

2013 RGGI Operating Plan Amendment Comments

These are my personal citizen comments on the RGGI operating plan. As noted below they do not represent the views of any organization. I follow climate policy issues closely and have been intimately involved in the New York RGGI program's stakeholder process. However, I have not been involved in funding aspects of RGGI before.

The original support of a RGGI auction by utility companies was predicated on the concept that the funds were to be returned directly to the ratepayers. The proposed plan has completely lost that feature. Janet Joseph noted that the 75% of the auction proceeds are being used for GHG reductions and 25% are for long-term investments for GHG reduction technologies. I will comment on that overall distribution.

I also want to comment on the Cleaner, Greener Communities Program. I have provided some of the comments I made on the Draft Vision CNY Regional Sustainability Plan Documents dated February 14th, 2013 and how it relates to this program.

Finally I have environmental justice concerns about this program. I recommend that New York start tracking households in fuel poverty to determine how RGGI may or may not impact those families.

Background

I am a meteorologist (BS and MS degrees), Certified Consulting Meteorologist, and have worked in the air quality industry for over 35 years. Originally I worked for consultants doing air quality modeling work for EPA and then went to work with an electric utility. After I retired from the non-regulated generating company that replaced that electric utility I became the Director of the Environmental Energy Alliance of New York which is an association of electric and transmission companies in New York. The Alliance deals with environmental and energy regulatory issues in New York. The following comments are my personal opinion. In no way do they reflect the position of any of my employers, either present or past, nor do they reflect the position of the Environmental Energy Alliance of New York member companies.

New York's Priority Problem

I believe New York State's priority problem is maintaining our water, sewer, and transportation infrastructure. The [New York State Comptroller's office recently released a report](#) noting that "New York faces a shortfall of up to \$89 billion in funding for water, sewer and transportation infrastructure over the next two decades". That report outlines the issues with funding and aging infrastructure that must be addressed. At the Business Council's 2012 Annual Industry-Environment Conference in October 2012, NYS Department of Environmental Conservation

(DEC) Commissioner Joseph Martens gave a presentation that highlighted the water and wastewater infrastructure issue. Earlier that month DEC had to address (basically had to find funding for emergency response and remediation) a wastewater crisis in Newburgh when a century old pipe failed next to a tributary to the Hudson River. His presentation noted that this is a ubiquitous problem that must be addressed. Moreover, he explained that if certain water and wastewater problems are not addressed the State would have no choice to but to deny applications for new development in some areas of the State simply because existing infrastructure cannot handle additional loads. The keynote presentation to the meeting by Richard Brodsky, a former member of the New York State Assembly, addressed the same general theme of fiscal issues affecting infrastructure. He noted that NY cities and other local governments simply do not have sufficient revenues available to maintain services and infrastructure. He explained that it will become a crisis when the last of the fiscal tricks and political maneuvers to push the final reckoning down the road are used up.

My comments on the “Draft Vision CNY Regional Sustainability Plan Documents dated February 14th, 2013 noted that the plan did not recognize the fiscal crisis that Central New York local governments must address. While it is all well and good that the document sketched out potential sustainable projects, the crux of my concern is that they should be ranked by cost effectiveness of infrastructure support. If a “sustainable” project supports other infrastructure needs then it might be supportable. If, on the other hand, the justification for the project does not address infrastructure needs then we simply cannot afford to consider the project with or without RGGI funds.

At the time I reviewed the CNY document I was unaware of the link to RGGI funding and I remarked that in many places in the document, success was defined in terms of GHG emissions reductions. Even though RGGI funding is involved I believe that is an inappropriate metric and that any of the CO2 emission reductions proposed will only be a symbolic gesture based on relative numbers. If NYSERDA disagrees then I believe it is incumbent upon them to quantitatively show what their proposed reductions would do to mitigate any of the climate disruptions enumerated in the ClimAid document.

My analysis shows that comparison of the RGGI emissions cap, 91 million metric tons of CO₂e, relative to the world demonstrates that any emissions reductions we could make will only have symbolic benefits. An analysis of U.S. and state by state carbon dioxide 2009 emissions relative to global emissions that quantifies the relative numbers and the potential “savings” in future global temperature and global sea level rise from a complete cessation of all CO₂ emissions is available at http://scienceandpublicpolicy.org/originals/state_by_state.html and has been adapted for RGGI in Table 1.

Importantly, the current growth rate in CO2 emissions from other countries of the world will quickly subsume any reductions in regional CO2 emissions, state-wide emissions from Electric Generating Units (EGUs), and even the entire state. According to data from the U.S. Energy Information Administration (EIA) and based on trends in CO2 emissions growth over the past decade, global growth will completely replace an elimination of all RGGI CO2 emissions in 41 days and the entire state in 79 days.

Furthermore, using assumptions based on the Intergovernmental Panel on Climate Change (IPCC) Assessment Reports we can estimate the actual impact to the environment. If New York as a whole stopped emitting all carbon dioxide (CO2) emissions immediately, the ultimate impact on projected global temperature rise would be a reduction, or a “savings,” of approximately 0.0027°C by the year 2050 and 0.0056°C by the year 2100—amounts that are, for all intents and purposes, negligible. Applying those assumptions to IPM projected cumulative emissions reductions from the RGGI 91,000,000 ton cap or 3.11 million tons per year the ultimate impact on projected global temperature rise would be a reduction, or a “savings,” of approximately 0.000048°C by the year 2050 and 0.000099°C by the year 2100.

Therefore, there is no real benefit to the CO2 reductions proposed. In this time of fiscal crisis it is inappropriate to consider those projects that do not provide cost-effective savings even if they provide CO2 reductions. Fortunately, there are many “no regrets” policies that provide CO2 savings as well as cost savings making them fiscally and environmentally sustainable. The RGGI Operating Plan should be revised to be consistent with that concept.

Overall Distribution of Funding

As noted earlier the original concept of a CO2 auction that raised the price of carbon but was revenue neutral to ratepayers has been abandoned. In its simplest form now New York’s RGGI auction proceeds are a tax to reduce fossil fuel emissions or “decarbonize”. Therefore the distribution of funding should address the most effective way to do that.

In the *Climate Fix*¹ Roger Pielke notes that there are only two ways to decarbonize economic activity. One is to improve the energy efficiency of the economy and the other is to reduce the use of carbon in energy supply. Improving energy efficiency provides direct benefits to rate payers and therefore should be encouraged to the extent possible. Unfortunately if the goal is, for example, to achieve the aggressive reductions of the New York Climate Plan of reducing

¹ Pielke, Jr., R.A., 2010a. *The Climate Fix: What scientists and politicians won't tell you about global warming*. Basic Books, 276 pp., ISBN 978-0-465-02052-2.

GHG emissions from all sources 80 percent below 1990 levels by 2050, then energy efficiency is insufficient by itself to achieve those goals.

At the stakeholder meeting, Janet Joseph noted that the 75% of the auction proceeds are being used for GHG reductions and 25% are for long-term investments for GHG reduction technologies. To the extent that GHG reductions are the result of energy efficiency and energy conservation programs I support those programs. However, I do not support GHG reductions from the use of existing renewable energy technology. Renewable energy is diffuse and intermittent. Current technology cannot be used to replace existing sources except at very high costs. Therefore, the 25% for long-term investments should focus on those problems. Furthermore, NYSERDA research should develop a road map for what would be needed to meet a low-carbon future for New York and develop a research program to address those needs. However, it is important to note that this effort should be truly looking long-term to develop the break throughs necessary to make renewable and zero carbon technology cheaper than fossil fuel energy.

Environmental Justice

The documentation and the discussions at the May 2, 2013 stakeholder meeting made much of the environmental justice considerations of the program. However, the thing that is missing is a metric to determine the potential impact of this regressive tax. In order to address that need I recommend the use of a Fuel Poverty statistic. Fuel poverty is defined in the United Kingdom as household that needs to heat its home to an adequate standard of warmth with more than 10% of its income. I propose that the metric could be defined in New York as a household that spends more than 10% of its income on home heating and electricity. I propose that environmental justice advocates be consulted to determine if that is the appropriate percentage for New York. An overview of the potential use of this parameter in the United States is available at: <http://www.opportunitystudies.org/2011/11/28/fuel-poverty-in-the-usa-the-overview-and-the-outlook/>.

The particular environmental justice issue that I think should be addressed is the impact of the increased costs on those least able to pay additional for necessary heat and electricity. The RGGI program estimated a small average ratepayer impact. However, that number does not provide any information about the range of impacts. If it represents half the households getting benefits and savings that negate higher costs from the other half we have to be sure that the higher costs are not disproportionate on the poor. The Green Jobs Green New York slide from the stakeholder meeting indicated that 33,669 small residential audits have been complete and that there were 9,161 projects contracted. Given that there are 7.1 million New York single family, mobile home and multi-family housing units suggests that real effort should

be made to be sure that RGGI funding targets those least able to pay the additional program costs and that we should keep track whether the program is causing more fuel poverty.

Cleaner, Greener Communities Program

According to the May 2, 2013 New York RGGI Advisory Group Meeting the Cleaner, Greener Communities Program will take up the 49% of the planned programs in the 2013 Operating Plan Amendment. I am writing to point out that while there are some advantages to this approach there also is a potentially serious problem with inefficiencies spreading out responsibility across ten organizations. I also want to make the point that the RGGI funded sustainability projects should be prioritized more by their contribution to infrastructure improvement than by greenhouse gas potential reduction. As noted above I believe the primary problem in New York State is infrastructure and it is such a pressing issue that we should rank the regional sustainability projects by that metric rather than GHG emission reductions.

I reviewed the Draft Vision CNY Regional Sustainability Plan Documents dated February 14th, 2013. My motivation to review the document was to determine if the targets are achievable and the implementation plans are realistic and cost-effective. I was unable to quantitatively complete that analysis because the supporting documentation was not available at the deadline for comments and still is not available at this writing.

I assume that the CNY sustainability effort is similar to the other nine regions. The CNY program did a baseline assessment, developed a GHG inventory, prepared an implementation strategy and wrote a sustainability plan document. The "VisionCNY" Sustainability Plan, Sustainability Targets and Implementation Strategy document was available in late 2012. It exemplifies the inefficiency of doing ten separate analyses without close central supervision or having a subject matter expert develop the common sections of each document. In particular, there were sections and documents that were apparently developed without realizing that the ClimAid report was available. Another example is that the ambient air quality analysis was written by someone unfamiliar with the data available.

This inefficiency approach will continue without a strong central presence. For example, during the May 2 stakeholder meeting an attendee questioned the funding reduction for water treatment plant energy efficiency. The Central New York Plan mentioned that as a potential project but all the regional programs should be told, if not ordered, to make that a priority because it has been effective and in my viewpoint because it addresses an infrastructure need.

The proposed operating program claims that all the regional sustainability programs had significant stakeholder input and will be complete by May 10, 2013. User input in CNY was

limited to individuals and organizations with experience and interest in this particular issue. However, the impact of some of the proposed programs affects everyone and I am pretty sure that if the general public were aware of some of the things proposed that there would be significant negative feedback. Please do not think that the support of the limited sector of society that participated is representative of the majority of the public. I want to emphasize the point that the draft final CNY report was incomplete. It did not provide any of the supporting data appendices. While the reports may be finalized it is inappropriate to suggest that they have been fully vetted.

Wind Energy

I strongly object to any support for wind energy in this program. It has been subsidized for many years and is no closer to providing cheaper power than fossil fuel power than before. It is time to face the fact that it will never be competitive with fossil fuel and cannot meaningfully supplement our energy requirements except at unreasonable cost levels. Wind penetration in New York is reaching a point where we have to consider its value as an alternative to fossil-fired power plants.

The ultimate requirement for any electrical energy source is the capability to provide dispatchable (i.e., electric energy generating units that provide power when requested as opposed to intermittent power like wind and solar that only provides power when the wind is blowing or sun is shining) energy and there is a current need to invest in new electric generation facilities that must be evaluated against that criterion. Let me give a specific example why I think that wind energy fails this test.

There is a proposal to replace the existing coal-fired Dunkirk, NY generating units with a new combined cycle natural gas fired turbine with a capacity of 440 MW. It is not unreasonable to expect that new unit will be able to provide electricity 90% of the time (the capacity factor is 90%) so we expect that it can provide 90% of 440 MW 8760 hours per year for a total of 3,468,960 MWhr of dispatchable power. The facility can schedule maintenance activities when loads are projected to be low and easily replaceable by other sources of power so we can expect that it will be available when we need it.

There are individuals that will oppose this re-powering proposal because it will “enable” hydro-fracking natural gas development and propose replacing the facility with wind and solar energy. Those proponents of renewable power will present their comparison of costs as levelized cost per Mwh for similarly sized capacity. In other words they will propose 440 MW of wind or solar. If that approach is used then the cost is for all intents and purposes the same and maybe even cheaper for the renewable power.

However, what we really need when we repower a facility is 3,468,960 MWhr of dispatchable power when the new facility is on-line. The capacity factor for wind is around 30% so in order to produce the same amount of power customers would need to invest in 1320 MW of wind capacity. Assuming that those wind turbines are in the same general area as the existing power plant means that all the turbines would have the same pattern of windy and calm periods because the wide area driver of wind speed is low and high pressure systems that are hundreds of miles across. That means that customers also have to pay for storage of the wind and it is not unreasonable to assume that two thirds of the wind capacity would have to have storage capability.

As a result, using wind power to replace a new combined cycle unit will require three times as much installed capacity plus storage for around two thirds of the capacity. But it gets even worse. Dispatchable power will be available for the seasonal peak loads. Those are generally very hot or very cold periods caused by high pressure systems when the wind resource is even worse. The New York Independent System Operator assumes that wind energy capacity during those periods is only 20% so that means to completely replace dispatchable load you need five times as much wind capacity.

Unfortunately there is even another reason why wind is uneconomic. Dr. Paul Joskow's paper "Comparing the costs of intermittent and dispatchable electricity generating technologies" (<http://dspace.mit.edu/handle/1721.1/59468>) demonstrates that levelized cost comparison is a misleading metric because it fails to take into account the large variations in the market value of electricity. On a daily basis the highest value of electricity is during the day when the winds are light and the value is low at night when the winds are higher. Market value of electricity also varies by season. In the spring and fall, electricity demand and value is low, but it peaks in the high demand periods of the summer and winter. Again the wind resource is highest in the low demand periods and lowest in the peak demand periods. This means that the payments to cover the cost of wind development are not in synch with the highest value of electricity generated. Dr Joskow proposes that be taken into account when the costs are compared and it significantly de-values wind development.

When the total costs of wind energy are compared to the total costs of a dispatchable technology such as nuclear, gas combined cycle or coal, wind is a loser. Moreover, it will always be a loser because of the pattern of intermittent wind against electricity peak needs. In this economic climate, we cannot continue the charade that somehow someday wind can be competitive. Therefore, no RGGI money should be spent subsidizing existing wind technology.

The remainder of this document presents the comments I made on the CNY Sustainability Plan.

Vision CNY Regional Sustainability Plan Chapter 3: Energy (Note that these comments have been edited slightly from the version submitted)

The energy management plan goal is to “Minimize the environmental impact of the region’s energy use by increasing the efficiency of energy and fuel consumption, curtailing energy demand and increasing the use of local clean energy sources in place of fossil fuels.” Increasing energy efficiency and reducing energy demand are admirable goals that I support. If the goal of the plan truly is to increase the use of local clean energy sources then I think something truly significant is missing. Rather than relying on intermittent and diffuse renewable energy I recommend that the plan endorse the construction of Nine Mile 3. In the attached analysis I show that nuclear energy will be cheaper on GWhr produced value than solar energy even using conservative assumptions.

This chapter has two targets:

- Reduce regional energy consumption per capita, including electricity and fuels, by 40% (below 2010 levels) by 2030.
- Reduce regional GHG emissions per capita by 40% (below 2010 levels) by 2030.

In the absence of the data in the appendices I was not able to determine if those targets are realistic. I note that in quantitative studies done elsewhere the energy consumption per capita values chosen are much less aggressive. In the absence of large easily converted sources of GHG emissions I also suspect that the emissions target is ambitious.

The Energy Strategies are described as “a course to effectively and efficiently achieve the energy targets, the CNY region has articulated a series of strategies that will enable energy and related GHG emission reductions.” Those strategies include the following:

1. Accelerate adoption of energy efficiency measures by promoting access to information and incentives for customers at all income levels, for businesses of all sizes, and for difficult to reach property types.
2. Encourage municipalities to adopt policies, codes and regulations that stimulate increased investment in energy efficiency and renewable energy.
3. Accelerate energy improvements in major public facilities and infrastructure.
4. Promote deployment of renewable energy.
5. Accelerate deployment of distributed alternative and efficient energy resources.
6. Increase the use of demand response programs during peak load periods to better manage electricity supply and consumption.

7. Upgrade power transmission and distribution systems to encourage the development of renewable energy projects, energy storage and smart grid including electric- vehicle-to-grid technologies.
8. Educate and motivate behavior change which minimizes energy usage.
9. Foster the development of clean energy manufacturing enterprises.
10. Promote innovative projects for clean energy generation, storage and distribution such as hydrogen fuel cells and eco-industrial or agri-business parks that co-locate symbiotic industrial processes.

There is a significant disconnect in the draft text between these strategies and the targets. For example, there is no table showing what reduction in energy consumption per capita or GHG emissions per capita are expected for each strategy or recommendation. Without those numbers any ranking is pretty much worthless.

The first strategy addresses energy efficiency. I support sustainability efforts in this regard because they have multiple benefits. There is one nagging issue I have with these proposals in general however. It is not clear to me how much effort has been made to determine how much has already been done. My house has more than the recommended insulation, all new energy conserving windows and has been tested for leaks so it is not clear how much more energy efficiency I can realistically expect to get. I suggest that it might be worthwhile to inventory the efficiency status of Central New York by visual surveys of house icicles. Those houses with enormous icicles and snowless roofs probably would be great candidates for retrofits. The number of houses without icicles and snow covered roofs are ones where much less efficiency gains are possible.

The first recommendation for the first strategy is the CNY Climate Change Innovation Program. I recommend that be changed to the CNY Energy Efficiency Innovation Program with all references to energy measures retained and all references to reducing GHG emissions removed unless the authors can quantify direct benefits to GHG emission reductions.

Combined heat and power along with distributed generation are touted as great things in this documented. It should be kept in mind that there are also disadvantages to these approaches. As noted there are particular applications where they make sense but that also limits how much can be expected. Note that modern combined cycle gas turbines have much lower emission rates than these systems. Moreover, these systems are local and have more community based impacts. In the worst case, over reliance on this technology could set back the gains we have made in air quality improvements. Economically the plan is not all that much different than the co-generation plan in the early 1990's that turned out to be a disaster. It bankrupted Niagara

Mohawk, raised rates for consumers and note that very few of the facilities built in that time frame are still operating.

I suggest that the emphasis for the CNY Green Finance recommendation should be on farms. In particular anaerobic digesters have significant environmental benefits as well as energy savings potential. Note that here as elsewhere I strongly disagree that GHG reductions per dollar of capital invested is a useful metric.

I support the CNY Universal Green recommendation as proposed.

The second energy strategy proposes policies for municipalities. I agree that municipalities can take a number of actions that would not hamper economic growth such as: adopt higher energy standards for their own buildings and facilities; offer partial or complete local property tax exemption for energy efficiency investments; and offer incentives for energy-efficient private development through PILOT agreements. However, subsidizing inefficient local generation; purchasing “green energy” for their own use; and reducing or eliminating permit fees for the installation of clean energy technology cost municipalities money that is already in tight supply. There also is a suggestion to eliminate regulatory obstacles such as burdensome height restrictions for wind turbines that inhibit installation of renewable energy technologies. I suspect that most of those height restrictions are based on safety considerations and therefore should not be eliminated. Moreover there are health considerations that must be addressed with traditional wind turbine designs.

The third energy strategy illustrates where I think the emphasis of the document should be changed. CNY Green Streets and CNY Bright Future are good ideas. I think that the emphasis in the CNY Sustainable Infrastructure recommendation should be shifted away from GHG inventories and climate action plans to energy audits and development of energy efficiency action plans at major water and wastewater facilities. This is a particular example where the document suggests that significant savings are easily achieved but one could ask if it is so simple why hasn't it been done already. This could have consequences on the potential energy savings projected.

Promoting the deployment of renewable energy on a regional basis in this plan is a losing proposition. If it is viable it will be deployed and, frankly, there are some technologies that do not make much sense in Central New York given our climate. There is no rationale that can support expending public funds in this financial climate to “showcase” any technology.

Renewable energy cannot be dispatched so costs of any wind or solar project has to include the cost to provide storage so that the energy is available upon demand. However you can argue that solar PV is a viable peak shaving mechanism because it peaks during the day when energy use is large. Wind energy diurnal peak is at night when energy use is not as high. Also important is the seasonal or annual peak energy load which occurs when it is very hot or very cold. Those conditions are typically associated with high pressure systems. Again solar is available because high pressure systems have fewer clouds and again wind energy fails because high pressure systems have light winds. If you have to include renewables, please emphasize solar over wind because of those short-comings.

I suggest emphasizing solar over wind because it has some advantages. However, that should not be taken as a wholesale endorsement of solar. The recommendation, CNY Solar Ramp Up, ignores the fact that Central New York is cloudy if lucky and snowing if not much of the winter. The [NYSERDA New York Solar Study](#) states that the cost of achieving the statewide goal of 5,000 MW of solar PV in the State exceeds the benefits in the Base Case scenario. Central New York is notoriously cloudy and snowy in the winter so solar PV capability has to be lower here than in the rest of the State. The recommendation that solar PV has to be focused on highly visible property suggests that this is more for public relations than practical application. Despite the fact that solar can shave peak energy use the acknowledgment that we don't have a peak load problem further weakens any value to solar PV. It should be withdrawn completely. If you have to include solar, please emphasize solar thermal and passive over solar PV because of our climate.

The recommendation for Great Lakes Wind ignores the fact that NYPA withdrew all proposals for offshore wind energy due to local opposition. Off shore wind is significantly more expensive too. It should be withdrawn completely.

The recommendation for My Wind to install at least 100 MW of new combined "community based" or mid-scale wind energy capacity ignores the fact that those locations have much lower capacity potential. Local impacts will be greater too. Finally because these wind energy projects cannot survive without subsidies this recommendation should be withdrawn completely.

The recommendation Home Grown Energy to establish sufficient biomass feedstocks such as willow and switchgrass crops on underutilized agricultural lands in the region to supply at least 35 MW of power generation. This is an ambitious goal. This recommendation needs to be justified more fully.

The CNY Hydro recommendation is naïve. The fact is that all cost-effective viable hydro locations are very likely already in use. Moreover the licensing requirements for hydro facilities would most likely prevent new installations. Unless this can be justified more fully it should be withdrawn.

Energy Strategy #5 which proposes to accelerate deployment of distributed alternative and efficient energy resources correctly identifies the siting issues. A concentrated effort to identify locations where this technology might be viable is appropriate. However, planning the level or deployment proposed is ambitious. Moreover the suggestion that these projects need to be deployed at visible private and public sites in the region to increase penetration needs to be justified. If the technology is cost-effective the results will stand for themselves wherever they are installed.

The recommendation to install at least 100MW of new CHP plants, at centrally-located government facilities, large nursing homes, industrial facilities, and public schools ignores the potential disadvantages of CHP.

The recommendation for CNY Biomass to identify public projects – at schools or other government or institutional facilities - that can demonstrate the capability of biomass while also building a market for it ignores the constraints of biomass use. Unless properly designed a biomass facility could be a pollution problem. In any event biomass handling is more difficult than fossil fuel use. It would be more appropriate to encourage a single centrally located biomass generating unit that could be built with all the necessary controls.

The CNY Green Farms recommendation should be the first recommendation. As noted in the document the expanded use of bio-digesters on farms and dairies to handle organic waste has significant co-benefits. Digesters represent an effective way to use an on-site resource to produce energy while also diverting waste from landfill and minimizing water quality run-off impacts. Additionally, the bio-digester can produce organic fertilizer that can displace the need to buy commercially produced fertilizer products. That deployment should be encouraged as a high priority. On the other hand providing technical and financial assistance to ramp up deployment of wind power, and solar PV on farms and dairies is much more likely to be a financial drain. Those promotions should be excluded from the plan.

Without the quantitative data it is not clear that the CNY Geothermal recommendation makes cost-effective sense with limit resources.

The recommendation CNY Waste to Watts to implement an active methane recovery system including landfill gas to energy technology at the Cortland County landfill and a biogas recovery project at the Cortland County WWTP should receive support over any plans for solar PV (panel arrays or flexible covers) or wind power projects at every landfill and resource recovery facility in the region.

The CNY Green Districts recommendation should be limited to a single demonstration of a district or campus-wide “net zero” energy projects with a focus on infill, transit-oriented developments, business parks, and institutions of higher education. When that demonstration is completed it should be publicized that the public understands what is specifically proposed so that they can decide whether this is a recommendation that should be pursued further. Note that this is one of only two recommendations (CNY Green Streets is the other) that actually mentions short or long term goals.

The Near Westside Demonstration Project: should be supported. The emphasis should be on energy efficiency and passive green energy projects. Energy Strategy #6 proposes to increase the use of demand response programs during peak load periods to better manage electricity supply and consumption. The document notes that Central New York does not experience the kinds of problems related to peak energy demand as do regions downstate. As a result it is not clear whether this is appropriate given the financial constraints we face. The strategy notes that increased use of demand-response programs on peak load days can further help alleviate the need to bring GHG-intensive power supplies online. The irony of that statement is that wind energy cannot displace fossil fuel facilities for the high energy demand day peaks (because those peak days occur during light wind conditions). New York State must therefore pay for both fossil fuel replacement plants and wind energy to provide power on the high energy demand days. I do not think we can afford that and this plan should not contribute to that problem.

Energy Strategy #7 proposes to upgrade power transmission and distribution systems to encourage the development of renewable energy projects, energy storage and smart grid including electric- vehicle-to-grid technologies. The existing power transmission and distribution systems are aging and need replacement. Whether we can afford to do that and make upgrades for renewable energy should be addressed.

Energy Strategy #8 proposes to educate and motivate behavior change which minimizes energy usage. It is not clear how much more behavior change can be expected. Minimizing energy use has been a message for quite a while. I disagree completely with the CNY Energy Challenge. If the homeowner gets help reducing energy and costs no mini-grants are necessary. On the other

hand, the CNY Model Green Home recommendation would demonstrate strategies and technologies to achieve deep energy savings and be more likely to encourage investments.

Energy Strategy #9 would foster the development of clean energy manufacturing enterprises. Every similar plan in the world includes this as a goal and no one can object to the concept. However, it is not clear if there are any qualitative much less quantitative benefits of this strategy vis-à-vis the targets of this plan. Why is this included here?

Energy Strategy #10 proposes to promote innovative projects for clean energy generation, storage and distribution such as hydrogen fuel cells and eco-industrial or agri-business parks that co-locate symbiotic industrial processes. Subsidizing these projects at the expense of the recommendations that would more cost-effectively reduce energy is inappropriate given the current financial situation.

Roger Caiazza

Table 1: Analysis of CO2 Emissions and Potential "Savings" in Future Global Temperature and Global Sea Level Rise from a Complete Cessation of All CO2 Emissions

http://scienceandpublicpolicy.org/originals/state_by_state.html

RGGI Scenarios	CO2 Emissions Million Metric Tons	Percentage of Global Total	Days Until Total Emissions Subsumed by Global Growth		Temperature "Savings"		Sea-Level "Savings"		Assumptions
			Global Growth	China Growth	Deg C		(cm)		
					2050	2100	2050	2100	
RGGI 106 MMT cap	0.17	0.001	0.1	0.1	2.56E-06	5.30E-06	1.85E-05	5.55E-05	Reduction of 1.5 MMT over 9 years (2012-2020)
RGGI 101 MMT cap	1.22	0.004	0.5	0.9	1.88E-05	3.89E-05	1.36E-04	4.07E-04	Reduction of 11 MMT over 9 years (2012-2020)
RGGI 97 MMT cap	2.14	0.007	1.0	1.5	3.29E-05	6.83E-05	2.38E-04	7.14E-04	Reduction of 19.3 MMT over 9 years (2012-2020)
RGGI 91 MMT cap	3.11	0.010	1.4	2.2	4.78E-05	9.90E-05	3.45E-04	1.04E-03	Reduction of 28 MMT over 9 years (2012-2020)
RGGI - 2012	91.0	0.306	40.8	64.7	0.0014	0.0029	0.0101	0.0303	Reduce by amount of entire cap
RGGI - 2012	94.3	0.317	42.3	67.1	0.0014	0.0030	0.0105	0.0314	CAMD RGGI affected source total
CT - 2012	6.8	0.023	3.1	4.8	0.0001	0.0002	0.0008	0.0023	CAMD RGGI affected source total
DE - 2012	4.8	0.016	2.2	3.4	0.0001	0.0002	0.0005	0.0016	CAMD RGGI affected source total
MA - 2012	13.2	0.044	5.9	9.4	0.0002	0.0004	0.0015	0.0044	CAMD RGGI affected source total
MD - 2012	22.2	0.075	10.0	15.8	0.0003	0.0007	0.0025	0.0074	CAMD RGGI affected source total
ME - 2012	2.9	0.010	1.3	2.1	0.0000	0.0001	0.0003	0.0010	CAMD RGGI affected source total
NH - 2012	5.2	0.017	2.3	3.7	0.0001	0.0002	0.0006	0.0017	CAMD RGGI affected source total
NY - 2012	35.4	0.119	15.9	25.2	0.0005	0.0011	0.0039	0.0118	CAMD RGGI affected source total
RI - 2012	3.7	0.012	1.7	2.6	0.0001	0.0001	0.0004	0.0012	CAMD RGGI affected source total
VT - 2012	2.3	0.008	1.0	1.6	0.0000	0.0001	0.0003	0.0008	CAMD RGGI affected source total
CT	36.6	0.123	16.4	26.0	0.0006	0.0012	0.0041	0.0122	Assume entire state emissions stop in 2012
DE	11.7	0.039	5.2	8.3	0.0002	0.0004	0.0013	0.0039	Assume entire state emissions stop in 2012
MA	71.2	0.239	31.9	50.6	0.0011	0.0023	0.0079	0.0237	Assume entire state emissions stop in 2012
MD	71.6	0.240	32.1	50.9	0.0011	0.0023	0.0079	0.0238	Assume entire state emissions stop in 2012
ME	18.5	0.062	8.3	13.2	0.0003	0.0006	0.0021	0.0062	Assume entire state emissions stop in 2012
NH	17.3	0.058	7.8	12.3	0.0003	0.0006	0.0019	0.0058	Assume entire state emissions stop in 2012
NY	175.6	0.590	78.8	124.9	0.0027	0.0056	0.0195	0.0585	Assume entire state emissions stop in 2012
RI	11.2	0.038	5.0	8.0	0.0002	0.0004	0.0012	0.0037	Assume entire state emissions stop in 2012
VT	6.3	0.021	2.8	4.5	0.0001	0.0002	0.0007	0.0021	Assume entire state emissions stop in 2012
All RGGI States	420.0	1.411	188.4	298.7	0.0065	0.0134	0.0466	0.1399	Assume entire RGGI state emissions stop in 2013

Nine Mile 3 vs. New York Solar

The NYSERDA New York Solar Study describes the project and provides the report at <http://www.nysERDA.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/Solar-Study.aspx>. They summarize the study as follows:

On August 4, 2011, the Power New York Act of 2011 (the Act) was signed into law. Section 22 of the Act directed NYSERDA to conduct a Study on Increasing Generation from Photovoltaic Devices in New York (the Solar Study). While the current contribution of solar photovoltaic (PV) energy generation is small and the cost of the technology is at a premium compared with market electricity prices, the Act sought analysis of the benefits and costs of PV, acknowledging that costs are declining and noting the potential for PV energy generation to contribute to economic development and job creation in the State.

The Act directed NYSERDA to conduct, in consultation with the Department of Public Service, a study regarding policy options that could be used to achieve goals (the Goals) of 2,500 MW of installed capacity operating by 2020 and 5,000 MW operating by 2025. The Act called for NYSERDA to report to the Governor and the legislature on or before January 31, 2012 regarding the Solar Study's findings and recommendations. Specifically, the Act directed that the Solar Study should: 1) Identify administrative and policy options that could be used to achieve the Goals, 2) Estimate the per-megawatt cost of achieving increased generation from PV devices and the costs of achieving the Goals using the options identified in the analysis, 3) Analyze the net economic and job creation benefits of achieving the Goals using each of the options identified in the analysis, and 4) Conduct an analysis of the environmental benefits of achieving the Goals using the options identified in the analysis.

Table 2 adapts an analysis (available at <http://nuclearfissionary.com/2010/04/02/comparing-energy-costs-of-nuclear-coal-gas-wind-and-solar/.019>) that compares energy costs of different types of power generating. Nine Mile 3 parameters are based on a Wikipedia article (http://en.wikipedia.org/wiki/Nine_Mile_Point_Nuclear_Generating_Station#Unit_3) and the costs for the under construction Georgia Power – Southern Company Vogtle 3 & 4 nuclear units. The total construction costs were scaled by the MW capacity of Nine Mile 3 and those units. The operational lifetime and capacity factor are based on information from the NYSERDA report. Note that the original assumed capacity factor of 15% degrades 0.5% per year for an average of 14.1% capacity over 25 years. The NYSERDA report notes that base case cost (\$ per

kWhr) is \$2,500 and in their low cost scenario is \$1,400. I could not find an equivalent cost for their high cost scenario so I used the cost in the RGGI reference case modeling analysis.

The results compare three scenarios of solar and nuclear costs. Importantly the total energy generated by the nuclear units is over 3 times as much as the energy from the New York Solar program. The only numbers that are close are the most optimistic solar scenario against the most pessimistic nuclear scenario and nuclear is still cheaper. In the middle range nuclear and the base case solar costs of solar are nearly double the nuclear cost of energy produced.

For Central New York almost all the economic value would accrue to our region for the nuclear case. New York Solar is a state-wide program. As a result, I recommend that the draft add a recommendation to encourage the construction of Nine Mile 3.

On March 27, 2013 there was a relevant post on this topic (<http://www.masterresource.org/2013/03/vogtle-nuclear-more-overruns/>) that should be included for full disclosure. Specifically the post criticizes the funding and cost-over runs of the Georgia Power – Southern Company Vogtle 3 & 4 nuclear units construction project. For this analysis the mid-range estimate has been modified to use the latest estimated cost. I have no argument against the author's point that this project that is all but financially insulated from its own failure so cost over-runs are inevitable. However, I do believe that the New York Solar program would suffer from the same problem.

Table 2: Comparison of New York Solar and Nine Mile 3

Scenario	RGGI Ref. Case	Base Case New York Solar	Low Cost New York Solar	Low Cost Nine Mile 3	Mid Cost Nine Mile 3	High Cost Nine Mile 3
MW	5000	5000	5000	1,600	1,600	1,600
Estimated Construction Cost	\$23,000,000,000	\$12,500,000,000	\$7,000,000,000	\$6,956,521,739	\$11,130,434,783	\$12,521,739,130
Useful life (years)	25	25	25	40	40	40
Capacity factor	14.1%	14.1%	14.1%	91.8%	91.8%	91.8%
Total kWh produced over useful life	154,395,000,000	154,395,000,000	154,395,000,000	514,667,520,000	514,667,520,000	514,667,520,000
Construction cost per kWh	\$0.149	\$0.081	\$0.045	\$0.014	\$0.022	\$0.024
Production costs per kWh (incl fuel)	\$0.000	\$0.000	\$0.000	\$0.019	\$0.019	\$0.019
Decommissioning costs per kWh (nuclear only)	\$0.000	\$0.000	\$0.000	\$0.002	\$0.002	\$0.002
Total cost per kWh	\$0.149	\$0.081	\$0.045	\$0.034	\$0.042	\$0.044