Energy Efficiency Portfolio Standard (EEPS-2) Program

Quarterly Report to the Public Service Commission

Quarter Ending March 31, 2019

Final Report | July 2019

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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.

NYSERDA Record of Revision

Document Title
Energy Efficiency Portfolio Standard (EEPS-2) Program Quarterly Report to the Public Service Commission Quarter Ending March 31, 2019 June 2019

Revision Date	Description of Changes	Revision on Page(s)
	Original Issue	Original Issue

Energy Efficiency Portfolio Standard (EEPS-2) Program

Quarterly Report to the Public Service Commission
Quarter Ending March 31, 2019

Final Report

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June 2019

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1 Introduction

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). The 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 March 31, 2019. Information contained within the 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

The Flex Tech and Local Law 87 Impact evaluation was completed in the first quarter of 2019.

3 Evaluation Status Update

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	Q2 2019	Q4 2019	Q4 2019	Q4 2019	A joint Existing Facilities, Multifamily Performance, and New Construction EEPS-2 closeout Impact Evaluation plan is underway.
Agriculture	N/A	N/A	N/A	N/A	N/A	No further evaluations planned.
New Construction	Completed	Q2 2019	Q4 2019	Q4 2019	Q4 2019	A joint Existing Facilities, Multifamily Performance, and New Construction EEPS-2 closeout Impact Evaluation plan is underway.
Agriculture Disaster	Completed	Completed	Completed	Completed	Completed	Program closed. No further evaluations planned.
FlexTech	Completed	Completed	Completed	Completed	Completed	Report Finalized
Commercial Existing Buildings Non-Participant Spillover Study	Completed	Completed	Completed	Completed	Completed	No future evaluations planned.
Multifamily Performance Program	Completed	Q2 2019	Q4 2019	Q4 2019	Q4 2019	A joint Existing Facilities, Multifamily Performance, and New Construction EEPS-2 closeout Impact Evaluation plan is underway.

Table 3-1 continued

EEPS Program	Impact Evaluation Schedule					
	Workplan Submittal	**Project Kickoff**	**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 Kickoff	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 continued

EEPS Program	Process and Market Evaluation Schedule					
	Workplan Submittal	**Project Kickoff**	**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 households 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 categorized as follows:

- Total number of recommendations made to date:[1] 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

Total Number of Recommendations	Through March 31, 2019
Made to date	247
Implemented to date	206
Rejected to date	41
Currently in progress	0

[1] The total number of recommendations made to date only includes recommendations made in final (not interim) evaluation reports.

4 Other Information

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 first quarter of 2019.

Appendix A: Completed Evaluation Summaries

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 Flex Tech and Local Law 87 impact evaluation report was finalized in the first quarter of 2019.

NYSERDA FlexTech and Local Law 87
Impact Evaluation Plan (2010-2016): Evaluation Summary
Evaluation Conducted by: DNVGL, March 2019

PROGRAM SUMMARY

The impact evaluation of the FlexTech Program ('Program') covers studies contracted in the EEPS-1/EEPS-2 funding timeframe and completed in program years 2010 through 2016. In addition to the evaluation of the Program overall, this evaluation plan will separately present the impact of projects with measures installed in response to New York City Local Law 87 (LL87).

The Program offers cost-sharing, up to 50%, up to $1,000,000 per technical assistance study or projects contracted in the EEPS-1/EEPS-2 funding timeframe.

New York City Local Law 87[2]

LL87 mandates buildings more than 50,000 gross square feet undergo periodic energy audit and retro-commissioning activities, as part of the Greener, Greater Buildings Plan (GGBP). The intent of this law is to inform building owners of their energy consumption through energy audits, which are surveys and analyses of energy use, and retro-commissioning, the process of ensuring correct equipment installation and performance.

In addition to benchmarking annual energy and water consumption, energy audits and retro-commissioning will give building owners a much more robust understanding of their buildings' performance, with the goal of eventually shifting the market towards increasingly efficient, high-performing buildings.

In summary, LL87's energy audit and retro-commissioning process requires the following:

1. Determine if a building needs to comply and what year it is due.
2. Conduct an energy audit and retro-commissioning of base building systems and complete an Energy Efficiency Report (EER) electronically.
3. Submit the EER once every 10 years to the City by December 31.

[2] (NYC Mayor's Office of Sustainability, 2017)

PURPOSE STATEMENT

This evaluation quantifies the Measure Adoption Rate (MAR) of FlexTech projects and for measures installed in response to LL87. The MAR quantifies the percentage of study-recommended savings that customers chose to adopt.

DETAILED IMPACT EVALUATION FINDINGS

This section provides quantitative results of the data collection and analysis activities. This report includes self-reported measure adoption rate results.

Data Collection Results and Observations

The achieved MAR survey sample is shown in Table 4. To define the MAR curve with relative precisions of 85/15 for the long-term adoption rate for each program, the data collection targeted a census of all customers receiving studies through the program during the EEPS-1 and EEPS-2 funding years.

Table 4. Data Collection Results

Program	Contacts	Projects	Sites	Measures
FlexTech	104	120	175	630
Local Law 87	45	49	58	266
Total	**149**	**169**	**233**	**896**

Analysis Results and Observations

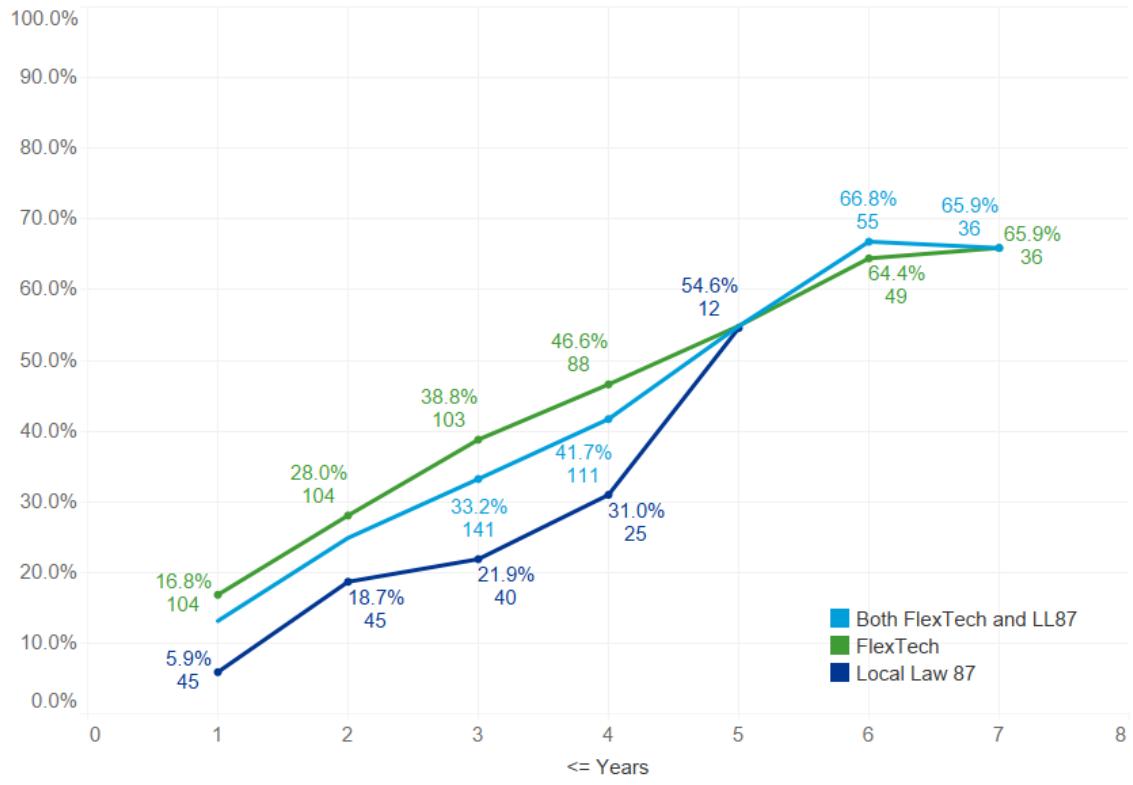
The self-reported measure adoption curves are shown in Figure 1. The figure shows the cumulative measure adoption rate for each year after measure recommendation in terms of percent of recommended combined energy (MMBTU) savings that were installed.[3] The numbers under the percentage is the number of customers represented in the percentage.

The curves show that for both programs by year five, more than half of the recommended savings have been adopted, and by year seven, almost 70% of savings are adopted. The curves for FlexTech and Local

[3] Combined energy is the total energy savings recommended/installed. The units used were end-use MMBTU, with electric energy converted to MMBTU using a 3,412 btu/kwh conversion factor, consistent with the approach taken in the NY 2025 EE target setting effort (see: nyserda.ny.gov/About/Publications/New-Efficiency)

Law 87 are similar, with no statistically significant differences through the five years with sufficient sample for LL87.

Figure 1. Self-Reported Combined Energy (MMBTU) Measure Adoption Curves by Program*



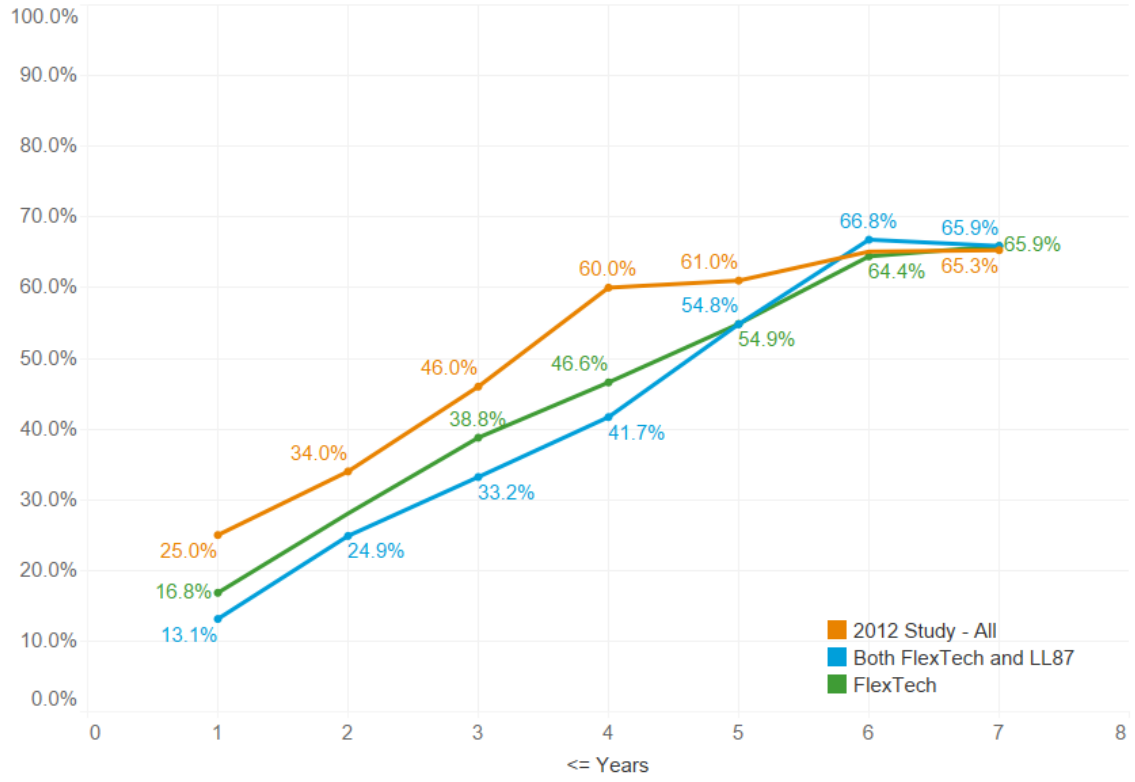
*In year >=6, the "Both FlexTech and LL87" result includes five customers from LL87. There were not enough customers represented to show LL87 as a standalone result for year >=6 (<9 customers).

Figure 2 shows the cumulative MAR curve found through this evaluation compared to the curve found in the 2012 evaluation (orange). The long-term FlexTech MAR[4] found through this study is consistent with 2012 at 65%. Based on the precisions found in the current evaluation, none of the self-reported MAR estimates from this evaluation are statistically different from the previous evaluation after and including year five.

[4] The year-by-year MAR changes based on a number of factors. However, over the course of evaluations, it has been observed that the MAR tends to plateau at around 65%, with only small incremental improvements in subsequent years. The point at which the MAR tends to peak or plateau has been referred to as the 'long term MAR'.

The 2012 evaluation found greater MAR in years one through four, and some of these differences are likely statistically significant. However, because the 2012 evaluation did not provide precisions for the MAR found in each year, DNV GL cannot say with certainty whether any of estimates for years one through four are statistically different between the two studies. The differences may be a function of economic climate. The 2012 study looked at the MAR for audits that were mostly completed prior to the 2008 recession (audits completed in 2003–2009), while the current study looked at audits funded after the recession (EEPS-1/EEPS-2 funding years 2009–2016). A slower uptake in the years following the recession might be expected.

Figure 2. Combined Energy (MMBTU) MAR Curve comparison to 2012 FlexTech Evaluation[5]



[5] MMBTU is based on a site conversion factor of 3,412 btu/kwh for electric measures to be consistent with the approach taken in the recent 2025 EE target setting effort. See nyserda.ny.gov/About/Publications/New-Efficiency). Note that past FlexTech evaluations used a source conversion factor.

EVALUATION METHODS AND SAMPLING

The key objectives of the MAR survey are to estimate MAR by year, with a 15% confidence interval at the 85% probability level. This is to ensure the comparisons to the MAR curve from the previous study will be sound. Assuming a relatively high coefficient of variation (cv) of 0.7, it is estimated that 40 to 45 observations per year will be needed to meet this requirement, for a total sample size of 300.

FlexTech projects typically include measure recommendations for multiple sites (e.g., chain stores and school districts) that historically have been difficult to disaggregate; therefore, past MAR studies have designated the project as the primary sampling unit. For this study a census of participants was attempted with subsampling of projects, sites, and measures within participants who had more than six sites or more than 20 measures. Weights were developed for each of the levels within a participant and an additional participant level weight was calculated to adjust for non-response. The combination of these weights was used to expand results to the population. The analysis was conducted using ratio estimation, with MAR calculated as the weighted sum of self-reported installed savings divided by the weighted sum of recommended savings across all sampled measures for each year.

Table 2. Methodology for Primary Data Collection

Research Approach	Target Group/ Population	Estimated Population Size (sites)	Estimated Population Size (projects)	Estimated Sample Size	Expected Sampling Confidence & Precision
MAR	FlexTech projects excluding LL87	<5200	<550	Maximum 23 per year	85/15 per year
	LL87 projects	<2360	<180	Maximum 68 per year	90/10 per year

PROGRAM FINDINGS

1. For both programs by year five, more than half of the recommended savings have been adopted, and by year seven, almost 70% of savings are adopted. The curves for FlexTech and Local Law 87 are similar, with no statistically significant differences through the five years with sufficient sample for LL87.
2. The long-term FlexTech MAR found through this study is consistent with 2012 findings at 65%. Based on the precisions found in the current evaluation, none of the self-reported MAR estimates from this evaluation are statistically different from the previous evaluation after and including year five.

RECOMMENDATIONS

DNV GL's five key recommendations from this impact evaluation are provided in Table 3.

Table 5. Recommendations

#	Finding	Recommendation
1	Measure descriptions were not always understandable to the customer, which contributed to no or partial response.	Consider providing customers both a detailed technical description as well as a more lay person description of the measure. This will improve future evaluability.
2	Many contacts had moved on or changed email addresses and phone numbers by the time of evaluation.	Consider additional follow up to the program. This will help keep contact information up to date and may increase MAR in both the short and long term.
3	A handful of customers with multiple sites and measures, indicated the survey appeared daunting when they first looked at it.	Consider asking about less measures per customer and/or offering an incentive for completion.
4	The evaluation sent audit recommendation forms to customers who recalled the audit but had forgotten what was recommended.	Consider making the completed audit forms accessible to customers online through a web-portal. This access could be used to drive (a small amount of) traffic on related web assets such as online stores dedicated to energy-efficient products or other NYSERDA priorities.
5	Despite attempting a census via online survey and through phone survey approaches, targeted precisions were not achieved.	It is possible that response rates could be improved by • sending paper letters in addition to emails • resending an online link to the audit results in the recruitment email • calling concurrent with the online survey launch • offering an incentive for participating in the survey

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EEA-EEPS2-2019-Q1-r-1-v1
7/19