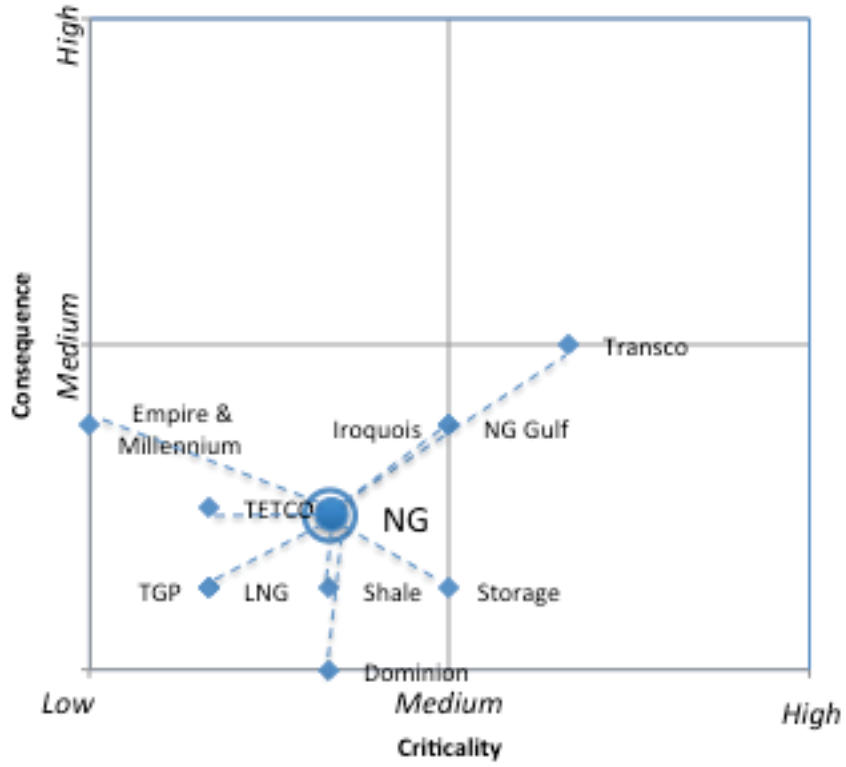
The VRA score for natural gas transportation is low to medium and, as a whole, is not a high concern for Energy Assurance. The aggregate criticality for natural gas pipelines is estimated at 1.6, and the average consequence at 1.5. Additional observations include:

The highest VRA score within this group is awarded to Transco pipeline, largely in recognition of its dominance of the NYC market and planned increase in capacity to deliver gas from the Marcellus area. Pipelines supply the majority of natural gas to NYC and Transco carries more than 60 percent of that volume. Statewide, it provides less than 10 percent of total capacity.

The VRA score for the Iroquois pipeline follows the same pattern as Transco. It is a major supply of natural gas to NYC.

Statistics from natural gas shale production do not fully reflect the importance of this new supply of natural gas for New York State and the entire Northeast. The shale VRA score reflects the limited existing levels of production and transportation capacity. Once transportation capacity increases, it is likely that the criticality portion of the VRA score will increase.

Figure 7-2. Natural Gas Aggregate VRA Score



Source: SAIC. Key: High=3; Medium=2; Low=1 NG Gulf = Natural Gas from the US Gulf region

Table 7-2. Natural Gas Aggregate VRA Score

	Criticality: 1.7				Consequence: 1.5				
	AVG Criticality	Location	Seasonal	Redundancy	AVG Consequence	Dominance	Customers	Sensitivity	Historical
Pipelines	1.6	2.2	1.3	1.3	1.5	1.7	1.8	1.7	1
Transco	2.3	3	2	2	2	2	3	2	1

Iroquois	2	3	1	2	1.8	2	2	2	1
TGP	1.3	2	1	1	1.3	2	1	1	1
TETCO	1.3	2	1	1	1.5	1	2	2	1
Dominion	1.7	2	2	1	1.0	1	2	2	1
Empire and Millennium	1	1	1	1	1.8	2	2	2	1
Storage	2	2	2	2	1.3	1	2	1	1
Shale	1.7	3	1	1	1.3	1	1	1	2
LNG	1.3	2	1	1	1.3	1	1	2	1
NG from Gulf	2	2	2	2	1.8	2	3	1	1

Source: SAIC. Key: High=3; Medium=2; Low=1

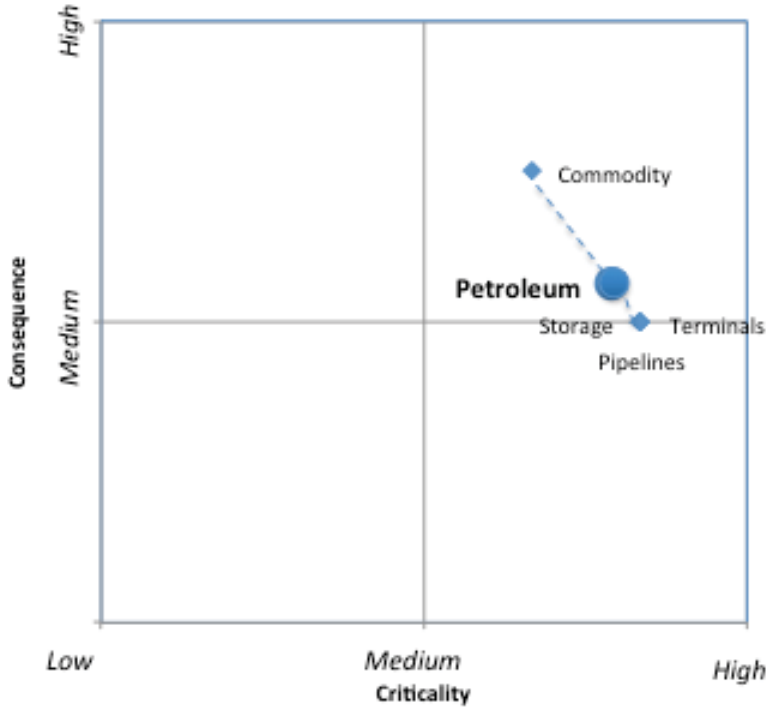
7.4.4.3 Petroleum

The VRA score for petroleum infrastructure and products (commodities) is estimated at 2.6 for criticality and 2.1 for consequence on a scale of 1 to 3, where 1 is a low risk and 3 is high (Figure 7-3). Of the three energy sectors (electricity, natural gas, and petroleum), petroleum has the highest VRA score, driven primarily by high seasonality, limited storage, and high dependency on shipped (pipeline, barge, truck) processed products. Beyond the methodology outlined above, two additional points help explain the detail of the scoring shown in Table 7-3.

There are numerous instances of seasonal vulnerability of distillate product (commodity) and of insufficiency of storage.

The role of terminals and the distribution of products from the terminals are independent and the coordination is largely dependent upon economic forces.

Figure 7-3. Petroleum Aggregate VRA Score



Source: SAIC. Key: High=3; Medium=2; Low=1 {storage, pipelines and terminals share a common point for consequence and criticality

Table 7-3. Petroleum Aggregate VRA Score

	Criticality: 1.7				Consequence: 1.5				
	AVG Criticality	Location	Seasonal	Redundancy	AVG Consequence	Dominance	Customers	Sensitivity	Historical
Petroleum	2.6	2.8	3	2	2.1	2.3	2	2.3	2
Storage	2.7	3	3	2	2	2	2	2	2
Terminals	2.7	3	3	2	2	2	2	2	2
Pipelines	2.7	3	3	2	2	3	2	2	1
Commodity	2.3	2	3	2	2.5	2	2	3	3

Source: SAIC. Key: High=3; Medium=2; Low=1

VIII. Appendix B – Disruption Tracking

NEW YORK STATE ENERGY SUPPLY DISRUPTION TRACKING PROCESS

8.1 Overview

Within New York State government there are multiple offices and agencies tracking energy data and information. This data flow and resulting analysis is used to inform State government officials and energy sector stakeholders about the possibility of energy supply disruptions and potential consequences. These entities, ranging from government agencies and authorities to non-profit grid operators and regulated electric and natural gas utilities, monitor conditions in markets for electricity, natural gas, petroleum products, and coal. The State monitors factors such as weather and temperatures as they relate to energy demand and tracks infrastructure components including pipelines, waterways and ports, highways, and railroads for operational disruptions and outages that may interfere with the normal delivery of electric power and fuels.

This document offers guidance to those within State government and private stakeholders on the various responsibilities within State agencies for tracking conditions and events that could contribute to any type of energy supply disruption affecting the State as well as processes in place to track the response and recovery from such occurrences.

When outages or disruptions do occur, State agencies and regulated utilities track the causes, responses, consequences, and resources required to restore or supplement normal energy supplies. Tracking data prior to an event, as well as response to outages and event duration, is carried out by a diverse group of entities, depending on their statutory or regulatory roles.

In brief, they include:

- **New York State Energy Research and Development Authority (NYSERDA)** - This non-regulatory authority tracks supply, demand, and price information for all petroleum fuels and coal and monitors the status of the supply infrastructure for these fuels and market dynamics affecting the supply and demand of all forms of energy at the national, regional, and State level.

  NYSERDA also serves as the State's Nuclear Coordinator and State Liaison with the Nuclear Regulatory Commission (NRC). NYSERDA's President serves as the Governor's designated State Liaison Officer (SLO), a primary communication link to the NRC. NYSERDA staff implements the day-to-day activities of the SLO role. By legislative mandate, NYSERDA also implements New York State's Nuclear Coordination Program.

  To better understand overall energy patterns, NYSERDA tracks long-term data trends for all energy sources and uses within the State with its annual *Patterns and Trends* report.[57] This document provides a backdrop against which short-term events can be gauged. The report presents data for a 15-year review of historical sector-by-sector New York State energy prices, consumption, expenditures, and various other energy statistics. It compiles multiple datasets from the Energy Information Administration (EIA) and the U.S. Census, as well data from other sources to describe long-term energy trends within the State. These wide ranging data sets act as benchmarks to gauge current market activity. Significant deviation from past history may act as an indicator of market imbalances or price disruption.

[57] Patterns and Trends and other energy statistics and reports can be found at http://www.nyserda.org/Energy_Information/energy_facts.asp

- **New York State Department of Public Service** (DPS) - This is the lead regulatory agency for all electric and natural gas supply disruptions. DPS works with electric and gas utilities, which have primary responsibility for responding to electric power and gas outages, supply disruptions and periods of unusually high demand.
- **New York State Office of Emergency Management (SOEM)** - This Office, in cooperation with other State agencies, monitors all major emergency events in New York, regardless of whether they relate to power outages and energy supply disruption, and leads in the coordination of State resources providing assistance to local responders.
- **New York Independent System Operator** (**NYISO**) - This non-profit entity manages the operation of the electric grid on behalf of the transmission owners and operators and ensures that electric generation is adequately dispatched to efficiently and economically serve demand.

  While there is communication among these entities, the individual data collection processes are generally disaggregated within the State. This document describes the activities of each of these entities as they relate to market and disruption monitoring for each of the major fuel and energy sources under their area of responsibility. Entities such as NYSERDA emphasize data analysis and market monitoring, whereas DPS and SOEM take a greater role in system outage response. NYISO tracks market and system conditions, and assists in responses to outages.

8.2 NYSERDA - Market Monitoring and Data Tracking Activities

8.2.1 Petroleum Fuels Data Overview

New York State and the neighboring states of the Northeast are heavily dependent on imports and fuel produced in other regions of the U.S. Crude oil from both domestic and foreign sources is used at Mid-Atlantic refineries to supply over 30 percent of northeast regional fuel supplies. Remaining refined product is sourced roughly equally from production facilities located in the U.S. Gulf Coast area and from foreign sourced imports into New York Harbor. More broadly, refined petroleum fuels are supplied through a complex, multilevel distribution network consisting of domestic and foreign refiners, brokers, futures and spot market investors, importers, and regional and local distribution companies. Disruptions of petroleum fuel supplies, or even the possibility of a fuel supply interruption, may adversely affect public welfare, particularly during the winter heating season. Additionally, disruptions may lead to sudden price increases affecting consumers' discretionary income, increase business costs, and shift financial resources out of the State to purchase additional energy supplies.

NYSERDA continuously tracks and updates the essential price, supply, and demand databases that alert staff to nascent energy supply problems. The Authority reviews data sources that characterize market dynamics as well as potential or implied demand, including weather data that drives heating and cooling demand. Situational analysis of fuel fundamentals also includes review of reports from other State and federal agencies. Relevant data is received from federal agencies and the trade press regarding pricing, supply and demand fundamentals, and the status of the transmission and distribution networks serving the State. NYSERDA staff communicate with private sector firms, fuel specific trade associations, and corresponding State, regional, and federal officials to ascertain market conditions prior to and during any energy supply disruption events.

8.2.2 Petroleum Fuels Data Monitoring/Tracking

NYSERDA staff performs market monitoring activities that continuously updates daily, weekly, and monthly petroleum fuels price, supply, and demand data series, at the State, regional and national level. This effort improves staff understanding of fuel specific market dynamics and to better anticipate

potential shortages or price spikes. While much of this data is maintained in-house, selected regional and statewide retail petroleum fuel prices are available on NYSERDA's website.

On a daily basis, NYSERDA monitors a number of fuel prices, including:

- Retail Prices: Regular gasoline and diesel prices in the US, NYS, and eight largest metro regions in NYS; (data source AAA)
- Spot Prices: Gasoline, West Texas Intermediate crude oil, #2 home heating oil, diesel, jet fuel, ULS diesel, and #6 residual fuels (varying sulfur contents)
- Prompt Month Futures Contracts: Gasoline, West Texas Intermediate crude oil, propane, butane, ethanol, #2 home heating oil, diesel, ultra-low sulfur (ULS) diesel

On a weekly basis, NYSERDA tracks the following:

- Retail Prices: Retail home heating oil, kerosene, and propane prices on a regional and statewide basis (source: expanded SHOPP Survey). Motor gasoline prices for statewide, upstate, downstate, and NYC from U.S. Weekly Retail Gasoline Prices – EIA; Diesel prices for Central Atlantic region from Weekly Retail On-Highway Diesel Prices – EIA.
- Inventories – Mid-Atlantic inventories of ULS diesel, home heating oil, propane, New England propane stocks, and residual fuel.
- Weekly Petroleum Product Terminal Prices NYSERDA tracks 14 different petroleum fuels or grades of fuel at 26 terminal locations around the State, in neighboring states, and in Canada. Not every type or grade of fuel is available at every terminal location. The general fuel types include gasoline and gasoline blending additives, distillate fuels, aviation fuels, residual fuels, and propane. This assists in energy supply disruption tracking as awareness of escalating prices in one geographic region relative to others is often an early indicator of fuel supply tightness or shortfalls. This is particularly true for the various heating fuels. (Source: Oil Price Information Service weekly newsletter publication)

On a monthly basis, NYSERDA tracks the following:

- Prime Supplier Sales in New York. NYSERDA tracks monthly volumes of 18 fuels or grades of fuel for local consumption in NYS. Out of 125 national companies, approximately 65 companies serve New York. While the majority of companies provide NY with this data, participation is not mandated by EIA or NYS. Aggregated monthly volumes for all companies are available on the EIA web site. The data has a three month lag which prevents any real time assessment. However, it does provide the only verifiable source of petroleum market share data by company and fuel type in the New York market. (Source: US EIA-782C Report Form)
- Averaging of Prices: Averaging of daily and weekly heating fuels, motor gasoline, and diesel prices to determine monthly average price for each of the respective fuels. For certain types of analysis monthly average prices are more useful.

On an annual basis, NYSERDA tracks information from the following sources:

- Petroleum Facilities: Major Oil Storage Facilities and Petroleum Bulk Storage data sets (source: NYSDEC). These two data sets track large and small petroleum terminal capacities in New York State.
- Propane Storage Cavern Capacity (source: NYSDEC)
- Propane Secondary Level Storage Capacity (source: NYS Office of Weights & Measures)
- Petroleum Terminal Encyclopedia (OPIS/Stalsby)
- Terminal Member Directory (International Liquid Terminals Association)
- Renewable Fuels Encyclopedia (OPIS/Stalsby).

8.2.3 Other Sources of Petroleum Fuel Information

In addition to its formalized data gathering function, NYSERDA maintains regular communication and attends informational meetings with key industry stakeholders. This includes organizations such as:

- Empire State Petroleum Association
- New York Petroleum Council
- New York Oil Heating Association
- Oil Heat Institute of Long Island
- Northeast Gas Association
- New York Propane Gas Association
- Propane Gas Association of New England
- New York Association of Service Stations & Repair Shops
- New York Association of Convenience Stores
- U.S. Coast Guard
- The American Waterways Operators (barge industry)

In addition to these parties, NYSERDA communicates with regional partners including those in neighboring states through the Department of Energy's (DOE) Energy Emergency Assurance Coordinator System. This is further described below. NYSERDA serves to consolidate information obtained from private sector interests with publicly available data to generate accurate assessments and analyses of potential energy supply disruptions. The results are shared with key government and private sector stakeholders.

8.2.4 Reporting of Data Tracking

As noted above, NYSERDA gathers a significant amount of data. As a next step, it analyzes this data in order to produce information and reports that put it into context for stakeholders and decision makers. In order to disseminate this information, NYSERDA produces several reports and offers datasets on its website. Timeframes for these reports and publications vary from weekly to annually. During critical periods, the frequency of selected reports may be increased to make more timely information available to stakeholders.

- NYSERDA Heating Fuels Report: One notable report is the Heating Fuels Report.[58] Retail price information is drawn from the EIA sponsored State Heating Oil and Propane Price (SHOPP) surveys. NYSERDA performs these weekly surveys during the heating season (biweekly during the summer) and presents average retail prices for home heating oil, propane and kerosene in various regions of the State for the current, prior and year-ago week. The report also consolidates regional and national spot price and inventory data for crude oil, home heating oil, diesel, residual oil, propane, and natural gas to track market activity to anticipate any potential shortages occurring within or beyond the State's borders. Heating degree day data, presented in past week, cumulative for the season, and in normal trends during the heating season for ten New York metropolitan areas and the statewide average, indicates if unusual temperatures could lead to regional or statewide fuel supply issues.

[58] http://www.nyserda.org/Energy_Information/wkly_htg_fuel_rpt.asp.

- Annual Winter Fuels Outlook Meeting: In early fall, NYSERDA convenes its Annual Winter Fuels Outlook meeting for key State government and private industry stakeholders. This meeting includes presentations outlining the status of critical heating fuels markets, inventories, prices, and expected demand.

8.2.5 Petroleum Supply Disruption Tracking Process

Due to its fragmented and comparatively unregulated market structure, supply disruptions and outages in the petroleum products industry are difficult to anticipate and track. Large scale disruptions, such as those caused by hurricanes in the U.S. Gulf Coast region, may impact crude oil and natural gas production, force the temporary shutdown of large amounts of refinery capacity, and disrupt the pipeline and electric transmission infrastructure used to manufacture and distribute petroleum products. Events of this magnitude are tracked in great detail at the regional and national level with clearly defined and developed data systems. Smaller, isolated multi-county or sub-state regional disruptions are more difficult to identify and assess because of a lack of clearly defined real-time data. To compensate for the lack of data, NYSERDA gives special emphasis to tracking market conditions associated with petroleum fuels supply, as described earlier in this document. This effort relies upon localized terminal price data, input on supply availability from the local petroleum distribution industry, and market assessment from petroleum trade organizations to assess the magnitude and potential duration of an event. Since supplier networks are diverse and vary by region, many outages and disruptions at the sub-State level are related to impairments in the infrastructure by which petroleum supplies are delivered.

8.2.6 Petroleum Fuels Infrastructure Disruption Tracking

Delivery of petroleum fuels rely on refined product pipelines, large transport and small local delivery trucks, railroads, and barges to deliver fuel to end-users. Heating fuels provide a unique problem in that their season is compressed into a short timeframe, magnifying any disruption during that period. NYSERDA tracks the following:

- Refined Petroleum Product Pipelines: NYSERDA relies on information services that include DOE's ISERnet, Energy Assurance Daily, alerts from the Oil Price Information Service, and the general petroleum trade press for information related to pipeline and other petroleum industry infrastructure outages. NYSERDA also maintains a point of contact with the three primary product pipelines serving New York; the Colonial, Buckeye, and TEPPCO pipeline systems.
- Roadways and Truck Transportation: The smooth, continuous operation of roadways and trucking fleets are critical for the efficient delivery of refined petroleum products to New York end-use customers. NYSERDA maintains a list of the largest petroleum transport fleet operators and regularly interacts with these companies to assess market conditions during high demand periods. One of the earliest indicators of supply disruptions are uncharacteristic large transport truck operations. When transport trucks are required to travel to distant, non-tradition terminal locations to pick up fuel, it is often an indication of insufficient supply within a local market area to meet demand. Many local news media outlets monitor local road conditions and the New York State Department of Transportation maintains a real-time web based service that provides information on road based outages and traffic issues. This is found at http://www.511ny.org/traffic.aspx. In addition, SOEM tracks major outage and disruptive events, including response and recovery.
- Waterways: Refined petroleum fuels and ethanol are transported in large volumes via barge and tanker on New York waterways. The terminals around New York Harbor comprise the largest refined petroleum product import area in the U.S. The United States Coast Guard (USCG) stations, Sector New York, Sector Long Island Sound, and Sector Buffalo are responsible for management and safety of commercial transport on waterways within New York Harbor, the North and South Shores of Long Island and the Sound, the Hudson, Niagara, and St. Lawrence

Rivers, and the Great Lakes. During the winter, ice formation can affect marine transport of liquid fuels. Through the USCG, NYSERDA tracks ice breaking operations in the winter along the major waterways in the State to ensure that fuel shipments are able to move. Daily specific port information for ice thickness, coverage, and conditions is included under the Sectors New York and Buffalo, Waterways Management web sites. NYSERDA attends the USCG Annual Ice Operations Meeting for Sector New York which brings together all factions of the waterborne shipping industry to discuss and coordinate ice operations and conditions in the New York Harbor and Hudson River areas. [59]

- Railroad: Rail shipments, while not as common as other modes of petroleum fuel transportation, are generally confined to interstate movements of bulk quantities of fuel. In recent years ethanol producers, many located in the Mid-Western U.S., have used railcars to move large volumes of ethanol to gasoline terminal and distribution areas such as the Port of Albany and New York Harbor. Railroad operations are also critical to the timely supply of propane to New York consumers. There are over a dozen propane terminals and storage caverns at least partially dependent on railcar operations in the State. NYSERDA stays in close contact with the operators of these facilities during the critical, high demand winter months. Railroad track outages which may disrupt the supplies of petroleum fuels depending on their scope, are reported through a variety of sources, including SOEM and the U.S. and NYS Departments of Transportation.

8.2.7 Natural Gas Data Tracking

NYSERDA monitors natural gas market conditions including prices, storage volumes, consumption, and production statistics at the national, regional and State level. Gas Daily and EIA's natural gas page are the principle sources of information.

NYSERDA tracks the most important New York area citygate daily prices and uses them for comparison to each other and other areas of interest. The comparison of Transcontinental Natural Gas Pipeline (Transco) Zone 6 NY and Zone 6 non-NY prices has historically captured the Zone 6 NY price premium (basis) associated with supply constraints within the State system. During the peak demand winter months these daily premiums can exceed $25.00/MMBtu.

- Daily Prices: On a daily basis, NYSERDA tracks: U.S. national natural gas average; Transco Zone 6 non-NY; price, and absolute high and low price to create a range; Transco Zone 6 NY; price, absolute high and low price to create a range, common high and low price range, volume, and number of deals (open interest); Dracut (Boston area); Algonquin, NYMEX Futures at Henry Hub current or front month price.
- Weekly Prices: On a weekly basis, NYSERDA tracks the most important Northeast weekly citygate prices. These prices are used for comparison to each other and other areas of interest. The extended geographic nature of these price observations allows for a rapid appraisal of price trends from distinct supply sources. These supply sources include Canadian gas, LNG (Canaport and Boston area terminals), US Gulf Coast, and the emerging Appalachian region shale formations. Specifically, tracking includes: Transco Zone 6 NY; Transco Zone 6 non-NY; Iroquois Zone 2; Texas Eastern M-3; Iroquois Receipts (Canadian Border); Niagara (Canadian Border); Dawn Hub (Ontario); Dominion North and South Points (Appalachia); Dracut (Boston); and Algonquin.

[59] Sector New York's port status reports are available at: http://homeport.uscg.mil/mycg/portal/ep/portDirectory.do?tabId=1&cotpId=2. In western New York, ports are monitored by Sector Buffalo and status reports are available at http://homeport.uscg.mil/mycg/portal/ep/portDirectory.do?tabId=1&cotpId=18.

- Monthly Prices: NYSERDA tracks and makes available on its website the monthly average price of natural gas delivered to customers in New York (Residential, Commercial, Industrial) from EIA's 'Natural Gas Navigator' Historic Price Series.
- TRANSCO Gates: Transco is an important natural gas pipeline serving the downstate market in New York. Therefore, NYSERDA monitors all the citygate prices on the Transco Pipeline from origination point, including Henry Hub (spot price) and Transco Zones 1 – 6. The extended geographic nature of these price observations, Gulf Coast to Northeast, allows for a rapid appraisal of price trends and supply pressures in the US Gulf Coast area on this specific pipeline.
- Weekly Storage: From EIA data, NYSERDA tracks national and eastern region storage volumes of natural gas on a weekly basis, recording current week, prior week, year-ago, and five year average

8.2.8 Coal Activities

Within the coal industry, NYSERDA monitors developments (e.g., industry-labor negotiations, rail disruptions, barge movements) that could lead to a supply shortage. NYSERDA does not collect price and supply data on a daily basis but is completely familiar with the data sets maintained by EIA. If circumstances indicate a disruption is likely, NYSERDA requests relevant information from all suppliers, distributors, and direct purchasers.

Beyond the electric sector, coal has limited use in New York, however 9 percent of New York's electricity generation was produced by coal in 2009.[60] Nearly all of the coal delivered to the State is shipped by rail. Over the years, railroad companies servicing the State have consolidated and removed uneconomic lines and track, thus reducing system flexibility. As a result, extensive planning may be needed to redirect emergency coal shipments during a shortage. Additionally, a possible shortage of available rail coal cars and resulting postponements in forming unit trains could delay delivery of bulk supplies to large coal users.

8.2.9 Weather/Temperature Data Tracking

NYSERDA tracks the number of heating and cooling degree data on a Statewide basis and for ten metropolitan areas across the State. This weekly and monthly information is from National Oceanic and Atmospheric Administration (NOAA). This data is put on NYSERDA's website and also included in its weekly Heating Fuels Report. On a daily and real time basis, SOEM monitors weather conditions and events, providing immediate updates to partner State agencies. The Daily Operational Brief, created and distributed by SOEM includes comprehensive short-term and long-term regional and national weather and climate forecasting and discussion as well.

8.2.10 Communication with Federal and State Partners

New York participates in the DOE Office of Energy (OE) Energy Emergency Assurance Coordinator System (EEAC) in order to access valuable energy security information, including daily news summaries, emergency situation reports, lessons learned from other states, links to outage and curtailment information and the ability to email to colleagues in other jurisdictions.

The EEAC is a cooperative effort that establishes a secure cooperative communications environment for state and local government personnel with access to information on energy supply, demand, pricing, and infrastructure. Designated members have expertise in electricity, petroleum, and natural gas. The current

[60] NYISO. "2010 Load and Capacity Data."

membership of approximately 200 people is made up of representatives from state energy offices, public utility organizations, state legislators, emergency management agencies, homeland security offices, local governments, and governors' offices.

Each state has designated at least one primary and one secondary designee per energy source (electricity, natural gas, and petroleum), which provides up to six individuals per state for the EEAC list. In the event of an energy supply disruption or emergency, OE relies upon the EEAC contacts to provide an up-to-date assessment of energy markets in the effected states. During these emergency situations, as well as other non-emergency situations in which the list may be used, the EEAC serves as the link between the state, industry, and OE.

8.2.11 Summary of NYSERDA's Information Sources

Daily:

- AAA, Fuelgaugereport.com
- Oil Price Information Service – Daily updates
- Oil Daily
- Gas Daily
- US DOE Energy Assurance Daily
- US DOE IserNet
- SOEM Midday Report
- Wall Street Journal Online

Weekly:

- Oil and Gas Journal
- Oil Price Information Service Newsletter
- Butane Propane News Weekly Propane Newsletter
- US DOE Energy Information Administration

Monthly:

- Butane Propane News Magazine
- LP Gas Magazine
- Oil & Energy Magazine, New England Fuel Institute
- Oil Heating Magazine
- US DOE Energy Information Administration

8.3 DPS Outage Tracking Activities

8.3.1 Electricity Outage Tracking

In New York, the DPS is the lead agency for all electric supply disruptions. DPS staff has the lead role in any electric system emergency affecting or occurring within the State. Actions to prevent or limit the loss of transmission facilities or generation resources may be coordinated by the NYISO and one or more utilities. The degree of DPS involvement depends on the nature and expected duration of the problem. Smaller outages and recovery might be handled entirely by the NYISO and the affected electric utilities, while any major system issue involves greater coordination with the DPS staff.

Electricity outages are tracked at the utility level. Data related to total outages and restoration times is available at each of their websites. At certain thresholds of system outages, this information is provided to State agencies including DPS and SOEM. Below is a list of the major electric utilities in New York State and the associated web based outage systems.

- Central Hudson Gas and Electric http://stormcentral.cenhud.com/default.aspx
- Con Edison http://apps.coned.com/weboutageinfo/stormcenter/default.aspx
- LIPA http://www.lipower.org/stormcenter/outages/outagemap.html
- National Grid: Upstate NY http://www1.nationalgridus.com/niagaramohawk/stormcenter/
- NYSEG http://www.nyseg.com/Outages/default.html (no online map)
- Orange and Rockland http://wp1.coned.com/or_stormcenter/default.aspx
- Rochester Gas and Electric http://ebiz1.rge.com/cusweb/outage/ (no online map)

The New York utilities participate in the Northeast Power Coordinating Council (NPCC), which includes all of the New England states and the provinces of Quebec, Ontario and New Brunswick in Canada. The NPCC is one of eight regional councils that comprise the North American Electric Reliability Council (NERC). New York State works with NYISO in emergency electric energy situations to implement pre-authorized crisis operating policies; assist any affected utility or utilities in enforcing mandatory conservation measures, if necessary; assure an efficient and smooth flow of information concerning the emergency to the appropriate levels of government and to the media; and redirect available supplies of excess fuel to affected utility generating stations.

Major utility outages are also reported to DOE. This information is subsequently released in reports such as Energy Assurance Daily, as well as on DOE's ISERnet. NYSERDA reviews these resources on a daily and as needed basis.

8.3.2 Natural Gas Outage Tracking

Primary legislative authority for most types of natural gas system emergencies rests with the DPS. However, the degree of government involvement depends on the nature and expected duration of the problem. Local supply disruptions and recovery might be handled entirely by the individual gas utility, while any major distribution system or interstate pipeline system damage will involve greater coordination with DPS staff and other appropriate State agencies/entities.

DPS will monitor supply curtailments that occur during periods of high natural gas demand, particularly during the winter heating season. Some customers who have elected to be served under an interruptible tariff, may have their natural gas service curtailed during these periods.

8.4 SOEM Outage Tracking Activities

Statewide Outage Information Sources and Coordination

All major outage and supply disruption information is directed to SOEM. If warranted, the State Emergency Operations Center (SEOC) is activated. The EOC serves to coordinate information gathering and State resources in the provision of assistance to local responders. On a daily and real time basis, SOEM monitors events within the State which may or may not have an energy related element. Incident reports are generated and communicated to local, State and federal agencies. The Daily Operations Brief is a comprehensive document that provides a common operating picture in support of achieving shared situational awareness between State agencies and the State's Executive leadership. It includes a summary of weather issues, unfolding events, and other items of interest related to domestic security and emergency response concerns. Major events are also posted on the *NY-Alert*.gov website.

SOEM is responsible for developing and staging emergency training exercises. On an energy specific basis, this includes Federal Emergency Management Administration (FEMA) observed exercises for the six nuclear power plants in New York. All other state exercises, regardless of primary theme, generally include energy supply and infrastructure components.

8.5 NYISO - Market and System Monitoring and Outage Tracking Activities

At the bulk electric system level, the NYISO coordinates the operation and dispatch of the generating facilities in the State, electricity imports into the State, and the management of electricity across the bulk power transmission system. The NYISO coordinates operations with the neighboring Independent System Operator of New England; the Pennsylvania, New Jersey, and Maryland Interconnect (PJM); Independent Electricity System Operator (IESO) of Ontario; and Hydro Quebec. The NYISO oversees a bid process for electricity and transmission usage, which enables the State's electric generators and other market participants to sell electricity and capacity at market-based prices, rather than regulated rates.

NYISO generates a significant amount of data related to electricity market conditions in New York, much of which is publicly available. On its website (NYISO.com), NYISO publishes pricing data for day-ahead, real time and hour-ahead markets. Additional information includes scheduled outages and interface flows, actual and forecasted load, and various studies, manuals and reports.

As a planning tool, the NYISO produces the Comprehensive Reliability Plan which is developed in two phases: The Reliability Needs Assessment (RNA) identifies system needs, if any, over a ten year horizon. If needs exist, the Solutions phase develops a plan to see that those needs are filled.

Published annually in April by NYISO, the Load and Capacity Data Report (referred to as the Gold Book) provides detailed information on existing and proposed changes to generation assets within the State including: owner/operator, unit, zone, location, in-service date, nameplate rating, summer and winter capabilities, fuel type and annual net energy. It includes information on transmission facilities by transmission owner, including: location, voltage, mileage, conductor type and summer and winter thermal ratings. Historical information includes annual energy and coincident and non-coincident peak demand, organized statewide and by load zone. The Gold Book also features long term (10-year) generation forecasts (econometric and with energy efficiency impacts) of annual energy and coincident and non-coincident peak demand, statewide and by load zone.

Electricity markets are also monitored by other State agencies including NYSERDA, which tracks prices from the NYISO and DPS, which tracks prices for its electricity oversight purpose. NYSERDA also makes extensive use of data collected from EIA's 'Electric Power Monthly' to analyze demand activity for various customer classes in New York, for general informational reporting, and for State Energy Plan needs.

8.6 Statewide Supply Disruption Tracking Processes

The need for a comprehensive plan setting forth the State's response strategies during energy emergencies was recognized by the State Legislature when it enacted the State Energy Law in 1976. At that time, the Legislature authorized the preparation of an "integrated resource plan specifying actions to be taken in the event of the declaration by the Governor of an energy or fuel supply emergency." New York's Energy Emergency Plan is a statutory responsibility of NYSERDA under Section 5-117 the Energy Law. All relevant State agencies contribute and review the Energy Emergency Plan on an annual basis.

Responsibility for energy emergency planning and response was transferred from the State Energy Office to the New York State Energy Research and Development Authority (NYSERDA) in 1995. Energy Law Section 5-117 authorizes the Governor to declare an energy or fuel supply emergency, which may remain in effect for up to six months. Extension beyond six months must be approved by the Legislature.

The Energy Emergency Plan establishes a four-stage response hierarchy that generally reflects the severity of the energy or fuel supply situation. [61] In brief, it involves different levels of activity depending on the severity of the event. These levels are described below:

- Stage I - **Increased Monitoring** - Conditions warrant increased monitoring of one or more portions of the energy supply and/or distribution system.
- Stage II - **Market Coordination** - There is active coordination between energy supply distribution systems and State agencies to moderate the effects of a potential emergency.
- Stage III - **Public Action** - The public is asked to take actions to moderate the effects of a potential emergency.
- Stage IV - **Emergency Declaration** - The Governor declares an energy or fuel supply emergency. Broad emergency powers are granted to the Governor or the Governor's designee.

At the onset of any emergency situation, the State Energy Emergency Plan will be reviewed by the lead agency to assess the applicability of individual response elements to the existing situation. Plan elements may be revised, excluded, or augmented based on the circumstances of the event.

Many outages and supply disruptions never advance beyond Stage I. In such cases, the appropriate lead State agency will monitor conditions. In the case of small, localized events affecting the energy supply system, the lead State agency for that fuel or energy type will track the circumstances leading up to the event, effects on the State, scope, duration of event and time and resources needed to return to a normal condition. The agency may also notify SOEM if it is determined the magnitude of the event warrants that action.

No specific type of energy emergency exists in isolation. A natural gas emergency may result in an electricity system emergency due to lack of fuel for electricity generation. The same natural gas emergency may result in a petroleum or coal emergency due to fuel switching. Similarly, a petroleum supply emergency may result in an electric system, natural gas or coal emergency. The response to any energy emergency situation must be cognizant of the potential impacts to all of the State's energy markets. The lead agency should consult with other effected agencies, as appropriate, in implementation of response actions.

In the event of a more significant disruption or energy emergency, the lead and partner agencies within New York, including SOEM, will track the situation. This tracking will continue until the situation has been brought under control, and response and protective actions have ended.

After any declared energy emergency requiring implementation of the Energy Emergency Plan, a post-emergency assessment report will be prepared by the lead State agency and will identify the strengths and weaknesses of the Energy Emergency Plan's response elements. The assessment report will review the causes of the emergency, private sector reaction to the situation, the effectiveness of governmental response to the emergency, and the resulting impact of the energy emergency and responses to it. Special attention is paid to the effectiveness of mitigation efforts in terms of reduced health and welfare threats, energy consumption, and public response to such actions.

[61] This process is described fully in the New York State Energy Emergency Plan.

IX. Appendix C – New York State Energy Markets

9.1 Electricity[62]

Unlike many States, New York does not rely heavily on any one fuel for electricity generation. Natural gas is the leading generation fuel followed by, nuclear, hydroelectric, coal and petroleum.[63] Improved and more stringent environmental regulations have encouraged electricity generators to increase the use of natural gas in place of oil and coal. New York has some renewable power capability and also imports electricity from neighboring States and Canada (Figure 9-1). Figure 9-2 shows the State's historical generation and Figure 9-3Figure shows electric transmission lines across New York State by voltage class.

The industry is primarily composed of investor-owned utilities (IOUs), governmental utilities, generation companies, transmission-only companies, and energy service companies (ESCOs). Wholesale electricity sales and transmission services are regulated by the Federal Energy Regulatory Commission (FERC) under the Federal Power Act,[64] whereas retail sales of energy and the accompanying service over local distribution lines (to the extent that they are owned by the IOUs) are regulated by the New York Public Service Commission (PSC) under Public Service Law, Article 2 (30-53), Residential Gas, Electric and Steam Utility Service[65]. Independent power producers are subject to fewer regulatory requirements by the PSC. Moreover, the PSC has fostered the development of ESCOs that may provide energy to retail end-use customers as an alternative to energy supplied by an investor-owned utility.

In 2010, New York utilities and independent power producers generated over 136 million MWh of electricity.[66] That power was produced through a well-balanced generation portfolio, including nuclear plants and conventional fossil fuel generators powered by coal or natural gas. Alternatively fueled power consists of the State's sizeable hydroelectric power facilities and a growing number of wind farms. Figure 9-1 shows the general location of the State's major power plants. It also shows other critical State energy infrastructure, including major transmission lines, locations with sizeable renewable energy potential, and fossil fuel infrastructure, such as coal mines, petroleum refineries, and oil import sites. This U.S. Department of Energy (DOE), Energy Information Administration (EIA) overview provides a reference point for emergency responders and Energy Assurance planners.

[62] This portion of the Energy Assurance Plan is developed to supplement, or enhance, a broader Electricity Report to be contained in the forthcoming 2013 New York State Energy Plan.

[63] Energy Information Administration, State Energy Profiles, New York: Analysis, http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=NY, see Figure 6xx *Historical Electricity Generation in New York*.

[64] Federal Power Act: http://uscode.house.gov/download/pls/16C12.txt.

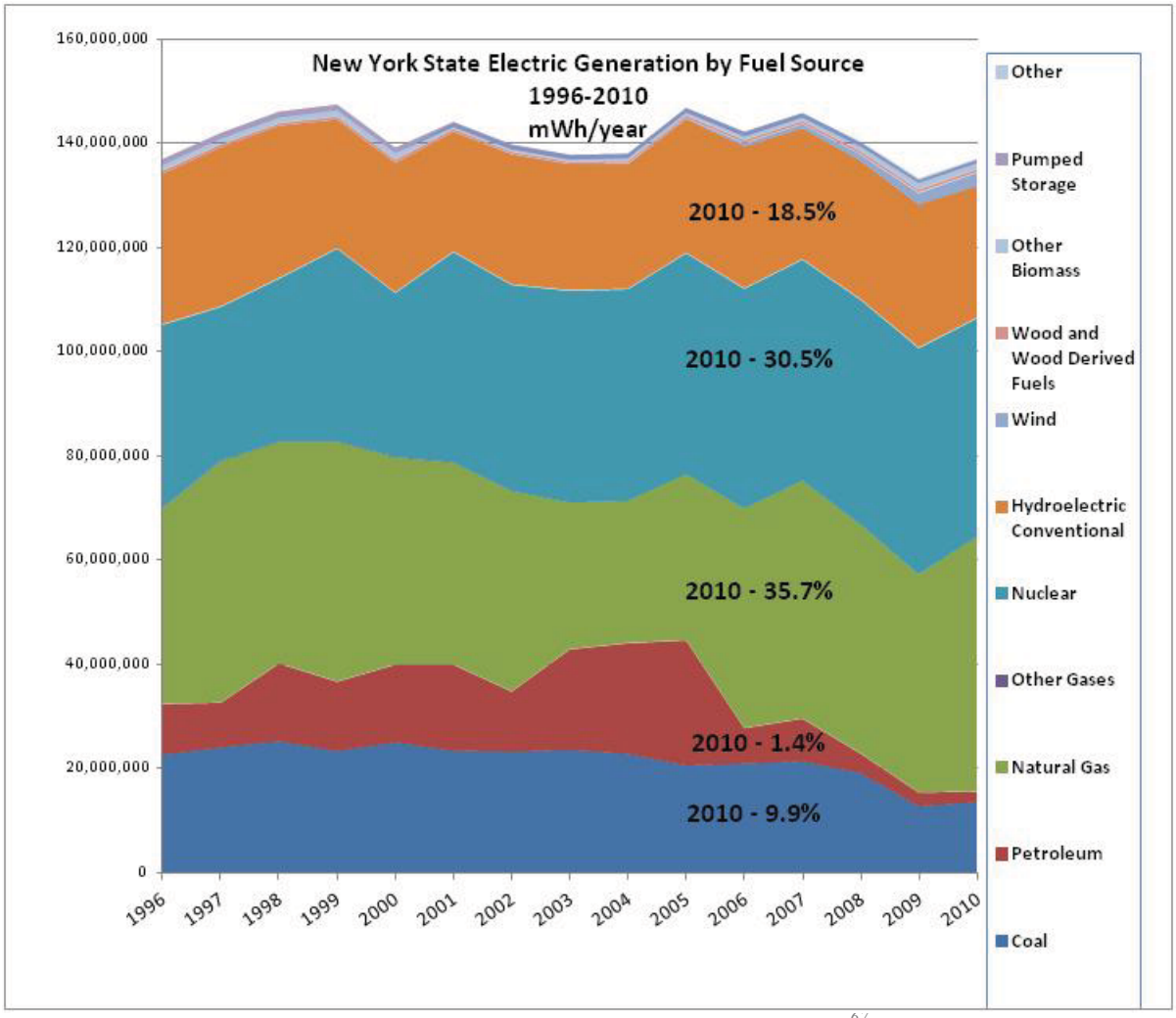
[65] http://law.justia.com/codes/new-york/2010/pbs/article-2/.

[66] http://www.eia.doe.gov/cneaf/electricity/st_profiles/new_york.html.

Figure 9-1. Map of Major Energy Infrastructure in New York

Source: EIA, State Energy Profiles, New York. http://www.eia.doe.gov/state/state_energy_profiles.cfm?sid=NY

Figure 9-2. Historical Electricity Generation in New York



Source: SAIC calculations using data from EIA [67]

Figure 9-2 highlights changes in fueling electricity generation from the late 1970s to 2008. Responding to the trend away from petroleum to natural gas, the North American Electric Reliability Corporation (NERC) felt it necessary to address the growing interdependency of natural gas and electricity. It published *2011 Special Reliability Assessment - Gas and Electric Interdependencies: A Bulk Power System Reliability Perspectiv*e, in which it stated:

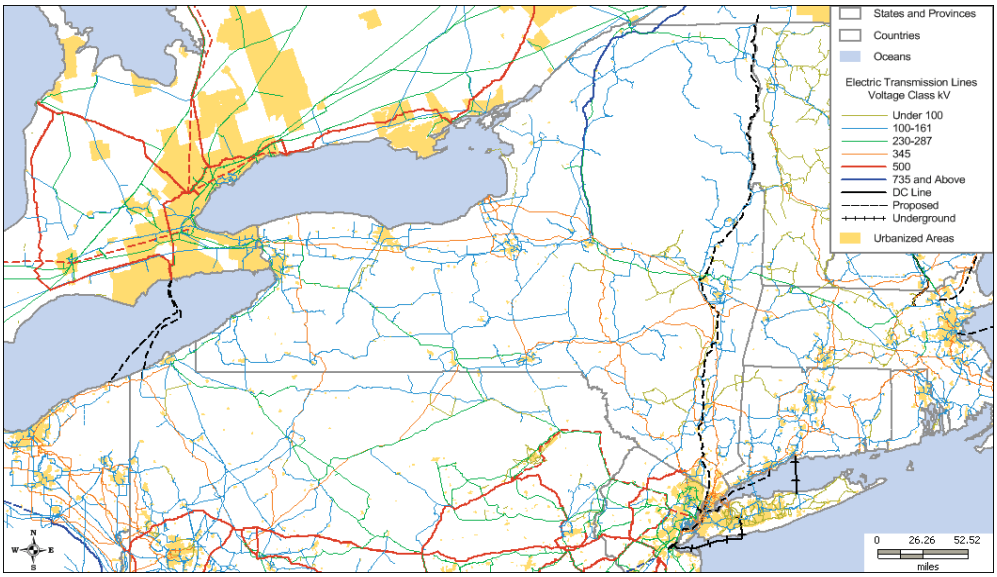
> "The majority of new North American generating capacity projected for the next ten years will rely on natural gas as its primary fuel. However, increased dependence on natural gas for generating capacity can amplify the bulk power system's exposure to interruptions in natural gas fuel supply and delivery. Mitigating strategies, such as storage, firm fuel contracting, alternate pipelines, dual-fuel capability, access to

[67] These data are subject to annual updating by EIA. However, all EIA state energy data are not released simultaneously. Post-plan completion updates are highly recommended. Data updates can begin at http://www.eia.gov/state/state-energy-profiles.cfm?sid=NY

multiple natural gas basins, nearby plants using other fuels, or additional transmission lines from other Regions, can contribute to managing this risk."

Figure 9-3 illustrates primary transmission in New York by voltage class. This provides perspective on the general location of this infrastructure.

Figure 9-3. Electric Transmission by Voltage Class



Source:

The municipally owned utilities, rural electric cooperatives, and public power authorities serve retail customers, and some own generation or transmission and distribution (T&D) facilities. The public power authorities are subject only to limited regulation by the PSC, such as approvals for major transmission facilities.

Unlike most other States, New York is a power control area by itself and the New York Independent System Operator (NYISO) is the designated operator for bulk power system operations. The New York Control Area (NYCA) is divided into 11 zones (referred to as interfaces). While the public power authorities are generally exempt from FERC jurisdiction, they have voluntarily agreed to participate in the NYISO-administered markets and are thus subject to the terms of the NYISO tariff. Municipally owned electric utilities taking their entire electric generation supply from the New York Power Authority (NYPA) are not regulated by the PSC. Utilities receiving supplemental power from sources other than NYPA are regulated by the PSC. The State's four rural electric cooperatives are exempt from PSC jurisdiction by virtue of Section 67 of the New York Rural Electric Cooperative Law. Municipally owned utilities, rural electric cooperatives, and public power authorities typically oversee and take responsibility for their own infrastructure needs.

In New York, electricity generally flows east from the Niagara Falls area and then south to New York City and Long Island. This direction of flow results primarily because about 40 percent of the State's electric generating capacity is located in New York City and Long Island while peak demand there was 50 percent of the statewide end-use consumer need. In 2008, end-use consumer load was about 47 percent of the statewide needs. Additionally, the higher operating costs associated with generating electricity in downstate regions, makes it more cost effective to import electric power much of the time. The majority of the State's baseload generating units are located in upstate New York areas, further supporting the west

to east to south flow. [68] More recent EIA data posted in September 2011 confirms this pattern. EIA noted that "Electric power often costs more in New York City, Long Island, and the Hudson Valley than in the rest of New York—especially for the mid-afternoon—due to transmission constraints on moving power into the New York City area."[69]

Stakeholders and Authorities

Governmental Authorities

The New York Public Service Commission (PSC)

New York's PSC regulates the State's electric, gas, steam, telecommunications, and water utilities. It is charged with ensuring that adequate and safe service is provided at just and reasonable rates, free from discrimination or unreasonable preference. It also exercises jurisdiction over the siting of major gas and electric transmission facilities and has responsibility for ensuring the safety of natural gas and liquid petroleum pipelines.

The PSC consists of up to five members, each appointed by the Governor and confirmed by the State Senate for a term of six years. The Chairman of the PSC is designated by the Governor and serves as the chief executive officer of the Department. The PSC has several staff arms and a broad mandate to ensure that all New Yorkers have access to reliable and low-cost utility services. The Office of Office of Electric, Gas & Water has oversight over electricity regulation within the State. It is mandated to ensure the safe and adequate service of electricity and it has assumed lead agency status for electric system emergencies.

Principal Energy Industry Stakeholders

Investor-Owned Utilities (IOUs)

Six regulated investor-owned electric power companies serve New York:

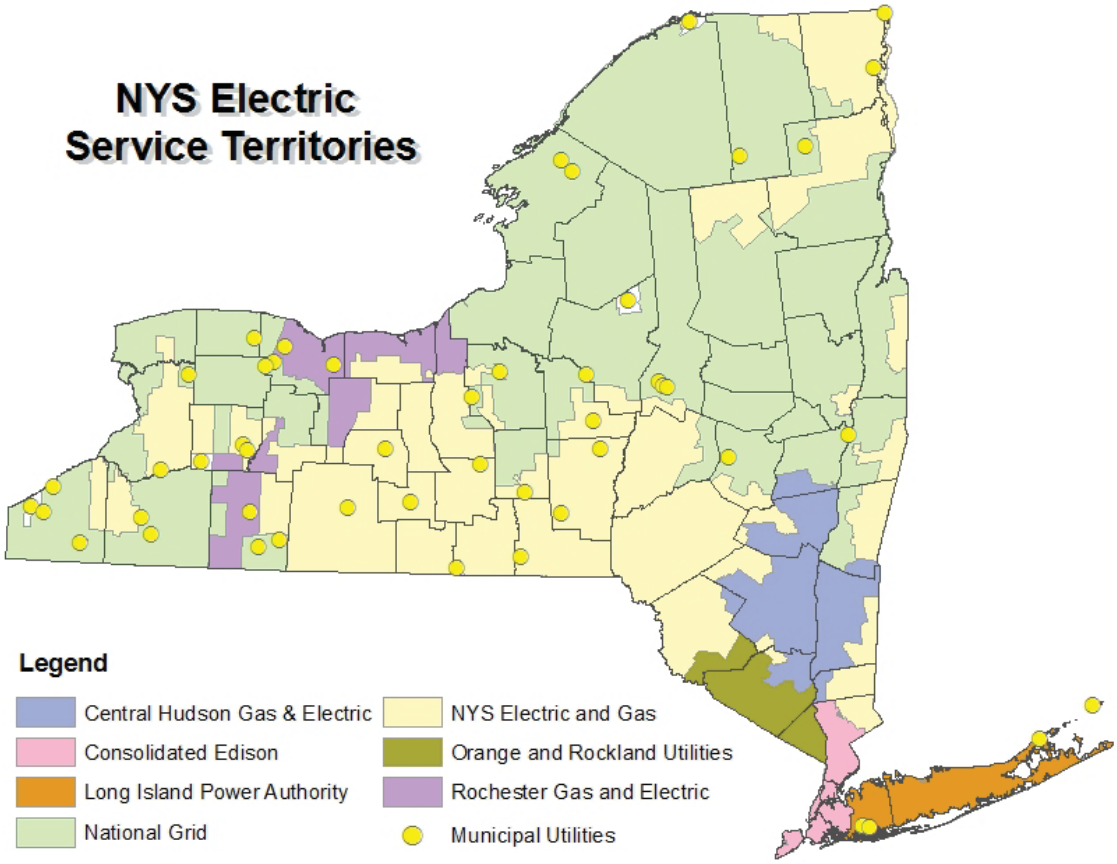
- Central Hudson Gas & Electric Corporation (Central Hudson)
- Consolidated Edison Company of New York, Inc. (Con Edison)
- Orange and Rockland Utilities, Inc. (O&R)
- New York State Electric & Gas Corporation (NYSEG)
- Rochester Gas and Electric Corporation (RG&E)
- Niagara Mohawk Power Corporation d/b/a National Grid

Their service territories are shown in Figure 9-4, and each is described below.

[68] From the 2009 New York State Energy Plan.

[69] http://205.254.135.7/todayinenergy/detail.cfm?id=3230.

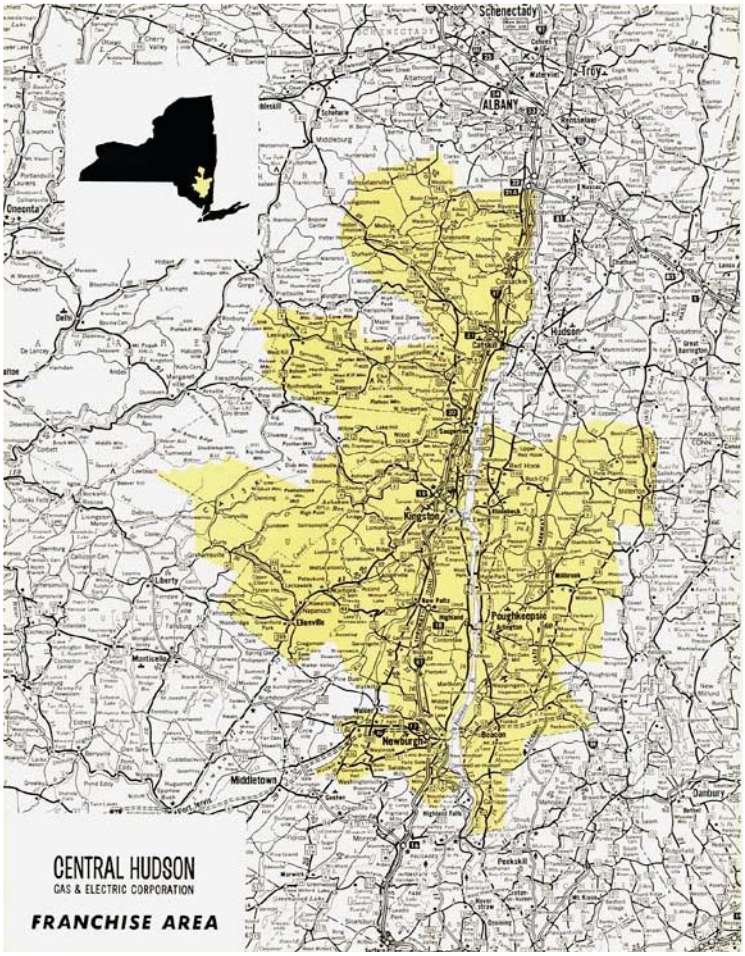
Figure 9-4 Service Territories of Electric Service Providers in New York



Central Hudson Gas & Electric Corporation (Central Hudson)

Central Hudson is an electric and gas T&D utility that serves approximately 300,000 electric customers and 74,000 natural gas customers in and around New York State's Mid-Hudson River Valley. The service territory extends from the suburbs of metropolitan New York City north to the Capital District at Albany, as depicted in the service territory shown below in Figure 9-5.

Figure 9-5. Central Hudson Service Territory



Source: http://www.cenhud.com/

- Electric Transmission: Central Hudson owns and operates an electric transmission system consisting of 629 pole miles of line and an electric distribution system consisting of 8,078 pole miles of overhead lines and 1,371 trench miles of underground lines.
- Natural Gas: Central Hudson owns and operates approximately 163 miles of natural gas transmission pipelines and 1,163 miles of distribution pipelines, in addition to its customer service lines and meters. Central Hudson also owns two propane-air mixing facilities for emergency and peak-shaving purposes, one located in Poughkeepsie and the other in Newburgh.

Consolidated Edison Company of New York, Inc. (Con Edison)

Con Edison, Inc. is a holding company incorporated in New York in 1997 that owns Con Edison and Orange and Rockland Utilities, Inc. (O&R). Con Edison, Inc. also owns competitive energy businesses, including Con Edison Solutions, a retail energy supply and services company, Con Edison Energy, a wholesale energy supply company and Con Edison Development, a company that participates in infrastructure projects within the service territory limits of Con Edison

Con Edison is a regulated utility that provides electric service in New York City (excluding a small area of Queens) and most of Westchester County. The company also provides natural gas service in Manhattan, the Bronx, and parts of Queens and Westchester. Additionally, Con Edison owns and operates the world's largest district steam system, providing steam service throughout Manhattan.

- Natural Gas: Con Edison's natural gas distribution system serves approximately 1.1 million gas customers in New York City and Westchester County. The company owns about 4,333 miles of gas mains as well as approximately 400,000 service pipes and it transports more than 200 million dekatherms of natural gas a year. Con Edison also owns a natural gas liquefaction facility (creating liquefied natural gas, or LNG) and storage tank at its Astoria property in Queens.
- Electric Service: Con Edison delivers electricity to approximately 3.3 million customers through 95,627 miles of underground distribution lines and 36,769 miles of overhead electric wires throughout a service territory that covers about 660 square miles. Con Edison delivered 56,667 million kilowatt-hours (kWh) of electricity in 2009. Additionally, Con Edison owns (or jointly owns) 438 miles of overhead circuits operating at 138, 230, 345, and 500 kilovolts (kV) as well as 727 miles of underground circuits operating at 69, 138, and 345 kV.
- Generating Facilities: Con Edison owns electric generating facilities located in Manhattan with an aggregate capacity of 706 megawatts (MW). In accordance with the New York PSC's restructuring orders issued in the 1990s, Con Edison sold the majority of its electric generating facilities, with the exception of those that also produce steam for Con Edison's steam business:
  - 74th Street Station Manhattan (cogeneration [70])
  - Ravenswood Station Queens
  - 60th Street Station Manhattan (cogeneration)
  - 59th Street Station Manhattan (cogeneration)
  - East River Station Manhattan (cogeneration)
  - Hudson Avenue Station Brooklyn (cogeneration)
  - BNYCP Plant Brooklyn Navy Yard Cogeneration Partners (cogeneration)
- Steam: Con Edison operates the largest steam distribution system in the United States. It produces and delivers over 23,000 million pounds of steam annually to approximately 1,760 customers in parts of Manhattan. (A map of mid and lower Manhattan is found in Section 6.5.3)

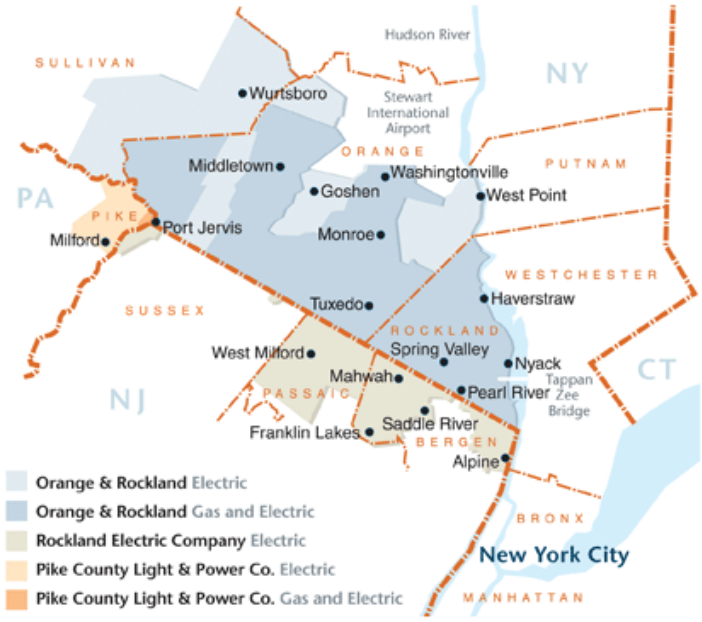
[70] The U.S. Energy Information Administration (EIA) defines cogeneration as "The production of electrical energy and another form of useful energy (such as heat or steam) through the sequential use of energy." EIA Glossary, http://www.eia.gov/tools/glossary/index.cfm?id=C.

Orange and Rockland Utilities, Inc. (O&R)

O&R is a wholly owned subsidiary of Con Edison, Inc., and is an electric and gas utility headquartered in Pearl River. O&R owns two utility subsidiaries: Rockland Electric Company and Pike County Light & Power Co., which operate in southeastern New York and adjacent portions of New Jersey and Pennsylvania. Together with its subsidiaries, O&R distributes electricity to more than 300,700 customers and delivers natural gas to 129,595 customers. Of the natural gas customers, 128,407 reside in New York, while the remaining 1,188 are in Pennsylvania. O&R also owns 554 miles of electric transmission lines, 5,460 miles of electric distribution lines, and more than 1,800 miles of gas pipeline. Its peak demand for electricity (reached on August 2, 2006) is 1,617 MW.

Service Territory: O&R's service territory encompasses approximately 1,350 square miles as shown in Figure 9-6.

Figure 9-6. O&R Service Territory



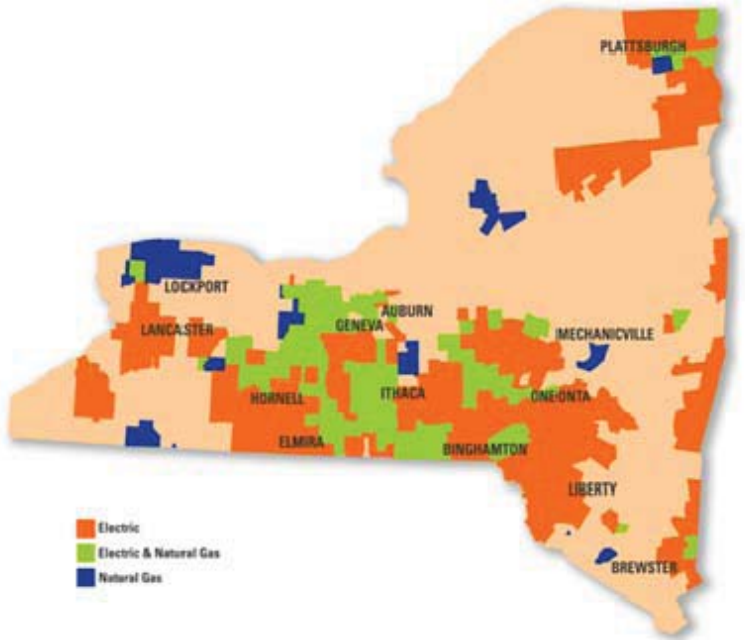
Source: http://www.oru.com/aboutoru/servicearea/index.html

New York State Electric & Gas Corporation (NYSEG)

NYSEG is a regulated electric and gas corporation based in Rochester. Among other activities, NYSEG is engaged in the purchase, sale, and distribution of electricity and natural gas in its service area, shown in Figure 9-7. The company serves approximately 872,000 electricity customers and 256,000 natural gas customers in upstate New York.

NYSEG is a subsidiary of Iberdrola USA, an energy services and delivery headquarter in Spain. In the United States, Iberdrola also operates in Connecticut, Massachusetts, Maine, and New Hampshire. Besides NYSEG, Iberdrola owns Rochester Gas and Electric Corporation (RG&E), Central Maine Power, and gas distributors Berkshire Gas, Southern Connecticut Gas, Connecticut Natural Gas, and Maine Natural Gas. Through NYSEG, RG&E, and Central Maine Power, Iberdrola owns 8,253 miles of transmission lines and 8,253 miles of distribution lines, reaching 1,843,000 customers in 2009, with a total consumption of 36,783 gigawatt-hours (GWh).

Figure 9-7. NYSEG Service Territory

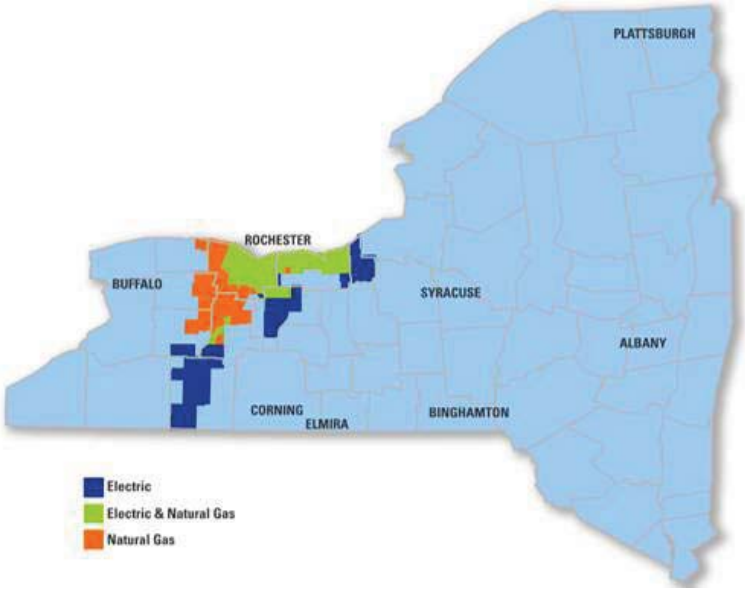


Source: http://www.nyseg.com/OurCompany/servicearea.html

Rochester Gas and Electric Corporation (RG&E)

RG&E is a regulated subsidiary of Iberdrola USA, sells gas and electricity as a local distribution company. RG&E provides electricity to approximately 367,000 business and residential customers as well as natural gas to about 303,000 residents and businesses in a nine-county region in and around the city of Rochester in upstate New York. RG&E's service territory is shown in Figure 9-8.

Figure 9-8. RG&E Service Territory



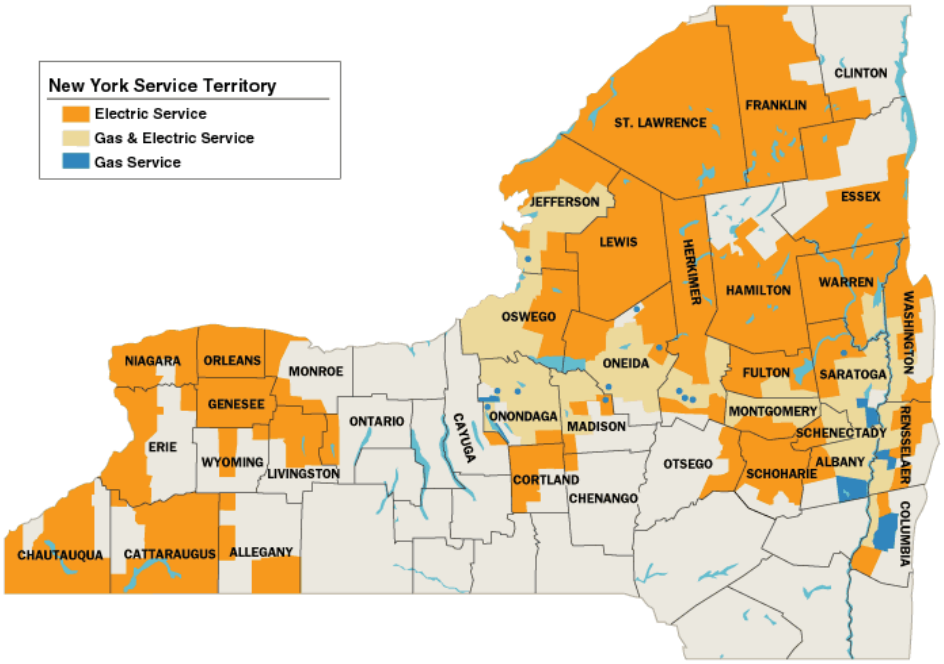
Source: http://www.rge.com/OurCompany/servicearea.html

Niagara Mohawk Power Corporation- a subsidiary of National Grid

National Grid is a major international energy delivery company, incorporated under the laws of England and Wales. Within the United States, the company delivers electricity to approximately 3.3 million customers throughout Massachusetts, New Hampshire, New York, and Rhode Island. It also manages the electricity delivery system on Long Island under an agreement with the Long Island Power Authority (LIPA).[71] National Grid is the largest power producer in New York State. It owns 6,650 MW of electricity generation capacity and provides power to over 1 million LIPA customers. The company is also the largest distributor of natural gas in the northeastern U.S., serving approximately 3.4 million customers in New York, Massachusetts, New Hampshire, and Rhode Island.

- Electricity Transmission: National Grid owns and operates approximately 8,600 miles of transmission spanning upstate New York, Massachusetts, Rhode Island, New Hampshire, and Vermont. The company's transmission system includes nearly 90 miles of underground cable and 524 substations. National Grid also owns and operates a direct current transmission line that is a key section of an interconnector between New England and Canada.
- New York Operations: With New York operations based in Syracuse, National Grid provides electric service to approximately 1.5 million customers (as well as natural gas service to about 540,000 customers in upstate New York). It also manages the "LIPA network serving 1.1 million customers with over 14,975 miles of circuit and 177 substations, delivering 22 TWh of electricity."[72] See Figure 9-9.

Figure 9-9. National Grid's New York Service Territory



[71] Public Service Enterprise Group (PSEG) entered into a 10-year contract to manage LIPA's electric transmission and distribution system, beginning on January 1, 2012. See NJ.com, "PSEG wins contract to oversee Long Island Power Authority grid for 10 years," December 20, 2011. http://www.nj.com/business/index.ssf/2011/12/pseg_wins_contract_to_oversee.html.

[72] http://www.nationalgridus.com/non_html/a2_us_facts.pdf.

Source: https://www.nationalgridus.com/niagaramohawk/about_us/serviceterr_map.asp

Emergency Response Plan: Electric[73]

Introduction to Energy Response Plan: Electric

Electricity is a fundamental part of New York's Energy Assurance; not only is it vital to the State's economy and welfare in its own right, but it also underpins the supply of the State's other energy resources, such as petroleum and natural gas. Electricity is used to operate pumps, monitoring devices, and controls so that all forms of energy can reach customers expeditiously and efficiently.

NYISO Emergency Response Procedures

There are many stakeholders involved in assuring adequate emergency response for loss of electric power. However, under the ISO system mandated by FERC, the area ISO, NYISO, has a central role in assuring system reliability. NYISO oversees the reliability of both generation and transmission. The PSC is responsible for key regulations relating to building, maintaining and operating reliable electricity utilities; however, NYISO, due to its statewide scope and instantaneous information systems, has become the key organization for monitoring normal operations and acting to prevent and mitigate system outage.

The NYISO *Emergency Operations Manual* (September 2010) addresses actions NYISO and "market participants" will take under emergency conditions to restore the stability of the electric system. An emergency is defined as the following.

Any abnormal system condition that requires immediate automatic or manual action to prevent or limit loss of transmission facilities or Generators that could adversely affect the reliability of the NYS Power System.

The NYISO *Emergency Operations Manual* observes that electric disturbances may develop into a magnitude sufficient to affect the reliable operation of the New York Control Area and be caused by conditions that include but are not limited to the following:

- Capacity deficiencies
- Reserve deficiencies
- Energy management or control deficiencies
- Loss of generation or transmission facilities
- High voltage
- Low voltage
- Source fuel emergencies
- Environmental episodes
- Overall electric system stability problems

[73] For updated data points, see 2013 NYSEP when published or follow the source URLs given for the most recent data possible.

Emergency Response Procedures and Operating States

In its *Emergency Operations Manual*, NYISO delineates various technical conditions that can lead to electrical outage, including

(i) exceeding transmission rating

(ii) high or low voltage

(iii) exceeding post-contingency voltage interconnection reliability operating limits (IROL)

(iv) operating reserve deficiency

(v) IROL stability limit violation

(vi) high or low frequency

(vii) over-generation

(viii) reducing transmission flows

(ix) load relief

These conditions lead to five operating stages with procedures for notification and response actions by NYISO and other stakeholders such as transmission and generation owners:

- Normal
- Warning
- Alert
- Major Emergency
- Restoration

When NYISO determines that the condition of the NYS Power System is *normal* or *warning*, it will operate the system according to procedures described in the NYISO *Transmission and Dispatching Operations Manual*.[74] When NYISO determines that the state of the NYS Power System *is alert, major emergency or restoration,* NYISO will operate the system according to procedures in the *Emergency Operations Manual*.[75]

PSC Notification

NYISO works with stakeholders to restore the stability of the electric system to normal as quickly as possible after a disruption. NYISO will inform generators, utilities, and transmission operators when alert, emergency, or restoration stages are initiated and has stated that it will notify the PSC within one hour when any of the following unusual operating conditions occur:

- Impending power supply shortfall.
- Curtailed electric use.
- Voltage reduction.
- Load shedding.

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[74] NYISO, *Transmission and Dispatching Operations Manual,* February 2012. http://www.nyiso.com/public/webdocs/documents/manuals/operations/trans_disp.pdf.

[75] NYISO, *Emergency Operations Manual*, November 2011. http://www.nyiso.com/public/webdocs/documents/manuals/operations/em_op_mnl.pdf.

- Unusual events as defined by the PSC.
- Major outages in neighboring systems.

Additionally, NYISO management will notify the PSC on the next business day when other NYS power system emergencies occur. The PSC monitors NYISO activity and report to State emergency authorities as appropriate as described below.

Summary of Utility Emergency Response Activity

State Emergency Response Supervision

The New York PSC staff has established contacts with electric utilities in the State to obtain outage information in the event of any service interruption. The NYS Comprehensive Emergency Management Plan (CEMP) identifies roles and responsibilities of entities participating in State emergency response, including the PSC and NYSERDA. Those agencies work closely with other State agencies in responding to electricity emergencies in coordination with the NYS CEMP.

Examples of IOU Response Activities

Incident management is what a typical IOU Electric Distribution Company (EDC) does both to prepare for and to react to an incident that may cause, or has caused, a loss of electricity. New York and local jurisdiction responders may wish to use the guide contained below to explain an outage to the public. The PSC also addresses the detailed utility response plans as it deems necessary when assessing State options during an incident.

Incident Management for Energy Emergencies

Table 9-1 summarizes the basic activity any EDC may undertake to mitigate outages and then restore power in the event of a storm or other problem affecting the delivery of electricity.

Table 9-1. Typical EDC Incident Mitigation and Response

Action	Explanation
Pre-Incident Preparation and Mitigation	
Planning, Building, Purchasing	• Continually assess electric capacity needs as customer base changes over time • Obtain generation capacity through building or purchase • Create and exercise protocols, working with regional entities, i.e., NYISO, (New York State Reliability Council (NYSRC), and Northeast Power Coordinating Council (NPCC), for emergency power acquisition • Acquire or identify sources of large and difficult-to-obtain equipment for rapid deployment in the event of component failure
Training	• Maintain staff readiness through on-going training and instruction
Protection	• Ensure infrastructure integrity • Build to and maintain NYISO, NYSRC, and NPCC industry standards for quality and operation • Maintain and repair equipment, poles, and lines regularly • Create, maintain, and exercise computer and electronic controls for system operation

Table 9-1. Typical EDC Incident Mitigation and Response

Action	Explanation
	• Instruct and encourage customers on the efficient use of power • Maintain rights-of-way (e.g., vegetation control) • Create and sustain mutual aid agreements among all utilities including municipal retail entities that purchase wholesale power for local distribution • Maintain financial integrity in order to sustain the company's responsibility to deliver power in compliance with State tariffs and rules • Ask customers with critical medical needs to notify the company
Awareness	• Monitor for conditions that may create shortages, interruptions, or other incidents • Analyze system needs and capacity in relation to potential problem, threat, or other potential cause of power loss
Mobilize	• Pre-position repair and technical personnel in advance of known threats such as a weather emergency • Prepare in advance for post-incident logistic support
Post-Incident Actions	

Incident	• Assess
	• Damage and impact of incident, especially:
	  • Backbone feeders
	  • Major trunk lines
	  • Critical users with immediate public health and welfare responsibilities
	  • Medical needs as known
	• Adequacy of rapid response capability
	• Needs (e.g., personnel, repair equipment, replacement parts) for response support in terms of incident response time to completion
	• Range of response steps relating to the incident such as public appeal and on-site and in-company responder adequacy vs. need to call for mutual aid assistance
	• Coordination and collaboration with other utilities or operational entities, local and State government, and consuming public
	• Action
	• Begin action steps as appropriate (may occur prior to assessment)
	• Monitor progress of action taken and make necessary adjustments
	• Report action and restoration progress to PSC and NYISO as appropriate
	• Sustain efforts with logistics support to completion

Evaluation	• Review all aspects of performance in relation to pre-event planning and training • Review incident response in relation to frequency and location of incidents • Collaborate with other stakeholders to enhance future response capability • Make changes to plans and preparatory steps as indicated
Source: EDC web sites and various response plans	

Restoration Priorities for Energy Emergencies

Power restoration is basically dictated by the electricity delivery infrastructure and the location of a problem within each EDC system. An EDC may be required to curtail normal operations in order to conserve a fuel source such as coal that is experiencing a supply disruption.

Table 9-2 shows typical curtailment options that an EDC may choose to employ when faced with an increasingly dire fuel shortage.

Table 9-2. Typical Electricity Restoration Priorities for Energy Emergency Emergencies

Curtailment Due to a Fuel Shortage Affecting Power Generation	
Burn Days	**Action to Take**
45	• Request industrial and commercial customers to voluntarily curtail non-essential power use • Request consuming public to conserve • Request wholesale electric systems (municipals, cooperatives) to implement conservation and curtailment plans
30	• Reduce distribution system voltage by up to 5 percent • Request emergency allocation • Request industrial and commercial customers to substantially reduce power
25	• Buy emergency power
20	• Request emergency back-up fuel
15	• Shut off ("open") selected circuits for short periods of time • Implement rolling curtailment as necessary for non-critical customer circuits

An EDC facing a capacity shortage will also have a variety of curtailment options. Curtailment due to a capacity shortage relates to the loss of either generation or transmission capacity (or both). An emergency plan would define this condition as occurring when a loss of generation capacity or bulk transmission exceeds supply that is available from operating units or for purchase. Table 9-3 lists typical curtailment options that an EDC may elect.

Table 9-3. Typical Electricity Curtailment Actions for Energy Emergency Emergencies

Curtailment Due to Capacity Shortage	
Step	Action taken in order listed [76]
1	Reduce power manually at all company facilities
2	Request wholesale power customers to run all available generation and reduce company power use
3	Request public conservation
4	Request municipal and other dependent systems to implement conservation and curtailment plans
5	Reduce distribution system voltages by up to 8 percent
6	Ask industrial and commercial companies to reduce non-essential power

[76] Note: The order of these steps varies among EDCs. Typically, restoration efforts may follow more than one response path in order to hasten recovery.

Curtailment Due to Capacity Shortage	
Step	Action taken in order listed [76]
7	Implement controlled load tariff load reduction as possible, given the remaining load
8	Request industrial and commercial customers to substantially reduce power
9	Interrupt service to selected circuits for short periods of time Implement rolling blackouts as necessary

Risk, Vulnerability and EDC Response

While the primary State agency working with utilities in New York is the PSC, this EAP is designed to give all potential responders a picture of how the electric utilities and related entities manage emergency risk issues. Risk in an electricity system can be divided into two levels, just as it can for other energy systems: supply and distribution. Each level operates in reference to the other, but this division is a useful way to examine risk and describe how various components of the electric industry prevent, mitigate, or recover from power problems. New York EDCs and others address capacity and interstate marketplace issues on the supply side while being prepared to maintain and restore power on the distribution side. An additional discussion of risk and vulnerability is contained in Section 5 VAR.

Major Issues and Electric Utility Industry Response

PSC Procedures

In order to understand electric utility emergency response activities in New York, it is useful to review the procedures directed by the PSC as they pertain to both mitigation (pre-emergency preparedness and measures) and incident response.

As a part of its foundational responsibilities, the New York PSC regulates IOU's to ensure safe and reliable service at reasonable rates. The PSC has established quality–of-service standards and resource planning guidelines to ensure that the electric utilities have sufficient resources and facilities for safe and reliable operation. Further, as part of its standards, guidelines, and regulations, the PSC ensures that the electric utilities are prepared to promptly restore service in the event of an outage, regardless of the cause.

The PSC provides resource planning guidelines to ensure the existence of adequate supplies of capacity and energy needed to serve each utility's load. In the development and evaluation of resource plans, utilities and the PSC consider a number of factors, including load forecasts, generation and transmission capacity forecasts, peak usage, and weather data.

Further aspects of reliability management occur in metrics used by the PSC to measure the frequency and duration of outages. Using incident measurement indices such as SAIDI and CAIDI; the PSC looks for the frequency and duration of events to understand the underlying cause(s) of an incident. This is seen as especially important in rural areas where circuits serve fewer customers per line mile and thus restoration is relatively more expensive to perform in relation to numbers of customers restored.

PSC staff ascertains whether or not equipment is adequate to meet a given load. It might appear on the surface that new generation is required; however, the PSC may find that there is only a need for balancing existing equipment. Utilities appreciate operational improvements that promote cost-effective electric

delivery. Table 9-4 summarizes representative problems at both the supply and the demand level and illustrates how a typical utility and their related stakeholders could respond.

Table 9-4. Power System Risk and Representative Mitigation and Response

Issue	Stakeholder Actions
Adequate* Generation Capacity *Balances routine supply and demand with sufficient reserve/capability to satisfy peak period needs	NYISO • Study and recommend additions as identified and needed through resource adequacy studies, such as Reliability Needs Assessment • Locate alternate supply • Ensure reliability of existing plants through market participation requirements • Encourage and facilitate new construction • Maintain wholesale system integrity • Use automatic and manual monitoring of power circuits • Maintain NYISO operation facility and infrastructure to highest standards • Train personnel • Coordinate with supply and distribution stakeholders • Inform and coordinate with PSC • Distribution Utilities • Plan for seasonal capacity needs • Build or buy into expanded capacity as forecasted and planned • Exercise energy trading and risk management (ETRM) market tools where applicable • Improve distribution efficiency • Encourage consumers to use energy efficiently • Coordinate with NYISO to ascertain that all generation options have are being sought. • Inform and coordinate with PSC
Adequate Transmission Capacity	NYISO • Study and recommend additions as identified and needed, such as through economic planning studies regarding congestion • Support capital acquisition by utilities to build additional infrastructure • Assist/testify before FERC, the PSC, or other authorities as applicable to support infrastructure improvements • Inform and coordinate with the PSC • Utilities • Coordinate with NYISO and other utilities • Plan and coordinate with PSC • Offer load curtailment programs to appropriate customers PSC • Maintain contacts, assess situation, advise other stakeholders as situation indicates
Critical Infrastructure Protection	All Utilities and NYISO maintain such protection as: • Perimeter protection on major sites • Guard forces • Access control • Back-up command centers • Professional security assistance • Electronic monitoring of transmission and distribution systems

Table 9-4. Power System Risk and Representative Mitigation and Response

Issue	Stakeholder Actions
	• Regular physical inspection and maintenance/upkeep • Meet National Infrastructure Protection Plan (NIPP) definitions and requirements • Training
Cybersecurity	NYISO • Meet NERC, NYSRC, and NPCC requirements • Ensure encryption of important files and documents • Ensure us of diverse redundancy of communication layers • Activate (or establish) a Security Committee Utilities • Follow reliability corporation standards • Actions similar to NYISO's – seen as an evolving issue, still under development • Communicate any sabotage to NYISO, DOE, PSC, local police and/or FBI, federal Department of Homeland Security (DHS), and other public authorities • Extend security extend to distribution feeder level, not below

Potential Causes of Outages
 	
(includes instabilities of equipment such as
 	
generation or transmission equipment failures
Loss of generator fuel supply
Distribution system equipment failures
Weather-related failures
Ice, which is considered as bad if not worse than major coastal storm
Solar flares or eruptions
Solar EMP (occurs on 11-year cycle)
Geological phenomena
Damage from physical or cyber-attacks on the system)
	NYISO
	• Maintain system reserves
	• Employ error dispatch for units on area control to ensure tie line flows at planned levels
	• Ensure spinning reserves are ready to pick up load
	• Establish stand-by reserve
	• Place 24/7 contingency analysis director on-site
	• Call upon reserves/automatic switching as needed
	• Follow operating procedures found in NYISO Emergency Operations Manual and other applicable documents
	• Distribution Utilities
	• Maintain redundant assets
	• Maintain and exercise emergency plans (see below)
	• Consult restoration priority list
	• Revise emergency plans periodically
	• Coordinate with NYISO and regional utilities
	• Meet NYISO, NERC, NYSRC, NPCC, and FERC requirements
	• Meet PSC requirements
	• Monitor
	  • In advance of and throughout major events
	  • Meet daily for small events (e.g., poles, small animals, distribution wires)
	• Move utility repair dispatch assets as needed
	• Call on established mutual aid agreements with IOU and Cooperatives to expand, restore, and repair
	• Communicate with PSC as needed
	• Share certain equipment (e.g., large transformers) as managed per Edison Electric Institute (EEI) or other arrangements
	• Once event is stable, use highly structured damage assessment process
	• Manage restoration and repair using Incident Command Structure
	• Secure equipment back-up, logistics, and emergency rolling stock (especially

Table 9-4. Power System Risk and Representative Mitigation and Response

Issue	Stakeholder Actions
	IOUs) • Monitor Electromagnetic Pulse (EMP) and adjust as needed • Greater hardening would require government support In case of extreme outage Reduce voltage as necessary to avoid extensive system damage such as: • Temporary reduction in amount of voltage • Load shedding • Conduct demand response applicable to distribution utilities and NYISO. • Initiate rotating reductions/curtailment • Effect system blackout

Public Communications

An ongoing source of concern during electricity outage is communications with the public. While utilities work diligently to repair infrastructure, they also face challenges in keeping the public informed and, especially, while responding to complex and severe storm damage. The Public Service Commission responded to concerns about this in New York State following major storms in the summer and fall of 2011. The commission, "urged" utilities "to improve storm performance."[77]

The Commission noted progress among utilities in this regards but made over 100 recommendations for improving communications, restoring power more rapidly and reducing overall outages. Many recommendations focused on utility interactions with local jurisdictions for removing debris and both obtaining and coordinating out-of-state crews entering the state under the aegis of Mutual Aid Agreements with neighboring utilities.

Also cited was the level of communications between utilities and media, in particular the telecommunications. The interface between electricity utilities and wire line companies such as cable and land line telephones was mentioned as well.

Specific recommendations may be obtained from the NY PSC at www.dps.ny.gov by accessing the Commission's Search Section referencing Cases 11-M-0481, 12-E-0283 and 11-M-0595. Information can also be obtained from Commission's Files Office, 14th floor, Three Empire State Plaza, Albany, NY 12223 (518-474-2500). This information is incorporated in this EAP by reference.

The New York Electricity System

This section describes the New York electric market, including its generation and transmission infrastructure, the status of electric choice, and the role of NYISO the PSC and other stakeholders. It also examines reliability issues related to electric markets, such as mandatory reliability standards and electric distribution reliability requirements.

[77] State of New York, Docket No. 12050/11-M-0481; 12-E-0285; 11-M-0595, *Utilities Urged to Improve Storm Performance,* Statewide Review of 2011 Utility Storm Restoration Efforts Completed, June 28, 2012. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BE1F9AB1A-094A-41E8-9F8F-CBB72F372A02%7D.

Consumption

Commercial customers make up the largest electric-consuming segment of New York's electric market, as shown in Table 9-5. The residential sector is the next largest electric-consuming group, followed by industrial and transportation sectors. Residential customers (the average New York household) consume about one-half the electricity of the average U.S. household, largely because few use electricity as their primary energy source for home heating and because demand for air-conditioning is low during the typically mild summer months. [78]

Table 9-5. NY Electric Energy Consumption in 2010 and 10 Year Share Comparison

Sector	Consumption (Million kilowatt-hours)	2000	2010
Commercial	77,276	42.1	53.4
Residential	50,946	30.3	35.2
Industrial	13,480	18.2	9.3
Transportation	2,922	n.a.	2.1
Other		9.4	n.a.
Total	**144,624**	**100**	**100**

Source: EIA, Table 8. Retail Sales, Revenue, and Average Retail Prices by Sector, 2000 and 2004 Through 2010, http://www.eia.gov/electricity/state/newyork/pdf/new_york.pdf

Customer Choice

Electric customers in New York have the choice to purchase electric supply from their local EDC or from an ESCO. In order to facilitate customer choice, the electric utilities' rates have been unbundled into separate electricity delivery and commodity supply charges. Forty-six ESCOs currently exist in New York, serving approximately 36 percent of large industrial customers, 24 percent of small commercial customers, and 14 percent of residential customers. [79] Customers choosing a competitive supplier comprise about 39 percent of statewide consumer load and 16 percent of statewide customer accounts.

Electric choice was introduced in New York in the 1990s. Some of the milestones enabling electric supplier choice include:

- 1992: New York's Home Energy Fair Practices Act was modified to include ESCOs in addition to traditional delivery utilities, ensuring that customers electing ESCOs were afforded the same essential consumer protections as customers supplied from utilities. (Note: The Home Energy Fair Practices Act is applicable to customer choice in the natural gas market as well.)
- 1999: The New York PSC issued Uniform Business Practices for Retail Competition to address certain inconsistencies in retail access rules and procedures. [80]
- 2001: The PSC adopted Uniform Retail Access Billing and Payment Processing Practices. [81]

[78] Energy Information Administration, State Energy Profiles, New York: Analysis, http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=NY.

[79] New York State Energy Plan 2009, Electricity Assessment: Resources and Markets, pp. 25.

[80] PSC Case No. 98-M-1343, In the Matter of Retail Access Business Rules – Order adopting Uniform Business Practices and Requiring Tariff Amendments, issued January 22, 1999.

[81] PSC Case No. 99-M-0631, In the Matter of Customer Billing Arrangements. Case No. 98-M-1743, In the Matter of Retail Access Business Practices – Order Establishing Uniform retail Access Billing and Payment Processing Practices, issued May, 18, 2001.

- 2004: The PSC issued its Statement of Policy on Further Steps Toward Competition in Retail Energy Markets,[82] which identified critical steps to accelerate development of competition in New York's energy markets, including the requirement that the State's largest distribution utilities develop individual implementation plans for the continued development of retail energy markets.
- 2008 - The PSC issued an order directing utilities to continue certain electric choice programs and structures but removing the requirement that customers continue to fund promotional programs regarding choice, unless a particular program could be shown to be beneficial to customers[83] ; (this is applicable to natural gas as well).

Restructured Electric Utility Market

Prior to restructuring, vertically integrated IOUs provided generation, delivery, and customer service. Today, New York's utilities serve primarily as T&D companies with extensive customer service functions. Independent power producers (IPPs) purchased the majority of the utilities' generation assets and now are the primary generation suppliers. New York's electric market also includes governmental utilities, such as NYPA (the largest State public power organization in the United States) and the Long Island Power Authority (LIPA). The State has many municipally owned electric utilities and rural electric cooperatives. In accordance with FERC orders, the Regional Transmission Organization (RTO) for New York manages the State's electricity transmission. The RTO for New York is NYISO. NYISO sets tariffs and rules for transmitting power, but the IOU and IPP are responsible for the reliable operation of the State's nearly 11,000 miles of high-voltage transmission as well as the dispatch of over 500 electric power generators. NYISO also administers the energy, ancillary services, and capacity markets in the State. In summary, the restructured New York electric utility market now consists primarily of the following entities.

- IOUs
- Governmental utilities
- IPPs
- ESCOs
- NYISO
- Residential, commercial, and industrial customers.

TableTable 9-6 shows the capacity and net generation of utilities and IPPs for 2008 and 2010

Table 9-6. New York Energy Production by Sector (2008 & 2010)

Item		Value
	2008	2010
Net Summer Capacity* (megawatts (MW))	38,720	9,357
Electric Utilities	11,784	11,032

[82] PSC Case No. 00-M-0504, Proceeding on Motion of the Commission Regarding Provider of Last Resort Responsibilities, the Role of Utilities in Competitive Energy Markets and Fostering Development of Retail Competitive Opportunities – Statement of Policy on Further Steps toward Competition in Retail Energy Markets, issued August 25, 2004. (Applicable to natural gas as well).

[83] PSC Case No. 07-M-0458, Proceeding on Motion of the Commission to Review Policies and Practices Intended to Foster the Development of Competitive Retail Energy Markets – Order Determining Future of Retail Access Programs, issued October 27, 2008. (Applicable to natural gas as well).

Table 9-6. New York Energy Production by Sector (2008 & 2010)

Item		Value
Independent Power Producers & Combined Heat and Power*	26,936	28,325
Net Generation (megawatt hours (MWh))	140,322,100	136,961,65
Electric Utilities	38,170,043	34,633,325
Independent Power Producers & Combined Heat and Power	102,152,057	102,328,319

Source: EIA, State Electricity Profiles, http://www.eia.doe.gov/cneaf/electricity/st_profiles/new_york.html.

Note: According to the data in previous tables, net generation appears to have dropped about 2 percent from 2008 to 2009.

*Definitions: *Net summer capacity* is "The maximum output, commonly expressed in megawatts (MW), that generating equipment can supply to system load, as demonstrated by a multi-hour test, at the time of summer peak demand" In contrast, *nameplate capacity* is the maximum rated output of a facility under the specific conditions designated by the manufacturer. The nameplate capacity is frequently expressed in megawatts and is usually indicated on a nameplate physically attached to the generator. A *combined heat and power (CHP)* plant is "a plant designed to produce both heat and electricity from a single heat source" – essentially a cogeneration plant.

Source: EIA Glossary, http://www.eia.gov/tools/glossary/

Generation Infrastructure

New York's Largest Generation Plants

New York's largest power plant is its 2,353-MW hydroelectric facility at Niagara. The fuel sources for its next nine largest plants include natural gas, nuclear power, petroleum, and pumped storage, as shown below in Table 9-7. A full list of all of the power plants located in New York, including location, fuel source, and generation capacity is contained in NYISO's *Load & Capacity Data* Report,[84] which is incorporated into this Energy Assurance Plan (EAP) by reference.

New York's nameplate generation capacity in 2008 consisted of:

- 22,568 MW independently owned
- 2,619 MW regulated utility-owned
- 6,635 MW owned by NYPA
- 201 MW owned by municipal electric companies
- 6,690 MW owned by National Grid (facilities formerly owned by KeySpan and LIPA).
- Additionally, an unknown quantity of customer-owned capacity exists to serve the on-site needs of facility owners.[85]

[84] New York Independent System Operator, *2010 Load & Capacity Data*, April 2010. http://www.nyiso.com/public/webdocs/services/planning/planning_data_reference_documents/2010_GoldBook_Public_Final_033110.pdf, pp. 27-59.

[85] NY State Energy Plan, Electricity Assessment: Resource Markets, pp. 11.

Table 9-7. New York's Ten Largest Plants by Generation Capacity (2010)

Plant	Primary Energy Source or Technology	Operating Company	Net Summer Capacity (MW)
Robert Moses Niagara	Hydroelectric	New York Power Authority	2,353
Ravenswood	Natural Gas	TC Ravenswood LLC	2,330
Nine Mile Point Nuclear Station	Nuclear	Nine Mile Point Nuclear Station LLC	1,773
Oswego Harbor Power	Petroleum	NRG Oswego Harbor Power Operations Inc.	1,648
Northport	Natural Gas*	National Grid Generation LLC	1,569
Astoria Generating Station	Natural Gas	U S Power Generating Company LLC	1,296
Roseton Generating Station	Petroleum	Dynegy Northeast Gen Inc.	1,212
Bowline Point	Natural Gas	Mirant New York Inc.	1,139
Athens Generating Plant	Natural Gas	New Athens Generating Company LLC	1,138
Blenheim Gilboa	Pumped Storage	New York Power Authority	1160
		Total:	**15,637**

Source: EIA, Form EIA-860, Annual Electric Generator Report, http://www.eia.gov/electricity/state/newyork/index.cfm

*Northport power station uses fuel oil as a secondary fuel source. Northport was constructed in the 1960s and was thus exempted from certain Clean Air Act requirements. However, as part of its acquisition of KeySpan in 2007 (FERC Docket No. ER10-70), National Grid committed to making certain emission reductions at Northport, including a 40 percent reduction of nitrous oxides, as well as the introduction of new steam turbine technology.

Nuclear Plants

Given their high capacity factor and use as baseload generation, New York's nuclear power plants (listed in Table 9-8) are critical to the State's Energy Assurance.

Table 9-8. New York State Nuclear Plants

Facility	Location (county)	Owner	Summer Capacity (MW)	Current Licensed Expiration	License Extension Application Pending
Ginna	Wayne	RE Ginna Nuclear Power Plant, LLC	581	09-18-2029	
FitzPatrick	Oswego	Entergy Nuclear Fitzpatrick LLC	855	10-17-2034	
Indian Point Unit 2	Westchester	Entergy Nuclear Indian Point	1,022	09-28-2013	20 years
Indian Point Unit 3	Westchester	Entergy Nuclear Indian Point	1,040	12-15-2015	20 years
Nine Mile 1	Oswego	Nine Mile Point Nuclear Station, LLC	630	08-22-2029	
Nine Mile 2	Oswego	Nine Mile Point Nuclear Station, LLC (LIPA owns 18	1,143	10-31-2046	

Table 9-8. New York State Nuclear Plants

Facility	Location (county)	Owner	Summer Capacity (MW)	Current Licensed Expiration	License Extension Application Pending
		percent)			
Source: EIA, State Nuclear Profiles, New York Nuclear Profile 2010, http://www.eia.gov/nuclear/state/newyork/					

Relicensing of Nuclear Power Plants: With the exception of Indian Point Units 2 and 3, all of New York's nuclear power plants have been relicensed in recent years, enabling them to operate for an additional 20 years beyond their original license term. Entergy, the owner of Indian Point Units 2 and 3, has filed applications to relicense. For additional discussion see NYS Energy Planning Board, "Transmission and Distribution Systems Reliability Study and Report", August 2012, pp. 84-85.

Alternate Fuel Plants

New York's hydroelectric generation is the highest of any State east of the Rocky Mountains. The 2,353-megawatt power plant is still New York's largest electricity generator. Non-hydroelectric renewable energy sources contribute only minimally to the State's power grid, although New York is one of the Nation's top generators of electricity from municipal solid waste and landfill gas. New York's photovoltaic solar power capacity is robust and the State became a substantial producer of wind energy by doubling its wind energy capacity between 2006 and 2008. In September 2004, the New York Public Service Commission adopted a renewable portfolio standard requiring 24 percent of the State's electricity to be generated from renewable sources by 2013. [86]

New York's Generation Portfolio

New York possesses a balanced generation portfolio, with fossil fuels, nuclear power, and renewable energy all playing an important role. Fuel diversity benefits New York by mitigating the risk of supply disruptions for particular fuel sources as well as moderating price volatility resulting from fuel price fluctuations. New York's fuel diversity is not guaranteed, however. In recent years, power producers have replaced oil and coal with cleaner-burning natural gas as environmental regulations have become more stringent and, relative to gas, coal and oil have become more expensive. That Indian Point Units 2 and 3 are set to expire in 2013 and 2015, respectively, is also noteworthy when considering the State's fuel diversity.

Measured in terms of capacity, natural gas-fired generation provides the State with the largest fuel resource, followed by petroleum and nuclear energy. Measured by hours of electricity generated, nuclear energy and natural gas are virtually tied, with hydroelectric power and coal following respectively. Table 9-9 shows the capacity of the New York electric power industry, while Table 9-10 lists the State's electric fuel sources by generation type.

[86] Energy Information Administration, State Energy Profiles, New York: Analysis, http://www.eia.gov/state/state-energy-profiles-analysis.cfm?sid=NY and http://www3.dps.ny.gov/W/PSCWeb.nsf/0/1008ED2F934294AE85257687006F38BD?OpenDocument.

Table 9-9. Electric Power Industry Capacity by Primary Energy Source (2008 & 2010)

Fuel Source	Capacity		Percentage Net Generation	
	2008	2010	2008	2010
Natural Gas	16,554	17407	42.8	44.3
Petroleum	7,273	6421	18.8	16.3
Nuclear	5,264	5271	13.6	13.4
Hydroelectric	4,299	4314	11.1	11.0
Coal	2,899	2781	7.5	07.1
Pumped Storage	1,297	1400	3.3	3.6
Other Renewable Energy Sources	1,134	1719	2.9	4.4
Other Gases		45		0.1
Total Electric Industry	**38,720**	**39,313**	**100.0**	**100.0**

Note: - (dash) = Data not available.

Source: EIA, State Electricity Profiles, New York, Table 4, http://www.eia.gov/electricity/state/newyork/

Table 9-10. Electric Power Industry Generation by Primary Energy Source (2008 & 2010)

Fuel Source	Net Electric Generation (rounded thousand MWh)		Percentage Net Generation	
	2008	2010	2008	2010
Coal	19,154	13,583	13.7	9.9
Petroleum	3,745	2,005	2.7	1.5
Natural Gas	43,856	48,916	31.3	35.7
Other Gases	Non reported			
Nuclear	43,209	41,870	30.8	30.6
Hydroelectric and Pumped Storage	26,723	24,942	19.0	18.2
Other Renewable Energy Sources	3,318	4,815	2.4	3.5
Other	987	832	0.7	0.6
Total Electric Industry	**139,992**	**136,963**	**100.0**	**100.0**

Note: - (dash) = Data not available.

Source: EIA, State Electricity Profiles, New York, http://www.eia.gov/nuclear/state/newyork/

For purposes of Energy Assurance, it is notable that 99 percent of generation capacity in New York City and Long Island is fueled by natural gas and/or oil, making those locations more susceptible to natural gas and oil supply disruptions; [87] see discussion in Section 8, Appendix B, Disruption Tracking.

Interdependency

As noted above, an NERC statement issued in December 2011 focused on the growing interdependency of natural gas and the generation of electricity. This discussion coincides with NYISO efforts to address gas-electricity interdependency. This issue also concerns the Northeast Gas Association (NGA) which works closely with regional RTOs to balance the supply and distribution of natural gas during the winter so that contract gas customers do not run short of fuel when gas-fired electricity demand spikes. The NERC study's key findings are summarized here:

- **Key differences exist between the electric and gas industries.** The electric industry is somewhat functionally bundled between supply and delivery. The natural gas industry is structurally unbundled between these functions. This difference requires diligence with regard to long-term planning and communication between regulatory frameworks.
- **Increase coordination** and communication is needed between the electric and gas industries. Information sharing is needed for the reliable operation of the bulk power system.
- **Storage solutions diminish interdependency issues.** Future natural gas storage facilities must satisfy traditional fuel supply reliability demands including day and nights swings in demand
- **Electric loads present unique challenges.** Increasing gas-fired generation will require enhanced support for large concentrated, high pressure variable gas loads.
- **Ample gas supply expected.** Shale gas is likely to make a significant contribution to future natural gas growth in the electric sector.
- **Pipeline expansion to accommodate the electric sector.** Pipeline infrastructure planning must account for the long-term growth of gas-fired generation.

NYISO has developed several new steps to address interdependency. Among these are:

- Explore and visualize with the PSC to increase gas delivery and storage capacity.
- Establish an Electric and Gas Coordination Working Group to increase coordination and enhance long-term planning.
- Begin a study pertaining to the long-range influence and possible challenges of Shale gas production and potential contingencies that may result.

The outcome of this broad planning effort should help the State address electricity reliability through greater coordination, cooperation and focused planning on the increasing interdependency of natural gas supply and the generation of electricity.

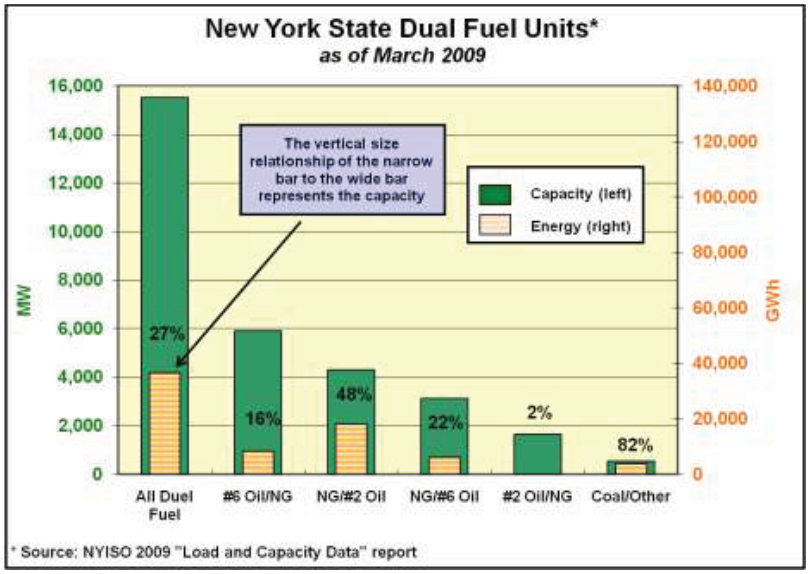
Dual-Fuel Generation

New York's Energy Assurance is aided by the fact that nearly 40 percent of the State's generation capacity is from dual-fuel units, capable of burning an alternate fuel in the event that the supply source for the primary fuel is disrupted. This added diversity provides New York consumers with valuable flexibility for assuring electric reliability, especially if one fuel supply source is compromised.

[87] *2009 NY State Energy Plan*, Electricity Assessment (Resource Markets) pp. 13.

Unlike other parts of New York that demonstrate a high level of fuel diversity, however, New York City and Long Island rely heavily on natural gas-fired generation with oil back-up.[88]. This reliance on fewer fuel sources introduces additional risk with regard to the consequences of natural gas interruptible tariff or supply disruptions. In order to mitigate the risk that a natural gas-fired generator would be unable to stay online, a reliability rule has been adopted that mandates minimum levels of fuel oil to be used for select generators in New York City and Long Island. (Note: The construction of dual-fuel generators has become less common because oil storage facilities and related equipment require significant additional capital and environmental permits and Certificates of Public Convenience & Necessity (CPCNs) frequently require natural gas use in newer units to avoid certain environmental regulations.) Additionally, permits and CPCNs may tightly constrain the number of hours dual-fuel units may run on oil. Figure 9-10 shows New York's dual-fuel capacity units by fuel types as of March 2009.

Figure 9-10. New York's Dual Fuel Units (2009)



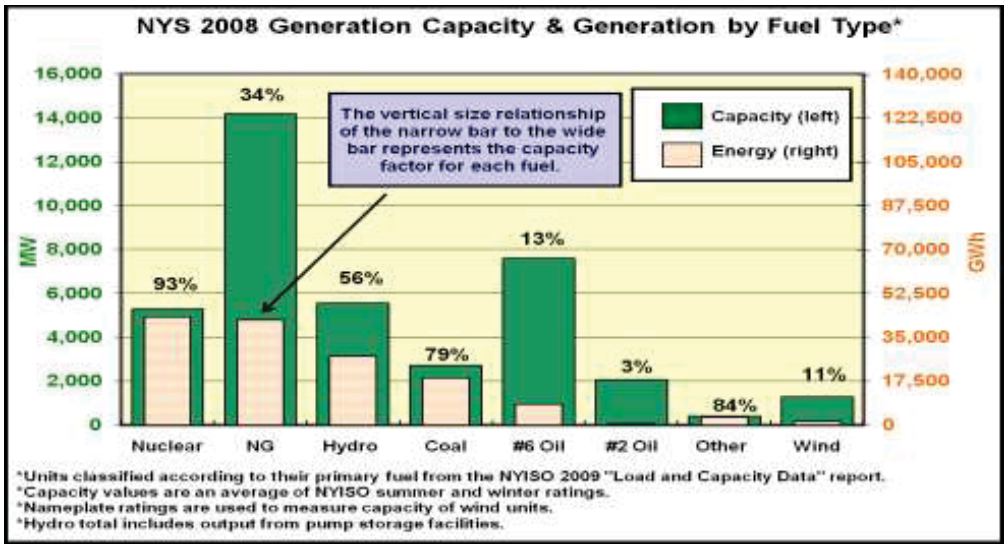
Capacity Factor[89]

The capacity factor for each of New York's primary fuel sources varies considerably. Figure 9-11 shows aggregate capacity (in MW), generation (in GWh), and capacity factors for each fuel type. This information will be updated in the 2013 State Energy Plan.

[88] *2009 NY State Energy Plan*, Electricity Assessment (Resource Markets) pp. 13.

[89] Capacity factor is the ratio of the net electricity generated during a defined time period to the energy that could have been generated at continuous full-power operation during the same period.

Figure 9-11. Aggregate Capacity, Generation and Capacity Factor by Fuel Type (2008)



Source: 2009 NYSEP, Electricity Assessment

New York's natural gas, nuclear facilities, and hydroelectric plants lead the State in capacity factor. Nuclear had the highest in 2008 with an aggregate capacity factor (93 percent) of all fuel types in 2008 [90], with natural gas and hydroelectric power plants following second and third, producing 79 percent and 56 percent capacity factors, respectively. New York's nuclear industry outperformed the national average with regard to capacity factor, with the nuclear industry in the United States averaging a 91.1percent capacity factor in 2008. Over the last few decades, the nuclear industry has dramatically increased its operational efficiency: the capacity factor for the nuclear industry in the United States was 56.3 percent in 1980, 66 percent in 1990, and 91.1 percent in 2008. Given the high capacity factor currently achieved, it is not expected that substantial additional increases in operational efficiency will be made. [91]

The high-capacity factor resources (nuclear, natural gas, and hydroelectric) along with coal constitute New York's baseload generation. On the other end of the spectrum, the capacity factor for No. 6 residual oil in 2008 was 13 percent and for No. 2 distillate oil units, it was only 3 percent. Generating units utilizing No. 2 distillate oil are generally peaking units, but use of both No. 6 residual oil and No. 2 distillate has decreased as oil prices have increased. Even though natural gas is New York's largest resource in terms of generation, it is still very close to nuclear energy for MW hours actually generated because of its lower capacity factor (34 percent). It should be noted that natural gas units had higher operating costs than nuclear, hydroelectric, and coal plants, but this fiscal restraint is diminishing with the advent of lower prices for natural gas as greater shale gas production enters the market.

Renewable Resources

Renewable resources play a significant role in New York's electricity portfolio due to hydropower and their loss would have a noticeable impact. According to EIA, hydroelectric power accounted for 19 percent of New York's generation in 2008 and constituted 11.1 percent of the State's capacity. As noted

[90] An updated State Energy Plan in 2013 may reflect a shift in capacity leadership consistent with the recent switch between nuclear and natural as leading fuels.

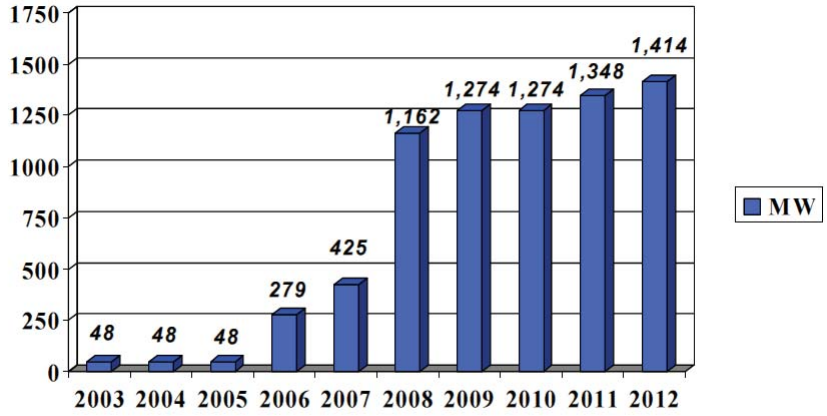
[91] World Nuclear Association, Nuclear Power in the USA, Updated 8 May 2012. http://www.world-nuclear.org/info/inf41.html.

above, the Robert Moses Niagara plant's 2,353-MW capacity is one of the largest hydroelectric facilities in the world. [92] On March 15, 2007, FERC issued a new license to NYPA for the continued operation and maintenance of the Robert Moses Niagara facility. Other renewable energy resources, such as wind, municipal solid waste, and landfill gas, represent 2.9 percent of New York's capacity and 2.4 percent of generation. This data may be updated in the 2013 SEP.

Renewable energy, especially wind energy, has become increasingly important to New York, especially in the State's central, western, and northern regions. Between 2008 and 2009, 13 new power plants came online in the State, eight of which are wind plants that added 851 MW of wind energy capacity throughout upstate New York. With the retirement of certain steam and natural gas-fired generators, 2008 saw a decrease in fossil fuel generation and an increase in renewable energy generation from 2007 [93] In order to fully exploit its wind energy potential, however, New York will need to expand its transmission infrastructure so that the wind farms, generally located in sparsely populated areas, can be connected to population centers with higher load. The State will also need to coordinate with NYISO and other electric utility industry stakeholders to address issues related to more fully incorporating wind energy and other intermittent resources into the grid. This relates especially to ISO requirements for resource availability for ready dispatch when system reliability is at risk and maintaining a higher level of spinning reserves to adjust for variable supply. (NYISO has already addressed many issues related to incorporating a higher percentage of wind energy into its grid. *See*, for example, NYISO's 2008 White Paper, *Integration of Wind into System Dispatch*.)

Figure 9-12 and 9-13 portray the dramatic increase in capacity and generation of wind energy in New York from 2003 to 2009.

Figure 9-12. New York Wind Plants: Historic Installed Nameplate Capacity



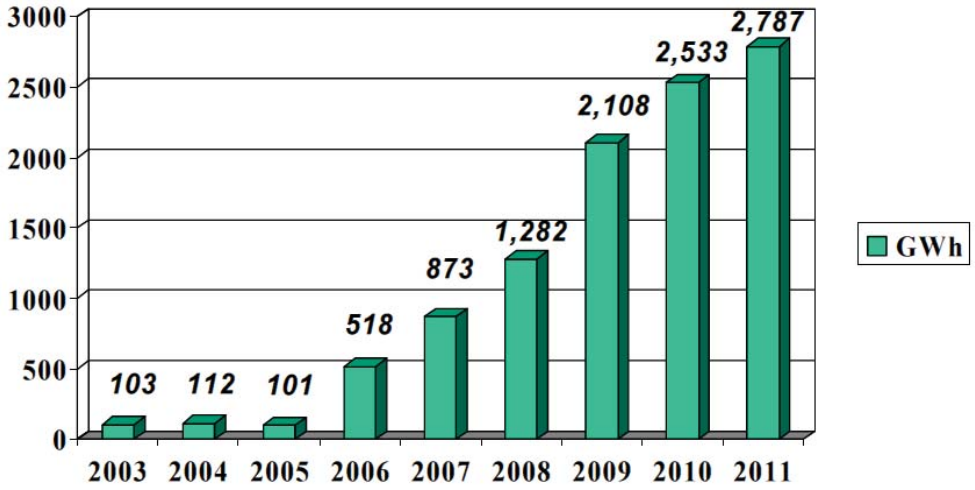
Note: Installed MW values are as of April 2012. Not all wind generation participates in the NYISO Capacity Market.

Source: NYISO 2012 Load and Capacity Data Report, "Gold Book," pp.54. http://www.nyiso.com/public/webdocs/services/planning/planning_data_reference_documents/2012_GoldBook_V3.pdf.

[92] See, EIA: http://www.eia.doe.gov/state/state_energy_profiles.cfm?sid=NY. Note that on March 15, 2007, FERC issued a new license to NYPA for the continued operation and maintenance of the Robert Moses Niagara facility.

[93] NYISO 2009 "Load and Capacity Data Report" pp. 25.

Figure 9-13. New York Wind Plants: Historic Generation



Source: NYISO 2012 Load and Capacity Data Report, "Gold Book," pp.55. http://www.nyiso.com/public/webdocs/services/planning/planning_data_reference_documents/2012_GoldBook_V3.pdf

The loss of all renewable resources would challenge electric reliability in New York. With the exception of the largest hydroelectric plants, many of New York's renewable resources are smaller and decentralized and their simultaneous loss is unlikely. However, conditions such as long-term drought and subsequent water use restrictions, plus short-term fluctuations in wind, could present a threat to the operation of New York's renewable resources. Dam impoundment and adequate spinning reserve from fossil generators help to moderate these risks.

State Policies Promoting Renewable Resources and Energy Efficiency

New York has several programs that promote renewable resources and energy efficiency. Renewable resources reduce the State's reliance on fossil fuels and help diversify New York's electric generation portfolio. Energy efficiency programs reduce electric demand as well, thereby lessening the need to build expensive new infrastructure.

New York also encourages net-metering for systems powered by photovoltaics, wind, biomass, fuel cells, combined heat and power (CHP)/cogeneration, anaerobic digestion, small hydroelectric, fuel cells using renewable fuels, and micro-turbines across many consumption sectors including commercial, industrial, residential, nonprofit, schools, local government, State government, federal government, agricultural, and institutional. [94]

Renewable Portfolio Standard (RPS)

New York adopted its RPS in 2004 in order to promote the development of renewable resources. The initial goal was to increase the amount of renewable electricity delivered to New York consumers to 25

[94] U.S. Department of Energy (DOE), Interstate Renewable Energy Council (IREC), and North Carolina Solar Center, Database of State Incentives for Renewable Energy (DSIRE), "New York: Incentives/Policies for Renewables & Efficiency." http://www.dsireusa.org/incentives/index.cfm?getRE=1?re=undefined&ee=1&spv=0&st=0&srp=1&state=NY.

percent by 2013. However, as a result of anticipated growth in energy efficiency stemming from the State's Energy Efficiency Portfolio Standard (EEPS), the RPS goal was increased. The new goal, launched in 2009, aspires to reduce electricity consumption through energy efficiency measures by 15 percent, while simultaneously meeting 30 percent of the State's electricity supply needs through renewable resources. The Governor also aimed to:

- Create new appliance efficiency standards and set more rigorous energy building codes.
- Invest $295 million for renewable energy projects throughout the State.
- Propose power plant siting legislation that creates an expedited review process for new wind power projects, re-powering projects that reduce emissions, and other power plants that have very low levels of carbon dioxide emissions.

Energy Efficiency Portfolio Standard (EEPS)

The PSC issued a decision on June 23, 2008 that established the New York EEPS proceeding. The EEPS is designed to reduce the State's electricity usage 15 percent of forecast levels by the year 2015, with comparable results in natural gas conservation. In order to achieve those goals, the Commission established interim targets and funding through the year 2011. Additionally, the State's utilities were directed to file energy efficiency programs. NYSERDA, as well as independent parties, were invited to submit energy efficiency program proposals for Commission approval. Between June 2009 and January 2010, the PSC approved 45 electric energy efficiency and 44 gas efficiency programs, including such programs as residential HVAC, appliance recycling, industry process efficiency, new construction, and distributed generation.

Imported Power

New York State is bounded by the Hydro Quebec control area to its north, the Ontario control area to its west, the New England control area to its east, and the Pennsylvania, New Jersey, and Maryland Interconnect (PJM) control area to its south. NYISO coordinates operations with the neighboring Hydro Quebec, Independent Electricity System Operator (IESO) of Ontario, Independent System Operator of New England (ISO-NE), and PJM. Over the last several years, New York has been a net importer of electricity from neighboring States and Canada. The State's ability to trade power between control areas and provide mutual support during emergency conditions improves system reliability throughout New York and coordinating regions.

The amount of electricity New York can import is constrained by the transfer capability between the State and each of these control areas, as shown in Table 9-11.

Table 9-11. Border Transfer Limits

Control Area	NY Import Limit (in MW)	NY Export Limit (in MW)
Hydro Quebec	1,500	1,000
ISO New England	1,200	1,525
PJM	1,500	2,000
Independent Electricity System Operator (IESO) (Ontario)	1,450	1,550

Control Area	NY Import Limit (in MW)	NY Export Limit (in MW)
Source: NYISO 2009 Reliability Needs Assessment		

According to NYISO, the total capacity available to New York is approximately 43,000 MW – 37,416 MW of in-State resources and 2,645 MW of import capability. [95] As the second largest exporter of electricity in the world Canadian electric imports are primarily generated by hydroelectric plants in Quebec, Ontario (and British Columbia). As observed by EIA, the Canadian and U.S. electricity markets are highly integrated, containing multiple transmission lines that cross the international border between the two countries; hence Canadian electricity resources enhance electric reliability for New York. [96]

Table 9-12 shows New York's total international imports, total international exports, and net interstate trade. The State's net imports vary considerably from year to year; however, New York's ability to trade with neighboring ISOs and Canada improves its energy reliability and abets Energy Assurance.

Table 9-12. International Imports, Exports, and Net Interstate Trade (in Million Kilowatt Hours)

Year	Total International Imports	Total International Exports	Net Interstate Trade
1990	3,802	3,090	-5,694
1991	3,259	202	-4,330
1992	3,530	477	-12,407
1993	5,768	222	-13,739
1994	12,971	190	-4,835
1995	9,002	103	-1,974
1996	7,511	462	-2,579
1997	3,045	1,495	-2,910
1998	2,500	1,674	-1,536
1999	3,170	2,193	-6,567
2000	10,663	2,000	-9,721
2001	11,845	4,083	-733
2002	14,075	3,111	-8,281

[95] NYISO's Power Trends 2010, pp. 4, http://www.nyiso.com/public/webdocs/newsroom/power_trends/powertrends2010_FINAL_04012010.pdf.

[96] http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html.

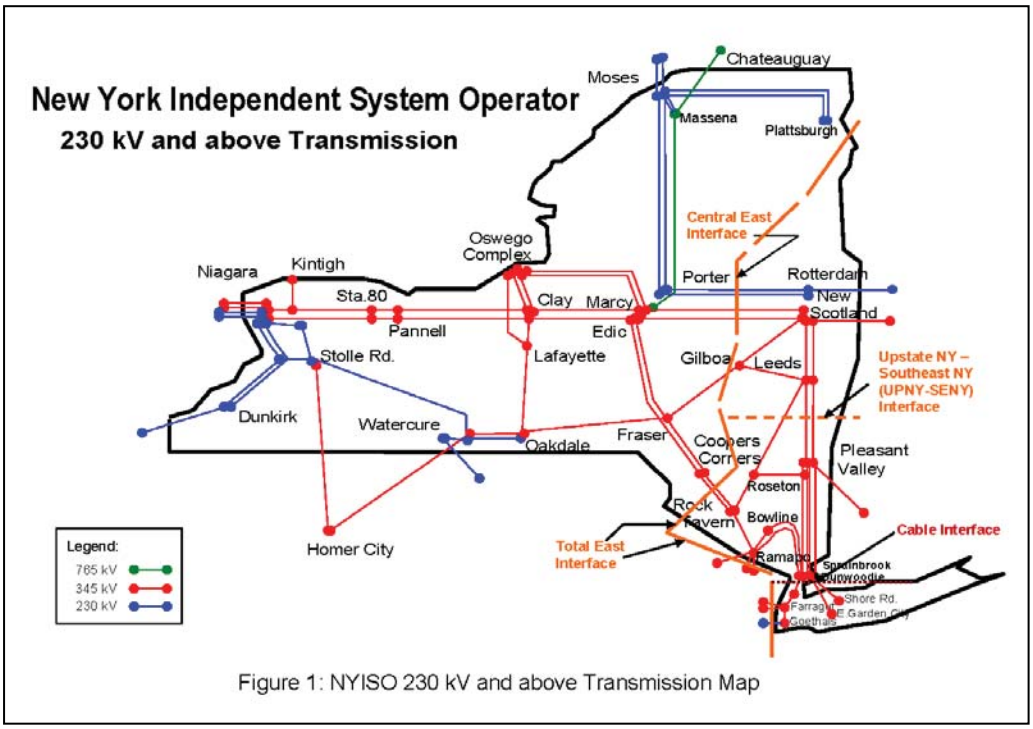
Year	Total International Imports	Total International Exports	Net Interstate Trade
2003	10,000	4,511	-12,532
2004	9,458	4,264	-21,281
2005	10,717	3,416	-11,768
2006	12,495	2,510	1,595
2007	14,366	3,078	-1,600
2008	16,678	3,361	-851
2009	11,254	1,459	-7,606
2010	9,373	2,343	-10,746
Source: EIA, State Electricity Profiles, 2010, January 2012 -New York, pp.198.http://www.eia.gov/electricity/state/newyork/http://205.254.135.7/electricity/state/pdf/sep2010.pdf			

New York's Electric Transmission System

Electricity is transmitted at high voltages in order to minimize power loss over large distances. According to NYISO, New York possessed 10,877 miles of transmission line in 2010, with 1,290 MW of transfer capability added since 2000. [97] In New York, sub-transmission occurs at several levels including 69 kV, 46 kV, 34 kV, and occasionally 115 kV. Voltages of 27 kV and 13 kV are generally used for distribution to consumers who typically take power at 120 V and 220 V. Figure 9-14 shows New York's largest transmission lines, which operate at 230 kV, 345 kV, and 765 kV. The many smaller transmission lines operating in the State, such as its 115-kV and 138-kV lines are not displayed because of their great number. However, a comprehensive list of all the State's transmission facilities is provided by NYISO in its 2010 Load & Capacity Data Report at pp. 75-108 and incorporated to this EAP by reference.

[97] http://www.nyiso.com/public/webdocs/newsroom/power_trends/PTrends_2010_-_By_The_Numbers_FINAL.pdf,

Figure 9-14. New York's 230 kV and Above Transmission



Source: NYISO 2009 Comprehensive Reliability Plan
Note: orange represents the limits of the Central East interface

Independent System Operators (ISOs)

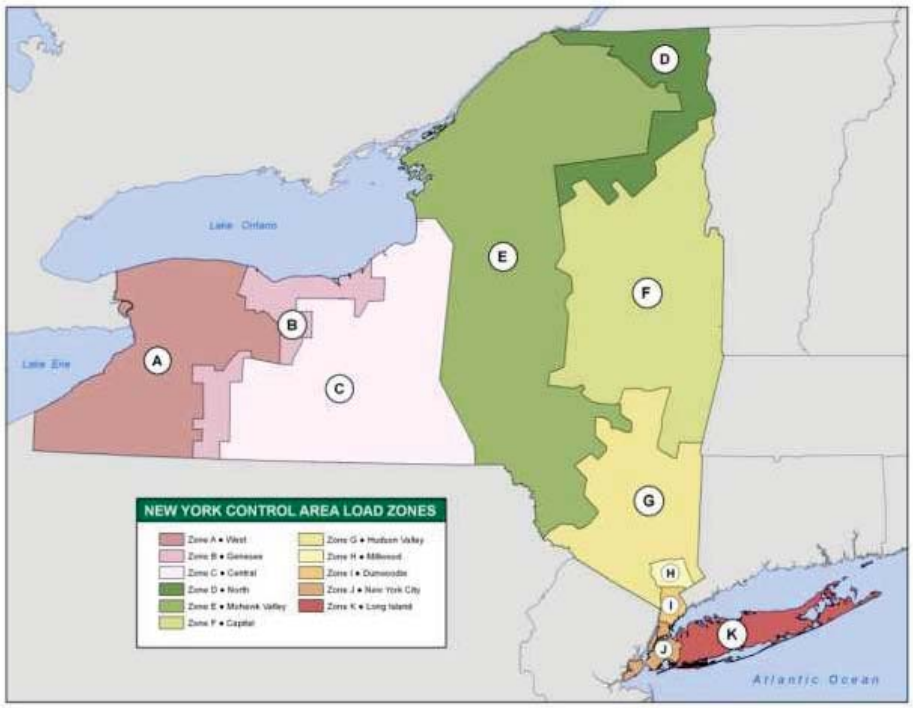
The role of NYISO has been noted many times throughout this Section. This sub-section provides greater detail about the role of the ISO in supporting electric reliability in New York.

FERC actively encouraged the development of ISOs in order to foster competition through non-discriminatory open access transmission service for electricity transactions. Open access requires that owners and/or operators of the transmission lines do not give any preference or deny the use of their transmission services to any sellers or purchasers of electricity. ISOs were also designed to reduce barriers, simplify fee structures, and develop common rules, rates, and service requirements. As such, ISOs are capable of introducing heightened efficiencies into the electricity transmission system. Among other benefits, the pooling of electric power and capacity has enabled utilities to reduce the level of reserves they need to ensure reliability when contingencies arise. An Energy Imbalance Service (EIS) market, with a central, independent operator, efficiently and quickly locates and schedules needed power, reduces some of the need for the expense of additional generation, lowers market transfer costs, and improves regional system reliability.

NYISO

As noted above, NYISO is an independent, not-for-profit organization that maintains functional control of New York's electric transmission system. NYISO works with individual utilities to monitor and control the electric system in order to ensure that the production of electricity is constantly balanced with electric demand, that voltage, thermal and other limits are not exceeded, and that system reliability is maintained. NYISO also administers the electric energy, ancillary services, and capacity markets in the State. Figure 9-15 depicts the NYISO zones of the NYCA.

Figure 9-15. New York Control Area Load Zones



Source: 2009 NYSEP, Electricity Assessment

While NYISO maintains operational control of the transmission system in order to ensure that generators have open, non-discriminatory access to move power throughout the State, NYISO, as noted above, does not own the transmission system. Instead, New York's utilities retain ownership of the transmission facilities. For Energy Assurance purposes, it is important to note that the utilities have ultimate responsibility for the maintenance, hands-on operation (based on directions from NYISO and the PSC), and upgrades of their transmission assets.

Operation and Dispatch

NYISO coordinates the operation and dispatch of the generating facilities in the State, electricity imports into the State, and the flow of electricity across the bulk power transmission system. It dispatches power with lower-cost power sent first, followed by increasingly higher-cost power. This ability to dispatch generated power is also a tool for mitigating shortage and outage. NYISO monitors power generation continuously and can dispatch it as needed, essentially instantaneously in many instances, to maintain load when existing generation is interrupted suddenly.

Specific Functions of NYISO

NYISO defines its core responsibilities to include the following:

- Reliability: Managing the efficient flow of power on high-voltage transmission lines from hundreds of generating units on a minute-to-minute basis.
- Markets: Administering New York's $11 billion wholesale electricity markets.

- Planning: Conducting long-term assessments of New York's electricity resources and needs and evaluating the feasibility of projects proposed to meet those needs.
- Technology: Developing state-of-the-art technology to sustain and enhance the performance and efficiency of the power grid and electricity markets serving New York State.

NYISO and Energy Assurance

The Energy Markets

NYISO administers a day-ahead and a real-time market for electricity, with approximately 95 percent scheduled in the day-ahead market and the remaining 5 percent accounted for in the real-time market. Most large electric generators require advanced notice to start up. NYISO enables generators to receive operating schedules ahead of time by operating a financially binding day-ahead market. The real-time market, however, permits NYSIO to efficiently and economically balance unanticipated system changes that occur regarding load and generation.

Ancillary Services Markets

NYISO runs competitive markets for key ancillary services that are required to support the power system, such as identifying reserves and assuring balanced voltage management. NYISO has opened these markets to include demand-side providers. Reserve resources provide fast ramping power in the event of problem such as a unit or line trip. Regulated resources are quickly adjusted to match voltage output frequency and consumption in response to constantly changing load.

The Long-Term Capacity Market

In order to ensure that sufficient resources are available to meet long-term projected load, NYISO administers a capacity market that matches buyers and sellers of capacity using a clearing price methodology. The capacity market has a locational element that addresses the constrained nature of New York's transmission system by requiring that loads in New York City and Long Island buy a certain percentage of their capacity from suppliers in those areas.

Demand Response

NYISO supports a number of programs designed to encourage reductions in usage based on economic or reliability signals. For example, NYISO has witnessed a significant increase in the registration of participants in its Special Case Resource (SCR) programs, which have effectively reduced the need for additional capacity resources based on customer pledges to reduce energy usage on demand. In 2011, NYISO had registrations of approximately 2,084 MW of SCRs, representing a 58 percent increase from the 1,323 MW of resources included in the 2008 Reliability Needs Assessment.[98]

The Financial Markets

NYISO administers financial markets in order to increase liquidity and improve market efficiency. Participants may purchase Transmission Congestion Contracts (TCCs) through an auction process, which

[98] NYISO 2009 Comprehensive Reliability Plan pp. 3.

allow purchasers to lock in a congestion cost payment.[99] TCCs are designed to satisfy the FERC requirement of providing firm transmission service. Participants may also purchase financial instruments, which enable participants to buy or sell power at the day-ahead price and then sell or buy it back at the real-time price, without producing or taking delivery of electricity.

Reliability Planning

NYISO forecasts and plans for changes in electric demand, as well as construction and retirement of generation and transmission assets, in order to ensure the reliable operation of the grid and the efficient operation of the markets. As part of its planning process, NYISO engages stakeholders in the Reliability Needs Assessment (RNA), which assesses the future reliability of New York's bulk power system in a ten-year forecast. The RNA evaluates potential shortfalls and solutions, and considers generation, transmission, and demand-side management solutions on a comparable basis. NYISO then develops the *Comprehensive Reliability Plan* (CRP),[100] which sets forth the plans and schedules to be implemented to meet the needs anticipated in the RNA.

NYISO's 2009 RNA determined that there were no reliability needs anticipated through 2018, assuming that the currently proposed market-based solutions and planned transmission upgrades are realized and that other assumptions, such as continued SCR participation and a reduction in peak load forecast and planned retirements remain accurate. The 2009 CRP accordingly found that New York's electric system will remain reliable through 2019. NYISO emphasizes that this conclusion is based on numerous assumptions and that all stakeholders must continue to vigilantly monitor the reliability of the electric system. An example of uncertainties in the RNA is that carbon emissions fees could affect New York's generation landscape. The State is a member of the Regional Greenhouse Gas Initiative (RGGI) [101] and has faced higher carbon allowance prices as CO_2 emissions requirements have become more stringent. If national cap–and-trade legislation is passed, fossil fuel units such as New York's coal plants could face significant pricing pressure.

Economic Planning

NYISO utilizes its Congestion Assessment and Resource Integration Study (CARIS)[102] to evaluate congestion on New York's transmission system and assess the relative costs and benefits of projects to alleviate that congestion. Approval for a specific project requires that 80 percent or more of the weighted vote of beneficiaries vote in favor.

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[99] *Electricity Transmission Congestion Costs*: A Review of Recent Reports, B.C. Lesieutre & J.H. Eto, Ernest Orlando Lawrence Berkeley National Laboratory, University of California Berkeley, Berkeley, CA, October 2003. "Congestion costs arise when, in order to respect transmission constraints, some higher cost generation is dispatched in favor of lower-cost generation that would otherwise be used (in the absence of the constraint)." http://certs.lbl.gov/pdf/54049.pdf.

[100] NYISO's *2010 Comprehensive Reliability Plan*, http://www.nyiso.com/public/webdocs/services/planning/reliability_assessments/CRP_2010_FINAL_REPORT_January_11__2011.pdf.

[101] For more information on RGGI, see http://www.rggi.org/.

[102] The 2001 study is available at http://www.nyiso.com/public/webdocs/committees/bic_espwg/meeting_materials/2011-12-22/CARIS_Draft_Report_12-20-11_changes_to_posted_version.pdf.

Transmission Studies & Interconnection Projects

NYISO provides expert engineering studies, models, and databases to support continuing infrastructure development in the New York electric system and supports reporting and compliance efforts related to the NERC, the NPCC, and the NYSRC.

Compliance

NYISO is committed to ensuring full compliance with the business and reliability standards that have been established by its regulators, including

- NERC's reliability standards related to the operations and planning of the bulk power system,
- the requirements of the NPCC and the NYSRC regarding regional reliability issues, and
- the business standards of the North American Energy Standards Board, relating to functions such as OASIS (Open-Access Same-Time Information System) postings to Gas and Electric Coordination.

NYISO participates actively in the stakeholder process of each of these entities and supports their efforts to create a reliable electrical grid in New York and throughout North America.

Emergency Procedures

NYISO-related emergency management procedures are contained above in the Emergency Procedure section.

Reliability NERC and Mandatory Reliability Standards

NERC is the Electric Reliability Organization (ERO) certified by FERC to help maintain and improve the reliability of North America's bulk power system by proposing new electric reliability standards and enforcing approved reliability standards. The standards apply to all "users, owners, and operators of the bulk-power system" in the continental United States, including New York entities.

The August 2003 Regional Blackout

The genesis for NERC's mandatory standards was the August 14, 2003 blackout that affected roughly 50 million people throughout all or parts of New York, Ohio, Michigan, Pennsylvania, New Jersey, Connecticut, Massachusetts, Vermont, and the Canadian provinces of Ontario and Québec. This blackout caused economic loss across the region estimated at from $4 to $10 billion. Almost the entire State of New York lost power and all six of the State's operating nuclear plants were shut down. In the wake of this blackout, the U.S. Congress passed the *Energy Policy Act of 2005* that required FERC to certify an ERO to establish and enforce mandatory reliability standard.

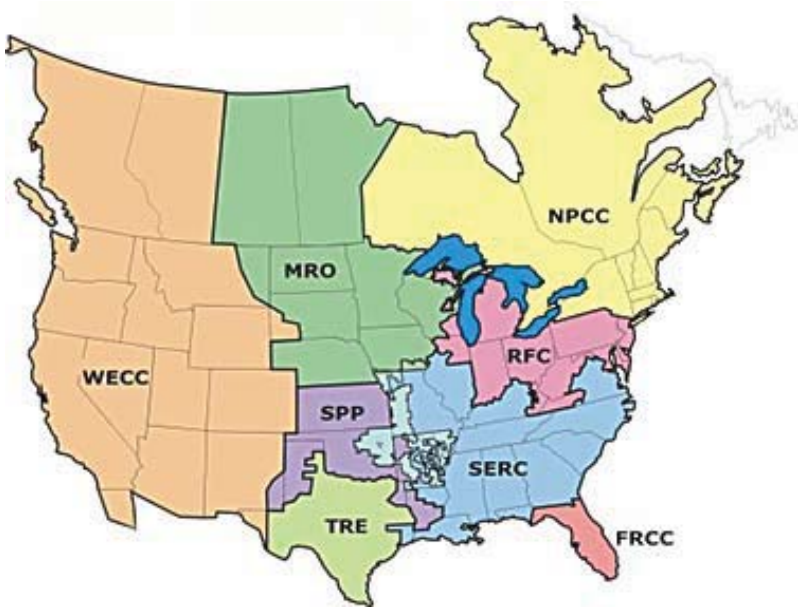
Reliability Assurance Structure

While NERC had previously facilitated the development of voluntary reliability standards, the standards did not become mandatory until June 18, 2007; after FERC issued Order No. 693 approving 83 of NERC's proposed 107 reliability standards. Those mandatory and enforceable standards exist in 13

separate areas, including resource and demand balancing, critical infrastructure protection, transmission operations, and transmission planning. [103]

New York electricity management falls within the NERC structure including regional councils that work closely with groups of States and Canadian provinces. NPCC encompasses New York, New England, and eastern Canada to promote and improve the reliability of the regional bulk power system. FERC has approved a delegation agreement between NERC and the NPCC whereby the NPCC oversees and enforces compliance with NERC and NPCC standards within its region. It is also common for regional entities to have additional standards that apply directly to their regions. Utilities in New York must abide by these as well as the standards set out by NERC. Figure 9-16 illustrates the NERC regions.

Figure 9-16. NERC Regions Map



Source: NERC, "Key Players: Regional Entities," http://www.nerc.com/page.php?cid=1%7C9%7C119

The NYSRC is a not-for-profit organization that promulgates reliability rules and monitors compliance regarding the New York bulk power system. NYSRC evaluates and sets the installed reserve margin (IRM) for New York annually that is set at 16.5 percent in excess of the NYCA summer peak demand forecast. NYISO uses the IRM in conjunction with the forecast peak load to establish minimum capacity requirements for each load-serving entity (LSE) located within the NYCA.

New York State Reliability Requirements

As mentioned, the reliability standards enforced by NERC apply to all "users, owners, and operators of the bulk-power system" in the continental United States, so New York's EDCs must comply with reliability standards just as NYISO does. NERC maintains a listing referred to as the Compliance Registry of all entities that can "materially impact the reliability of the bulk-power system" and for whom the standards are applicable. NERC has also listed fourteen "functional categories" for which reliability

[103] For more information on NERC's reliability standards, see http://www.nerc.com/page.php?cid=2%7C20.

standards apply. New York EDCs fall into one or more of those categories, such as distribution provider, generator operator, generator owner, load-serving entity, purchasing-selling entity, transmission owner, transmission operator, and transmission service provider.

Reliability is enhanced also by PSC requirements that electric utilities file emergency response plans. Such plans contain communication protocols for public information and working with the PSC during emergencies. [104] While public power authorities are generally exempt from FERC jurisdiction, they have voluntarily agreed to participate in the NYISO-administered markets and are thus subject to the terms of the NYISO tariff, including the reliability requirements contained therein.

Constraints in New York's Transmission System

NYISO monitors and records transmission congestion on its system and publishes the list of major constraints in its annual *Reliability Needs Assessment.* According to NYISO, the major constraint within the State exists across the Central-East Interface located between the northwest and southeast portions of the State. The next most significant constraint is the Pleasant Valley-Leeds 345 kV line, between the upper and lower Hudson Valley areas. In 2008, the Central-East Interface accounted for 46 percent of the total congestion in New York, while the Pleasant Valley-Leeds line accounted for 27 percent of the total. Overall, the annual gross congestion costs to New York increased from $86 million in 2003 to $243 million in 2008. [105]

As New York's load continues to grow, it will have to address whether to upgrade transmission facilities for greater east to west to south flow of electricity or whether to attempt to build generation closer to the centers of demand. Table 9-13 shows the State's annual electric growth rate has increased at a faster rate downstate than upstate.

Table 9-13. Historic Annual Electric Growth Rate

Historic Annual Energy by Zone - GWh

Year	A	B	C	D	E	F	G	H	I	J	K
2002	16,355	9,935	16,356	6,450	7,116	11,302	9,970	2,162	5,962	51,356	21,544
2003	15,942	9,719	16,794	5,912	6,950	11,115	10,451	2,219	6,121	50,829	21,960
2004	16,102	9,888	16,825	5,758	7,101	11,161	10,696	2,188	6,216	52,073	22,203
2005	16,498	10,227	17,568	6,593	7,594	11,789	10,924	2,625	6,435	54,007	22,948
2006	15,998	10,003	16,839	6,289	7,339	11,337	10,417	2,461	6,274	53,096	22,185
2007	16,258	10,207	17,028	6,641	7,837	11,917	10,909	2,702	6,344	54,750	22,748
2008	15,835	10,089	16,721	6,734	7,856	11,595	10,607	2,935	5,944	54,835	22,461
2009	15,149	9,860	15,949	5,140	7,893	10,991	10,189	2,917	5,700	53,100	21,892
2010	15,903	10,128	16,209	4,312	7,906	11,394	10,384	2,969	6,264	55,114	22,922
2011	16,017	10,040	16,167	5,903	7,752	11,435	10,066	2,978	6,208	54,060	22,704

Legend: Upstate = Zones A through G; Downstate = Zones H through K
Source: NYISO "Gold Book, 2012, Load and Capacity Data Report, Table I1, Historic Requirements, pp.20, http://www.nyiso.com/public/webdocs/services/planning/planning_data_reference_documents/2012_GoldBook_V3.pdf

[104] 16 NYCRR § 105.

[105] NY State Energy Plan, Energy Infrastructure Issue Brief pp. 23.

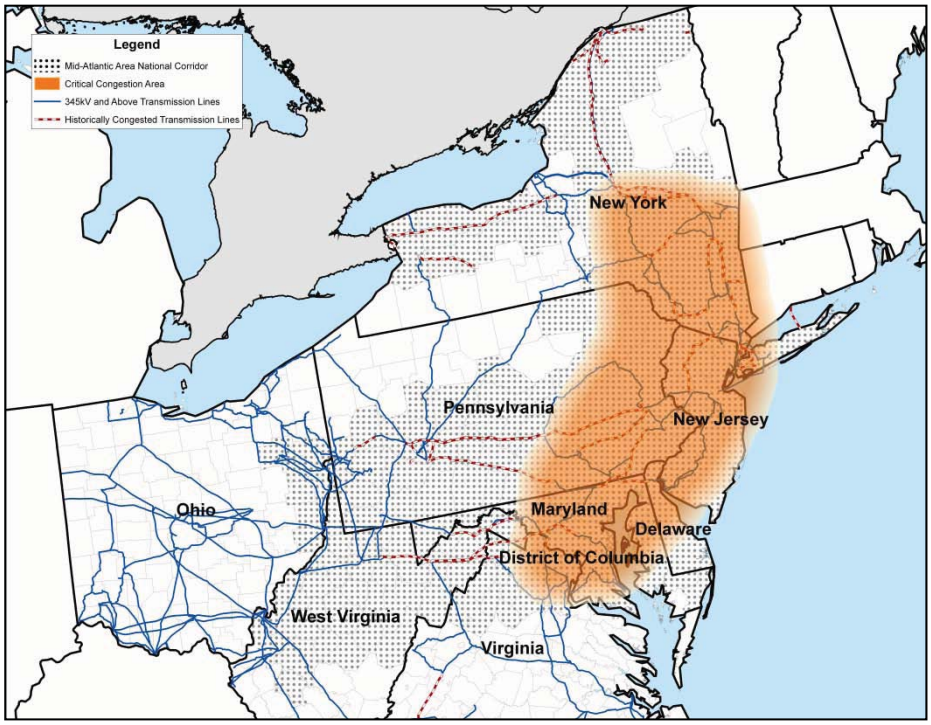
National Interest Electric Transmission Corridors

On a regional scale, Congress and the DOE have acted to locate and address congestion in electricity transmission. The *Energy Policy Act of 2005* required DOE to conduct a nationwide study of electric transmission congestion and to report the findings. On October 2, 2007, DOE issued an order designating two National Interest Electric Transmission Corridors (NIETC):

- the Mid-Atlantic Area National Corridor (including some or all of Delaware, Ohio, Maryland, New Jersey, New York, Pennsylvania, Virginia, West Virginia, and D.C.
- the Southwest Area National Corridor (including seven counties in Southern California and three counties in western Arizona).

Figure 9-17 shows the Mid-Atlantic Area National Corridor

Figure 9-17. Mid-Atlantic National Interest Electric Transmission Corridor



Source: DOE, National Interest Electric Transmission Corridors and Congestion Study, NIETC Mid-Atlantic Area Corridor Map.
http://nietc.anl.gov/documents/docs/NIETC_MidAtlantic_Area_Corridor_Map.pdf

The designations became effective October 5, 2007 and will remain in effect until October 7, 2019 unless DOE rescinds or renews the designation. [106] DOE found that if action is not taken to address congestion in these areas, consumers in the covered areas (including southeast New York) could face threats to the reliability of their electricity supply.

Within the State, DOE designated the New York counties shown in Table 9-14 to be within the corridor.

[106] DOE's National Electric Transmission Congestion Report and Order, Docket No. 2007–OE–01, October 5, 2007, 72 F.R. 56992.

Table 9-14. New York Counties Designated by DOE to be Within the Corridor

Albany	Genesee	Niagara	St. Lawrence
Bronx	Greene	Oneida	Saratoga
Broome	Herkimer	Onondaga	Schenectady
Cayuga	Jefferson	Ontario	Schoharie
Chenango	Kings	Orange	Seneca
Clinton	Lewis	Orleans	Suffolk
Columbia	Livingston	Otsego	Sullivan
Delaware	Madison	Putnam	Ulster
Dutchess	Monroe	Queens	Wayne
Erie	Montgomery	Rensselaer	Westchester
Franklin	Nassau	Richmond	Wyoming
Fulton	New York	Rockland	

FERC Backstop Siting Authority

The NIETC designation enables FERC, under certain conditions, to approve siting and construction of transmission facilities within the corridor. State authorities will continue to have primary responsibility for deciding how to resolve transmission congestion problems, evaluating transmission projects, and siting transmission facilities. However, for the first time, the *Energy Policy Act* gave FERC authority to site a transmission line within a corridor if the State has not acted within one year regarding a proposed transmission line, or has approved the line within one year but included onerous conditions. Specifically, FERC is authorized to site a transmission line if the agency finds that the proposed project:

- Is eligible for a construction permit issued by FERC.
- Is located in a National Corridor designated by DOE.
- Will be used in interstate commerce.
- Is in the public interest.
- Will reduce transmission congestion significantly and protect and benefit consumers.
- Is consistent with sound national energy policy and will enhance energy independence.
- Will maximize the use of existing towers or structures, to the extent reasonably and economically possible.

FERC siting power, unlike the PSC's, is not constrained by the Public Service Law Article VII requirement that the facility represents the minimum adverse environmental impact.

Time Frame for Siting Transmission Lines

Siting of transmission lines is historically time-consuming. In addition to Article VII, the PSC's siting review regulations require applicants to have completed a System Reliability Impact Study pursuant to NYISO's interconnection approval process. NYISO has indicated that its entire interconnection process takes from 27 to 52 months, with the majority of its reviews requiring between 36 and 38 months.

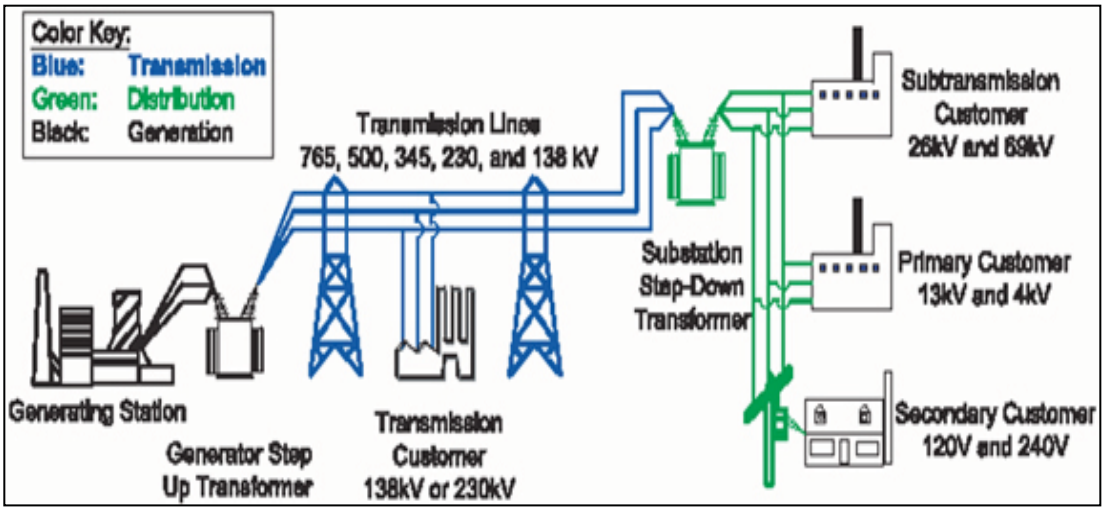
A full list of the transmission expansion projects proposed for the State of New York is contained in the NYISO 2009 *Comprehensive Reliability Plan*.[107] That list is incorporated to this EAP by reference.

Electricity Distribution in New York

As discussed in Section 6.5.2, 6.5.2 Stakeholders and Authorities, regulated EDCs are subject to requirements established by statute and are regulated by the PSC. As discussed above, the State is affected by rulings made by FERC and standards set by NERC. PSC officials work continually with the EDCs to enhance distribution system operations and maintenance in order to ensure reliable service.

Figure 9-18 illustrates a typical electric system. Like the generating and transmission systems, distribution is deceptively simple from the customer's perspective. However, it is the consumption of electricity at the distribution level that provides the basic data required to plan for capacity. Behind the wall switch and meter are wires carrying several levels of kilovolts as power is stepped down by sub-station transformers from high-voltage, long-range transmission to voltage levels for various local distribution lines. Complex transformers also step-up power for long-range transmission as it leaves the generating plant. The local distribution system contains a network of infrastructure from poles to junction boxes to the wires and meter at the end user's location. Utilities also operate complex communication networks for routine and emergency operations, control rooms to monitor network activity, maintenance and repair shops, equipment, and trained personnel plus an accounting and billing operation to ensure that electrons are accounted for when purchased.

Figure 9-18. Electric System Diagram



Source: U.S. DOE, OE, This illustration is no longer available at the OE web site. However, it is retained here because it contains a great deal of explanatory information. More information is available from OE at http://energy.gov/oe/information-center/educational-resources/electricity-

The DOE diagram illustrates an additional level of complexity that will help stakeholders unfamiliar with the electricity system understand potential issues in electricity distribution. Some industrial users receive power directly from high-voltage transmission lines and maintain end-use transformation off-grid. The diagram also illustrates two additional levels: small industry and commercial/institutional users. These customers may obtain favorable bulk rates applicable to their size and demand.

[107] NYISO, *2009 Comprehensive Reliability Plan*, pp. 113-114. http://www.nyiso.com/public/webdocs/newsroom/planning_reports/CRP__FINAL_5-19-09.pdf.

The last element of the distribution system is residential service. The restoration of electrical outage affecting residential customers may convey the appearance of discrimination and favoritism due to repair protocols. Utilities have found that, after addressing health and safety issues, it is expeditious to first restore T&D lines that reach the most customers the soonest. This means that customers on a heavily used line generally will have power restored before others. Emergency responders should understand that there may be exceptions related to such factors as storm destruction patterns, complexities in coordinating vegetation and electrical repair crews and other logistical issues.

EDCs assess outage location and scope after any disruption or incident. Incidents that occur only in a smaller sub-system typically result in more rapid restoration than incidents that occur at or near the bulk power level. This is because it may take more time to repair complex large-scale components that must be restored before local distribution needs can be addressed.

Data Collection and Analysis

New York utilities regularly collect survey data pertaining to electricity reliability based on outage recording and detection systems. New York EDCs use the System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI) to monitor loss of power over time.[108]

Following major incidents such as storms, PSC staff will carry out informal and formal staff-level analyses to determine if EDCs used appropriate preparation, processes, mutual aid, and resources first to mitigate outages and then to restore power. Reports, or even formal docket hearings, may follow such analyses.[109] The PSC maintains liaison with each utility to ensure the flow of information and to handle special requests. The PSC also maintains liaison with NYISO, which also does extensive contingency planning.

9.2 Natural Gas

The State has approximately 4.7 million natural gas customers served by 18[110] local gas distribution companies (LDCs). The LDC natural gas franchise territories branch out from the more densely populated areas of New York. There are many rural areas in the state that do not have natural gas service for a variety of reasons.

LDCs deliver natural gas to their customers on either a firm or interruptible basis. Customers may also choose to purchase the commodity from an LDC or another provider. Firm deliveries are generally provided to residential and small commercial and industrial customers that do not have alternative fuel burning capability. Interruptible delivery service is not guaranteed and is used by larger customers; e.g., multifamily buildings, and commercial and industrial customers that have alternate fuel supplies[111].

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[108] SAIFI measures the average number of times a typical customer's service is interrupted in a year, and is calculated by dividing the number of customers interrupted by the number of customers served. CAIDI is the average outage duration that a customer would experience, measured in units of time (minutes or hours). According to Institute of Electrical and Electronics Engineers (IEEE) Standard 1366-1998, the median value for North American utilities is approximately 1.36 hours/year.

[109] See, for example, PSC Case 90-E-1119, Reliability and Quality of Electric Service Standards, Order Adopting Standards on Reliability and Quality of Electric Service (issued July 2, 1991).

[110] Bath, Central Hudson, Chautauqua, Consolidated Edison, Corning, Fillmore, KeySpan Energy Delivery Long Island, KeySpan Energy Delivery New York, National Fuel Gas Distribution, Niagara Mohawk, NEA Cross, New York State Electric and Gas, Orange and Rockland Utilities, Reserve, Rochester Gas and Electric, St. Lawrence, Valley Energy, and Woodhull.

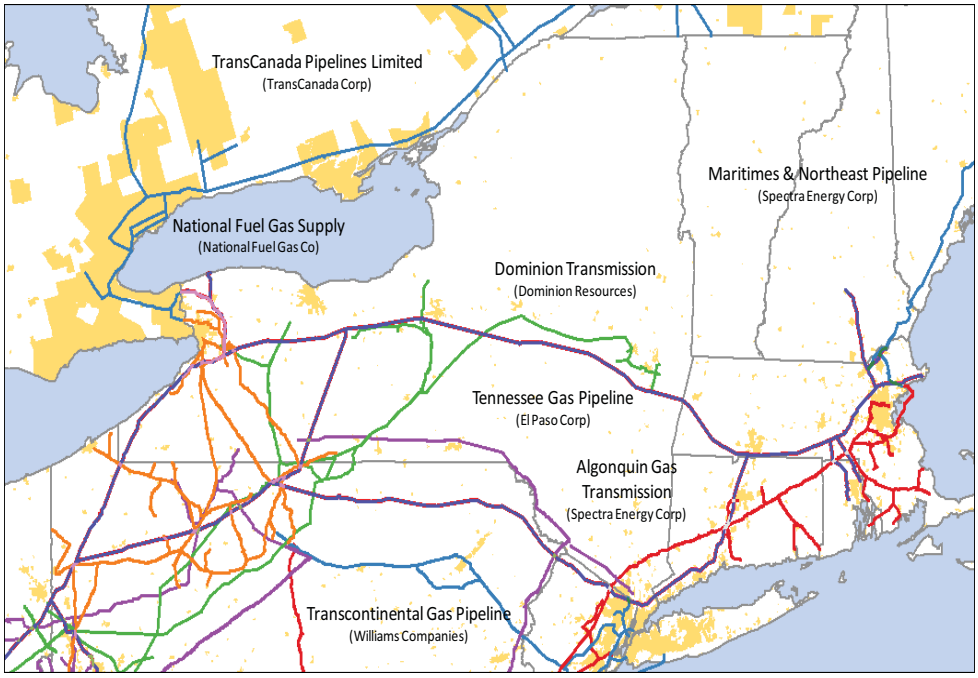
[111] Data from the 2009 State Energy Program.

Although western New York produces a small amount of natural gas, the majority of New York's natural gas supply is brought in via pipeline from other states and Canada (Figure 9-19).

The Transcontinental, Texas Eastern and Tennessee Gas transmission pipelines from the Gulf Coast and the Iroquois pipeline from Canada link up with local gas distribution networks that supply the New York City metropolitan area and Long Island. Many other gas transmission systems branch in from Pennsylvania and Canada to feed other parts of the state.

New York has moderate natural gas storage capacity, developed principally from depleted natural gas fields in the Appalachian Basin in western New York and from salt caverns. These storage sites, along with those in Pennsylvania and West Virginia, are important for supplying the Northeast region, particularly during the peak demand winter season. New York's residential, commercial, and electric power sectors all consume large amounts of natural gas.

Figure 9-19. Generalized Natural Gas Pipelines Supplying NYS



Source: SAIC calculations, using data and maps from Ventyx®/ABB

Natural gas storage plays a significant role in meeting the state's weather sensitive gas needs. Approximately 35 to 40 percent of LDCs winter gas requirements are met through gas withdrawn from storage facilities, primarily depleted gas wells, located in Pennsylvania and western New York. Generally, using storage facilities that are close to market is an economic way to meet seasonal demands. The alternative would be to build additional pipeline capacity all the way back to the gas production areas. In addition, some LDCs have peaking supplies in the form of LNG storage located within their service territories that is critical to meeting gas demand on peak winter days. [112]

The Marcellus Shale formation is an unconventional gas reservoir found throughout the Allegheny Plateau region of the northern Appalachian Basin of North America. In the United States, the Marcellus shale runs across the Southern Tier and Finger Lakes regions of New York, in northern and western Pennsylvania, eastern Ohio, through western Maryland, and throughout most of West Virginia extending across the state line into extreme western Virginia. The U.S. EIA publishes occasional updates about shale gas and responders are urged to refer to EIA for on-going developments in this area.

Estimates for the technically-recoverable gas in Marcellus is a moving target, but some studies seem to indicate that it could be enough to supply U.S. consumption for at least 14 years. According to a recent estimate in 2008, Terry Engelder, a Pennsylvania State University geosciences professor, estimates the amount of natural gas in the Marcellus Shale formation to be 363 TCF of recoverable resources. The United States Geological Survey had estimated that the Marcellus contained only 54 km^3 (1.9x1012 cu ft). In April 2009, the United States Department of Energy estimated the Marcellus to contain 262 TCF of recoverable gas.

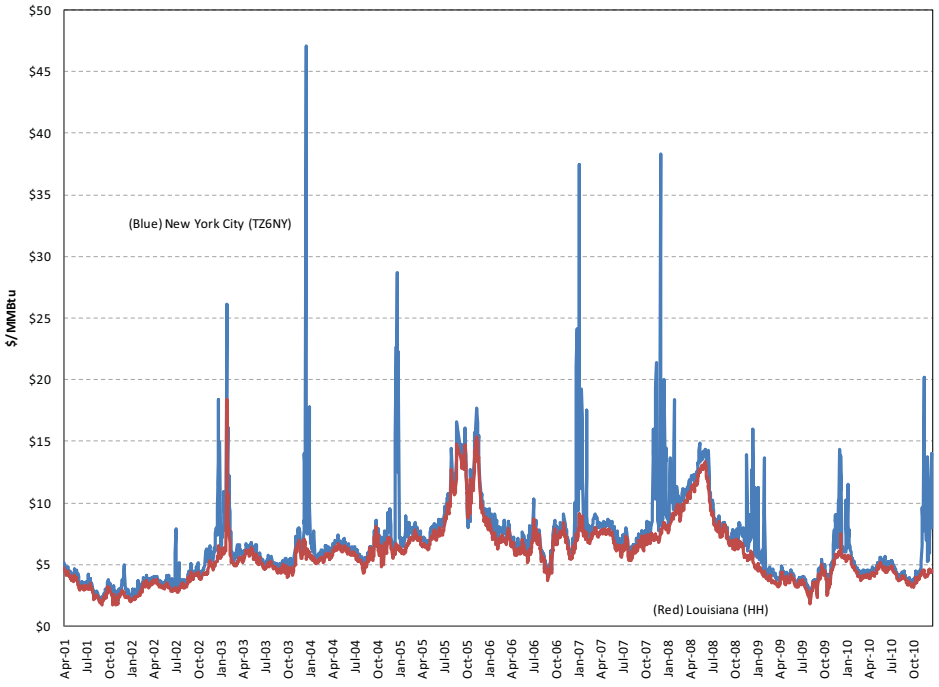
[112] From the *2009 New York State Energy Plan;* As of August 2011, the last propane peaking plant serving a New York local distribution utility was decommissioned.

Natural Gas Prices

The natural gas market price paid by customers is composed of three major components: the wellhead price paid to the producer, interstate gas pipeline transportation costs, and the local distribution company's delivery charge. Spot natural gas commodity prices (prices negotiated for next day, weekend, or extended weekend) have shown an increasing trend with a high degree of volatility over the past 10 years. Natural gas commodity prices have ranged from approximately $2 per MMBtu in early 1999 to peaks as high as $12 to $14 per MMBtu in recent years. The natural gas "commodity" price is measured at the Henry Hub price point in Louisiana. It differs from a price delivered, such as Transco Zone 6 New York (TZ6NY) that addresses the cost delivered to the New York City delivery point or "city gate". The rapid influx of natural gas produced from shale lowered prices to approximately $2.50 per MMBtu in 2012. EIA projects a return to slightly higher prices in 2013. [113]

Prices delivered to New York City include the price of the commodity plus the cost to transport the gas from the Gulf of Mexico (typically a point in Louisiana) to New York City "city gate." As Figure 9-20 shows, the prices delivered to New York City tend to be far more volatile. Peaking prices experienced in 2003 had not been reached again although price volatility is always a risk. Lower national prices, driven by the significant addition of shale gas into the market, kept state prices low through 2012. For the purpose of this chapter, Table5 tabulates the historical percentiles for commodity prices (priced in Louisiana) and for delivered prices in New York City. This table provides a sense of how "expensive" or "within range" prices are at a particular time (the percentiles follow a log-normal distribution, typical of energy prices) and uses two sets of data to establish what the meaning of "normal."

Figure 9-20. Spot Natural Gas Prices in New York City and Louisiana



Source: SAIC calculations using data from Ventyx® and the Intercontinental Exchange

[113] EIA Natural Gas Overview, http://205.254.135.7/naturalgas/.

Table 9-15. Louisiana and New York City Price Percentiles of Spot Natural Gas Prices (2001-2010)

Percent	Using History from 2001 through 2010		Using History from 2005 through 2010	
	New York City	Louisiana	New York City	Louisiana
1%	$2.248	$2.103	$2.786	$2.103
5%	$3.023	$2.766	$3.665	$2.766
10%	$3.540	$3.202	$4.242	$3.202
20%	$4.286	$3.822	$5.063	$3.822
30%	$4.920	$4.342	$5.752	$4.342
40%	$5.535	$4.842	$6.414	$4.842
50%	$6.179	$5.362	$7.102	$5.362
60%	$6.898	$5.937	$7.864	$5.937
70%	$7.760	$6.621	$8.770	$6.621
80%	$8.907	$7.522	$9.964	$7.522
90%	$10.784	$8.978	$11.892	$8.978
95%	$12.628	$10.391	$13.764	$10.391
99%	$16.981	$13.669	$18.104	$13.669
Source: SAIC calculations using data from Ventyx® and the Intercontinental Exchange				

One of the most significant impacts to prices during the last 10 years was caused by hurricanes Katrina and Rita in 2005. As the storms made their way through the Gulf of Mexico, they damaged oil and gas production platforms, refineries, and processing plants which resulted in prices jumping to unprecedented levels ($14/MMBtu for the commodity in November 2005). The two datasets included in Table 9-15 depict this "break" (prior/post Katrina) and reflect a perception that price patterns have changed since 2005.

Prior to Katrina and Rita, prices tended to follow a somewhat more predictable pattern with prices increasing in the winter when demand increased and dropping during the summer months when demand lessened. By the spring of 2006, prices were back down to the average levels of the period 2003 to 2005 (pre-Katrina) with the price for natural gas averaging approximately $7/MMBtu. From 2009 to 2012, prices moved lower in response to shale-driven supply.

Retail prices include the commodity cost of natural gas and the pipeline and LDC delivery charges. Because the commodity price makes up a significant portion of the customer's delivered price, retail prices have exhibited a similar pattern of growth and volatility. As natural gas prices moved lower from 2009 to 2012, this percentage has diminished to approximately 30 to 40 percent.

Regulated Local Distribution Companies: Natural Gas

New York is the fourth largest gas-consuming state, using approximately 1,182 billion cubic feet of natural gas per year (2010 data). The approximately 4.43 million natural gas customers in the State can be broken down by volume into the following four sectors: (i) residential 33%, (ii) commercial/industrial 31%, (iii) power generation 35%, and (iv) transportation 1%. Those customers are mostly served by the following gas local distribution companies (LDC).

- Central Hudson Gas & Electric Corporation (Central Hudson)
- Consolidated Edison Company of New York, Inc. (Con Edison)
- Orange & Rockland Utilities, Inc. (O&R)
- New York State Electric and Gas Corporation (NYSEG)

- Rochester Gas & Electric Corporation (RG&E)
- Niagara Mohawk Power Corporation d/b/a National Grid
- Corning Natural Gas Corporation (Corning)
- KeySpan Energy Delivery of New York (now part of National Grid)
- KeySpan Energy Delivery of Long Island (now part of National Grid)
- National Fuel Gas Distribution Corporation (NFGD)
- St. Lawrence Gas Company (St. Lawrence)

New York's LDCs utilize major interstate and intrastate pipeline systems for access to domestic and imported natural gas supplies. Those pipelines include Algonquin Gas Transmission Co. (AGT), Columbia Gas Transmission Corp. (Columbia), Dominion Transmission, Inc. (DTI), Empire State Pipeline Co. (Empire), Iroquois Gas Transmission System (IGTS), National Fuel Gas Supply Corp. (NFGS), North Country Pipeline, Tennessee Gas Pipeline Co. (Tennessee), Texas Eastern Pipeline Co. (TETCO), Transcontinental Gas Pipe Line Corp. (TRANSCO), and TransCanada Pipelines, Ltd. (TransCanada).

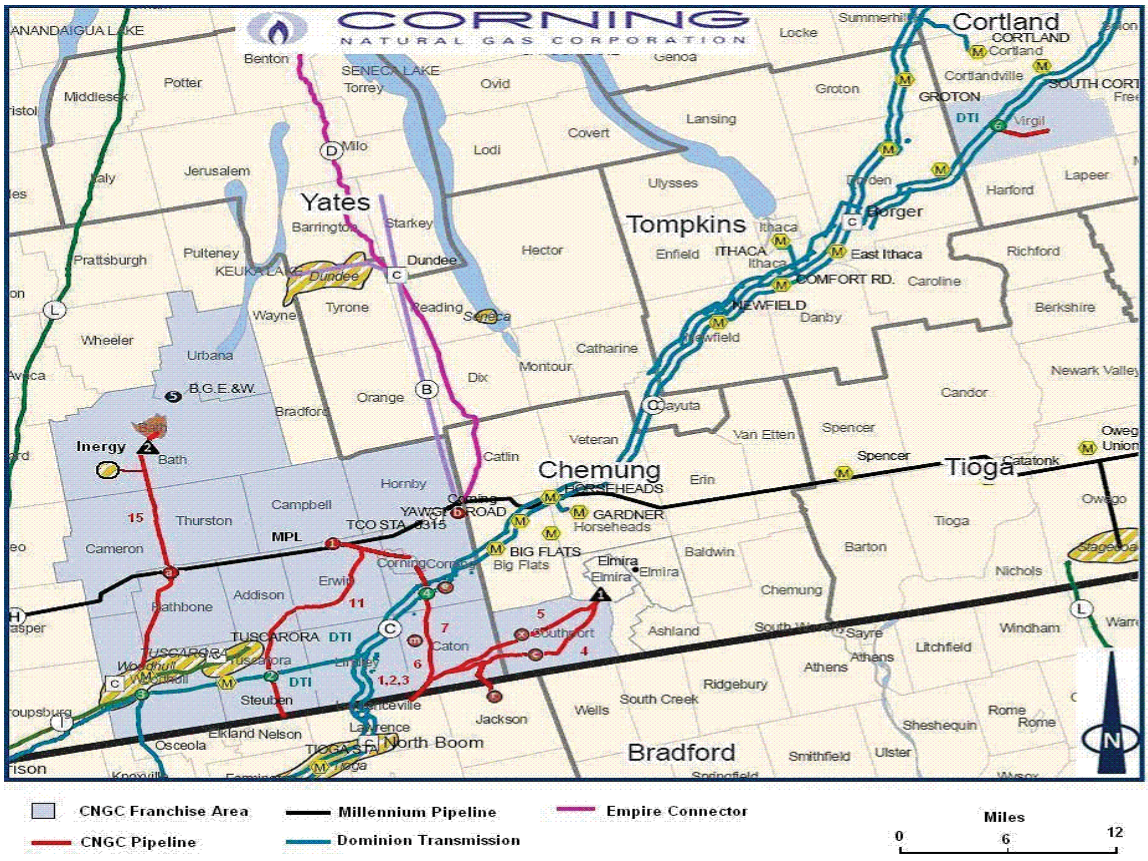
The LDCs not already described in Section 6.5.2.1.4, Investor-Owned Utilities, are described below.

Corning Natural Gas Corporation (Corning)

Corning is an investor-owned LDC, located in the Finger Lakes region of the Southern Tier of New York State. It provides natural gas, transportation, storage, and other unbundled energy services throughout a franchise service territory that encompasses 400 square miles, 15 townships, and 385 miles of pipeline (Figure 9-21). Corning distributes natural gas to nearly 15,000 customers in upstate New York. Corning also provides wholesale gas delivery services to NYSEG in Elmira, New York and to the Village of Bath, New York.

In addition to its role as a local gas utility, Corning is also an intrastate pipeline that moves significant volumes of gas to large industrial users and other utilities. In 2009, Corning completed a two-mile pipeline to connect its operations to the Marcellus Shale gas fields in Pennsylvania.

Figure 9-21. Corning Service Territory



Source: http://www.corninggas.com/index.asp?pageId=17

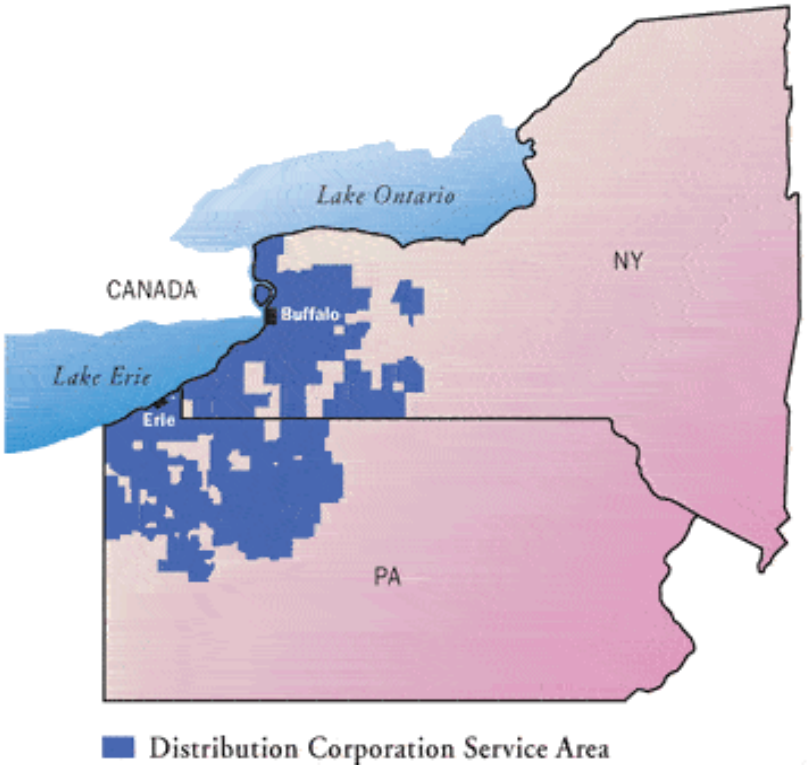
KeySpan Energy Delivery of New York and KeySpan Energy Delivery of Long Island

On August 24, 2007, KeySpan Energy Delivery completed its merger with National Grid. Subsequently, on May 1, 2008, KeySpan Energy Delivery changed its name to National Grid. National Grid is described in Section 6, Investor-Owned Utilities.

National Fuel Gas Distribution Corporation (NFGD)

NFGD, a subsidiary of National Fuel Gas Company, sells or transports natural gas to nearly 731,000 customers in western New York and northwestern Pennsylvania, including Buffalo, Niagara Falls, and Jamestown, New York and Erie and Sharon, Pennsylvania. See Figure 9-22.

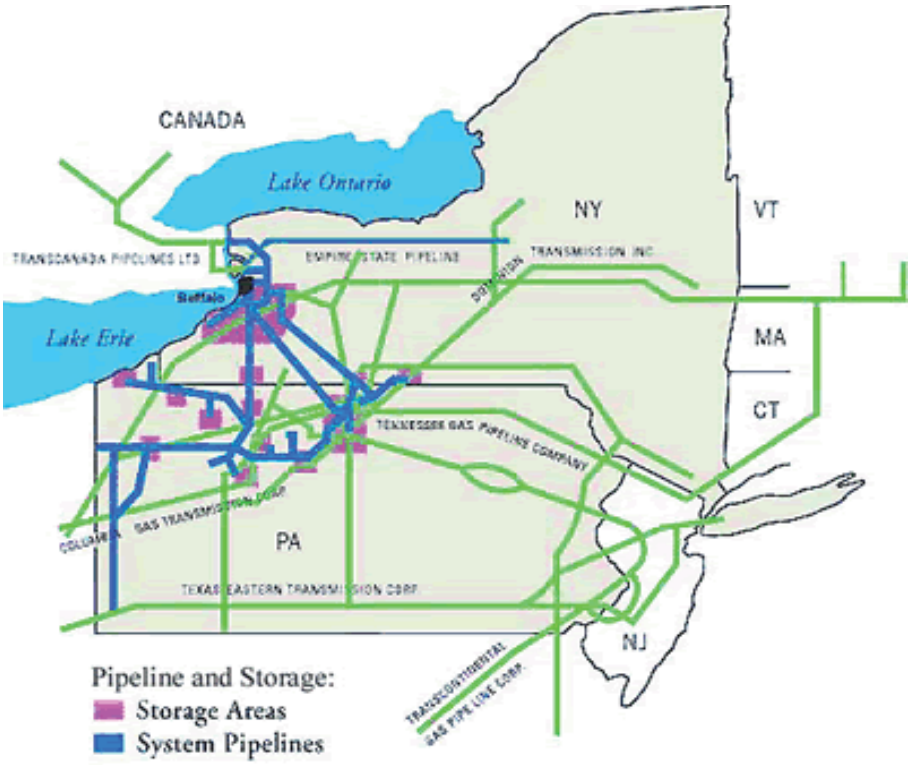
Figure 9-22. NFGD Service Territory



Source: http://www.nationalfuelgas.com/maps/utility.htm

National Fuel Gas Supply Corporation, also a subsidiary of National Fuel Gas Company, provides interstate natural gas transmission and storage through an integrated gas pipeline system that extends approximately 2,972 miles from southwestern Pennsylvania to the New York-Canadian border at the Niagara River. That gas pipeline system includes the Empire State Pipeline, a 157-mile natural gas transmission pipeline running from an interconnection with TransCanada Pipeline near Buffalo, NY to Syracuse, NY. A map of National Fuel Gas Supply Corporation's pipeline and storage facilities is shown in Figure 9-23.

Figure 9-23. NFGC Pipeline Map



Source: http://www.nationalfuelgas.com/maps/pipeline.htm

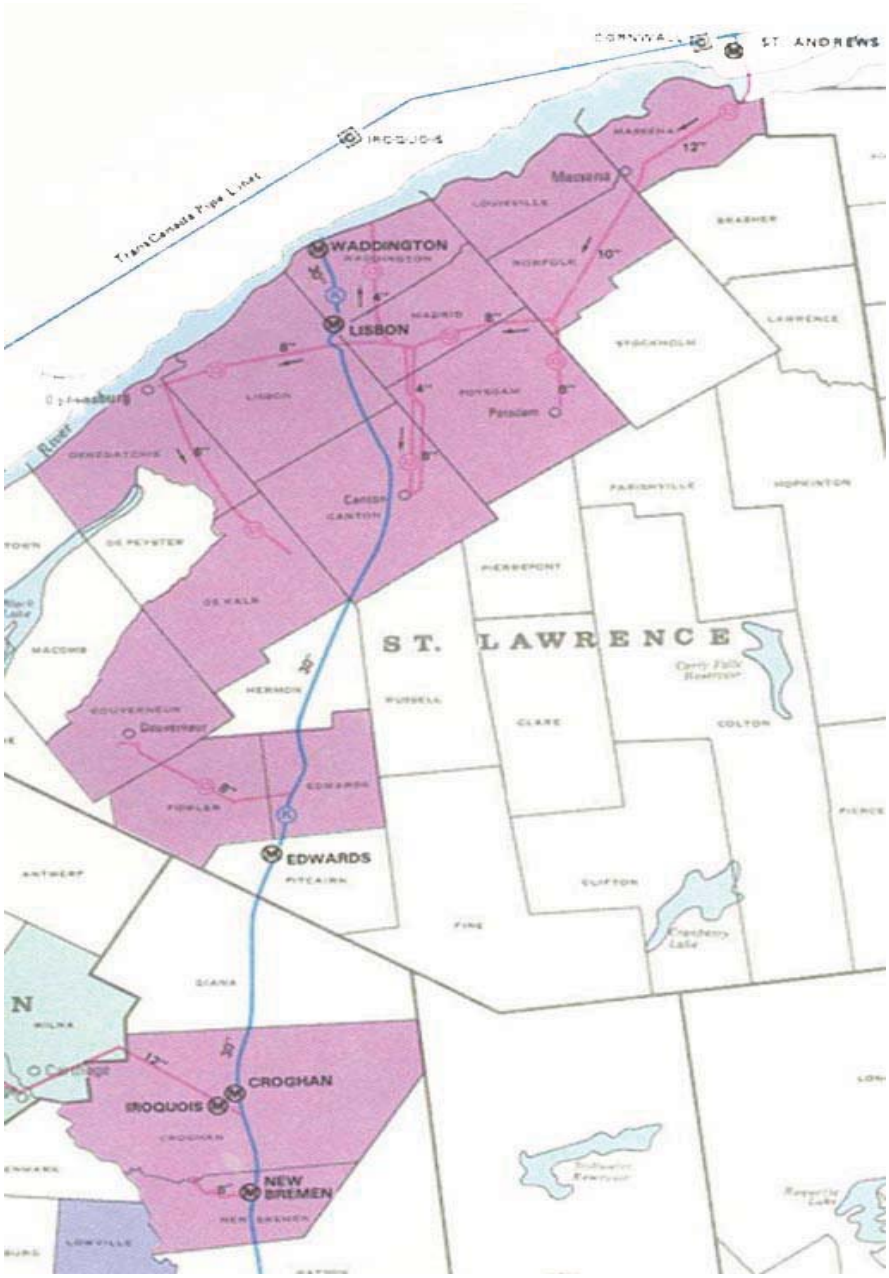
St. Lawrence Gas Company (St. Lawrence)

St. Lawrence is a public LDC that distributes natural gas to approximately 13,800 residential customers, 1,600 commercial customers, and 23 industrial customers within a 785-square mile service territory within New York State (**Error! Reference source not found.**). The company is a wholly owned subsidiary of Enbridge Gas Distribution in Canada. St. Lawrence serves the cities and towns of Beaver Falls, Canton, Croghan, Gouverneur, Heuvelton, Lisbon, Madrid, Massena, New Bremen, Norfolk, Norwood, Ogdensburg, Potsdam, Raymondville, and Waddington. Additionally, St. Lawrence has the franchise rights to expand into another 11 municipalities.

Other Natural Gas Companies within the New York PSC's Jurisdiction

Contact information for all natural gas utilities regulated by the PSC is contained in the New York PSC website. That list has been reproduced in Table 9-24.

Figure 9-24. St. Lawrence Service Territory



Source: http://www.stlawrencegas.com/about.shtml?page=territory

Table 9-16. Potential Public Information Steps for State Government – Natural Gas

Phase	Suggested Response for NYSERDA
Early Warning	• Review and reinforce communications within the State and ascertain that everyone understands their role, what can and cannot be said, and by whom • Work with the PSC (and the DPS) and OEM to keep the Governor's office apprised • Keep Governor's staff and legislative offices informed • Review/prepare graphic energy market presentations and other materials to explain consumption patterns and anomalies • Work with the PSC and OEM to provide helpful conservation and mitigation advice to the public • Continue to acquire supply & demand data • Coordinate with the PSC and OEM on media contacts in order to help reporters (especially newly assigned) understand basic energy facts and issues • Review weather forecasts often
Pre-Emergency Declaration	• Maintain information actions per above • Coordinate with the PSC and OEM to draft energy conservation recommendations if shortage is predicted to increase • Work with natural gas utilities on heating issues to provide media advisories on setting back thermostats, using cooking fuel wisely, checking heating equipment and conserving hot water • Consider public meetings and use of the Internet as appropriate • Share State energy data with other states, National Association of State Energy Officials (NASEO) and DOE, as needed • Assist the Governor in making follow-up announcements to assure the public and to encourage continued cooperation and compliance • Estimate the probability and timing of greater shortage • Prepare briefings on possible supply and demand restraint measures should shortage intensify
Emergency Declared	• Maintain information actions per above • Assist the PSC and OEM with media briefings (sometimes in conjunction with energy stakeholder representatives) • Develop follow-up messages from the Governor to assure the public and to maintain compliance • Work with the PSC and OEM (in coordination/conjunction with the Governor's office or others) to announce enforcement actions, if any

Other Response Actions that May Be Taken by State Authorities

Communications and Public Information

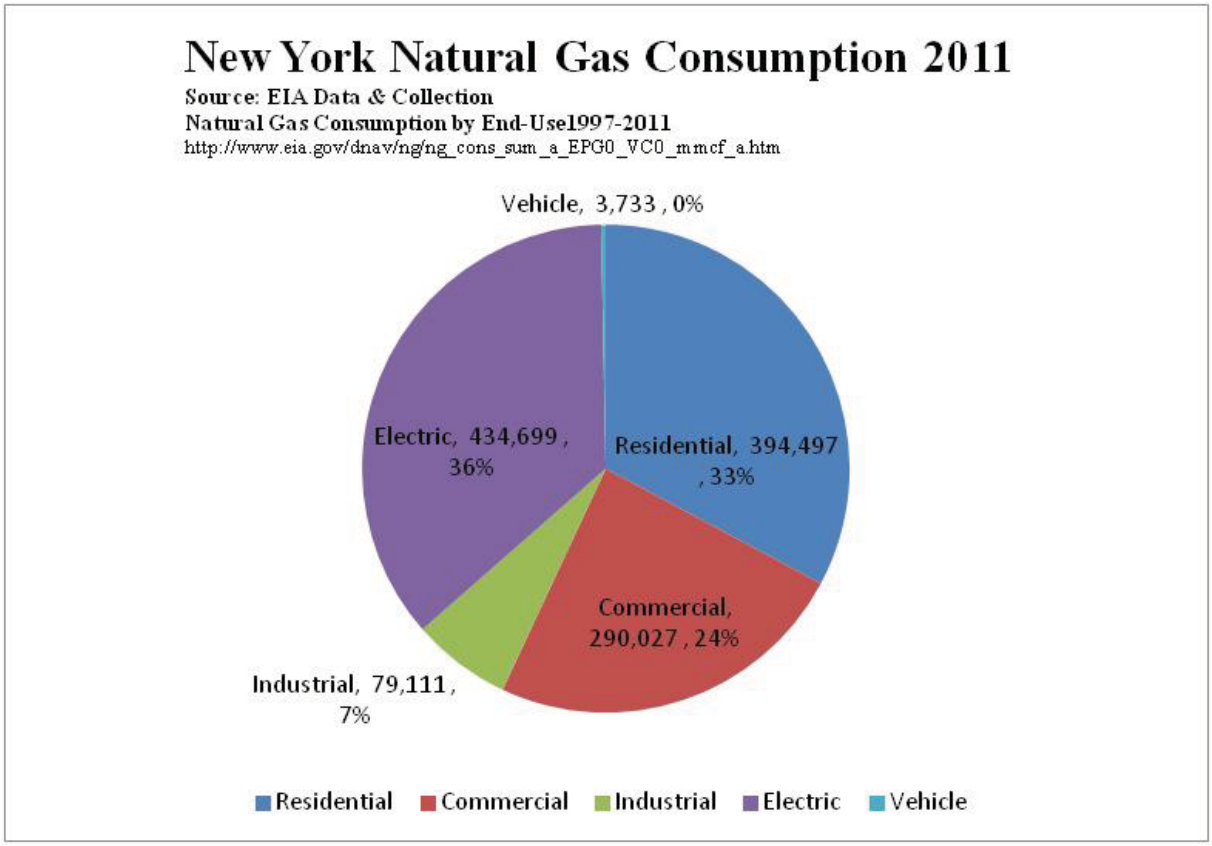
Energy shortages require public explanations. The first suggested measure in responding to an energy incident after monitoring is public information. Most small events are not reported in the media. However, any event can come to the media's attention regardless of how many customers are affected or the time it takes to restore the system. People will turn to the media for answers and the media may query both company and State officials.

The public will expect Local Delivery Companies (LDC) and government in New York to provide accurate information without exacerbating the situation. Most citizens can manage short-term outages

and, although annoyed, will be patient. Over the years, most energy companies and governments have learned the value of being forthright when discussing energy interruptions. Lack of candor can turn public opinion against energy providers and government, thus diminishing cooperation during restoration.

Emergency Response Plans

Figure 9-25. Natural Gas Use, 2011



Natural gas is also a critical part of New York's energy supply. Total gas use in New York in 2011 was approximately 1,202 Bcf. [114] By sector; New York's consumption differs slightly from the national figures, with the State's residential customers representing the second largest gas-consuming segment, using approximately 393 Bcf in 2011. The electric power industry was first, consuming 434 Bcf in the State in 2011. Commercial customers followed with 290 Bcf and industrial customers with 76 Bcf. Regarding natural gas production, New York produces a small amount of natural gas in the Appalachian Basin; however, the vast majority of its supply is brought in via pipeline from other States and Canada. New York's indigenous natural gas resource basin includes the Marcellus Shale formation, which may contain unconventional shale gas in the Southern Tier and Western regions of the State.

[114] Derived from: http://www.eia.gov/dnav/ng/ng_cons_sum_a_EPG0_VC0_mmcf_a.htm

Natural Gas Market Description and Issues

This section discusses natural gas market components and principal delivery systems and examines New York's indigenous gas resources, its local distribution companies, gas pipelines, and storage capabilities. Additionally, this section addresses issues that affect the reliability of the New York natural gas market, including major risks and vulnerabilities. Finally, this section discusses strategies to mitigate risk and to recover from natural gas supply disruptions.

National and Regional Infrastructure and Supply for New York

In its overview of regional natural gas markets, the Federal Energy Regulatory Commission (FERC) places New York in the Northeast natural gas market. FERC provides the following summary regarding the state of that market:

Natural gas use is increasingly important to the Northeast. Though traditionally the Northeast has been a winter peaking region, increased reliance on natural-gas fired generation has evened out annual gas use. Increased dual requirements for natural gas as a space heat fuel and utilization in gas-fired electric generation plants has imposed greater challenges on the Northeast, compared to other regions, in aligning commercial and operating conditions between the gas and power industries. The Northeast has little indigenous production (mainly in the Appalachian basin) and none in New England although this trend could begin to change with the successful exploitation of the Marcellus Shale play located in the heart of Appalachia. [115]

In its 2009 *State of the Market* report, FERC noted the importance to the Northeast market of the newly completed Rockies Express Pipeline (REX). REX became fully operational in November 2009. It is one of the largest pipelines constructed in the United States, ranging 1,679 miles from northwestern Colorado to eastern Ohio and providing 1.8 billion cubic feet per day of capacity. [116] At the time of its completion, REX relieved constraints in the East that put upward pressure on prices. [117] Soon after REX became operational, natural gas began flowing from the Marcellus Shale production areas in Pennsylvania and West Virginia, which had the effect of making REX's influence on the New York natural gas market very slight. As noted above, natural gas prices have fallen in the last three years. This is a direct result of the dramatic increases in natural gas production from the shale formations in the United States, including the Eagle Ford and Bakken, among others.

Regarding the Northeast natural gas market, FERC also observed that:

- Pipeline utilization remains highly seasonal, with major regional pipelines often operating at high load factors during the winter months [118].
- The Northeast relies upon conventional gas storage and liquid natural gas (LNG) to meet peak-day gas needs.
- LNG plays a critical role in the supply mix of the Northeast.
- The Northeast possesses the nation's most extensive portfolio of dual use gas-oil fired power plants to respond to price and load changes.

The map in Figure 9-26 shows the Northeast's LNG facilities and major gas trading hubs.

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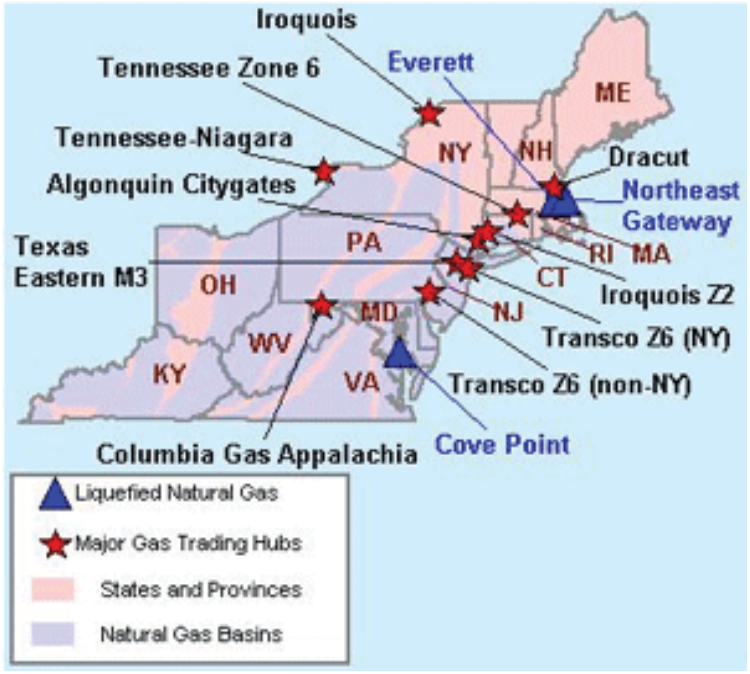
[115] http://www.ferc.gov/market-oversight/mkt-gas/northeast/ngas-ne-reg-des.pdf.

[116] http://www.kindermorgan.com/business/gas_pipelines/rockies_express/.

[117] 2009 *State of the Market Report,* pp. 13, http://www.ferc.gov/market-oversight/st-mkt-ovr/som-rpt-2009.pdf.

[118] Seasonal peaking may diminish as more gas is used to generate electricity. Lower cost Marcellus Shale is expected to reduce the cost of gas, thus accelerating this trend.

Figure 9-26. Northeast LNG and Gas Trading Hubs



Source: http://www.ferc.gov/market-oversight/mkt-gas/northeast.asp

Gas Supply Sources

In-state natural gas production meets approximately 5 percent of New York's natural gas demand. Domestic production may grow in the future with the exploitation of unconventional natural gas, particularly shale formations. As noted above, most of New York's natural gas needs are met through interstate pipeline that transport natural gas from gas-producing regions in the United States and Canada. Ninety-five percent of New York's natural gas supply is provided by natural gas supply production regions in other states (primarily from the Gulf Coast region) as well as Canada. Canada provides the United States with approximately 1.6 trillion cubic feet of natural gas annually, down significantly from the amount historically imported from Canada.[119] Imports from Canada totaled about 3.6 trillion cubic feet and accounted for about 90 percent of total imports as recently as 2009. Due to the overabundance of U.S. supply and Canada's increasing ability to absorb displaced gas for things like oil sands production, industrial activity, power generation, and economic growth, it is unlikely that Canadian imports will stop their decline in the near future.[120]

In-State Natural Gas Resources

Natural gas production in New York has historically provided only a small portion of the State's total gas supply. In year 2009, approximately 6,700 active natural gas wells in New York met about five percent of State demand.[121] However, from 1998 to 2008, New York's natural gas production increased over 200

[119] 2009 NYSER, Natural Gas Assessment, p. 13.

[120] Bentek Market Call, February 2012, page 5.
http://www.bentekenergy.com/DissectingNatgasSupplyAndDemand.aspx

[121] New York (NY) *State Energy Plan* 2009 Volume I, p. 55.

percent, from 16.7 billion cubic feet to 50.3 billion cubic feet.[122] This increase was due predominantly to exploitation of the prolific wells in the Trenton-Black River formation in the Finger Lakes region of New York. Trenton-Black River production is responsible for approximately 69 percent of New York's natural gas production.

Shale Gas

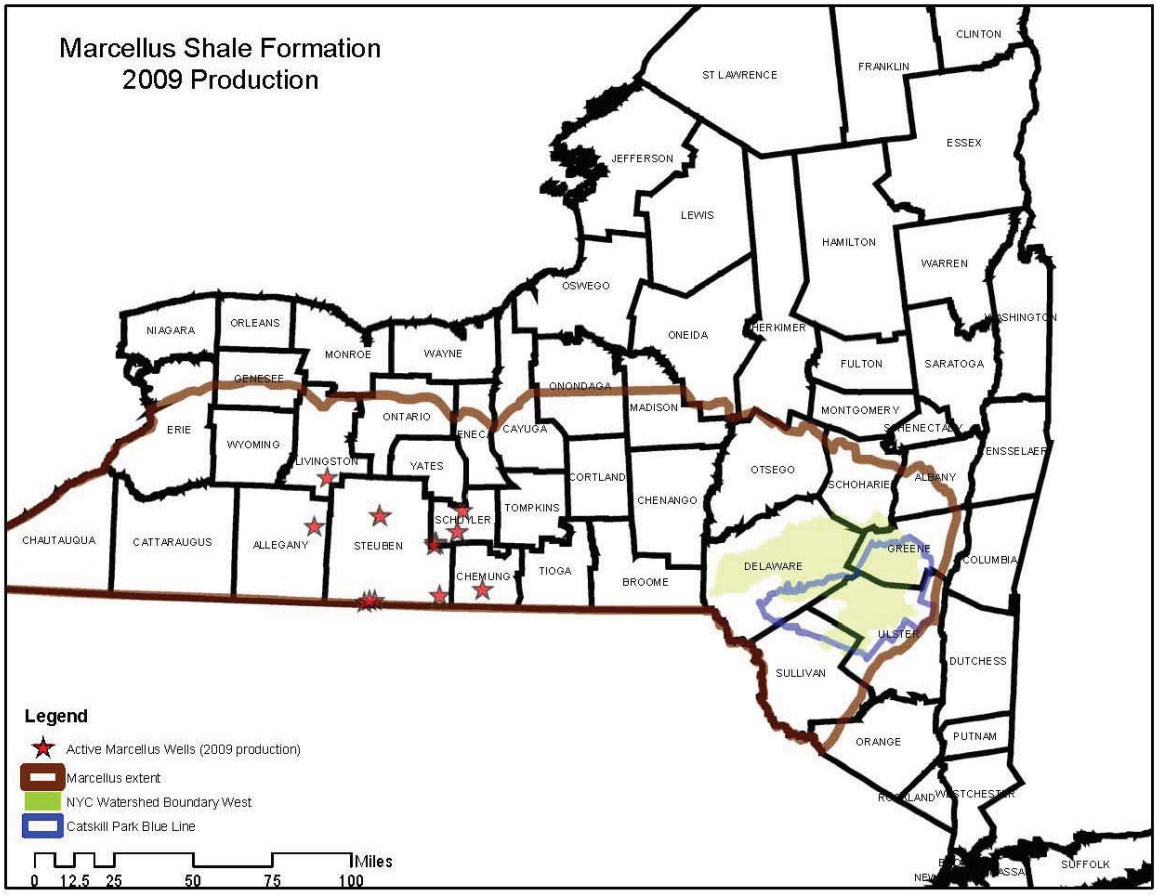
New York may have in-state natural gas resources located in the Marcellus and other shale gas formations. As noted above, these formations are located in close proximity to high-demand markets on the East Coast. According to geologists cited in the New York Department of Environmental Conservation "2011 Annual Oil and Gas Production Data Report" estimates suggest that the" entire Marcellus Shale formation may contain up to 489 trillion cubic feet of natural gas throughout its entire extent."[123]

Within New York, the Marcellus Shale gas formation is located in much of the Southern Tier extending from Chautauqua and Erie counties in the west to the counties of Sullivan, Ulster, Greene and Albany in the east. The map in Figure 9-27 delineates the boundaries of the Marcellus Shale formation within the State of New York.

[122] Department of Environmental Conservation, 2011 *Annual Oil and Gas Production Data*. http://www.dec.ny.gov/energy/36159.html.

[123] New York DEC *Marcellus Shale,* http://www.dec.ny.gov/energy/46288.html.

Figure 9-27. Marcellus Shale Formation in New York

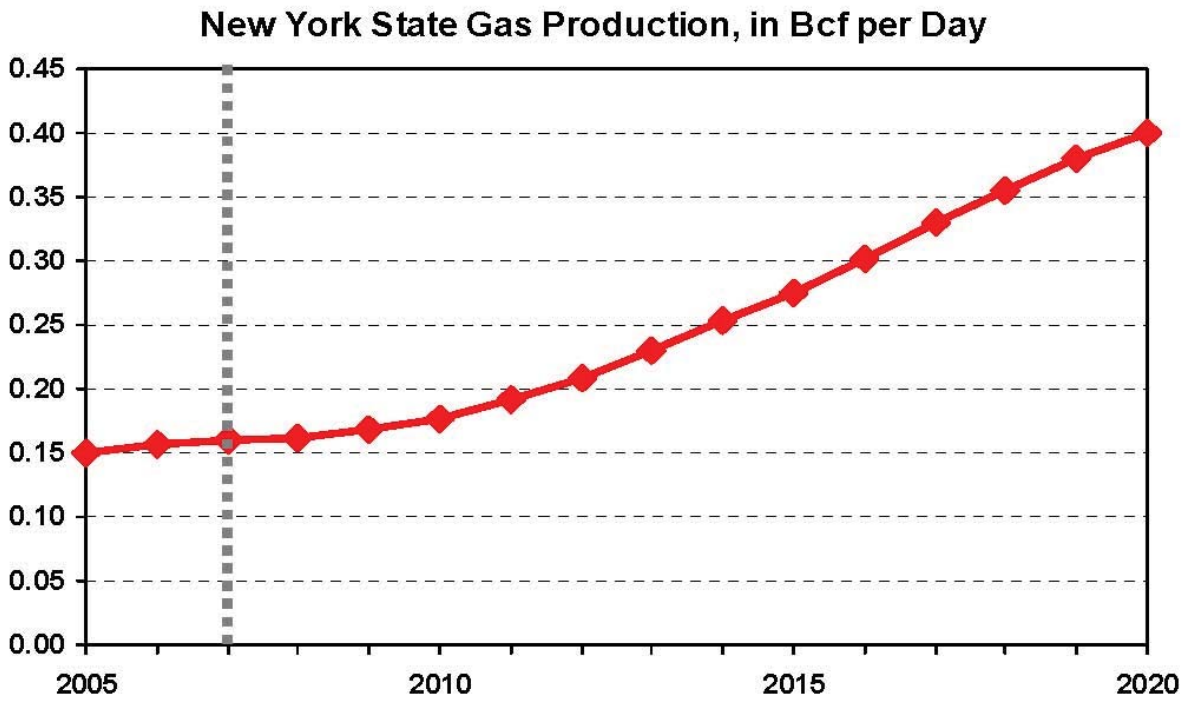


Source: http://www.dec.ny.gov/energy/46381.html

As a result of technological innovations New York's potential natural gas reserves could increase from 55 billion cubic feet in 2007 to a forecasted 146 billion cubic feet by 2020. [124] The graph in Figure 9-28 shows the level of in-State natural gas production in New York by year starting in 2005 and projects in-State production through the year 2020. Recent pipeline expansion projects will provide New York with greater access to gas supplies from the Appalachian region, including Marcellus Shale formation production.

[124] 2009 NYSER, Natural Gas Assessment, p. 30.

Figure 9-28. New York State Gas Production



Source: 2009 NY State Energy Plan, Section 2, Natural Gas Assessment

New York's Local Distribution Companies

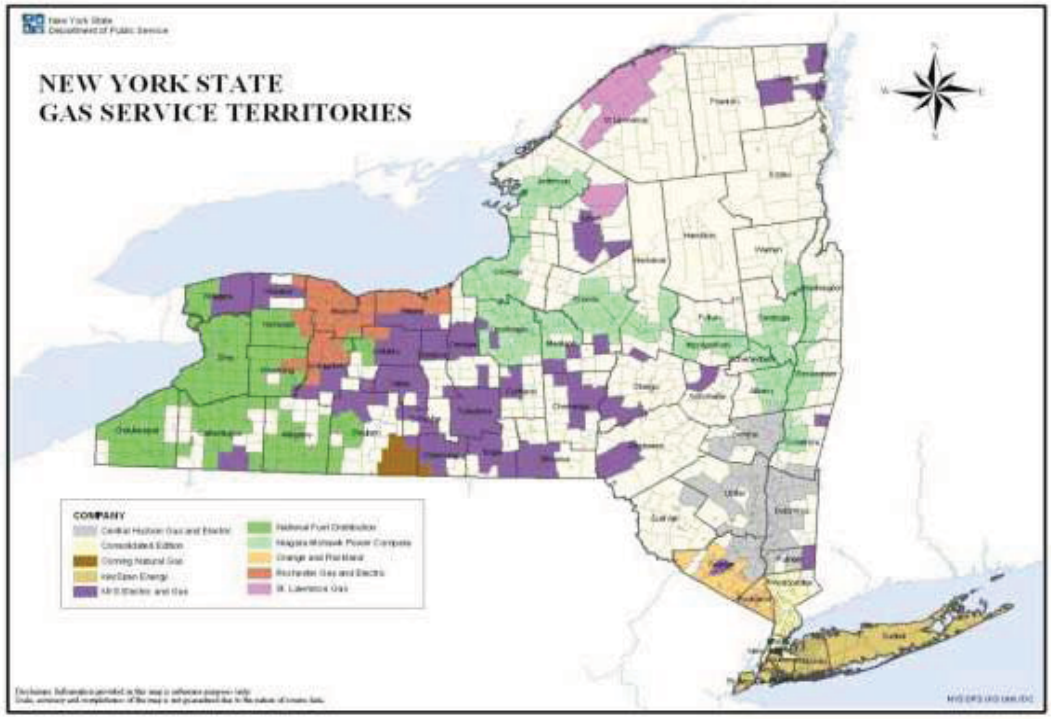
Eleven local gas distribution companies (LDCs) serve the State's 4.7 million natural gas customers in New York. These LDCs are described in Section 6.5.2, 6.5.2 Stakeholders and Authorities, and in Appendix A.

The downstate market, including Long Island, New York City, Westchester, Orange and Rockland Counties, is served by National Grid (formerly the KeySpan Energy Delivery of New York City and KeySpan Energy Delivery of Long Island), Consolidated Edison Company of New York, and Orange & Rockland Utilities, Inc. The LDCs serving the downstate market rely on interstate pipeline companies to supply natural gas, that connect either directly to production areas in the Gulf Coast region, to Canada, or to major storage areas in the Northeast.

New York's upstate market is served by the following LDCs: Central Hudson Gas & Electric, Corning Natural Gas, National Fuel Gas Distribution Corporation, National Grid, New York State Electric & Gas Corporation, Rochester Gas and Electric Corporation, and St. Lawrence Gas. Most of these LDCs rely on interstate pipeline companies to supply natural gas. However, St. Lawrence is a small regional natural gas importing pipeline, which depends upon Canadian natural gas imports for its natural gas supplies. [125] Figure 9-29 shows the service territories for New York's LDCs.

[125] http://www.eia.doe.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/northeast.html.

Figure 9-29. New York LDC Service Territories



Source: 2009 NY State Energy Plan, Section 2, Natural Gas Assessment

Natural Gas Pipeline Companies Serving New York

New York's LDCs depend on the interstate natural gas pipeline infrastructure for the transportation of gas supply to their distribution systems. Most of the major pipelines serving New York extend back to the natural gas production regions southwest to Texas, and Louisiana and north to Canada, while others access the Appalachian production region. A description of each major interstate natural gas pipeline is presented below, followed by a regional map depicting the natural gas pipeline systems for the Northeast region. See Figure 9-30.

Algonquin Gas Transmission Co. (Algonquin)

Algonquin is a 1,120 mile pipeline with a capacity of 2.44 billion cubic feet per day that is owned by Spectra Energy Transmission. The pipeline connects to Texas Eastern Transmission and Maritimes & Northeast.

Columbia Gas Transmission Corp. (Columbia)

Columbia Gas Transmission Corp. (Columbia) is a 12,000-mile pipeline network that transports an average of 3 billion cubic feet of natural gas per day and operates in 10 states. Columbia also owns and operates 37 underground natural gas storage fields in four states with nearly 600 billion cubic feet of total capacity.

Dominion Transmission, Inc.

Dominion maintains 7,800 miles of pipeline in Ohio, West Virginia, Pennsylvania, New York, Maryland and Virginia. Dominion is also interconnected via pipeline with Dominion Cove Point LNG, one of the largest liquefied natural gas (LNG) import facilities in the United States.

Dominion Cove Point LNG is situated on the Chesapeake Bay near Lusby, Maryland, south of Baltimore. It has a storage capacity of 14.6 billion cubic feet and a daily send-out capacity of 1.8 billion cubic feet. The facility receives LNG shipments via transport ship from countries throughout the world, including Trinidad, Nigeria, Norway, Venezuela and Algeria.

Empire State Pipeline Co.

The Empire Pipeline is a 233 mile natural gas pipeline that has a capacity of 750 million cubic feet per day. The pipeline begins with its interconnection with the TransCanada Pipeline near Buffalo, New York, and continues through western and central New York and east to the Syracuse area, serving local gas utilities and electric generators in the State. In 2008, the Empire Pipeline was expanded with the addition of 77 miles of pipe from Rochester, New York to Corning, New York, where gas is delivered to the new Millennium pipeline, providing Empire with access to interstate natural gas markets.

Iroquois Gas Transmission System (Iroquois)

Iroquois is a 416-mile interstate pipeline with facilities that extend from the international border in Waddington, New York across eastern New York State, western Connecticut, and the Long Island Sound, to South Commack, New York and extending to Hunts Point, New York. The pipeline is owned by TransCanada Corporation, Dominion Resources, KeySpan Corporation, New Jersey Resources Corporation, and the Iberdrola Corporation. It has a peak day deliverability of about 1.2 billion cubic feet per day.

Iroquois has proposed to expand its system to connect the Marcellus gas supplies to the New York, New England and eastern Canadian gas markets.

National Fuel Gas Supply Corp.

National Fuel owns and operates a network of 2,972 miles of pipeline ranging from the Canadian gateway at Niagara, south to the Ellisburg-Leidy Hub, and west to the Appalachian Basin. National Fuel's gas pipeline system includes the Empire State Pipeline, which runs 157 miles from an interconnection with TransCanada Pipeline near Buffalo, NY to Syracuse, NY. Additionally, the company owns 31 underground natural gas storage facilities (four are co-owned with other companies).

North Country Pipeline

North Country Pipeline is an intrastate pipeline that extends about 22 miles from the Canadian border in northeastern New York near Champlain to the Plattsburgh area. The North Country Pipeline utilizes natural gas imported from the TransCanada system and it has a capacity of about 100 dekatherms per day.

Tennessee Gas Pipeline Co.

Tennessee Gas Pipeline is a business unit of El Paso Corporation. It is comprised of about 14,000 miles of pipeline with a capacity of 6,487 million cubic feet per day. It stretches from the Mexican border to Canada, serving markets across the Midwest and mid-Atlantic regions, including Chicago, New York, and Boston. The pipeline enters New York at several points including southwestern Pennsylvania, central Pennsylvania, Niagara and through New Jersey into the New York City area, extending into Connecticut.

Texas Eastern Pipeline Co.

Texas Eastern Pipeline Co. is an approximately 8,700-mile pipeline that connects Texas and the Gulf Coast with natural gas markets in the northeastern United States. Owned by Spectra Energy Transmission, Texas Eastern Pipeline has a capacity of 6.7 billion cubic feet per day as well as 75.1 billion cubic feet of storage, including storage fields located near Accident, Maryland, and Oakford and

Leidy Pennsylvania. The pipeline also connects to East Tennessee Natural Gas and Algonquin Gas Transmission.

Transcontinental Gas Pipe Line Corp. (TRANSCO)

Transco, owned by the Williams Companies, Inc., is a 10,000-mile natural gas pipeline that extends from South Texas to New York City. It has a system peak design capacity of 8.6 billion cubic feet per day and a seasonal storage capacity of 207 billion cubic feet. The pipeline obtains its natural gas from the Gulf Coast area and imported LNG and it supplies numerous markets in the Southeast, Northeast and Mid-Atlantic, including New York City and Atlanta.

TransCanada Pipelines, Ltd. (TransCanada)

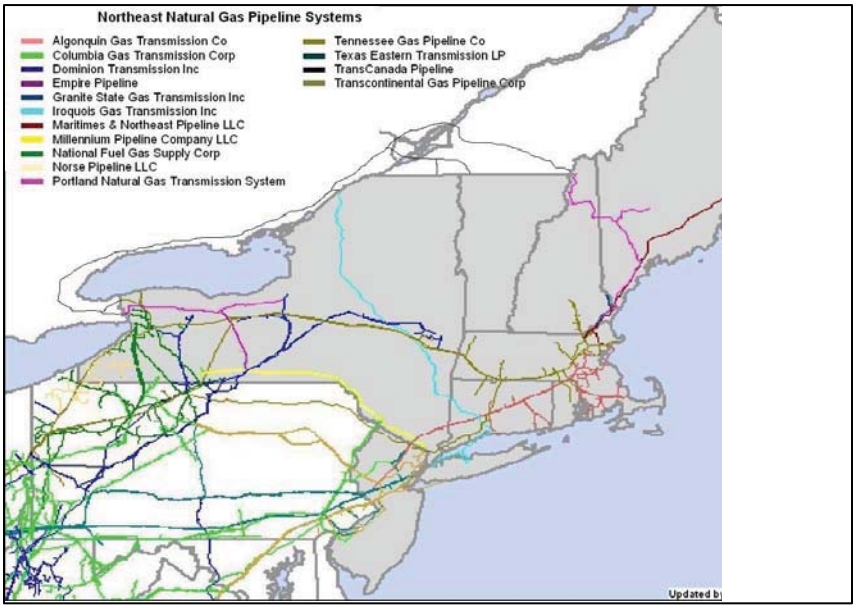
TransCanada owns and operates a vast network of more than 37,000 miles of wholly-owned pipeline (and 4,847 miles of partially-owned pipeline) and connects to most major natural gas supply basins and markets in North America. TransCanada transports a full 20 percent of the natural gas consumed in North America, moving 15 billion cubic feet of natural gas per day. TransCanada also provides significant underground natural gas storage service, offering approximately 380 billion cubic feet of natural gas storage capacity.

The Canadian Mainline, part of the TransCanada Pipeline, extends 8,762 miles from the Alberta/Saskatchewan border east to the Québec/Vermont border and connects with other natural gas pipelines in Canada and the U.S. The Iroquois Gas Transmission system (of which TransCanada owns a 44.5 percent share) connects from the Canadian Mainline at the Canada-U.S. border. The Iroquois pipeline draws just over one billion cubic feet per day off the TransCanada Pipeline and delivers a large portion to the New York City metropolitan area.

New York's existing natural gas pipeline infrastructure faces constraints in the New York downstate area, including New York City and Long Island. [126] On peak demand days, capacity into the downstate New York market is full (meaning the utilization rate, or flow relative to design capacity, approaches or reaches 100 percent). Several pipeline projects have been completed in the last few years to address these constraints and to provide for the projected increase in natural gas demand in New York. Nevertheless, the State will need to develop additional pipeline capacity in order to meet demand and reduce constraints on the system.

[126] NYS Energy Infrastructure Issue Brief at 31. http://www.nysenergyplan.com/final/Energy_Infrastructure_IB.pdf

Figure 9-30. Northeast Natural Gas Pipeline Systems



Source: http://www.northeastgas.org/pdf/nngips_0109.pdf

In addition to REX, described above, New York's pipeline expansions in recent years include:

- The Millennium pipeline and associated projects provide approximately 525 million cubic feet per day of new pipeline capacity to the New York market, with 300 million cubic feet per day deliverable directly to the downstate New York City and Long Island markets.
- The Leidy to Long Island expansion on the Transcontinental Gas Pipeline Corporation pipeline system provides 100 million cubic feet per day of new pipeline capacity for the downstate New York City market.
- The Empire Connector project interconnects Empire's existing pipeline with the new Millennium Pipeline near Corning, N.Y., providing 525 million cubic feet per day of additional capacity.
- The Ramapo Expansion on the Spectra/Algonquin Pipeline upgrades Algonquin's facilities to interconnect with Millennium at Ramapo, N.Y. to expand Algonquin's capacity by 325 million cubic feet per day.
- The Market Access Expansion project of the Iroquois Pipeline upgraded Iroquois' facilities to expand capacity by 100 million cubic feet per day for delivery to Hunts Point, N.Y.
- The 08/09 Expansion project of the Iroquois Pipeline upgraded Iroquois' facilities to receive additional volumes from Algonquin to expand capacity by 200 million cubic feet per day for delivery to Long Island. [127]

In addition to those recent projects, National Grid and Con Edison have proposed new delivery points directly into the constrained downstate market area. Specifically, Con Edison plans to add delivery capacity in lower Manhattan, while National Grid has proposed adding delivery capacity in the Jamaica Bay (Rockaway Peninsula) area. Additionally, as regional shale gas is developed, projects are being

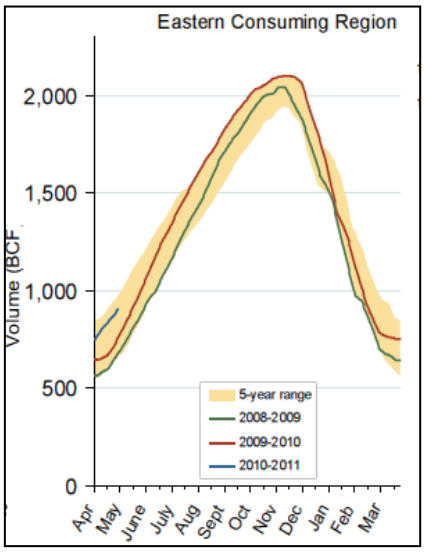
[127] NYS Energy Infrastructure Issue Brief; pg 40;
http://www.nysenergyplan.com/final/Energy_Infrastructure_IB.pdf

proposed to expand existing pipelines to provide access to Appalachian region production, thereby providing a significant source of natural gas supply close to the New York market.

Natural Gas

Natural gas pipelines serving New York do not have the capacity to meet all the demand that exists during the coldest part of the winter months, when load is greatest. For that reason, storage fields provide an essential part of the interstate natural gas system. Numerous interstate pipeline and independently-owned storage facilities (often depleted gas wells) are located at points along the interstate pipeline systems. These storage fields are filled during the non-heating summer months (typically April through October) and tapped during the winter to meet increased heating demands. Substantial amounts of storage that serve the State's markets are located in Pennsylvania as well as the southern tier of New York, among other locations. Natural gas is most typically stored in one of three ways: depleted reservoirs in oil and/or gas fields, aquifers, and salt cavern formations. Natural gas may also be stored in a liquid form (liquefied natural gas or LNG) in above-ground tanks. Figure 9-31 depicts the seasonal trend in natural gas storage for the Eastern geographical region that includes New York. The graph shows that inventories build up before the winter season and are thereafter drawn down.

Figure 9-31. Natural Gas Storage Cycle



Source: FERC, derived from EIA, www.ferc.gov/oversight (Natural Gas Markets)

Nationally, there has been a growing trend by the electric generation industry to use natural gas as a fuel source to generate electricity. According to EIA, usage of natural gas for electric generation was as high as 432 Bcf in 1999, dropped to 259 in 2004 and rose to 432.5 in 2010. [128] Similarly, in New York, the bulk of new electric generation plants utilize natural gas as their primary fuel source, due to factors such as its environmental, economic, and operational advantages. Between 2001 and 2007, about 5,000 MW of new natural gas-fired electric generation was constructed in the State, which, when added to New York's existing natural gas-fired generation, produced approximately 31 percent of the electricity generated in the State. [129]

[128] http://www.eia.gov/dnav/ng/hist/n3045ny2a.htm.

[129] 2009 NYSER Natural Gas Assessment, p. 9.

Historically, natural gas was a relatively high-priced fuel source for electric generation. Consequently, natural-gas fired power plants were utilized mainly to meet peak summer demand. While New York still experiences its greatest demand peaks during the winter months, continued construction of natural gas-fired electric generation and continued low, stable natural gas prices may further even out the seasonal demand for natural gas potentially causing summer demand to equal or exceed winter demand. [130]

There are approximately 400 natural gas storage facilities throughout the United States that contain a total working gas storage capacity of approximately 3.8 trillion cubic feet. In New York, about 35 to 40 percent of the winter gas requirements of LDCs are met through gas withdrawn from (as noted above) storage facilities primarily located in Pennsylvania and western New York. The total working gas storage capacity of Pennsylvania's storage fields is approximately 390 billion cubic feet, while for New York the storage field capacity is about 100 billion cubic feet. [131] According to NYSERDA, the potential withdrawal rates are higher in Pennsylvania than in New York, making storage in Pennsylvania more available for short-term demand spikes. Table 9-17 shows the FERC-jurisdictional storage fields in New York, as provided by the EIA.

[130] 2009 NYSER, Natural Gas Assessment, pp. 7, 12-13.

[131] 2009 NYSER, Natural Gas Assessment, p. 13

Table 9-17. New York Natural Gas Storage Fields

Company	Field	County	Type	Total Capacity (Bcf)**	Working Gas Capacity (Bcf)
Columbia Gas Transmission Corporation	Dundee	Schuyler, Steuben	DGF	11.36	3.87
	Greenwood	Steuben	DGF	3.32	0.17
	North Greenwood	Steuben	DGF	3.20	1.10
Dominion Transmission, Inc.	Quinlan	Cattaraugas	DGF	7.90	4.00
	Woodhull	Steuben	DGF	35.90	20.60
Honeoye Storage Corporation	Honeoye	Ontario	DGF	11.25	6.57
Inergy Midstream. LLC (formerly owned by Arlington Storage Company, LLC)	Thomas Corners	Steuben	Depleted Gas/Oil Field (DGF)	10.00	7.00
Inergy Midstream. LLC (formerly owned by Central New York Oil and Gas Company)	Stagecoach	Tioga	DGF	30.54	24.74
Inergy Midstream. LLC	Seneca Storage Field	Schuyler	Salt Dome	2	1.5
National Fuel Gas Supply Corporation	Beech Hill	Allegany	DGF	23.0	9.90
	Bennington	Reie, WY	DGF	5.13	1.80
	Colden	Erie	DGF	18.72	7.55
	Collins	Erie	DGF	6.68	2.85
	Corry	Erie	DGF	1.25	0.20
	Derby	Erie	DGF	0.47	0.25
	East Independence	Allegany	DGF	6.40	2.20

	Holland	Erie	DGF	2.67	1.10
	Lawtons	Erie	DGF	2.85	0.97
	Nashville	Cattaraugus	DGF	8.98	3.93
	Perrysburg	Cattaraugus	DGF	5.05	1.85
	Sheridan	Chautauqua	DGF	4.41	1.10
	West Independence	Allegany	DGF	11.80	7.30
	Zoar	Erie	DGF	2.25	0.60
	Adrian	Steuben	DGF	9.00	6.20
	Wycoff	Steuben	DGF	6.97	6.11
**Total capacity is the volume of gas a facility can hold. Working capacity is what is typically stored by the owner/operator. Note: Data as of November 30, 2010.					

Source: http://www.ferc.gov/industries/gas/indus-act/storage/fields-by-location.pdf and New York Department of Public Service, Gas Policy and Supply (Interview with Mr. J.P. Sano).

Table 9-18 depicts planned storage additions derived from industry sources.

Table 9-18. Planned Storage Projects

Project	Company	Description	Status/ Est. In Service
Stagecoach Storage Facility North and South Project	Central NY Oil & Gas	Increase the throughput capacity of the North Lateral to approximately 560 MMcf/d, and that of the South lateral to approximately 728 MMcf/d	Proposal under development 2011
Stagecoach Storage Facility Marc I Project	Central NY Oil & Gas	Proposed 39 mile, 30 inch bi-directional gas pipeline that will provide transport capacity between Tennessee 300 Line and Transco's Leidy Line.	Proposal under development 2011
Alleghany Storage	Dominion	New and expanded storage at four different storage locations adding 125,000 dths of withdrawal capacity and transportation.	FERC Filing 2012
Seneca Storage	Arlington Storage Company	Expand storage capacity by adding 1 BCF of space.	Proposal under development 2011

Factors Relating to the Reliability of the New York Natural Gas Market

Natural gas is moved regionally through a transmission system, composed of about 272,000 miles nationwide of large diameter pipe to gate stations (city gates); where municipal gas companies and local distribution companies (LDCs) reduce the pressure in the line from transmission levels to distribution levels. [132] From there, natural gas is transferred into distribution lines or "mains" for delivery to customers. The consumption sectors for New York are discussed below.

Consumption Sectors

As noted above, New York is the fourth largest gas-consuming state in the U.S. As described in the New York *State Energy Plan*, Natural Gas Assessment, the State's use of natural gas is broken down into the following sectors shown in Table 9-19.

[132] *See,* American Gas Association website, http://www.aga.org/Kc/aboutnaturalgas/consumerinfo/Pages/NGDeliverySystem.aspx.

Table 9-19. Natural Gas Consumption by End Use (million cubic feet)

	2004	2005	2006	2007
Volumes Delivered to all Consumers	1,088,747	1,066,637	1,082,292	1,170,822
Residential	392,738	406,175	356,453	400,259
Commercial	359,070	275,721	259,972	285,030
Industrial	78,289	80,682	77,827	77,273
Vehicle Fuel	1,276	2,425	2,762	2,758
Electric Power	258,650	304,059	388,040	408,260
	2008	**2009**	**2010**	**2011**
Volumes Delivered to all Consumers	1,163,696	1,125,656	1182328	1,202,067
Residential	394,196	404,858	390,491	394,497
Commercial	290,150	280,763	287,389	290,027
Industrial	79,966	72,166	75,475	79,111
Vehicle Fuel	3,386	3,798	3,485	3,733
Electric Power	399,385	367,869	425,488	434,699

Source: http://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SNY_a.htm and
http://www.eia.gov/dnav/ng/ng_cons_sum_a_EPG0_VC0_mmcf_a.htm

The data show growth in total gas consumption for New York of 10.4 percent from 2004 through 2011. The residential, electric power and vehicle fuel sectors, however, generally demonstrate an increase in gas consumption, while the commercial sector dipped and appears to be reviving and industrial sector has varied within a, narrow, but consistent margin. The residential customers are currently the second largest consuming sector, with electric power the largest. Residential and commercial customers largely utilize natural gas for space heating. Given their size and volume, residential customers would face a significant impact from a severe disruption of supply in the natural gas market. These numbers give responders perspective on the relative vulnerability to shortage among end-use sectors.

Design Day

The risk of natural gas supply disruptions in New York is reduced by the fact that LDC's generally gauge supply needs sufficient to meet demand for a specified peak, or design, day. The New York Public Service Commission defines design day to be "a 24-hour period of the greatest theoretical gas demand, used as the basis for designing purchase contracts, and/or production facilities, and/or delivery capacity." [133] The design day is a basis for capacity requirements to ensure that natural gas companies are prepared to meet customer demands on the coldest days. The practice of preparing for a peak day includes

[133] http://www.dps.state.ny.us/glossary.html.

supply to customers who arrange for their own transport through the distribution system as well as reserves for demand contingencies and anomalies in the volume of demand (e.g., weather events that extend beyond a moving average or "normal" pattern). In addition, seasonal peaking service contracts are in place to supplement gas supply for winter use.

Interruptible Service

LDCs provide natural gas delivery to customers on either a firm or interruptible basis. Firm service is offered to customers under schedules or contracts which anticipate no interruptions. This type of service is generally provided to residential and small commercial customers as well as industrial customers that do not have alternative fuel burning capability. In contrast, interruptible service contemplates the potential disruption of gas service if capacity is insufficient to meet all customer needs. Indeed, interrupted service may be invoked during any period when demand exceeds, or is expected to exceed, capacity. This type of service, as noted above, is used primarily by large customers that have alternate fuel burning capability, such as electricity generators. The incentive for electing interruptible service is its lower price as measured against firm service. It is also an invaluable part of the overall tariff, enabling LDCs to meet demand for firm customers during the highest demand periods without having to pay extraordinary rates for additional supply expected at such times.

Public Service Commission Requirements Regarding Interruptible Customers and Backup Fuel

After a series of oil supply disruptions and oil price spikes that occurred in January 2000, the New York Public Service Commission (PSC) docketed Case 00-G-0096 (In the Matter of Criteria for Interruptible Gas Service) and issued orders that require interruptible natural gas customers that use petroleum fuels as backup to enter the winter season with verifiable reserves of alternative fuel backup, or alternatively, acceptable firm supply arrangements. Specifically, the PSC issued orders on August 24, 2000 and January 31, 2001 requiring the following:

LDCs were directed to file tariffs requiring interruptible natural gas customers to have provable storage capacity and alternate fuel on hand to withstand interruptions of service for at least seven days, in the case of Temperature Control (TC) customers, and ten days, for on demand (fully) interruptible customers.

Customers that lack sufficient storage space to meet those obligations are required to enter the heating season with filled tanks and arrangements (for example, a contract which is not dependent on spot market purchases) suitable to the LDC, for replenishment of storage tanks such that the initial storage plus replenishment equals the minimum storage inventory for its type of service.

Additionally, large contract customers, such as electric generators with interruptible gas contracts, are required to maintain, or have on call, the equivalent of five days of petroleum fuel at the maximum winter burn rate.

After a severe distillate fuel supply shortfall during the winter of 2002-2003, the PSC and local distribution companies took the following additional steps:

- Required LDCs to notify certain stakeholders of impending weather induced interruptions;
- Required certain LDCs with interruptible service to hold two preseason test interruptions to verify the ability of interruptible customers to switch to backup fuel;
- Required local distribution companies to switch interruptible customers to firm service for 12 months if they fail to interrupt use when appropriate.

Power Generation and Interruptible Service

Many power plants in New York have dual-fuel capability, which permits them to burn an alternate fuel, typically distillate or residual fuel oil. These types of generators are logical candidates for interruptible service. They provide LDCs with leeway to protect firm customer requirements when natural gas demand peaks. For interruptible service to perform optimally, however, it is necessary that a sufficient number of such interruptible generators exist, that adequate alternate fuel is available for generation when natural gas is supply is interrupted, and that dual-fuel generators are not restricted by environmental regulation from using the alternative fuel.

Over the last several years, the electric generation sector has become more reliant on natural gas as a fuel source due to the lower cost of gas. Gas also provides environmental benefits, has better heat rates (efficiencies) for combined cycle gas turbines (CCGT) and requires no significant on-site fuel storage. However, the new natural gas generators do not have the extensive amount of backup distillate or residual fuel oil stored on site that enables the older, base-load, generators to run on backup fuel for extended lengths of time. In contrast, the newer, gas-fired CCGT facilities typically use distillate oil as an alternate fuel, limited to 720 hours or 30 days. [134] As a result, the newer gas generators may not provide the same level of firm customer protection as LDCs obtained from older model generation equipment.

Regulation

State Regulation

The PSC regulates LDCs in New York. Its regulatory authority extends to oversight of the retail rates and services of the LDCs and it is responsible for ensuring that New York customers have access to reliable, safe, and reasonably priced natural gas distribution service. Beyond oversight of LDC rates and services, New York agencies possess authority regarding the siting of certain natural gas infrastructure.

Customer Choice

New York customers have the right to purchase natural gas from either the LDC or an Energy Service Company (ESCO). In order to facilitate customer choice and competition among commodity suppliers, LDC rates have been unbundled into separate delivery and commodity charges. Customers that choose to purchase gas supplies from the LDC are referred to as "sales customers," while those who purchase the commodity from an ESCO are called "transportation customers." Coupled with customer elections regarding firm or interruptible service, customers possess four possible combinations of delivery service and commodity service options: firm or interruptible utility provided gas, and firm or interruptible delivery service with gas provided by ESCOs.

Generally, larger customers have elected third party gas suppliers at a higher rate than small customers, such as residential and small commercial. The number of customers participating in customer choice continues to grow in New York. In 2010, 16 percent of residential customers chose an ESCO, up from 11 percent in November 2007 and 2 percent in December 1999. [135] The rate rises to 29 percent of small commercial and industrial customers, while 41 percent of large industrial customers have chosen an ESCO. Finally, virtually all electricity generators receive service through a third party energy provider. [136]

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[134] NY *State Energy Plan 2009*, Section 2, Natural Gas Assessment, pp. 21-22.

[135] http://www.eia.gov/oil_gas/natural_gas/restructure/state/ny.html.

[136] NY *State Energy Plan*, Section 2, Natural Gas Assessment, pp. 6.

Siting of Natural Gas Infrastructure

The construction of a new gas pipeline or LNG [137] facility is time-consuming; the planning, regulatory approval process and construction takes several years. The PSC has jurisdiction over applications to construct and operate "major" gas transmission lines in New York, defined as facilities extending a distance of at least 1,000 feet and operated at pressures of 125 psi or more. [138] In order to grant authority to construct major gas transmission lines, the PSC must find and determine: (i) the basis of the need for the facility, (ii) the nature of the probable environmental impact, (iii) that the facility represents the minimum adverse environmental impact, considering alternatives and other relevant considerations, (iv) that the location of the line will not pose an undue hazard to persons or property along the area traversed by the line, (v) that the location of the facility conforms to applicable state and local laws and regulations, and (vi) that the facility will serve the public interest, convenience, and necessity. Additionally, there is a streamlined process for natural fuel gas transmission facilities that extend 1,000 feet or more, but less than ten miles. [139] New York also has an established regulatory program to oversee oil and gas drilling. The Department of Environmental Conservation (DEC) oversees well permitting, drilling operations and site restoration when drilling is completed.

Additionally, the DEC has authority to permit natural gas wells pursuant to Environmental Conservation Law Article 23. Consideration of gas well applications involves review of the State Environmental Quality Review Act. [140] DEC also participates as a cooperating agency in FERC proceedings involving applications for new natural gas storage projects as well as proposals to increase working gas capacity of an existing storage field.

Federal Regulation

Federal Agencies

Federal law changed interstate natural gas pipelines from company-controlled assets to price-regulated common carriers in 1992. Two federal agencies, the U.S. Pipeline and Hazardous Materials Safety Administration (PHMSA) and FERC, have a central role in U.S. and New York pipeline safety regulations. These regulations pertain to the critical infrastructure components of the natural gas system as well as many other issues affecting price, location, construction and related matters.

U.S. Pipeline and Hazardous Materials Safety Administration (PHMSA), Public Law 90-481, the Natural Gas Pipeline Safety Act of 1968, forms the basis for federal pipeline safety rules. [141]

"The Department of Transportation's Pipeline and Hazardous Material Safety Administration (PHMSA) administers the Department's national regulatory program to assure the safe transportation of natural gas,

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[137] In 2012, a moratorium prohibited the location of new LNG facilities in New York City. Additionally, New York State regulations, as of 2012, do not allow the siting of new intrastate LNG facilities. (6 NYCRR Part 570. The New York State Department of Environmental Conservation has proposed to develop and promulgate regulations addressing the safe siting, construction, operation, and inspection of LNG facilities. Until those regulations are promulgated, however, it is not likely that an LNG facility will be sited in the State.

[138] Article VII, Public Service Law. (Note: FERC retains jurisdiction to site natural gas pipelines used in interstate commerce, while the PSC has authority over intrastate pipelines.)

[139] Public Service Law § 121-a, 16 NYCRR, Subpart 85-1.

[140] http://www.dec.ny.gov/permits/357.html.

[141] http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/49US_Code_Chapters_601_Chapters_603.pdf

petroleum, and other hazardous materials by pipeline. Regulations and other approaches to risk management are promulgated to assure safety in design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Since 1986, the entire pipeline safety program has been funded by a user fee assessed on a per-mile basis on each" regulated pipeline.

Federal Energy Regulatory Commission

FERC possesses general regulatory authority pursuant to the Natural Gas Act over the interstate natural gas pipelines. Specifically, it possesses jurisdiction regarding:

- Pipeline rates and services.
- The construction and operation of interstate natural gas pipeline facilities and oversight of related environmental matters.
- Interstate natural gas storage facilities.
- Liquefied natural gas import facilities.

Even if FERC grants certification of an interstate pipeline, storage, or LNG facility over which it has jurisdiction, the applicant must still obtain certain approvals from the affected state(s) pursuant to the Clean Water Act, Coastal Zone Management Act, and Clean Air Act. If a state finds a proposed project is inconsistent with its federally approved coastal management program, the applicant may appeal the state's decision to the U.S. Secretary of Commerce. [142] Through this process, the state maintains a role in the building of new natural gas infrastructure.

When a pipeline project is approved by FERC pursuant to the Natural Gas Act, the Act grants the right of eminent domain to the applicant. Therefore, if the applicant is unable to obtain necessary property and rights-of-way through agreement with affected property owners, the Natural Gas Act provides a mechanism for reaching a solution.

The Restructuring Rule

FERC's Order 636, issued on April 8, 1992, fundamentally changed the national natural gas market. Also known as the Restructuring Rule, Order 636 mandated the unbundling of sales services from transportation services, providing natural gas customers with full choice of providers and opening gas markets to competition. The unbundling requirement was meant to ensure that the gas of other suppliers would receive the same quality of transportation services as the pipeline company's own gas, thereby increasing competition among gas sellers and diminishing the market power of pipeline companies. As a result, interstate natural gas pipelines effectively became common carriers transporting natural gas; they no longer bought and sold the gas. In the process of enforcing the Restructuring Rule, FERC established its presence in several areas of the national natural gas market and thus directly affected sales in New York. Samples of oversight undertaken by FERC include:

- Requires pipelines to unbundle (i.e., separate) their sales services from their transportation services.
- Determining rate-setting methods for interstate gas pipelines.
- Developing rules for pipeline company business practices.

[142] For example, the Broadwater Liquefied Natural Gas project was proposed to be located offshore of Long Island and it received FERC approval. Nevertheless, New York found the site inconsistent with its Coastal Zone Management Act plan and the State's determination was upheld by the U.S. Department of Commerce in April 2009.

- Approving or disapproving the siting, construction and operations of interstate gas pipelines.
- Coordinating gas pipeline projects with applicable federal agencies.
- Affecting environmental, endangered species and historic preservation reviews.
- Cooperating with OPS.
- Examining pipeline mergers and acquisitions in coordination with other federal agencies and state authorities.

Risk and Vulnerability – Mitigation and Recovery

For the purpose of analysis, risk of supply interruption into the State can be divided into two categories, supply and distribution. Pipelines bring natural gas into the state where LDCs distribute it to consumers and manage all of the consumer-end related billing activity. Sales at the consumer level ultimately dictate the volume acquired from natural gas producers (many of which overlap the companies that drill for and produce crude oil).

Natural gas is similar to electricity because supply and distribution operate with reference to each other. In this sub-section, risk and vulnerability are assessed by describing what natural gas providers do to mitigate or recover from gas supply problems. It also discusses how New York LDCs address local needs and capacity on the supply side while being prepared to maintain infrastructure, repair damage and restore gas on the distribution side. A more detailed analysis of risk and vulnerability is contained in Section 7.

Pipeline Inspection

The PSC has responsibility for ensuring the safety of natural gas and liquid petroleum pipelines. That authority stems from its general regulatory powers (in accordance with §66 of the Public Service Act) over all natural gas utilities in New York. Additionally, §65 of that law requires each gas utility to provide safe, adequate service at just and reasonable charges, without discrimination or preference. Section 67 authorizes the PSC to inspect natural gas meters. The PSC exercises jurisdiction over the siting of major gas and electric transmission facilities. It has exercised its authority to promulgate regulations regarding the safety of natural gas pipelines, including 16 NYCRR 255.1 *et seq*., which relate to safety requirements for the design, fabrication, installation, inspection, testing and operation and maintenance of gas transmission and distribution systems.

The exercise of the PSC's authority regarding the safety of natural gas pipelines helps ensure that jurisdictional natural gas utilities and operators construct, operate and maintain their facilities to ensure safe and reliable service and, consequently, avoid or mitigate outages and interruptions of service.

Additionally, Executive Law §§716 directs the state Office of Homeland Security to conduct a review and analysis regarding the security measures taken by the PSC to address critical infrastructure, including pipelines, and to issue non-public reports based on the findings. Pursuant to that law, the PSC has the authority to require that any recommendations made by the Office of Homeland Security be implemented.

Restoration of Distribution

Each jurisdictional natural gas utility has established procedures to restore service in the event of an outage, regardless of the cause of the outage. There are specific provisions that address restoration of service in the event of an outage. The jurisdictional natural gas utilities have executed those procedures on numerous occasions.

The PSC and its staff arm, the Department of Public Service (DPS), have established contacts with natural gas utilities to obtain outage information in the event of any service interruption. The PSC has priority of service rules and communicates with affected gas utilities during incidents to coordinate and abet mutual assistance among responding LDCs. The PSC also interacts with individual customers to provide information and resolve questions during emergency or outage situations.

The information contained in Table 9-20 summarizes the activities that result from PSC oversight of the natural gas industry and also summarizes representative LDC activity designed both to mitigate and to restore services when natural gas supply is threatened or lost.

Table 9-20. System Risk and Representative Response

Issue	Stakeholder Response
Inadequate Transportation Capacity	LDCs • Monitor and maintain communications • Coordinate with PSC and other LDCs • Review capacity expansion plans PSC • May develop dockets for review of capacity plans • PSC (through the DPS) works closely with LDCs to monitor potential and imminent capacity issues • Review LDC expansion plans
Weather-Related Shortage (including natural disasters)	Utilities • Assess, monitor situation • Increase draw from storage, as needed • Purchase gas from other regions • Coordinate with PSC and other LDCs • Communicate with pipelines as needed • Increase line pack [143] and pump more gas • Interrupt interruptible tariff customers • Invoke curtailment criteria for firm service customers if condition persists • Post information on web site and inform media PSC • Monitor, communicate, advise

[143] Line pack is the ability to add more natural gas into a line by increasing the pressure of gas in the line. Usually this is done as a form of storage prior to a period of anticipated high demand such as winter.

Issue	Stakeholder Response

Sudden Supply Loss (load curtailment, facility failure)
• Local pipeline break
• Transport system pipeline break
• Local contractor ruptures feeder lines
• Automatic shut-down due to intrusion to electronic controls
• Ground movement occurs (earthquake, large equipment or structure failure near gas line)
• Pipeline pumps fail for lack of electricity
• Process plant/ storage facility, explosion/fire
• Other natural cause or human-induced interruption
	Utilities
	• Local feeder line break (often contractor-caused)
	• Assess, monitor situation
	• Send local crews to repair
	• Control ignition source, if applicable
	• Control leak, as applicable
	• Isolate and shut off supply
	• Report to PSC
	• Inform locality/citizens
	• Coordinate with individual jurisdictions
	• Seek assistance/coordinate with local fire departments
	• Post information
	• Send liaison to the State Office of Emergency Management (SOEM) if needed
	• Seek mutual aid if required
	• Invoke re-lighting procedures if shut-off was required
	• Curtail as necessary during time of repair
	• Transmission pipeline system break
	  • Assess, monitor
	  • Invoke same steps as during severe weather outage
	  • Offer mutual aid crews as local outage or transport system event requires
	  • Work closely with all authorities for large-scale burner tip re-light

Critical Infrastructure Protection	• Utilities maintain such protection as:
	  • Perimeter protection on major sites
	  • Guard forces
	  • Access control
	  • Back-up command centers
	• Maintain and monitor *supervisory control and data acquisition (*SCADA) systems
	• Professional security assistance
	• Electronic monitoring
	• Regular inspection and maintenance
	• Meet National Infrastructure Protection Plan (NIPP) definitions/requirements
	• Training

Cybersecurity	Utilities • Support as part of monitoring and control networks (e.g., SCADA) • Employ alarm systems for abnormalities in system flow

Issue	Stakeholder Response
	• Use manual mode if system hacked or shut down • Employs fail safe devices to prevent gas flow if intrusion occurs • Follow disaster recovery plan to re-start • Maintain alternate control facilities

Typical Gas Utility Emergency Plans and Priority Setting

The jurisdictional LDCs file emergency response plans with the PSC. These plans are a part of the State's overall energy preparedness portfolio of which this Energy Assurance Plan is an additional component. It is not necessary to duplicate the detailed LDC response plans here; however, they are summarized below to provide insight into the process:

Federal and State regulations require that each natural gas "operator" develop written procedures "to minimize the hazard resulting from a gas pipeline emergency."[144] The following basic provisions outline a typical LDC restoration response:

Typical Issues Addressed in LDC Plans

- Identify events requiring immediate attention.
- Communicate with all necessary stakeholders.
- Prompt and effective response mechanisms for:
- Gas leaks.
- Affecting pipeline infrastructure:
- Fire.
- Explosion, per above.
- Natural disaster.
- Maintain resources such as people, equipment, tools and materials.
- Train to deploy response actions.
- Establish and train to use emergency shutdown and pressure reduction by pipeline section.
- Define and assure contingent area safety.
- Notify public authorities and emergency responders.
- Begin and complete restoration process.
- Furnishing action plan to responders.
- Post-event review and evaluation.

Other Typical Considerations Found in LDC Emergency Plans

Define level of emergency such as:

- Moderate

[144] *Transportation of Natural and Other Gas by Pipeline*: Minimum Federal Safety Standards, 49 C.F.R. §192.615(a).
http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/49US_Code_Chapters_601_Chapters_603.pdf

  - Explosions or fires in which gas facilities are involved resulting in damage less than, for example, $50,000.
  - Service interruptions involving more than, for example 50 customers.
  - Release of gas from company distribution system that results in:
  - Ignited gas.
  - Coverage by media.
  - Outage of health care facilities or other sensitive premises.
  - Events, such as odorant spills or noisy gas leaks, which may be expected to result in a sudden, heavy influx of calls to the dispatch or customer services center.
  - Any leak or non-leak damage, including coating damage, to a distribution line with a pressure greater than, for example, 200 pounds-force per square inch gauge (PSIG.)
- Minor
  - Explosions or fires in buildings that are served by or near gas facilities but where gas is not suspected as being involved.
  - Evacuation of more than a single family residence.
  - Carbon monoxide calls resulting in occupants being taken for emergency health care.
  - Irate customer complaints.
- Other
  - Service interruptions involving less than, for example, 50 customers.
  - Evacuation of a single family residence.
  - Class 1 gas leaks.
  - Other hazards to the public or private property that require immediate response.
  - Environmental spills

Such a plan would also provide detailed procedures and responsibilities for personnel, from management to field, for staffing and operating repair situations, securing a safe result and informing stakeholders.

Natural Gas Curtailment Priority

One of the most important parts of an LDC's emergency plan to state responders is the priority list for curtailing customer usage during a shortage. Table 9-21 summarizes the curtailment plan of a representative LDC, though the order of curtailment for individual LDCs will vary. [145]

Table 9-21. Typical Natural Gas Curtailment Priority List

Priority Number	Curtailment	Comments
1	Electric generation	If gas not needed for critical electric generation
2	Interruptible transport and firm transport without customer-owned supplies	
3	Interruptible service	Category 1 - No. 6 Oil, 1.5% Sulfur

[145] This curtailment plan is a summary of the plan filed by Central Hudson Gas & Electric Corporation with the PSC as part of its tariff filing. It can be found at http://www.dps.ny.gov.

Table 9-21. Typical Natural Gas Curtailment Priority List

Priority Number	Curtailment	Comments
		Content or Higher Category 2 - No. 6 Oil, Less than 1.5% Sulfur Content and No. 4 Oil Category 3 - All Others
4	Requirements of customers with installed dual-fuel capability	
5	Certain firm industrial and commercial requirements for boiler fuel or space heating	Where total annual requirements are 100,000 hundred CF (Ccf)or greater
6	Certain firm industrial and commercial requirements for boiler fuel or space heating.	Where total annual requirements are between 12,000 Ccf and 99,999 Ccf
7	Certain firm industrial and commercial requirements for which there are feasible alternate fuels	Where total annual requirements are 100,000 Ccf or greater
8.	Certain firm industrial and commercial requirements for which there are feasible alternate fuels	Where total annual requirements are between 12,000 Ccf and 99,999 Ccf
9	Process and feedstock requirements with no technically feasible alternative fuels	Where total annual requirements are 12,000 Ccf or greater
10	Plant protection requirements for customers curtailed in Priorities 5 through 9 above	
11	Firm industrial and commercial requirements	where the total annual requirements are less than 12,000 Ccf
12	Interruptible transport and firm transport with customer owned supplies	
13	Firm residential requirements including the requirements of apartment houses, prisons, dormitories, nursing homes, hospitals and residential hotels.	

Source: https://www2.dps.state.ny.us/ETS/jobs/display/download/4867976.pdf

Cybersecurity

Cybersecurity for natural gas pipelines and LNG storage falls under the oversight of the U.S.PHMSA. In general, LDCs are aware of cybersecurity but believe that the electric/mechanical safeguards employed in their systems accomplish the necessary protection.

SCADA systems for natural gas provide monitoring data and some limited ability to change settings of control valves. However, the gas system is essentially controlled by mechanical means with electronic communications involved only in data acquisition and changes to the set points of the mechanical controls. The mechanical controls have limits on adjustability, which prevent electronic signals from causing problems. If the natural gas SCADA system failed or was attacked, the utilities would lose visibility and would revert to mechanical recordings for system monitoring.

Concern over cybersecurity throughout the United States has grown with the increasing threat of terrorist activity. New York, and natural gas utilities, will undoubtedly be involved in assessing and developing protocols for improving cybersecurity as national efforts to reduce risk and vulnerability in this area continue.

Response Actions that May Be Taken by State Authorities

Pursuant to Public Service Law §65 and §66, the PSC has broad regulatory authority to ensure the safe and adequate service of electricity and natural gas at just and reasonable charges. Given this authority, the PSC has assumed lead agency status for electric system and natural gas emergencies and will activate the DPS Emergency Plan when an emergency arises or appears imminent. (In contrast, NYSERDA will assume the lead role for petroleum and coal supply emergencies.) In either case, the State Office of Emergency Management (SOEM) will assume responsibility for the coordination of the State response, including the activation and operation of the State Emergency Coordination Center (SECC). These government agencies will also coordinate with industry representatives, as needed, such as the Northeast Gas Association (NGA) as well as affected LDCs.

Communications and Public Information

Energy shortages require public explanations. The first suggested measure in responding to an energy incident after monitoring is public information. Most small events are not reported in the media. But any event can come to the media's attention regardless of how many customers are affected or the time it takes to restore the system. People will turn to the media for answers and the media may query both company and state officials.

The public will expect LDC and government in New York to provide accurate information without exacerbating the situation. Most citizens can manage short-term outages and, although annoyed, will be patient. Over the years, most energy companies and governments have learned the value of being forthright when discussing energy interruptions. Lack of candor can turn public opinion against energy providers and government, thus diminishing cooperation during restoration.

Media Preparation

The keys to successful media relations are planning, preparation and training. Maintaining updated information on normal energy consumption patterns is the first step toward accurate reporting. Equally important, preparation permits government responders to interpret what is learned from LDCs. This enhances government's perspective and ability to assist as needed.

A useful part of preparation for an energy emergency is regular staff training that includes practice in media relations. This involves gathering data under pressure, completing analyses rapidly, and conveying complex information effectively.

Preparing and coordinating public relations materials and protocols for a natural gas shortage are the same for other energy forms as well. State officials should anticipate that not all stakeholders will be equally prepared or sufficiently knowledgeable to speak about or provide advice on energy matters. It is always prudent to coordinate and cooperate in order to provide a timely and consistent message for the governor, to the general public and neighboring states. The guidelines in Table 9-22 below may be helpful.

Table 9-22. Potential Public Information Steps for State Government

Phase	Suggested Response for NYSERDA
Early Warning	• Review and reinforce communications within the State and ascertain that everyone understands their role, what can and cannot be said, and by whom • Work with the PSC (and the DPS) and SOEM to keep the Governor's office apprised • Review/prepare graphic energy market presentations and other materials to explain consumption patterns and anomalies • Work with the PSC. SOEM and LDC to provide helpful conservation and mitigation advice to the public • Continue to acquire supply & demand data • Coordinate with the PSC and SOEM on media contacts in order to help reporters (especially newly assigned) understand basic energy facts and issues • Review weather forecasts often
Pre-Emergency Declaration	• Maintain information actions per above • Establish Joint Information Center (JIC) (on site or virtual) • Agencies cooperating and coordinating include: • State Emergency Management Office (SOEM) • Department of Public Service (DPS) • Department of Environmental Conservation (DEC) • Empire State Development (ESD) • Office of Temporary Disability Assistance (OTDA) • Consumer Protection Board (CPB), and the New York State Department of Health (DOH). • Coordinate with JIC, and distribution industry associations to draft energy conservation recommendations if shortage is predicted to increase • Work with LDC on heating issues to provide media advisories on setting back thermostats, using cooking fuel wisely, checking heating equipment and conserving hot water • Consider public meetings and use of the Internet as appropriate • Share State energy data with other states, National Association of State Energy Officials (NASEO) and DOE, as needed • Assist the Governor in making follow-up announcements to assure the public and to encourage continued cooperation and compliance • Estimate the probability and timing of greater shortage • Prepare briefings on possible supply and demand restraint measures should shortage intensify
Emergency Declared	• Maintain information actions per above • Assist JIC, PSC and SOEM with media briefings (sometimes in conjunction with energy stakeholder representatives) • Develop follow-up messages from the Governor to assure the public and to maintain compliance • Work with the PSC and SOEM (in coordination/conjunction with the Governor's office or others) to announce enforcement actions, if any

Potential State-Initiated Emergency Mitigation Measures

If a natural gas shortage were to continue for an extended time, the State may wish to invoke energy emergency mitigation measures. In a natural gas emergency in which available natural gas supplies are

unable to satisfy demand, the 2009 NYS Energy Emergency Plan (NYSEEP) provides for potential response actions, listed in Table 9-23, for each stage of a natural gas supply emergency. These measures are in addition to the list of response actions delineated in the NYSEEP and summarized in Section 6 of this EAP.

No measure is suggested for reducing possible natural gas use in vehicles since this consumption is relatively minor compared to space heating and industrial uses. Potential measures for mitigating a prolonged state of natural gas shortage include:

Table 9-23. Potential Emergency Mitigation Measures

Measure 1	Lead Agency	What It Does	Target Consumers
Public Information for Energy Conservation Voluntary Measure Consider for Pre-Emergency Declaration phase	PSC (Through DPS) is the lead agency (NYSERDA is available to assist) and in coordination with SOEM	Promotes voluntary reduction in energy use to aid recovery and restoration efforts, share limited energy supplies equitably and assure sufficient energy for priority customers. Gives the public specific guidance for type of energy shortage and may stimulate the use of alternatives or efficiency measures.	All users, general public

Recommended Steps for State Responders	Metrics
General • Use PSC, DPS, SOEM and NYSERDA staff knowledge; obtain information from sister states, DOE, NASEO and others to develop conservation guidance Administration • Coordinate with State natural gas utilities, and State agencies such as SOEM and NYSERDA working with their media and public relations professionals • Develop brochures, handouts, video, audio, Internet and other dissemination materials • Work with media and others to obtain low cost or free airtime or print space • Hold public meetings for town energy task forces and concerned citizens • Provide feedback to legislature and local jurisdictions	LDCs report lower demand Query LDCs after incident to see if supply availability improved after public information was provided Enforcement • Not Applicable

Measure 2	Lead Agency	What It Does	Target Consumers

Compressed Work Week Voluntary Measure Consider for Pre Emergency and Declared Emergency phases	PSC (Through DPS) is the lead agency (NYSERDA is available to assist) and in coordination with SOEM	This is a form of flexible time management. It could reduce hours of operation for buildings and thus the volume of natural gas required. Many federal agencies already support a 10-hour, 4-day/week schedule for employees.	Commercial, institutional, industrial consumers

Recommended Steps for State Responders	Metrics
General • Requires State and local government leadership • Participation of major employers is highly desirable • Certain businesses and agencies cannot participate due to the nature of their work Administration • DPS works with State personnel management and private employers to enlist support • Work with unions and other employee organizations to obtain support • Ask affected local jurisdictions to help solicit participants; New York Empire State Development (ESD), and New York Department of Labor (NYSDOL) • Determine which businesses/agencies are capable of participating • If mandatory, develop list of exemptions • If mandatory, work with Attorney General to set up enforcement and appeals procedures • Assist participants in coordinating with out-of-state entities if necessary • Ascertain equity issues (including overtime pay) if measure is mandatory • Coordinate with affected local jurisdictions Enforcement • Not Applicable	Seek assistance of selected commerce associations (e.g. Chambers of Commerce) to gauge effectiveness Query LDCs after incident to see if supply availability improved after public information was provided

Measure 3	Lead Agency	What It Does	Target Consumers
Telecommuting Voluntary Measure Consider for Pre Emergency and Declared Emergency phases	PSC (Through DPS) is the lead agency (NYSERDA is available to assist) and in coordination with SOEM	Reduces natural gas consumed in places of employment.	Commercial & Government

Recommended Steps for State Responders	Metrics
General • Needs assistance from ESD, business associations, employee unions and groups Administration • Encourage all business sectors to participate • Provide technical assistance • Seek advice and operating procedure help from national and regional telecommuting organizations • Publicize and explain • Design this measure for self-administration • Consider publicized recognition or awards for participating employers • Coordinate with affected local jurisdictions • Provide “success stories” to media Enforcement • Not Applicable	Seek assistance of selected commerce associations (e.g. Chambers of Commerce) to gauge effectiveness Query LDCs after incident to see if supply availability improved after public information was provided

Measure 4	Lead Agency	What It Does	Target Consumers
Reducing Government Agency Hours of Operation Voluntary Measure or Mandatory Measure Consider for Pre Emergency and Declared Emergency phases	PSC (Through DPS) is the lead agency (NYSERDA is available to assist) and in coordination with SOEM	Creates a short workweek for state and local government in order to provide limited natural gas for high priority use by critical care and residential consumers.	Government (State and local)

Recommended Steps for State Responders	Metrics
General • Chief elected official, cognizant agencies and other authorities or leaders as needed • Approval and coordination required Administration • Develop criteria to identify agencies/buildings to reduce hours or close • Develop criteria for return to normal operations • Coordinate with employee unions, if applicable • Attend to employee issues such as criteria for any wage/salary changes, and impact on benefits, such as sick leave/vacation time • Provide timely notice to employees Enforcement • Applicable public authority	Measure average computer, lighting and elevator use during non-emergency periods to create baseline for "typical" worker cost per defined period of time. Conduct survey of State government to determine number of employees participating. Estimate savings based on pre-determined "typical" cost basis, per above. * *Consider same pre-determined measurement for commerce and work with commercial sector associations to achieve. Publicize participants and compliment in public.

Measure 5	Lead Agency	What It Does	Target Consumers
Hot Water Set Back Voluntary Measure or Mandatory Measure Consider for Pre Emergency and Declared Emergency phases	PSC (Through DPS) is the lead agency (NYSERDA is available to assist) and in coordination with SOEM	Reduces temperature of hot water at commercial, governmental and industrial facilities. Also recommended as a voluntary measure for residential and institutional users.	Commercial, institutional and industrial consumers

Recommended Steps for State Responders	Metrics
General • Recommend a percentage (e.g., 5 or 10%) reduction in temperature and consult with cross-section of user representatives • Design this measure for building operator self-certification • Use local inspectors for random verification Administration • Notify the public • Use standard testing procedures • Arrange media coverage • Enlist support and technical assistance from plumbing professionals • If mandatory, work with Attorney General to set up enforcement and appeals procedures • Coordinate with local authorities as appropriate Enforcement • Self-enforcement and local code officials; See note above regarding Attorney General	Work with business and institutional entities and associations to provide regular reporting on reductions implemented. Use DOE or other standard measurements for reducing hot water costs per size of unit, volume of use or other pre-determined measurement.

Measure 6	Lead Agency	What It Does	Target Consumers
Building Temperature Adjustment Voluntary Measure or Mandatory Measure Consider for Declared Emergency phases	PSC (Through DPS) is the lead agency (NYSERDA is available to assist) and in coordination with SOEM	Reduces/restricts space conditioning in commercial, institutional and public facilities.	Building owners and operators

Recommended Steps for State Responders	Metrics
General • Recommend a +/- 5 % seasonal temperature adjustment in consultation with commercial, institutional and industry representatives • Use building operator self-certification (building operator keeps log for review by management) for this measure • Use local inspectors and town energy task forces for random verification Administration • Work with ESD and NYSDOL for support • Notify the public • Establish self-certification and self-enforcement feedback • Use standard testing procedures • Arrange media recognition for participating companies • If mandatory, work with Attorney General to set up enforcement and appeals procedures • Coordinate with affected local jurisdictions Enforcement • Self-enforcement and local code officials; See note above regarding Attorney General	Work with business and institutional entities and associations to provide regular reporting on reductions implemented. Work with local jurisdictions and building owner/operator associations to ascertain compliance and numbers participating Use DOE or other standard measurements for reducing hot water costs per size of unit, volume of use or other pre-determined measurement.

Natural Gas Utilities Listed by PSC as Subject to its Jurisdiction

The New York PSC provides the comprehensive list of LDCs with their respective contact information that fall within the PSC's regulatory authority, shown in Table 9-24

Table 9-24. Natural Gas Utilities Regulated by PSC

Company	Address	Phone
Bath Electric, Gas & Water System	Drawer 310 Bath, NY 14810	(607) 776-3072
Central Hudson Gas & Electric Corporation	284 South Avenue Poughkeepsie, NY 12601	(845) 452-2000
Chautauqua Utilities, Inc.	8850 West Route 20, PO Box 100 Westfield, NY 14787	(716) 789-2022
Consolidated Edison Company of N Y, Inc.	4 Irving Place New York, NY 10003	(212) 460-4600
Corning Natural Gas Corporation	330 West William Street Corning, NY 14830	(607) 936-3755
Empire State Pipeline	6363 Main Street Williamsville, NY 14221	(716) 857-7536
Filmore Gas Company, Inc.	P.O. Box 181 Filmore, NY 14735	(585) 567-2272
KeySpan Energy Delivery (Long Island)	175 E. Old Country Road Hicksville, NY 11801	(631) 755-6650
KeySpan Energy Delivery (New York)	One MetroTech Center Brooklyn, NY 11201	(718) 403-2000
N.E.A. Cross of New York, Inc.	1405 Olde Road Clymer, NY 14724	(716) 355-2777
National Fuel Gas Distribution Corporation	6363 Main Street Williamsville, NY 14221	(716) 857-7000
New York State Electric & Gas Corporation	4500 Vestal Parkway East P.O. Box 3607 Binghamton, NY 13902	(607) 762-7200
Niagara Mohawk Power Corporation	300 Erie Boulevard West Syracuse, NY 13202	(315) 474-1511
Orange and Rockland Utilities, Inc.	One Blue Hill Plaza Pearl River, NY 10965	(845) 352-6000
Reserve Gas Company, Inc.	13441 Railroad Street Alden, NY 14004	(716) 937-9484

Company	Address	Phone
Rochester Gas & Electric Corporation	89 East Avenue Rochester, NY 14649	(716) 546-2700
St. Lawrence Gas Company, Inc.	33 Stearns St. Massena, NY 13662	(315) 769-3511
Valley Energy, Inc.	523 S. Keystone Ave. Syre, PA 18840	(570) 888-9664
Woodhull Municipal Gas Company	P.O. Box 13 Woodhull, NY 14898	(607) 458-5220

9.3 Petroleum

This section focuses on liquid petroleum energy products. Three fuel types are emphasized because they are the most widely used in New York: motor gasoline, distillate, and propane (also known as liquefied petroleum gas or LPG). Motor gasoline used for vehicles in New York State totaled more than 136 million barrels (MMbbl) in 2009. [146] More than 130 MMbbl of distillate were consumed, including heating oil, diesel fuel, and other products such as jet fuel. Propane, an important fuel in rural markets, held a relatively small portion of the State's 2009 petroleum consumption – 8.3 MMbbl or 3 percent of the total.

In order to understand how crude oil and refined petroleum products affect Energy Assurance, this section discusses the principal liquid petroleum market delivery systems. Industry issues, supply disruption, mitigation, response, and energy shortage identification are noted in order to identify how disruptive energy events may be managed. Certain agency response activities and suggested crisis response measures are discussed so that they may be considered for mitigating emergencies.

International and National Petroleum Market Description and Issues

International and National Market Factors

The National Association of State Energy Officials and the National Association of Regulatory Utility Commissioners (NASEO/NARUC) *State Energy Assurance Guidelines* discuss all of the principal energy markets including the petroleum market as it relates to Energy Assurance. [147] While the details of that discussion should be considered as included by reference in this EAP, several aspects of particular interest to New York State are summarized below.

International Commodity

Petroleum is an international commodity. The *New York State Energy Plan* notes that:

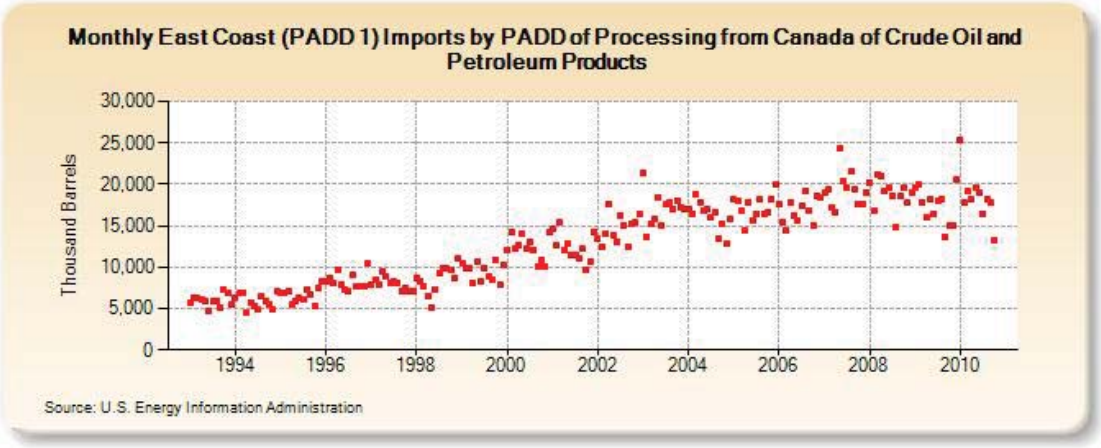
[146] For updated data points, see 2013 NYSEP when published or follow the source URLs given for the most recent data possible.

[147] NASEO/NARUC, *State Energy Assurance Guidelines*, v. 3.1, December 2009, www.naseo.org/eaguidelines/.

The geographic location of crude oil is as important a consideration as its quantity and quality. While there are a number of important crude oil producing regions around the world, one of the most vital is the Middle East, home to many member nations of the Organization of Petroleum Exporting Countries (OPEC). OPEC crude oil reserves equaled approximately 910 billion barrels in 2007 and accounted for 69 percent of total world reserves. As a comparison, U.S. crude oil reserves in 2007 equaled about 21 billion barrels and accounted for 1.6 percent of the worldwide total. [148]

In addition to OPEC oil, as a part of Petroleum Administration for Defense District (PADD) 1, New York receives significant petroleum from Canada. The U.S. Energy Information Administration (EIA) has noted that Canadian oil imports to PADD 1 increased steadily from 1993 to 2011. New York has been an important beneficiary of this trend, as illustrated in Figure 9-32.

Figure 9-32. PADD 1 Imported Petroleum Products from Canada



Source: EIA. http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MTTIPP1CA1&f=M

While there are domestic laws pertaining to the integrity and safety of petroleum shipping and pipelines (see discussion about PHMSA under Appendix C. Natural Gas), as well as certain trade practices prohibited in the United States, crude oil and its products are bought and sold in an unregulated international marketplace. Petroleum is generally governed by the economic principles of supply and demand; however, essential elements of this marketplace can be obscure. In other words, both sides of the supply and demand equation can be, and often are, adjusted in order to affect market pricing.

Some of the factors that affect pricing, and thus create uncertainty, include the ability of producers to increase or decrease extraction, of refiners to expand or contract product production, and of end users to increase or reduce consumption. For example, speculation in oil futures from participants who do not take actual possession of (wet) barrels affects price. This in turn may send market signals that result in an exaggerated picture of physical market components. Components of this market may be more or less vulnerable depending on the apparent need for petroleum products at any given moment and the ability of the market to "clear." In other words, supply is expected to satisfy demand at a price that facilitates this exchange. If it does not, there may be risk of shortage.

[148] *New York State Energy Plan,* Section 5, Petroleum Assessment, pp. 3.

Essential Market Systems

Four essential systems affect petroleum: exploration and production, transportation by pipeline, shipping by other means (e.g., water and rail), and refining plus local delivery. Each has its own supply and demand structure, and these system structures further complicate the availability and price of petroleum products sold for consumption.

Exploration and Production

At the international and national levels, oil exploration and production are affected by a complex system of demand for crude oil (and natural gas because production wells often produce both), the cost of exploration including location and discovery of the resource, infrastructure, supplies, insurance, time, personnel, national and local laws and regulations, and forces of nature.

Transportation

The transportation of crude oil is affected by many factors, some relate to pipelines, others to water or retail shipping, and many to both. Pipeline delivery is related to the availability of electricity to operate pumps as well as U.S. and State pipeline safety regulations. Water and rail shipping have different market factors such as vessel or rail car availability, location, and weather. Maritime shipping and rail must work with unions and shipping is vulnerable to pirates in certain areas. Issues that affect all forms of transportation include insurance, availability of skilled personnel, international or national shipping and transportation rules, and differences between local and international prices that create arbitrage opportunities. Within the United States, crude oil can move from production to refinery via international and interstate pipelines, thus reducing risk and cost in the U.S. domestic market. Even though U.S. petroleum dependency on international supplies dropped from about 60 percent to 55 percent from 2008 to 2011, [149] ocean shipping continues to be an important component of the supply equation. The price of Canadian oil, which reaches the U.S. primarily by pipeline, is also influenced by world prices, which are, in turn, influenced by shipping costs.

Shipping is of special concern for New York because a large percentage of the State's petroleum product comes through the New York and Buffalo harbors. International imports support the U.S. petroleum system and are an essential pathway through which the United States is linked to world prices with all of the implications this has for domestic price and supply risk. Shipping issues are noted at several points in this analysis, especially as they affect the movement of refined product to markets in the New York City, Long Island, Hudson Valley, and western areas of the State.

U.S. Petroleum Market History and Dynamics

History

The late-1970s OPEC embargo of oil to the United States signaled the growing ability of economically emerging nations to affect the price and other market fundamentals of world oil supply. Major U.S. companies were losing control over significant oil fields as foreign countries nationalized assets and began to dictate crude oil prices. Political factors entered into the price of oil as such nations began to assert more influence over the course of international affairs. Major oil companies, comfortable with a system dominated by U.S oil and regional interests,[150] were not equipped to counter these trends.

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[149] EIA, Energy In Brief, *"How dependent are we on foreign oil?"* http://www.eia.gov/energy_in_brief/foreign_oil_dependence.cfm.

[150] An example is the national oil price-setting mechanism operated by the old Texas Railway Commission.

Major oil companies were also witnessing a growing spot market that supplied a burgeoning off-brand retail sector. The spot market, born of an opportunity to sell excess refined products, produced mixed results for major petroleum companies. It worked to lower the price of oil products in some markets while increasing the risk of fuel availability in times of shortage. It helped change the dynamics of vertically integrated oil companies by offering alternate paths to market through increasing numbers of independent wholesale and retail sellers. Vertically integrated companies began to lose market share in direct sales of fuel but benefited from the ability of the spot market to absorb highly valued refined products. To increase economic efficiency and profits, and to compete more effectively with the unbranded retail sellers supported by spot market product, major suppliers drastically reduced wholesale and retail oil product storage, creating the "just-in-time" oil market in the United States. The reduction of storage reinforced profits for major oil companies who, as noted above, helped create the spot market, which in turn, reduced market share for ancillary products and services such as tires and vehicle repair.

Even the so-called Seven Sisters, the seven largest international oil companies, [151] could not compete effectively in a growing multi-national climate with diminishing U.S. domestic crude oil production. Further, monopolistic pricing mechanisms like those of the Texas Railway Commission were eventually replaced by transparent electronic-based pricing. Exploration, production, supply, refining, and retail marketing became more fluid. Some of the major oil companies merged; others shed components to concentrate on one or a few aspects of their formerly vertically integrated companies. Independent local oil product distribution companies were closely tied to one of the major suppliers into the 1970s; by the beginning of the 21st century, many of those same independent distributors had become major regional suppliers of distillate, motor gasoline, and even propane, for a variety of branded and unbranded retail outlets.

Refinery Industry Dynamics

Refineries are manufacturing plants that turn crude oil into saleable products and, hence, lie at the heart of the petroleum product market. Energy Assurance and reliability are directly connected to the ability of refineries to manufacture essential fuels and other products in sufficient quantity to meet demand. This ability is affected by many factors such as acquisition costs, routine maintenance, safety issues, major equipment repair or replacement, insurance, cost of capital, and sale prices.

Until the 2008 recession, analysts had noted the risk to Energy Assurance resulting from the difficulty of expanding the refining industry. During the 2008-2010, recession, several refineries shut down temporarily or simply closed; even onsite expansion was not vigorously pursued. During this period, profitability in refining diminished and EIA data indicate that the refining industry may diminish more. [152]

Several refineries in the New York State area have closed or undergone management changes in recent years. A refinery in Delaware City, Delaware, closed and then reopened under new ownership in 2010. Sunoco closed its Eagle Point refinery in Westville, New Jersey and its Marcus Hook refinery in Delaware County, Pennsylvania and has indicated its intent to close its Philadelphia refinery if a buyer could not be found by July 1, 2012. [153] On the other hand, refinery capacity in Louisiana has increased,

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[151] The international oil companies known as the "seven sisters" – Amoco, BP, Chevron, Exxon, Mobil, Shell, and Texaco – have subsequently merged to become BP (formerly BP-Amoco), Chevron (merged with Texaco), ExxonMobil, and Shell. More about the history and political issues facing the oil industry can be found in *The Prize* by Daniel Yergin and *Seven Sisters* by Anthony Samson.

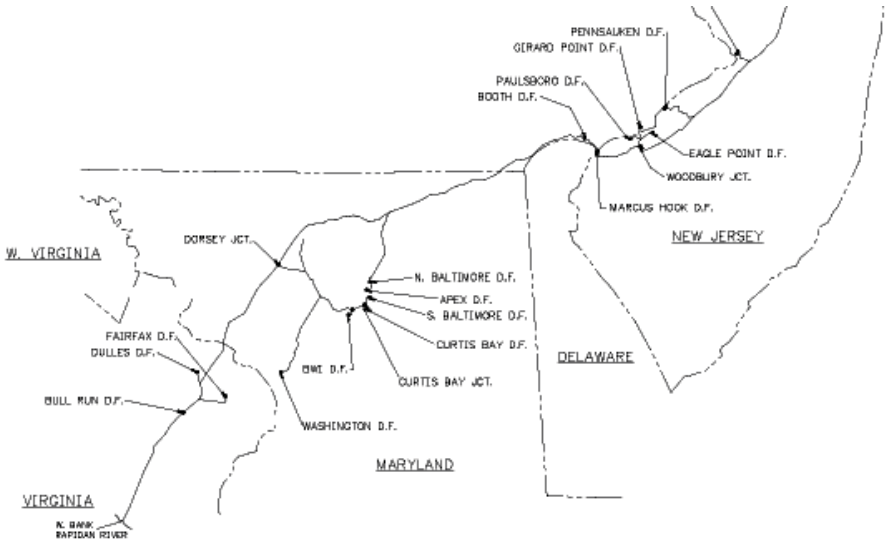
[152] EIA, *This Week In Petroleum*, "Recent Changes to U.S. Refinery Capacity," March 31, 2010, http://www.eia.gov/oog/info/twip/twiparch/100331/twipprint.html, and news releases and information on various company websites.

[153] This date or the entire intent to sell could change. For recent information check DOE/OE, Energy Assurance Daily, April 3, 2012, http://www.oe.netl.doe.gov/docs/eads/ead040312.pdf.

partially offsetting these closings. These changes could increase price volatility when demand increases, thus accelerating supply risk along with price and economic vulnerability for consumers.

Although refinery capacity abroad has expanded in such countries as China, India, and Saudi Arabia, the trend in the U.S. is unclear. Notwithstanding current estimates, capacity could indeed increase when the U.S economy rebounds from recession, Closure of refiners in or near New York State portend greater price volatility for New York consumers even if capacity at distant refineries expands. The State is also served by refineries from the Gulf Coast via product shipped through the Colonial Pipeline to its terminus at Port Mobil, Staten Island. Product is then shipped to New York State locations via barges from New York Harbor. Figure 9-33 shows a map of this important supply route.

Figure 9-33. Colonial Pipeline Map



Source: Colonial Pipeline Company, "System Map: Northeast." http://www.colpipe.com/ab_mapne.asp. A set of national system maps presented by Colonial Pipeline at the 2012 National Energy Assurance Conference, June 28, 2012, shows major sections and points of interest and can be found at http://www.doe-oe-regionalexercises2011.govtools.us/National/documents/Belden.pdf

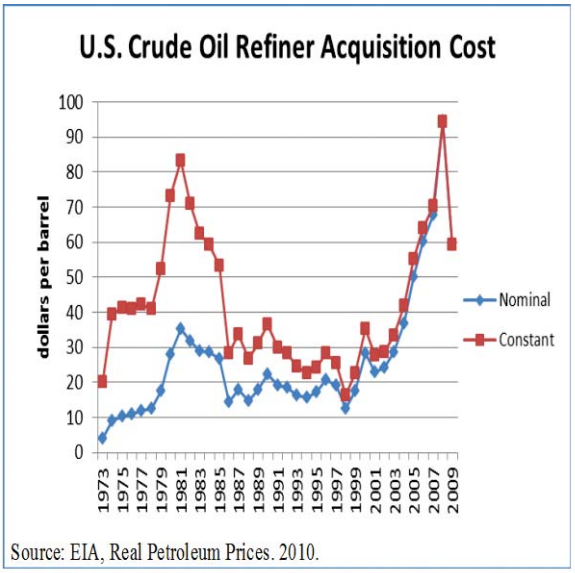
EIA has emphasized an additional trend in the reduction of refinery utilization. It estimated that ethanol use from March through June 2010 would increase about 400,000 barrels per day over the same period in 2007, and noted that the increase in ethanol sales, plus lower overall gasoline consumption, suggested that 640,000 barrels per day less gasoline would be needed from refiners and importers during this same period. New York City requires the use of reformulated gasoline blended with ethanol and the New York Harbor is principal ethanol distribution point for the State and the adjacent area. EIA tracks ethanol production and sales and notes that Albany also supplies large quantities to New York and adjacent States from a large storage facility in that city.

EIA estimated that the overall effect of ethanol blending has reduced U.S. refinery utilization rates to about 83 percent by the end of 2009, or about 9 percent less than the peak in early 2007. It could be said that lower refinery utilization reflects progress toward the long-stated goal of reduced dependence on

foreign oil however the data do not specifically support that conclusion.. Increased use of ethanol also has air quality benefits. But contrary to popular expectation, reduced imports of foreign petroleum have not eliminated price volatility or risk associated with wide-spread dependence on a crop-based commodity used for fuel.

Figure 9-34 illustrates the price history of refiner acquisition costs for crude. These costs reflect the value of refinery products as demand increased through 2009.

Figure 9-34. Crude Oil Refinery Acquisition Cost



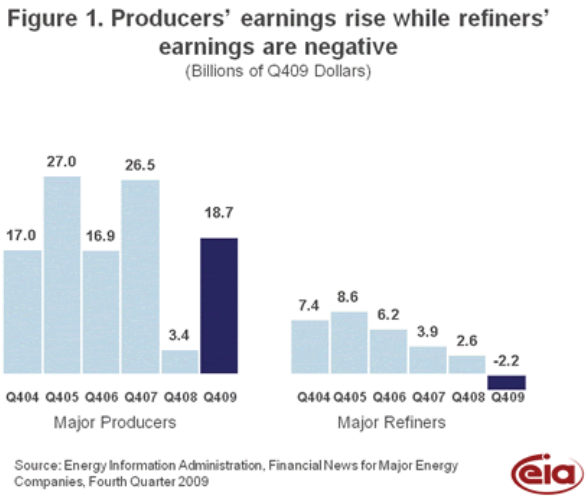
Nominal dollars equal average US refiner cost; constant dollars equals the price a refiner would have paid in year-2009 dollars during each historic year.

Other Factors Influencing Refinery Operation

The availability of crude oil at a price favorable for making a profit can no longer be assumed. Many refinery operators have found that the high cost of crude oil plus lower demand for refined products reduces comfortable refinery margins. Some reasons for this are related to prices set by foreign producers, including OPEC, or by commodity speculation. Other reasons are domestic and international economies, including rapid growth in demand, cost of infrastructure creation, availability and cost of raw materials including chemical components, technology, safety, insurance, trained personnel, heightened security, environmental rules, taxes, and community opposition to expansion.

Figure 9-35 illustrates, with data from fourth quarter 2004 (Q404) through fourth quarter 2009 (Q409), the disparity between the relatively ample earnings for production (exploration and producing oil from wells) and reduced earnings associated with the cost of refining products. The implication for Energy Assurance is that lower refinery earnings lead to less total product available for sale. If supply is disrupted in a low-inventory, just-in-time supply system, the potential for significantly higher prices is a significant risk factor. In the past, it was typical to observe seasonal production adjustments that supplied some margin of excess supply to compensate for unexpected surges in demand. But the contemporary petroleum market increases risk from both the reduced refinery volumes available throughout the year and the rapid demand to supply signal system. The last line of defense might be expected in storage; however storage has also diminished, as noted below, adding further risk to the petroleum market.

Figure 9-35. Producer and Refiner Earnings



National Storage and Reserves

Petroleum supply stakeholders say shortage is best handled ("cleared") entirely by price. When product is short, jobbers will send trucks to terminal racks outside of their usual area to re-supply. Higher prices cover the cost of driving farther to seek a wider variety of sources. Market fundamentals teach that upward pressure on prices also attracts newer volumes of product, which should help satisfy and moderate retail demand, thus reducing the impact of the limited supply. Over time, supply and demand tend to balance. This theory works well enough, but it is subject to variance due to both short- and long-term market changes. A significant factor in the U.S. market, for example, is the reduction in petroleum terminal storage capacity. This is a long-term trend in which suppliers have moved to a reduced-storage supply chain. While improving market efficiency from the seller's viewpoint, it reduces market flexibility from the perspective of the buyer.

The just-in-time delivery mechanism has perpetuated change reflecting a newer, and higher-priced, balancing point. As just-in-time product delivery strategy reduces the need for product storage, it makes price signals from the refinery to market more efficient but also more volatile. Speculators on the New York Mercantile Exchange (NYMEX) increase this volatility as they trade petroleum commodities based on the real-time risk due to refinery status, national oil politics, and the political turmoil in some oil-producing counties.

Local storage, discussed below, can make up for some of the storage removed from the national supply chain, but not all. The federal government has one important mechanism to manage this (see the next section); but it occurs at the crude oil level so is only minimally effective at reducing local time-limited shortage of petroleum products.

Petroleum Reserve

Risk associated with New York's oil product supply is lowered by two separate petroleum reserves. The first is the U.S. Strategic Petroleum Reserve (SPR), located near the Louisiana and Texas Gulf Coasts. The SPR has a total capacity of 727 MMbbl, which is available to U.S. refineries in case of severe supply shortage. At the end of 2009, the SPR contained 726.6 MMbbl – 292.6 MMbbl in sweet crude oil (low-sulfur oil easier to distill into products) and 424 MMbbl of sour crude oil (high-sulfur oil more expensive to distill or "crack"). At the time, EIA estimated that this fill level equaled 75 days of imported supplies.

The maximum draw from the SPR is 4.4 MMbbl per day. The last major drawdown occurred in response to shortages caused by Hurricanes Katrina and Rita in 2005. [154]

The other reserve that helps buffer New York against supply shortages is the Northeast Heating Oil Reserve, discussed below.

The New York State Petroleum Market

New York Liquid Petroleum and Propane Gas Supply Systems

The distribution of petroleum products in New York begins with major oil refiners and large independent wholesalers. companies. Depending on price and supply status, refined petroleum products may be delivered to New York by many petroleum companies. Major national product trading firms that buy from a variety of suppliers also sell petroleum in New York. Motor gasoline is supplied directly by the major companies or through independent petroleum marketers, also known as jobbers. Most of the distillate and propane passes though jobbers as well. New York consumers purchase motor gasoline, distillate, and propane mostly through independent retailers.

Primary Petroleum Supply

In-State Production

According to EIA, New York has some oil and natural gas activity in the Western and Southern Tier areas of the State. In 2008, the State produced 35,000 barrels (bbl) of crude oil.

Transportation of Crude Oil and Petroleum Products

New York Harbor: The New York Harbor is a central distribution hub for refined petroleum products into the downstate New York area, as well as the Hudson Valley and much of New England. New York Harbor has bulk terminal storage capacity of 75 MMbbl. More information about New York petroleum product terminals can be found in Section 5, Table 5-4, above.

Pipeline System: New York is dependent on the continuity of the interstate pipeline network for supply. As noted above, the Colonial pipeline serves New York City and the Hudson Valley with its terminus at Port Mobil on Staten Island. According to the New York *Petroleum Infrastructure Study-Final Report* (*Study*), approximately 365 MMbbl of petroleum product reach New York annually at the Staten Island terminal. For distillate heating fuels and residual oil, this plus routine tanker shipments from the Gulf Coast are sufficient for a relatively normal winter. However, any weather or other challenge to supply can result in the need for additional tanker loads, some of which may not, in fact, reach New York until a shortage passes, leading to temporary local price increases. [155] Extra costs occasioned by requirements of the Jones Act – which states that only U.S.-flagged vessels can be used to ship cargo (including petroleum) to or from U.S. ports [156] – can further increase costs to consumers, because oil tankers may not

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[154] EIA, Strategic Petroleum Reserve, *Quick Facts and Frequently Asked Questions,* August 2010.

[155] ICF Consulting for NYSERDA, Chas. Wesley, Project Manager, *Petroleum Infrastructure Study-Final Report*, September 2006. http://www.dps.ny.gov/00G0996_NYSERDA_Final_Report.pdf, The *Study* notes that Gulf Coast delivery represents "marginal" barrels feeding the New York market when demand is high. See pp. 33.

[156] Merchant Marine Acts of 1920, 41 Stat. 988, as amended, and 1936, 19 Stat. 1985. Under these acts the United States reserves its coastal shipping to vessels built and documented in the United States and manned by U.S. citizens.

be in position to ship from the U.S. Gulf to the New York area at the time of a shortage and, in any event, are more expensive to operate than comparable foreign-flagged vessels.

Western New York State receives petroleum products from Canada through the Port of Buffalo, as well as from Pennsylvania and the Midwest through the Buckeye and Sunoco pipelines. The Buckeye pipeline reaches New York via the ConocoPhillips Bayway Refinery facility at Linden, New Jersey. It is then transshipped by pipeline to Long Island City and Inwood, Queens. Aviation fuel (primarily distillate-based jet fuel) is then moved from Long Island City to La Guardia airport and from Inwood to JFK.

The State also receives propane from the Enterprise-owned Texas Eastern Products Pipeline Company (TEPPCO) pipeline, which originates in the U.S. Gulf Coast area. The pipeline enters the southwestern part of New York from Pennsylvania, and travels to storage caverns and a distribution terminal located in Watkins Glen. It then travels eastward to distribution terminals located in Harford Mills and Oneonta and ending at the Selkirk terminal.

Terminals Serving New York

Petroleum product terminals are a key component of the New York petroleum supply system. Terminals delineate between supply entering the State and distribution to consumers inside the State. According to the Internal Revenue Service (IRS),[157] there are 73 petroleum product terminals located in New York State. The five largest owners are Buckeye Terminals, LLC (10 locations), Global Companies (8), Hess (6), Bayside Fuel Oil Depot Corporation (4) and Petroleum Fuels and Terminals (4). Other major companies hold less than four terminals in New York, including:

- BP Products North America
- CITGO
- Conoco Phillips
- Getty Terminals
- Marathon
- Motiva
- Sunoco
- TransMontaigne

Terminals and locations can be found in Section 5, Table 5-4, above.

Terminals and Product Distribution Markets

Major terminal companies serve petroleum product markets throughout the United States. Such companies do not necessarily have refinery operations but may buy petroleum products from suppliers. Their primary market influence is though acquiring non-contract product from refineries, in essence creating and maintaining the spot market for excess petroleum products. They balance the cost of their market involvement with efficiencies in purchasing so their market presence is basically transparent to the end user. They could also be called National Jobbers. An example is Global Companies LLC, which acts as national product middleman and operates eight terminals in New York. According to Bloomberg Businessweek, Global "operates as a petroleum and energy marketing company in the United States and

[157] IRS, "Active Fuel Terminals@05/31/12," http://www.irs.gov/pub/irs-utl/tcn_db.pdf.

internationally. It also operates gasoline terminals having a capacity of 950,000 barrels. It offers distillates and gasoline, such as heating oil, diesel fuel, and kerosene; and natural gas and oil." [158]

The petroleum market in New York has changed over the past two decades, affected by consolidation and divestiture at the national, regional, and local levels. The basic distribution structure remains the same. However, fewer companies supply the same volume of petroleum products. Regional offices of the remaining supply companies have been consolidated as well, reducing the number of competitive contacts that State responders could reach in the event of a shortage. The impact on supply, however, is transparent to customers so notwithstanding complaints about consolidation from various retail dealers, consumers are unlikely to see a difference in product availability.

Petroleum Product Acquisition – Prices/Contracts

The most important factor in jobber product acquisition is price. Jobbers will seek the lowest-cost fuel and will send trucks to terminals (within a cost-effective distance determined by their own calculations) [159] to collect supply for their retail outlets. That the prices differ daily (for example, the Hess terminal in the Bronx may post a different price on any given day than the Hess terminal in Rochester) means that these considerations are recalculated daily or even hourly.

Consumer contracts are another important element of fuel acquisition. Contract-secured accounts generally are served first; non-contract customers (so-called unbranded outlets or "will-call" customers) follow. Many of the State's unbranded dealers are combined with convenience, or "C," stores that are supplied with spot market product. About 50 percent of older, and 95 percent of newer, New York C stores sell spot market fuel. [160]

Ordering Product

Retail dealers signal their jobbers for resupply in two ways. Either they send a regular (often daily) posting to the jobber indicating how much product they anticipate selling, or the jobber obtains this information automatically via electronic sensors in the retailer's underground tanks. In the latter case, an automatic tank gauge (ATG) sends a morning reading and the jobber's tanker is dispatched as appropriate. Under this system, a retailer may never need to know if there is a shortage as long as sales proceed at a normal pace. However, if a shortage worsens, the jobber is likely to inform the retailer of a chance that supply could run short before the end of the day. This type of automation is still under development for other end users. Some of the middlemen encourage it; others seem indifferent or reluctant to incur the expense of an automated system. [161]

Local Storage

Storage is another piece of the State's fuel logistics chain. Local storage diminished significantly in New York, as it did elsewhere in the United States, when major suppliers moved to just-in-time delivery. According to the 2009 *New York State Energy Plan*, and as shown in Figure 9-36, total petroleum product

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[158] Bloomberg Businessweek, Company Overview of Global Companies LLC, http://investing.businessweek.com/research/stocks/private/snapshot.asp?privcapId=4293006.

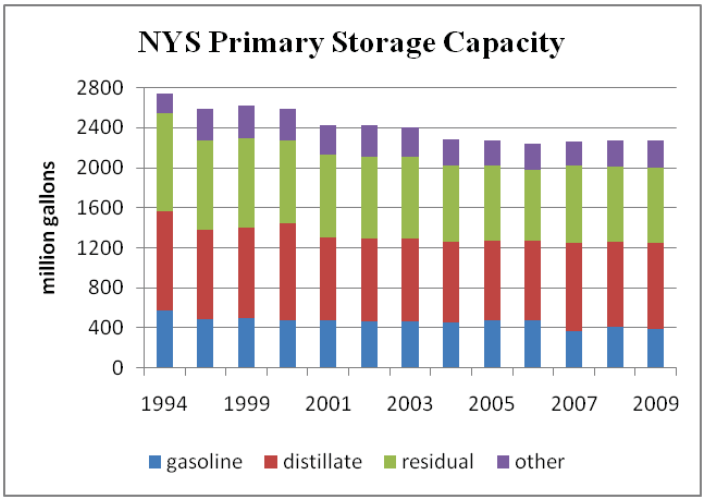
[159] The price spread varies and is affected by weather. In general, most jobbers will not drive farther than 100-135 miles out of their area for fuel. As a rule of thumb, they will not make such an out-of-area pick up unless there is a price spread of 10 cents or greater.

[160] New York Association of Convenience Stores, *Today's Convenience Stores,* http://www.nyacs.org/industry/today.htm. The definition of old and new is unclear; but it is assumed that newer relates to 21st century.

[161] Personal discussions with various New England and New York dealers.

storage diminished from 2.74 billion gallons to 2.28 billion gallons, or almost 17 percent, from 1994 to 2008, and has held at about 2.3 billion gallons since then. [162]

Figure 9-36. New York Petroleum Product Storage Capacity



Distillate storage declined by 14.7 percent from 1994 to 2008. The decline follows a reduction in the use of heating oil. Less usage may indicate reduced risk for users who converted away from distillate, but since reduced use and storage are more or less parallel, just-in-time risk continues for remaining users during periods of very high demand, typically during sustained cold weather when the overall delivery system is already constrained. This high demand may combine with other risk factors (e.g., time to ship additional supply from the Gulf Coast or international imports combined with weather-related slowdowns in barge movements that fuel New York City and Long Island), creating an even more fragile supply situation.

There are approximately 41,438 registered bulk oil facilities of varying sizes in New York. [163] The Petroleum Infrastructure Study focused on facilities in the New York City, Long Island, and Hudson Valley areas. FigureFigure 9-37, although somewhat dated, illustrates the relative density of major oil storage facilities (MOSF) in the State's most highly concentrated petroleum market. [164] These data were gathered in 2003, but according to Long Island marketers, have not changed drastically. [165] The fourth line of the figure, Number of Facilities, refers to terminal facilities that may contain multiple tanks. Table 9-25 illustrates Petroleum Bulk Storage in New York City. These vary in size but are generally smaller than those classified by the New York State Department of Environmental Conservation as MOSF.

[162] 2009 NYSEP Petroleum Assessment.

[163] New York State Department of Environmental Conservation (NYSDEC), Bulk Storage Database – major oil storage facilities (MOSF), petroleum bulk storage (PBS) and other storage programs, BSFOIL.dbf. 2010.

[164] Illustration from ICF Consulting for NYSERDA, Chas. Wesley, Project Manager, Petroleum Infrastructure Study-Final Report, September 2006. http://www.dps.ny.gov/00G0996_NYSERDA_Final_Report.pdf, pp. 39.

[165] Interview and discussions with Long Island oil dealers, 2010.

Figure 9-37. Summary of Major Oil Storage Facilities in the New York City, Long Island, and Hudson Valley Areas

	Study Area Sub Region				
	Hudson	Long Island	NYC Metro- NY	NYC Metro- NJ	Total
Total Terminal Capacity (1000 bbl)	16,325	7,970	7,848	71,054	103,197
Average Terminal Size (1000 bbl)	653	725	357	1,692	1,032
Share of Capacity in Study Area	15.8%	7.7%	7.6%	68.9%	100.0%
Number of Facilities	25	11	22	42	100
Facilities with Vessel/Barge Access	23	10	19	42	94
Facilities with Pipeline Connnection	4	6	8	NA	18
Facilities with Truck Racks	24	10	18	NA	52
Facilities with Railroad Access	3	0	0	NA	3

Source: NY data is based on NYSDEC MOSF database for 2005. NJ data is taken from Army Corps of Engineers, *U.S. Waterway Data CD, 2003*

Table 9-25. New York State Department of Environmental Conservation, Bulk Storage Database – Petroleum Bulk Storage New York City 2012 – Illustrative Examples

Facility Name	County	Locality	Site Address
1030 Boynton Avenue	Bronx	New York City	1030 Boynton Avenue
104 Second Ave	New York	New York City	104 Second Ave
2314-18 Crotona Ave	Bronx	New York City	2314-18 Crotona Ave
332 E 9th St	New York	New York City	332 E 9 St
501 Seventh Avenue	New York	New York City	501 7th Ave
735 Bryant Ave	Bronx	New York City	738 Bryant Ave
858-860 Southern Blvd	Bronx	New York City	858-860 Southern Blvd
Aytem Realty Corp	Bronx	New York City	3425 Knox Pl
Breast & Imaging Center-Mskcc	New York	New York City	300 East 66th Street
Bronx Water Maintenance	Bronx	New York City	930 Zerega Avenue
Emigrant Savings Bank	Bronx	New York City	74 Hugh J Grant Circle
Generoso Realty Corporation	Bronx	New York City	1802 Lurting Avenue
Hanover Court Mutual Housing Co-Op	Queens	New York City	92-31 57th Ave
Manhattan Eye, Ear & Throat Hospital	New York	New York City	210 East 64th Street
Rose Arms	Bronx	New York City	1350 Shakespeare Avenue

Saker Aviation Services	New York	New York City	Downtown Manhattan Heliport

Source: NYSDEC, Bulk Storage Database Search Results
http://www.dec.ny.gov/cfmx/extapps/derexternal/abs/results.cfm?pageid=4

Northeast Heating Oil Reserve

If the effects of cold weather or other system problem impede the transport of distillate to terminals during a winter peak, the Northeast Heating Oil Reserve may be tapped. This reserve was created in 2000 and as of February 2012, was changed from what was essentially a paper reserve to actual storage for one million barrels of ultra-low sulfur distillate located at two terminals—500,000 barrels at a Hess Corporation facility in Groton, Connecticut and the same amount at a Global Companies, LLC facility in Revere, Massachusetts. [166]

The value of this reserve may be limited for direct consumption within the New York State area adjacent to the reserve because of potential limitation in local fuel transfer from the reserve to New York end users. However, the existence of the reserve would lessen pressure on the entire northeast heating oil system during an impending or actual shortage by lessening some of the competitive demand on supplies transported up the Colonial Pipeline, or received by ship into Staten Island for use in the greater New York City area.

Fuel Curtailment

Commercial, institutional (including governmental), and industrial end users may purchase fuel with long-term supply contracts. However, most motor fuel (diesel and motor gasoline) is sold through contracts with general retail outlets. These contractual arrangements may be altered during a significant supply shortage.

If crude oil supply is less than refiners anticipate, prices increase. This means that the refiners' margins decrease unless they raise the cost of the petroleum products they sell. This is what happened when OPEC embargoed crude oil in the 1970s, and again when Venezuela crude shipments diminished in 2002-2003 during a workers' strike there. In a weak economic market, when petroleum consumption is flat or regressing, refiners may also reduce production to prevent supply from exceeding demand and help maintain their margins. Another way to explain this is that a common response of the petroleum product industry to lower consumption is to reduce production in order to balance supply and demand. Decreasing supply may not completely prevent lower prices, but it can soften the impact on refiners' profits.

If refinery production falls far enough, or demand outstrips supply, product marketers may be notified (or jobbers may simply recognize on their own [167]) that a contract volume has been lowered, or curtailed. Because federal trade practice laws prevent discrimination in choosing or favoring buyers, jobbers will in turn reduce the amount of product available to all of their retail dealers. In such cases, a retailer may be put on allocation; that is, may obtain less to sell than contracted with the jobber. As such dealers try to supply their own retail contract customers; allocation reduces their ability to serve "will-call" customers who are often, although not always, consumers of moderate means. Should the curtailment continue (and the curtailment percentage drop), retail contract customers may receive less as well.

In contrast to the situation for heating oil, local propane distribution systems are generally able to manage short-term supply reductions because the propane is sold mainly to a contracted customer base, filled in

[166] U.S DOE, U.S. Petroleum Reserves, Northeast Home Heating Oil Reserve –Profile, http://www.fossil.energy.gov/programs/reserves/heatingoil/.

[167] Observations obtained from petroleum retailers during interviews.

cycles. Thus, not all customers will need to be refilled simultaneously. The expectation is that most contract propane customers will have enough fuel on hand until normal supply is restored. As supply a remains low over time, or diminishes further, all customers become increasingly vulnerable to the risk of a propane shortage.

Experienced retail dealers monitor market conditions and check tank volumes frequently. If supply is short, they may adjust their hours of operation but unless a public authority authorizes them to expand driver hours of service (they receive an HOS waiver), they have few options but to curtail delivery. [168] For this reason, some of the petroleum emergency mitigation measures in Tables 9-36 through 9-53 may help mitigate the impact of severe shortages. The least obtrusive of the suggested mandatory measures provides substitutes for rationing (e.g., tank topping prevention or odd-even day purchases). The most stringent measure transfers a percentage of product received by jobbers from private company control to the State government for sale (at retail by the dealer) to selected, priority, end users. [169]

Implications of Price and Shortage

The economic burden of price as the mediator of an energy shortage is that the consumer must reduce fuel usage or pay more. End users with insufficient cash flow, weak market position, lack of alternative sources or prices hedges, or other disadvantages are vulnerable. Homeowners may conserve up to a point beyond which their jobs, health, or other needs demand fuel-or-food decisions. The problem for Energy Assurance Responders is that these outcomes can vary significantly.

Price Verses Demand in Motor Gasoline

Price elasticity in retail fuel sales is part of the Energy Assurance equation. In the 1970s before price controls were removed, lines full of exasperated and sometimes contentious drivers formed at gasoline fuel stations when supply was short and prices escalated rapidly. From 2006 to 2008, long after price controls were lifted, reduced supplies of refined motor gasoline and other fuels resulted in increasingly high retail prices. [170] Similar price increases occurred again from late 2011 to mid-2012. Lines seen at filling stations in the 1970s did not reappear, however, indicating that higher fuel prices did help balance supply and demand in the retail market. This suggests that price does affect behavior and, thus, is a form of defense against at least one unwelcome reaction to shortage.

However, gauging the degree of price elasticity in retail motor gasoline sales is difficult, in part because it is subject to factors such as employment levels and consumer acceptance of volatile price changes. Anecdotal experience indicates that in 2011 to 2012, when prices finally exceed $4.00/gallon, driver behavior began to change, especially for discretionary driving and highway speed. However, this reaction coincided with an economic recession brought about by other market issues that did not include fuel prices, making specific conclusions harder to draw.

As sales volumes dropped in response to the recession of 2008-2010, prices plummeted and anecdotal experience indicates that drivers resumed former highway speeds. Purchases of more fuel-efficient vehicles (i.e. hybrid electric) may reflect mid- to long-term consumer response to high fuel prices.

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[168] Relief from HOS regulation is desired mainly because shortages upset the normal fuel acquisition and deliver routines. In acquisition, drivers may spend more time at terminal racks thus exceeding work-hour limits. On the delivery side, shortage may create abnormal demand to fill tanks, or, in the event of severe weather, require more time to reach and deliver to customers.

[169] N.Y. ENG. LAW § 10-105: NY Code - Section 10-105: Fuel set-aside.

[170] High crude oil prices and speculation added to the cost.

New York City, Long Island, and the Hudson Valley

The three southeastern areas of New York combine to contain one of the most densely populated areas in the United States. Petroleum supplied to and distributed within the area is more concentrated and delineated than petroleum sold elsewhere in the State. The area's petroleum infrastructure was studied at the request of NYSERDA in 2005 and the principal observations of this study are highlighted in this EAP. The *Petroleum Infrastructure Study* (the *Study*)[171] notes several industry-related factors affecting this area.

- *Consolidation*. The petroleum product distribution industry is increasingly concentrated as the number of firms decline over time and those surviving become larger.
- *Increased efficiency and reduction of costs*. Advances in software and electronics have allowed inventory to be managed more effectively and efficiently in real time.
- *Declining volumes of inventory*. This situation exists throughout the country and for all fuel types. In the industry's efforts to minimize costs, managers are reducing inventories. The improved technology of inventory management, as well as the advances in shipping, allows this "just-in-time" inventory management.
- *The influence of the NYMEX spot and forward markets*. The futures market for both crude oil and heating oil has become more prominent over the past two decades. Levels of storage both influence the forward prices, and in turn, are influenced by them. A market in backwardation results in retailers stocking only supplies that are necessary to serve fixed clients. Conversely, a cantango market encourages building up stocks. [172]

Major Area Market Players

The *Study* also lists the major participants in the southeastern New York petroleum market. Table 9-26 lists these entities and their general locations.

[171] ICF Consulting for NYSERDA, Chas. Wesley, Project Manager, Petroleum Infrastructure Study-Final Report, September 2006. http://www.dps.ny.gov/00G0996_NYSERDA_Final_Report.pdf.

[172] Backwardation - the forward month prices are lower than the spot month prices; Cantango - forward month prices are higher than the spot month prices.

Table 9-26. New York City, Long Island, and Hudson Valley Petroleum Facilities

Player	Hudson	Long Island	NYC Metro - NY	NYC Metro – NJ[#]
Fuel Refineries	0	0	0	2
Petroleum Bulk Terminals[+]	25	11	22	42
Petroleum Bulk Plants[+],*	10	13	16	3
Fuel Oil Distributor	52	93	89	95
Transportation				
Marine Tankers and Barges	Between 125 and 175			
Inter-regional Pipelines	0	1	1	3
Railroad	N.A.	N.A.	N.A.	N.A.
Trucks	208	372	356	380

[*]Only bulk plants with storage capacity are included here. This includes plants with capacity between 400,000 gal and 2,100,000 gal. terminals have storage capacities over 2,100,000 gal
[#]The NYC Metro - NJ data has been gathered from public sources
+Number of Bulk Terminals and Bulk Plants estimated from the NYSDEC Major Oil Storage System Database

Source: Petroleum Infrastructure Study, pp 29

Infrastructure Constraints

The extensive infrastructure that supports the delivery of petroleum products into the downstate New York market typically operates efficiently. However, under certain conditions interruptions or limitations can create system constraints, or bottlenecks, as in the following examples.

- Limited pipeline capacity under the Hudson River carrying petroleum products from New Jersey terminals and refineries. This asset generally operates near full capacity thus limiting demand response capacity.
- Barges originating from New York Harbor terminals transit the East River on the way to distribution terminals in New York City, on the north shore of Long Island, and the southern shore of Connecticut. Any operational disruption in this transportation corridor would have fuel supply ramifications.
- Limited highway capacity (e.g., traffic congestion) can slow tanker truck delivery.
- Transit through the small opening for barge traffic into Port Jefferson Harbor can be limited due to high winds and waves in this critical supply point. Severe winter storms, resulting in extended barge delays, may curtail fuel deliveries to area terminals.
- Operational limitations of barges and tugs in high wind/wave conditions at various off-loading locations.
- Limited storage capacity at certain terminals to manage surge-related demand.
- Limited truck loading capacity at terminals, especially affecting driver hours during periods of intense demand.
- Highway infrastructure (e.g., bridge and roadway) age and deterioration that may include bridge weight limits forcing tanker trucks to drive longer, costlier routes.

Market Process Constraints

Examples of marketplace practices that hinder supply, especially during periods of intense demand, include:

- The cascading, or domino, effect when shore-based terminals are short of supply, causing in-land terminals that receive fuel from the shore-based facilities to also experience reduced supply.

- Regulations requiring the transition from single-hull to double-hull barges reduce available bottoms and mean that many of the older, single-hull barges are being replaced by larger, double-hull vessels. The older, smaller vessels are important for navigating restricted-access areas where newer, larger, vessels maneuver with difficulty.
- Larger, integrated suppliers going out of the terminal business may create potential gaps in the local market system. However, this also creates an opportunity for smaller marketing companies to expand.
- Competition among fuels for available space on the constrained pipeline serving Long Island limits capacity for carrying certain distillate classes (e.g., aviation fuel, diesel, and home heating fuel, as well as some motor gasoline). This has the result of adding supply risk for various end users. Expansion of pipeline capacity is seen as a way to mitigate this issue. [173]
- Amount of time required to secure harbor construction and dredging permits increases delivery risk.
- The conservative approach taken by marine pilots who are unwilling to navigate narrow inlets during high wind/wave conditions (due to potential hull damage, product leakage, and subsequent high liability and cost damage claims) increases delivery risk.
- Curtailment of interruptible-tariff natural gas customers creates extra competition among all distillate users as distillate substitutes for natural gas.
- Failure of interruptible-tariff customers to have sufficient back-up fuel on hand threatens distillate availability during curtailment.

Other Competitive Issues Concerning New York Area Marketers

New York City area marketers are concerned that failure to deliver product to customers when supply interruptions occur can result in lost revenue or accounts. All New York State jobbers faced with shortage look for work-arounds such as alternative sources or other ways to locate and quickly move supply. Some of these steps involve driving farther to out-of-area terminals, seeking driver HOS waivers so that a company can keep its trained and skilled drivers on duty longer, acquiring back-up tanker trucks if available, asking customers to accept less than full delivery for a short period of time, sending trucks on alternative (less fuel-efficient) routes, and in the long-term even preparing to add local storage by seeking permits to build or expand (typically a three-year process).

Where downstate dealers may be able to reach relatively distant and geographically dispersed terminals, NYC-area retail dealers do not feel that they have the luxury of driving out of the area to cover supply shortage. They perceive that the bulk of supply reaching their area comes from essentially the same source and hence is severely constrained during any shortage affecting the region. [174]

This issue is closely related to the issue of alternate supply during potential or actual shortage, especially during the winter months. The New York State Public Service Commission docketed Case 00-G-0096 (In the Matter of Criteria for Interruptible Gas Service) and issued orders that require interruptible natural gas customers who use petroleum fuels as backup to enter the winter season with verifiable reserves of alternative fuel backup, or acceptable firm supply arrangements. This rule has mitigated some of the problems experienced by NYC-area oil dealers when natural gas utilities cut gas to interruptible tariff customers. However, the industry holds that the rule does not entirely relieve oil dealers from facing

[173] Interviews with petroleum dealers on Long Island, 2011.

[174] Ibid.

shortage. Prudent oil retailers still must develop risk mitigation strategies including purchase and storage of product in anticipation of potential interruptions.

Long-Range Mitigation Strategies

In the short-term, New York State petroleum dealers may seek driver HOS waivers or other alternatives when supplies are threatened or short. However, the industry may examine long-range strategies for mitigating some of the more severe issues.

Dealers may expand storage and make other infrastructure improvements while working closer with other segments of the energy industry. For example, greater dialogue between petroleum retailers and electric and natural gas utilities might be explored in order to smooth fuel-switching transitions.

Government and petroleum product association representatives already communicate, coordinate, and cooperate on shortage matters. Streamlining the permitting process for critical remediation efforts may be one area for further consideration. Numerous price-posting organizations provide market indicators that can assist dealers in supply planning. The stress of events may reduce timely communications, thereby extending the time it takes to find acceptable solutions to chronic shortages. Coordinated solutions may be found through patience and cooperation among the various private and public sector stakeholders.

Propane Delivery Profile

Propane Delivery

In 2008, New York consumers used almost 360 million gallons of propane, or liquefied petroleum gas (LPG). There are several important sources of propane to the New York market, including:

- The Enterprise Texas Eastern Products Pipeline Company (TEPPCO) pipeline that originates in the U.S. Gulf Coast area. It enters New York in the southwestern area of the State from Pennsylvania and runs to storage caverns and a distribution terminal located in Watkins Glen. It then moves LPG eastward to distribution terminals located in Harford Mills and Oneonta and ends at the Selkirk terminal.
- Mid-Atlantic and Canadian refineries that manufacture propane moved into the New York market by railcar and truck.
- Railcars originating from distant Midwest supply sources that arrive at a number of terminals located throughout the State for local fuel distribution.
- Propane trucked into New York that is sent from ocean terminals located in New England.

Propane from all these sources is distributed to end users by smaller delivery trucks called bobtails.

Most of the propane sold in New York is purchased on contract and delivered to consumer tanks that are owned by the delivery company. Dealers generally contract with a propane transport company to have contract product delivered to their local bulk plants by large-capacity transport trucks. Propane marketing companies (jobbers) must plan ahead and “nominate” supply for seasonal demand as well as adjusting such orders monthly. Changes to nominations may be made as late as one week prior to shipment. The frequency of deliveries is governed by weather conditions and temperature-driven demand curves, with winter being the period of peak demand.

In 2010, 369 member companies belonged to the New York Propane Gas Association (NYPGA). Of these, five companies have 15 or more outlets. Table 9-27 lists companies (or subsidiaries) with four or more outlets. Overall, local dealers dominate the New York propane market with fewer than 3 percent of the companies operating more than 4 outlets.

Table 9-27. Major Propane Operators in New York, 2010

Company	Number of Outlets
Amerigas	22
DiSanto Propane	10
E & V Energy Company	4
Griffith	28
Inergy	16
Main-Care Energy	5
Paraco Gas	20
Ray Murray, Inc.	5
Suburban Propane	24
Texas Liquids	4
Source: New York State Propane Gas Association 2010.	

Supplying the New York Market

Winter peak demand is the key to propane marketing in New York and the entire Northeast. Pipeline flow and storage cavern infrastructure cannot meet this demand alone. Propane supplies from distant truck terminals and railcar capacity are also needed. Limited volumes may also be received from New England ocean terminals at Providence, RI and Newington, NH. However, much of the fuel arriving at those locations is destined for New England consumers.

Propane received on the East Coast also must compete with demand from European consumers and, overall, the price of propane obtained through these ports may be higher than that purchased via the pipeline or sent by rail from Canada. Even when ordered, shipped supply does not always meet demand. In 2009, propane shipments to East Coast ports arrived too late to relieve shortages. In 2010, a collision involving a tanker scheduled for the New England terminals made resupply extremely difficult and expensive. The railroads, while a critical source of fuel, do not have the capacity to match the volumes obtained from either the pipeline or the ports.

Propane Storage

The industry must store propane during off-peak summer months in order to meet peak season demand. To do this, TEPPCO maintains a 50 million gallon underground regional storage facility at Watkins Glen. Local retailers also maintain above-ground storage tanks to meet short-term demand. The overall propane storage structure has been challenged in the past two decades by limited secondary storage capacity at the jobber level. Marketers limit storage for a variety of reasons such as maintenance cost, environmental regulations, and local opposition to expansion. In New York, locally initiated opposition has introduced a two- to five-year delay in replacing or expanding secondary storage.

Other barriers to storage include inter-jurisdictional requirements abetted by the political independence of local jurisdictions within the State. The industry notes that local officials place requirements on installation beyond industry and State standards. The result is that the system has less flexibility when demand is high. Propane marketers look to tertiary storage at the customer's location to make up some of the difference.[175]

These storage constraints plus fiscal considerations are why most propane retailers require automated delivery contracts. With a known customer base and a record of usage rates, a knowledgeable propane dealer can estimate how much fuel remains in a customer's tank and compare that to what would be required to satisfy demand. This strategy can be difficult if contract customers reduce scheduled refills or call for immediate "will-call" service,[176] as happened in New England in 2009.[177] The contract nature of propane sales provides some margin of safety because at any time about two-thirds of the State's propane customers will have sufficient supply in their tanks to sustain them until normal supply can be resumed. Will-call customers run low during such periods and are the most vulnerable to shortage.

Curtailment

Generally, State propane dealers learn about impending shortages from the terminal operators. There are no regulations or laws requiring suppliers to inform marketers about impending supply issues but informal communications can fill this void. If allocations are invoked reducing available fuel, word usually spreads quickly.

Supply delays may cause propane delivery trucks to back up at both the wholesale and retail levels. Excess time spent waiting at terminal racks, coupled with normal customer deliveries, can cause driver hours to exceed federal maximums. New York propane and liquid petroleum industry officials consider relief from federal hours of service (HOS) regulations for supply and distribution drivers a vital tool for mitigating a shortage while it is still manageable. However, if supply levels fall too far, jobber-owned transport trucks will be sent for increasingly long distances to purchase supply. Companies will incur further costs and waiting times, resulting in increased supply risk and higher costs for all customers. Stress expands across the system due to limited capacity. Examples include: pipeline capacity that is designed to meet historical supply volume but not emergency peak levels, terminals with only enough loading racks to meet routine demand, rail heads that close over the weekends, and jobbers or retailers operating only enough trucks for normal operations.

Risk increases when supply is reduced, or the TEPPCO line shuts down during winter. This occurred at the beginning of the 2010-2011 heating season; a confluence of events began with a break in the TEPPCO line between Harford Mills and Selkirk. Although the line was repaired quickly, the federal Pipeline and Hazardous Materials Safety Administration (PHMSA) determined that the line was out of compliance with federal regulations and required extensive hydrostatic testing before it could resume operations. Both Watkins Glen and Harford Mills have limited capacity at truck-loading racks to expedite tanker truck fill rates. Even with the completion of testing early in 2011, marketers experienced difficulty in making up the loss. In the interim, New York (and New England) customers had to pay higher prices due to the added cost of long-haul trucking, imported product prices, and regional demand premiums for limited supply. Figure 9-38 illustrates the supply dilemma affecting New York State and New England during the 2010-2011 season.

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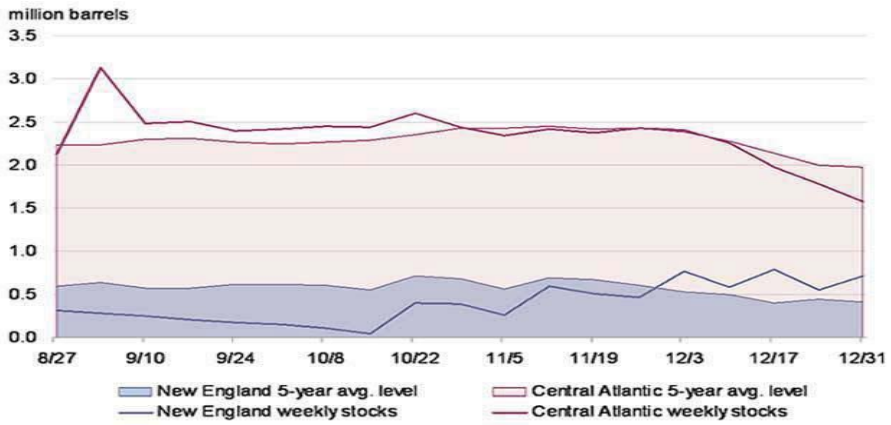
[175] Interview with State propane-industry representatives, Albany, New York, December 2010.

[176] "Will-call" refers to non-contract customers who call only when they require fuel.

[177] Walt Hart, Purvin & Gertz, New England consumers appear to have deferred propane tank refills due to high prices prior to 2009 heating season, EIA-NASEO 2009 SHOPP Conference, August 2009, pp. 19.

Figure 9-38. Northeast Propane Stocks at Beginning of 2010 Heating Season



Source: EIA, This Week in Petroleum, January 5, 2011, http://www.eia.gov/oog/info/twip/twiparch/110105/twipprint.html

Other Operational Issues

Natural gas from the Appalachian area may yield growth in regional natural gas processing plants. These plants (called fractionators) remove unwanted liquids such as propane, ethane, and butane from natural gas. Additional propane from new gas processing plants could increase routine domestic supply and abet pre-season fill. The additional production capacity would be of limited value during a shortage, however, unless delivery capacity is also increased.

The ownership of retail propane marketing has changed over the past three decades so that more regional and national marketers participate in direct sales to consumers. This means that the entire industry is moving away from its former status with many independent owners to a more concentrated market. This has the potential of leading to greater attention from policy-makers as well as efficiencies within the propane system. New York ownership, however, appears to have remained outside of the national trend and retained a large number of local dealers with, as noted above, less than 3 percent of its propane companies operating at four or more retail locations.

Energy Assurance for the propane market appears to lie in the hands of skilled retailers and experienced marketers who, like their counterparts selling refined petroleum products, find work-around solutions and alternatives for overcoming shortage situations. The primary method is to seek supply from remote sources and to truck it to local bulk plants for distribution. It may even be necessary to divide a customer's contracted load so that all customers receive enough to manage until the regional system is balanced. The State propane supply system is still sufficiently local that retailers, no matter how fierce the competition when product flow is unhindered, are willing to assist each other in dire circumstances. For example, retailer *A* may not be able to fill a customer's tank due to insufficient wholesale supply. A local competitor, retailer *B*, may be unwilling to service *A*'s customer directly due to liability issues. But retailer *B* can help retailer *A* by letting *A* fill his bobtail from *B*'s bulk supply, thus protecting the customer.

Petroleum Product Risk and Vulnerability

Introduction

This section focuses on risks found in the New York State petroleum product market, including fuel loss at the major supplier level before shortage is felt by consumers, and loss of fuel threatening end-use sectors. These risks tend to mingle. Major international and national events such as the OPEC oil embargoes, the oil spill in Prince William Sound, Alaska (commonly referred to as the Exxon Valdez oil spill), massive hurricanes disrupting refinery operations in the U.S. Gulf Coast Region, the collapse of the BP Deepwater Horizon offshore platform, damage to an interstate pipeline, and major refinery fires all represent the worst sort of risks managed by petroleum companies. Lesser risks include the impact of refinery maintenance shutdowns or occasional pipeline pump failures. Other, more localized, risks include closed service stations or the temporary failure of an energy retailer to deliver product during a period of high demand.

Hazardous Materials

Another aspect of the petroleum product risk spectrum is the daily management of hazardous materials. Hazard events may not cause a shortage, but they will draw significant attention and raise supply-related questions. New York officials may or may not activate the State Emergency Operations Center (SEOC) [178] in Albany in response to geographically distant petroleum risk events. However, once an emergency affecting the production and distribution of petroleum is reported, increased monitoring is indicated. If a petroleum hazard occurs inside the State, the need for hands-on activity is greater. State and local officials will undoubtedly respond robustly to safety and health issues that expose people, animals, or property to hazardous materials.

Risk and Response Addressed by Petroleum Industry Stakeholders

Many issues can threaten or interrupt routine petroleum operations and put supply at risk. These issues can occur at any point from exploration and production to distribution. In all cases, when State officials are informed by whatever means, it is important that they monitor the situation actively in order to detect whether the problem increases energy risk for New York consumers.

Repair and Restoration

Due to competitive concerns, it is uncommon for the petroleum industry to disclose details about specific infrastructure damage, assessments, or repair. Federal rules pertaining to safety and effective hazard management do exist, but as the 2010 Deepwater Horizon disaster demonstrates, both federal and State governments lack the expertise and tools for thorough monitoring or evaluation of repair, and restoration measures. Further, media and the public will focus on the dramatic portions of supply interruption. For example, a refinery explosion or fire garners attention; the long, tedious job of repair and restoration – far more salient for returning supply to normal – is usually reported with less intensity. [179] The result of this relative lack of public information is that State officials are more likely to be well informed and contribute to restoration in a meaningful way if they maintain proprietary communications with petroleum professionals such as State and local petroleum association executives (see below).

[178] The State SEOC is located in Albany and usually activated for declared emergencies such as hurricanes.

[179] The 2010 BP disaster appears to be an exception given the extensive on-going media coverage of that event.

Risk Associated with Commodities

With the sale of vertically integrated petroleum company components, the marketing of crude oil and finished products shifted from intra-company to inter-company, thus increasing economic risk because single companies could no longer control the entire supply-purchase chain. Large companies are perhaps better equipped to manage commodities risk both through in-house staff and through contractors who sell energy-tracking and risk management (ETRM) systems to help manage commodity risk. The commodity futures market adds to price volatility as traders on NYMEX invest in petroleum futures contracts. As noted above, disparity between the purchases of barrels for actual use and the purchase of futures for the sake of trading complicates risk. Also, supply risk is compounded by financial market elements such as the availability of credit, growing competition for commodities from economically emerging nations, and the overall economic health of national and international economic systems.

Getting Information about Supply Disruptions or Other Distribution Problems

In most cases, State responders will find it easier to obtain details about supply issues and infrastructure problems from local marketing companies and distributors or trade associations than from major petroleum suppliers. These organizations are more likely than the supply companies to inform NYSERDA about problems, or to be able to answer questions should NYSERDA contact them for information.

Agencies NYSERDA might want to contact before a petroleum-related problem occurs include statewide and regional petroleum trade associations such as:

- Empire State Petroleum Association (ESPA)
- New York Oil Heat Association
- Oil Heat Institute of Long Island
- Hudson Valley Oil Heat Council
- New York Propane Gas Association (NYPGA)
- New York Petroleum Council (NYPC)

Derivation of Response Activities

Some of the response activities suggested in Table 9-28 are derived from common sense, but most of the measures are based on observation. For example, petroleum product distributors request HOS waivers during cold snaps. Suppliers impose fuel allocations in response to supply/demand imbalance. Companies reroute crude oil and petroleum products around major pipeline breaks where the infrastructure permits. Also, railroad or tanker truck capacity is purchased following pipeline interruption, especially if demand is sufficient to pay for higher transportation costs.

Table 9-28. Supply Issues Affecting the Petroleum Industry and Probable Response

Issue	Petroleum Industry Response
Weather Events (or Forecast)	Allocate contract supply, reduce release to spot market
Temperature extreme	Add distribution capacity as price increases
Wind conditions	Prepare/protect distribution infrastructure
Rain/flood conditions	Seek alternative routes and delivery means
Ocean storms	Reroute ships, seek alternative supply market
Snow/ice	Equip local delivery vehicles. Request HOS waivers

Issue	Petroleum Industry Response
Geologic Events Earthquake	Allocate contract supply, reduce release to spot market Assess damage, repair as required, reroute supply
Electromagnetic Events Solar flares	Electronic and computer systems may be vulnerable. It is unlikely that efforts to reduce this threat will be reported or discussed with State officials
Supply System Issues Embargo Production field exhaustion Environmental hazard Equipment failure Refinery outage Pipeline flow issues Storage tank failure Regulations Tank integrity Bottoms (shipping) Tankers not available Jones Act restrictions Ocean storms	Allocate contract supply, reduce release to spot market Seek assistance from federal authorities Explore and produce new locations – an ongoing activity Reduce hazard and adjust prices to cover cost or close facilities Assess then repair, replace, or shut down as economics indicate Maintenance, effect safety response, assess, and per above Assess, repair, replace, reroute, allocate Meet safety obligations as required, adjust prices to cover costs Maintain, assess, repair, replace, or shut down Seek new ships as market permits Work with federal government to modify, eliminate Predict, effect safety measure, reroute
Regional Transportation Issues Highway interruption Port and river issues Weather conditions Insufficient trucks available Terminal queuing	Seek assistance of New York State Department of Transportation (NYSDOT), man State and local emergency coordination or operation centers, reroute Participate with port authorities, constantly assess and inform SOEM officials Pre-fill customers, maintain large contract customer base, locate alternate supply sources Seek HOS waivers if conditions warrant
Human-Instigated Issues Worker strikes Lack of experienced workforce Terrorism Cyber attack (IT risk) Workplace mistakes Training	Work with unions, have back-up contractors to replace staff as necessary Expand and train as economics permit Harden infrastructure, remain in communication with U.S. Department of Homeland Security (DHS) Assess, turn to IT and security professionals Train and monitor personnel, prepare media response Results are best barometer and are seen at the supply level.

Issue	Petroleum Industry Response
Commodities	Refinery workers are highly trained and drilled regularly. Distributor organizations provide and encourage employee training. Use of a variety of in-house and ETRM consultants to evaluate and manage the sale and purchase of crude oil and petroleum products

Distribution: Risk and Vulnerability - New York Petroleum Industry

At the State level, the risk shifts from supply to distribution, which takes place between a terminal and the consumer. The list in Table 9-29 was developed in conversation with representatives of the petroleum industry. Not all participating companies do everything suggested in this list; however, it provides a useful starting point when State responders inquire about petroleum supply and distribution issues related to petroleum industry response to problems.

Table 9-29. Summary of Distribution-Level Issues and Potential Responses Taken by the Petroleum Industry

Issue and Potential Risk	Potential Vulnerability and Response
Spot-market purchases increase as major suppliers/refiners reduce direct retail ownership (i.e., branded outlets)	Branded outlets are less vulnerable than spot-market fuel stations due to supply contracts that reduce risk during shortage Spot-market outlets enjoy price advantage while supply is abundant The petroleum industry anticipates that higher prices will clear or re-balance the market
Reduction in storage for all petroleum products is related primarily to economics Environmental issues and regulations Major petroleum suppliers approve of storage reduction in order to manage demand signals and prices efficiently	Reduced local storage increases customer risk when supply is tight Industry views environmental regulations as a cost driver State propane dealers see reduced secondary storage as increasing delivery problems during shortage
Federal law requires electronic and manual (every 30 days) tank integrity monitoring	Some dealers complain, but all seem to understand safety implications Attention to safety reduces insurance risk and potential legal exposure
Some gasoline retailers and large users increase automatic fill ordering via electronic equipment on tanks	At the beginning of shortage, retail dealers entering orders into the system manually may miss supply signals and receive less supply than anticipated
The petroleum industry employs many contract protocols and cost plans that are reflected in	A dealer's ability to remain in business is a market/private-sector decision

Issue and Potential Risk	Potential Vulnerability and Response
pricing rather than reliability risk An example would be zone pricing (in which an area is priced as a unit to maximize profit)	Overall, the loss of a dealer is quickly compensated by a purchase or expansion by another, so that reliability does not appear to diminish with the loss of an individual dealer
Product allocation applies to contract or branded outlets but affects spot-market outlets as well	When supply diminishes, excess product supplying unbranded sellers is reduced When supply is tight, spot buyers bid up the price
Major propane delivery is by truck from out-of-State. HOS waivers grant relief from federal rules HOS waivers are granted by State and federal officials based on verification of need by product distribution associations	If HOS waivers are necessary, interstate coordination with neighboring State propane representatives and energy offices are a given Associations ask many questions and work with retail dealers to find alternatives for HOS waiver requests
Dealer consolidation occurs throughout the retail petroleum product market but is a significant concern for retail propane industry where local ownership (versus franchise ownership) has been the norm.	Interstate companies such as Inergy and Suburban Propane hold increasing market share, although New York retains many local retailers and reliability has not appeared to diminish
Sources: Interviews with petroleum distribution association and industry representatives, 2010.	

Risk and Responsibility Addressed by State Stakeholders

Table 9-30 guides State and local government Energy Assurance responders encountering distribution risk. Inevitably, new risks and attendant vulnerabilities will appear and authorities will want to be alert for other events, not listed, that also threaten the reliability of petroleum product fuels in the State.

Table 9-30. Loss of Fuel by Consumption Sector – Risk and Vulnerability

Consumption Sector	Petroleum Product Supply Issues – Risk/Mitigation Factors/Observations	Economic and Related Vulnerabilities
Residential	Price volatility adversely affects many users, especially low-income users Price escalates rapidly when supply is short, thus reducing consumption and lowering fuel risk Federal, State, and local safety regulations mitigate risk by requiring attention to the physical integrity of infrastructure Positive track record for in-State distribution industry has eased risk to New York State Petroleum product industry record on major external events is uneven; risk is	Loss of propane increases vulnerability of rural and suburban heating customers Loss due to price escalation increases vulnerability for low-income users and those burdened by recession Some reduction in vulnerability is seen if high prices reduce consumption, thus providing a level of system self-correction Economically vulnerable citizens may have to make choice of fuel or food Sales of other goods and services may suffer, increasing economic vulnerability Insufficient propane (or alternative fuels)

Consumption Sector	Petroleum Product Supply Issues – Risk/Mitigation Factors/Observations	Economic and Related Vulnerabilities
	situation-dependent Loss of fuel from event such as refinery closure increases risk to all petroleum product-consuming segments of the sector Some petroleum terminals may have limited rack space thus foster longer times idling (or traveling to other terminals) for retail tankers waiting to fill Port-related issues such as construction and dredging may increase risk	for space heating increases vulnerability to disease and illness and consequent loss of productivity Loss of propane in winter is more dangerous to residents than loss of motor gasoline during peak driving season Increased wait time at any terminal for any reason adds cost and price volatility
Commercial	Price volatility adversely affects some users more than others, especially business and institutions weakened by recession Price escalates rapidly when supply is short, thus reducing consumption and lowering fuel risk Industry track record for distribution within NYS is good, thus easing risk to State Petroleum product industry record on major external events is uneven; risk is situation-dependent Loss of fuel due to refinery closure increases risk to all petroleum product-consuming segments; resulting high motor fuel costs increases risk for retail merchants Petroleum product terminal issues as noted above Port-related issues such as construction and dredging increase risk for all commercial sectors	Price volatility is absorbed by most commerce (e.g., price increase passed to customer or lower profits for commercial enterprise) Financially at-risk enterprises, especially small establishments, are more vulnerable High prices increase risk for retailers because customer purchasing may decline, affecting sales profitability Higher prices lead to lower consumption, providing some level of self-correction and lowering risk Some commercial entities may not have sufficient cash or capital to endure a low-consumption period Higher fuel costs for institutions may lower services to clients, especially increasing vulnerability for challenged populations Long-term higher fuel costs for government institutions may result in tax increase
Industrial	Petroleum products account for about 44 percent* of the fuel used by industry for space conditioning and processes Loss of petroleum products is a serious concern for industrial process Space conditioning, lighting, or fueling vehicles generally entails lower risk than loss of process	Loss of industrial process-related fuel or feedstock increases economic vulnerability Price volatility in petroleum markets increases vulnerability as on-hand process inventory drops Industry is generally less vulnerable to non-process fuel supply issues if energy alternatives are on-site Industry may reduce vulnerability with

Consumption Sector	Petroleum Product Supply Issues – Risk/Mitigation Factors/Observations	Economic and Related Vulnerabilities
		certain alternative energy systems, especially combined heat and power (CHP) systems
Transportation	Ability of the petroleum product industry to obtain supply from alternate (e.g., out-of-State) terminals reduces risk When demand for motor gasoline increases, risk associated with any loss increases The distillate (including diesel) market usually parallels motor gasoline market Shut-down of out-of-State refineries increases in-State risk Road and bridge congestion in the New York City region increases risk Port-related issues in Long Island Sound, as well as weather in both New York and Buffalo harbors increases risk	Price volatility increases economic vulnerability Increasing price of petroleum products may slow demand, thus lowering vulnerability Price inelasticity shifts economic vulnerability to goods and services as discretionary dollars move from other sectors to petroleum products 2008 anecdotal data suggests at $4.00/gallon fuel price may be more elastic than previously thought Very high crude oil costs appear to affect overall economic growth Serious supply loss could produce rationing by major suppliers, thus increasing economic vulnerability
Agriculture	Loss of distillate hinders operation of major farm machinery operating on diesel fuel Degree of risk depends on crop growth and harvest cycles Loss of propane affects space heating for livestock, increasing risk for both farmers and consumers On-site fuel storage moderates risk	Greatest economic risk related to diesel is to crop harvesting when time management is the most critical Vulnerability is seasonally dependent Loss of propane creates greater economic vulnerability for livestock (especially poultry) than crops Loss of motor gasoline may create spot burdens but can be managed with relatively small amounts of on-site storage
	*Industrial estimate derived from New York Industrial Energy Use, EIA, SEDS, Table #S6. Industrial Sector Energy Consumption Estimates, 2008, line losses excluded.	

Identifying Problems

Introduction

As supply risk shifts from the international/national petroleum industry to local jobbers and retail dealers, the State's role in reacting to shortage increases. The laws discussed in Section 6.5.2, *6.5.2 Stakeholders and* Authorities outline the roles and responsibilities of essential State stakeholders and agencies.

Identifying Supply Shortage Problems

The *Energy Supply Disruption Tracking Plan* developed by NYSERDA as part of the *Energy Assurance Plan*, helps responders understand when to begin data-tracking efforts related to a potential or actual shortage. Tables 9-31 through Table 9-33 expand the examination of disruption by focusing on some of the conditions that responders may observe before and during a fuel shortage. This list is not exhaustive; responders should also rely on their own training and experience. Attention to seasonal conditions, regular monitoring of supply and consumption, contact with industry and government representatives, and open communications are all essential to preparedness.

Table 9-31. Potential Shortage Conditions and Probable Impacts to Observe: Warning Phase [180]

I. Early Conditions [Warning Phase] (one or more may apply)	Probable Impacts Observed
Severe cold weather in any region affecting New York may cause local supply problems	Petroleum product prices may increase Natural gas prices may also rise in parallel with petroleum products Supply-constrained areas such as Long Island increase supply efforts ahead of other areas
Reports of shortages in other parts of the United States or reports of natural disasters, terror, or political difficulties in oil-producing countries may affect petroleum and petroleum product prices on NYMEX	State jobbers and retailers may experience temporary supply difficulties evidenced by increased waiting time at terminal supply racks
Local prices may move up rapidly in response to spot market prices or speculation on commodity markets	Some gasoline outlets see greater-than-normal buying as motorists attempt to secure the lowest price
NYMEX forward pricing for petroleum products increases[181] rapidly	Although there is an on-going national debate about the rapidity of rising vs. falling prices, consumers "observe" that prices increase more rapidly than they fall and complain about it, especially during the summer driving season
Interruptible natural gas customers may enter distillate market for back-up fuel	Marketers and retailers may see shortages if distillate sales are switched from residential and other moderate users to large interruptible customers such as industry, large institution, or power generation

[180] The phases used here were derived from similar descriptions in the Electricity Section of this EAP. They are used to delineate increasingly difficult shortage situations and are not meant to be hard or fast descriptors.

[181] The term for this condition is "cantango," meaning forward prices are moving higher. The opposite price movement is called "backwardation."

Table 9-32. Potential Shortage Conditions and Probable Impacts to Observe: Pre-Emergency Declaration Phase (Actual or Threatened Tightening Supply)

II. Tightening Conditions [Pre-Emergency Declaration Phase] (in addition to previous phase; one or more may apply)	**Probable Impacts Observed**
DOE, NYMEX, American Petroleum Institute (API), and Oil Price Information Service (OPIS) reports reflect a decrease in the availability of product (e.g., from Middle East, South America, or domestic refineries) Petroleum and propane associations hear from members that rack waiting time has increased	Some jobbers report supply and delivery problems or related issues (e.g. extended rack wait time) Supply-related waivers from federal or State restrictions may be sought Deliveries may be temporarily extended beyond routine hours Tighter market conditions are indicated by upward pressure on prices or price volatility
Spot prices increase National and regional oil companies may begin to hold jobbers to contract allocation versus replenish-as-needed	Some retail dealers become uncertain about product availability and question information received from prime suppliers
Problems with energy delivery systems, such as refinery outages, transportation (including waterway) interruptions, or rapid increases in consumer-level storage, are observed	State government assistance in suspending commercial driver HOS rules may be sought New York Port Authority assistance may be required with marine and river issues Marketers may struggle to maintain contract supply in light of interruptible fuel shifts Coast Guard may be called to assist in-coming supply ships and barges
Petroleum product dealers report increased pressure on their ability to deliver fuel	Some customers call dealers to top off home storage tanks Dealers complain to associations about increased cost of rack waiting time or other shortage-related delays

Table 9-33. Potential Shortage Conditions and Probable Impacts to Observe: Emergency Declaration Phase (Significant Shortage of Supply in One or More Petroleum Products)

III. Severe Conditions [Emergency Declaration Likely or Issued] (in addition to previous phases; one or more may apply)	**Probable Impacts Observed**
Regional and State fuel dislocation is brought on by large-scale storms; extended,	During peak driving season, gasoline stations may curtail operating hours and motorists may queue to purchase

Table 9-32. Potential Shortage Conditions and Probable Impacts to Observe: Pre-Emergency Declaration Phase (Actual or Threatened Tightening Supply)

II. Tightening Conditions [Pre-Emergency Declaration Phase] (in addition to previous phase; one or more may apply)	**Probable Impacts Observed**
widespread winter cold; embargo; infrastructure failure or damage; accidents; or other natural causes or human acts	available fuel regardless of price Lack of courtesy in service stations queues may result in altercations and a resultant need for police visibility
Retail energy prices continue to rise Some vendors may not be able to buy wholesale product regardless of price	Customers (including government agencies) who contract with vendors for spot-market fuel may not be able to obtain product During winter months, will-call heating oil and propane customers may have difficulty locating fuel regardless of price
Local product storage is extremely low or exhausted	Hoarding may be observed
Major petroleum product suppliers sharply reduce allocations to jobbers Spot-market fuel diminishes severely	Retail dealers are overwhelmed with customer inquiries Retail dealers may curtail hours of operation or close to conserve fuel Jobbers may travel long distances to buy from terminals with supply Interstate driver HOS rule suspensions become routine
Shortages are generally regional in scope but possibly broader	Requests for government assistance and relief increase rapidly State governments may speed efforts to coordinate interstate mitigation measures
Taxi and mass transit fares may increase to cover rising fuel costs Existing assistance programs may be insufficient to help low-income families in distress	Where mass transit is available, ridership increases significantly Tourism and discretionary shopping suffers Economic dislocation occurs, especially for income-challenged consumers

State-Initiated Response Measures

Introduction

While petroleum industry and federal government officials usually cooperate in responding to an energy emergency, State government may wish to take additional steps. Table 9-34 summarizes initial steps that the various sectors may take when a shortage or other problem surfaces. During the initial stage of a problem, public relations and communications may be used to give market price signals and allow industry recovery efforts the time to reduce or manage demand. Table 9-35 summarizes the communications suggestions. When supply is tight, the petroleum industry will often call for HOS waivers and some of the mitigation measures contained in earlier New York Energy Emergency Plans are similar to those suggested by the NASEO/NARUC *State Energy Assurance Guidelines*,[182] and are found in Tables 9-36 through 9-53.

Table 9-34. Response Guidance Table

Response Initiation					
	Energy Sector	**Local Sector**	**State Sector (OEM/PSC/ NYSERDA)**	**Federal Sectors**	**Observations**
Condition	Potential Steps to Take				
I. Early Conditions (one or more may apply) [Warning Phase]	Monitor Inform NYSERDA Check status of preparedness plans	Monitor Communicate with energy sector	Monitor NYSERDA notifies New York Office of Emergency Management (OEM) Communicate with State petroleum associations	Monitor as requested from State	N/A
II. Tightening Conditions (in addition to previous phase; one or more may apply) [Pre-Emergency Declaration Phase]	All of the above Prepare repair crews as needed Activate repair and restoration actions as needed Assess delivery issues Expand supply acquisition if possible	All of the above Provide local repair and recovery assistance as requested	All of the above Consider public information about conservation and energy efficiency management Evaluate/approve HOS waivers Discuss potential mandatory measures with OEM and other State agencies according to time of year and general	All of the above Provide technical assistance as requested from DOE – Office of Electricity Delivery & Energy Reliability (OE)	OEM would begin to develop contingency options including use of State Emergency Coordination Center (SECC) Energy industry asks out-of-area energy entities

[182] NASEO/NARUC, *State Energy Assurance Guidelines*, v. 3.1, December 2009, www.naseo.org/eaguidelines/.

Response Initiation					
	Energy Sector	**Local Sector**	**State Sector (OEM/PSC/ NYSERDA)**	**Federal Sectors**	**Observations**
Condition	Potential Steps to Take				
			conditions Initiate public information actions including requests for conservation Voluntary deferment of home oil or propane tank fill-up		for assistance
III. Serious to Severe Conditions (in addition to previous phases; one or more may apply) [Emergency Declaration Likely or Issued Phase]	All of above Repair and restore Accelerated supply acquisition efforts Seek government assistance with HOS waivers Seek government assistance with supply and equipment enhancement	All of above Assist State at SECC and regional level, and provide responders as needed.	All of above OEM to activate SECC as needed. Activate Joint Information Center (JIC) Work with other States to enhance supply as possible. Initiate response measures from voluntary to mandatory depending upon success of successive measures	All of above	Local government response capacity exceeded Energy industry can no longer effect relief by itself
IV. Recovery	All sectors review actions and plans in order to evaluate lessons learned and improve response capabilities				

Communications Protocols - Public Relations and Coordination

Energy shortages require public explanations. The first suggested response measure after monitoring is public information. Most small events are not reported in the media. However, any event can come to the media's attention regardless of how many customers are affected or the time it takes to restore the system. For example, a small event in New York City may be reported while a similar event elsewhere might be ignored. People will turn to the media for answers and the media may query both company and State officials.

The public will expect energy companies and government to provide accurate information without exacerbating the situation. Most citizens can manage short-term outages and, although annoyed, will be patient. Over the years, most energy companies and governments have learned the value of being

forthright when discussing energy interruptions. Lack of candor can turn public opinion against energy providers and government, thus diminishing cooperation during restoration.

Media Preparation

The keys to successful media relations are planning, preparation, and training. Maintaining updated information on normal energy consumption patterns is the first step toward accurate reporting. When a petroleum shortage occurs, NYSERDA may first contact affected energy distribution associations to learn the cause and assess the situation. If an energy shortage develops slowly, State officials will have time to prepare and check facts; if the onset of a shortage occurs rapidly, the State needs to be prepared to ramp up communications very quickly. Equally important, preparation permits government responders to interpret what is learned from energy companies. This enhances government's perspective and ability to assist as needed.

Regular staff training that includes practice in media relations is useful. This involves gathering data under pressure, analyzing rapidly, and conveying complex information effectively.

Coordinating Information

NYSERDA works with OEM and others to brief senior State officials and may reply directly to petroleum-related emergency questions from the media. Energy providers and associations will also respond to the media. The governor may choose to meet the media as well. OEM is prepared to provide coordination among the various stakeholders in order to avoid contradictory and confusing statements to the media.

The process for preparing and coordinating public relations materials and protocols for a petroleum shortage are the same as for other energy forms. NYSERDA should anticipate that not all stakeholders will be equally prepared or sufficiently knowledgeable to speak about or provide advice on energy matters. It is always prudent to coordinate and cooperate in order to provide a timely and consistent message for the governor, the general public, and neighboring States. Table 9-35 illustrates the public relation response.

Table 9-35. Public Relations Response Level

Phase	Suggested Response for NYSERDA
Early Condition [Warning Phase]	Review and reinforce communications within the State and ascertain that everyone understands their role, what can and cannot be said, and by whom Work with OEM and keep governor's staff and legislative offices informed Review/prepare graphic energy market presentations and other materials to explain consumption patterns and anomalies Provide OEM public relations officer with regular approved updates Continue to acquire supply and demand data, as available Coordinate with OEM on media contacts to help reporters (especially newly assigned) understand basic energy facts and issues Review news and weather forecasts often Counsel local governments to arrange credit with oil companies (especially major suppliers) well in advance of an anticipated shortfall, because companies may not approve such credit expeditiously

Phase	Suggested Response for NYSERDA
Tightening Conditions [Pre-Emergency Declaration Phase]	Maintain information actions per above Establish Joint Information Center (JIC) (on-site or virtual), with cooperating and coordinating agencies including: OEM Department of Public Service (DPS) Department of Environmental Conservation (DEC) Empire State Development (ESD) Office of Temporary Disability Assistance (OTDA) Consumer Protection Board (CPB) New York State Department of Health (DOH) Coordinate with JIC and distribution industry associations to draft energy conservation recommendations if shortage is predicted to increase For propane issues, work with New York Heating Oil Association (NYHOA) or NYPGA to provide media advisories on setting back thermostats, using cooking fuel wisely, checking heating equipment, and conserving hot water For vehicle issues, provide driving tips in coordination with NYSDOT, New York Department of Motor Vehicles (NYSDMV), New York Division of State Police (NYSP), NYHOA, NYPGA, and NYPC Consider public meetings and use of the Internet as appropriate Share State energy data with distribution industry associations, other States, NASEO, and DOE as needed The governor may make announcements to assure the public and to encourage continued cooperation and compliance Estimate the probability and timing of a greater shortage Prepare briefings on possible supply and demand restraint measures should shortage intensify
Severe Conditions [Emergency Declaration Likely or Issued]	Maintain information actions per above Assist JIC and OEM with media briefings (sometimes in conjunction with energy stakeholder representatives) Develop follow-up messages for the governor to assure public and to maintain compliance OEM (in coordination/conjunction with JIC and the governor's office or others) announces enforcement actions, if any

Additional New York State Information Tools

Emergency Alert System

The Emergency Alert System (EAS) enables State and local government officials, with voluntary cooperation by area broadcasters, to advise the public directly in the event of life-threatening emergencies. The NYSERDA president, the PSC chairperson, and the chairperson of the State Disaster Preparedness Commission (DPC), or designated representatives, decide jointly to activate the EAS in a life-threatening energy emergency. Agency communication directors coordinate development of the appropriate public message and the DPC chairperson activates the EAS system.

NY-Alert, the New York State All-Hazards Alert and Notification web-based portal found at http://www.nyalert.gov/Public/SiteText/SiteTextDisplay.aspx?text=AboutSite. , offers a single point

through which State and local governments can provide emergency information to a defined audience (local, county, regional, or state-wide). OEM coordinates appropriate use of NY-Alert.

Energy Hotline/Public Inquiry/Media Monitoring

In an energy emergency, a toll-free Energy Hotline may be activated by the lead agency, which would establish hours and provide staff and telephone lines as needed to respond to public inquiries. Information provided through the Hotline would come from EAS messages, press releases, and briefings provided by a designated representative of the JIC. Regular briefings would be held to keep Hotline staff prepared to respond to inquiries. The Energy Hotline would serve as a primary source of information to the general public. Important operation aspects of such a Hotline would include:

- The Hotline supervisor oversees monitoring of both broadcast and print media reports.
- A daily news clipping package would be compiled and circulated by the lead agency.
- Reports of inaccurate information would be brought to the attention of lead agency's communication director or the appropriate representative at the JIC.
- Corrections would be made at press briefings, through press releases, through the Hotline, or by direct contact with the originating station or publication.

Response and Mitigation Measures

Hours-of-Service Waivers

As noted above, HOS waivers from federal driver safety rules [183] are often requested by propane distribution companies and heating oil marketers when supplies are tightening before an actual shortage, generally during the coldest periods of winter. The basic premise of HOS waivers is to permit professionally trained drivers to remain at the wheel longer than highway safety regulations allow. Because much of New York's heating oil and propane is brought into the State by interstate pipeline, rail, and tanker truck from out-of-State locations, coordination with neighboring energy offices is important.

Voluntary Energy Conservation Requests

These are noted in several places throughout the suggested action steps below. Ordinarily, energy providers know best when their supply has reached the critical point at which it is prudent to seek public cooperation. However, energy companies, whose businesses are built on maintaining public confidence and the apparent transparency of their service, are often reluctant to make such requests. NYSERDA may wish to consider offering assistance in this regard if a petroleum shortage moves into a serious stage. This should not be undertaken lightly because many times what appears to be a serious shortage is mitigated rapidly by energy providers or external conditions. It is prudent for State officials to work closely with petroleum product providers to fully examine and discuss voluntary emergency conservation steps.

Suggested Energy Emergency Mitigation Measures

The measures suggested in Tables 9-36 through 9-53 progress from voluntary actions to mandatory rationing. Suggested timing is contained in the left-most column. Implementation steps are in the right column with other agencies or groups that may be involved. For most events, only the least stringent

[183] New York abides by the federal HOS regulations under Federal Motor Carrier Safety Administration Regulations (FMCSA) (49 CFR 395) and FMCSA (49 CFR 390.23).

voluntary measures are suggested. Mandatory measures involve process and political decisions that may be unrelated to Energy Assurance. Selecting appropriate measures is a matter of judgment.

Table 9-36. Implementation of Energy Emergency Response Mitigation Measures: Public Information for Energy Conservation, Voluntary Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Public Information for Energy Conservation Voluntary Measure Consider for Warning and Pre-Emergency Declaration Phases	NYSERDA/ OEM (Note: Similar measures taken for natural gas and electricity would be initiated by PSC)	Applies to all petroleum fuels	Promotes voluntary reduction in energy use to aid recovery and restoration efforts, share limited energy supplies equitably, and help ensure sufficient energy for priority customers. Gives the public specific guidance for type of energy shortage and may stimulate the use of alternatives.	Can apply to all fuel consumer groups according to the nature of the shortage: • Heating oil and propane • Transportation fuels
Recommended Steps for State Responders			**Metrics**	
General • Use NYSERDA and OEM staff knowledge; obtain information from sister States, DOE, NASEO, and others to develop conservation guidance Administration • Coordinate with State fuel distribution associations working with their media and public relations professionals • Develop brochures, handouts, video, audio, Internet, and other dissemination materials • Work with media and others to obtain low-cost or free airtime or print space • Hold public meetings for concern citizens • Provide feedback to legislature and local jurisdictions Enforcement • Not Applicable			Heating oil and propane • Time transport trucks spend at terminal racks • Number of customer emergency calls and complaints. (NYSERDA can seek assistance of NYHOA and NYPGA to survey jobbers and retail dealers) Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations)	

Table 9-37. Implementation of Energy Emergency Response Mitigation Measures: Compressed Work Week, Voluntary Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Compressed Work Week Voluntary Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA	Motor gasoline and diesel fuel (note: space condition savings may not occur as demand is switched from institutional to residential consumers)	This is a form of flexible time management. It could reduce vehicle miles traveled (VMT) for workforce, but runs risk of increasing leisure driving instead. (Many federal agencies already support a 10-hour, 4-day/week schedule for employees.)	Commuters using motor vehicles

Recommended Steps for State Responders	Metrics
General • Requires State and local government leadership • Participation of major employers is highly desirable • Certain businesses and agencies cannot participate due to the nature of their work Administration • Work with State personnel management and private employers to enlist support • Work with unions and other employee organizations to obtain support • Ask affected local jurisdictions to help solicit participants. Coordinate with New York Empire State Development (ESD), NYSERDA, and New York State Department of Labor (NYSDOL) • Determine which businesses/agencies are capable of participating • If mandatory, develop list of exemptions • If mandatory, work with Attorney General to set up enforcement and appeals procedures • Assist participants in coordinating with out-of-State entities, if necessary • Ascertain equity issues (including overtime pay) if measure is mandatory	Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations) Enforcement • Not Applicable unless mandatory. If so, seek assistance of Attorney General

• Coordinate with affected local jurisdictions	

Table 9-38. Implementation of Energy Emergency Response Mitigation Measures: Variable Work Hours, Voluntary Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Variable Work Hours Voluntary Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA	Motor gasoline and diesel fuel	Reduces traffic congestion, and fuel lost in idling and stop-and-go driving. May also encourage greater use of mass transit and carpooling.	Commuters using personal motor vehicles Note: Consider exemption for two-wheeled motor vehicles
Recommended Steps for State Responders			**Metrics**	
General • Solicit business sectors to participate • Needs assistance from ESD, business associations, and employee unions and groups Administration • Publicize and explain • Coordinate with NYSDOL • Seek active help of unions • Provide technical assistance to participants • Encourage self-administration by participants • Coordinate feedback with affected local jurisdictions • Provide "success stories" to media Enforcement • Not Applicable			Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations)	

Table 9-39. Implementation of Energy Emergency Response Mitigation Measures: Telecommuting, Voluntary Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Telecommuting Voluntary Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA	Motor gasoline and diesel fuel	Reduces VMT and motor fuel consumption.	Commuters using personal vehicles
Recommended Steps for State Responders			**Metrics**	
General • Needs assistance from ESD, business associations, and employee unions and groups Administration • Encourage all business sectors to participate • Provide technical assistance • Seek advice and operating procedure help from national and regional telecommuting organizations • Publicize and explain • Design this measure for self-administration • Consider publicized recognition or awards for participating employers • Coordinate with affected local jurisdictions • Provide "success stories" to media Enforcement • Not Applicable			Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • NYHOA Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations)	

Table 9-40. Implementation of Energy Emergency Response Mitigation Measures: Reducing Government Agency Hours of Operation, Voluntary or Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Reducing Government Agency Hours of Operation Voluntary Measure or Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA	Heating oil and propane (Can also apply to other space conditioning energy sources such as natural gas and electricity)	Creates a short workweek for State and local government in order to divert tight fuel supplies to critical and residential consumers.	Government (institutional type) users

Recommended Steps for State Responders	Metrics
General • Involve chief elected official, cognizant agencies, and other bodies as needed; approval and coordination required Administration • Develop criteria to identify agencies/buildings to reduce hours or close • Develop criteria for return to normal operations • Coordinate with employee unions, if applicable • Attend to employee issues, such as criteria for any wage/salary changes and impact on benefits such as sick leave and vacation time • Provide timely notice to employees • Publicize and compliment participants and compliment in public. Enforcement • If voluntary, not applicable • If mandatory, seek assistance of participating agencies	Heating oil and propane • Time transport trucks spend at terminal racks • Number of customer emergency calls and complaints (NYSERDA can seek assistance of NYHOA and/or NYPGA to survey jobbers and retail dealers) • Number of employees participating (Conduct survey of State government. Estimate savings based on pre-determined "typical" cost basis based on state government motor vehicle use purchase records or similar documentation)

Table 9-41. Implementation of Energy Emergency Response Mitigation Measures: Hot Water Set Back, Voluntary or Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Hot Water Set Back Voluntary Measure or Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA	Heating oil and propane (Can also apply to other space conditioning energy sources such as natural gas and electricity)	Reduces temperature of hot water at commercial, governmental, and industrial facilities. Also recommended as a voluntary measure for residential and institutional users.	Commercial, governmental, and industrial, and possibly residential and institutional, consumers

Recommended Steps for State Responders	Metrics
General • Recommend a percentage reduction in temperature and consult with cross-section of user representatives • Design this measure for building operator self-certification • Use local inspectors for random verification Administration • Notify the public • Use standard testing procedures • Arrange media coverage • Enlist support and technical assistance from plumbing professionals • Coordinate with local authorities as appropriate Enforcement • If voluntary, self-enforcing • If mandatory, self-enforcing and work with Attorney General to set up appeals procedures • Consider asking local code enforcement agencies to assist.	Heating oil and propane • Time transport trucks spend at terminal racks • Number of customer emergency calls and complaints (NYSERDA can seek assistance of NYHOA to survey jobbers and retail dealers) • Consider assistance from plumbing professionals and local authorities for gathering and sharing relevant data

Table 9-42. Implementation of Energy Emergency Response Mitigation Measures: School System Fuel Conservation, Voluntary or Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
School System Fuel Conservation Voluntary Measure or Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA with assistance of State Department of Education (NYSED)	Motor gasoline and diesel fuel	Reduce VMT and motor gasoline consumption in the education sector (similar to other ride-sharing measures).	Primarily aimed at students using motor gasoline and diesel fuel vehicles but could be extended to designated personnel Note: this measure has local political ramifications and would require complete support from local jurisdiction and school authorities
Recommended Steps for State Responders			**Metrics**	
General • Requires approval and cooperation of local government and school boards (see note in "Target Consumers") Administration • NYSERDA coordinates with NYSED to lay groundwork • Consult with local government and school boards through appropriate associations and local school systems • Assist school districts with planning as needed • School officials to address scheduling, services, meals, extra-curricular activities , and post-school-day use of facilities • School officials to coordinate with parent-teacher and related associations, if any and as appropriate • School officials to determine rules for high school students who drive motor vehicles to school, such as minimum number per auto • NYSERDA provides technical support on vehicle use, alternative fuels, and related issues • NYSERDA monitors in coordination with			Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations) • Consider assistance from School District professional staff to monitor and report (See note in "Target Consumers")	

NYSED Enforcement • If voluntary, self-enforcing • If mandatory • School district officials and local public safety agencies • Coordinate enforcement at local level	

Table 9-43. Implementation of Energy Emergency Response Mitigation Measures: Building Temperature Adjustment, Voluntary or Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Building Temperature Adjustment Voluntary Measure or Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA	Heating oil and propane (Can also apply to other space conditioning energy sources such as natural gas and electricity)	Reduces/restricts space conditioning in commercial, institutional, and public facilities	Commercial, institutional, and public facilities
Recommended Steps for State Responders			**Metrics**	
General • Recommend a +/- 5 percent seasonal temperature adjustment in consultation with commercial, institutional, and industry representatives • Use building operator self-certification (building operator keeps log for review by building owner or management) for this measure • Use local inspectors for random verification Administration • Work with ESD and other State agencies for support • Notify the public • Establish self-certification and self-enforcement feedback • Use standard testing procedures • Arrange media recognition for participating			Heating oil and propane • Time transport trucks spend at terminal racks • Number of customer emergency calls and complaints (NYSERDA can seek assistance of NYHOA to survey jobbers and retail dealers) • ESD may provide assistance with random surveys of clients it has assisted Enforcement • If voluntary, self-enforcing If mandatory, self-certification with possible random inspection by local code officials	

companies • If mandatory, work with Attorney General to set up appeals procedures • Coordinate with affected local jurisdictions • Copy federal reward and certificate program* • (*Similar to a U.S. ENERGY STAR certificate) • Publicize and develop positive media attention for compliance	

Table 9-44. Implementation of Energy Emergency Response Mitigation Measures: Employer-Based Travel Assistance, Voluntary or Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Employer-Based Travel Assistance Voluntary Measure or Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA	Motor gasoline and diesel fuel	Reduces consumption of motor fuels by increasing average vehicle occupancy. Also reduces VMT and queuing. This measure: Could be used in conjunction with high-occupancy vehicle (HOV) lanes May be coordinated with telecommuting measure	Commuters using personal motor vehicles Note: Consider exemption for two wheeled vehicles

Recommended Steps for State Responders	Metrics
General • Requires cooperation of participating companies • Company-based plan is essential whether a voluntary or mandatory measure Administration • "Recruit" State agencies and companies over predetermined size (e.g., 100 employees) • Coordinate with ESD and NYSDOL • Coordinate with NYSDOT planners and companies to set up employee carpool, vanpool, or busing arrangements, including schedules and access locations • Employers determine applicability of staggered or flexible work hours, guaranteed ride home feature, preferred parking, company	Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations) • Consider assistance from local officials for surveying and monitoring requests Enforcement • Encourage self-enforcement in cooperation with associations • NYSERDA, with assistance from the Attorney General, could monitor for compliance

rewards, subsidy, or other inducements • Employers handle insurance questions and NYSDOL and NYSERDA assist in obtaining government safety requirement information • Monitor in coordination with business associations • Coordinate with affected local jurisdictions • If mandatory, work with Attorney General to set up enforcement and appeals procedures • Provide favorable media coverage for compliance • Promote rewards and competitive compliance achievement in the business community	

Table 9-45. Implementation of Energy Emergency Response Mitigation Measures: Reduction in State Government Travel, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Reduction in State Government Travel Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely or Issued	NYSERDA	Motor gasoline and diesel fuel	This measure sets an example for other entities by requiring State government officials to pay special attention to travel, schedule employee field visits and meetings so that trips can be combined, and increase use of electronic communications.	State government commuters driving motor vehicles
Recommended Steps for State Responders			**Metrics**	
General • Governor instructs cabinet to take appropriate vehicle reduction measures • Department of Administration Administration • Most effective as a mixture of incentives and prohibitions • Emphasis on use of alternative fuel vehicles helps to mitigate the effect of a motor gasoline shortage • Agencies assist by selecting an in-house coordinator to work with motor pool vehicles • NYSERDA and OEM help by providing assistance with area employee schedule coordination to encourage ride-sharing • Vehicles should carry written logs for feedback on			Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations) • Consider assistance from participating State agencies to monitor motor pool activity and report • VMT, times of travel, etc. (can be tracked using written logs) Enforcement • Agencies to provide enforcement	

trips and other use for further curtailment and coordination • State should invite media to see how the system works after implementation, as an example to private companies and to assure the public that State government is setting an example	with internal penalties for employee non-compliance • Agencies to monitor written logs (noted above) • Exceptions should be granted as needed • Internal recognition as positive reinforcement for compliance • Report results to media

Table 9-46. Implementation of Energy Emergency Response Mitigation Measures: Modified Fuel Purchase Times, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Modified Fuel Purchase Times Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Issued	NYSERDA	Motor gasoline and diesel fuel	Aids in the equitable distribution of motor gasoline and is designed to alleviate long lines at retail gasoline stations. This measure may be used in conjunction with the odd/even measures (See Table 6-45).	All motor vehicle consumers
Recommended Steps for State Responders			**Metrics**	
General • Cooperation of NYHOA and service stations is vital • Depends on retail gasoline outlets selling product in a prudent manner while pacing sales to avoid depleting supply until resupply occurs • Encourage retail outlets within the same area to stagger hours in coordination with their associations • Set retail outlet weekend operations with distribution association agreement (e.g., first or last digit of tax number designates day) Administration • Coordinate with NYHOA and NYPC to obtain agreement among participant organizations and dealers • Attorney General's assistance is required to work outside of State and federal anti-trust laws • Attorney General needs to obtain federal permission			Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations)NYHOA • Consider assistance from the distributor associations in sending reports of fuel purchase aggregate activity Enforcement • Local police departments to observe that retail outlets adhere to hours • Attorney General works with local law enforcement officials to define	

to allow its representatives to monitor and keep discussions focused on measure management • Obtain agreement about number of hours retail outlets will remain open (e.g., 4 to 6 hour per day) • Determine if flag or other identification system is useful • If not self-enforcing, work with Attorney General to set up appeal procedures • Work with distribution industry associations to monitor • Coordinate with affected local jurisdictions	enforcement details

Table 9-47. Implementation of Energy Emergency Response Mitigation Measures: Add Temporary HOV Lanes, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Add Temporary HOV Lanes Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Issued	NYSERDA in coordination with NYSP and local police departments, as appropriate	Motor gasoline and diesel fuel	Adds preferential lanes to existing State HOV lanes or on non-HOV highways and encourages additional ride-sharing to reduce congestion and VMT.	All drivers, with special focus on commuters

Recommended Steps for State Responders	Metrics
General • Identify HOV lanes and prepare protocols in coordination with NYSDOT • Requires support of law-enforcement agencies • Once political, public, and administrative approval is obtained, publicize and explain to motoring public Administration • NYSERDA/OEM to work with NYSDOT to develop signage and determine placement • Determine hours of HOV lane operation • Set number of required vehicle occupants • Determine exemptions for use (e.g., public safety, law enforcement, emergency, medical, energy provider, and commercial vehicles) • Establish procedure to monitor if traffic decreases in standard lanes while increasing in	Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations) • Consider assistance from toll agencies to report HOV activity Enforcement • State Police and other local police departments, as appropriate

HOV (if it does not, HOV lanes are probably not saving fuel) • Develop explanatory material and deliver to motoring public through media, auto clubs, Internet, electronic messaging, and mailings • Coordinate with affected local jurisdictions	

Table 9-48. Implementation of Energy Emergency Response Mitigation Measures: Enhanced Speed Limit Enforcement, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Enhanced Speed Limit Enforcement Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration or Issued	NYSERDA with NYSP and other local police departments, as appropriate	Motor gasoline and diesel fuel	Achieves maximum energy savings through increased compliance with existing speed limits to reduce motor fuel consumption.	All vehicle drivers
Recommended Steps for State Responders			**Metrics**	
General • Requires approval by the State and local government law enforcement required • Political approval is essential Administration • Law enforcement could undertake this measure independently; however, coordination with all stakeholders is crucial for success • OEM, NYSDOT, and NYSERDA may work with law enforcement agencies to develop public education and information campaign • Enhanced enforcement may require increased appropriations for labor needs • OEM and NYSERDA work with law enforcement to monitor effectiveness of measure			Motor gasoline and diesel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations) • Ask NYSP for assistance with data collection Enforcement • NYSP and local police departments	

Table 9-49. Implementation of Energy Emergency Response Mitigation Measures: Parking Management, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Parking Management Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Likely Issued	NYSERDA	Motor gasoline and diesel fuel	Provides for parking preference to ride-sharing vehicles. Reduces VMT and use of motor fuel, and directs attention to voluntary ride-sharing, employer assistance, work hour modifications, and related VMT-reducing measures.	All vehicle drivers

Recommended Steps for State Responders	Metrics
General • Needs cooperation of business and State and local government Administration • Work with appropriate business associations and local parking management on equity issues • Coordinate with ESD • Stakeholders work with NYSERDA to determine appropriate restrictions and pricing issues • Local jurisdictions assist in determining equity issues related to increased fees and disposition of fees • Local governments to determine status of on-street parking and rules for off-street parking • Stakeholders help determine exemptions • Unions and related organizations to be consulted • OEM coordinates public information • Work with local jurisdictions to coordinate with parking management agencies for monitoring effectiveness	Motor gasoline and diesel fuel • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations) • Consider assistance from unions and related organization, local governments, and business participants in providing aggregate parking records with attention to proprietary issues Enforcement • Parking attendant where available to screen vehicles • Signage at parking facilities • Radom checks of non-attended lots by local law enforcement departments

Table 9-50. Implementation of Energy Emergency Response Mitigation Measures: Prevention of Tank Topping, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Prevention of Tank Topping Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Issued	NYSERDA	Heating oil and propane	Prevents panic buying by heating oil and propane customers. This measure is similar to minimum and maximum purchase measure (see odd/even, Table 6-45).	Heating oil and propane customers

Recommended Steps for State Responders	Metrics
General • Requires active cooperation of jobbers and heating oil and propane dealers • Needs NYHOA promotion and oversight for success • Consult with NYPC Administration • Coordinate with jobbers and dealers to set procedures • Work with associations to prepare media material to inform the public • Attorney General needed to set up enforcement and appeals procedures • Coordinates with local jurisdictions and law enforcement	Heating oil and propane • Time transport trucks spend at terminal racks • Number of customer emergency calls and complaints (NYSERDA can seek assistance of NYHOA to survey jobbers and retail dealers) Enforcement • Oil and propane dealers keep record of customer fill and refuse to make top-off deliveries • Retail outlets screen will-call and make determination. • Consider sharing a list of abusers with NYHOA and NYPGA to identify panic purchasers

Table 9-51. Implementation of Energy Emergency Response Mitigation Measures: Increased Motor Gasoline Tax, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Increased Motor Gasoline Tax Mandatory Measure	Department of Taxation and Finance in coordination with NYSERDA	Motor gasoline	A temporary increase in the gasoline tax could further reduce the use of motor vehicles	All users of motor gasoline

Consider for Tightening to Severe Phases, Emergency Declaration Issued				

Recommended Steps for State Responders	Metrics
General • Requires approval by the General Assembly • To be used only if already high fuel prices do not sufficiently discourage fuel use during a severe shortage • Entails serious political risk for State officials • Consult with NYPC and NYHOA Administration • Coordination of the governor's office, NYSERDA, ESD, Department of Taxation, and local government • Department of Taxation may also wish to coordinate with the distribution associations and others in the petroleum industry to effect tax collection • Media assistance is highly desirable in order to explain such a measure to the public and enlist their continuing cooperation during the temporary levy of the tax • Careful recordkeeping of sales and VMT in the State is needed to demonstrate if the tax is effective • Could involve additional State expense to pay for real-time traffic surveys • This is a highly controversial measure likely to face significant opposition. Higher prices due to shortage may be sufficient to achieve results; an added tax should be considered only as an option for the most extreme shortage	Motor gasoline • Time transport trucks spend at terminal racks • Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations) Enforcement • Department of Taxation & Finance - Collections

Table 9-52. Implementation of Energy Emergency Response Mitigation Measures: Odd/Even, Carless Day, and Minimum/Maximum Purchase, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
Odd/Even, Carless Day, and Minimum/ Maximum Purchase Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Issued	NYSERDA	Motor gasoline and possibly diesel fuel	Discourages panic fuel purchases and risk of increasing local shortage due to topping off motor fuel tanks.	Motoring public

Recommended Steps for State Responders

General

- Requires support from NYPC, NYHOA, and retail outlets, as well as coordination with local government
- Public acceptance is crucial

Administration

- Develop detailed implementation plan in coordination with retail outlets and petroleum associations
- Determine minimum/maximum purchase levels if minimum/maximum option is added
- Coordinate with NYSDMV
- Set license plate or other protocol for identifying status of vehicles
- Determine days of operation (e.g., workweek only, set number of days, rotating weekend control)
- Prepare reference materials for use by retail outlets and for State agency staff when answering inquires
- Set up extra telephone or computer response banks to answer questions
- Secure emergency funding for staff time, if necessary
- Coordinate with law enforcement for random checks and follow-up
- Determine exemptions such as:
  - agriculture vehicles
  - common carriers
- Provide data to the public illustrating fuel savings
- Retail outlets may not have sufficient, capable, or trained personnel to enforce. If local law enforcement does not enforce, measure should not be considered
- Attorney General's assistance is required to work outside of State and federal anti-trust laws
- Attorney General needs to obtain federal permission for its representatives to monitor and keep discussions focused on measure management

Enforcement

Local law enforcement departments

Metrics

Motor gasoline and diesel fuel

- Time transport trucks spend at terminal racks
- Fuel purchase activity (NYSERDA can seek assistance from NYHOA to survey service stations for their observations)
- Consider data assistance from NYSDMV and NYSP for appropriate activity to monitor for proprietary-sensitive measurement

• energy company vehicles • medical emergency • two-wheeled vehicles (motorcycles, mopeds, etc.) • public safety vehicles • rental vehicles • sanitation vehicles • telecommunications vehicles • Carefully weigh potential rules for dealing with motorists identifying other motorists as violators • Work with Attorney General to set up appeals procedures • Notify the public; explain to the media • Monitor and follow up • Coordinate with affected local jurisdictions • Seek continuing media coverage to encourage public cooperation	

Table 9-53. Implementation of Energy Emergency Response Mitigation Measures: State Petroleum Product Fuel Set-Aside, Mandatory Measure

Measure	Lead Agency	Energy Source	What It Does	Target Consumers
State Petroleum Product Fuel Set-Aside Mandatory Measure Consider for Tightening to Severe Phases, Emergency Declaration Issued Consider only when public would accept full-scale vehicle (or other) fuel rationing	NYSERDA	All petroleum product fuels authorized under State Set-Aside Act (N.Y. ENG. LAW § 10-105 : NY Code - Section 10-105: Fuel set-aside)	Assists petroleum product suppliers in providing product to designated priority end users in circumvention of federal non-discriminatory marketing rules and helps ensure that priority end users have fuel available for vital public services. This measure also can be used to establish fueling priorities for guiding retail dealers in selling fuel to specified users. Note: Both natural gas and electric curtailment procedures approved by the PSC contain priority lists for restoration of service	Petroleum product customers per Act under "Energy Source"
Recommended Steps for State Responders				
General			Administration	

• Designed to provide "hardship" assistance based on the availability, not price, of product
• Transportation fuel sectors of heaviest impact would be motor gasoline, diesel, and perhaps aviation fuels imported into the State
• Could also apply to propane, heating oil, and kerosene depending on season
• Maximum percentage of incoming product set aside by major suppliers, and reallocated to priority users, to be determined by governor in coordination with petroleum industry, especially NYPC, NYHOA, and NYPGA
• Suggested monthly set-aside levels could be:
  • Motor gasoline: 5 percent
  • Middle distillate (diesel & heating oil): 4 percent
  • Propane: 3 percent
  • Aviation gasoline: 5 percent
  • Kerosene: 2 percent
• Reasons for using set-aside include refiners' inability to supply accounts adequately for sustained period of time, or price not clearing the market
• Governor may designate certain geographic areas as suffering from supply imbalance and redirect product as needed
• Applicants include jobbers for sale to direct customers and for resale to retail dealers and their end users
• Suggested priority users' order to be determined at time set-aside is recommended, among the following:
  • agricultural production
  • aviation ground support
  • cargo, freight and mail
  • emergency services
  • energy production
  • health care
  • passenger transportation
  • sanitation
  • telecommunications
 	
Enforcement
 	
• Attorney General when false information has been provided to obtain set-aside fuel
• May require additional enforcement personnel at retail outlets if motor gasoline is allocated to filling stations to meet critical need groups (e.g.
	• NYSERDA notifies major petroleum companies
	• OEM provides SECC or works with NYSERDA to develop alternate site if SECC is not available
	• OEM and NYSERDA coordinate with petroleum stakeholders to generate information for media, including press releases
	• Finalize and provide application and other forms
	• NYSERDA determines where applications can be picked up (e.g., local government offices or via the Internet), and how application is returned for investigation, verification, and evaluation (e.g., facsimile, E-mail, hand delivery, regular mail)
	• Provide access and operation information to potential applicants using services of distribution associations, media, and Internet
	• Establish processing order (e.g., first come, first served)
	• Establish protocol for releasing remaining set-aside volumes if conditions dictate/permit
	• Maintain coordination and communications with petroleum stakeholders, NYSDOT, ESD, law enforcement, and participating local jurisdictions
	• Attorney General's assistance is required to work outside of State and federal anti-trust laws.
	• Attorney General needs to obtain federal permission to allow its representatives to monitor and keep discussions focused on measure management
	• NYSERDA monitors imported fuel supply using State, federal, and private-sector data
	• Obtain prototype forms from NASEO; ascertain geographic area(s) of operations
	• NASEO can arrange for guidance if the State wishes to employ this measure

medical personnel at a near-by hospital) • Local law enforcement departments	
	Metrics Measurement may be inappropriate because This not a fuel-savings measure. It is designed to help ensure that critical users can obtain fuel to serve critical needs of the public It may be possible to survey critical end users to determine if their needs are being met

9.4 Coal

The reader is directed to the 2009 New York State Energy Plan. This report characterizes coal use, production, prices, transportation, and reserves at the global, national and State levels. Recent trends and developments in the coal industry are addressed, including advanced coal technologies and environmental factors that affect how coal is used. Current New York State and federal programs and initiatives that relate to the use of coal are identified.

9.5 Energy Efficiency

Energy efficiency is defined as methods and technologies that can reduce the input requirements of energy, electricity, or fuel used to accomplish the same level of output. [184] It encompasses technologies, processes, or actions that provide reductions in energy use while maintaining equal or greater quality of services. [185] Conservation may extend beyond this definition to involve changes in behavior, lifestyle, or use of materials in such a way to use less energy while maintaining or reducing quality of services. The reader is directed to the 2009 New York State Energy Plan.

9.6 Renewables

This Report evaluates the existing, planned, and potential use of New York's renewable energy resources, including hydropower, wind power, bioenergy, [186] solar energy, and geothermal energy. The scope of this Report includes large-scale renewable electricity, customer-sited renewable energy, and renewable fuels, as well as policies and programs designed to stimulate implementation of renewable resources. The use of hydrogen as an energy carrier is also covered in this Report as renewable resources can be used to generate hydrogen for use in multiple applications. This report also discusses the issues and challenges that impede the use of renewable resources and the possible policy options that could be used to overcome the challenges.

9.7 Smart Grid, Cybersecurity, and Emerging Technologies [187]

The concept of the "smart grid" encompasses use of advanced/enhanced technology and two-way communications to improve the operations and the efficiency of the entire electric grid from generation to end-use consumption. Such an approach seeks to:

- enable active participation of consumers
- enable the grid to accommodate all generation and storage options
- enable new products, services, and markets
- provide improved power quality for the digital economy
- optimize asset utilization and operational efficiency
- anticipate and respond to system disturbances

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[184] State Energy Planning Board. *2013 State Energy Plan Final Regulations*. November 2011. HYPERLINK "http://www.nysenergyplan.com/regulations.aspx" http://www.nysenergyplan.com/regulations.aspx State Energy Planning Board. *2013 State Energy Plan Final Regulations*. November 2011. HYPERLINK "http://www.nysenergyplan.com/regulations.aspx" http://www.nysenergyplan.com/regulations.aspx

[185] The Energy Efficiency Report will focus primarily on building energy efficiency, and the Transportation Report will detail transportation efficiency. This definition includes combined heat and power (CHP).

[186] Bioenergy resources include: biomass such as wood, biogenic waste, biogas such as landfill gas, and biofuels such as ethanol.

187 Reliability Study of the New York State's Transmission and Distribution Systems- Draft. Report of the 2013 New York State Energy Plan

Currently, the electric grid in New York, like most other large power systems in the world, uses modern technologies and approaches to control electricity flow and operations. Increased use of smart grid technologies in New York could result in significant improvements, including:

- enhanced operator decision-making capability through faster communications and broader regional visualization, potentially avoiding events similar to the 2003 Northeast Blackout and 2006 Long Island City Outages
- reduced power system losses
- greater demand response options and results for customers
- mitigation of fault duty issues, thereby enhancing distributed generation
- improved outage management systems
- automated operation of the distribution system [188]
- modernizing older utility systems
- increasing dynamic reactive compensation and power flow control in key parts of the system to maintain proper voltages
- increasing power flow transfers or reduce power transfer degradations
- reducing effects of system disturbances [189]

Several initiatives to expand the use of advanced technology and implement smart grid elements are underway in New York. In addition, the State is pursuing smart grid implementation with an integrated approach and strategy through its work with utilities and on various task forces and consortiums.

Increased Use of Advanced Technology

New York's transmission and distribution (T&D) system already has significant capability utilizing digital and enhanced communication technologies. On the bulk power system, what can be characterized as smart grid monitoring and communication equipment is employed for transmission systems above 115 kV. Distribution facilities, however, are typically less sophisticated than transmission systems, particularly in remote areas of the State. Recent enhancements include Con Edison's 14-kV autoloop system, which is more resilient and sophisticated than most radial circuits, as well as its Dynamic Feeder Rating program for 345-kV feeders, which provides real-time information regarding thermal conditions of feeders to network operators, allowing for greater power transfers and operational flexibility. Con Edison is currently installing similar functionality on select 138-kV feeders.

The PSC has also approved several projects in rate proceedings that fall under the smart grid umbrella, including developing dynamic feeder ratings for transmission lines, replacing outdated circuit breakers, bifurcating network primary feeder cables, and installing enhanced distribution automation.

Current Research and Development (R&D) and Pilots

Utilities in New York are currently undertaking several smart grid R&D activities. Orange and Rockland has a smart grid pilot project that will test increased monitoring and communication on two distribution

[188] Distribution automation involves the remote monitoring, coordination, and operation of various distribution equipment, e.g., automatic sectionalizing switches.

[189] These systems are generally referred to as Flexible AC Transmission Systems (FACTS), which covers a number of system types that can control voltage and transmission capacity, e.g., Static VAR Compensator (SVC), Static Synchronous Compensator (STATCOM) and those that can control flows, e.g., Unified Power Flow Controller (UFPC), Interline Power Flow Controller (IPFC), and Variable Frequency Transformer (VFT).

circuits. Con Edison is using the Long Island City network as its primary location for hosting pilot projects, and it will host a superconductor pilot project funded by the U.S. Department of Energy. Both Orange and Rockland and Con Edison are also participating in the Electric Power Research Institute (EPRI) Green Circuit program, which is an R&D effort aimed at reducing distribution line losses. In addition, NYSERDA has also issued several notices to support R&D projects for smart grid technologies.

The Advanced Energy Center at Stony Brook University is coordinating efforts to assist the various business sectors of the smart grid community with R&D needs as well as providing a center for validation and verification of product functions and capabilities. It is working with universities from around the State to provide a comprehensive array of services.

Smart Grid Implementation

The State is pursuing a comprehensive, integrated strategy to enable smart grid technology. The Department of Public Service (DPS) has several efforts underway to oversee the regulated utilities' activities with regard to smart grid, including interacting with utilities in rate cases and through regular quarterly meetings. A key objective is to ensure that prior to making infrastructure investment decisions, utilities have appropriately considered investment in a qualified smart grid system, consistent with the 2007 Energy Independence and Security Act (EISA). That legislation also created a Smart Grid Advisory Board, of which National Grid is a member, as well as a Smart Grid Task Force. The bill further allocated funds to support the advancement of smart grid research. The Task Force has been working with industry and interested stakeholders to improve the focus on smart grid developments.

The American Recovery and Reinvestment Act (ARRA) created a significant new opportunity to expand the smart grid in New York, through national funding of an Electric Delivery and Energy Reliability Program totaling $4.5 billion. Capital investment for advanced technology on the transmission system can be significant. The Department of Energy issued a Funding Opportunity Announcement for a Smart Grid Investment Grant (SGIG) to provide capital for smart grid projects and create jobs. The SGIG funding required States to provide 50 percent matching funds. Therefore, New York recipients of ARRA projects were required to seek approval from the PSC. No funding was used for interactive customer meters.

On July 24, 2009, the PSC approved matching funds of approximately $392 million for ratepayer funding of projects. . New York utilities, including those not regulated by the PSC, ultimately received ARRA grants for a number of projects with a total cost $571 million. Con Ed received the largest portion of the funding for New York State with projects worth a total of $251 million for SGIG projects, and $92 for its Smart Grid Demonstration Grant (SGDG) project. The Con Edison SGIG project is mostly for acceleration of a wide variety of distribution automation projects, including underground network sectionalizing devices and an underground network loop configuration. The Con Edison SGDG project is for a secure interoperable open smart grid system. The system will demonstrate a scalable, cost-effective smart grid prototype that promotes cybersecurity, reduces electricity demand and peak energy use, and increases reliability and energy efficiency. The system will include renewable energy generation, grid monitoring, electric vehicle charging stations, transmission automation, and consumer systems that will help expand the use of renewable energy and lead to greater consumer participation in the electricity system.

LIPA also received funding for a project to create a Smart Energy Corridor and NYPA received funding for a project to evaluate instrumentation and dynamic thermal ratings for overhead lines. Finally, NYSEG was awarded a project for the development of a compressed air energy storage demonstration; that project is going through an initial study to determine its feasibility.

The NYISO, on behalf of itself and the transmission owners, was awarded $37.4 million in DOE funding for a project to enhance deployment of synchrophasors (also referred to as phasor measurement units or PMUs) and expand the use of capacitors to make the bulk power system more efficient. With matching

funds approved by the PSC for the investor-owned utilities, the total project investment in system monitoring and voltage control devices will be $75 million. The PMU potion of the project will help protect bulk system reliability by providing additional system data much more quickly, and the capacitor project will reduce transmission losses by approximately $9.6 million per year in wholesale power costs.

New York's bulk electricity grid requires the constant balancing of electricity supplies with demand, on a moment-to-moment basis, involving vast amounts of data, calculations, and analysis on an ongoing basis. Following the Aug. 14, 2003, blackout in the Northeastern United States and parts of Canada, a U.S.-Canada Power System Outage Task Force issued a report that called for the increased use of time-synchronized recording devices for better wide-area visibility of the grid and improved post-disturbance analysis of this type of event. In response to the 2003 Outage Task Force's recommendations, NERC, and utility industry representatives agreed to accelerate the deployment of synchronized PMUs in the North American Eastern Interconnection. Several PMU owners and entities were involved in the project, including NYPA and NYISO.

PMUs can greatly enhance the capabilities of system operators by providing them with essential data on the status of the grid thousands of times faster than current widely used technologies. Time-synchronized phasor technology and the dynamic data it provides can be used locally, within substations for the purposes of system protection and control, and/or to provide system operators and planners with greatly enhanced insights into the wide-area dynamic system behavior, greatly improving grid operators' visualization capabilities and situational awareness. In addition to helping avoid future disturbances like the 2003 Northeast regional blackout, the PMU initiative and related technologies are intended to provide a range of enhancements to overall grid operational reliability and efficiency, including improved system visualization and real-time awareness across multiple power systems, greater support for integration of renewable resources, and better asset utilization. Eventually, the NYISO's PMU network will connect with PMU networks in New England, the mid-Atlantic, the Midwest, and Ontario, Canada, to create a North American Synchrophasor Initiative (NASPI) Network covering the eastern United States and Canada.

The State will also benefit from national efforts to develop smart grid standards. A critical component of the smart grid landscape is the communication framework, or the ability of various systems and equipment used for communications between the grid and its customers, to "talk" to each other. The National Institute of Standards and Technology (NIST) is leading the development of standards-based protocols for smart grid.

The State's efforts to develop a strategy and approach to smart grid is complemented by the work of the New York Smart Grid Consortium, composed of representatives from the power generation, transmission, and distribution sectors, including utilities, transmission companies and independent providers, technology companies, NYISO, State governmental entities, energy and grid technology researchers from universities, and the Brookhaven National Laboratory. The Consortium has developed a work plan and vision statement to guide the phased development of the smart grid. The agreement on a common vision among Consortium members allows all stakeholders to understand their roles, responsibilities, and opportunities in a roadmap toward the New York smart grid. Further, it allows them to make investments that they know will be relevant.

While the expected benefits of smart grid are commendable, the transition to a smart grid realm poses challenges both procedurally and technically. The ever-increasing amounts of data must be secured against hacking and cybersecurity attacks. Available technologies for new and existing buildings are limited, and the value propositions to many owners remain inadequate or not well understood. Moreover, energy costs as a percentage of overall budgets remain relatively small in many situations and the initial costs of performance-enhancing technologies can be high. This gap is exacerbated by actual and perceived reliability, component compatibility, impact on end-users' lifestyles and business practices, and uncertainty throughout the delivery chain associated with marketing, warranty, installer capabilities, and

post-installation support. Finally, the unfamiliarity and complexity of transactions associated with verifying energy savings and selling negative load to a supplier, and the challenges of modeling energy savings cash flow to facilitate financing, are barriers that must be overcome. These challenges are categorized in the following:

Procedural Challenges

- Broad set of stakeholders
- Complexity of the smart grid
- Transition to smart grid
- Ensuring cybersecurity plans and standards for systems
- Consensus on standards
- Development and support of standards
- Research and development
- Having a critical mass for implementation of the smart grid

Technical Challenges

- Smart equipment
- Communication systems
- Data management
- Cybersecurity
- Information/data privacy
- Software applications

Recognizing the benefits and challenges, the PSC has established guidelines to create a balanced and careful approach while smart grid technology is still developing, yet also creating the conditions that will allow optimal technology solutions to flourish. The PSC encourages electric utilities to develop smart grid systems that integrate new intelligent technologies, while optimizing the use of existing facilities and resources and maintaining just and reasonable rates for electric customers.

Energy Storage

Large-Scale and Instant Consumption

- Electricity in large interconnected power systems must generally be produced and delivered on a large scale and consumed more or less instantly. Yet from the standpoint of operational system reliability as well as economics there is substantial value in being able to store electricity at times when production and resources exceed supply, and then being able to use that energy when consumption exceeds resources. Practically speaking, however, the capability to store electricity has historically been limited, costly, and complex.
- The constant need to precisely match electricity supply with the variability of demand involves the processes of system “regulation” and “balancing” of the flows of electrons. Generally, this is achieved by a combination of having some conventional facilities running below their normal output (spinning reserves) and others standing by, capable of being brought online within 10 to 30 minutes of notification. Such processes present many operational and other challenges and inherent inefficiencies that can impact reliability.

- The issues associated with incorporating large amounts of variable renewable resources into the bulk grid have highlighted those challenges, and created a renewed emphasis on both the value and feasibility of energy storage. Conventional energy storage systems such as hydropower pumped storage, as well as an array of emerging storage technologies, have the potential to complement the integration of renewable energy, as well as provide new tools to enhance overall system reliability and create a more robust power grid.
- Hydroelectric pumped storage has been the most widely used means of storing electricity for use by the bulk power system. In these systems, water flows or is pumped into the reservoirs during off-peak hours and released later to produce electricity when demand is higher. Pumped storage accounts for approximately four percent of New York's generating capacity. While that level is twice the national average, it is not expected to expand due to the lack of sites where it may be permitted and economically constructed. New York has access to additional "storage" in the form of conventional hydroelectric power projects with large reservoirs, both within the State and across the border in Quebec.
- An array of new technologies and applications has begun to provide additional marketable, grid-scale energy storage resources, including flywheels, advanced batteries, compressed air, and potentially the off-peak usage of plug-in electric vehicles for feeding power back into the grid.

New York to Date

New York State has been a leader in promoting the implementation of some of these new energy storage technologies. In 2009, NYISO became the first grid operator in the nation to have federally approved market rules to facilitate integration of new energy storage systems. Specifically, these storage systems were enabled to participate in the markets as frequency-regulation providers, delivering reserve capacity that helps grid operators maintain the balance between supply and demand.

In January 2011, Beacon Power began operations of a 20-MW flywheel energy storage plant in Stephentown, NY, the first full-scale flywheel energy storage facility to provide frequency-regulation service on the U.S. electric grid. Beacon's flywheel systems are high-speed rotating mechanical devices that use the principle of kinetic energy to store and then discharge electricity from the grid. Conversely, they are also capable of facilitating system balancing and regulation by taking, or "absorbing," limited amounts of power from the grid.

Additionally, when the first phase of an AES Energy Storage 20-MW energy storage system in Johnson City, NY, entered operation in December 2010, it became the first commercial grid-scale battery-based storage system to operate as a generator in the U.S. The AES Energy Storage facility uses advanced lithium-ion batteries that convert electricity into chemical energy for later release. The company is actively looking at other opportunities for development of grid-scale battery storage facilities, primarily as a source of balancing and regulation services.

Active consideration is also being given to the role of batteries and other forms of energy storage in the potential development of "micro-grids," which are electrically isolated sets of power generators and/or other resources that supply all of the demand of a particular group of customers within a discrete location.

Cybersecurity

It is an accepted position in the electric power and critical infrastructure protection communities that the high-voltage transmission portion of the grid is generally regarded as critical because outages on the transmission system can have a significant impact over a widespread area.

The lower-voltage electric distribution part of the grid is generally considered to be less critical because distribution-level outages tend not to have a significant adverse impact beyond the local area.

Among the several hundred electric substations in New York State, only 63 currently qualify as part of the Bulk Power System (BPS) based on the Northeast Power Coordinating Council (NPCC) performance

definition where their loss or incapacitation would have a significant adverse impact outside the local area. With the new 100-kV bright line definition numerous substations will be included in this category within two years. Given the importance of these assets, security measures are in place to help protect the substations from a physical or cyber attack.

Physical security systems include full-coverage electronic intrusion detection, monitoring, and alert notification systems remotely monitored on a 24/7 basis. The transmission owners in New York have deployed such security systems at each of its BPS substations, or are currently in the process of upgrading systems to take advantage of the latest available improvements to these systems. The most critical electric utility substations in New York have modern and reliable intrusion detection, monitoring, and alarming technologies in place. Transmission owners are presently expanding installation of these new state-of-the-art security systems at other important and vulnerable facility locations on a regular and steady basis.

Power grid security from the cyber perspective has been the subject of much focused attention in recent years. NERC has adopted and FERC has approved mandatory and enforceable cybersecurity regulations on the electric industry pursuant to the Energy Policy Act of 2005, including Section 215 of the Federal Power Act. NERC is also in the process of revising its Critical Infrastructure Protection (CIP) standards.

Beginning in the early 1990s, a growing appreciation has been developing within the electric power industry that the advent of computerized Supervisory Control and Data Acquisition (SCADA) systems in the operation of the electric power grid presents vulnerability from hackers and other possible unauthorized cyber intruders. The possibility of a remote intruder interfering with the operational engineering management of the power grid has become more fully understood.

To date, it does not appear that a bulk power system outage has been caused by a cybersecurity intrusion. However, the electric industry understands that a cyber attack capable of causing regional or widespread disruption lasting in excess of 24 hours is possible. The source for such an attack could be local or from the other side of the globe.

As has been reported in prominent news outlets recently, there is ample reason to be concerned that an outside organization or nation-state with destructive goals could mount a structured cyber attack targeting utility operations systems in order to cause widespread disruption to a given geographic region. Organizations have used structured physical attacks on utility infrastructure elements around the world to achieve a variety of goals. A number of studies and reports document thousands of attempted unauthorized intrusions into utility information systems, with the number increasing every year. Though there is heated discussion about the ease or likelihood of "cyber sabotage," it remains a possibility that an organization with sufficient resources, such as a foreign intelligence service or well supported terrorist group, could conduct a structured cyber attack on the electric power grid of the United State or a key State such as New York.

NERC was charged by FERC in 2003 with developing industry-wide mandatory standards to ensure that all entities responsible for the reliability of the bulk electric systems in North America undergo a process to identify and then protect critical cyber assets that control or could impact the reliability of the those systems.

After years of working group sessions, drafting of industry comments, and significant interest from Congress, NERC Critical Infrastructure Protection Standards were adopted and became effective in 2010. [190]

[190] North American Electric Reliability Corporation (NERC), Reliability Standards, Critical Infrastructure Protection (CIP), http://www.nerc.com/page.php?cid=2%7C20.

X. Appendix D – New York State Energy Emergency Plan

NEW YORK STATE
ENERGY EMERGENCY PLAN:

An Integrated Resource Plan Specifying Actions to be taken in the Event of an Energy or Fuel Supply Emergency

2011

Prepared by:

New York State Energy Research and Development Authority

December 2011

nyserda
Energy. Innovation. Solutions.

PREFACE

PREFACE

New York's energy markets are increasingly influenced by national and international economic and market events – often beyond the State's control. These include increasingly sophisticated financial and operating practices, changing policy and regulatory environments, expanding opportunities and access to products and services, and intense competition. National and State energy policy, along with underlying market forces, have resulted in a diverse energy marketplace and an economy more vulnerable to energy supply disruption.

Given the changes that have occurred and continue to evolve in electric, natural gas and petroleum markets, the State must periodically examine strategies for responding to supply disruptions or fuel emergencies to ensure that such actions are appropriate and responsive to meeting critical public needs. The success of New York's Energy Emergency Plan depends on cooperation among energy market participants and government agencies to facilitate industry response efforts during difficult market events. The State must ensure that priority health and safety needs are met during a severe or prolonged fuel disruption.

The State cannot prevent shortages of fuel or rapid increases in prices that result from natural or man-made disasters or other market-disrupting events, nor does it have regulatory control over the factors that affect supply. Regulatory and policy actions affecting long-term supply occur primarily at the federal level. Natural gas and petroleum drilling regulations and taxing decisions; the size, fill rate, and release of the nation's strategic oil reserves; and the regulation of interstate gas and oil pipelines and truck, rail, and water-borne shipping of product are all federal responsibilities, although shared in many instances with the states. In addition, foreign relations and national defense priorities are prime factors affecting imported energy markets. The federal government, through the U.S. Department of Energy (U.S. DOE) and its Energy Information Administration (EIA), also plays a direct role in helping markets and industry respond to fuel emergencies and monitoring market conditions.

In the event of a significant disruption in energy supplies, the federal government could adopt limited supply-enhancement and demand-management strategies. Supply-enhancement measures could include relaxation of regulations governing drilling, mining, shipping, transmission, or environmental restrictions on energy use or extraction. Petroleum supplies could be physically augmented with crude oil supplies released from the Strategic Petroleum Reserves. Demand-restricting strategies in the past were promulgated at the federal level with implementation delegated to the states. The New York State Energy Emergency Plan assumes the same powers could be granted to states in the event of serious, widespread, or extended energy disruptions and presents a strategy that would lead to a formal emergency declaration.

During an emergency, both the State and federal governments would have responsibility for greater energy market intelligence, including data collection, analysis, and information dissemination. The U.S. DOE and EIA state-of-the-art computer capabilities make it possible to quickly access critical energy data. During an emergency, U.S. DOE, EIA, and individual states or regional organizations perform more active market monitoring and communicate this information freely. Information, such as regional and statewide pricing, inventory availability, and shipping and import characteristics, is crucial to providing an accurate portrayal of energy markets upon which policy makers can base decisions and public support for any potential voluntary or mandatory policies and programs.

While the market is recognized to be the most efficient allocator of scarce resources during both normal market conditions and disruptions, in an actual energy emergency State government needs to ensure adequate energy resources and in particular, that the most pressing energy priority needs are met for all of its citizens. Beyond responding to certifiable health and safety issues involved

in meeting the energy needs of priority users during an emergency, New York State government can expect pressure from the general public to mitigate price impacts.

In general, since the Organization of Petroleum Exporting Countries' (OPEC) oil crises of the 1970s and early 1980s, the energy industry has become more efficient and flexible, as well as more dependent on real-time supply to meet customer needs. Many previous industry practices (such as long-term supply-lifting contracts, exclusive development and supply agreements, and fixed-price contracts) have been replaced with near real-time pricing and greater diversity in supply sources. Financial instruments have made it possible for energy firms to better manage risks. However, the impact of these instruments on price and supply security on a broader basis is as yet untested in a serious, extended energy supply disruption.

New York State should continue to support industry efforts to respond aggressively to new marketplace opportunities, while encouraging contingency planning and effective communication among energy suppliers, transporters, and appropriate government agencies. State government itself must be prepared to take effective and responsive measures to protect the health and welfare of its citizens during catastrophic or extended disruptions of energy supplies. The New York State Energy Emergency Plan (hereafter, the "Energy Emergency Plan") has been prepared as a strategy tool to help New York State prepare for and respond to a broad range of energy emergencies.

CHAPTER 1

INTRODUCTION

PURPOSE AND SCOPE

The role of energy emergency management has evolved over the years from strictly managing physical shortages of petroleum products, such as those that occurred during the OPEC embargoes of the 1970s and early 1980s, to a broader concern for the adequacy and reliability of all energy supplies. Many different events can occur that could lead to actual or potential interruptions in the steady delivery of different energy products to the State's consumers, businesses, and industries. Such events could pose significant threats to residents, in terms of mobility, comfort, and health, as well as to the continued operation of businesses. And as all energy markets are nearly fully integrated, a supply disruption in one market will affect other markets as well.

An energy emergency is defined as an imbalance between fuel supply and demand or a price escalation significantly above the recent prevailing average sufficient to result in a general threat to the health and welfare of the State's citizens. It can be local, regional, Statewide, or even national or international in scope. It can be caused by insufficient supply, excessive demand, or even a perception of such that leads to extreme consumer behavior resulting in panic buying or storing of excess product to ensure future availability.

Officials at every level of government must be prepared to respond to such incidents in an appropriate, constructive, and responsive manner. Government can facilitate the operation of energy markets in periods of stress by increasing monitoring of supply and distribution conditions, observing relative price movements among sectors and regions, and initiating cooperative efforts among industry members, associations, and government officials to identify and correct system bottlenecks or market failures. Government can work to alleviate such problems by locating or identifying alternative supplies, arranging more flexible delivery arrangements, adjusting regulatory requirements, or encouraging intra-industry sharing of available supplies. Government must also be prepared to provide objective information to the public on market activities, restrain consumers if it appears that overreaction is occurring in light of market fundamentals, or take punitive action in situations where individuals or organizations are found to be taking advantage of market uncertainty to gain unfair advantage. Government should be looked to for implementation of voluntary or mandatory demand-reduction measures or supply-allocation programs only when actual, wide-scale disruptions of energy markets are expected to last for an extended period of time.

The availability of adequate and reliable energy resources plays a vital role in the economic activities and general well-being of New Yorkers. This is true for all fuels: electricity, natural gas, all refined petroleum products, and coal. These energy resources typically originate beyond the State's borders, necessitating an uninterrupted flow of pipeline, waterway, rail car, and highway deliveries to meet the energy needs of New York's end-users.

The reliable flow of energy supplies to end-users in the State depends on numerous factors. New York consumers depend primarily on out-of-State sources for primary energy supplies (*e.g.*, petroleum products, natural gas and coal). There is always an inherent potential for disruption in the delivery of these supplies due to inclement weather or natural and man-made disasters affecting transmission or distribution facilities. Further, the evolving realignment, restructuring,

and consolidation of some energy markets are expected to have notable impacts on supply dynamics. It remains to be seen whether supply stability is maintained at current levels in a mostly cost-driven environment, compared to earlier mandated criteria established by regulation.

To respond effectively and in a timely manner to future energy emergencies, New York is:

- Maintaining continuous energy resource supply, demand, and price monitoring and up-to-date electronic data processing capability.
- Performing periodic review and update of the Energy Emergency Plan with strategies that address all types of energy emergencies.
- Prepared to implement a standby State fuel set-aside program, if necessary.
- Coordinating activities with federal agencies, other states, New York State agencies, and the energy supplier industry to exchange supply, demand, and price market intelligence.
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NEW YORK STATE LEGISLATIVE MANDATE

New York State Executive Law, Article 2-B, establishes the State Disaster Preparedness Commission and requires the commission to develop disaster preparedness plans. Such disaster preparedness plans are to address disaster prevention, response and recovery, and collectively comprise the elements of the State's Comprehensive Emergency Management Plan (CEMP). The CEMP is comprised of three main volumes, one of which is the Response and Short-Term Recovery portion of the plan. The CEMP provides general strategic guidance and an organizational structure of New York State agencies during emergency response and short-term recovery operations. Further, the CEMP includes numerous functional annexes to address various response activities. Each annex brings together the collective resources of various response disciplines. This Energy Emergency Plan serves as an annex to the CEMP and utilizes all of the existing powers and authorities that are realized in the CEMP.

The need for a comprehensive plan setting forth the State's response strategies during energy emergencies was recognized by the State Legislature when it enacted the State Energy Law in 1976. At that time, the Legislature authorized the preparation of an "integrated resource plan specifying actions to be taken in the event of the declaration by the Governor of an energy or fuel supply emergency." Responsibility for energy emergency planning and response was transferred from the State Energy Office to the New York State Energy Research and Development Authority (NYSERDA) in 1995. [191]

Energy Law Section 5-117 authorizes the Governor to declare an energy or fuel supply emergency, which may remain in effect for up to six months. Extension beyond six months must be approved by the Legislature. Upon declaration by the Governor of an energy emergency threatening the health and welfare of the State's citizens or economy, NYSERDA's President is granted broad authority to:

- Allocate available supplies of energy or energy resources among areas, users, persons, or categories of persons or users. In allocating available supplies, the President shall give priority to energy and energy resources use essential to public health and safety, and shall

[191] Subdivision 15 of Section 1854 of the Public Authorities Law.

thereafter attempt to allocate the remaining supply equitably and in a manner designed to avoid undue hardship.

- Impose restrictions on any wasteful, inefficient or nonessential use of energy or energy resources, and upon the promotion of such uses.
- Waive State and local environmental protection requirements to the extent necessary for emergency use of energy resources not meeting such requirements for a period of not more than thirty (30) days; provided, however, that an additional thirty (30) days may be granted for good cause. Only one such waiver and one extension thereof may be granted any facility within any six-month period. (Energy Law §5-117 (1)(a),(b), and (c)).

A second source of emergency powers exists to address specific liquid fossil fuel supply problems affecting the State. Liquid fuels include petroleum fuels and propane. NYSERDA's President is authorized to activate a fuel set-aside system for liquid fossil fuels under Article 10 of the Energy Law and the accompanying regulations. [192] This authority was also transferred to NYSERDA in 1995. This program exists in "standby" status, to be implemented by NYSERDA's President if "he (sic) finds that implementation of the ... program for one or more liquid fuels is necessary to prevent or alleviate energy hardships or shortages." [193]

Energy Law Section 10-105(2)(b) authorizes a monthly fuel set-aside by each prime supplier of liquid fossil fuels. [194] The amount of product set-aside may not exceed 3 percent. Upon a declaration by NYSERDA's President that activates the set-aside program, each prime supplier doing business in the State will be directed to make available up to 3 percent of its total available monthly supply to the State for allocation to qualifying users under the set-aside program. Allocation of set-aside product will be granted on a month-to-month basis to priority users' wholesale supplier for delivery to end-users. Priority uses are identified during an emergency to alleviate emergency or hardship conditions in the most effective and equitable manner possible. For example, priority uses would generally include those uses supporting public health and safety, such as medical care and law enforcement. NYSERDA may also determine that a particular area of the State is experiencing a significant supply imbalance compared to other regions of the State and is authorized to issue a General Distribution Order directing some or all prime suppliers to release all or a portion of their set-aside supplies into the designated market.

In the event the set-aside program is activated, NYSERDA would work with local county energy coordinators, through the State Office of Emergency Management (OEM), to implement the program in a rapid and effective manner. The set-aside program has three major operational aspects: allocation assessment, data management, and communications. NYSERDA would review the identification of eligible applicants by county officials, review and establish monthly set-aside amounts for each county, contact prime suppliers, process exempt category applications and applications requesting in excess of 25,000 gallons of product, and perform program review and reporting requirements. In the event of a long-term fuel supply emergency, other State agencies' resources could be used to respond adequately to the situation.

Pursuant to its general authority with regard to electric and gas corporations (see, *e.g.*, Public Service Law Sections 65 and 66), the Public Service Commission has assumed lead for electric system and natural gas emergencies.

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[192] NYCRR Chapter IV, Subchapter D, Part 7900.

[193] Ibid §7900.2(a).

[194] A prime supplier is any person who makes the first sale of any liquid fossil fuel into the New York State distribution system for use within the State.

Individual State agencies and departments may also have specific legal bases that require and/or authorize certain emergency planning and response actions that are not included in this document. Additionally, under a State Declaration of Disaster Emergency (New York State Executive Law, Article 2-B, Section 28), the Governor may issue an Executive Order that directs State agencies to take such actions as may be necessary to protect the public health and safety.

All of these powers must be exercised in a manner which does not conflict with federal law, may be exercised notwithstanding any State or local law or contractual agreement to the contrary, and are in addition to any other emergency powers vested in the Governor that he or she may choose to delegate to NYSERDA's President. In exercising the power granted pursuant to Energy Law Section 5-117 (1) and (2), as described above, Section 5-117 (3) authorizes NYSERDA to supersede any emergency power previously vested in any other State agency.

ENERGY EMERGENCY PLAN OBJECTIVES AND GUIDELINES

The principal objectives of the Energy Emergency Plan are to:

- Protect public health, safety, and welfare.
- Minimize economic disruption.
- Direct scarce energy supplies in an equitable manner among competing essential purposes.

The Energy Emergency Plan has been developed in accordance with certain planning guidelines that aim to:

- Provide the flexibility required to meet a broad range of supply disruptions that may have materially different consequences depending, for example, on the time of year.
- Incorporate and, if necessary, supplement private sector emergency planning efforts, such as the emergency operating plans of local electric distribution companies in the State. In general, less invasive governmental action is preferred.
- Rely to the maximum extent practicable on voluntary rather than mandatory strategies.
- Include detailed strategies and options, as far as practicable, in order to respond to a broad range of information needs.
- Develop New York State's emergency response options in light of federal strategies and energy industry practices.

The benefits of the Energy Emergency Plan include:

- Providing advance notice of available emergency response strategies and options to energy suppliers, energy users, and all levels of government to allow necessary preparations before an actual emergency occurs.
- Protecting public health and safety in times of critical need.
- Minimizing delays in establishing response mechanisms during energy emergencies.
- Promoting consumer and supplier cooperation during periods of emergency.
- Coordinating State, federal and private sector actions for maximum effectiveness during an energy emergency.

INVOLVED STATE AGENCIES

New York State agencies that may be involved in the State's response to an energy emergency include, in alphabetical order:

- Department of Agriculture and Markets (Ag & Markets)

Obtains status of farm and agriculture fuel and energy requirements, maintaining liaison with farm and agriculture-related associations.

- Department of Environmental Conservation (DEC)

Issues waivers of environmental restrictions and maintains liaison with the U.S. Environmental Protection Agency.

- Department of Health (DOH)

Lead agency for nuclear and radiological emergency response and maintains liaison with the New York City Department of Health and Mental Hygiene, hospitals and other health-related agencies and facilities.

- Department of Public Service (DPS)

Lead agency for electric system and natural gas emergency response.

- Department of Transportation (DOT)

Assist in monitoring and expediting distribution of energy resources. Perform critical roadway maintenance. Coordinate with federal agencies for any necessary transportation system waivers.

- New York State Homes and Community Renewal (NYSHCR)

Administers the Weatherization Assistance Program for low-income households.

- Division of Military and Naval Affairs (DMNA)

Identifies potential impacts upon military and civil defense operations, and identifies resources that can be used to mitigate a crisis.

- Division of State Police (State Police)

Assists in emergency energy resource deliveries to critical or sensitive locations through such activities as vehicle escorts and traffic control, and enforces other emergency response measures as required by statute.

- Education Department (State Ed)

Maintains liaison with school districts and identify needed energy supplies.

- Office of Emergency Management (OEM)

Part of the Division of Homeland Security and Emergency Services (DHSES). Provides coordination of the State's emergency response.

- Empire State Development (ESD)

Provides information on impacts to market participants, maintaining liaison with regional tourism centers and business and trade groups.

- Energy Research and Development Authority (NYSERDA)

Lead agency for petroleum and coal energy emergencies.

- Office of General Services (OGS)

Provides general equipment support and maintains liaison with institutions supplied under State fuel contracts.

- Office of Counter Terrorism (OCT)

Part of the Division of Homeland Security and Emergency Services (DHSES). Oversees and coordinates state agencies' homeland security resources. Prescribes protective measures commensurate with current terrorist threat.

- Office of Temporary and Disability Assistance (OTDA)

Administers the Low-Income Home Energy Assistance Program and emergency residential fuel programs.

- Office of the Attorney General (AG)

Support enforcement actions as necessary.

DEFINITIONS

Appendix A lists the most common terms and acronyms used in the Energy Emergency Plan.

CHAPTER 2

NEW YORK STATE ENERGY EMERGENCY MANAGEMENT STRUCTURE

OBJECTIVES

This section outlines the administrative framework to be used to respond to serious or extended State energy emergencies. The structure involves several components that can be viewed as a series of sequential steps, beginning with the identification of an impending short-term energy disruption, up through a gubernatorial declaration of an actual energy emergency, and ending with an evaluation of the implementation of policies and actions taken to mitigate its impact. The broad objectives of the management structure are to:

- Gather information and assess the current and emerging situation.
- Provide for communication and coordination among government decision makers.
- Establish appropriate emergency response measures.
- Assign responsibility for implementation of specific response mechanisms.
- Direct implementation of the emergency response measures.
- Monitor and evaluate results.

ENERGY EMERGENCY OPERATIONS

Lead agency responsibility in the event of a severe or extended energy emergency will be assumed by either NYSERDA or Department of Public Service (DPS), depending upon the type of energy involved. NYSERDA will assume lead agency status for petroleum or coal supply emergencies. DPS will assume lead agency status for electric system and natural gas emergencies. The State Office of Emergency Management (OEM) will assume responsibility for the coordination of the State response, including the activation and operation of the State Emergency Coordination Center (SECC), as necessary. NYSERDA and DPS will also receive the full support of other State agencies.

Together, the lead agency and OEM will coordinate collection, assessment, and dissemination of information necessary to implement individual response measures comprising specific emergency response programs. Depending on the emergency situation, the lead agency's functions could include:

- Monitoring energy price, supply, and demand data received from primary and secondary sources, including:
    - Natural gas/electric utility services.
    - All petroleum/propane rail car, barge, and tanker energy supply movements.
    - Inventory of affected fuels in the wholesale and commercial sectors.
- Expediting appropriate waivers for truck, rail car, and waterborne shipments of liquid and solid fossil fuels (*e.g.*, oil, propane, and coal).
- Coordinating alternative fuel substitution for natural gas and electricity users.

- Estimating the impacts of emergency measures on energy supply and demand levels, industry, and the economy.
- Developing energy emergency response recommendations.
- Initiating emergency measure implementation actions.
- Preparing information and analyses for decision makers and the media.

The lead agency and OEM would be responsible for coordinating information flow and fielding inquiries from governments at all levels, as needed. A hotline may be used to respond directly to the general public's inquiries and a Joint Information Center (JIC) may be established to disseminate information to the media and the public. A nucleus of NYSERDA or DPS staff would work with managers and analysts assigned to the emergency response from various State agencies. Table 1 provides a more explicit listing of State agencies that may be involved in energy emergency response and their responsibilities. The general responsibilities of NYSERDA, DPS and OEM are presented below:

NYSERDA

- Serve as lead agency for petroleum products and coal emergency response. Assist in implementing petroleum and coal emergency procedures.
- Monitor the overall fuel price, supply, and demand situation.
- Discuss potential corrective actions or interventions with major energy suppliers and key State Agencies.
- Issue emergency orders and directives as necessary and appropriate.
- Operate a public relations center in close coordination with the Joint Information Center discussed later in this plan, and maintain liaison with the media and local governments.

DPS

- Serve as lead agency for electric system and natural gas emergency response. Assist in implementing electric and natural gas emergency procedures.
- Monitor status of interruptible industrial and commercial natural gas users and users with dual fuel capability.
- Maintain liaison with the electricity and natural gas dispatch centers of the State's investor-owned Local Distribution Companies (LDCs), electric generators, energy service companies and marketers, other wholesale suppliers, and key State Agencies.
- Maintain liaison with the New York Independent System Operator (NYISO) and Northeast Gas Association.

OEM

- Coordinate the State response to the emergency.
- Coordinate with federal, state and local entities, as appropriate.

OEM, NYSERDA and the NYS Public Service Commission are participating member agencies of the State Disaster Preparedness Commission (DPC), a multi agency organization charged with responding to a wide range of natural and man-made disasters that could occur in the State.

THE ROLE OF LOCAL GOVERNMENTS

Local governments are the first place most residents and businesses would turn for information and assistance when energy emergencies or supply disruptions occur. OEM and the lead agency would consult with local governments to determine the existence of unusual conditions or events that should be addressed. Conditions that might require special attention could include:

- Local laws, regulations, and ordinances that might impede the success of emergency response programs.
- Local policies regarding traffic flow, routes, and transit service that might have the potential for improving the effectiveness of the energy emergency response measures initiated at the State level. NYSDOT, the New York State Thruway Authority and local law enforcement should be included in these consultations since most major highway facilities are owned by the State.
- Unusual energy use patterns not adequately represented by aggregate data.
- Fuel requirements for essential municipal services and alternative operational patterns.

County Emergency Managers

The Emergency Manager for each county coordinates County emergency response activities for the County Executive, and advises the County Executive regarding the need for declaring a local state of emergency based on the severity of the situation and the necessity to use additional executive power to respond effectively to the emergency. The Emergency Manager:

- Activates the County's response organization and initiates County response activities
- Notifies and briefs County departments, agencies and other organizations involved in an emergency response
- Maintains and manages an Emergency Operations Center
- Facilitates coordination between the County, the lead agency, towns, cities and villages in the County, local governments outside the County, the State of New York, and private emergency support organizations.

City and County Energy Coordinators

A network of city and county Energy Coordinators was established by the Emergency Fuel Office (the predecessor agency to the State Energy Office) in 1974 in response to the need for energy information at the local level during the OPEC oil embargo. On a voluntary basis, local municipal government officials appointed staff to assist in processing emergency fuel inquiries, conducting fuel-related surveys, submitting various reports and generally identifying potential fuel problems in localities throughout the State. The network is a vital link between consumers and State government. OEM maintains an up-to-date list of these local Energy Coordinators, and will coordinate periodic training on the Energy Coordinators' roles and responsibilities. Depending on the individual County's emergency planning and response structure, the role of local Energy Coordinator may be part of the responsibilities of the County Emergency Manager.

New York City Office of Emergency Management

The New York City Office of Emergency Management (OEM) was created in 1996 to ensure interagency coordination before, during and after disasters or emergencies. Its mission includes planning, preparing for and mitigating emergencies; educating the public on preparedness; coordinating and supporting responses to and recovery from emergencies; and collecting and disseminating critical information. OEM maintains a corps of emergency management personnel

including responders, planners, watch commanders and administrative and support staff to identify and respond to various hazards and assist federal, State and City officials with emergency response. OEM's public information staff provides accurate, timely information to the public and media organizations. New York City's Citywide Incident Management System (CIMS) was established in 2004. CIMS establishes a formal command matrix and provides a protocol for governing how City agencies should respond to emergencies.

FEDERAL AND STATE LIAISONS

An ongoing liaison with federal officials and other states' emergency planners, particularly in the neighboring New England and Mid-Atlantic regions, is maintained by NYSERDA to establish a coordinated response to energy shortages. As the energy supply and demand situation dictates, it might become necessary to interact with federal energy officials and other states' energy officials to obtain information or discuss specific management strategies. A number of formal and informal mechanisms are available throughout the federal government to coordinate information regarding energy emergencies. However, the emergency response management process within U.S. DOE is now primarily limited to communication exchange. U.S. DOE maintains an emergency contact list to expedite communications with the states. The U.S. DOE Office of Energy Emergencies conducts certain outreach and coordination programs to facilitate timely information exchange and provide a central point of contact for energy emergency preparedness.

TABLE 1: ENERGY EMERGENCY RESPONSE AGENCY RESPONSIBILITIES

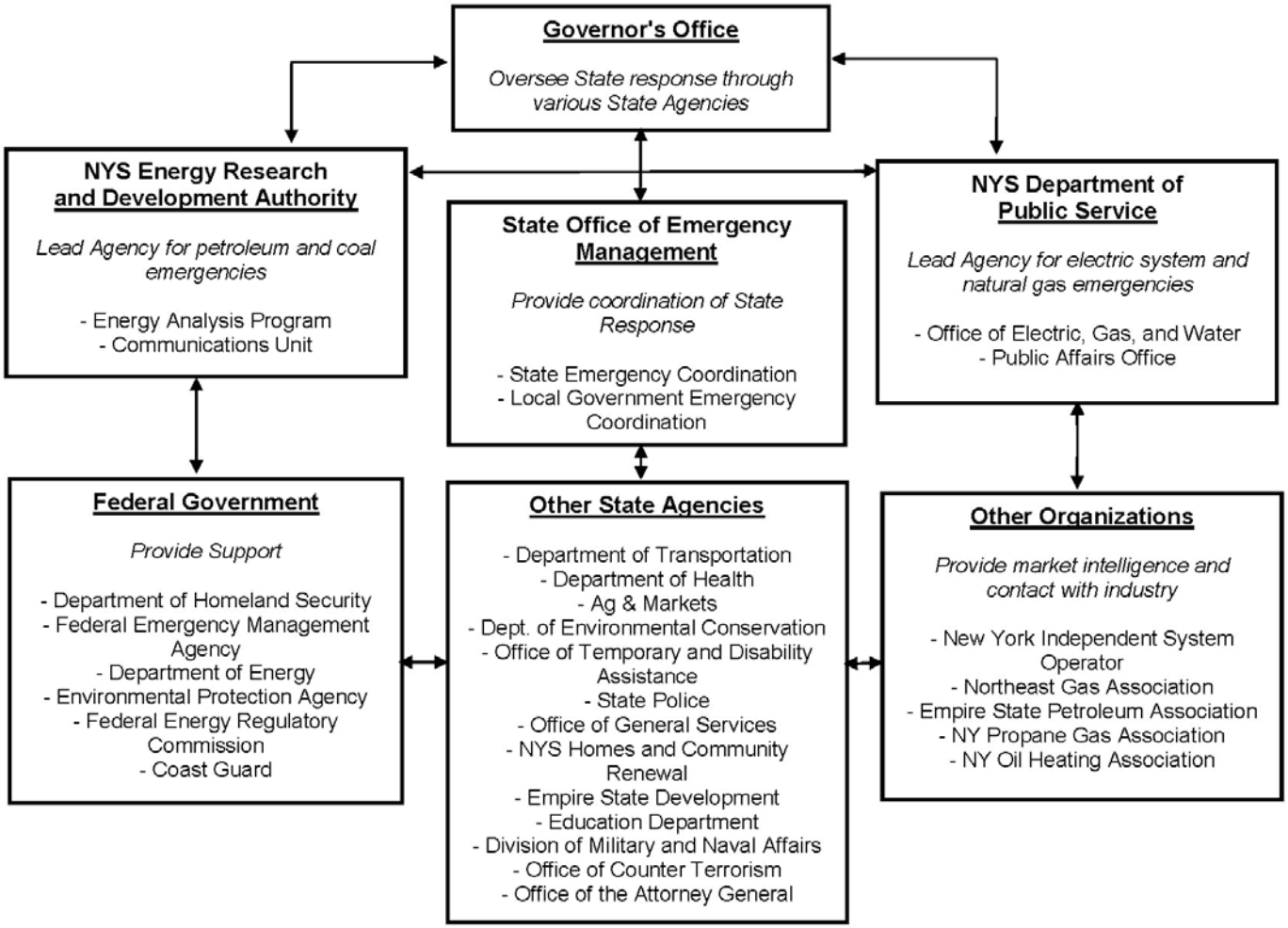
Agency	Responsibility
NYS Energy Research & Development Authority	Serve as lead agency for petroleum and coal emergency response. Assist in implementing petroleum and coal emergency procedures. Monitor the overall fuel price, supply, and demand situation. Discuss potential corrective actions with major energy suppliers. Issue emergency orders and directives as necessary and appropriate. Operate a public relations center and maintain liaison with the media and local governments.
NYS Department of Public Service	Serve as lead agency for electric system and natural gas emergency response. Assist in implementing electric and natural gas emergency procedures. Monitor status of interruptible industrial and commercial natural gas users and users with dual fuel capability. Maintain liaison with the electric and natural gas dispatch centers of the State's investor-owned Local Distribution Companies (LDCs), electric generators, and wholesale suppliers. Maintain liaison with the Independent System Operator (ISO) and Northeast Gas Association.
NYS Office of Emergency Management	Provide coordination of State response.
NYS Agriculture & Markets	Maintain liaison with farm and agriculture-related associations. Obtain status of fuel requirements for seasonal agricultural production.
NYS Empire State Development	Maintain information on status of industry and commercial closings due to energy shortages. Provide information on energy supply circumstances affecting specific industries. Maintain liaison with regional tourism centers and business/trade groups.
NYS Education Department	Maintain liaison with all school districts. Coordinate with school administrators to identify needed energy supplies.

NYS Division of Military and Naval Affairs	Identify fuel shortages that would affect military and civil defense operations. Prepare inventory of available heavy equipment and supplies (*e.g.*, generators for emergency hospital use).
NYS Department of Transportation	Assist in preparations to expedite energy resource deliveries, if necessary. Coordinate with federal agencies for any necessary waivers (*i.e.*, weight restrictions, driver's hours of operation, geographical area limitations) to expedite distribution of fuel. Conduct maintenance operations such as snowplowing, sanding, traffic signals, etc. Coordinate with U.S. Coast Guard for ice breaking operations on the Hudson River to facilitate winter fuel deliveries. Maintain liaison with appropriate federal agencies, such as U.S. Department of Transportation and local transit authorities.
NYS Office of General Services	Maintain liaison with all institutions supplied under State fuel contracts. Provide general equipment support, including telecommunications facilities, computer equipment and other office systems. Total operational management of approximately 41 State-owned facilities statewide. Solely responsible for supporting and managing the energy needs for numerous State agencies that occupy these facilities.
NYS Office of Temporary and Disability Assistance	Maintain liaison with all local social service districts and human services institutions. Administer Low-Income Home Energy Assistance Program and emergency fuel programs to assist qualified residents with heating costs.
NYS Homes and Community Renewal	Determine status of state-assisted housing fuel and energy requirements and maintain liaison with housing owners and statewide associations. Coordinate Weatherization Assistance Program network response to decrease energy use in low-income housing units. Issue energy conservation recommendations to all HCR-regulated property owners.
NYS Division of State Police	Assists in emergency energy resource deliveries to critical or sensitive locations through such activities as vehicle escorts and traffic control, and enforces other emergency response measures as required by statute.
NYS Office of Counter Terrorism	Oversee and coordinate state agencies' homeland security resources.

	Recommend and communicate changes to Homeland Security Advisory System threat alert level. Review and assess measures taken to protect energy-related critical infrastructure by state agencies and others. Prescribe protective measures commensurate with current terrorist threat.
NYS Department of Environmental Conservation	Issue waivers of environmental restrictions (*e.g.*, sulfur in fuel content standards). Maintain liaison with the U.S. Environmental Protection Agency.
NYS Department of Health	Maintain liaison with the New York City Department of Health and Mental Hygiene, hospitals and other health-related agencies and facilities. Act as the State Lead agency for nuclear and radiological emergencies.
NYS Office of the Attorney General	Support enforcement actions as necessary.

FIGURE 1

Listing of Organizations Involved in State Energy Emergency Planning Activities



CHAPTER 3

FEDERAL EMERGENCY RESPONSE

FEDERAL ENERGY EMERGENCY AUTHORITIES

Federal energy policy relies to a large extent on market forces to allocate energy supplies during a severe shortage or state of emergency. Often, the first noticeable effect of a supply shortage is a sharp rise in prices above the recent prevailing average. In general, consumption of fuel supplies declines in response to the higher prices and available supplies are attracted to higher priced areas.

The National Response Framework (NRF) and National Incident Management System (NIMS) were developed by the federal government as a way to integrate the various federal domestic prevention, preparedness, response and recovery plans into a single all-discipline, all-hazards approach. The NRF is supported by the NIMS, a national system that creates standardized incident management processes, protocols and procedures. The following federal emergency response plans are linked by the NRF:

- Federal Response Plan
- U.S. Government Interagency Domestic Terrorism Concept of Operations Plan
- Federal Radiological Emergency Response Plan
- Mass Migration Response Plans
- National Oil and Hazardous Substances Pollution Contingency Plan

The NRF includes an Emergency Support Function Energy Annex (ESF-12) that was formerly part of the Federal Response Plan (FRP), and is implemented in anticipation of a significant event likely to result in a need for federal assistance and/or in response to an actual event requiring federal assistance under a Presidential declaration of a major disaster or emergency. ESF-12 describes the roles and responsibilities of federal departments for energy emergency response. The U.S. DOE is the lead federal agency when the Federal ESF-12 is activated. Within the ESF-12, DOE is responsible for:

- Forecasting energy price, supply, and demand, and estimating system damage.
- Advising local authorities on energy restoration, assistance and supply priorities.
- Providing recovery coordination to affected parties.
- Providing regular incident situation reports.
- Providing a single point of access for Departmental assets and expertise.
- Serving as an information clearinghouse on recovery assistance, funding and emergency response resources and organizations for the energy sector.
- Assisting in the provision of temporary fuel supply.
- Recommending conservation actions.
- Reviewing requests to the National Communications System for Telecommunications Service Priority.

To meet these responsibilities, DOE (www.doe.gov):

- Collects and reports to Congress, information filed by electric energy generators, transmitters and distributors on loss of firm load, system voltage reductions or public appeals, bulk system operational actions and fuel supply emergencies;
- Assists affected energy stakeholders in obtaining repair crews and materials from outside affected areas; and
- Assists affected energy stakeholders in dealing with Federal Emergency Management Agency (FEMA) by coordinating with publicly owned electric, gas and lifeline utilities in applying for FEMA cost sharing for repairs.

Other major federal agencies and offices that respond to energy emergencies include:

- Environmental Protection Agency (EPA) - www.epa.gov - State governors can apply to the EPA for a temporary suspension of the state's Clean Air Act (CAA) implementation plan to adjust normal refinery operations or allow the importation or use of non-conforming, higher-sulfur petroleum products or coal, which may be more readily available during an emergency than conforming fuels.
- Federal Energy Regulatory Commission (FERC) - www.ferc.gov - FERC is responsible for regulating the interstate transportation and wholesale sales of natural gas and electricity. FERC can implement programs to curtail natural gas sales or shed load to low-priority customers. If a natural gas emergency is declared by the U.S. President, FERC may prohibit certain industrial uses of natural gas or order allocation of available supplies. Emergency measures for electricity are limited to authorizing the temporary connection or use of surplus transmission or generating facilities.
- Federal Emergency Management Agency (FEMA) - www.fema.gov - Has the lead responsibility for coordinating federal responses to civilian emergencies and disasters.
- US Department of Transportation (DOT) - www.dot.gov - US DOT has several sub-agencies that may relate to an energy emergency. These include:
- Office of Pipeline Safety (OPS) - OPS rules apply to inter and intra-state pipelines. Additionally, State regulations for natural gas generally reinforce the federal requirements.
- Federal Maritime Administration (FMA) - In the event that the State requires long distance waterborne fuel delivery (usually heating oil or motor gasoline) aboard an international shipping carrier not registered in the United States, a waiver from the federal act requiring the use of US-flagged vessels (Jones Act) would be sought through the FMA. U.S. DOE would assist with this.
- Federal Motor Carrier Safety Administration (FMCSA) - If the State receives a request to waive highway fuel transport driver hours in order to facilitate delivery during a shortage, it may be necessary to contact FMCSA.
- Department of Homeland Security (DHS) - www.dhs.gov - In the event of a terrorist attack, natural disaster, or other large-scale emergency, DHS will assume primary responsibility for ensuring that emergency response professionals are prepared to act.
- Department of Defense (DOD) - www.dod.gov - If a potential energy emergency is severe enough to threaten mission readiness or ongoing operations, special authorities exist to ensure military energy priorities are met.
- U.S. Coast Guard - The US Coast Guard is an arm of the Department of Homeland Security and has responsibilities related to Maritime Homeland Security. The Coast Guard base in the NY Harbor area, Sector New York, is located on Staten Island. The

following web site is specific to the New York Harbor area. www.harborops.com. New York is also served by Coast Guard Sector Buffalo http://homeport.uscg.mil/buffalo , Sector Long Island Sound http://www.uscg.mil/d1/sectLIS/ , and Station Burlington (Lake Champlain) which reports to Sector Northern New England http://www.uscg.mil/d1/sectNNE/ .

The listing above is not all-inclusive. Other federal agencies may be contacted as needed. A useful compendium of federal authorities, responsibilities and capabilities is available in the National Association of State Energy Officials' (NASEO) State Energy Assurance Guidelines document, dated June 2009. This document is available at the NASEO website; http://www.naseo.org/eaguidelines/index.html.

FEDERAL POLICY OPTIONS

Programs and energy policy options available at the federal level to deal with energy emergencies include:

- Increased monitoring of market supply, demand, and price fundamentals.

The current federal market monitoring system for obtaining weekly fuel inventory reports at the federal, regional, and state levels for petroleum fuels, and nationally and East and West of the Mississippi River for natural gas, performed by the DOE's Energy Information Administration (EIA), helps to alert decision makers to an impending emergency and is used to determine the severity of supply shortages or restrictions by location. EIA works with energy companies to gather and disseminate information and perform data analysis.

The monitoring system is designed to obtain accurate and timely information and is used to calm markets, helping to avoid panic behavior by consumers or businesses. Collecting this information is critical to ensuring that the supply and distribution system responds effectively to an emergency. Mitigating a deteriorating energy emergency situation depends on objective analysis of appropriate energy price, supply, and demand data.

- Release of crude oil stockpiles contained in the Strategic Petroleum Reserve (SPR).

The federal SPR program was authorized by the Energy Policy and Conservation Act of 1975 (EPCA). The SPR was established to diminish the vulnerability of the United States to a severe petroleum supply interruption and serves to meet the nation's obligations under International Energy Agency (IEA) oil-sharing agreements. Historically, the primary objective of drawing down the SPR has been to move crude oil into the distribution system at a specified rate to replace lost imports.

- **Northeast Home Heating Oil Reserve -** www.fossil.energy.gov - On July 10, 2000, a 2-million-barrel home heating oil component of the SPR in the Northeast was established. The intent was to create a buffer large enough to allow commercial companies to compensate for interruptions in supply or severe winter weather. The reserve, which equals two million barrels, is held in four terminals located in New Jersey, Connecticut, and Rhode Island.

Increase domestic oil production through royalty reductions on federal leases and direct regulatory action to encourage private production to increase domestic product output.

In the case of a severe energy supply emergency, the federal government can order increased production from oil fields on federal, state, and private lands, pursuant to Section 106 of the

EPCA. In addition, production from the Naval Petroleum and Oil Shale Reserves may be increased pursuant to a joint resolution of Congress.

- Encourage fuel-switching and provide environmental waivers.

U.S. EPA can expedite voluntary power generation at coal plants to facilitate inter-regional power transfers that displace oil or natural gas, pursuant to Section 202 of the Federal Power Act. Additionally, U.S. EPA can encourage states to temporarily waive environmental restrictions on burning high-sulfur oil, pursuant to Section 110(f) of the Clean Air Act.

- Restrict use of natural gas or petroleum as a primary fuel.

Under the Powerplant and Industrial Fuel Use Act of 1978, [195] the President has the authority to prohibit any powerplant or major fuel-burning installation from using natural gas or petroleum as a primary fuel during an emergency.

[195] Powerplant and Industrial Fuel Use Act of 1978, Pub. L. No. 95-620, 92 Stat. 3289 (1978), codified as amended at 42 U.S.C., Section 8301-8484 (2002).

CHAPTER 4

ENERGY MARKETS INTELLIGENCE

NYSERDA continuously updates the essential price, supply, and demand databases that alert staff to impending energy supply problems. Staff compile, analyze, and disseminate weekly, monthly, and annual energy statistics relevant to both national and New York State energy markets and trends. Relevant data is also received from federal agencies and the trade press regarding pricing, supply and demand fundamentals, and the status of the distribution networks serving the State. NYSERDA staff communicate with private sector firms, their associations, and corresponding state, regional, and federal officials to ascertain market conditions prior to and during any energy events. NYSERDA staff compiles this data into the following reports:

- Heating Fuels Report (weekly during September – April heating season, twice a month during summer)
- Heating Fuels Inventory Review (monthly in July and August if need determined)
- Transportation Fuels Market Assessment (Spring and Summer if need determined)
- Patterns & Trends, NYS Energy Profiles (annual – released in March)
- Winter Fuels Outlook (annual – released in the Fall)
- Monthly Wholesale Electric Price Report
- Weekly Summer Electricity Outlook Report (summer months if need determined)

In addition to these formal reports, NYSERDA staff performs the following activities:

- Continuously update weekly and monthly petroleum and natural gas price, supply, and demand data series, both nationally and regionally.
- Maintain up-to-date petroleum fuels price and supply information on NYSERDA's web site.

Advance indications of an impending petroleum supply and demand imbalance may be determined by staff as part of its regular analysis of energy price and supply data. NYSERDA monitors developments (*e.g.*, industry-labor negotiations, rail disruptions, barge movements) that could lead to a coal strike or shortage but does not regularly collect price and supply data. If circumstances indicate a coal strike or disruption is likely, NYSERDA would request relevant information from all suppliers, distributors, and direct purchasers. Coal producers would be contacted for information on production and delivery schedules as they affect New York State. For both petroleum and coal, supply and demand data would be studied to prepare for allocation or redistribution of supplies. Electric generators would be surveyed to determine their stockpile levels, estimates of resupply needs, and alternative supply options, if any.

The Department of Public Service (DPS) is the lead agency for all electric and natural gas emergencies. Details of New York State's emergency planning for electric and natural gas emergencies can be found in the New York State Department of Public Service Emergency Plan.

PETROLEUM

New York State and the Northeast are heavily dependent on foreign countries and other regions of the U.S. for crude oil and refined petroleum products, more so than most regions of the country. The State's consumers and businesses are significantly more vulnerable than other

regions of the country during periods of supply disruptions in oil-producing nations, or during any instances of distribution bottlenecks or infrastructure breakdowns.

Refined petroleum fuels are supplied through a complex, multilevel distribution network consisting of domestic and foreign refiners, brokers, futures and spot market investors, importers, and regional and local distribution companies.[196] Disruptions of these fuel supplies, or even the possibility of an interruption, may lead to sudden price increases above the recent prevailing average that reduce consumers= discretionary income, increase business costs, and shift financial resources out of the State to purchase additional energy supplies.

Petroleum market dynamics in New York have been affected greatly by energy company mergers, buyouts, and market withdrawals. Over the years, a growing reliance on a smaller number of retail outlets, a reduction in overall statewide terminal storage capacity, and the trend to "just-in-time" inventory management practices, combined with increased use of financial instruments by large distributors rather than holding physical inventories to ensure future supplies, has increased the potential impact of interruptions in the supply and distribution of petroleum fuels.

Motor Gasoline and Transportation Diesel Fuels

New York consumers and businesses rely on petroleum fuels to meet 97 percent of their transportation needs. Gasoline is the primary automotive fuel, accounting for 51 percent of all petroleum consumed in the State in 2009. Diesel is also an important fuel used in the transportation sector. Demand for these fuels typically peaks during the summer driving season. However, transportation diesel may come under supply and price pressure during the winter months because this fuel may also be used as a heating fuel.

Distillate Fuels

The continuous flow of distillate fuels (diesel, home heating oil, and kerosene), which are consumed in the residential sector for space and water heating, the commercial and industrial sectors for power and space heating, the transportation sector to move goods and people, and for electricity generation, has become increasingly exposed to supply uncertainty. The expanded role of imported products to meet New York's distillate requirements increases the risk to New York consumers of a petroleum fuels emergency. Evolving oil industry supply and distribution practices and de-emphasizing inventory buildup, increases the risk that short-term cold or severe weather will disrupt deliveries or sharply increase demand. Either event may lead to a supply imbalance and result in price spikes.

Distillate fuels are vital to the health and welfare of New York State's citizens. Thirty percent of the State's homes are heated with home heating oil or kerosene. These homes generally have a 275 gallon[197] storage tank, providing only limited protection in case of a supply or delivery interruption. Diesel fuel is the primary liquid fuel for truck, bus, and train transport. All three fuels, kerosene, home heating oil, and diesel, are also used in the electricity generation sector as

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[196] A detailed description and explanation of the New York State supply and distribution network in included in the most recent New York State Energy Plan.

[197] A full 275-gallon storage tank contains enough oil to meet the typical heating needs of households for approximately 25 days. Factors influencing this estimate include: internal and external temperatures, housing size, insulation levels, equipment efficiency, and water heating requirements.

either a primary fuel or as a secondary backup fuel for natural gas. The surge in demand for distillate fuels by traditional natural gas users at the same time that the residential sector is also increasing demand has the potential to seriously disrupt the supply availability of distillate fuels to all economic sectors.

Propane

Propane, or LPG (liquefied petroleum gas), represents a small proportion (2.1 percent in 2009) of total petroleum use in the State. However, it is an important "specialty" fuel, vulnerable to supply shortfalls. Most residential propane users live in suburban and rural areas of the State and depend on propane for cooking, space heating, and hot water needs. The residential sector accounted for 71 percent of the State's propane demand in 2009. These residential consumers, particularly those living in mobile homes, generally lack any alternative source of energy.

New York receives a significant amount of propane from producing areas of the U.S. Gulf Coast via a pipeline owned by the Texas Eastern Products Pipeline Company (TEPPCO). The company also maintains truck-loading terminals and storage facilities at Selkirk, Oneonta, and Watkins Glen, NY. In addition to the loading terminal, the Watkins Glen facility has an underground cavern capable of storing over one million barrels of propane. The balance of supplies is transported into the State by train rail car and truck. The transportation of this fuel originates from refineries in the mid-Atlantic and the Midwest regions, ship-borne deliveries received at ocean terminals in Portsmouth, NH, and Providence, RI, and from Canada.

Pipeline deliveries pose a concern for emergency planners because of the inability to increase deliveries significantly during periods of unusually cold weather, due to the physical constraint of the pipeline=s volume and pumping capacity. Distributors must rely on additional supplies entering the region via rail car or truck. However, these transportation modes are particularly vulnerable to weather related disruptions such as icy roads, storms, or the availability of surplus rail cars. As overall New York State demand has increased, supply flexibility improvements have been made by TEPPCO resulting in the increased throughput of volumes on the pipeline, expanded storage capacity at the SEA-3 terminal in New Hampshire, and construction of additional local storage capacity around the State.

COAL

In 2009, 7 million tons of coal was used in New York State, representing 0.7 percent of the nation’s demand. Electricity generation was 86.9 percent of this total, while the industrial sector accounted for 10.4 percent, and the institutional and commercial sectors used 2.7 percent. The use of coal in New York for electric generation dropped significantly in 2009, from 8.9 million short tons in 2008 to 6.1 million short tons in 2009, a 31.5 percent decline. New York ranked thirty-third among U.S. states in coal use. A small percentage of coal in New York in 2009 was used for purposes other than electric generation, including: 145 thousand tons were used for coke plants; 638 thousand tons for industrial plants; and 22 thousand tons for commercial and institutional purposes. The industrial plants include three cement manufacturing facilities in New York that use coal. In mid-2011, one of these facilities, the Holcim plant in Catskill, NY, was mothballed.

As of April 1, 2011, New York had eight (8) coal-fired electricity generating plants located seven (7) counties of the State. These facilities, representing 2,380 megawatts of net summer capability for the New York electricity system, accounted for 9.9 percent (13,815 gigawatt-hours) of electricity generation in the State in 2010. These plants are all located outside of the metropolitan New York City area; the greatest concentration is in Western New York. Electric generation coal stockpiles average about 12 weeks at normal consumption rates.

In 2009, domestic coal delivered to New York originated in six states. Wyoming was the largest supply source with 41.7 percent, and Pennsylvania and West Virginia combined accounted for 53.8 percent. 96.4 percent of the total coal delivered to the State in 2009 was delivered by rail. As rail companies servicing the State have consolidated and removed uneconomic lines and trackage, thus reducing system flexibility, complex planning may be needed to redirect emergency coal shipments during a shortage. Additionally, a possible shortage of available rail coal cars and resulting postponements in forming unit trains could delay delivery of bulk supplies to large coal consumers. Quickly increasing coal availability in the State would require cooperation between the State and federal government, as well as the coal and rail industries.

Barge and trucks also move a minimal amount of coal to end-users in New York. Although coal seems universal in form, it varies significantly by a number of important parameters, including its energy, sulfur, and moisture content(s); hardness; volatility; and ash fusion temperature. Often coal supplies for one user are not suitable for another because boilers and coal-handling equipment are designed to use a specific type of coal.

The most likely event that would trigger an extended interruption in coal supply is a miner's strike. Current labor contracts should be monitored closely. A strike-related production cutoff of large enough magnitude would make it increasingly difficult to meet demand after on-site stockpiles are exhausted.

ELECTRICITY

Primary legislative authority for most types of electric system emergencies rests with the Department of Public Service (DPS). As a result, DPS staff would have the lead role in any electric system emergency affecting or occurring within the State. NYSERDA is responsible for emergencies involving fuel supply or deliverability problems. The highly integrated nature of the electric system requires that the New York Independent System Operator (NYISO) and one or more individual utilities coordinate actions involving transmission, distribution, or generation supply problems. The degree of government involvement would depend on the nature and expected duration of the problem. System blackouts and recovery might be handled entirely by the ISO or an individual electric utility, while any major distribution system damage might involve greater coordination with DPS staff.

The NYISO coordinates the operation and dispatch of the generating facilities in the State, electricity imports into the State, and the flow of electricity across the bulk power transmission system. The NYISO also coordinates operations with the neighboring Independent System Operator of New England; the Pennsylvania, New Jersey, and Maryland Interconnect (PJM); Independent Electricity System Operator (IESO) of Ontario; and Hydro Quebec.

In addition, the NYISO facilitates fair and open competition in the wholesale power market and creates an electricity commodity market in which power is purchased and sold on the basis of competitive bidding. It utilizes a bid process for electricity and transmission usage, which enables the State's utilities and other market participants to offer electricity at competitive prices, rather than regulated rates.

The New York utilities participate in the Northeast Power Coordinating Council (NPCC), which includes all of the New England states and the provinces of Quebec, Ontario and New Brunswick in Canada. The NPCC is one of eight regional councils that comprise the North American Electric Reliability Council (NERC). New York State would work with the NYISO in emergency electric energy situations to implement pre-authorized crisis operating policies; assist any affected utility or utilities in enforcing mandatory conservation measures, if necessary; assure an efficient and

smooth flow of information concerning the emergency to the appropriate levels of government and to the media; and redirect available supplies of excess fuel to affected utility generating stations.

NATURAL GAS

Primary legislative authority for most types of natural gas system emergencies rests with the Department of Public Service (DPS). As a result, DPS staff would have the lead role in any natural gas system emergency affecting or occurring within the State. The degree of government involvement would depend on the nature and expected duration of the problem. System blackouts and recovery might be handled entirely by the individual gas utility, while any major distribution system damage might involve greater coordination with DPS staff.

New York State used approximately 1,142 billion cubic feet of natural gas in 2009 [198], making it the fourth largest gas consuming state in the nation behind Texas, California, and Louisiana. The State has approximately 4.69 million natural gas customers [199] served by various local gas distribution companies (LDCs). [200] These LDCs depend on major interstate and intrastate pipeline systems for access to domestic and imported, particularly Canadian, natural gas supplies. [201] Gas production within New York is growing and currently is sufficient to meet about 5 percent of the State's natural gas requirements. [202]

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[198] http://www.eia.gov/naturalgas/data.cfm. The breakdown of the volumes by sector: residential 35%; commercial/ industrial 31%; power generation 32%; transportation 0.33%; and the remaining is pipeline distribution use and lease fuel.

[199] http://www.eia.gov/naturalgas/data.cfm. The breakdown by sector is: 4.31 million residential customers and 0.38 million commercial/industrial/power generation/transportation customers.

[200] Central Hudson Gas & Electric Corporation (CHG&E), Consolidated Edison Company of New York, Inc. and Orange & Rockland Utilities (Con Edison/O&R), Corning Natural Gas Company (Corning), National Grid, New York State Electric and Gas Corporation (NYSE&G), Rochester Gas & Electric (RG&E), National Fuel Gas Distribution Company (NFGD), and St. Lawrence Gas Company (St. Lawrence).

[201] These pipelines are: Algonquin Gas Transmission Co. (AGT), Columbia Gas Transmission Corp.(Columbia), Dominion Transmission, Inc. (DTI), Empire State Pipeline Co. (Empire), Iroquois Gas Transmission System (IGTS), National Fuel Gas Supply Corp. (NFGS), North Country Pipeline, Tennessee Gas Pipeline Co. (Tennessee), Texas Eastern Pipeline Co. (TETCO), Transcontinental Gas Pipe Line Corp. (TRANSCO), and TransCanada Pipelines, Ltd. (TransCanada).

[202] New York State Department of Environmental Conservation, Revised Draft SGEIS 2011, page 2-4.

CHAPTER 5

RESPONSE ACTIONS

Effective emergency response strategies are designed to be flexible and staged to become increasingly more intensive as an emergency grows more serious. Emergency planning is intended to facilitate appropriate and flexible emergency response while not unnecessarily imposing the constraints of a one-size-fits-all hierarchy. This Plan documents various stages, classes, and types of emergencies and response actions for petroleum, coal, electric system, and natural gas emergencies. At the onset of any emergency situation, the Energy Emergency Plan will be reviewed by the lead agency to assess the applicability of individual response elements to the existing situation. Plan elements may be revised, excluded, or augmented to take into account specific exigencies meriting response whether or not they are specifically referenced in this Plan.

It should also be recognized that no specific type of energy emergency exists in isolation. A natural gas emergency may result in an electricity system emergency due to lack of fuel for electricity generation. The same natural gas emergency may result in a petroleum or coal emergency due to fuel switching. Similarly, a petroleum supply emergency may result in an electric system, natural gas or coal emergency. The State's response to any energy emergency situation must be cognizant of the potential impacts to all of the State's energy markets. The lead agency should consult with other affected agencies, as appropriate, in implementation of response actions.

The State's Energy Emergency Plan is based on a four-stage response hierarchy that generally reflects the severity of the energy or fuel supply situation.

- Stage I - **Increased Monitoring** - Conditions warrant increased monitoring of one or more portions of the energy supply and/or distribution system.
- Stage II - **Market Coordination** - There is active coordination between energy supply distribution systems and State agencies to moderate the effects of a potential emergency.
- Stage III - **Public Action** - The public is asked to take action to moderate the effects of a potential emergency.
- Stage IV - **Emergency Declaration** - The Governor declares an energy or fuel supply emergency. Broad emergency powers are granted to the Governor or the Governor's designee.

PETROLEUM EMERGENCIES

LEAD AGENCY

NYSERDA is charged with the responsibility for responding to liquid petroleum product (gasoline, heating oil, kerosene, diesel, propane, residual fuel, etc.) emergencies. In the event of an in-State petroleum emergency, or an out-of-State event immediately affecting New York supplies, NYSERDA will act as the lead agency and the NYSERDA Energy Emergency Implementation Plan will be activated. Support agencies will implement their internal emergency response plans, as needed, and their activities will be coordinated by OEM.

POTENTIAL RESPONSE MEASURES

The response activities described below for petroleum product shortages may be initiated by New York in the absence of federal initiatives. The State's strategy for responding to petroleum product shortages places a premium on flexibility and informed choice rather than rigid formulas and procedures. The precise circumstances of a particular emergency would dictate the appropriate response. A staged response involving pre-emergency and emergency elements would be used in periods of market disruption.

In the case of petroleum products, the designation of pre-emergency stages I through III are determined by the President of NYSERDA. If public health, safety, or general welfare is jeopardized by an energy supply situation, the Governor may declare an energy emergency for the State as a whole or for individual areas of the State as necessary. After the Governor has declared an energy emergency, the stand-by State fuel set-aside program for liquid fossil fuels may be activated if the President of NYSERDA finds that implementation of the program for one or more liquid fuels is necessary to prevent or alleviate energy hardships or shortages. A Governor’s energy emergency declaration beyond six months must be approved by the Legislature.

The nature of a given fuel supply emergency would determine which response options are most appropriate. Criteria for evaluating and selecting relevant emergency response options may include:

- Energy savings potential - amount of fuel saved or use reduced.
- Adverse impact - relative burden or hardship on end-users and suppliers.
- Equity - sharing of hardship or available supplies among end-users.
- Administrative burden - efficiency and flexibility of program operation.
- Compliance - likelihood of cooperation, acceptance, and understanding of emergency measures.
- Environmental impacts – review actions to reduce demand/consumption of the given energy source(s) under constraint (subject of the energy emergency concern) in order to reduce the use of nonconforming fuels through waivers of permits or other regulatory requirements.
- Effectiveness in mitigating the problem.

Potential Response Stage Actions

Stage I - Increased Monitoring

- NYSERDA increases monitoring activities of weekly energy supply, demand, and price data by expanding fuels types, and level of detail. This includes data on production, imports, exports, and volumes supplied. As a result, staff may determine advanced indications of an impending petroleum and demand imbalance.
- NYSERDA increases the frequency and the level of detail in selected published reports.
- Update web page energy data more frequently.

Stage II - Market Coordination

- NYSERDA formally contacts New York State petroleum industry trade organizations to alert them to the situation. Request they encourage their membership to make all effort to coordinate supply activities.

- If necessary, request NYS DOT to grant waivers of Drivers Hours of Operation Regulations to facilitate shipments and movements of gasoline as required.
- Encourage New York State human service agencies to coordinate appropriate State, County and federal assistance programs to assist low-income, handicapped, and elderly persons with their transportation needs as a result of the shortage.
- If appropriate, request a waiver for the Jones Act from the U.S. Department of Transportation. A waiver would allow non-U.S. flag tankers to operate between U.S. ports.
- Notify the State Office of Emergency Management which may consider activation of a virtual Multi Agency Coordination (MAC) Group to address policy issues in the event the emergency progresses to Stage III or IV.

Stage III - Public Action

- Activities under this phase would increase as NYSERDA determines, through ongoing monitoring, that an energy supply problem is imminent.
- The Governor's Office and other concerned State agencies would be advised.
- NYSERDA would work with the New York State Department of Environmental Conservation (DEC) and other State agencies to call attention to the supply problem and guide steps or actions to reduce fuel demand and consumption.
- NYSERDA would identify administrative resources that may be needed under an emergency scenario and would keep affected participants, the State Office of Emergency Management (OEM), and the Governor's Office apprised of events.
- OEM may consider establishment of a more formal MAC Group.
- OEM may consider activation of any or all of the functional annexes of the State CEMP.
- OEM may consider activation of the State Emergency Coordination Center and JIC.
- If fuel demand and consumption reduction efforts alone are not sufficient to mitigate the supply constraints, NYSERDA would contact DEC regarding DEC issuance of waivers for use of non-conforming fuels to prevent escalation of the emergency situation.

Transportation Fuels (Gasoline and diesel)

- Request a reduction by the consuming public and State and local government employees in all non-essential travel.
- Encourage carpooling efforts by the public.
- Encourage the use of mass transportation systems within the State.
- Request the strict enforcement of posted speed limits within the State.
- Request all non-emergency governmental, commercial, and industrial facilities to operate on a limited hour basis or limited number of days per week.

Distillate Fuels For Heating (Heating Oil, Kerosene, Diesel)

- Request all non-essential commercial, office, governmental and industrial operations to reduce their consumption.
- Request all heating oil, kerosene, and diesel consumers to voluntarily curtail use.
- Request residential sector to voluntarily lower temperatures.
- Request all non-emergency governmental, commercial, and industrial facilities to operate on a limited hour basis or limited number of days per week.

- Request all distillate fuel-using private office buildings, schools, and universities to reduce their thermostats settings for space and domestic hot water heating.
- Request curtailment of deliveries to non-essential users.
- Request Limit fill-ups to 50 percent of capacity on all residential and other essential deliveries where the intended use is for heating or hot water.
- Request restriction of temperatures in all non-essential buildings of commercial and governmental users to 65 degrees F during working hours and to facility maintenance levels during non-working hours.

Propane Fuel

- Request all propane consumers to voluntarily curtail propane use.
- Request all non-essential commercial, office, governmental and industrial operations to reduce their consumption.
- Request curtailment of deliveries to non-essential users.
- Limit fill-ups to 50 percent of capacity on all residential and other essential deliveries where the intended use is for heating or hot water.
- Request all non-emergency governmental, commercial, and industrial facilities to operate on a limited hour basis or limited number of days per week.
- Request all propane-using private office buildings, schools, and universities to reduce their thermostats settings for space and domestic hot water heating.
- Request all second homeowners using propane in New York State to reduce their thermostatic settings at these homes to minimum property protection settings.
- Discontinue recreational uses of propane, such as heating of swimming pools, saunas, spas and ornamental fireplaces not used for heat.
- Discontinue filling portable 20-gallon or smaller propane cylinders unless the fuel will serve as the primary cooking fuel or has primary space heating application for a residence.
- Request industries with dual-fuel capability to convert from propane to the alternative fuel.
- Request curtailment of deliveries to non-essential users.
- Request limit on fill-ups to 50 percent of capacity on all residential and other essential deliveries where the intended use is for heating or hot water.
- Request restriction of temperatures in all non-essential buildings of commercial and governmental users to 65 degrees F during working hours and to facility maintenance levels during non-working hours.

Stage IV - Emergency Declaration

- If public health, safety, or the general welfare are believed to be jeopardized by an energy supply imbalance or emergency event, the Governor may declare an Energy Emergency.
- Emergency response options would be implemented pursuant to orders issued by NYSERDA=s President.
- Enforcement would be based on Section 5-119 of the State Energy Law (and, as appropriate, portions of the Public Service Law), which imposes civil and criminal sanctions for violations.

- If the President of NYSERDA finds sufficient energy hardships or shortages exist, the standby fuel set-aside program for liquid fossil fuels under Article 10 of the State Energy Law and Part 7900 of 9NYCRR may be activated. Enforcement would be based on Section 10-107 of the State Energy Law.

The following actions, or parts thereof, may be recommended in the event of a petroleum fuel supply shortfall.

- Fuel Set-Aside Program to alleviate spot shortages and temporary hardships by allocating in-State supplies of petroleum products that are "set aside" from each prime supplier's available supply.
- Minimum Motor Fuel Purchase Program to assist in the orderly distribution of supplies of motor fuel by discouraging "tank topping" and reducing the length of waiting lines at retail outlets.
- Odd/Even Motor Fuel Purchase Program to assist the equitable and orderly distribution of motor fuel by reducing consumer visits to retail outlets. This measure involves retail sales of motor fuel based on vehicle license plate numbers and letters.
- Petroleum Allocation Program to provide equitable distribution of scarce supplies among all classes of end-users upon delegation under federal allocation or price control programs during a severe petroleum shortage.
- Impose restrictions on wasteful, inefficient, or nonessential uses of energy or energy resources. This may include ordering restrictions that were merely requested during a Stage III response.
- Waive State and local environmental protection requirements for individual facilities for a period of 30-60 days during each six month period that the emergency is extant.

Implementation of some of the actions listed above, such as the fuel set-aside and allocation programs, will require identification and determination of priority energy and fuel supply uses. NYSERDA will rely upon the appropriate State agencies to assist in this task. For example, priority medical needs are best determined by the Department of Health, school needs by the State Education department, etc.

COAL EMERGENCIES

LEAD AGENCY

NYSERDA is charged with the responsibility for responding to coal supply emergencies. In the event of an in-State coal emergency, or an out-of-State event immediately affecting New York supplies, NYSERDA will act as the lead agency and the NYSERDA Energy Emergency Implementation Plan will be activated. Support agencies will implement their internal emergency response plans, as needed, and their activities will be coordinated by OEM.

POTENTIAL RESPONSE MEASURES

The State's Energy Emergency Plan is based on the same four-stage response hierarchy as is used for petroleum emergencies (see Section 5.1.2). NYSERDA monitors developments (*e.g.*, industry-labor negotiations, rail disruptions, barge movements) that could lead to a coal supply disruption or shortage. If circumstances indicate a coal strike or disruption is likely, the four-stage response hierarchy would be implemented.

Stages I & II – Increased Monitoring and Market Coordination

NYSERDA would request relevant information from all suppliers, distributors, and direct purchasers. Coal producers would be contacted for information on production and delivery schedules as they affect New York. Supply and demand data would be studied to prepare for allocation or redistribution of supplies. Electric generators would be surveyed to determine their stockpile levels, estimates of resupply needs, and alternative supply options, if any.

Stage III – Public Action

If a problem in the supply or distribution of coal is identified by NYSERDA:

- The Governor's Office and other concerned State agencies would be advised.
- The media would be informed and encouraged to promote appropriate conservation measures to reduce demand, with care taken to avoid hoarding caused by premature public notice.
- NYSERDA would work with the New York State Department of Environmental Conservation (DEC) and other State agencies to call attention to the supply problem and guide steps or actions to reduce fuel demand and consumption.
- NYSERDA would contact or convene a meeting with the major suppliers and large end-users of coal, rail companies, and others to agree on procedures to be followed in the event of an emergency.
- Regular contact and consultation would occur with appropriate DOE regional officials.
- If fuel demand and consumption reduction efforts alone are not sufficient to mitigate the supply constraints, NYSERDA would contact DEC regarding DEC issuance of waivers for use of non-conforming fuels to prevent escalation of the emergency situation.
- Notify OEM which may consider virtual Multi Agency Coordination (MAC) Group activation to address policy issues in the event the emergency progresses to Stage IV.

Stage IV – Emergency Declaration

In the event that a coal shortage continues to the point where emergency measures appear necessary, NYSERDA would recommend that the Governor declare an energy emergency.

NYSERDA would require all suppliers, distributors, and direct purchasers to report:

- Stocks in inventory and estimated number of days supply.
- Stocks in transit, expected transit time, and estimated number of days supply.
- Schedule of shipments for the next 30-day period and the following 30-day period.

NYSERDA would then implement emergency measures such as fuel switching and fuel allocation. NYSERDA may direct electric generators to immediately switch coal-fired plants to alternative fuel capability, wherever possible, to reduce coal-fired generation to a minimum. Coal supplies from these plants could then be reassigned to coal users without alternative fuel capability. Due consideration would be given to the amount of coal needed to protect the utility generating plants and the need to keep certain units operating to maintain electric supply system reliability.

The aim of an allocation program is to ensure adequate volumes of coal (to be determined by NYSERDA on a case-by-case basis) for priority end-users. NYSERDA would implement the following priority schedule for coal allocation, unless circumstances indicate otherwise:

- Medical, psychiatric, educational, and correctional facilities without alternative fuel capability.
- Other essential service facilities without alternative fuel capability.
- Residential structures without alternative fuel capability.
- All others, including electric generation.

By authorization of its President, NYSERDA would allocate coal supplies in response to applications for emergency assistance.[203] Such allocation would be issued on behalf of end-users in the private sector and met by prime suppliers, similar to the liquid fossil fuel set-aside program described in Section 5.2.

In addition:

- OEM may consider establishment of a more formal MAC Group.
- OEM may consider activation of any or all of the functional annexes of the State CEMP.
- OEM may consider activation of the State Emergency Coordination Center.

ELECTRIC SYSTEM EMERGENCIES

LEAD AGENCY

The New York State Department of Public Service (DPS) is the staff arm of the Public Service Commission (PSC). The Commission regulates the State's electrical utilities and is charged by law with the responsibility of ensuring that such utilities provide adequate service. In the event of an in-State electrical emergency, as specified in Table 5-1 below, DPS will act as the lead agency and the DPS Emergency Plan will be implemented. Support agencies will implement their internal emergency response plans, as needed, and their activities will be coordinated by OEM.

ELECTRIC SYSTEM THREAT ASSESSMENT

The DPS Emergency Plan calls for different levels of response actions based on the severity of the situation. Table 5-1 shows the DPS emergency severity classifications for transmission and distribution emergencies and bulk power supply emergencies.

Table 5-1: Electric Emergency Severity Classifications

Class	Transmission and Distribution	Bulk Power Supply

[203] Upon approval of such requests, the applicant must bear the responsibility for any additional expenses incurred in shipping the allocated product to his location.

I - Localized Emergency or Receives Media Attention	Any emergency that might receive media attention. Includes storm anticipation.	Any event or bulk system condition that puts the bulk power system at risk of losing the ability to reliably operate. Includes, but is not limited to, the use of voltage reduction or public appeals by the ISO or any member company in order to restore the bulk system conditions to normal.
II – Widespread or Major Incident	Any emergency that results in service interruptions likely to last in excess of 24 hours, or to more than 10 percent of the customers in a given operating area of any major NYS electric utility.	Any event or bulk system condition that results in the controlled use of load shedding to restore a company's or the NYISO's bulk power system to the normal operating state.
III – Catastrophic Event (may include Emergency Declaration)	Any emergency that results in service interruptions likely to last in excess of 72 hours, or to more than 25 percent of the customers in a given operating area of any major NYS electric utility	Any event or bulk system condition that results in the uncontrolled loss of load anywhere in the State or that results in partial or full bulk power system separation of a member system of the ISO from a neighboring pool. Excludes storms that precipitate distribution load loss, but includes storms that affect the bulk power system.

Four categories of emergencies have also been developed to classify different types of electric system emergencies, as described in Table 5-2. The different responses to each type of emergency are covered in separate subsections. Where appropriate, different emergency responses may be specified for utility-specific and multi-utility emergencies.

Table 5-2. Electric Energy Emergency Categories

Category	Description
System blackout	Uncontrolled rapid loss of a large portion of the electric supply system due to equipment failure or disruption. System can be restored using a restoration plan.
Distribution disruption	Loss of power to many customers due to extensive damage to transmission or distribution system. Due to extensive damage, restoration may take days or weeks.

Supply shortage	Inadequate generation supplies or transmission capability reduces the amount of deliverable electricity. Voltage reductions (brownouts), customer appeals, and controlled rolling blackouts may occur.
Fuel constraints	Electric utilities experience difficulties in securing adequate fuel supply to keep their generating units operating. Fuel conservation or switching may be required, and additional fuel supplies may need to be secured. NYSERDA plays an active role for petroleum and coal supply emergencies. Natural gas supply emergencies remain with DPS.

Emergencies that fall into the first three categories (system blackout, distribution disruption, or supply shortage), as well as fuel constraint emergencies involving natural gas, are addressed under the NYISO Emergency Operations Manual or the DPS Emergency Plan. Fuel constraints emergencies involving petroleum and coal may involve action by NYSERDA. (See sections 5.1 and 5.2, above).

SYSTEM BLACKOUT

Extreme weather conditions such as lightning, snow or ice storms, or a hurricane can cause a major disruption of service very quickly. A faulty piece of equipment may cause a fire that can quickly disrupt service or even cause a blackout. However, many events occur in stages that allow coordinated action steps to be implemented, before it is necessary to take more extreme measures such as voltage reductions, partial load reductions, or rolling brown-outs, that might avoid a utility or system-wide blackout.

DISTRIBUTION DISRUPTION

Extreme weather conditions or equipment failure may cause isolated or widespread service outages. Many events occur in stages, such as the loss of one line or substation, multiple lines or substations, or transformers, resulting in partial or total system outages.

SUPPLY SHORTAGE

Various events may occur, such as extreme weather conditions or equipment failures that may cause the loss of a generating unit or a transmission line or lines. Steps leading up to and including voltage reduction(s), partial load reduction(s) or rolling brownouts, or blackouts may be necessary to prevent one or more individual utilities or the entire NY system from becoming blacked out.

FUEL CONSTRAINTS

If electric utilities or generators experience difficulty in securing adequate environmentally acceptable petroleum or coal supplies to keep their generating units operating, NYSERDA would work with affected electric generators and fuel suppliers to determine the extent and potential duration of the supply difficulty. Fuel conservation or switching might be required and additional fuel supplies might need to be secured from alternate sources. Short of an emergency declaration, to prevent escalation of the emergency situation NYSERDA would make recommendations to the State Department of Environmental Conservation (DEC) that necessary waivers be granted to

specific generators, allowing the use of non-conforming fuels for a defined period of time. In the event of a declared emergency, NYSERDA would direct DEC to issue any necessary waivers. See sections 5.1 and 5.2 for more detailed discussion of NYSERDA's response plans for petroleum and coal supply emergencies. Section 5.4 provides discussion of DPS response plan for natural gas emergencies.

POTENTIAL RESPONSE ACTIONS

Emergency response actions for system blackout, distribution disruption and supply shortage emergencies would be triggered by information indicating an impending inability to supply load. Then:

- Electric generators, NYISO, transmission owners, local distribution companies, and DPS would make determinations implementing appropriate response actions, as detailed in their respective emergency response plans. Activities under this phase would likely increase if DPS determines that loss of power is imminent. Constant review and reassessment of the situation would be carried out as long as the threat of emergency persists.
- If public health, safety, or general welfare were jeopardized by an electric system disruption, supply shortage, or actual blackout, the Governor may declare an emergency. Emergency response options would be based on DPS procedures, described in the DPS Emergency Plan.

Emergency response actions for fuel constraint emergencies would entail:

- In response to information indicating an impending fuel supply or air quality problem affecting fuel use, NYSERDA or DPS would work with generators or LDCs to evaluate the severity of the problem. The LDCs, generators, and NYSERDA or DPS then would make a determination implementing energy emergency plan responses based on a mutual assessment of the situation.
- If public health, safety, or general welfare were jeopardized by a fuel supply problem, the Governor may declare an energy emergency.

In an electric system emergency, DPS would assess the type and severity of the emergency as described in Tables 5-1 and 5-2, above. Based on that assessment, a staged response would be implemented as described below. The staged response is a guideline and would not be constrained by the Table 5-1 severity assessment. Elements of the staged response may be employed to respond to any severity class, as deemed necessary by DPS. The exception to this is an Emergency Declaration by the Governor. An Emergency Declaration would warrant activation of the Severity Class III – Catastrophic Event response detailed in the DPS Emergency Plan.

Stage I - Increased Monitoring

- Monitor approaching storms and plan accordingly.
- Monitor utility emergency operations.
- Monitor restoration activities on site, if needed.
- Prepare regular status reports.
- Conduct follow-up investigation.

Stage II – Market Coordination

- Maintain contact with NYISO.

- Activate Peak-Load Reduction Plan for State agencies and affiliates.
- The Peak-Load reduction program implements those provisions of Executive Order No.111 dealing with load reduction during peak demand periods at all State agencies and affiliated entities. The program shall be implemented within 60 minutes of DPS staff issuing a "Load Reduction Order" for State agencies to implement their peak load reduction plan and procedures. This program applies to all agencies and branches of State government, public benefit corporations, public authorities, community colleges, and leased spaces as listed in Appendix B of the NYSERDA Guidelines implementing Executive Order No. 111, entitled "Green and Clean".
- Notify the State Office of Emergency Management which may consider activation of a virtual Multi Agency Coordination Group (MAC) to address policy issues in the event the emergency progresses to Stage III or IV.

Stage III – Public Action

- DPS Office of Consumer Services will provide consumer assistance with restoration of service and resolution of issues.
- Assist in developing State response and issue notices for voltage reduction, rolling blackouts, closures, etc.
- OEM may consider a partial activation of the SECC.
- OEM may consider establishment of a more formal MAC Group to address policy issues in the event the emergency progresses to Stage IV.
- OEM may consider activating any or all of the functional annexes of the State CEMP.

Stage IV – Emergency Declaration

- Class III Catastrophic Event response by DPS would be activated, as specified in the DPS Emergency Plan.
- Assess duration and estimates of service restoration time.
- OEM may consider a full activation of the SECC.

AGENCY COORDINATION

The lead agency, working with the NYISO, electric generators, and LDCs, is responsible for contacting other agencies such as NYSERDA, DPS, DEC, and OEM when an electric system emergency is declared at any level.

The following table identifies the lead agency and other involved agencies for each class of electricity system emergency. The lead agency's public information officer (PIO) would be the primary point of contact for press inquiries. Additional information on public communications is presented in Section 6 of this Plan.

Electric System Emergency	Lead Agency	Other Agencies
System blackout	DPS	OEM, NYSERDA
Distribution disruption	DPS	OEM, NYSERDA
Supply shortage	DPS	NYSERDA, OEM

Fuel constraints	NYSERDA (petroleum & coal)	DPS, DEC, OEM
	DPS (natural gas)	NYSERDA, DEC, OEM

COORDINATION WITH NYISO AND UTILITY EMERGENCY PROCEDURES

Under Title 16, Chapter II, Section 105 of the Public Service Law, each New York State electric corporation must file an electric emergency plan (updated annually) with the PSC that addresses storms and other causes of electric system emergencies with storm-like characteristics. Each corporation's plan must contain the following elements (list not inclusive):

- Criteria used to classify severity of electric emergencies.
- Emergency response training program.
- Pre-emergency mitigation plans and preparations.
- Service restoration procedures.
- Procedures for maintaining communications and responding to customer contacts.
- Policy and criteria regarding mutual aid with other utilities.
- Operating and emergency personnel contact lists.

These plans, along with the NYISO's emergency operations manual, form the foundation for responding to electric system emergencies. Both the electric corporations' emergency plans and NYISO emergency operating procedures are filed at the DPS offices.

NUCLEAR POWER PLANT EMERGENCY

A nuclear power plant emergency is defined as an event or series of events at a nuclear power plant that results in a licensee declaring one of four emergency classification levels (ECL). The ECLs can range in severity from extremely low level events that pose no threat to the public safety but which warrant an increased awareness on the part of plant and offsite personnel to degraded conditions that threaten public safety and for which some form of protective actions will likely be initiated. Any protective actions taken are intended to minimize the risk to the general public. In the event of a nuclear power plant emergency, the New York State Radiological Emergency Preparedness Plan may be implemented.

Impact of the loss of electric generation from one or more nuclear power plants to the State's electric system would be assessed by DPS as a potential electric system emergency in the same manner as any other electric system power supply loss.

NATURAL GAS EMERGENCIES

A natural gas supply emergency is defined as a disruption in the ability of the pipeline transmission system causing a shortfall in the supply of gas needed to maintain safe and adequate service to either the State as a whole, or a specific geographic area within the State. There are two main causes of a gas supply emergency:

- Rupture in a major gas transmission line or a breakdown of transmission line equipment such as compressor stations.
- Curtailment of gas supplies.

LEAD AGENCY

The New York State Department of Public Service (DPS) is the staff arm of the Public Service Commission (PSC). The Commission regulates the State's natural gas utilities and is charged by law with the responsibility of ensuring that such utilities provide adequate service. In the event of an in-State natural gas emergency, DPS will act as the lead agency and the DPS Emergency Plan will be implemented. Support agencies will implement their internal emergency response plans, as needed, and their activities will be coordinated by OEM.

POTENTIAL RESPONSE MEASURES

New York State may require the actions described below during an emergency in which available natural gas supplies are unable to satisfy demand. Coordination among industry representatives, Northeast Gas Association (NGA), and government officials is needed to ensure the effectiveness of these emergency response measures.

These measures may require action by DPS, at the direction of the PSC, or an emergency order issued by NYSERDA pursuant to a declaration of an energy emergency by the Governor. As with petroleum and coal emergencies, the State's response to natural gas emergencies follows the four-stage response hierarchy:

Stage I – Increased Monitoring

- Establish and maintain communications with the affected utility or utilities and the Northeast Gas Association (NGA) [204].
- Gather and report data on utility demand, supply, storage inventories, peaking capabilities and supplemental supplies during the emergency.
- Report on a regular basis to the Director of the DPS Office of Electric, Gas and Water and the Chairman of the PSC regarding the severity of the situation, remedial activity and the effectiveness of those actions.

Stage II – Market Coordination

- Each Local Distribution Company (LDC) or marketer operating within the State may be requested to identify the essential-service customers within its service territory. Essential service includes, as specifically determined by each LDC (or marketer), minimum gas requirements for the following uses:
- Houses, apartments, prisons, dormitories, day care centers, nursing homes, and hospitals.
- Essential food productions, processing, and distribution for basic human needs.
- Essential services such as medical, pharmaceutical, police, fire protection, sanitation, communication, water, snowplowing, sanding and traffic signal maintenance.
- Manufacturing products necessary on an immediate, short-term basis for protection of public health and safety.
- Determine the costs associated with obtaining additional emergency natural gas supply.
- Assist the affected utility or utilities and NGA Gas Supply Coordinator(s), when requested, in obtaining additional supplies of gas during the emergency.

[204] The Northeast Gas Association (NGA) is a trade association composed of the 32 LDCs that provide natural gas to customers in Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

- Notify the State Office of Emergency Management which may consider activation of a virtual MAC Group to address policy issues in the event the emergency progresses to Stage III or IV.

Stage III – Public Action

During periods of uncertain supply or emergencies that reduce gas supply, threatening loss or curtailment of service to non-interruptible customers, NGA implements its Standard Operating Procedures - Pooling of Gas Supply. The Standard Operating Procedures are divided into two sequential phases:

- Actions to be taken by a specific utility to bring supply and demand into balance.
- Coordinated actions to be taken by all LDCs in the region to correct a supply imbalance.

The Procedures, which establish specific steps to be followed in case of an emergency, are implemented on an upstate/downstate basis through gas supply coordinators for each region. The Gas Policy and Supply Section of the DPS Office of Electric, Gas and Water will gather data and report on utility demand, supply, storage inventories, peaking capabilities, and supplemental supplies during the emergency. Staff will also assist in preparing public appeals to help reduce consumption.

In addition, during a Stage III natural gas emergency:

- OEM may consider establishment of a more formal MAC Group to address policy issues in the event the emergency progresses to Stage IV.
- OEM may consider activating any or all of the functional annexes of the State CEMP.
- OEM may consider partial activation of the SECC.

Stage IV – Emergency Declaration

Depending on the severity of the shortage and the degree to which essential service is threatened, one or more of the following actions may be taken:

- Curtailment of service to all large, non-essential commercial and industrial users by an amount sufficient to balance supply and demand.
- Curtailment of service to all non-essential industrial users to minimum levels required for plant protection.
- Curtailment of service to all non-essential commercial users to minimum levels required for plant protection.
- Complete interruption of service to large, non-essential commercial and industrial users.
- DPS Policy Section Staff will determine if curtailments instituted by the utility or utilities are proper;
- if they call for the closing of non-essential businesses.
- if they call for obtaining exemptions from requirements such as air quality standards and minimum temperature settings.
- DPS staff will aid essential businesses, such as hospitals and processors of perishable foodstuffs, in obtaining exemptions from curtailment to ensure the public welfare.
- DPS staff will maintain contact with DPS Gas Safety field personnel regarding the status of any needed repairs or proper steps to ensure curtailment compliance.
- OEM may consider full activation of the SECC.

NGA will be asked to play an advisory role on questions of fuel substitution for emergency situations involving dual-fuel customers. NGA will also be asked to provide assessments of the impact government actions have on natural gas users.

Each LDC or marketer operating within the State may be requested to advise the essential-service customers within its service territory of actions to be taken during an emergency to minimize gas consumption while continuing to provide essential service.

CHAPTER 6

PUBLIC INFORMATION

OVERVIEW

Communicating accurate and timely information to the media and public is essential to managing an energy emergency. Effective communication helps minimize public confusion and anxiety, encourages positive public response to appeals for voluntary conservation efforts, and improves public understanding of possible mandatory measures for dealing with the emergency.

If the OEM Emergency Coordination Center (ECC) is activated for the energy emergency, OEM will take the lead role in coordinating and monitoring a Statewide public information process to support activities related to actual and potential energy supply emergencies. If the ECC is not activated, the lead role for communications in petroleum or coal emergencies will be taken by the NYSERDA Communications Unit, and the lead role for communications in electric system or natural gas emergencies will be taken by the DPS Public Affairs Office.

The Director of Communications (DC) for the lead communications agency will disseminate information to the media and coordinate with the Governor's Press Office and public information offices of other involved agencies. The DC will issue press releases, coordinate briefings and be responsible for disseminating timely and accurate information to the general public and providing guidelines that encourage emergency energy demand reduction.

The public information process will involve a Statewide, interagency, multimedia approach that informs the public of:

- The current energy situation.
- Appropriate background information.
- Contingency measures to be implemented, including those already in place.
- Special conservation efforts.
- Fuel supply availability.

For petroleum and coal emergencies that do not require activation of the ECC, NYSERDA will establish an internal Emergency Public Information Coordinating Group that would include Communications staff. Appropriate liaisons from the Energy Analysis, Energy Efficiency Services, and Energy Resources, Transportation, and Environmental Research Programs will be named to provide a direct information link from staff to the DC for briefings and specific questions and concerns. The liaison will have primary contact with the group through the DC. The Coordinating Group will review all public announcements related to the energy emergency, with final sign-off by the DC, who will coordinate appropriate approvals by NYSERDA’s President and the Governor's press office. Upon notification by NYSERDA's President, the DC will begin emergency operations as outlined below.

For natural gas and electric system emergencies, the DPS DC would work directly with Directors of the DPS Offices of Electric, Gas and Water, and Consumer Services to coordinate communications. The DC and DPS Public Affairs staff will review all public announcements related to the energy emergency, with final approval to be made by the DC. The DC will then coordinate appropriate approvals by the Public Service Commission Chairman and the Governor’s press office.

ESTABLISH JOINT INFORMATION CENTER

The lead communications agency, NYSERDA or DPS, will establish a Joint Information Center (JIC) to provide a common location for all involved parties to share and disseminate information to the media and the public during an energy emergency. These parties could include the State Office of Emergency Management (OEM), Department of Public Service (DPS), Department of Environmental Conservation (DEC), Empire State Development (ESD), Office of Temporary and Disability Assistance (OTDA), Consumer Protection Board (CPB), and the New York State Department of Health (DOH). This will enhance the coordination, timeliness, and accuracy of information released regarding the energy situation. Under the JIC, all involved parties will work together with the Director of Communications to coordinate public information during a declared energy emergency. The JIC could be located at the State ECC, if activated, or a virtual JIC could be established using computers, phones and other technology.

INFORMATION RELEASE

Press releases will be prepared by the lead communications agency and issued after consulting with all involved parties. All State agencies will be encouraged to provide appropriate information about services or assistance for the public for inclusion in releases.

JIC-NEWS MEDIA BRIEFINGS

News media briefings will be held regularly during an energy emergency to provide accurate and timely information concerning the nature and scope of the emergency, protective or conservation measures, and possible health or other impacts.

Briefings will be held as need dictates, but to the extent possible, will be held at regularly scheduled times with advance written notice given to the media. All parties will be properly notified of, and afforded equal opportunity to participate in, the media briefings. Each press release issued would be timed, dated, numbered, and distributed in hard copy or electronically to appropriate sources, such as media, other State agencies, and concerned parties.

Supplies for the JIC may include:

- Appropriate materials such as maps, fact sheets, and fuel supply information.
- Copies of the State Energy Emergency Plan and current State Energy Plan.
- Telephone set-up and fax machine.
- T.V. Monitor and audiovisual equipment.
- Computers with internet access.
- Necessary office supplies and equipment.

After the decision is made to establish the JIC, the lead agency or OEM would be responsible for setting up and distributing supplies necessary to operate the Center.

COORDINATED INFORMATION RELEASE

Coordination with a specific energy industry may be warranted when distribution of guidelines, pamphlets, and bulletins through energy distributors would provide valuable information to energy users, helping to avoid a product shortage or alleviate problems during an actual shortage.

The lead agency may contact individual Chief Executive Officers (CEO) of energy suppliers to request their assistance and ask the CEO to name a contact person for lead agency's Director of

Communications (DC). For example, the contact person could be the manager of government relations, marketing, or public information.

Materials provided through this joint effort could include lists of mandatory or voluntary conservation measures, telephone numbers, and contact people for special assistance and advice on dealing with potential or actual energy emergencies. The lead communications agency would provide individual companies with camera-ready materials to be printed and distributed through local dealers or retail outlets.

EMERGENCY ALERT SYSTEM

The Emergency Alert System (EAS) enables State and local government officials, with voluntary cooperation by area broadcasters, to advise the public directly in the event of life threatening emergencies.

The NYSERDA President, the PSC Chairperson and the Chairperson of the State Disaster Preparedness Commission, or their designated representatives, would decide jointly to activate the EAS in a life threatening energy emergency. Upon such decision, the lead agency's DC would coordinate development of the appropriate public message and the DPC Chairperson would activate the EAS system.

In addition, NY-Alert, the New York State All-Hazards Alert and Notification web-based Portal, went online June 1, 2007. This portal – www.nyalert.gov – offers one-stop shopping through which State and local governments can provide emergency information to a defined audience (local, county, regional, or statewide). OEM will coordinate appropriate use of the NY-Alert system.

ENERGY HOTLINE/PUBLIC INQUIRY/MEDIA MONITORING

In an energy emergency, a toll-free Energy Hotline may be activated by the lead agency, which would establish hours, and provide staff and telephone lines as needed to respond to public inquiries.

Information provided through the Hotline would come from EAS messages, press releases, and briefings provided by a designated representative of the JIC. Regular briefings would be held to keep Hotline staff prepared to respond to inquiries. The Energy Hotline would serve as a primary source of information to the general public. The Hotline supervisor would oversee monitoring of both broadcast and print media news reports.

A daily news clipping package would be compiled and circulated by the lead agency. Any reports of inaccurate information would be brought to the attention of lead agency's DC or the appropriate representative at the JIC. Corrections would be made at press briefings, through press releases, through the Hotline, or by direct contact with the station or publication.

CHAPTER 7

RECOVERY PHASE

The Recovery Phase begins when the emergency situation has been brought under control, the initiation of response activities has ended, and the relaxation of protective response actions taken is being considered. During the recovery phase of an emergency, the lead State agency will:

- Review recovery actions and develop strategies for meeting ongoing local and State energy needs;
- Continue to monitor local, State and energy industry actions;
- Receive and assess requests for aid from local, State and federal agencies, energy suppliers and distributors;
- Work with OEM and other State and local emergency organizations to establish priorities to repair damaged energy systems;
- Update State and local news organizations with assessments of energy supply, demand and requirements to repair or restore energy systems;
- Keep accurate records of emergency responses;
- Draft recommendations and other reports, as appropriate; and
- Assess any environmental impacts from emergency response efforts and develop remedial strategies for restoring resources to the pre-emergency condition.

After any declared energy emergency requiring implementation of the Energy Emergency Plan, a post-emergency assessment report will be prepared by the lead State agency and will identify the strengths and weaknesses of the Energy Emergency Plan's response elements. The assessment report will review the causes of the emergency, private sector reaction to the situation, the effectiveness of governmental response to the emergency, and the resulting impact of the energy emergency and responses to it. Special attention will be paid to the effectiveness of mitigation efforts in terms of reduced health and welfare threats, energy consumption, and public response to such actions.

APPENDIX A

DEFINITIONS AND ACRONYMS

A comprehensive glossary of energy terms and definitions and a wealth of energy information is available at the Department of Energy, Energy Information Administration's website http://www.eia.doe.gov. Definitions of many of the terms and acronyms used in the New York State Energy Emergency Plan are presented below.

Agency - State department, local government, agency, board, public benefit corporation, public authority, or commission.

Allocation - apportionment of fuel based on purchases and consumption amounts for stated periods.

API - American Petroleum Institute; a trade association of the petroleum industry.

Assignment Order - an emergency fuel allocation issued by NYSERDA.

Aviation Fuels - petroleum-based fuels designed for use in aircraft, fuels designed to operate aircraft combustion engines, and refined-petroleum turbine engines.

Bbl - Barrel; 42 gallons; a unit of measurement.

Branded Product - the registered name of a prime supplier's petroleum fuel.

Bulk Plant - one or more storage tanks owned or leased by wholesale distributors or prime suppliers storing product for redistribution of product to end-users.

Coal - a solid fuel including bituminous (soft), anthracite (hard), metallurgical, and lignite types.

Customer of Record - a purchaser who has entered into an oral or written contract with a supplier at least 15 days prior to the Governor's declaration of emergency establishing a product volume requirement, method of delivery, and payment and credit terms.

Dealer - a person who resells product through retail sales outlets under consignment, lease, commission and proprietorship terms.

Degree Day - a unit measuring the extent to which the outside temperature falls below 65 degrees Fahrenheit in a day. One degree day is counted for each degree below 65 degrees for each calendar day on which such deficiency occurs. A number of systems based on degree days are used by fuel oil dealers for customers subscribing to automatic delivery services.

Diesel Oil - a petroleum fraction used as a fuel in internal combustion engines.

DOE - U.S. Department of Energy.

Distributor – one who purchases the major portion of their requirements from a major oil company and is authorized to use its trademark (branded) or an independent business who buys product from one or more suppliers and uses its own trademark (unbranded).

End User - consumers of allocated products, including wholesale purchasers and consumers.

Energy Emergency – an imbalance between fuel supply and demand sufficient to result in a general threat to the health and welfare of the State's citizens.

Energy Source - substances, such as petroleum, natural gas, and coal that supply heat and power; also electricity and renewable forms of energy.

Essential Services - means judicial proceedings, law enforcement, fire protection, emergency medical service, snow and ice removal, telecommunications, sanitation and water services and other necessary public services.

Fuel Oil - petroleum distillate product burned for the generation of heat and the generation of power.

Hardship/Emergency - an unforeseen combination of circumstances or the resulting state that calls for prompt action in order to ameliorate or eliminate something that causes or entails suffering or privation.

Hopper Car - a railway car used for transporting and delivering coal, each capable of carrying up to 100 tons of coal.

LNG - liquefied natural gas; gas that has been cooled to approximately minus 160 degrees centigrade for storage or shipment as a liquid under high pressure in cryogenic containers.

LPG - liquefied petroleum gas; a substance that is gaseous under normal atmospheric conditions and can be liquefied under moderate pressure at normal temperatures. Propane and butane are the principal examples; commonly known as bottled gas, tank gas, and LPG.

MAC Group – Multi Agency Coordination Group

Middle Distillates - refined products in the middle of the distillation range of crude oil including kerosene, home heating oil, range oil, stove oil, and diesel fuel.

Motor Fuels - fossil fuels including gasoline, diesel fuel, and propane used to drive internal combustion engines.

Motor Gasoline - a refined petroleum product which, by its composition, is suitable for use as a fuel in internal combustion engines.

NYSERDA - The New York State Energy Research and Development Authority. A public benefit corporation established pursuant to Title 9 of Article 8 of the Public Authorities Law of the State of New York.

Octane Rating - a rating of gasoline in terms of antiknock qualities as determined by dividing by two the sum of the research octane number plus the motor octane number. The higher the number the greater the antiknock qualities of the gasoline.

Peak Shaving - the use of supplemental supplies of gas (e.g., LNG, propane-air mixtures) for distribution by gas utilities to supplement the normal supply of pipeline gas during periods of extremely high demand of relatively short duration.

Petroleum Products - refined or re-refined petroleum product from synthetic or crude oil or oil extracted from other sources.

Petroleum Products Pipeline - a pipeline that performs the trunk function and carries petroleum products, including interstate, intrastate, and intracompany pipelines.

Pipeline Terminal - the entity (be it gas processing plant, refiner, importer, mining company or any reseller) that makes the first sale of any product that is subject to state set-aside or allocation control into the state distribution system for end-use in the State.

Priority Consumer - any end-user who is ranked for allocation purposes according to essential service performed, importance of consumption requirements, or by gradation of alternate fuel capability.

Propane - a hydrocarbon fuel that is gaseous at ordinary atmospheric temperatures and is readily converted to a liquid state; commonly known as "bottled gas."

Residual Fuel Oil - heavier, high-viscosity fuel oil, which usually needs to be heated before it can be pumped and handled conveniently (Nos. 4, 5, and 6 fuel oil; Bunker C). Primarily used in industry, large commercial buildings, and electric generation.

Retail Sales Outlet - a site on which a supplier maintains an ongoing business of selling any allocated product to end-users or wholesale purchaser-consumer.

State Set-Aside - the amount of allocated product which is made available from the total supply of a prime supplier for utilization by the State to resolve emergencies and/or hardships due to fuel shortages during a declared energy emergency.

SECC - State Emergency Coordination Center

Surplus - an allocated product with no restrictions on its purchase.

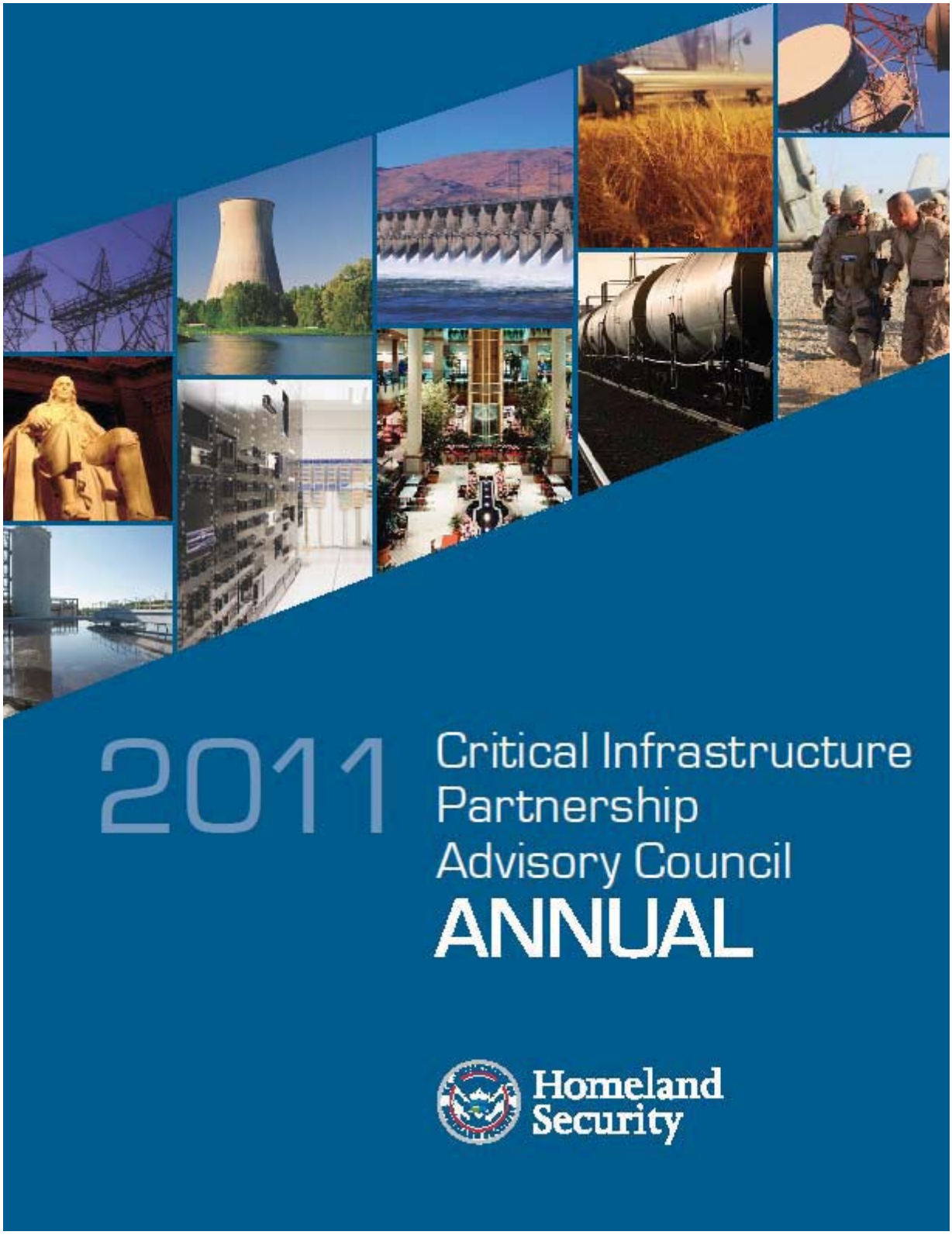
Tanker Terminal - a facility for receiving and loading ocean-going tankers and barges.

Unbranded - used to describe the product sold by an independent marketer.

Wholesale Purchaser-Consumer - any person who is an ultimate consumer, who as part of normal business practices, purchases or obtains an allocated product from a supplier and receives delivery of that product into a storage structure substantially under the control of that person at a fixed location. References made to "direct purchaser" or "end-user" are the same as wholesale purchaser-consumer.

Wholesale Purchaser-Reseller - any person who purchases, receives through transfer, or otherwise obtains (as by consignment) an allocated product and resells or otherwise transfers that product to other purchasers without substantially changing its form or content.

XI. Appendix E – Protecting Critical Infrastructure



XII. Appendix F – List of Acronyms and Equivalents

Acronyms

AAA – American Automobile Association
AGT – Algonquin Gas Transmission Co.
AMI – advanced metering infrastructure
API – American Petroleum Institute
ARRA – American Recovery and Reinvestment Act of 2009
ATG – automatic tank gauge
Bcf – billion cubic feet
Bcf/d – billion cubic feet per day
BEA – U.S. Bureau of Economic Analysis
BPS – bulk power system
Btu – British thermal unit
CAES – compressed air energy storage
CAIDI – customer average interruption duration index
CARIS – Congestion Assessment and Resource Integration Study
CBO – Congressional Budget Office
CEMP – Comprehensive Emergency Management Plan
CENG – Constellation Energy Nuclear Group
CHP – combined heat and power
CIP – critical infrastructure protection
CO_2 – carbon dioxide
CPB – Consumer Protection Board
CPCN – certificate of public convenience & necessity
CRP – comprehensive reliability plan
DC – director of communications
DEC – Department of Environmental Conservation
DHS – U.S. Department of Homeland Security
DHSES – New York State Division of Homeland Security and Emergency Services
DOE – U.S. Department of Energy
DOH – New York State Department of Health
DOT – U.S. Department of Transportation
DPC – New York State Disaster Preparedness Commission
DPS – New York State Department of Public Service
DTCR – dynamic thermal circuit rating
Dth – dekatherm
DTI – Dominion Transmission, Inc.
EAP – Energy Assurance Plan
EAS – Emergency Alert System

EDC – Electricity Delivery Company; also Electricity Distribution Company
EDF – Électricité de France
EEAC – Energy Emergency Assurance Coordinator
EEI – Edison Electric Institute
EEPS – Energy Efficiency Portfolio Standard
EIA – U.S. Energy Information Administration
EIS – energy imbalance service
EISA – 2007 Energy Independence and Security Act
EMP – electromagnetic pulse
EMS – emergency management system
EOC – emergency operations center
EPRI – Electric Power Research Institute
ERO – Electric Reliability Organization
ESCO – energy service company
ESD – Empire State Development
ESF – Emergency Support Function, under FEMA (ESF-12 is energy)
ESPA – Empire State Petroleum Association
ETRM – energy trading and risk management
EV – electric vehicle
FACTS – flexible AC transmission system
FBI – Federal Bureau of Investigation
FERC – U.S. Federal Energy Regulatory Commission
FMCSA – Federal Motor Carrier Safety Administration
GEIS – generic environmental impact statement
GWh – gigawatthour
HH – Henry Hub
HOS – hours of service
HOV – high-occupancy vehicle
HVAC – heating, ventilation, and air conditioning
IAP – incident action plan
IC – incident commander
ICS – incident command system
IESO – Independent Electricity System Operator (Ontario)
IGTS – Iroquois Gas Transmission System
IOU – investor-owned utility
IPFC – interline power flow controller
IPP – independent power producer
IPPNY – Independent Power Producer New York
IREC – Interstate Renewable Energy Council
IRM – installed reserve margin
IRS – U.S. Internal Revenue Service

ISER – DOE/OE Infrastructure Security and Energy Restoration (ISER) Division
ISO – Independent System Operator
ISO-NE – Independent System Operator of New England
JIC – Joint Information Center
km^2 – square kilometer
kV – kilovolt
kW – kilowatt
kWh – kilowatthour
LAN – local-area network
LDC – local distribution company
LILCO – Long Island Lighting Company
LIPA – Long Island Power Authority
LLC – limited liability company
LNG – liquefied natural gas
LPG – liquefied petroleum gases
LSE – load-serving entity
MEUA – Municipal Electric Utilities Association of New York
MMbbl – million barrels
MMBtu – million British thermal units
MMcf – million cubic feet
MMcf/d – million cubic feet per day
MMgal – million gallons
MOSF – major oil storage facility
MW – megawatt
MWh – megawatthour
NARUC – National Association of Regulatory Utility Commissioners
NASEO – National Association of State Energy Officials
NASPI – North American Synchrophasor Initiative
NERC – North American Electric Reliability Corporation
NETL – National Energy Technology Laboratory
NFGD – National Fuel Gas Distribution Corporation
NFGS – National Fuel Gas Supply Corporation
NGA – Northeast Gas Association
NIETC – National Interest Electric Transmission Corridors
NIMS – National Incident Management System
NIPP – National Infrastructure Protection Plan
NIST – National Institute of Standards and Technology
NOAA – National Oceanic and Atmospheric Administration
NPCC – Northeast Power Coordinating Council
NRC – Nuclear Regulatory Commission
NYC – New York City

NYCA – New York Control Area
NYISO – New York Independent System Operator
NYMEX – New York Mercantile Exchange
NYOHA - New York Oil Heat Association
NYPA – New York Port Authority
NYPC – New York Petroleum Council
NYPGA – New York Propane Gas Association
NYS – New York State
NYSDMV – New York Department of Motor Vehicles
NYSDOL – New York State Department of Labor
NYSDOT – New York State Department of Transportation
NYSED – New York State Department of Education
NYSEG – New York State Electric and Gas Corporation
NYSERDA – New York State Energy Research and Development Authority
NYSIC – New York State Intelligence Center
NYSP – New York Division of State Police
NYSRC – New York State Reliability Council
NYSRECA – New York State Rural Electric Cooperative Association
O&M – operations and maintenance
O&R – Orange & Rockland Utilities, Inc.
OASIS – open-access same-time information system
OE – DOE Office of Electricity Delivery and Energy Reliability
OEM – Office of Emergency Management
OHILI – Oil Heat Institute of Long Island
OPIS – Oil Price Information Service
ORU – Orange and Rockland Utilities
OTDA – Office of Temporary Disability Assistance
PBS – Petroleum Bulk Storage
PHMSA – U.S. DOT Pipeline and Hazardous Materials Safety Administration
PIO – public information officer
PJM – Pennsylvania, New Jersey, and Maryland Interconnect
PMU – phasor measurement unit
PSC – Public Service Commission
PSEG – Public Service Enterprise Group
psi – pounds per square inch
R&D – Research and Development
REX – Rockies Express Pipeline
RFG – reformulated gasoline
RFO – residual fuel oil
RG&E – Rochester Gas & Electric Corporation
RGGI – Regional Greenhouse Gas Initiative

RNA – reliability needs assessment
RPS – renewable portfolio standard
RSS – really simple syndicate
RTO – Regional Transmission Organization
SAIDI – system average interruption duration index
SAIFI – system average interruption frequency index
SCADA – supervisory control and data acquisition
SCC – New York State Corporation Commission
SCR – special case resource
SECC – State Emergency Coordination Center
SEOC – State Emergency Operations Center
SEP – State Energy Plan
SGDG – Smart Grid Demonstration Grant
SGEIS – Supplemental Generic Environmental Impact Statement
SGIG -–Smart Grid Investment Grant
SHOPP – State Heating Oil and Propane Price Survey
SLO – State Liaison Officer
SMS – simple message service
SOEM – New York State Office of Emergency Management
SPDES – State Pollutant Discharge Elimination System
SPR – Strategic Petroleum Reserve
STATCOM – static synchronous compensator
STC – National Grid's Smart Technology Center
SVC – static VAR compensator
T&D – transmission and distribution
TCC – transmission congestion contracts
Tcf – trillion cubic feet
TEPPCO – Texas Eastern Products Pipeline Company
TETCO – Texas Eastern Pipeline Co.
TETCO – Texas Eastern Transmission Company
TRANSCO – Transcontinental Gas Pipe Line Corporation
TTX – table-top exercise
TZ6NY – Transco Zone 6 New York
UC – unified command
UFPC – unified power flow controller
ULS – ultra-low sulfur
USCG – United States Coast Guard
USGS – United States Geological Survey
VAR – volt-ampere reactive
VFT – variable frequency transformer
VMT – vehicle miles traveled

VoIP – Voice over Internet Protocol

VRA – Vulnerability and Risk Assessment

Units for Comparing Energy[205]

Some popular units for comparing energy include British Thermal Units (Btu), barrels of oil equivalent, metric tons of oil equivalent, metric tons of coal equivalent, and terajoules.

In the United States, the Btu, a measure of heat energy, is the most commonly used unit for comparing fuels. Because energy used in different countries comes from different places, the Btu content of fuels varies slightly from country to country.

The Btu content of each fuel provided below and used in the energy calculator reflects the average energy content for fuels consumed in the United States.

Btu Content of Common Energy Units

1 barrel (42 gallons) of crude oil = 5,800,000 Btu

1 gallon of gasoline = 124,238 Btu (based on U.S. consumption, 2011)

1 gallon of diesel fuel = 138,690 Btu

1 gallon of heating oil = 138,690 Btu

1 barrel of residual fuel oil = 6,287,000 Btu

1 cubic foot of natural gas = 1,023 Btu (based on U.S. consumption, 2011)

1 gallon of propane = 91,333 Btu

1 short ton of coal = 19,858,000 Btu (based on U.S. consumption, 2011)

1 kilowatthour of electricity = 3,412 Btu

http://www.eia.gov/cfapps/ipdbproject/docs/units.cfm

Energy Equivalent Conversions				
	Million Btu (British thermal units)	Giga (10^9) Joules	TOE (Metric Tons of Oil Equivalent)	TCE (Metric Tons of Coal Equivalent)
Million Btu (British thermal units)	1.00000	0.94782	39.68320	27.77824
Giga (10^9) Joules	1.05506	1.00000	41.86800	29.30760
TOE (Metric Tons of Oil	0.02520	0.02388	1.00000	0.70000

[205] http://www.eia.gov/energyexplained/index.cfm?page=about_energy_units

Equivalent)				
TCE (Metric Tons of Coal Equivalent)	0.03600	0.03412	1.42857	1.00000

Mass Equivalent Conversions					
	Short Tons	Kilograms	Metric Tons	Long Tons	Pounds
Short Tons	1.00000	0.00110	1.10231	1.12000	0.00050
Kilograms	907.18470	1.00000	1000.00000	1016.04700	0.45359
Metric Tons	0.90718	0.00100	1.00000	1.01605	0.00045
Long Tons	0.89286	0.00098	0.98421	1.00000	0.00045
Pounds	2000.00000	2.20462	2204.62272	2240.00030	1.00000

Volume Equivalent Conversions					
	Barrels	U.S. Gallons	Liters	Cubic Feet	Cubic Meters
Barrels	1.00000	0.02381	0.00629	0.17811	6.28981
U.S. Gallons	42.00000	1.00000	0.26417	7.48049	264.17200
Liters	158.98730	3.78541	1.00000	28.31676	1000.00000
Cubic Feet	5.61460	0.13368	0.03531	1.00000	35.31478
Cubic Meters	0.15899	0.00379	0.00100	0.02832	1.00000

Scale Conversions					
Prefix	Kilo-	Mega-	Giga-	Tera-	Peta-
Numerical Equivalent	Thousand (10^3)	Million (10^6)	Billion (10^9)	Trillion (10^12)	Quadrillion (10^15)
Also Referred to As			Million Kilo-, Thousand Mega-	Billion Kilo-	

Petroleum Product Conversions	
Product	**Barrels per Metric Ton**
Refined Petroleum Products	
Asphalt	6.06
Distillate Fuel Oil	7.46
Gasoline, Aviation	8.90
Gasoline, Motor	8.53
Greases	6.30
Jet Fuel, Kerosene-Type	7.93
Jet Fuel, Naphtha-Type	8.27
Kerosene	7.73
Liquefied Petroleum Gas (LPG)	11.60
Lubricants	7.00
Miscellaneous Products	8.04
Naphthas	8.22
Natural Gas Liquids (NGL)	10.40
Natural Gasoline	10.00
Paraffin Oil	7.14
Paraffin Wax	7.87
Petrolatum	7.87
Petroleum Coke	5.51
Residual Fuel Oil	6.66
White Spirits	8.50

http://www.eia.gov/cfapps/ipdbproject/docs/unitswithpetro.cfm

What are Mcf, Btu, and therms? How do I convert prices in Mcf to Btus and therms?
M — is one thousand (1,000); MM equals one million (1,000,000).
Mcf — is the volume of 1,000 cubic feet (cf) of natural gas.
MMBtu — is 1,000,000 British thermal units (Btu). One Btu is the heat required to raise the temperature of one pound of water by one degree Fahrenheit.
Therm — One therm equals 100,000 Btu, or 0.10 MMBtu.
In 2010, the average heat content of natural gas for the residential, commercial, and industrial sectors was about 1,025 Btu per cf; one Mcf = 1.025 MMBtu or 10.25 therms.
You can convert prices from one basis to another as follows:
$ per Mcf divided by 1.025 = $ per MMBtu
$ per Mcf divided by 10.25 = $ per therm
$ per MMBtu multiplied by 1.025 = $ per Mcf
$ per therm multiplied by 10.25 = $ per Mcf

http://www.eia.gov/tools/faqs/faq.cfm?id=45&t=7

Also, see EIA's Energy Calculators at
http://www.eia.gov/kids/energy.cfm?page=about_energy_conversion_calculator-basics for a simple way to convert various units of energy.

Appendix G – New York State Energy Assurance Intrastate Tabletop Exercise, After Action Report

Executive Summary: The exercise planning team (EPT) designed the New York State Energy and Research Development Authority (NYSERDA) Energy Assurance Plan (EAP) Tabletop Exercise (TTX) to provide participants the opportunity to evaluate the New York State Energy Assurance Plan (EAP) in response to an energy emergency or disruption. Through discussion during the TTX, participants had the opportunity to demonstrate their current capabilities, which provided insight into strengths and areas for improvement in energy emergency response. To demonstrate the energy capabilities, NYSERDA and the EPT invited several energy and support agencies to participate in the TTX.

Three planning meetings took place prior to the TTX: an initial planning conference on April 21, 2011; a midterm planning conference on June 2, 2011; and a final planning conference on October 4, 2011.

The NYSERDA EAP TTX simulated a realistic and plausible emergency. It was a facilitated discussion in which participants focused on key elements of their area of Energy Assurance and knowledge of market fundamentals and dynamics in order to validate content and identify areas for improvement. The exercise included three modules that were presented to participants. After each presentation, participants worked within and across groups to formulate and discuss appropriate response issues and exercise objectives. After the group discussions, participants engaged in a facilitated plenary discussion in which a spokesperson from each group presented a synopsis of the group's actions based on scenario. Each participant received a situation manual (SitMan). The SitMan included the exercise agenda, introduction, scenario modules, and acronym list. In addition to the SitMan, participants received a copy of the *Guide to Energy Emergency Response in New York*.

The EPT developed the following objectives for the TTX:

- Review the flow of information between the energy industry and state and local government energy stakeholders leading up to a potential energy disruption.
- Examine the process and effectiveness of communications between government energy stakeholders, energy industry representatives, and emergency management officials during significant energy supply disruptions.
- Discuss the communications flow between industry stakeholders during a significant energy supply disruption that supports an informed government decision-making process.
- Discuss the data-gathering function and understand the context of information that government energy stakeholders can provide.
- Identify data sets that might be needed based on the type of energy disruption.
- Identify potential downstream consequences and energy sector interdependencies that may occur during significant energy supply disruption.
- Identify and discuss the concept or operations in the draft EAP. Identify gaps, critical issues, and potential solutions.

Strengths and Areas for Improvement

The NYSERDA EAP TTX encouraged utility providers, state and local agencies, and energy leads to identify strengths, identify areas for improvement, and brainstorm possible solutions to energy emergency issues.

Strengths: Participants identified the following major strengths during the TTX:

- The exercise allowed utility providers, state and local agencies, and energy leaders to identify gaps in their emergency response and brainstorm ways to close the gaps.
- If approved, proposed pipeline projects in the region will increase natural gas capacity in the coming years.
- The natural gas pipeline and distribution companies have a preexisting and familiar process for information sharing that they can utilize during an emergency.
- The petroleum participants clearly articulated which regulations would affect their ability to operate in this emergency environment and knew how to request waivers from those regulations.
- Early in the discussion, New York City Office of Emergency Management (NYC-OEM) discussed the importance of reaching out to critical facilities about any potential energy shortage.
- The State and local agencies identified the command of this incident from a response and recovery perspective and outlined the relationship between New York City, surrounding counties, and New York State.

Areas for Improvement: Participants identified the following areas for improvement and additional discussion during the TTX:

- There is a lack of formal information sharing among energy sectors before a disruption. Participants were in general agreement for the need of formal information sharing.
- In the current market, the oil industry is at a competitive disadvantage given the cost of oil compared to natural gas
- The petroleum industry has an entire class of non-traditional customers that are only customers for a few days or weeks each year. This occurs when the interruptible natural gas glass of service these customers have is enforced and forces them off the natural gas supply grid. In response to this action, these customers move to backup petroleum fuels to continue their operation. This occurs during the coldest times of the year when the traditional oil customers are experiencing their highest demand. This action often strains the petroleum fuel distribution system supply and delivery capacity.
- Concerns were expressed about adequate storage and delivery infrastructure, as well as physical access to product, to meet peak demand.
- The region needs a formal forum for inter-sector cooperation.
- Fuel shortages may affect the ability to provide routine and emergency services in the downstate New York area.
- Public safety warming centers may be interruptible natural gas service customers.
- Not all participants are familiar with all aspects of the requirements for curtailing natural gas service to maintain system pressure.
- As the cost to supply petroleum increases during periods of peak demand, the costs will be passed to the consumers, which could be confused with price gouging.
- Days on hand oil requirements are of limited effectiveness when the ability to execute supply delivery contracts is hampered by the overall scenario (i.e. cold weather both increases oil demand, making it harder to obtain supply and interferes with logistics).
- Energy leaders in the region currently have limited ability to reach out to New England to share information.
- The electricity providers identified that the regulations limiting liquid fuel holding tanks at newer generation plants are a major impediment to maintaining service in an emergency.
- The petroleum sector coordination is conducted by internal polling based on personal relationships.

- There are several classes of interruptible natural gas service. Temperature Controlled customers have their service curtailed when temperatures fall below fifteen degrees Fahrenheit.
- The New York State Department of Public Service takes an active role in communicating with regulated utilities; but statewide coordination among energy stakeholders can be strengthened.
- The system controllers scale back electric imports into the NYC area and require in-city generators to ramp up an equal amount if they anticipate a winter storm. Percentage reductions are dependent on the storm forecast.
- The large price imbalance between petroleum (i.e. distillate and residual) and natural gas leads to economic preference for natural gas.

EXERCISE OVERVIEW

Exercise Details

Name: New York State Energy and Research Development Authority (NYSERDA) Energy Assurance Plan (EAP) Tabletop Exercise (TTX)

Exercise Date: November 3, 2011

Duration: 5 hours

Location: Marriott Hotel, 101 James Doolittle Boulevard, Uniondale, NY

Sponsor: New York State Energy Research and Development Authority (NYSERDA)

Program: Department of Energy – ARRA Grant Program

Mission: Preparedness

Objectives:

- Review the flow of information between the energy industry and state and local government energy stakeholders leading up to a potential energy disruption.
- Examine the process and effectiveness of communications between government energy stakeholders, energy industry representatives, and emergency management officials during significant energy supply disruptions.
- Discuss the communications flow between industry stakeholders during a significant energy supply disruption that supports an informed government decision-making process.
- Discuss the data-gathering function and understand the context of information that government energy stakeholders can provide.
- Identify data sets that might be needed based on the type of energy disruption.
- Identify potential downstream consequences and energy sector interdependencies that may occur during significant energy supply disruption.
- Identify and discuss the concept or operations in the draft EAP. Identify gaps, critical issues, and potential solutions.

Scenario Type: Response to an energy emergency or disruption.

Exercise participants participated from various organizations, jurisdictions, and agencies as depicted in Table 1-1.

Table 1-1. Participating Jurisdictions and Agencies

Participants	
State	Long Island Power Authority New York State Department of Environmental Conservation New York State Division of Homeland Security and Emergency Services New York State Energy Research and Development Authority New York State Public Service Commission
City	New York City Office of Emergency Management
Private Sector	Carbo Industries Inc. Central Hudson Gas & Electric Con Edison of NY, Inc. Fred M. Schildwachter & Sons Inc. National Grid Gas Control Long Island Hart Petroleum Hess Corp JEM Consulting Solutions Long Island Gasoline Retailers Association Motiva Enterprise LLC National Fuel Gas Distribution Corp. New York Oil Heating Association Northeast Gas Association Northville Industries Corp. OIL HEAT INSTITUTE OF Long Island Orange and Rockland Utilities, Inc. Skaggs-Walsh Spectra Energy Sprague Energy Corp. Williams-Transco

Number of Participants

- Participants (including exercise planning team): 58
- Exercise staff: 6
- Total participants: 64

EXERCISE DESIGN SUMMARY

Exercise Purpose and Design

The purpose of the New York State Energy and Research Development Authority (NYSERDA) Energy Assurance Plan (EAP) Tabletop Exercise (TTX) was to provide participants the opportunity to evaluate the EAP in response to an energy emergency or disruption. The exercise focused on stakeholder communications, coordination across multiple agencies, and timely and appropriate notifications.

Exercise Objectives

The following objectives formed the foundation for the observations in this exercise:

- Review the flow of information between the energy industry and state and local government energy stakeholders leading up to a potential energy disruption.
- Examine the process and effectiveness of communications between government energy stakeholders, energy industry representatives, and emergency management officials during significant energy supply disruptions.
- Discuss the communications flow between industry stakeholders during a significant energy supply disruption that supports an informed government decision-making process.
- Discuss the data-gathering function and understand the context of information that government energy stakeholders can provide.
- Identify data sets that might be needed based on the type of energy disruption.
- Identify potential downstream consequences and energy sector interdependencies that may occur during significant energy supply disruption.
- Identify and discuss the concept or operations in the draft EAP. Identify gaps, critical issues, and potential solutions.

Scenario Summary – Module I

After a summer of widespread extreme heat and humidity, temperatures in the Northeast begin to drop as autumn approaches. Demand for electricity during peak hours declines with the cooling temperatures. As the long-term winter forecasts become available, it becomes apparent that the decrease in energy demand will be temporary. The weather forecasts for the downstate New York region predict a drier winter, but with colder-than-average temperatures. The coldest period will be from mid-December to mid-February.

Date: Sunday, January 1

Heading into the beginning of the year, the early winter predictions for the downstate region prove to be true. Since mid-December, average daytime temperatures have hovered near the low 20s. Forecasts show that sometime during the middle of the first week of January, temperatures will slip below 15 degrees for the downstate region.

Date: Tuesday, January 3

Early in the morning of Tuesday, January 3, temperatures dip to 14 degrees and are not predicted to rise above 18 degrees during the day. Temperature control measures (applied to interruptible gas consumers and selected electricity generators) are put into effect for the first time this year. The large residential and

commercial facilities using interruptible natural gas service work throughout the day to convert to on-site heating oil supply. While many facilities convert or curtail with no problem, a small fraction have difficulty. This is not a significant concern, as temperatures are predicted to rise above 21 degrees on Wednesday. Boiler monitors are sent to supervise the transition.

Date: Wednesday, January 11

As predicted, the temperature rises to 21 degrees by Wednesday at 0930. Facility operators convert the boilers back to natural gas and resume normal operations. The utilities remind interruptible customers of their responsibility to maintain their reserve inventories and encourage rapid replenishment, as it is still early in the winter.

Temperatures are predicted to remain in the 20-degree range for the rest of the week, but a winter storm is predicted for the end of the week. Not much precipitation is expected, but high winds are anticipated.

Date: Friday, January 13

On Friday morning, the predicted storm creates high winds throughout New York City, with temperatures in the 20-degree range. By midday, a barge moving up the East River, fighting high winds from the storm and a falling tide, strikes the south end of Roosevelt Island and runs aground. The barge is carrying 4.2 million gallons of No. 2 heating oil to terminals on the North Shore of Long Island. Two of the tanks on the barge are breached and leaking into the river. The Coast Guard has closed the East River to northbound marine traffic at the Williamsburg Bridge and southbound marine traffic will be stopped at the Robert F. Kennedy Triborough Bridge.

Scenario Summary – Module II

Date: Saturday, January 14

Crews have been working on the spill in 20-degree temperatures. The barge has been securely moored to Roosevelt Island and the Coast Guard is reviewing a lightering plan to remove the oil and gasoline from the damaged cargo holds. Commercial divers will survey the barge below the waterline. The extent and impact of the spill are being evaluated, but it appears to be minor at this time. The Coast Guard anticipates that the East River will be open by Tuesday.

Date: Sunday, January 15

A cold front brings much lower temperatures in the middle of the holiday weekend. Thermometers across the downstate region dip to 10 degrees early Sunday morning, and the temperature is expected to reach 16 degrees during the day. Natural gas service to temperature controlled and other interruptible service class customers as well as selected electric plants has been interrupted. Oil delivery service is working near capacity to serve traditional heating and surging interruptible backup fuel demand.

Date: Monday, January 16, Martin Luther King (MLK) Day Holiday

Overnight the temperature has dipped to single digits and will reach a high of 14 degrees on Monday. Temperatures are not predicted to rise above 20 degrees until next week. Remaining facilities, including selected electric generators, are once again required to convert to their heating oil systems or curtail their usage. Due to the MLK holiday weekend and cold temperatures, a number of boiler operators are unavailable or greatly delayed in reporting to assigned locations. Many facilities are reporting that they are concerned about the amount to time they will be able to stay on their heating oil systems, as they have been unable to replenish their supply.

Scenario Summary – Module III

Date: Tuesday, January 17

Early in the morning, the Coast Guard reports that divers investigating breaches in the leaking barge have found that two additional tanks were damaged. Combined with a delay in getting lightering equipment to the barge, they anticipate that the East River will be closed to vessel traffic through Thursday or Friday. Daytime temperatures in the high teens persist.

Date: Wednesday, January 18

Weather forecasts show the possibility of colder temperatures extending well into next week and a potential nor'easter delivering the first major snowfall of the 2012 winter during the weekend. Oil distribution companies report that combined demand of traditional and non-traditional customers during extended periods of cold temperatures is taxing their ability to meet total demand.

Approximately 30 percent of the facilities that are temperature control customers report that they will have to come off their heating oil systems by the end of the day due to a lack of supply of heating oil and an inability to be resupplied. The affected interruptible customers represent approximately 25 percent of the demand for natural gas.

Date: Friday, January 20

Friday afternoon brings relief in the form of warmer temperatures as the thermometer approaches 19 and is anticipated to rise another degree or two. The warming trend is anticipated to last through the weekend, delivering temperatures in the mid 20s by Sunday and maintaining them through the following week.

By the late afternoon, the Coast Guard has cleared the East River for vessel traffic and is working with the private sector to prioritize vessels to be the first in.

ANALYSIS OF OBJECTIVES

This section reviews the performance of the exercised objectives. Each observation precedes an analysis and an idea(s) discussed section.

Observations

Observation 1.1: Area for Improvement. NYS DPS and NYSERDA should continue to monitor the interaction between the various interruptible natural gas service glasses, the petroleum supply and distribution industry, and the availability of petroleum backup fuels.

NYS EAP Reference: Natural Gas Interruptible Customers 6.2.3.3., Petroleum Curtailment 6.3.3.2.9

Analysis: The petroleum industry considers all the interruptible natural gas service class customers as non-traditional customers. As a result, the petroleum fuels distribution industry makes limited efforts to secure supply for these customers. The petroleum representatives stated that having these temporary customers creates a strain on their ability to service their traditional customers.

Ideas Discussed:

- DPS should recommend to the Public Service Commission, that all new interruptible service class applications must have and maintain 10 days physical supply on-site.
- All existing gas interruptible customers that have the ability to install 10-day supply capacity actually spend money to make sure that they have supply on hand.
- All existing gas interruptible customers that do not have the ability to install a 10-day supply should not be allowed to have interruptible natural gas service.

Observation 1.2: Strength. The state and local agencies identified jurisdictional command of this incident from a response and recovery perspective and outlined the relationship between New York City, Nassau County, and New York State.

> **NYS EAP Reference:** Section 3 Stakeholders and Authorities, Subsections 3.2.1 (NYSERDA) 3.2.3 DHSES/OEM), 3.2.6.1 (NYC-OEM), 3.3.2 (FEMA – Coast Guard); 6.3.7.1 State Initiated Response Measures

Analysis: During the introductory module, the participants representing the participating state and local agencies identified that the authority to command the response and recovery rests with the United States Coast Guard. Each agency verbalized their unique role in responding to the incident and discussed how they would participate in issuing joint information to the public immediately after the incident. Coordinating public information continued throughout all three modules of the workshop.

The representatives from NYC-OEM outlined their priorities in this incident and established that they would be in a monitoring role and would coordinate with the New York State Office of Emergency Management (NYS-OEM) as needed. The regional representative from NYS-OEM reinforced that they would monitor the situation, but would transition to a support role as needed and as requested by the responding localities. Both NYC-OEM and NYS-OEM clearly articulated that the initial response would be handled locally and that requests for supporting personnel and resources would move to the appropriate county office of emergency management that could either fill the request or pass the request to NYS-OEM.

The representative for New York City Fire Department (FDNY) discussed the department's response to support this incident through the use of its fire fighting boats. He also noted early on that the oil slick produced in this scenario would probably affect the FDNY fire station in the area that houses the

responding fireboats. He discussed the options for moving the boats as the scenario unfolded to mitigate the impacts on the fire service in the area.

Participants from NYSERDA and NYSDPS initially outlined their methods of coordinating with the private sector energy providers to assess the situation. With ongoing assessment underway, they also identified the need to support joint information sharing with the governor's office and NYS-OEM. Throughout the exercise, NYSERDA and NYSDPS were able to explain the assessment process, outreach activities, and any statutory authorities that they had in this type of incident. Of particular note, NYSERDA specifically referenced the NYS statutes that allowed the NYSERDA President to take action to promote energy conservation and discussed the type of event and triggers that they would use to implement those authorities.

Ideas Discussed: none

Observation 1.3: Area for improvement. Several key players in this type of scenario were not at the exercise.

NYS EAP Reference: Section 3 Stakeholders and Authorities

Analysis: During the introductory module, the participants representing state and local agencies identified that the authority to command the response and recovery rests with the United States Coast Guard in this event. However, the Coast Guard was not at the table to discuss the operations and interagency coordination that would be taking place in the initial phases of the operation. County emergency representatives, from Nassau, Suffolk and Westchester, were not present. Furthermore, the group identified several aspects of the scenario that would likely affect the Port Authority of New York and New Jersey (PANYNJ). During the report back, the exercise planning team leader clarified that those agencies were invited but that prior commitments and staffing constraints meant they could not attend.

Ideas Discussed:

- NYSERDA should continue to build contacts and seek participation from PANYNJ, the Coast Guard, and other relevant players to participate in Energy Assurance training, planning, and exercises.
- All participants should attempt to update their contacts on an annual basis to ensure smooth communication during energy supply events.

Observation 1.4: Strength. Early in the discussion, New York City Office of Emergency Management (NYC-OEM) discussed the importance of reaching out to critical facilities about any potential energy shortage.

Analysis: NYC-OEM maintains a list of facilities and partner agencies in the city that are critical to life safety operations. While information was scarce in the opening module and the state and local agencies were still assessing the situation, the NYC-OEM staff identified working with their critical partners to try to assure that those partners were aware of the situation and were taking steps to prepare for a potential energy shortage as a result of stretched oil supplies resulting from the river being closed.

Ideas Discussed:

- Develop a better understanding, at both the State and local level, of energy demand and fuel supply to critical facilities required to respond to emergency situations.
- Participants again discussed the unknown factor of how much backup fuel each interruptible natural gas service customer had available at various times during the year.

Observation 1.5: Area for Improvement. The petroleum sector coordination is conducted by internal polling based on personal relationships.

> **NYS EAP Reference:** Section 3 Stakeholders and Authorities; Section 6.3 Energy Emergency Plan Petroleum, subsection 6.3.6 Identifying Problems

Analysis: The petroleum stakeholders discussed that they would work with the New York State Energy Research and Development Authority (NYSERDA) through their trade organization. In the short-term, this type of communication provides for strong public/private partnership; however, in the long-run information sharing predominantly based on the close relationships between the key players at the highest levels of each organization presents a risk. As trusted agents and key personnel leave their roles, gaps will develop in this region's tightly knit communications network. If personnel is lost with little or no notice and an incident occurs before the replacement can integrate into the petroleum community, major information gaps may occur.

Ideas Discussed:

- The petroleum sector providers should consider their continuity of operations (COOP) planning in the context of the region's close-knit communications environment. The major players should consider creating opportunities for the personnel in their succession of leadership to meet and build the types of relationships that facilitate swift and honest information sharing during incidents.
- All participants should attempt to update their contacts on an annual basis to ensure smooth communication during energy supply events.

Observation 1.6: Area for Improvement. The electricity providers identified that the regulations limiting the size of liquid fuel holding tanks at newer generation plants are a major impediment to maintaining service in an emergency.

> **NYS EAP Reference:** Section 6.1.2.4 Generation; sub-section 6.1.2.4 Dual Generation; sub-section 6.1.2.5 Capacity Factor; sub-section 6.2.3.3.2 Power Generation and Interruptible Service

Analysis: During Module 1 and Module 2, the electrical energy providers identified that they would be monitoring the flow of natural gas to their facilities and would make the decision to switch to alternative liquid fuel sources as dictated by their natural gas service class. These participants noted that at this point in this type of scenario, they would be running all available generators. They also stated that the older generation plants would likely have larger liquid storage tanks but that newer plants are likely to be limited to two to three days of liquid fuel storage capacity on-site. The electrical producers would like to have additional on-site storage to promote general reliability and emergency generations. They identified later in the exercise that this situation is even more critical as the demand for indigenous generation increases during periods of limited incoming supply due to delivery and transportation constraints.

Ideas Discussed:

- The electrical generation owners should work with the appropriate state regulatory agencies to identify the possibilities for including higher capacity liquid fuel storage tanks in future generation plants.
- Older plants with significant on-site fuel storage should be recognized for the reliability that they offer.

Observation 1.7: Area for Improvement. Energy leaders in the region currently have limited ability to reach out to New England to share information.

NYS EAP Reference: Section 6.1.2.5 Imported Power

Analysis: During the first report back session, the petroleum participants reported that their ability to reach out across their own region was strong; however, that the ability to reach out to New England was limited to updates within their own agencies or organizations. Given New England's geographic proximity and the vast economic and infrastructure linkages, the group determined that they needed to have greater ability to gather information from New England petroleum suppliers and producers.

Ideas Discussed: The petroleum participants and regulatory agencies should work to develop relationships with their counterpart organizations in New England and New Jersey through regional meetings and discussions.

Observation 1.8: Strength. The petroleum participants identified those regulations that would impact their ability to operate in this emergency environment and knew how to request waivers from those regulations.

NYS EAP Reference: Section 3 Stakeholders and Authorities

Analysis: Petroleum participants discussed how the Department of Transportation hours of service regulations, bridge toll wait times, ethanol blending limits, and transshipment lightering and vapor recovery requirements affect their flexibility with fuel delivery. In many cases, the participants experienced similar circumstances as those presented in the scenario and for each impediment, the group identified the appropriate state or federal regulatory agency and the process for seeking waiver for these requirements. For example, the group discussed the possibility of working with the various bridge and highway authorities to establish segregated express no-toll lanes on all roads into and out of New York City and at all bridge points to speed commodity transport traffic.

Discussion expanded to the state regulations requiring ultra low sulfur diesel fuel for home heating oil and on-road diesel, the federal 10 percent motor fuel blending requirement, and the vapor capture requirements necessary to fully draw down on storage tanks.

Ideas Discussed: None.

Observation 1.9: Area for Improvement. Substitution of contractual for physical supply of back-up fuel is of limited efficacy when scenario conditions hamper the ability to execute emergency contracts.

NYS EAP Reference: Section 6.2 Energy Emergency Plan: Natural Gas; specifically sub-section 6.2.3.3.1 Public Service Commission Requirements Regarding Interruptible Customers and Backup Fuel

Analysis: State regulations require that certain interruptible natural gas customers be required to maintain on-site storage of alternative backup fuel (generally heating oil). If on site storage capacity is insufficient, these customers meet their on-site storage requirements by having contingency contracts with heating oil providers. Many energy stakeholders felt that interruptible customers should be required to maintain their storage on-site at all times and that the allowance for emergency contracts, rather than physical supply, should be eliminated. However, many acknowledged that the carrying costs of maintaining the on-site fuel requirements would be a major burden on these customers. In an emergency where heating oil delivery is limited into the terminals and from refineries, wholesalers and retailers will likely not be able to obtain the product to meet the needs of their contingency contract holders. In this event, the result is that those users will be forced to cease operations until natural gas service is restored or backup fuel becomes available.

Ideas Discussed:

- Some participants recommend all new applications for interruptible service (especially temperature controlled) must demonstrate 10 days alternate fuel supplies on-site
- All existing customers who have the ability to maintain the 10 days on-site should be required to do so with an adequate supply.
- Some participants suggested that all who cannot physically maintain 10-day supply should be moved to firm supply.

Observation 1.10: Area for Improvement. As the cost to supply petroleum fuels increases, the costs will be passed on to the consumers, which could be confused with price gouging.

NYS EAP Reference: Section 5.7.1 Communications and Public Information

Analysis: The petroleum producers discussed the various methods that that sector could take to reroute fuel from outside of the region. However, these methods are resource intensive and there will be additional costs that will be passed on to the consumers. The group discussed the importance of coordinating the message with the State Attorney General's Office during the emergency to limit the misperception that the fuel providers are price gouging.

Ideas Discussed: The energy sector providers, potentially with the support of NYSERDA and the Department of Public Service, should establish a relationship with the State Attorney General's Office to educate that office on the energy sector's post emergency activities. NYSERDA notes the agency has a strong relationship with the NYS Attorney General's Office and provides the Office with regular fuel price updates through NYSERDA's Heating Fuels and Transportation Fuels Reports.

Observation 1.11: Strength. The natural gas stakeholders have a preexisting and familiar process for information sharing that they can utilize during an emergency.

NYS EAP Reference: NYS EAP Reference: Section 6.2.6 Typical Gas Utility Emergency Plans and Priority Setting

Analysis: During the second report back session, participants from the natural gas sector outlined their process for conducting regular calls with the interstate pipeline industry. They also discussed the importance of monitoring system pressure at the local level and how these operators use sensing systems to automate the controls based on system pressure.

The natural gas grid is tightly linked by various providers, from interstate pipeline to local grid and as a result, the communications methods are codified and used on a regular basis. These communication methods are easily expandable in both frequency and intensity during an emergency.

Ideas Discussed: None.

Observation 1.12: Area for Improvement. Not all participants are familiar with all the requirements for curtailing natural gas service to maintain system pressure. New York has several different classifications of interruptible natural gas service, all with their own set of regulatory requirements.

NYS EAP Reference: Section 6.2.5 Risk and Vulnerability – Mitigation and Recovery

Analysis: One type of interruptible service requires the natural gas grid operators to curtail service to this specific class of interruptible gas users when the temperature reaches 15 degrees Fahrenheit. These customers are not allowed to return to gas service until the temperature reaches 20 degrees Fahrenheit. The purpose of this requirement is to assure that adequate system pressure exists at all times in the natural gas system.

During the discussion, the participants addressed the need for further education and outreach on this service class and the importance of making sure that natural gas customers fully understand the terms of this service class. The Department of Public Service reminded the attendees it is the responsibility of the customer to understand all aspects of the service class they have selected.

The petroleum producers also posed the question of what happens if interruptible customers or oil distributors do not have the available supply of oil.

Ideas Discussed: The New York State Department of Public Service and the natural gas grid operators should improve public information to natural gas customers, especially focused on interruptible customers.

Observation 1.13: Area for Improvement. Public safety warming centers may be interruptible customers for natural gas.

NYS EAP Reference: Section 3.2.6.1 New York City Office of Emergency Management

Analysis: The NYC-OEM discussed the need to open and operate warming centers for residents that are unable to heat their home or are experiencing homelessness. During that discussion, the government agencies discussed the potential that the facilities (schools, community centers) that would house these warming centers could very likely be on an interruptible natural gas service. If this is the case and the temperature gets low enough to require curtailment of natural gas supply, these facilities may not be suitable as warming centers.

Ideas Discussed: The NYC-OEM should review the list of emergency shelter and public warning sites and consider making adjustments based on their heating fuel service class.

Observation 1.14: Area for Improvement. Fuel shortages may impact the ability to provide routine and emergency services in the New York City.

NYS EAP Reference: Section 3.2.6.1 New York City Office of Emergency Management

Analysis: State and local agencies discussed that New York City emergency services vehicles fuel at dedicated City refueling points and at fire stations, many of which have a diesel fuel tank. In addition, each ambulance and fire truck is filled to capacity at the beginning of each shift. However, during very cold weather or very hot weather the city's ambulance may have to run their engines extensively to control their internal temperature because they do not operate from stations. The Office of Emergency Management identified that the City's Office of Administration provides central fuel purchasing for all city services. While emergency services are a stated priority for refueling during an emergency, the potential exists that supplies may be limited to the City during an emergency.

The petroleum providers also identified that as the situation worsened any available motor fuel would be diverted to emergency services and critical infrastructure.

Ideas Discussed: The NYC-OEM should consider the need for a citywide fuel shortage plan that outlines the options for routing fuel in from various other regions in the case that an emergency affects one primary supply direction.

Observation 1.15: Area for Improvement. The region could benefit from a formalized forum for inter-sector cooperation.

NYS EAP Reference: 5.7.1 Communications and Public Information

Analysis: During normal, day-to-day operations, each part of the energy sector is focused tightly on their own operations. Exercises, like this one highlight the need for increased cooperation among the various parts of the energy sector prior to emergencies. Going forward, the State could benefit from a formalized process built around inter-sector cooperation; in its absence, stakeholders will continue to focus on maintaining their own sector and normal operations.

Ideas Discussed:

- The energy sector should identify a regular, formal process for discussing emergency coordination among the natural gas, petroleum, and electricity sectors.
- The energy sector should conduct two emergency exercises a year to facilitate inter-sector discussion and coordination.

Observation 1.16: Strength. The region will have increased natural gas capacity in the coming years.

NYS EAP Reference: 6.2.2.3.1 Natural Gas Pipeline Companies Serving New York

Analysis: There are at least two new natural gas pipeline proposals currently under development that could, if approved and built, provide additional natural gas capacity to New York City. The gas lines may be in place in the coming years and will ease natural gas supply constraints for the next six to eight years as demand catches up with this new supply. This new supply will mitigate the impacts of some energy emergencies.

Ideas Discussed: none.

CONCLUSION

The NYSERDA EAP TTX successfully allowed utility providers, state and local agencies, and energy industry leaders to identify strengths, identify areas for improvement, and brainstorm possible solutions to energy emergency issues. The exercise also provided participants the opportunity to interact with a broad cross-section of New York's energy stakeholders and to understand the interdependencies across energy subsectors. NYSERDA and its consultant will utilize the findings and recommendations from this AAR to make appropriate revisions to the content of its EAP.

Appendix A
ACRONYMS

Table A-1 Acronyms

Acronym	Meaning
AAR/IP	After Action Report/Improvement Plan
DHS	U.S. Department of Homeland Security
DPS	Department of Public Service
EAP	Energy Assurance Plan
EOC	Emergency Operations Center
FDNY	New York City Fire Department
HSEEP	Homeland Security Exercise and Evaluation Program
EPA	U.S. Environmental Protection Agency
MLK	Martin Luther King
NYC-OEM	New York City Office of Emergency Management
NYPUC	New York Public Utilities Commission
NYS	New York State
NYSERDA	New York State Energy Research and Development Authority
FOUO	For Official Use Only
SAIC	Science Applications International Corporation
NYS-OEM	New York State Office of Emergency Management
TTX	Tabletop Exercise