

# Energy Efficiency Portfolio Standard (EEPS-2) Program

Quarterly Report to the Public Service Commission  
Quarter Ending September 30, 2018

Final Report | December 2018

## **NYSERDA's Promise to New Yorkers:**

NYSERDA provides resources, expertise, and objective information so New Yorkers can make confident, informed energy decisions.

### **Mission Statement:**

Advance innovative energy solutions in ways that improve New York's economy and environment.

### **Vision Statement:**

Serve as a catalyst – advancing energy innovation, technology, and investment; transforming New York's economy; and empowering people to choose clean and efficient energy as part of their everyday lives.



**Energy Efficiency Portfolio Standard  
(EEPS-2) Program**  
**Quarterly Report to the Public Service Commission**  
**Quarter Ending September 30, 2018**

*Final Report*

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# 1 Introduction

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This quarterly report reflects progress on Energy Efficiency Portfolio Standard (EEPS-2) Program evaluation activities administered by the New York State Energy Research and Development Authority (NYSERDA). This report contains the anticipated schedule and status of current and upcoming evaluation studies, summaries of recently completed evaluations, and the status of evaluation recommendations through September 30, 2018. Information contained within this report corresponds with the guidance received from the New York State Department of Public Service (DPS) and has been discussed with the Evaluation Advisory Group in July 2012 and the E2 Working Group in March 2014.

## **2 Evaluation Reports Completed**

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NYSERDA completed the Industry & Process Efficiency impact evaluation report in the third quarter of 2018; a summary of the evaluation is provided in the appendix of this report.

### 3 Evaluation Status Update

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Tables 3-1 and 3-2 provide the anticipated schedule and status of current and upcoming impact, process, and market evaluation activities by program. As applicable, table notes further clarify information about study timing. Planned evaluation projects and timing may change based on input from stakeholders, the EEPS-2 evaluation review, and program progress. Likewise, evaluation project schedules are subject to change based on progress in administering the evaluation studies themselves. Future quarterly reports will highlight any timeline revisions. Timeline revisions made this quarter are designated by cell shading—PY denotes program year and Q denotes quarter.



**Table 3-1. Impact Evaluation Schedule and Status**

EEPS Program	Impact Evaluation Schedule					
	Workplan Submittal	Project Kickoff	Data Collection Complete	Draft Report	Final Report	Notes
Industrial & Process Efficiency	Completed	Completed	Completed	Completed	Completed	Report Finalized
Existing Facilities	Completed	TBD	TBD	TBD	TBD	A joint Existing Facilities, Multifamily Performance, and New Construction EEPS-2 closeout Impact Evaluation plan is in development.
Agriculture	N/A	N/A	N/A	N/A	N/A	No further evaluations planned
New Construction	TBD	TBD	TBD	TBD	TBD	A joint Existing Facilities, Multifamily Performance, and New Construction EEPS-2 closeout Impact Evaluation plan is in development.
Agriculture Disaster	Completed	Completed	Completed	Completed	Completed	Program closed. No further evaluations planned.
FlexTech	Completed	Completed	Q3 2019	Q4 2019	Q4 2019	EEPS-2 closeout Impact Evaluation Measure Adoption Rate draft report in development.
Commercial Existing Buildings Non-Participant Spillover Study	Completed	Completed	Completed	Completed	Completed	No future evaluations planned.
Multifamily Performance Program	Completed	TBD	TBD	TBD	TBD	A joint Existing Facilities, Multifamily Performance, and New Construction EEPS-2 closeout Impact Evaluation plan is in development.

**Table 3-1 continued**

EEPS Program	Impact Evaluation Schedule					
	Workplan Submittal	Project Kick-off	Data Collection Complete	Draft Report	Final Report	Notes
Point-of-Sale Lighting	Completed	Completed	Completed	Completed	Completed	Program closed with no further evaluations planned.
EmPower New York Closeout evaluation	Completed	Completed	Completed	Q3 2019	Q3 2019	EEPS-2 closeout Impact Evaluation is combined with the HPwES closeout evaluation. Evaluation is underway with work expected to be completed by Q3 2019.
Home Performance with ENERGY STAR® Closeout evaluation	Completed	Completed	Completed	Q3 2019	Q3 2019	EEPS-2 closeout Impact Evaluation is combined with the EmPower closeout evaluation. Evaluation is underway with work expected to be completed by Q3 2019.
New York ENERGY STAR® Certified Homes	N/A	N/A	N/A	N/A	N/A	No further evaluations planned.

\* TBD indicates that final plans for EEPS-2 closeout evaluation are under development at this time.

**Table 3-2. Process and Market Evaluation Schedule and Status**

EEPS Program	Process and Market Evaluation Schedule					
	Workplan Submittal	Project Kick-off	Data Collection Complete	Draft Report	Final Report	Notes
Existing Facilities	Completed	Completed	Completed	Completed	Completed	Future Market Evaluation plans are defined within NYSERDA's Clean Energy Fund (CEF) Investment Plan, both in the Market Characterization and Design Chapter (MCDC) and other sector-specific chapters.
Agriculture	n/a	n/a	n/a	n/a	n/a	Future Market Evaluation plans are defined within NYSERDA's CEF Investment Plan.
New Construction	Completed	Completed	Completed	Completed	Completed	Future Market Evaluation plans are defined within NYSERDA's CEF Investment Plan.
Agriculture Disaster	Completed	Completed	Completed	Completed	Completed	Program closed with no further evaluations planned.
FlexTech	Completed	Completed	Completed	Completed	Completed	Future Market Evaluation plans are defined within NYSERDA's CEF Investment Plan.
Multifamily Performance Program	Completed	Completed	Completed	Completed	Completed	Future Market Evaluation plans are defined within NYSERDA's CEF Investment Plan.
Point-of-Sale Lighting	Completed	Completed	Completed	Completed	Completed	Program closed with no future evaluations planned.

**Table 3-2 continue**

EEPS Program	Process and Market Evaluation Schedule					
	Workplan Submittal	Project Kick-off	Data Collection Complete	Draft Report	Final Report	Notes
EmPower New York	Completed	Completed	Completed	Completed	Completed	Future Market Evaluation plans for Low- to Moderate-Income are defined within NYSERDA's CEF Investment Plan: MCDC.
Home Performance with ENERGY STAR®	Completed	Completed	Completed	Completed	Completed	Future Market Evaluation plans are defined within NYSERDA's CEF Investment Plan.
New York ENERGY STAR® Certified Homes	n/a	n/a	n/a	n/a	n/a	No future evaluation plans in this area.
C&I Natural Gas Market Characterization	Completed	Completed	Completed	Completed	Completed	No future evaluation plans in this area.

### 3.1 Recommendation Tracking

Recommendations generated from NYSERDA evaluation studies are tallied in Table 3-3 and are categorized as follows:

- Total number of recommendations made to date:<sup>1</sup> cumulative number of recommendations contained in NYSERDA final evaluation reports.
- Total number of recommendations implemented to date: cumulative number of recommendations contained in NYSERDA final evaluation reports that have been implemented and incorporated into programs.
- Total number of recommendations rejected to date: cumulative number of recommendations contained in NYSERDA final evaluation reports that have been rejected.
- Total number of recommendations currently in progress: cumulative number of recommendations contained in NYSERDA final evaluation reports that are still under consideration.

**Table 3-3. Recommendation Tracking**

<b>Total Number of Recommendations</b>	<b>Through September 30, 2018</b>
Made to date	243
Implemented to date	201
Rejected to date	39
Currently in progress	3

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<sup>1</sup> The total number of recommendations made to date only includes recommendations made in final (not interim) evaluation reports.

## **4 Other Information**

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Per the DPS reporting guidance, this section provides an opportunity to report significant activities or events not already reflected in the report. There are no other significant activities requiring explanation for the third quarter of 2018.

## **Appendix A: Completed Evaluation Summaries**

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This appendix contains a high-level summary of each recently completed evaluation study. The full report on each evaluation study is available on the NYSERDA website. The Industrial & Process Efficiency impact evaluation report was finalized in the third quarter of 2018.

# NYSERDA Industrial and Process Efficiency Program Impact Evaluation (2014-2017) Impact Evaluation Summary

*Evaluation Conducted by:* Energy Resource Solutions (ERS), the principal consulting firm, and ADM Associates, the supplemental consulting firm, September 2018.

## PROGRAM SUMMARY

The Industrial & Process Efficiency (IPE) program is a mature industrial resource acquisition program that has been in place since 2009, helping to fund a large quantity of custom projects covering many unique and varied measure types. NYSERDA’s IPE program aims to help manufacturers, data centers, and other production facilities increase output and improve processing as efficiently as possible. NYSERDA calculates financial support for these projects on first-year annual energy savings, and, when appropriate, accounts for reductions in energy intensity (the energy used per unit of production or workload). The projects included in the evaluation were initiated through NYSERDA’s Energy Efficiency Portfolio Standard (EEPS-2)<sup>2</sup> and Clean Energy Fund (CEF)<sup>3</sup> Resource Acquisition Transition chapter funding.

## EVALUATION OBJECTIVE AND HIGH-LEVEL FINDINGS

The objective of this impact evaluation was to estimate the gross savings for the program, which includes the energy savings for electricity and energy savings for natural gas. The evaluated savings are based on the rigorous project-specific measurement and Verification (M&V) and calculations of representative realization rates (RRs) from a sample of projects from the population. The sample is designed to provide program gross energy savings with 10% relative precision at 90% confidence for each of three project types (process, data center, and non-process). The evaluation objectives and methods are summarized in Table 1-1.

**Table 1-1. IPE Program Gross Impact Evaluation Objectives and Methods**

Objective	Purpose	Method
Estimate gross energy impacts	To establish annualized first-year evaluated gross energy savings based on electric (kWh) and fuel savings (MMBtu) at the customer site.	On-site M&V using on-site logging, custom engineering assessments, and/or billing analysis of a representative sample of program participants.

## DETAILED IMPACT EVALUATION FINDINGS

The realization rate (RR) for the electric energy savings component of the Program is 0.86. Table 1-2 provides the results of the evaluation effort for electric savings.

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<sup>2</sup> Department of Public Service, Filing #4779 Case No. 07-M-0458, 2016

<sup>3</sup> CEF Quarterly Report, Case 14M0094, 2016



**Table 1-2. Electric Savings Overall (MWh) and by Facility Type for EEPS-2 and CEF Transition Funded Projects**

<b>Metric</b>	<b>All Electric Projects</b>	<b>Industrial Processes</b>	<b>Data Center Processes</b>	<b>Industrial and Data Center Non-Processes</b>
Sample size	55	17	16	22
Population size	188	39	29	135
Weighted tracking savings, MWh	171,336.5	23,712.6	26,673.4	120,950.4
Weighted evaluated savings, MWh	147,984.8	20,353.7	29,069.7	98,561.4
Total reported savings, MWh	167,782.9	16,434.7	22,537.4	128,810.8
Evaluated gross savings, MWh	144,915.6	14,106.7	24,562.1	104,966.8
Weighted RR	86%	86%	109%	81%
Standard error	3.9%	3.5%	3.4%	5.4%
Relative precision at 90% confidence	7.4%	6.7%	5.2%	11.0%
Standard deviation of the RR	0.38	0.38	0.36	0.35
Error ratio	0.34	0.31	0.28	0.35
% of evaluated gross savings	100%	14%	20%	67%

While the sample was designed to achieve 90/10 confidence and relative precision, the non-process group achieved a relative precision of 11%. This is driven by the greater-than-anticipated variability in RR and the lower weighted RR for this group. Further detail on sample design and weighting is included here in appendix A.

The RR for the natural gas savings component of the program is 0.91. Table 1-3 provides the results of the evaluation effort for natural gas savings.

**Table 1-3. Natural Gas Savings (MMBtu) Overall and by Facility Type for EEPS-2 and CEF Transition Funded Projects**

<b>Metric</b>	<b>All Natural Gas Projects</b>	<b>Industrial Processes</b>	<b>Industrial and Data Center Non-Processes</b>
Sample size	30	16	14
Population size	55	27	28
Weighted tracking savings, MMBtu	701,646	475,182	226,464
Weighted evaluated savings, MMBtu	635,861	439,768	196,093
Total reported savings, MMBtu	701,441	468,752	232,689
Evaluated gross savings	635,675	433,817	201,483
Weighted RR	91%	93%	87%
Standard error	0.8%	1.1%	1.1%
Relative precision	1.5%	2.0%	2.1%
Standard deviation of the RR	0.35	0.33	0.39
Error ratio	0.42	0.47	0.38
% of evaluated gross savings	100%	69%	31%

## EVALUATION METHODS AND SAMPLING

The Impact Evaluation Team analyzed the evaluation findings in terms of whether or not Program M&V had been performed. The IPE program requires that M&V be performed by the applicant for projects whose savings exceed a certain threshold.<sup>4</sup> Table 1-4 presents the populations and target samples.

**Table 1-4. Populations and Target Samples by Upper-Level Strata for EEPS-2 and CEF Transition Funded Projects**

Metric	Total		Electric			Natural Gas	
	Total MMBtu	Total kWh	Industrial Processes	Data Center Processes	Industrial and Data Center Non-Processes	Industrial Processes	Industrial and Data Center Non-Processes
Sample size	30	55	17	16	22	16	14
Population size	55	188	39	29	135	27	28
Target relative precision	10%	10%	10%	10%	10%	10%	10%
Target relative precision	0.5	0.3	0.3	0.3	0.3	0.5	0.5
% of total reported savings	100%	100%	9%	13%	77%	67%	33%

### *Lower-Level Stratification*

The lower-level stratification variable is project size. Size categories were based on the magnitude of project savings for electric or natural gas savings projects, respectively. Four size categories were defined per upper-level stratification category. Cutoffs were established using the method described in the *2004 California Evaluation Framework*.<sup>5</sup>

## PROGRAM FINDINGS

A review of the differences between the program-reported and evaluated savings demonstrates some findings that are valuable for program improvement.

- The majority of differences relating to savings occurred at Measure Performance, after installation of the project. For projects that received Program M&V, many of these differences are driven by changes that took place after Program M&V (e.g., a different load profile that represents a new typical operation) and could not have been predicted by the program. The Application Review category also shows significant differences, and these should be the target for improvement in the future, as they are attributable to issues in the savings calculations that were likely preventable.
- The differences are dispersed among numerous categories, and while certain categories represent a larger portion of the differences, it is important to note that no systemic differences were found.

<sup>4</sup> See Appendix C for Program M&V thresholds.

<sup>5</sup> TecMarket Works, et al. *The California Evaluation Framework*. Project Number: K2033910. Prepared for the California Public Utilities Commission and the Project Advisory Group. June, 2004. Pages 327 to 339 and 361 to 384. <http://www.cpuc.ca.gov/NR/rdonlyres/F14E59AF-25B9-45CE-8B3C-D010C761BE8D/0/CAEvaluationFramework.pdf>

Differences, even within a given category, were diverse in nature and reflect the unique nature of the projects and the TRs approach to estimating energy savings.

- A small number of high-impact differences occurred in the electric sample, and seven of these 10 are related to supercomputer measures. Supercomputer sites trend toward very large savings, representing 40% of the sampled energy savings in this study. A key finding related to these projects is related to the investigation of the baseline efficiency for a given supercomputer. All cases were partially or entirely capacity expansion projects, so the baseline case includes a theoretical “standard efficiency” supercomputer operating at the same loads. The program established a protocol for calculating the baseline efficiency of supercomputers in 2013 (and later revised slightly in 2018), which was thoroughly reviewed as a part of this evaluation. This baseline determination document is available by request from NYSERDA.

## Recommendations

- **Calculate and track demand impact in accordance with the New York State Technical Resource Manual.** Going forward, it is recommended that all IPE projects with a component of electrical energy savings have the peak demand impacts calculated in accordance with the New York Technical Resource Manual (NYTM). This will allow the program to track demand impact values that have been calculated in a uniform manner and within the guidelines of the Department of Public Service and to claim these values in regulatory reporting. Even if not a key metric right now, demand and energy historically have cycled back and forth in terms of relative importance. Grid resiliency and related concerns are gaining visibility. It may be prudent and worth the relatively small marginal effort to estimate demand savings at the same time and with similar rigor as energy savings.
- **Leverage all available site-specific data during the EA phase.** Impactful differences were associated with the EA phase of project review. These differences ranged from the use of non-site-specific data, a misuse or non-use of trend data, and errors in calculations. It is recommended that Technical Reviewers leverage all available site-specific data and review their assumptions with the site to ensure their understanding of the project is in line with the participant’s intent. Many of the differences were preventable, and this recommendation should not incur additional cost to the technical reviewers or the program.
- **Continue with Program M&V and baseline characterization procedures.** The IPE program has achieved strong realization rates for both electric and natural gas savings for the past two evaluations. These results are largely attributable to the rigorous M&V requirements of the program and to the standardized and detailed methodology<sup>6</sup> that is used to characterize the baseline alternative considered in the individual project savings calculations. The program staff is experienced and successfully leverage these tools, as evidenced by the strong RRs. The Impact Evaluation Team recommends that the IPE program continue with Program M&V and the use of a standardized baseline characterization protocol, as they represent best practices in the implementation of an industrial program, particularly one that considers a wide variety of large and complex custom measures.

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<sup>6</sup> Available by request from NYSERDA.



NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean-energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975.

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