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NYSERDA Technology and Market Development Program

Semiannual Report through June 30, 2015

Final Report

August 2015
Revised October 2015

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.

NYSERDA Record of Revision

Document Title
NYSERDA Technology and Market Development Program Semiannual Report through June 30, 2015 August 31, 2015 Revised October 2015

Revision Date	Description of Changes	Revision on Page(s)
8/31/2015	Original Issue	Original Issue
10/23/2015	Budget for Emerging Technology/Accelerated Commercialization was over reported in table 2-3 and 3-9. Metrics were under-reported in several programs in tables 3-2, 3-3, 3-4, 3-5, 3-6, 3-11, 3-18, 3-23.	Pgs. 14, 18, 20, 22, 24, 26, 32, 39, 55, 56, 62

NYSERDA Technology and Market Development Program

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Final Report

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Albany, NY

October 23, 2015

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1 Introduction

1.1 Public Policy Context

The System Benefits Charge (SBC) Portfolio was established by Order of the New York State Public Service Commission (PSC) in 1998. The PSC established the ratepayer-supported SBC and designated the New York State Energy Research and Development Authority (NYSERDA) as the Administrator of the program. The program was re-authorized in 2001 and again in 2006 for five-year terms. For the period 2006 through 2011, program funding was $154 million per year, of which approximately half focused on energy efficiency resource acquisition/deployment activities and half on technology and market development activities.

In its September 20, 2010, petition to the PSC to continue the SBC, NYSERDA proposed some modifications to the program, including consolidating and transferring the resource acquisition and deployment activities within the Energy Efficiency Portfolio Standard (EEPS) Program and requesting to extend the current SBC Program by six months to coincide with the December 31, 2011, conclusion of the current EEPS Program. The petition also summarized the history and accomplishments of the SBC Program and described a proposed Technology and Market Development (T&MD) portfolio to serve as the next iteration of the SBC Program.

The PSC issued a Notice of Proposed Rulemaking on October 6, 2010 (Case 10-M-0457) and asked for comments on NYSERDA's proposal to be submitted by November 22, 2010. NYSERDA and the Department of Public Service (DPS) also conducted a Technical Conference on November 4, 2010, to provide stakeholders and interested parties with more information on the potential uses of SBC funds for the T&MD Program. The PSC issued an Order on December 30, 2010, which "reaffirmed its high level commitment to the continuation of SBC programs and to the important State policy goals they support."[1] The December 30, 2010 Order continued SBC funding through the end of 2011, but deferred a decision on the proposed T&MD Program, pending a more robust stakeholder input process and submission of an Operating Plan.

[1] PSC. Case 10-M-0457 and Case 05-M-0090. *Order Continuing System Benefits Charge Funded Programs*. Issued and effective December 30, 2010.

NYSERDA submitted the T&MD Operating Plan on May 16, 2011. On June 8, 2011, PSC issued a Notice of Proposed Rulemaking requesting public comment on the Operating Plan by July 25, 2011, with reply comments due August 15, 2011. The Operating Plan requested average annual program funding of $70 million for seven initiatives, plus $15 million for an incremental Combined Heat and Power (CHP) Initiative.

In a PSC Order issued on October 24, 2011, NYSERDA's T&MD Operating Plan was approved, including a CHP initiative, for five years (January 1, 2012 through December 31, 2016). The average annual funding rate of $93.8 million represented $80 million in program costs and $13.8 million for administration, evaluation, and New York State Cost Recovery Fees.[2] This plan included $65 million in program costs ($76.2 million total) for NYSERDA's "base" T&MD initiatives and $15 million in program costs ($17.6 million total) for a CHP Initiative. Of the $15 million for CHP, $5 million in SBC funds was approved in the Order to be used for the CHP Aggregation and Acceleration Program, and, at NYSERDA's option, for feasibility studies. The remaining $10 million for the CHP Performance Program was to be derived from a source or sources other than the SBC funds approved in the October 24, 2011 Order. NYSERDA was directed to submit a plan for funding the balance of the CHP Initiative by March 31, 2012. Additionally by March 31, 2012, NYSERDA was also directed by the Order to submit an accounting of SBC III funds that were uncommitted as of December 31, 2011 with the option to submit a proposal for use of those funds, as well as SBC III funds that may become uncommitted in the future.

A revised T&MD Operating Plan was filed with PSC on December 22, 2011, updating NYSERDA's May 16, 2011 submittal to comport with the October 24, 2011 Order.[3]

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2 PSC. Case 10-M-0457 – *In the Matter of the System Benefits Charge IV.* Issued and effective October 24, 2011.

3 NYSERDA, 2011. Technology and Market Development Program Operating Plan for 2012-2016, System Benefits Charge, December 22 and revised November 13, 2012 and February 15, 2013 http://www.nyserda.ny.gov/-/media/Files/General/System-Benefits-Charge/SBC-Five-Year-Operating-Plan.pdf

On March 9, 2012, NYSERDA submitted a full accounting of uncommitted SBC III funds as directed in the October 24, 2011 Order. On March 30, 2012, NYSERDA submitted a petition proposing ways to allocate those uncommitted SBC III funds among three primary activities:

- Develop and implement programs to reduce solar electric (also known as solar photovoltaic or PV) balance-of-system (BOS) costs and support priority solar electric technology development ($10 million).
- Provide cost-sharing support as part of a Brookhaven National Laboratory (BNL) proposal to the U.S. Department of Energy (DOE) solicitation for a New York State Energy Storage Innovation Hub ($10 million, with $2.5 million allocated to the New York Battery and Energy Storage Technology Consortium [NY-BEST]).
- Expand NYSERDA's Advanced Buildings Program ($5.76 million, including $3 million for an Advanced Buildings Consortium [ABC] and $3.76 million for a deep energy savings initiative in commercial buildings).

NYSERDA requested to apply $1.75 million in uncommitted SBC III funds to New York State Cost Recovery Fee assessments applicable to SBC III. In addition, NYSERDA requested approval to allocate uncommitted SBC III funds to projects committed as of December 31, 2011. A notice inviting comments was issued on May 11, 2012, and requested comments by August 3, 2012.

In addition, on March 30, 2012, NYSERDA submitted petitions to provide funding for the CHP Program and to provide continued funding and expansion of NYSERDA's workforce development initiatives as directed in the October 24, 2011 Order.[4] PSC issued a Notice of Proposed Rulemaking on May 9, 2012, and requested comments by August 3, 2012.

On September 13, 2012, the PSC issued an Order and approved, with modifications, NYSERDA's requests in its petition regarding uncommitted SBC III funds.[5] The PSC approved the reallocation of SBC III funds into the T&MD portfolio to support T&MD solar electric activities ($10 million) and Advanced Buildings activities ($5.76 million) as well as NYSERDA's support of the BNL proposal and NY-BEST

[4] Petitions related to adjusting the goals and funding for EEPS programs were also submitted on this date.

[5] PSC. Case 10-M-0457 – *In the Matter of the System Benefits Charge IV*. Issued and effective September 13, 2012.

($10 million, with $2.5 million allocated to NY-BEST).[6] Also approved was NYSERDA's allocation of SBC III funds to New York State Cost Recovery fee assessments. The PSC did not approve NYSERDA's request to reallocate uncommitted SBC III funds to projects committed as of December 31, 2011 in advance, but directed NYSERDA to submit for review and approval any proposals separately. The Order directed NYSERDA to submit, within 60 days, a supplemental revision to its T&MD Operating Plan to account for the approved initiatives. A revised T&MD Operating Plan was filed with PSC on November 13, 2012 to comport with the September 13, 2012 Order. This plan included $75.15 million in average annual program funding plus $12.06 million in average annual funding for administration, evaluation, and cost recovery.

The PSC issued an Order on December 17, 2012 and approved, with modifications, the requests described in the balance of NYSERDA's March 30, 2012 petitions.[7] In this Order, the PSC approved NYSERDA to reallocate $35.9 million from the Benchmarking and Operations Efficiency and the Electric Reduction in Master-Metered Buildings Energy Efficiency Portfolio Standard (EEPS) programs and $22.7 million in uncommitted EEPS-1 funds to support the T&MD CHP Initiative. In addition, the Order approved NYSERDA reallocating $24 million in EEPS-1 funds ($12 million in electric funding and $12 million in natural gas funding) to support T&MD workforce development initiatives. PSC also directed NYSERDA to submit by February 15, 2013, a supplemental revision to its T&MD Operating Plan to comport with the December 17, 2012 Order.[8] NYSERDA submitted a revised T&MD Operating Plan on February 15, 2013, aligning the report with the December 17, 2012 Order. On June 16, 2014, NYSERDA submitted a petition to the PSC to add $7.5 million to the CHP initiative. This petition was withdrawn on

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6 Per the September 13, 2012 Order, if the BNL proposal was not selected by US DOE, NYSERDA had seven days to notify the DPS Office of Energy Efficiency and the Environment (OEEE) of this decision and 60 days to submit a proposal on how those funds should be reallocated. On December 5, 2012, NYSERDA notified DPS OEEE of the proposal denial and designated February 5, 2013 as the date for NYSERDA to submit an alternative proposal to use the funds. The due date for this submission was subsequently extended three times and on September 5, 2013, NYSERDA submitted a petition to transfer $7.5 million in uncommitted SBC III funds to a Power Electronics Manufacturing Consortium proposal in response to a US DOE solicitation. In an Order issued December 20, 2013, the PSC approved use of these funds with the same requirements regarding proposal acceptance and denial as described above.

7 PSC. Case 07-M-0548 - Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard and Case 10-M-0457 – In the Matter of the System Benefits Charge IV. Issued and effective December 17, 2012.

8 NYSERDA was also directed to submit a supplemental revision to its EEPS Operating Plan by February 15, 2013 and did so on that date.

November 14, 2014[9] with the recommendation that the uncommitted funds be considered within the overall context of the Clean Energy Fund (CEF).

The CEF proceeding was initiated by the PSC in a May 8, 2014 Order Commencing Proceeding.[10] The Commission noted in the Order that NYSERDA's CEF proposal "should refocus on market and technology transformative strategies designed to provide temporary intervention and support to overcome specific barriers and produce self-sustaining results." In response, NYSERDA filed its CEF Proposal on September 23, 2014 (Proposal).[11] In its Proposal, NYSERDA provided information regarding the four portfolios of activity that would constitute the CEF: market development; technology and business innovation and business innovation (subsequently recast as innovation and research in the CEF Information Supplement); NY Green Bank; and the NY-Sun program. Also in that filing, NYSERDA advanced both budget and benefit information regarding the proposed market development and business and technology innovation portfolios, among other issues. NYSERDA filed a CEF Information Supplement to supplement and replace the original proposal on June 25, 2015 in order to assist the stakeholder comment process and to provide more detailed information for PSC deliberation.

Going forward, NYSERDA's proposed CEF would comprise both the market development and innovation and research activities and is intended to supersede the final year (calendar 2016) of the current T&MD portfolio. A PSC Order on this request is anticipated in late 2015.

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9 Case 10-M-0457, *In the Matter of the System Benefits Charge IV*, Withdrawal of Petition for Allocation of Uncommitted T&MD Funds, November 14, 2014.

10 Case 14-M-0094 – *Proceeding on Motion of the Commission to Consider a Clean Energy Fund*, Order Commencing Proceeding. Issued and effective May 8, 2014.

11 Case 14-M-0094 – *Proceeding on Motion of the Commission to Consider a Clean Energy Fund*, Clean Energy Fund Proposal, September 23, 2014.

1.2 T&MD Program Mission and Objectives

The mission of the T&MD Program is to test, develop, and introduce new technologies, strategies, and practices that build the statewide market infrastructure to reliably deliver clean energy to New Yorkers.

Specifically, objectives designed to support this mission include:

- Moving new/under-used technologies and services into the marketplace to serve as a feeder to help achieve EEPS and Renewable Portfolio Standard (RPS) goals.
- Validating emerging energy efficiency, renewable, and smart grid technologies/strategies and accelerate market readiness in New York State.
- Stimulating technology and business innovation to provide more clean energy options and lower cost solutions, while growing New York State's clean energy economy.
- Spurring actions and investments to achieve results distinct from incentive-based programs.

The nine initiatives that comprise the T&MD portfolio (detailed in Section 3) will be assessed based on their ability to support these objectives. Future evaluation reports will present these findings as programs are assessed.

Achievement of T&MD portfolio goals is dependent on long-term or multi-phase investments and for this reason, several of the T&MD initiatives build on the experience and success of programs funded by previous rounds of the SBC Program or other funding sources. Although this desired and necessary continuity of effort makes it difficult to attribute performance results and outcomes to a specific phase of funding, NYSERDA recognizes the importance of attempting to clearly delineate progress made in the T&MD portfolio from earlier or alternate funding sources. Toward this end, NYSERDA intends to count outputs and outcomes supported at least in part by T&MD funds toward T&MD performance milestones and results. Where prior SBC or other funded activities are foundational to the success of the T&MD program and illustrative of potential future expectations for the T&MD portfolio, they are highlighted to help convey a more complete picture of possible program benefits, but these achievements will not be tallied toward the T&MD goals unless they have received T&MD funds.

The majority of T&MD activities undertaken to date have been dedicated to issuing solicitations, selecting and launching projects, meeting with stakeholders and scoping programs. Results from foundational SBC III programs (e.g., Smart Grid; Advanced Clean Power; Clean Energy Business Development; and Environmental Monitoring, Evaluation, and Protection) continue to accrue and are reported in more detail in the SBC III annual report. Commercialization benefits from projects started in 2012 will take a few years to materialize and will be reflected accordingly in future reports.

1.3 Organization of the Report

This semiannual report, filed pursuant to the October 24, 2011 PSC Order, describes how the T&MD Portfolio is progressing toward its mission and objectives. The report is divided into the following sections:

- Section 1: Introduction
- Section 2: Portfolio-Level Reporting
- Section 3: T&MD Initiatives
- Section 4: T&MD Program Evaluation Activities
- Appendix A: T&MD Program Advisory Committee Members
- Appendix B: T&MD Program Logic Models
- Appendix C: Evaluation Report Summaries
- Appendix D: Target Ranges

As all the T&MD programs become fully operational and mature, the content of these semiannual reports will expand and evolve to reflect the activities undertaken within each of the initiatives and how accomplishments to date relate to the T&MD portfolio's mission and the output and outcome metrics established in the Operating Plan.

2 Portfolio-Level Reporting

2.1 Portfolio Level Progress

To establish and implement the T&MD portfolio, NYSERDA has engaged in an intensive outreach process with stakeholders, developed and released competitive solicitations to implement the initiatives within the portfolio, and conducted other activities to put the T&MD initiatives into operation. These activities are outlined in the following sections.

2.1.1 Solicitations Released

In the past six months of the T&MD Program, NYSERDA staff has been actively engaged in developing competitive solicitations to acquire implementation contractors, trade allies, and customers to support each T&MD initiative. Table 2-1 presents solicitations released, release date, and proposal due date or open enrollment end date. Note that solicitations released prior to January 1, 2015 were included in prior semiannual reports and are omitted from Table 2-1.

Table 2-1. Solicitations Released from January 1, 2015 through June 30, 2015

Some of the solicitations listed in this table may have split funding sources, and some solicitations may have been revised since their initial release date.

Solicitation Number	Solicitation Name	Solicitation Release Date	Solicitation Closing Date
PON 2033	Clean Energy On-the-Job Training	02/13/2015	12/31/2015
RFP 3083	Reforming the Energy Vision Demonstration Project	02/11/2015	03/05/2015
RFP 3014	New York State Generation Attribute Tracking System	02/05/2015	03/25/2015
RFP 3044	NY Prize Community Grid Competition	02/11/2015	05/15/2015
RFP 3065	Developing an Economic Framework for Future Electricity Systems Investments & Tariff Rate Designs	01/23/2015	02/25/2015
RFP 3072	Behavior-Integrated Clean Energy Design, Market Development & Evaluation Services	02/04/2015	02/27/2015
PON 2033	Clean Energy On-the-Job Training	02/13/2015	12/31/2015
RFP 3047	Environmental Monitoring Support services for the State Licensed Disposal Area (SDA) and the WNYNSC	02/19/2015	04/22/2015
RFP 3062	Environmental Research: Information Dissemination	03/06/2015	04/06/2015
PON 2982	Locomotive Idle Reduction Program	02/26/2014	07/15/2015
RFP 3069	Operations and Maintenance Support Services for SDA and WNYNSC	04/01/2015	05/12/2015
RFP 3019	CHP System Inspection and Re-commissioning	04/07/2015	05/19/2015
RFP 3084	Renewable Portfolio Standard Program Purchase of Renewable Energy Attributes	04/07/2015	05/08/2015
RFP 3	Fund Administration Loan Investment Servicing and Custodial Services	03/03/2015	04/20/2015
RFP 3067	High Resolution LiDAR and Aerial Orthoimagery for the Western NY Nuclear Service Center & Environs	05/12/2015	06/09/2015
RFP 3108	Strategic Program Development Training	05/05/2015	05/20/2015
RFP 2917	Inventory of Supply Side Organizations in New York State's Clean Energy Economy	04/30/2015	06/18/2015
RFP 2990	Salesforce Application Development	04/23/2015	05/21/2015
PON 3106	CGC Phase II Implementation Grants RD#3 CGC Team	04/30/2015	07/31/2015
PON 3082	NY-Sun Commercial/Industrial Incentive Program	05/04/2015	12/29/2023
PON 3090	Integrated Mobility solutions for Smarter Cities and Communities	05/29/2015	07/29/2015
RFI 2568	CHP Acceleration Program	07/20/2013	11/30/2016
RFP 3143	Staff Augmentation	07/14/2015	08/12/2015

2.1.2 Implementation of T&MD Initiatives

Table 2-2 provides a summary of anticipated T&MD portfolio benefits for the five-year funding period (2012-2016) and out years (2017-2020), as well as achievements to date for applicable metrics for the first three and a half years of program operation (2012 through June 30, 2015). Performance milestone tables (included for each initiative in Section 3 of this report) show progress through June 30, 2015 against the Operating Plan's expected benefits. Benefits achieved in the first three and a half years of the T&MD Program should be viewed with two important points of context:

- Most programs are competitively bid, requiring time to develop and issue solicitations, select winning bidders and negotiate contracts. Several solicitations were issued between January 1, 2012 and June 30, 2015.
- Several T&MD programs are continuing and building on successful, long-standing programs funded with prior rounds of SBC monies or other sources. Where possible, existing programs have maximized use of other funds prior to utilizing T&MD funds.

An Output/Leading Indicator describes the anticipated immediate results associated with initiative activities. An Outcome/Impact describes expected achievements in the near, intermediate, and longer term. Consistent with the Operating Plan for Technology and Market Development Programs (2012-2016), where a target is a range, the range's minimum value is shown in Table 2-2. Refer to Appendix D for the details on the target ranges.

With regard to on-site energy savings, the level of achieved savings to date should be viewed in the context of the expected ramp up of savings over time. Specifically, two of the expected contributors to the overall savings goals in NYSERDA's T&MD Operating Plan, the Advanced Codes and Standards and Advanced Buildings programs, anticipated most of their savings to be achieved in late 2014 through 2016 or later. The energy savings reported in Table 2-2 for all programs except Market Pathways Products Partners are program-reported; market impact evaluation activities have not yet been conducted on these other programs yet. Future reports will present findings from those studies once they are finalized. The energy savings for the Market Pathways Products Partners Program are adjusted for the evaluation findings from a market/impact evaluation that was completed in 2014.[12]

[12] http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014%20New%20York%20Products%20Program%20Evaluation.PDF

Electricity, fossil fuel and demand savings/generation targets and progress refer to the cumulative savings that are achieved through a particular time period from all measures installed; e.g., T&MD savings for 2012 - 2014 are the energy savings achieved in 2014, as a result of energy efficiency measures installed from January 2012 through December 2014.

The progress for the 2012-2013 time period was restated in the NYSERDA Technology and Market Development Program: Semiannual Report through December 31, 2014[13] after the underlying data, that is now in a centralized data warehouse, went through a quality and reconciliation process resulting in corrections across the program. By restating the results for the previous reporting period, NYSERDA is following financial reporting practices and meeting the validation and verification criteria for all reporting.

Primary energy savings for CHP systems (expressed in MMBtu) is based on the difference between the amount of energy displaced at grid-level generators and the energy used on-site by the CHP installations, accounting for both the avoided energy losses over the transmission and distribution system and the energy saved due to replacement of the on-site boiler with more efficient equipment. The energy displaced at grid-level generators is estimated based on the electricity system simulation model used in the New York State Energy Plan process.

The CEF proposal recommends reprogramming a substantial amount of 2016 T&MD funding to be repurposed for CEF work. The 2016 T&MD goals presented in this document are the goals that were established in the second revision of the Operating Plan for Technology and Market Development Programs (2012–2016) dated February 15, 2013, and do not reflect any adjustment associated with the requested reallocation of 2016 funds. Other noteworthy program implementation and progress milestones are each described in greater detail in Section 3.

[13] http://www.nyserda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/SBCIV-Documents

Table 2-2. Summary of Anticipated Cumulative T&MD Benefits through June 30, 2015 (at full implementation) for Energy Efficiency, CHP, and Other Benefits[14]

Table 2.2 Energy Efficiency Projects

Benefit Description	2012-2016	Out Years	Total	Thru Selected Period
On-site Electricity Savings from Energy Efficiency Projects, Technologies, Replications, and Codes & Standards (Cumulative Annual GWh)	541.60	647.70	1,189.30	16.77
GWh Savings from Funded Project and Technology Installations	171.60	0.90	172.50	16.77
GWh Savings from Anticipated Replications not Directly Funded by Program		29.80	29.80	0.00
GWh Savings from Codes & Standards Activities supported by the Program	370.00	617.00	987.00	0.00
On-site Fossil Fuel Savings from Energy Efficiency Projects, Technologies, Replications, and Codes & Standards (Cumulative Annual MMBtu)	3,323,200	2,802,600	6,125,800	70,363
MMBtu Savings from Funded Project and Technology Installations	965,200	7,800	973,000	70,363
MMBtu Savings from Anticipated Replications not Directly Funded by Program		231,800	231,800	0
MMBtu Savings from Codes & Standards Activities supported by the Program	2,358,000	2,563,000	4,921,000	0
On-site Demand Reduction from Energy Efficiency Projects, Technologies, Replications, and Codes & Standards (Cumulative Annual MW)	133.00	242.40	375.40	127.23
Demand Reduction from Funded Project and Technology Installations	43.00	5.30	48.30	127.23
Demand Reduction from Anticipated Replications not Directly Funded by Program		30.10	30.10	0.00
Demand Reduction from Codes & Standards Activities supported by the Program	90.00	207.00	297.00	0.00

[14] The target and progress for the System-wide CO2 Emission Reductions, Energy Efficiency - Onsite and Central Station (Annual Tons) have been recalculated using an updated emission factor of 625 lbs CO_2e/MWh for the electricity grid (from 826 lbs CO2e/MWh). An average emission factor of 625 pounds of CO_2e/MWh is used to estimate emission reductions associated with electricity use reductions for all sectors. This value includes emissions from in-state electricity generation as well as emissions associated with net imports of electricity. The emission factor for electricity is based on data from Patterns & Trends - New York State Energy Profiles: 1997 – 2011 (NYSERDA 2013) and methodology from the GHG Inventory and Forecast prepared for the 2014 Draft New York State Energy Plan (April 2014).

Individuals may participate in more than one training course for the Clean Energy Training for Practitioners benefit.

Table 2-2 continued

Table 2.2 CHP Projects

Benefit Description	2012-2016	Out Years	Total	Thru Selected Period
On-site Electricity Generated from CHP Projects, Technologies, and Replications (Cumulative Annual MW)	18.00	29.50	47.50	85.37
MWs Installed from Funded Project and Technology Installations	18.00	19.50	37.50	85.37
MWs Installed from Anticipated Recplications not Directly Funded by the Program		10.00	10.00	0.00
On-site Electricity Generated from CHP Projects, Technologies, and Replications (Cumulative Annual GWh)	121.00	216.25	337.25	678.80
GWhs Generated from Funded CHP Project and Technology Installations	121.00	155.25	276.25	678.80
GWhs Generated from Anticipated Replications not Directly Program Funded by Program		61.00	61.00	0.00
Primary Energy Savings from CHP Installations (Cumulative Annual MMBtus)	157,300	281,125	438,425	882,446
MMBtu Consumed from Funded Project and Technology Installations	157,300	201,825	359,125	882,446
MMBtu Consumed from Anticipated Replications not Directly Funded by Program		79,300	79,300	0

Table 2.2 Other TMD Benefits

Benefit Description	2012-2016	Out Years	Total	Thru Selected Period
System-wide CO2 Emission Reductions, Energy Efficiency - On-site and Central Station (Annual Tons)	363,890	366,555	730,444	9,370
Advanced Technologies Reaching Commercial Availability	46	42	88	14
Improved Technologies Deployment Programs Adopted by the Market or Further Supported by Deployment Programs	10	9	19	1
Commercial Sales of New and Improved Supported Technologies (millions)	$26.5	$157.7	$184.2	$3.5
Funding Leveraged (co-funding and outside investment) by Investment (millions)	$696.5	$103.0	$799.5	$386.5
Clean Energy Businesses Graduating from Incubators	90	72	162	11
Clean Energy Companies Receiving Support	525	200	725	270
Retail and Supply Chain Businesses Partnering with NYSERDA to increase Market Share of Energy Efficient Products	1,750		1,750	1,316
Clean Energy Training for Practitioners (Trainees)	39,056	9	39,065	11,549
Supply Chain Training to Facilitate Adoption of Energy Efficient Products (Partner Employees)	1,525		1,525	2,139

2.1.3 Budget and Spending Status

Table 2-3 shows the T&MD program budget and financial status through June 30, 2015. Committed and spent funds are also shown as a percent of the total 2012-2016 budget. As of June 30, 2015, three and a half years of T&MD activity has been completed of the five-year program (i.e., 70%); thus, as shown in Table 2-3, NYSERDA's funding commitment level is mostly on target at a portfolio level.

Table 2-3. Budget and Financial Status for T&MD Programs through June 30, 2015

Totals may not sum exactly due to rounding.

	2012-2016 Budget	Spent Funds	Percent of 2012-2016 Budget Spent	Committed Funds[a,b]	Percent of Budget 2012-2016 Committed
Power Supply and Delivery					
Smart Grid/Electric Vehicle	$61,281,382	$8,396,541	14%	$39,305,473	64%
Advanced Clean Power	$51,771,962	$9,281,669	18%	$34,116,857	66%
Combined Heat and Power[c]	$75,000,000	$3,533,584	5%	$44,139,310	59%
Total Power Supply & Delivery	*$188,053,344*	*$21,211,794*	*11%*	*$117,561,640*	*63%*
Building Systems					
Advanced Buildings	$75,336,161	$8,247,098	11%	$55,307,399	73%
Advanced Energy Codes & Standards	$16,679,794	$1,608,344	10%	$9,761,691	59%
Total Building Systems	*$92,015,955*	*$9,855,442*	*11%*	*$65,069,090*	*71%*
Clean Energy Infrastructure					
Market Development	$70,380,281	$31,712,818	45%	$41,564,744	59%
Clean Energy Business Development	$41,761,046	$10,333,219	25%	$24,535,604	59%
Environmental Monitoring, Evaluation and Protection (EMEP)	$18,550,048	$3,676,593	20%	$12,286,144	66%
Workforce Development[c]	$39,000,000	$7,129,791	18%	$14,893,550	38%
Total Clean Energy Infrastructure	*$169,691,375*	*$52,852,420*	*31%*	*$93,280,043*	*55%*
Total of All Program Areas	***$449,760,674***	***$83,919,656***	***19%***	***$275,910,773***	***61%***
Administration (8%)	$39,765,533	$25,497,667	64%	$25,532,010	64%
NYS Cost Recovery Fee (1.7%)	$7,585,944	$2,684,817	35%	$2,684,817	35%
Evaluation (5%)	$26,363,458	$3,288,941	12%	$9,590,867	36%
Grand Total - Portfolio	***$523,475,609***	***$115,391,082***	***22%***	***$313,718,467***	***60%***

[a] Committed funds include amounts spent plus remaining funding obligated under a contract, purchase order, or incentive award. In addition, committed funds include planned funding for contracts awarded and under negotiation and planned funding under active development through solicitations with specific due dates.

[b] Committed funds may decrease from period to period as a result of the disencumbrance/cancellation of contracts, or due to the actual award amount(s) resulting from a due date solicitation being less than the planned award.

[c] Funding was increased in PSC's December 17, 2012 Order.

3 T&MD Initiatives

This section provides a status update on each of the nine T&MD initiatives, including budget status and highlights of early achievements during the first three and a half years of the five-year funding period. As noted in Section 2, benefits achieved in the first three and a half years of the T&MD program should be viewed with two important points of context:

- Most programs are competitively bid, requiring time to develop and issue solicitations, select winning bidders and negotiate contracts. Several solicitations were issued in between January 1, 2012 and June 30, 2015.
- Several T&MD programs are continuing and building on successful, long-standing programs funded with prior rounds of SBC monies or other sources. Where possible, existing programs have maximized use of other funds prior to utilizing T&MD funds.

An Output/Leading Indicator describes the anticipated immediate results associated with initiative activities. An Outcome/Impact describes expected achievements in the near, intermediate, and longer term.

3.1 Power Supply and Delivery Initiatives

Table 3-1 shows committed and spent funds for this initiative as a percentage of the total 2012-2016 budgets. Later sections describe progress for each area of this initiative.

The level of committed funding in two program areas appears to be lower than might be expected at this point in time. Reasons are as follows:

- NYSERDA's program activities for Resource Development are not constant over time but instead vary with changes in state policy and energy priorities, which lead to differences in expenditures from year to year.
- Interest in the CHP market has increased as a result of the program's new catalog sales approach (predefined units make selection easier and cheaper for customer) and aggressive marketing program (regular CHP Expos event). Industry participants have reported customer sales cycles on occasion have been reduced to almost three months (as opposed to 12-15 months) and are attributing this reduction to the change in practices. As of June 30, 2015, there are 13 approved vendors and 154 approved CHP systems.

Table 3-1. Power, Supply, and Delivery Budget and Financial Status through June 30, 2015

Totals may not sum exactly due to rounding.

	2012-2016 Budget	Spent Funds	Percent of 2012-2016 Budget Spent	Committed Funds[a,b]	Percent of Budget 2012-2016 Committed
Smart Grid/Electric Vehicle					
Smart Grid	$47,284,415	$6,908,266	15%	$30,466,632	64%
Electric Vehicle	$13,996,967	$1,488,275	11%	$8,838,841	63%
Total Smart Grid/Electric Vehicle	*$61,281,382*	*$8,396,541*	*14%*	*$39,305,473*	*64%*
Advanced Clean Power					
Technology Innovation	$27,826,749	$7,179,217	26%	$27,636,150	99%
Resource Development	$13,945,213	$477,293	3%	$1,254,781	9%
Solar Cost Reduction	$10,000,000	$1,625,159	16%	$5,225,926	52%
Total Advanced Clean Power	*$51,771,962*	*$9,281,669*	*18%*	*$34,116,857*	*66%*
Combined Heat & Power[c]					
CHP Aggregation & Acceleration	$25,000,000	$1,840,916	7%	$5,571,569	22%
CHP Performance	$50,000,000	$1,692,668	3%	$38,567,741	77%
Total Combined Heat & Power	*$75,000,000*	*$3,533,584*	*5%*	*$44,139,310*	*59%*
Grand Total - Power, Supply, & Delivery Initiatives	***$188,053,344***	***$21,211,794***	***11%***	***$117,561,640***	***63%***

[a] Committed funds include amounts spent plus remaining funding obligated under a contract, purchase order, or incentive award. In addition, committed funds include planned funding for contracts awarded and under negotiation and planned funding under active development through solicitations with specific due dates

[b] Committed funds may decrease from period to period as a result of the disencumbrance/cancellation of contracts, or due to the actual award amount(s) resulting from a due date solicitation being less than the planned award.

[c] Funding was increased in PSC's December 17, 2012 Order.

3.1.1 Smart Grid and Electric Vehicle Infrastructure

3.1.1.1 Smart Grid

The Smart Grid Program is designed to promote product development and demonstrations targeted at ensuring high levels of security, quality, reliability and availability of electric power; improving economic productivity; and minimizing environmental impacts while maximizing safety and sustainability. A smarter grid will be characterized by the widespread application of advanced sensing, communication and control devices, and other uniform diagnostic systems to support real-time visualization of electric grid operating conditions. This smarter grid is expected to reduce energy losses, extend equipment life, reduce operating costs, increase system resiliency to disruptions, support quicker restoration after disruptions, support the integration of distributed energy resources, and increase the throughput or transfer of electric

energy between regions of the State. A smarter grid will also be essential to accelerating adoption of grid-powered electric vehicles (GPV) and associated infrastructure. Projects funded through program activity must demonstrate significant statewide public benefit and quantify all energy, environmental, and economic impacts. Technology demonstrations, product development, research studies, and engineering studies are all eligible for funding support through periodic program solicitations.

The following key program activities and accomplishments have been performed during this reporting period:

- The Electric Power Transmission and Distribution (EPTD) Smart Grid Program solicitation (PON 3026) was released December 12, 2014. This third solicitation under the T&MD plan made $10 million available over two rounds with due dates of February 18, 2015 and August 5, 2015. Four proposals were awarded under Round 1 totaling $3.2 million of NYSERDA funding. One engineering study, one product development and two demonstration projects were selected for funding.

Table 3-2 shows performance milestones and results for the Smart Grid Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Signed contracts and completed projects are for technology development, demonstration and pilot projects including several large flagship projects. Signed contracts and completed projects for research studies include studies on technologies, market barriers and policies related to increased smart grid implementation in New York State.

Table 3-2. Smart Grid Performance Milestones and Results through June 30, 2015

Smart Grid
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
Technology, development, demonstration or pilot projects	Signed Contracts - Target	7	10	12		29
	Signed Contracts - Progress	10	4			14
	Completed Projects - Target		5	9	15	29
	Completed Projects - Progress	0	2			2
Research Studies	Signed Contracts - Target	2	3	3		8
	Signed Contracts - Progress	12	14			26
	Completed Projects - Target		2	3	3	8
	Completed Projects - Progress	0	8			8
All Projects	Supported Companies - Target	8	12	14		34
	Supported Companies - Progress	21	17			38

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$18.0	$42.0	$52.0		$112.0
	Leveraged Funds Amount (millions) - Progress	$13.4	$7.7			$21.1
	Products and Technologies Commercialized - Target			1	2	3
	Products and Technologies Commercialized - Progress	0	0			0
	Product Revenue Amount (millions) - Target				$6.0	$6.0
	Product Revenue Amount (millions) - Progress	$0.0	$0.0			$0.0
	Market Adoption - Target			2	4	6
	Market Adoption - Progress	0	0			0

3.1.1.2 Electric Vehicle Infrastructure

The electric vehicle (EV) infrastructure efforts include engineering studies, product development, demonstration projects and pilot programs to validate technology that minimizes negative grid impacts from grid-powered vehicle (GPV) charging, develops GPV-to-grid communication technologies and control processes, and promotes new business models that enable the benefits of vehicle storage for the distribution system. The electric vehicle infrastructure program partially funds the Behavior Research Program further discussed in Section 3.2.1.2.

The following key program activities and accomplishments have been performed during this reporting period:

- NYSERDA launched a Charge NY website in April 2015, which has information for a variety of audiences about plug-in electric vehicles (PEVs) and their benefits. NYSERDA will launch a new program in 2015 to engage stakeholders in community-focused PEV outreach and have additional stakeholders, such as employers and car dealers, take on larger roles in expanding the PEV market.
- As of June 2015, more than 600 electric vehicle charging stations have already been installed, with up to an additional 250 expected by the end of 2015.
- NYSERDA's contractor, Energetics Inc., released updated reports on the use of NYSERDA-supported EV charging stations installed through the EV Charging Station Demonstration Program. The report shows quarterly use of the stations broken down by geographic region, type of location, and business model.
- Projects focused on detailing the grid impacts of EVs and identifying policy- and technology-based solutions met with stakeholders including utilities, the New York Independent System Operator (NYISO), DPS, EV charging station suppliers, and electric grid experts.
- NYSERDA met periodically with stakeholders, including auto manufacturers, environmental groups, EV infrastructure providers, site owners, and installers to solicit input for the design of new EV-related programs.

Table 3-3 shows performance milestones and results for Electric Vehicle Infrastructure Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Research studies focus on technologies, market barriers and policies related to increased grid powered vehicle implementation in New York State. Leveraged funds include co-funding and outside investments for electric vehicle infrastructure.

Table 3-3. Electric Vehicle Infrastructure Performance Milestones and Results through June 30, 2015

Electric Vehicle
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
Technology, development, demonstration or pilot projects	Signed Contracts - Target	4	9	12		25
	Signed Contracts - Progress	1	10			11
	Completed Projects - Target		3	6	16	25
	Completed Projects - Progress	0	1			1
Research Studies	Signed Contracts - Target	4	2	2		8
	Signed Contracts - Progress	1	11			12
	Completed Projects - Target		4	2	2	8
	Completed Projects - Progress	0	0			0
All Projects	Supported Companies - Target	5	10	15		30
	Supported Companies - Progress	3	19			22

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$4.0	$14.0	$24.0		$42.0
	Leveraged Funds Amount (millions) - Progress	$7.9	$3.3			$11.2
	Products and Technologies Commercialized - Target		1	1	2	4
	Products and Technologies Commercialized - Progress	0	0			0
	Product Revenue Amount (millions) - Target				$9.0	$9.0
	Product Revenue Amount (millions) - Progress	$0.0	$0.0			$0.0
	Market Adoption - Target			1	2	3
	Market Adoption - Progress	0	0			0

3.1.2 Advanced Clean Power

3.1.2.1 Clean Power Technology Innovation Program

The Clean Power Technology Innovation Program works to advance clean power technology, assist New York State innovators in product development, and overcome barriers and institutional impediments to the widespread use of renewable and clean power, and storage technologies. Technologies eligible under this program include innovative renewable-electric and other advanced clean power technologies for grid-connected applications, storage technologies for sub-utility-scale stationary applications, or technologies that improve grid power quality and reliability. Subsystems and components of these technologies, as well as improved innovative manufacturing methods for these technologies are included. Examples of technologies include fuel cells, batteries, solar electric power, wind power, hydropower, power conditioning equipment, waste heat to electricity, biomass to electricity and innovative control or monitoring technologies.

The following key program activities and accomplishments have been performed during this reporting period:

- C Speed is finalizing development and testing of a state-of-the-art aircraft radar system that can detect aircraft in the immediate vicinity of wind turbines. The U.S. Department of Defense, U.S. Department of Homeland Security, U.S. Department of Energy and U.S. Department of Transportation have issue with radar interference from wind turbines which have caused thousands of megawatts of wind energy development to be stalled or blocked. In March 2015, the technology received a major vote of confidence by the U.S. Air Force (a significant stakeholder) when Travis Air Force Base published an article on the technology indicating, "This new radar could be a game changer….and our goal is to support green energy while retaining our mission requirements and making sure Travis is viable in the future."
- Thirty-four proposals for Round 2 of PON 2942 (Advanced Clean Power) were received by May 5, 2015. The proposals were reviewed and six proposals were recommended for funding.

Table 3-4 shows performance milestones and results for the Technology Innovation program through June 30, 2015. Commercialization metrics for projects that only received SBC III funding are not reported here; those metrics are reported in the SBC III annual report. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Leveraged funds include co-funding and outside investments for clean power technology projects.

Table 3-4. Clean Power Technology Innovation Performance Milestones and Results through June 30, 2015

Clean Power Technology Innovation
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Signed Contracts - Target	15	26	10		51
	Signed Contracts - Progress	12	12			24
	Completed Projects - Target		10	15	26	51
	Completed Projects - Progress	0	4			4
	Supported Companies - Target	19	32	13		64
	Supported Companies - Progress	12	13			25

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$20.0	$32.0	$13.0		$65.0
	Leveraged Funds Amount (millions) - Progress	$20.2	$15.7			$35.8
	Products and Technologies Commercialized - Target		1	2	5	8
	Products and Technologies Commercialized - Progress	2	1			3
	Product Revenue Amount (millions) - Target	$1.0	$1.0	$3.0	$50.0	$55.0
	Product Revenue Amount (millions) - Progress	$0.6	$0.2			$0.8

Energy Storage Commercialization Center
Performance Milestones and Results

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$2.0	$2.0	$1.0	$2.0	$7.0
	Leveraged Funds Amount (millions) - Progress	$0.5	$0.0			$0.5
	Products and Technologies Commercialized - Target	1	4	4	16	25
	Products and Technologies Commercialized - Progress	0	0			0
	Revenue Amount (millions) - Target	$0.2	$2.2	$1.4	$6.3	$10.1
	Revenue Amount (millions) - Progress	$0.0	$0.9			$0.9
	Product Development Tests - Target	2	8	6	25	41
	Product Development Tests - Progress	0	4			4

3.1.2.2 Resource Development Program

The Resource Development Program is focusing on activities that will stimulate the development of new renewable energy supplies, technologies, and businesses in the renewable energy industry with the greatest potential to meet near-to-intermediate-term energy and environmental goals. Similar to previous efforts to address market barriers that helped develop land-based wind energy in Upstate New York, this program concentrates on the gap in understanding offshore wind energy. Marine resource and site assessment activities will increase knowledge of coastal marine energy assets and their suitability for power development and improve understanding of the capacity in New York State to manufacture, construct, and service new marine-based electrical generation projects and components.

The following key program activities and accomplishments have been performed during this reporting period:

- Offshore Wind Values – NYSERDA is collaborating with the Long Island Power Authority (LIPA) and PSEG-Long Island to assess methodologies to adequately understand and quantify all the value components offshore wind will add to New York beyond project and grid-specific costs and benefits.
- Bureau of Ocean Energy Management (BOEM) NYS Offshore Wind Task Force – NYSERDA is a member of this task force led by the New York Department of State (DOS). BOEM organizes this task force to provide guidance and advice on New York State interests and impacts of siting offshore energy projects in federal waters off of New York State. NYSERDA has been an active participant and presenter at these meetings.
- During this reporting period, NYSERDA arranged an in-person meeting between New York state agencies and BOEM with objectives to identify existing and new opportunities to enhance New York's role in project development, strengthen relationships between key federal and state partners, discuss issues related to project review, including issues specific to New York, and specifically discuss the Long Island-NYC Offshore Wind Collaborative proposal review schedule. This meeting served to re-ignite federal and state collaboration on this topic.
- Northeast Wind Resource Center—NYSERDA is an active supporter of the National Renewable Energy Laboratory-funded Northeast Wind Resource Center (NWRC) led by the Clean Energy States Alliance. The NWRC's purpose is to provide credible information, targeted outreach, and direct engagement with stakeholders and decision makers about offshore wind energy. The NWRC plans to support the development of a viable offshore wind industry by:
    - Collecting and disseminating Web-based information by creating an NWRC-specific website and by maintaining websites for the U.S. Offshore Wind Hub, the Offshore Wind Accelerator Project, and the Maine Ocean and Wind Industry Initiative.
    - Developing strategies to increase opportunities for multistate collaboration.
    - Sponsoring regular webinars, workshops, and meetings.
    - Coordinating with other regions (e.g., Southeast Coastal Wind Coalition).

Table 3-5 shows performance milestones and results for the Resource Development Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Signed contracts and completed projects include studies, surveys and plans. Stakeholder engagements include engagements with stakeholder organizations and consortia in support of developing a research/program agenda. Leveraged funds include co-funding and outside investment.

Table 3-5. Resource Development Performance Milestones and Results through June 30, 2015

Resource Development
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Signed Contracts - Target	3	2	1		6
	Signed Contracts - Progress	3	0			3
	Completed Projects - Target	1	1	2	2	6
	Completed Projects - Progress	1	1			2
	Stakeholder Engagements - Target	2	1			3
	Stakeholder Engagements - Progress	2	1			3

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target		$1.0	$1.5		$2.5
	Leveraged Funds Amount (millions) - Progress	$0.0	$0.0			$0.0
	Site Development Potential (MW) - Target				1,000.00	1,000.00
	Site Development Potential (MW) - Progress	0.00	0.00			0.00

3.1.2.3 Solar Cost Reduction[15]

This program will help achieve the goals of the NY-Sun initiative[16] through activities that reduce the balance-of-system (BOS) costs of solar electric installations and support priority solar electric technology development in New York State. BOS costs include non-module hardware, labor, design, permitting and interconnection, and can amount to approximately one-half of the installed cost of a solar electric system.

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15 The September 13, 2012, Order in Case 10-M-0457, *Order Authorizing the Reallocation of Uncommitted System Benefits Charge III Fund*, included $10 million for a new initiative within the Advanced Clean Power Program focused on reducing the balance-of-system costs for solar electric installations and the development of priority solar electric technology.

16 In his 2012 State of the State Address, Governor Cuomo announced the NY-Sun initiative, designed to install, in 2013, four times the customer-sited solar electric capacity installed in 2011, while protecting the ratepayer by keeping costs under control.

A dialogue with representatives of the industry, permitting authorities, and various stakeholders will be conducted through workshops and other means to develop a thorough understanding of the solar electric project development process and the elements that constitute BOS cost components.

The following key program activities and accomplishments have been performed during this reporting period:

- The PV Trainers Network (PVTN) is continuously providing trainings in localities across the State along with informational webinars, podcasts, and customized assistance for local officials. The PVTN has developed a PVTN Procurement Toolkit for local officials as a result of numerous requests for assistance and advice on procurement from localities across the State. This toolkit will be available on the PVTN website.
- The NYS Association of Towns magazine (*Talk of the Towns and Topics)* published a cover story entitled "Plug Into the Sun," which featured the PVTN and its services for local officials.

Table 3-6 shows performance milestones and results for the Solar Cost Reduction program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Signed contracts and completed projects for develop tools, practices, studies, surveys, and engagements are projects that reduce solar electricity costs. Signed contracts and completed projects for technology, development, demonstration or pilot projects are for balance-of-system (BOS) projects. The meetings, workshops, and conferences are a result of BOS projects. The training sessions focus on aspects of solar electricity for authorities having jurisdiction, local officials, and trainers. Leverage funds include co-funding and outside investment for BOS projects.

Table 3-6. Solar Cost Reduction Performance Milestones and Results through June 30, 2015

Solar Cost Reduction
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
Technology, development, demonstration or pilot projects	Signed Contracts - Target	7	3			10
	Signed Contracts - Progress	0	4			4
	Completed Projects - Target		2	5	3	10
	Completed Projects - Progress	0	0			0
Develop tools, practices, studies, surveys, engagements	Signed Contracts - Target	7	2	1		10
	Signed Contracts - Progress	0	8			8
	Completed Projects - Target		5	3	2	10
	Completed Projects - Progress	0	0			0
All Projects	Supported Companies - Target	6	2	1		9
	Supported Companies - Progress	0	11			11
	Solar (PV) Trainees - Target	1,800	200			2,000
	Solar (PV) Trainees - Progress	0	2,014			2,014
	Training Sessions - Target	180	20			200
	Training Sessions - Progress	0	76			76
	Meetings, Workshops, Conferences - Target	1	4	3	2	10
	Meetings, Workshops, Conferences - Progress	0	0			0

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$5.5	$5.0	$2.6		$13.1
	Leveraged Funds Amount (millions) - Progress	$2.0	$2.9			$4.9
	Products and Technologies Commercialized - Target				1	1
	Products and Technologies Commercialized - Progress	0	0			0
	Product Revenue Amount (millions) - Target				$7.2	$7.2
	Product Revenue Amount (millions) - Progress	$0.0	$0.0			$0.0
	Market Adoption - Target		3	2	2	7
	Market Adoption - Progress	0	0			0

3.1.3 Combined Heat and Power (CHP)

3.1.3.1 CHP Aggregation and Acceleration Program

The CHP Aggregation and Acceleration Program will develop and transform the marketplace for CHP systems from 50 kW to 1.3 MW, the nameplate capacity range of a majority of NYSERDA's previous CHP projects. The program will accomplish this transformation by (1) compiling a vetted catalog of prequalified equipment, and (2) creating and validating rules-of-thumb for simplifying the analysis used to determine the capacity needs of a given site. This focus on prepackaged CHP modules that include all major components will reduce the need for (and thus reduce the costs of and opportunities for errors during) equipment-integration engineering and assembly; nevertheless, site-specific engineering regarding placement of equipment at the site and tie-ins to the site's infrastructure will still be necessary.

The following key program activities and accomplishments have been performed during this reporting period:

- Conducted two CHP Expos which provided opportunities for prospective customer to meet the approved CHP vendors.
- Conducted five CHP Power Breakfast/Lunch and Learn events, which combine a presentation of CHP technology and the CHP Acceleration Program with a tour of a CHP system.
- Made presentations at two conferences and one webinar.
- Participated in six stakeholder meetings.
- Selected a contractor that will conduct site inspections and recommissioning activities to verify system performance and identify opportunities for enhanced production.

Table 3-7 shows performance milestones and results for the CHP Aggregation and Acceleration Program through June 30, 2015. Energy savings reported in Table 3-7 are program-reported; evaluation activities have not yet been conducted on these programs. Future reports will present findings from those studies as they are finalized. Project count, peak load demand, electric generation, and primary energy savings targets are established for projects installed through a particular time period. Progress or project count, peak load demand, electric generation, and primary energy savings refers to the cumulative savings that are installed, contracted or accepted through a particular time period; e.g., T&MD savings for 2012 - 2013 are the energy and demand savings/generation achieved or expected as of December 31, 2013 as a result of activity from January 2012 through December 2013. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period.

Table 3-7. CHP Aggregation and Acceleration Performance Milestones and Results through June 30, 2015

CHP Aggregation and Acceleration
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2012-15	2012-16	2012-20
All Projects	Projects - Target	3	21	30	37
	Applications Accepted but not yet Contracted - Progress	0	4		
	Projects Under Contract but not yet Installed - Progress	4	28		
	Projects Installed - Progress	0	9		
	Total Progress	4	41		
All Projects	Peak Load Electric Generation (MW) - Target	1.00	7.00	10.00	12.50
	Peak Load Electric Generation Applications Accepted but not yet Contracted (MW) - Progress	0.00	0.09		
	Peak Load Electric Generation Under Contract but not yet Installed (MW) - Progress	0.02	1.14		
	Peak Load Electric Generation Installed (MW) - Progress	0.00	0.55		
	Total Progress	0.02	1.78		
All Projects	Electric Generation (GWh) - Target	6.10	42.70	61.00	76.25
	Electric Generation Applications Accepted but not yet Contracted (GWh) - Progress	0.00	0.53		
	Electric Generation Under Contract but not yet Installed (GWh) - Progress	0.09	6.94		
	Electric Generation Installed (GWh) - Progress	0.00	3.37		
	Total Progress	0.09	10.84		
All Projects	Primary Energy Savings (MMBtu) - Target	7,930	55,510	79,300	99,125
	Primary Energy Savings Applications Accepted but not yet Contracted (MMBtu) - Progress	0	686		
	Primary Energy Savings Under Contract but not yet Installed (MMBtu) - Progress	119	9,028		
	Primary Energy Savings Installed (MMBtu) - Progress	0	4,381		
	Total Progress	119	14,096		

		2012-13	2014-15	2016	2017-20	Total
All Projects	Pre-Packaged Systems - Target	10	8	2		20
	Pre-Packaged Systems - Progress	64	98			162
	Knowledge/Technology Transfer Activities - Target	4	4	2		10
	Knowledge/Technology Transfer Activities - Progress	19	72			91

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$20.0	$20.0	$10.0		$50.0
	Leveraged Funds Amount (millions) - Progress	$3.4	$16.2			$19.7
	Leveraged Funds Replicated (millions) - Target				$40.0	$40.0
	Leveraged Funds Replicated (millions) - Progress	$0.0	$0.0			$0.0
	Peak Load Electric Generation Replicated (MW) - Target				10.00	10.00
	Peak Load Electric Generation Replicated (MW) - Progress	0.00	0.00			0.00
	Electric Generation Replicated (GWh) - Target				61.00	61.00
	Electric Generation Replicated (GWh) - Progress	0.00	0.00			0.00
	Primary Energy Savings Replicated (MMBtu) - Target				79,300	79,300
	Primary Energy Savings Replicated (MMBtu) - Progress	0	0			0

3.1.3.2 CHP Performance Program

The CHP Performance Program funds installations of CHP systems using energy, summer peak demand, efficiency, and environmental performance-based payments. The program funds clean, efficient, cost effective, gas-fired systems using site-specific designs. In accordance with the PSC Order, systems are required to meet a minimum fuel conversion efficiency of 60% and a maximum of 1.6 pounds/MWh of NO_x emissions.[17] To quantify the performance-based payments, the program applies rigorous, multi-year system performance measurements, which is a groundbreaking approach for energy efficiency program administrators.

Additional incentives are geared toward projects that:

- Offer greater potential value to the distribution system.
- Operate at higher overall efficiency levels.
- Are located at critical infrastructure, including facilities of refuge.

Additional incentives for projects that offer greater potential value to the distribution system will initially be limited to the Con Edison service territory.

The following key program activities and accomplishments have been performed during this reporting period:

- The Program exceeded its five-year Outputs/Leading Indicator targets two years early.
- The first project installation transitioned into the performance period and is now generating their own power, reducing electric grid demand, improving reliability, lowering costs, and reducing greenhouse gas emissions.
- Hospitals, colleges, and universities are under contract in the program to install CHP projects that will provide energy and demand savings and resiliency for buildings of shelter, laboratories with sensitive equipment, and other needs.
- An innovative manufacturing site has contracted to integrate CHP into their process in a project that also leverages activity with the New York City Industrial Development Agency and the New York City Energy Efficiency Corporation.

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[17] PSC. Case 07-M-0548 - Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard and Case 10-M-0457 – In the Matter of the System Benefits Charge IV. Issued and effective December 17, 2012.

Table 3-8 shows performance milestones and results for the CHP Performance Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Energy savings reported in Table 3-8 are program-reported; evaluation activities have not yet been conducted on these programs. Future reports will present findings from those studies as they are finalized. Project count, peak load demand, electric generation, and primary energy savings targets are established for projects installed through a particular time period. Progress for project count, peak load demand, electric generation, and primary energy savings refers to the cumulative savings that are installed, contracted or accepted through a particular time period; e.g., T&MD savings for 2012 - 2013 are the energy and demand savings/generation achieved or expected as of December 31, 2013 as a result of activity from January 2012 through December 2013. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period.

Table 3-8. CHP Performance Program Performance Milestones and Results through June 30, 2015

CHP Performance Program
Performance Milestones and Results

Outputs/Leading Indicators

			2012-13	2012-15	2012-16	2012-20
All Projects	Projects - Target			1	5	16
	Applications Accepted but not yet Contracted - Progress		4	7		
	Projects Under Contract but not yet Installed - Progress		0	7		
	Projects Installed - Progress		0	1		
		Total Progress	4	15		
All Projects	Peak Load Electric Generation (MW) - Target			2.00	8.00	25.00
	Peak Load Electric Generation Applications Accepted but not yet Contracted (MW) - Progress		24.27	25.96		
	Peak Load Electric Generation Under Contract but not yet Installed (MW) - Progress		0.00	28.26		
	Peak Load Electric Generation Installed (MW) - Progress		0.00	2.80		
		Total Progress	24.27	57.02		
All Projects	Electric Generation (GWh) - Target			10.00	60.00	200.00
	Electric Generation Applications Accepted but not yet Contracted (GWh) - Progress		187.22	174.69		
	Electric Generation Under Contract but not yet Installed (GWh) - Progress		0.00	260.48		
	Electric Generation Installed (GWh) - Progress		0.00	25.00		
		Total Progress	187.22	460.17		
All Projects	Primary Energy Savings (MMBtu) - Target			13,000	78,000	260,000
	Primary Energy Savings Applications Accepted but not yet Contracted (MMBtu) - Progress		243,389	227,095		
	Primary Energy Savings Under Contract but not yet Installed (MMBtu) - Progress		0	338,629		
	Primary Energy Savings Installed (MMBtu) - Progress		0	32,500		
		Total Progress	243,389	598,224		

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$30.0	$110.0	$110.0		$250.0
	Leveraged Funds Amount (millions) - Progress	$11.5	$107.8			$119.2

3.2 Building Systems Initiative

Table 3-9 shows the Building Systems budget and financial status through June 30, 2015. Committed and spent funds are also shown as a percentage of the total 2012-2016 budget. The following sections describe progress for each area of this initiative.

Table 3-9. Building Systems Budget and Financial Status through June 30, 2015

Totals may not sum exactly due to rounding.

	2012-2016 Budget	Spent Funds	Percent of 2012-2016 Budget Spent	Committed Funds[a,b]	Percent of Budget 2012-2016 Committed
Advanced Buildings					
Emerging Technology/Accelerated Commercialization	$32,446,215	$1,322,840	4%	$12,118,573	37%
Technology Development	$33,613,215	$4,438,075	13%	$35,505,811	106%
Demand Response	$9,276,731	$2,486,183	27%	$7,683,016	83%
Total Advanced Buildings	*$75,336,161*	*$8,247,098*	*11%*	*$55,307,399*	*73%*
Advanced Energy Codes & Standards	$16,679,794	$1,608,344	10%	$9,761,691	59%
Grand Total - Building Systems Initiatives	***$92,015,955***	***$9,855,442***	***11%***	***$65,069,090***	***71%***

[a] Committed funds include amounts spent plus remaining funding obligated under a contract, purchase order, or incentive award. In addition, committed funds include planned funding for contracts awarded and under negotiation and planned funding under active development through solicitations with specific due dates.

[b] Committed funds may decrease from period to period as a result of the disencumbrance/cancellation of contracts, or due to the actual award amount(s) resulting from a due date solicitation being less than the planned award.

3.2.1 Advanced Building Technologies

3.2.1.1 Emerging Technology/Accelerated Commercialization (ETAC) – Buildings

The ETAC Buildings component is a new, deliberate approach to accelerating commercial introduction of emerging or underused building technologies and strategies. ETAC will serve both as a feeder effort to support New York State clean energy programs and also to encourage market adoption without additional ratepayer support. This effort focuses on three market sectors: commercial/institutional, multifamily, and residential.

ETAC-Commercial/Institutional

NYSERDA's ETAC-CI program is targeted to technology developers and owners of multiple buildings wishing to gain independent validation of performance for a product, technology, or approach that is commercially available, yet not in widespread use, and accelerate market acceptance. Projects receive a NYSERDA-funded performance measurement and verification (M&V) study tailored to each project. Performance validation considers factors such as energy savings and other benefits, and pathways to overcome market challenges. Project results and validated performance information is shared through targeted, deliberate outreach to the market, other New York Program Administrators, and Department of Public Service staff. Support is offered through both competitive and open enrollment solicitations. The ETAC-CI open enrollment program, launched in May 2013, consists of two program tracks: Energy Performance Validation and Focused Demonstrations. Projects in the Focused Demonstration track receive NYSERDA funding to support installation and project costs, but must fall within one of NYSERDA's identified priority categories of technologies or approaches, and must also provide prior independently-verified performance data.

The following key program activities and accomplishments have been performed during this reporting period:

- Six proposals were received under round 2 of large scale demonstration solicitation requesting more than $3.8 million of NYSERDA funding.
- Two proposals submitted to round 1of the large scale demonstration solicitation have been selected and are in contract negotiations.
- Several focused demonstration applications have been received and are under review.
- Of nine contracted projects in the open enrollment program, two are Energy Performance Validation projects and seven are Focused Demonstration projects. All projects include at least two demonstration host sites. Technologies being demonstrated include advanced lighting and shading controls, remote energy analytics, HVAC packaged rooftop unit advanced controls, steam and hot water radiator controls, window air conditioner controls, and a building information and energy management system. Visit nyserda.ny.gov/All-Programs/Programs/ETAC-CI/ETAC-CI-Resources for project descriptions.
- Over the reporting period, ETAC-CI staff met with approximately half a dozen technology developers regarding potential projects. NYSERDA continues to participate in the Consortium for Energy Efficiency's Emerging Technology Collaborative to share information with other program administrators on emerging technologies and approaches.

ETAC-Multifamily

The goal of this program is to identify commercially available energy-efficiency methodologies, technologies or strategies that are commercially available, but under-used in the multifamily (MF) market and to address the market barriers preventing their broader adoption. This goal will be accomplished through selected projects that will demonstrate the technologies or strategies, identify barriers to their implementation and develop strategies that will address the barriers identified. Project contractors will achieve technology transfer via a combination of published papers and presentations.

The following key program activities and accomplishments have been performed during this reporting period:

- All three contractors have secured demonstration sites for their ETAC projects.
- One contractor has submitted an M&V plan for its ETAC project.
- A draft of a second round for the ETAC solicitation has been completed.

ETAC-Residential

ETAC-RES targets the low-rise residential market, typically buildings of three stories in height or fewer above-grade. ETAC-RES demonstration projects are intended to validate improved energy efficiency performance under real-world conditions, and overcome current market barriers and accelerate market uptake of proven, but underutilized, energy-saving technologies. The three current projects are focused on LED lighting. Subsequent solicitations under ETAC-RES will likely focus on high-efficiency HVAC equipment.

The following key program activities and accomplishments have been performed during this reporting period:

- Demonstration site agreements are in place for all 18 building sites that were acquired by contractors under PON 2752. Of these sites, 15 are new construction and three are remodels. Lighting systems and monitoring equipment are installed at nine of the sites. Some of the homes are occupied and real-time energy usage data from the lighting circuits is being collected, while others are serving as display homes with opportunities for the public to see well-designed, high-quality LED lighting systems showcased in a home.

- A case study for one of the completed homes was developed, and is available on the ETAC-RES website.[18] Initial estimates show that the homeowners will save over $110 annually on their lighting costs, while enjoying the convenience of a Lutron Caseta lighting control platform.
- ETAC-RES staff has developed a draft Program Planning Request (PPR) for what will be the next competitive solicitation to be offered, most likely in last quarter of 2015.

Table 3-10 shows performance milestones and results for the ETAC Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Energy savings reported in Table 3-10 are program-reported; evaluation activities have not yet been conducted on these programs. Future reports will present findings from those studies as they are finalized. Project count, peak load demand, electric generation, and primary energy savings targets are established for projects installed through a particular time period. Progress for project count, peak load demand, electric generation, and primary energy savings refers to the cumulative savings that are installed, contracted or accepted through a particular time period; e.g., T&MD savings for 2012 - 2013 are the energy and demand savings/generation achieved or expected as of December 31, 2013 as a result of activity from January 2012 through December 2013. Blank cells indicate the lack of a target in a particular time period.

[18] http://www.nyserda.ny.gov/All-Programs/Programs/Emerging-Technologies-and-Accelerated-Commercialization-Residential

Table 3-10. Emerging Technology/Accelerated Commercialization Performance Milestones and Results through June 30, 2015

Emerging Technology/Accelerated Commercialization (ETAC)
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2012-15	2012-16	2012-20
All Projects	Projects - Target	1	6	12	17
	Applications Accepted but not yet Contracted - Progress	0	4		
	Projects Under Contract but not yet Installed - Progress	0	11		
	Projects Installed - Progress	1	3		
	Total Progress	1	18		
All Projects	Peak Load Reduction (MW) - Target	0.55	1.25	2.00	2.30
	Peak Load Reduction Applications Accepted but not yet Contracted (MW) - Progress	0.00	0.87		
	Peak Load Reduction Under Contract but not yet Installed (MW) - Progress	0.00	0.24		
	Peak Load Reduction Installed (MW) - Progress	0.00	0.25		
	Total Progress	0.00	1.36		
All Projects	Energy Savings (GWh) - Target	2.00	6.20	9.60	10.50
	Electric Savings Applications Accepted but not yet Contracted (GWh) - Progress	0.00	12.01		
	Electric Savings Under Contract but not yet Installed (GWh) - Progress	0.00	4.21		
	Electric Savings Installed (GWh) - Progress	0.00	0.55		
	Total Progress	0.00	16.77		
All Projects	Primary Energy Savings (MMBtu) - Target	5,000	36,200	70,200	78,000
	Primary Energy Savings Applications Accepted but not yet Contracted (MMBtu) - Progress	0	44,721		
	Primary Energy Savings Under Contract but not yet Installed (MMBtu) - Progress	0	24,029		
	Primary Energy Savings Installed (MMBtu) - Progress	1,053	1,614		
	Total Progress	1,053	70,363		

		2012-13	2014-15	2016	2017-20	Total
All Projects	Stakeholder Engagements - Target	7	5	1		13
	Stakeholder Engagements - Progress	20	5			25
	Knowledge/Technology Transfer Activities - Target	8	17	10	3	38
	Knowledge/Technology Transfer Activities - Progress	0	7			7

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$1.0	$3.5	$2.0		$6.5
	Leveraged Funds Amount (millions) - Progress	$0.1	$2.5			$2.5
	Leveraged Funds Replicated (millions) - Target				$21.0	$21.0
	Leveraged Funds Replicated (millions) - Progress	$0.0	$0.0			$0.0
	Peak Load Reduction Replicated (MW) - Target				7	7
	Peak Load Reduction Replicated (MW) - Progress	0	0			0
	Energy Savings Replicated (GWh) - Target				30	30
	Energy Savings Replicated (GWh) - Progress	0	0			0
	Primary Energy Savings Replicated (MMBtu) - Target				231,800	231,800
	Primary Energy Savings Replicated (MMBtu) - Progress	0	0			0
	Market Adoption - Target			4	3	7
	Market Adoption - Progress	0	0			0

3.2.1.2 Technology Development

Under the Technology Development area, NYSERDA will undertake targeted building technology development activities that address the technical and economic barriers and opportunities for new or emerging products. As a complement to Technology Development, NYSERDA plans to establish an Advanced Building Consortium to guide and conduct targeted high priority technology development and demonstration projects and to help accelerate the introduction of emerging technologies to New York State markets.

The following key program activities and accomplishments have been performed during this reporting period:

- Completed Round 5 of PON 2606. Eleven projects were recommended for funding totaling nearly $2.3 million and leveraged more than $2.7 million in external funding.
- To date, PON 2606 has received 279 proposals requesting $48.4 million in NYSERDA funds. Through Round 5 approximately $18 million has been committed of the $25 million PON 2606 Budget.
- NYSERDA is evaluating the potential impacts for supporting a consortium to advance technologies that operate building systems with a holistic approach that optimizes the whole building efficiency instead of discrete system efficiencies and maximizes the benefits from on-site energy resources.

<u>Behavior Research Program (now Market Insights Team)</u>

NYSERDA's Market Insights Team (formerly the Behavior Research Program) works with Action Research, Inc. (Action Research), Behavioral Ideas Lab (ideas42), and clean energy programs in New York State to implement and evaluate clean energy pilots to identify opportunities where behavior science can be used to improve clean energy program outcomes. The behavior research pilots are documented in public presentations, case study reports, and published articles. Funding to demonstrate successful pilot interventions at a larger scale was available through NYSERDA's Behavior Demonstration Program (PON 2646) and four demonstration projects are under contract development.

The following key program activities and accomplishments have been performed during this reporting period:

- Issued RFP 3072 (Behavior-Integrated Clean Energy Design, Market Development and Evaluation Services) to provide behavioral design and evaluation services to NYSERDA's Clean Energy Fund (CEF) strategies, and contracted with Behavioral Ideas Lab (ideas42). Ideas42 initiated its review of NYSERDA CEF strategies and will prioritize NYSERDA's CEF strategies for behavior-integration during the next reporting period. Separate contracts under this RFP with an independent evaluation consultant and a second behavior design consultant are under development.
- Contracted five behavior research pilots and a second contract with Action Research under the second and final round of PON 2631, Behavior Research and Energy Decision Making.
- Completed fieldwork of two behavior pilots funded under the first round of PON 2631 that were contracted under a prior reporting period: one pilot provided customized programmable thermostat set points to promote winter heat savings to sub-metered apartment dwellers in the Capital District; and the second pilot was conducted at Clarkson University to influence student residents of dorm suites to conserve water, electricity and heat in response to receiving electronic real-time energy and resource feedback. The evaluations for both pilots will be completed during the next reporting period.
- Designed and initiated field deployment of a behavior pilot with Action Research using intrinsic messaging to influence residents of low-income multifamily, non-metered apartments in Downstate New York to conserve AC during the summer months.

Table 3-11 shows performance milestones and results for the Technology Development Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Anticipated achievements and results are estimates based on savings per program dollar invested in projects. Blank cells indicate the lack of a target in a particular time period. Signed contracts and completed projects are for clean power technology projects. Supported companies are clean energy companies. Products and technologies commercialized are clean power technologies that have reached commercial availability. Product revenue includes commercial sales of supported clean power technologies. Leveraged funds include both co-funding and outside investment for clean power technology projects.

Table 3-11. Technology Development Performance Milestones and Results through June 30, 2015

Advanced Buildings Technology Development
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Signed Contracts - Target	23	18	5		46
	Signed Contracts - Progress	29	41			70
	Completed Projects - Target		23	18	5	46
	Completed Projects - Progress	0	9			9
	Supported Companies - Target	12	9	2		23
	Supported Companies - Progress	25	35			60

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$7.0	$5.0	$2.0		$14.0
	Leveraged Funds Amount (millions) - Progress	$34.1	$17.6			$51.7
	Products and Technologies Commercialized - Target		1	4	1	6
	Products and Technologies Commercialized - Progress	2	3			5
	Product Revenue Amount (millions) - Target			$8.0	$75.0	$83.0
	Product Revenue Amount (millions) - Progress	$0.7	$2.0			$2.7

3.2.1.3 Enabling Demand Response and Load Management

Under the Enabling Demand Response (DR) Load Management Program, NYSERDA will help increase participation and reliability of performance in utility and New York State Independent System Operator (NYISO) programs. These outcomes can suppress wholesale energy costs, reduce congestion costs, increase reliability, and provide other benefits. The development of enabling DR technologies and new demand management models through this program will increase the technical potential of DR in New York State.

The Existing Facilities Program (PON 1219) is the active solicitation offering open-enrollment incentives for DR projects across New York State. Enhanced incentives are currently offered in Con Edison territory via the Demand Management Program. Clean distributed generation projects are eligible in Con Edison territory exclusively and load curtailment projects and energy storage projects are eligible statewide. The incentives for DR are $100 or $800 per kilowatt (kW) for Upstate or Downstate, respectively, and the incentives for energy storage are $300 per kW in Upstate or $2,600 and $2,100 per kW for Downstate thermal or battery storage, respectively. Demand Management Program DR projects are required to enroll

in the NYISO ICAP/SCR program. The NYSERDA Existing Facilities Program also offers prequalified incentives for interval meters on a per-unit basis. Interval meters must enable at least 40 kW worth of demand response in an approved DR program. The prescriptive incentive is $1,500 per meter or 100% of project cost, whichever is less.

NYSERDA has historically funded DR projects with SBC III resources. Benefits from this SBC III DR investment continue to accrue and were reported in the 2014 SBC III annual report finalized in March 2015. (Prior historical accomplishments are in the SBC III annual report through December 2012).

The following key program activities and accomplishments have been performed during this reporting period:

- NYSERDA via the active solicitation (PON1219) issued six purchase orders for implementation of demand response enablement measures representing approximately $5 million in private investment.
- NYSERDA issued one purchase order reserving incentive funding for a performance-based clean generation project that is planned to offset a project cost of approximately $0.5 million via PON1219.

Table 3-12 shows performance milestones and results for the Demand Response Program through June 30, 2015. Energy savings reported in Table 3-12 are program-reported; evaluation activities have not yet been conducted on these programs. Future reports will present findings from those studies as they are finalized. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period.

Table 3-12. Demand Response Performance Milestones and Results through June 30, 2015

Demand Response
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2012-15	2012-16	2012-20
All Projects	MW Registered - Target	9.00	23.00	41.00	46.00
	MW Registered Applications Accepted but not yet Contracted (MW) - Progress	2.05	3.39		
	MW Registered Under Contract but not yet Installed (MW) - Progress	5.44	12.59		
	MW Registered Installed (MW) - Progress	39.57	111.29		
	Total Progress	47.06	127.26		

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	MW Registered Evaluated - Target				23.00	23.00
	MW Registered Evaluated - Progress	0.00	0.00			0.00

3.2.1.4 Advanced Energy Codes and Standards

The Advanced Codes and Standards Initiative consists of two components: a set of code activities targeted at the commercial and residential building sectors in New York State, and a set of standards activities directed at influencing State and national appliance and equipment standards and specification setting processes for various equipment types. Activities within these areas are described in the following sections.

3.2.1.5 Annual Statewide Compliance Assessments

Statewide compliance assessment studies provide a means to track compliance trends associated with changing codes and standards. These assessment studies help identify where program intervention may be needed. Compliance assessments will occur as a phased effort.

The following key program activities and accomplishments have been performed during this reporting period:

- NYSERDA received the final report of a statewide compliance assessment of commercial building alteration projects, permitted under the Energy Conservation Construction Code of New York State – 2010 and completed between January 1, 2011 and December 31, 2012. The report, published by NYSERDA, is available at http://www.nyserda.ny.gov/Cleantech-and-Innovation/EA-Reports-and-Studies/Energy-Efficiency-Services-Reports

3.2.1.6 Development and Delivery of Advanced Training and Tools

Training to support new and advanced codes and standards is critical, particularly at points of adoption. Training efforts will build on those developed using American Recovery and Reinvestment Act of 2009 (ARRA) funds, with new or enhanced approaches and topics that address areas of low compliance or code change.

The following key program activities and accomplishments have been performed during this reporting period:

- NYSERDA received draft curricula for design professionals, one of four primary audience groups targeted by NYSERDA for energy code training, with the expectation that training delivery will begin next quarter.
- NYSERDA funded 40 training sessions to 1,911 audience members primarily code enforcement officials and construction professionals.

3.2.1.7 Technical Support, Studies, and Resources

Technical consulting and other research firms will be competitively selected to provide technical and administrative support Advanced Codes and Standards program efforts, including new strategies to improve compliance and enforcement.

The following key program activities and accomplishments have been performed during this reporting period:

- NYSERDA received final drafts of the proposed International Energy Conservation Code (IECC) 2015 Supplement, Regulatory Impact Statement and Regulatory Impact Statement Summary, Statement Explaining Why a Job Impact Statement is Not Required, Rural Area Flexibility Analysis (RAFA), RAFA Summary, Regulatory Flexibility Analysis for Small Business and Local Government (RFASBLG), RFASBLG Summary, Rule Text, Rule Text Summary and Substance of Final Rule. These documents were prepared for the NYS Department of State, to assist in accelerating adoption of IECC 2015.
- NYSERDA launched cost effectiveness and equivalency studies of IECC 2015 and ASHRAE 90.1-2013 to assist the NYS Department of State in accelerating adoption of IECC 2015.
- NYSERDA launched NYStretch, an effort to develop an above-minimum Energy Code intended for optional municipal adoption. This effort will last approximately two years.
- NYSERDA is nearing contract for a gap analysis and action plan to implement third party enforcement support.

3.2.1.8 Pilots and Expanded Implementation Assistance

Pilots testing strategies for improved code compliance and enforcement strategies, and stretch and green planning efforts were developed for competitive selection. NYSERDA also will support the construction and code enforcement communities by strategically providing implementation assistance to increase compliance with new and advanced codes and standards.

The following key program activities and accomplishments have been performed during this reporting period:

- NYSERDA received a strong response to RFP 2694 (Energy Code Support Service for Municipalities), and will proceed with projects designed to improve Energy Code compliance and enforcement focused on the State's anticipated adoption of IECC-2015. Projects include:
    - Municipal support for building plan review and on-site inspection support and education.
    - New York State Energy Code Conference.
    - Foundational work on a New York State Stretch Code.
    - Print and online publications on best practices for Energy Code enforcement and compliance for municipalities, designers and builders.
    - Gap Analysis and Action Plan for Implementing Third Party enforcement support to municipalities.
- NYSERDA received a strong response to RFP 2852 (NYSERDA Energy Code Training and Support Website) and will seek to expand on its online presence among the enforcement, design, and construction communities specific to Energy Code education and information.

Table 3-13 shows performance milestones and results for the Advanced Energy Codes & Standards Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Energy savings reported in Table 3-13 are program-reported; evaluation activities have not yet been conducted on these programs. Future reports will present findings from those studies as they are finalized. Blank cells indicate the lack of a target in a particular time period. The training sessions are for new or expanded code training modules. The program support solicitations will competitively hire consulting and market research firms to provide program support. The support solicitations are for pilots and program implementation assistance.

Table 3-13. Advanced Energy Codes & Standards Performance Milestones and Results through June 30, 2015

Advanced Energy Codes
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
Code compliance efforts	Annual Code Compliance Assessments - Target	2	2	1		5
	Annual Code Compliance Assessments - Progress	1	0			1
	Training Sessions - Target	6	6			12
	Training Sessions - Progress	0	40			40
	Code Requirement Trainees - Target	7,000	6,000	2,000		15,000
	Code Requirement Trainees - Progress	0	1,911			1,911
Equipment and appliance standards efforts	State/Federal Standards Conformance Assessments - Target	1	1	1		3
	State/Federal Standards Conformance Assessments - Progress	0	0			0
All Projects	Program Support Solicitations - Target	1	1			2
	Program Support Solicitations - Progress	0	0			0
	Implementation Support Solicitations - Target	1	1			2
	Implementation Support Solicitations - Progress	1	2			3

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
Code compliance efforts	Energy Savings Installed (GWh) - Target	84.00	140.00	90.00	317.00	631.00
	Energy Savings Installed (GWh) - Progress	0.00	0.00			0.00
	Energy Savings Installed (MMBtu) - Target	575,000	1,057,000	726,000	2,563,000	4,921,000
	Energy Savings Installed (MMBtu) - Progress	0	0			0
	Peak Load Reduction Installed (MW) - Target	18.00	28.00	19.00	64.00	129.00
	Peak Load Reduction Installed (MW) - Progress	0.00	0.00			0.00
Equipment and appliance standards efforts	Energy Savings Installed (GWh) - Target		5.00	51.00	300.00	356.00
	Energy Savings Installed (GWh) - Progress	0.00	0.00			0.00
	Peak Load Reduction Installed (MW) - Target		2.00	23.00	143.00	168.00
	Peak Load Reduction Installed (MW) - Progress	0.00	0.00			0.00

3.3 Clean Energy Infrastructure Initiatives

Table 3-14 shows the Clean Energy Infrastructure budget and financial status through June 30, 2015. Committed and spent funds are also shown as a percent of the total 2012-2016 budget. Progress for each area of this initiative is described in following sections.

Table 3-14. Clean Energy Infrastructure Budget and Financial Status through June 30, 2015

Totals may not sum exactly due to rounding.

	2012-2016 Budget	Spent Funds	Percent of 2012-2016 Budget Spent	Committed Funds[a,b]	Percent of 2012-2016 Budget Committed
Market Development					
Market Research	$4,640,141	$3,440,454	74%	$4,144,640	89%
Market Pathways	$55,710,000	$24,150,358	43%	$30,567,930	55%
Education/Behavior	$10,030,140	$4,122,007	41%	$6,852,174	68%
Total Market Development	*$70,380,281*	*$31,712,818*	*45%*	*$41,564,744*	*59%*
Clean Energy Business Development					
Innovation Entrepreneurial Capacity	$36,761,046	$8,269,424	22%	$20,934,847	57%
Market Intelligence	$1,688,584	$711,279	42%	$963,978	57%
Direct Support for Business	$2,400,000	$787,039	33%	$2,050,975	85%
Marketing	$911,416	$565,477	62%	$585,804	64%
Total Clean Energy Business Development	*$41,761,046*	*$10,333,219*	*25%*	*$24,535,604*	*59%*
EMEP	$18,550,048	$3,676,593	20%	12,286,144	66%
Workforce Development					
Renewable Energy/Advanced Technologies	$15,000,000	$2,745,821	18%	$5,215,662	35%
Energy Efficiency	$24,000,000	$4,383,969	18%	$9,677,889	40%
Total Workforce Development	*$39,000,000*	*$7,129,791*	*18%*	*$14,893,550*	*38%*
Grand Total - Clean Energy Infrastructure	***$169,691,375***	***$52,852,420***	***31%***	***$93,280,043***	***55%***

[a] Committed funds include amounts spent plus remaining funding obligated under a contract, purchase order, or incentive award. In addition, committed funds include planned funding for contracts awarded and under negotiation and planned funding under active development through solicitations with specific due dates.

[b] Committed funds may decrease from period to period as a result of the disencumbrance/cancellation of contracts, or due to the actual award amount(s) resulting from a due date solicitation being less than the planned award.

3.3.1 Market Development

The Market Development initiatives help to create the foundation for long-term changes in the market for the delivery of products and services that address energy efficiency and the adoption of renewable energy technologies. Strategies address the supply chain, consumer behavior, market barriers, and education. Market Development activities identify new market opportunities and keep the supply chain informed about technological innovations and provide the technical tools, resources, and training necessary to promote energy efficiency and renewable options to consumers.

3.3.1.1 Market Research

The Market Research component identifies market and institutional barriers to technology and product adoption, obtains critical early stage information and insights to guide investment decisions, and further advances the reach of T&MD and EEPS programs and other public policy goals. Its goal is to amass specific market intelligence and identify program opportunities to increase implementation efficiency and effectiveness. Since the start of the program in 2012, 14 projects have been completed, covering a variety of technologies and topics including lighting, data centers, solar electric and NYSERDA wide corporate strategy. These various studies have offered insights on how NYSERDA can best position its programs and overall organizational structure to advance key energy efficiency and renewable energy technologies.

The following key program activities and accomplishments have been performed during this reporting period:

- NYSERDA filed a CEF Information Supplement on June 25, 2015. Market research through NYSERDA's Corporate Strategy Assessment was leveraged to develop the key barriers, decisions points, and proposed strategies included in NYSERDA's proposal, as well as an initial estimation of benefits.

Table 3-15 shows performance milestones and results for the Market Research Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period.

Table 3-15. Market Research Performance Milestones and Results through June 30, 2015

Market Research
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Completed Projects - Target	2	1	1		4
	Completed Projects - Progress	3	11			14

3.3.1.2 Market Pathways

The Market Pathways component works across the supply chain and sectors to promote the stocking, specification, sales, installation, maintenance, and use of energy-efficient products and strategies. NYSERDA provides tools, business strategies, and business and marketing materials to manufacturers, suppliers, distributors, retailers, service providers, designers, specifiers, contractors, and builders. The following sections describe progress in key areas.

New York Products Program

The New York Products Program (Products Program), formerly known as the Energy $mart^{SM} Products Program, seeks to increase sales of residential energy-efficient appliances, lighting, and home electronics products. The Products Program works on the supply side with retailers and manufacturers and on the demand side by marketing to consumers. The overall goal of the Products Program is market transformation: to increase awareness of and demand for energy-efficient products, that have included ENERGY STAR® certified appliances, high-efficiency HVAC equipment, and home electronics. Past Products Program activities included incentives for cooperative advertising and special promotions, as well as marketing campaigns on both the supply and demand sides of the appliance and lighting markets. Other activities included the development and distribution of special point-of-purchase (POP) materials; development of educational materials, coordination with retailers in their outreach efforts that support the Program's objectives, and training sessions for retail sales staff and managers.

During the first half of 2015, the Products team began to focus on new initiatives that align with the principles of the Clean Energy Fund and address specific market barriers impacting the adoption of high efficiency residential products and integrated systems. One of the initiatives was Program Opportunity Notice (PON) 3125 which targets retailers, manufacturers, distributors/vendors, and other stakeholders to provide them with an opportunity to propose market-driven solutions to increase the availability and demand of targeted high-efficient products. PON 3125 will be released in the summer of 2015.

The following key program activities and accomplishments have been performed during this reporting period:

- For the first six months of 2015, 2,444 of POP pieces that promote program-qualified products were distributed to 176 partner locations. Additionally during this time approximately $630,211 in incentives was paid out to program partners while 9 Sales Trainings for Active Retailers (STAR) trainings were completed by partners online.

Business Partners Programs

The Business Partners Programs are designed to accelerate the adoption of energy efficiency products and services within the commercial sector. Activities help service providers (contractors, vendors, installers, distributors, designers) in the commercial midmarket supply chain develop business models to address the primary factors affecting their customers' operations and energy decisions. New market opportunities are identified and the supply chain is informed of technological innovations and provided the technical tools, resources, and training necessary to promote profitable energy efficiency options to their customers.

Technical and sales training is provided for the network of service providers (Business Partners) focusing on quality and efficient design practices, and maintenance, repair and replacement services for energy products in commercial and industrial buildings. Tools and resources are made available so that Business Partners can use to design projects, demonstrate cost-benefit information, and help customers develop and implement energy efficiency plans. These tools and resources enable Business Partners to differentiate their business models within the marketplace, make it easier to demonstrate the value of clean energy solutions, increase customer confidence in project benefits, improve project performance, streamline the procurement of energy services, and help integrate energy efficiency information into the decision making processes for buyers and sellers. Incentives are provided to help Business Partners overcome risk, understand new technologies, and encourage the expansion of new clean energy solutions for their customers.

Business Partner programs have focused on commercial lighting design, roof-top HVAC service and maintenance, and motor inventories. ICF Resources is the implementation contractor for the Commercial Lighting Business Partners Program. The core elements of the lighting program provide educational and technical support and resources to Lighting Business Partners (lighting contractors, distributors, manufacturer representatives, architects, engineers, and energy service companies [ESCOs]) that incorporate lighting quality elements into their interior energy-efficient lighting projects. DNV GL is the implementation contractor for the HVAC Business Partners Program that provides HVAC Business Partners (primarily commercial HVAC firms and refrigeration firms) with quality maintenance strategies and tools in accordance with ASHRAE/ACCA Quality Maintenance Standard 180. Partners learn to evaluate and upgrade commercial roof top units (RTU) beyond what is typically offered as standard practice. The Motors Program focuses on providing educational and technical support to NYSERDA's Partners (motor suppliers, repair shops, electrical companies, manufacturers, and distributors) who perform motor inventories and sell and promote National Electrical Manufacturers Association (NEMA) Premium® motors and variable speed drives (VSDs).

The following key program activities and accomplishments have been performed during this reporting period:

- Commercial Lighting and HVAC Program Business Partners demonstrated project replicability in various market sectors such as retail, grocery, schools, and industrial applications that matched the specific Partner business model focus.

Innovative Strategies

Innovative Strategies is designed to support the identification and demonstration of sector-specific approaches, tools, and strategies for demonstrating and verifying energy savings and to broadcast the energy efficiency message to building owners, operators, and the financial sector. Opportunities to standardize efforts will be identified where appropriate, and credibility will be provided to approaches that reduce the barriers to financing energy efficiency projects that are not addressed by EEPS programs. The goals of the Commercial/Industrial Emerging Technologies and Advanced Commercialization (ETAC-CI) initiative are to identify, demonstrate, and accelerate adoption of newer, under-used energy-saving technologies and strategies in the State.

The following key program activities and accomplishments have been performed during this reporting period:

- A matrix providing energy efficiency and renewable energy financing options for both the private and public sectors is being reviewed and modified for placement on the NYSERDA website.
- The number of tax lien authorities enrolled as members of Energize NY and, therefore, able to offer Commercial Property Assessed Clean Energy Financing was increased from 12 to 17.
- Energize NY closed on its first financing. The project was a 53-kW solar electric system at 5 Spokes Creamery in Goshen, NY. (Visit http://ny.gov/rev4ny to watch a video case study).

Table 3-16 shows performance milestones and results for the Market Pathways Program through June 30, 2015. Energy savings reported for the Business Partners program in Table 3-16 are program-reported; evaluation activities have not yet been conducted on these programs. The recently completed evaluation factors for the efficiency products with Energy $mart Partners have been applied to the energy savings reported for the Product Partners program. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period.

Table 3-16. Market Pathways Performance Milestones and Results through June 30, 2015

Market Pathways
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
Market Pathways - RES	Energy Smart Product Partner Participants - Target	940	200	100		1,240
	Energy Smart Product Partner Participants - Progress	610	281			891
	Product Partner Trainees - Target	200	200	100		500
	Product Partner Trainees - Progress	130	353			483
Market Pathways - Midstream Support	Midstream Partner Participants - Target	430	55	25		510
	Midstream Partner Participants - Progress	95	318			413
	Midstream Partner Trainees - Target	375	375	275		1,025
	Midstream Partner Trainees - Progress	1,103	553			1,656
	Factsheets - Target	4	4	1		9
	Factsheets - Progress	0	0			0
	Seminars/Webinars - Target	4	4	1		9
	Seminars/Webinars - Progress	12	8			20
Market Pathways - C/I	Innovative Energy Efficiency Investment Strategy Participants - Target	20	5	5		30
	Innovative Energy Efficiency Investment Strategy Participants - Progress	12	5			17
	EAL Evaluations - Target	4	4	2		10
	EAL Evaluations - Progress	0	0			0
	EAL Seminars/Webinars - Target	4	4	2		10
	EAL Seminars/Webinars - Progress	48	0			48
	Factsheets - Target	3	2	1		6
	Factsheets - Progress	0	0			0
	Seminars/Webinars - Target	4	4	2		10
	Seminars/Webinars - Progress	0	0			0

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
Market Pathways - RES	Energy Savings Installed (GWh) - Target	50.00	50.00	25.00		125.00
	Energy Savings Installed (GWh) - Progress	5.91	3.88			9.79
	Energy Savings Installed (MMBtu) - Target	254,000	419,000	222,000		895,000
	Energy Savings Installed (MMBtu) - Progress	142,610	82,136			224,747
Market Pathways - Midstream Support	Energy Savings Installed (GWh) - Target	15.00	15.00	7.00		37.00
	Energy Savings Installed (GWh) - Progress	4.64	52.16			56.79
	Market Adoption - Target	1	1	1		3
	Market Adoption - Progress	0	0			0
Market Pathways - C/I	Completed Projects - Target	5	10	3	2	20
	Completed Projects - Progress	0	1			1

3.3.1.3 Education to Change Behavior and Influence Choices Component

Economic Development Growth Extension Program

The Economic Development Growth Extension (EDGE) Program is facilitated by Regional Outreach Contractors (ROCs) who perform outreach, education, and promotion of NYSERDA program opportunities to residents, businesses, institutions, and local governments across the State. Formerly known as the Energy $mart Communities Program, EDGE educates New Yorkers about the role that energy efficiency and renewable power can play in reducing energy costs and providing clean, reliable energy for homes, schools, and workplaces. The EDGE Program was designed to include support for Governor Cuomo's Regional Economic Development Council initiative by aligning the program territories geographically and providing direct support to advance the strategic priorities and regionally significant projects identified in each region. Through this alignment with the Regional Councils, NYSERDA provides a greater level of education and adoption of energy-efficiency practices at the community level. NYSERDA has contracted with the New York State Economic Development Council and Solar One, a team that includes regionally-based economic development organizations to provide on-the-ground outreach support.

The following key program activities and accomplishments have been performed during this reporting period:

- EDGE's emphasis has moved away from promoting these SBC-specific programs to promoting opportunities for various new NYSERDA initiatives and other Statewide opportunities. That outreach and marketing conducted by the Regional Outreach Contractors includes but is not limited to the following activities:
    - EDGE Program ROCs have established new partnerships that have led to referrals from these new relationships.
    - ROCs have also participated in public outreach events including the Consolidated Funding Application Workshops held across the state to support the efforts of the Regional Economic Development Council initiative.
    - Instrumental in identifying municipal contacts for interviews conducted for the Governor's Community Energy Deployment Working Group, now known as the NYS Community Partnership (NYSCP). Conducted interviews and provided write-ups for the Working Group.
    - Assisted in staffing the first NYSCP workshop held in White Plains, NY.
    - Instrumental in providing contacts to invite to the NY-Prize Statewide Energy Tour workshops as well as marketing the NY-Prize Solicitation –RFP 3044 for Round 1. Held webinars to connect potential projects with consultants.
    - Provided contacts with banks and invited them to the NY Green Bank Road Show.
    - Established relationships with Constituency-Based Organizations to assist in establishing Community Solarize Programs for the NY-Sun initiative.

- Conducted outreach to public schools in the various regions to encourage them to enlist in the K-Solar program.
- Promoted the PV (Solar) Trainers Network workshops to partners and contacts in the appropriate regions.
- NYC ROCs have been instrumental in planning workshops for and tours of CHP sites events, which lead to increased attendance in the programs' CHP Expos. These events have increased the demand for CHP in the Con Ed territory as well as Central New York, which had over 100 participants in the only event held Upstate and was promoted by the Central New York ROCs.

Behavioral Demonstrations

Projects selected under the Behavioral Demonstrations program will test the efficacy, persistence, and cost effectiveness of behavioral interventions designed to encourage consumers to use less energy and invest in energy efficiency services. Implementation contractors are partnered with utilities, and the utilities will specify metrics and cost effectiveness criteria that, if met, will compel them to invest in further expansion of these interventions absent NYSERDA funding.

The following key program activities and accomplishments have been performed during this reporting period:

- Seventeen proposals were received in response to PON 2646.
- NYSERDA is currently in the process of contracting with the five organizations selected for funding by the Technical Evaluation Panel.

Low-Income Forum on Energy (LIFE)

The Low-Income Forum on Energy (LIFE) is the longest running statewide low-income energy dialogue in the United States. LIFE brings together a diverse range of parties committed to addressing the challenges and opportunities facing low-income New Yorkers as they seek safe, affordable, and reliable energy. Guided by a steering committee composed of State agencies, utilities, contractors, and community-based organizations, the program undertakes several initiatives to increase awareness of low-income energy issues.

The following key program activities and accomplishments have been performed during this reporting period:

- LIFE hosted as series of seven Regional Meetings in May and June of 2015. Meetings venues were located in Manhattan, Long Island, Watertown, Saratoga Springs, Buffalo, Corning, and Kingston. In total, the meetings were attended by 486 individuals representing 230 organizations.
- LIFE produced and distributed four electronic newsletters that include feature articles of interest to low-income energy stakeholders along with hyperlinked resources for readers to connect with further information. Each newsletter arrives in over 3,700 inboxes.
- LIFE hosted four webinars on various topics including program updates, best practices, and consumer protections. On average, the webinars were attended by 45 individuals representing 30 organizations.
- The LIFE Steering Committee met twice (February 25 and April 20) to plan for LIFE initiatives, share program information, and discuss opportunities for collaboration.
- LIFE increased its number of followers on Twitter by 19 percent.

Table 3-17 shows performance milestones and results for the Education/Behavior Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Signed contracts are the sponsorship on behavioral pilots. The meetings, workshops and conferences are the sponsorship of annual LIFE conferences. The LIFE program anticipates sponsoring, planning and supporting a total of seven LIFE conferences and regional meetings. Completed projects include completing and evaluating behavioral pilots.

Table 3-17. Education/Behavior Performance Milestones and Results through June 30, 2015

Education/Behavior
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Signed Contracts - Target	5	3			8
	Signed Contracts - Progress	0	0			0
	Meetings, Workshops, Conferences - Target	2	2	1		5
	Meetings, Workshops, Conferences - Progress	1	1			2
	Community Partnership Participants - Target	250	250	75		575
	Community Partnership Participants - Progress	465	393			858

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Completed Projects - Target		4	6	2	12
	Completed Projects - Progress	0	0			0

3.3.2 Clean Energy Business Development

3.3.2.1 Innovation/Entrepreneurial Capacity Building

There are three Proof-of-Concept Centers (POCC): New York University, in partnership with the City University of New York, and Columbia University, in partnership with Stony Brook University, Cornell NYC Tech, and Brookhaven National Laboratory, are co-branding the two programs as PowerBridgeNY. Another POCC is run through High Tech Rochester as NEXUS-NY. The mission of the POCCs is to accelerate the translation of clean energy research into marketable products and services. This translation is primarily accomplished by fostering successful pre-startup companies. Generally, the next step for these companies is to participate in a business mentoring or incubation program. NYSERDA is investing approximately $5 million in seed money at each center over a five-year period. The centers are expected to operate independently after NYSERDA funding ends.

The objectives of the POCC initiative are to:

- Accelerate the commercialization of innovations out of research institutions and into the marketplace, particularly through startups.
- Early in the research and development phase, match emerging clean energy technologies that have scalable commercialization potential, based on real market need, with the investment community.
- Establish sustainable regional innovation ecosystems of potential investors and entrepreneurs in clean energy technologies and solidify the POCC linkages to them.

The following key program activities and accomplishments have been performed during this reporting period:

- For all of the programs, the Cycle 2 teams have been selected and are actively engaged in customer discovery and market validation. Cycle 1 teams are finishing up the development of a minimally viable prototype and looking to start building a business.

<u>Emerging Clean Energy Business Development</u>

The Clean Energy Business Incubator program was initiated in 2009 with funding from SBC III. The purpose of these incubators is to foster the viability and growth of seed-stage and early-stage clean energy companies, most of which are still in the process of commercializing technologies and have yet to earn revenue from commercial operation and product sales. The incubators assist companies by providing ready access to investors, development partners, mentors, and service providers.

The following key program activities and accomplishments have been performed during this reporting period:

- New York University's New York City Accelerator for a Clean and Resilient Economy (NYC ACRE) assisted Honest Buildings, a New York City-based startup that has developed a platform to connect professionals in the real estate construction and design space, raise $11.5 million from leading venture capitalists.
- Rochester Institute of Technology's Venture Creations incubator assisted Sweetwater Energy, a Rochester-based startup that has developed technology to extract sugars from biomass to help meet the world's bioenergy and biochemical needs, raise almost $18 million from investors.
- The Tech Garden's Clean Tech Center helped Ephesus Technologies, a Syracuse-based clean energy company that markets and installs LED lighting systems at music and sports venues, leverage $300,000 in NYSERDA R&D funding to raise more than $6.3 million from investors while creating 24 jobs in Upstate New York.

Table 3-18 shows performance milestones and results for the Innovation/Entrepreneurial Program through June 30, 2015 for T&MD funded projects only. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Leverage funds include co-funding and outside investments to help clean energy businesses. Product revenue includes commercial sales of new and improved supported technologies. The following key program metrics and accomplishments have been tracked and achieved by companies working with the NYSERDA-sponsored incubators during this reporting period: Private capital raised, non-NYSERDA grants awarded, new commercial products developed, revenue generated, jobs created and retained, strategic partnerships formed, and mergers and acquisitions completed.

Table 3-18. Innovation/Entrepreneurial Milestones and Results through June 30, 2015

Innovation/Entrepreneurial Capacity
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Incubators or POCCS Participants - Target	65	90	50	200	405
	Incubators or POCCS Participants - Progress	29	58			87

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$40.0	$45.0	$25.0	$40.0	$150.0
	Leveraged Funds Amount (millions) - Progress	$40.2	$26.7			$66.8
	Products and Technologies Commercialized - Target	5	10	10	15	40
	Products and Technologies Commercialized - Progress	1	5			6
	Product Revenue Amount (millions) - Target	$2.5	$5.0	$5.0	$7.5	$20.0
	Product Revenue Amount (millions) - Progress	$0.0	$0.0			$0.0
	Businesses Graduated from Incubators - Target	36	36	18	72	162
	Businesses Graduated from Incubators - Progress	9	26			35
	FTEs Associated with Incubator Graduates - Target	108	108	54	216	486
	FTEs Associated with Incubator Graduates - Progress	185	67			252

3.3.2.2 Market Intelligence

New York State Clean Energy Innovation Metrics

NYSERDA worked with SRI International to research and prepare a 2012 report on clean energy technology metrics. To determine the metrics to present, focus groups were held involving nearly 100 individuals including entrepreneurs affiliated with cleantech startup companies, cleantech investors, executives, and other representatives of larger, more established technology companies, directors of cleantech incubators, representatives from cleantech industry consortia, universities conducting cleantech research, and other cleantech organizations.

The NYS Clean Energy Technologies Innovation Metrics 2012 report reveals New York State's strong record of support for existing and emerging clean energy technology companies and creation of an environment conducive to innovation, entrepreneurship and technology-led growth. For example, New York State's commitment to growing cleantech is demonstrated by its national rank in the top five in many key cleantech economic indicators:

- 1st overall in wind patenting.
- 2nd in overall cleantech patenting.
- 2nd in electric and gas energy efficiency investment.
- 3rd in state energy efficiency policies.
- 3rd in university research expenditures.
- Top three in science, technology, engineering, and mathematics (STEM) degrees awarded and venture capital investment.
- 4th in a number of cleantech companies and green goods and services employment.

This first report and analysis was funded under SBC III. Future iterations of the report will be supported under T&MD funding and will be used to inform future T&MD programs.

The following key program activities and accomplishments have been performed during this reporting period:

- In second half of 2014, work began on the second issue of the NYS Clean Energy Technologies Innovation Metrics report with contractor SRI. A user survey was completed to understand user usage and additional reporting needs. Data sets were obtained, manipulated and are in process of formatting for the next report. The next issue of the report is expected to be completed in the third quarter of 2015.

Table 3-19 shows performance milestones and results for the Market Intelligence Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Signed contracts include creating annual benchmark reports on clean energy business and financial indicators for New York State. Website downloads support the dissemination of clean energy benchmark information.

Table 3-19. Market Intelligence Performance Milestones and Results through June 30, 2015

Market Intelligence
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Signed Contracts - Target	2	2	1		5
	Signed Contracts - Progress	0	2			2
	Website Downloads - Target	100	200	200		500
	Website Downloads - Progress	0	80			80

3.3.2.3 Direct Support for Business Acceleration Program

The NYSERDA Entrepreneurs-in-Residence (EIR) program offers experienced entrepreneurial coaching to NYSERDA contractors and incubator clients. Some of the general outcomes and observations from the program show that companies struggle with customer delivery and engagement and the development of an overall business strategy. Most of these companies are founded by technical entrepreneurs, and prefer to focus on technology development more than commercialization.

The NY EXCEL (New York Executive Clean Energy Leadership) program at Skidmore College and NY Clean Start at NYC-ACRE and NYU target experienced entrepreneurs and executives with a concentrated course about the markets, financing models, permitting requirements, technology solutions and other unique aspects of the cleantech industry necessary to start a successful clean energy business. The ultimate goals of NY EXCEL and NY Clean Start are to increase the number of clean energy entrepreneurs in the State, create well-paying jobs in New York communities, and provide solutions for addressing the long-term challenge of energy independence.

The following key program activities and accomplishments have been performed during this reporting period:

- **NY EXCEL** completed its first cohort in January 2015 at Skidmore College. The course includes visits to NYISO and NYSERDA and well as seminars by renewable experts, legal, and regulatory entities and took 10 students around NYS for weekend classes, company visits, and support centers in Syracuse (September), Saratoga (October), White Plains and New York City (November), and Rochester (December).
- The New York City Accelerator for a Clean Resilient Economy (NYC-ACRE) in collaboration with New York University is hosting the **Clean Start Program** for professionals with five to 10 years of experience who have targeted a transition into the clean energy sector. The Clean Start curriculum combines business and technology to create a hybrid platform for professionals to team up with leaders of New York's clean energy economy—from startups, industry members, and utilities. The 120-hour evening and weekend part-time curriculum is designed to attain a professional certificate from the New York University School of Continuing and Professional Studies Center for Global Affairs. Classes at NYU started in January and completed in July of 2015.
- The **Commercialization Toolkit** program will be designed to provide an accessible framework for guiding company development, an easy way to assess overall business readiness, and a ready-made suite of resources tailored to the specific needs of clean economy entrepreneurs as they pursue successful commercialization of their offerings. NYSERDA and New England Clean Energy Council (NECEC) Institute reached a contract in December, the project started in January 2015, is progressing well and has a target releases date for the toolkit in December.

Table 3-20 shows performance milestones and results for the Direct Support for Business Acceleration Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Companies supported includes companies with new and improved products serving New York State markets. Business executives transitioned includes the transition of business executives to the clean energy technology industry.

Table 3-20. Direct Support for Business Acceleration Performance Milestones and Results through June 30, 2015

Direct Support for Business Acceleration
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Companies Supported - Target	59	59	32		150
	Companies Supported - Progress	41	33			74

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Business Executives Transitioned - Target		18	18	9	45
	Business Executives Transitioned - Progress	0	23			23

3.3.3 Workforce Development Initiative

New York State's ambitious energy and environmental goals require trained workers with applied skills in energy efficiency, renewable energy, and advanced technologies. The Workforce Development (WFD) Initiative is designed to address the ongoing need for workers with skills that will result in quality installations, services and maintenance for clean energy technologies.

The following key program activities and accomplishments have been performed during this reporting period:

- NYSERDA co-sponsored a meeting with the NYS Pathways in Technology Early College High School (P-TECH) program. The purpose of the meeting was to create a dialog among NYSERDA and State Education Department funded high schools and their college and industry business partners. The intent is to leverage the statewide network and share successful strategies for building college/career pathways in the clean energy sector.

Table 3-21 and Table 3-22 show performance milestones and results for the Workforce Development Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Community Colleges may offer renewable energy, advanced technology, and energy efficiency courses.

Table 3-21. Workforce Development – Renewable Energy Performance Milestones and Results through June 30, 2015

Workforce Development Renewable Energy
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Renewable Energy Technical Trainees - Target	500	1,000	500		2,000
	Renewable Energy Technical Trainees - Progress	0	1,090			1,090
	Entry Level Trainees - Target	90	200	190		480
	Entry Level Trainees - Progress	0	162			162
	OJT, Hands-On Training - Target	150	380	150		680
	OJT, Hands-On Training - Progress	39	80			119
	Training Organizations - Target	2	3	1		6
	Training Organizations - Progress	0	0			0
	Certifications Developed - Target		2	1		3
	Certifications Developed - Progress	0	0			0
	Course Development - Target	2	4	2		8
	Course Development - Progress	0	14			14

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$0.8	$2.3	$1.3		$4.4
	Leveraged Funds Amount (millions) - Progress	$1.1	$1.5			$2.6

Table 3-22. Workforce Development – Energy Efficiency Performance Milestones and Results through June 30, 2015

Workforce Development Energy Efficiency
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Energy Efficiency Technical Trainees - Target	3,448	5,517	4,828		13,793
	Energy Efficiency Technical Trainees - Progress	96	5,582			5,678
	Entry Level Trainees - Target	800	1,280	1,120		3,200
	Entry Level Trainees - Progress	0	422			422
	OJT, Hands-On Training - Target	467	747	653		1,867
	OJT, Hands-On Training - Progress	48	95			143
	Training Organizations - Target	2	3	1		6
	Training Organizations - Progress	10	1			11
	Certifications Developed - Target		2	1		3
	Certifications Developed - Progress	0	0			0

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$1.3	$3.8	$2.0		$7.1
	Leveraged Funds Amount (millions) - Progress	$0.4	$5.7			$6.1

3.3.4 Environmental Monitoring, Evaluation, and Protection (EMEP)

EMEP provides knowledge to reduce the adverse impacts associated with electricity generation that damages New York's ecosystems and the health of its residents, and it assists planning efforts for cleaner alternative options. Additionally, informing the clean energy technology industry about life cycle environmental impacts early in the development stage can minimize unanticipated negative effects and document the energy and environmental attributes of products. EMEP also provides critical energy-related environmental research to help support the regulatory responsibilities of a range of other agencies in New York State including the Department of Environmental Conservation, Department of Health, Department of State, and the Office of the Attorney General.

The following key program activities and accomplishments have been performed during this reporting period:

- New projects have been selected and contracted as a result of two new solicitations issued during the previous reporting period: PON 2912 (Acid Deposition and Mercury Research in New York State), which resulted in eight new projects, and PON 2981 (Energy-Related Air Quality and Health Research in New York State), which resulted in seven new research projects and two new fellowship projects.

- Outreach activities included participation and support for the Adirondack Research Consortium annual conference, the Northeast Ecosystem Research Cooperative conference, and NYSERDA's Partnership for Environmental Improvement meeting.
- RFP 3062 was issued to select new outreach contractors to assist with the dissemination of program products and research findings.

Table 3-23 shows performance milestones and results for the EMEP Program through June 30, 2015. Outputs/Leading Indicators measure immediate results; Outcomes/Impacts measure achievements. Blank cells indicate the lack of a target in a particular time period. Signed contracts include several large flagship projects. The meetings, workshops and conferences are sponsored by NYSERDA. Briefings are on research projects convening with policymakers or other stakeholders. Leveraged funds include co-funding and outside investment to support projects and sponsored research.

Table 3-23. Environmental Monitoring Performance Milestones and Results through June 30, 2015

Environmental Monitoring, Evaluation and Protection (EMEP)
Performance Milestones and Results

Outputs/Leading Indicators

		2012-13	2014-15	2016	2017-20	Total
All Projects	Signed Contracts - Target	23	28	9		60
	Signed Contracts - Progress	20	31			51
	Completed Projects - Target	5	23	23	9	60
	Completed Projects - Progress	0	9			9
	Program Advisory Group Meetings - Target	2	2	1		5
	Program Advisory Group Meetings - Progress	3	0			3
	Science Advisory Committee Meetings - Target	2	2	1		5
	Science Advisory Committee Meetings - Progress	3	0			3
	Meetings, Workshops, Conferences - Target	5	6	3		14
	Meetings, Workshops, Conferences - Progress	7	13			20
	Briefings - Target	12	12	6		30
	Briefings - Progress	5	5			10

Outcomes/Impacts

		2012-13	2014-15	2016	2017-20	Total
All Projects	Leveraged Funds Amount (millions) - Target	$3.5	$4.5	$3.0		$11.0
	Leveraged Funds Amount (millions) - Progress	$2.5	$4.6			$7.1
	EMEP Research Citations - Target			3,000		3,000
	EMEP Research Citations - Progress	0	0			0
	Peer-reviewed Scientific Journal Articles - Target	10	35	45	29	119
	Peer-reviewed Scientific Journal Articles - Progress	15	1			16

4 T&MD Program Evaluation Activities

NYSERDA is actively working with third-party evaluation contractor, Industrial Economics (IEc), to conduct evaluation of the T&MD programs. During the first half of 2014, a comprehensive plan was developed for evaluation of the T&MD programs over the next three and six years. This plan will be used by NYSERDA and IEc to guide the evaluation efforts and will be updated as needed. This section summarizes evaluation work completed, underway, and planned for the T&MD programs. Some evaluations are program-specific, while others are done at a higher level to inform and optimize the portfolio level results.

4.1 Program Theory and Logic Models

Program Theory and Logic Model (PTLM) reports are typically developed early in the program time line, and updated as changes are made. PTLM reports inform evaluation work by documenting the relationships between program activities, outputs, and short/medium/long-term outcomes the program intends to induce.

Prior to January 2015, PTLM activities were completed and reports posted to NYSERDA's website for the following programs/areas:

- Smart Grid[19]
- Advanced Codes and Standards[20]
- Economic Development Growth Extension[21]
- New York Products[22]
- Clean Energy Business Development[23]
- Workforce Development[24]
- CHP Aggregation and Acceleration[25]

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19 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2013ContractorReports/2013-PLM-EPTD-Smart-Grid-Program.pdf

20 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2013ContractorReports/2013-PLM-Advanced-Codes-Standards.pdf

21 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2013ContractorReports/2013-PLM-EDGE-Program.pdf

22 http://www.nyserda.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/NYE$-Evaluation-Contractor-Reports/2012-Reports/Market-Analysis.aspx

23 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2013ContractorReports/2013-PLM-Clean-Energy-Business-Development.pdf

24 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2013ContractorReports/2013-PLM-Workforce-Development.pdf

25 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-PLM-CHP-Acceleration.pdf

- Advanced Buildings: ETAC[26]
- Advanced Buildings: Technology Development[27]
- Solar Cost Reduction[28]
- Clean Power Technology Innovation[29]

During this reporting period, no PTLMs were completed.

PTLMs are planned or are underway for the following programs/areas:

- Transportation
- Demand Response

Following the development of a PTLM, NYSERDA typically engages in an Evaluation Readiness Review[30] to help identify whether a program has various factors, or when such factors will be in place, to ensure an evaluation is justified, feasible, and likely to provide useful information. For example, programs must have appropriate data tracking to support evaluation. Evaluation Readiness Reviews have been completed for several programs to date and have helped identify areas to strengthen or solidify in order to lay the groundwork for the most productive evaluations.

4.2 Process Evaluation

Process Evaluation reviews oversight and operations, gauges customer satisfaction, and recommends process and efficiency improvements. The goal of Process Evaluation is to inform real-time adjustments and maximize program efficiency and effectiveness through actionable recommendations. The T&MD Operating Plan identified that formative process evaluations would be conducted on most programs during the early stages of implementation and repeated periodically to examine program efficiency and effectiveness in light of the

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26 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-PLM-Advanced-Buildings.pdf

27 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-PLM-Advanced-Buildings.pdf

28 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-SCR-logic-model.pdf

29 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-CPTI-Logic-Model-Report.pdf

30 Formerly known as Evaluability Assessment.

program's stated outcomes and impacts. Process evaluations are typically conducted through in-depth interviews resulting in a qualitative assessment and will be supported by secondary research, such as review of program documents, as appropriate. Evaluations of NYSERDA's organizational processes (e.g., competitive solicitation) may also be conducted.

Prior to January 2015, focused process evaluations were completed for the following T&MD programs. Each of these process evaluation reports is available on the NYSERDA website:

- Smart Grid[31]
- Workforce Development[32]
- EMEP[33]

During this reporting period, process evaluations have been completed, reports posted on NYSERDA's website, and summaries included in Appendix C for the following programs/areas:

- Solar Cost Reduction[34]

Process evaluations which are or will be underway in the near term cover the following programs, with estimated completion date indicated in parentheses:

- Technology Development (Q3 2015)
- EDGE (Q3 2015)
- Advanced Codes and Standards (Q3 2016)[35]

4.3 Market and Impact Evaluation

The IEc team will also assist NYSERDA in evaluating the T&MD portfolio's near-and long-term impacts through full-scale impact and market evaluations. Early evaluation activities will include collecting baseline information to identify the program effects on the number and knowledge base of market participants and

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31 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2013ContractorReports/2013-PLM-EPTD-Smart-Grid-Program.pdf

32 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-EMEP-Workforce-Development.pdf

33 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-EMEP-Citation-Analysis.pdf

34 http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/Solar-Cost-Reduction-process-evaluation.pdf

35 Process evaluation completion date is indicative of pre- and post-training surveys, which are ongoing throughout the life of the program.

whether barriers to more widespread technology adoption are being effectively addressed. Later evaluation activities will examine longer-term impacts such as technology commercialization and replication. Some methods expected to be used in assessing program impacts include surveys and interviews with program participants and nonparticipants, Delphi panels, case studies, on-site measurement and verification of energy savings for certain technologies, technology commercialization tracking, technology transfer, bibliometric tracking, and citation analysis.

This area includes the following three primary activities, which are briefly described as intended to apply to the T&MD programs:

- **Market characterization** will describe a specific market or market segments, including size of the market, key market actors, distribution channels, market actor awareness and knowledge, key market drivers and opportunities, and market barriers. The market characterization assesses the market before or early in the commencement of a specific intervention or program, for the purpose of guiding the intervention and/or facilitating future evaluation of effectiveness.
- **Market impact assessment** is used to analyze the extent to which a market has been transformed by specific program interventions or programs. Market impact assessment describes changes in market actor awareness and knowledge, key market drivers and opportunities, and market barriers, as well as the value of the program perceived by key market actors. Market assessment also collects and tracks information on key indicators the program is expecting to influence (i.e., the adoption of clean energy and energy-efficient products, services, or practices). Market impact assessments may require a previous market characterization study, as previously defined.
- **Energy impact evaluation** will address program-specific, directly induced quantitative changes (e.g., kWh, kW, and therms) attributable to the T&MD programs. This evaluation is distinguished from market impact assessments, previously described, which assess other program outcomes distinct from energy and demand savings.

Prior to January 2015, focused market evaluations were completed for the following T&MD programs:

- NY Products Program[36]

During this reporting period, market evaluations have been completed, reports posted on NYSERDA's website, and summaries included in Appendix C for the following programs/areas:

[36] http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014%20New%20York%20Products%20Program%20Evaluation.PDF

- NYSERDA and National Customer Awareness of ENERGY STAR® for 2014 (Analysis of Consortium for Energy Efficiency Household Survey)[37]

Market/Impact evaluations are planned or are underway for the following programs/areas with expected completion date in parentheses:

- ETAC/Technology Development Market Assessment (Q4 2015)
- Smart Grid Market Assessment (Q4 2015)
- Advanced Codes and Standards Impact Evaluation (two phases: Q4 2015 and Q4 2018)
- Market Pathways: Business Partners (TBD)

4.4 Higher Level Studies

In addition to evaluation activities, NYSERDA also plans to conduct studies organized around one or more high-level research questions that focus on data, impacts, and processes across programs. The studies reflect a range of evaluation activities, including evaluation readiness reviews, market characterizations, process evaluations, and market and energy impact assessments. The list of high level studies is likely to evolve over time to meet the needs of NYSERDA's portfolio. Currently, this list includes but is not necessarily limited to the following activities:

- **Data and resources:** How can the NYSERDA R&D Metrics Database and the existing data from prior evaluations best support evaluation efforts for the T&MD portfolio?
- **Solicitation process and markets:** How well is NYSERDA's current solicitation process reaching intended markets and soliciting high-quality proposals?
- **NYSERDA's reputation:** What is the effect of NYSERDA's reputation on support for products and innovations, and how can NYSERDA best use its institutional credibility to support products and innovations?
- **Portfolio performance:** What are the effects of NYSERDA's shift from focus on technology development to its newer, broader focus on technology and business development?
- **R&D demonstration project impacts:** What are the direct and replication impacts of NYSERDA demonstration projects and how do these evolve and accumulate over time?
- **Informing decisions and policy:** How can NYSERDA and external organizations effectively incorporate learning from past NYSERDA projects into decisions about the design of programs and policies?

[37] http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/NYSERDA%20-and-National-Awareness-of-ENERGY-STAR.pdf

During the first half of 2014, the R&D demonstration project impact study was completed.[38] This study updated a prior similar evaluation and addressed R&D demonstration projects completed in 2008-2010. Some of the other studies are being scoped out or are underway.

[38] http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-RD-Demo-Survey-Report.pdf

Appendix A: T&MD Program Advisory Committee Members

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NREL Innovation and Entrepreneurship Center, Center for Renewable Energy Economic Development

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Jane Weissman
Executive Director
Interstate Renewable Energy Council, Inc. (IREC)

Ed Wisniewski
Executive Director
Consortium for Energy Efficiency (CEE)

Appendix B: T&MD Program Logic Models

No logic models were completed during this reporting period from January 1, 2015 through June 30, 2015. Future reports will include logic models as they are available.

Appendix C: Evaluation Report Summaries

NYSERDA and National Awareness of ENERGY STAR® for 2014: Analysis of Consortium for Energy Efficiency Household Survey

Conducted by: Research Into Action (RIA), April 2015

Evaluation Objectives and Approach

In the fall of 2014, members of the Consortium for Energy Efficiency (CEE) sponsored the 13th National Household Survey of Consumer Awareness of ENERGY STAR®. Each year, the survey objectives have largely been the same: to collect national data on consumer recognition, understanding, and purchasing influence of the ENERGY STAR label, as well as data on messaging and product purchases. CEE members may choose to supplement the national sample by adding additional data points in order to assess label awareness in their local service territories. In 2014, CEE conducted additional surveys in the NYSERDA area.

The report discusses the results of the CEE 2014 ENERGY STAR Household Survey among respondents in the NYSERDA over-sample, as compared to national respondents (excluding NYSERDA area respondents). This survey builds upon prior years' survey results and focuses on the extent to which consumers recognize the ENERGY STAR label, understand its intended messages, and use (or are influenced by) the label in their energy-related purchase decisions.

In recent years, CEE has conducted an annual survey of households across the nation. In 2001, 2004, 2006, 2008, 2010, 2012, and 2014 NYSERDA elected to fund an over-sample within the SBC service area. This provided an opportunity to collect time series data for the NYSERDA area and to draw comparisons to the national results.

Nationally, the 2001 survey was conducted both by mail and by WebTV, although in the NYSERDA area, it was administered exclusively by mail. From 2004 to 2014, the survey and all over-samples were administered exclusively by WebTV.[39] The over-samples conducted in NYSERDA's service area in

[39] CEE conducted this survey via an interactive Internet-based format with a random sample of households that are members of a WebTV panel designed to be representative of the US population. Panel members are provided with an Internet-based appliance (WebTV) and respond to questionnaires administered to them via WebTV or the Internet. Where possible, comparisons between 2001, 2004, 2006, 2008, 2010, 2012, and 2014 national results rely on WebTV data to provide the most appropriate basis for comparison.

2004, 2006, 2008, 2010, 2012, and 2014 included several questions in addition to those in the national surveys.

Key findings from this report:

- In 2014, unaided recognition of the ENERGY STAR label remained significantly higher in NYSERDA's area than nationally (79% and 75%, respectively). Aided recognition, both in the NYSERDA area and nationally, has increased since 2012 (88% and 83%), respectively compared to both at 82% in 2012).
- Most NYSERDA respondents (82%) reported the ENERGY STAR label "very much" or "somewhat" influenced their purchasing decisions. This number increased significantly from 65% in the 2012 survey and is significantly higher than the national respondents (71%)
- Overall, shoppers in the NYSERDA area are significantly more likely to either look or ask for certain ENERGY STAR-labeled products than shoppers nationally. Shoppers both nationally and in the NYSERDA area reported looking for ENERGY STAR-labeled appliances (including washing machines, refrigerators, and dishwashers) more than any other product type.
- Similar to 2012, consumer awareness of the ENERGY STAR Most Efficient program remains low within both the NYSERDA area and nationally. Although, over half of respondents who were aware of ENERGY STAR Most Efficient either "somewhat" or "strongly" agreed that they would purchase a product with this designation. Increasing consumer awareness of ENERGY STAR Most Efficient should be a focus in order to maximize savings as the market share of ENERGY STAR products increases.
- Similar to 2012, the most common locations of ENERGY STAR labels cited by NYSERDA respondents were store displays, appliance or electrical equipment labels, and TV commercials.
- Energy efficiency of the appliance decreased in importance to NYSERDA respondents making appliance purchases in 2014, compared to 2012. Two-thirds rated a high to very high level of importance to energy efficiency in appliance selection in 2014 compared to about three-quarters in both 2012 and 2010.

Solar Cost Reduction Program Process Evaluation

Conducted by: Industrial Economics, Inc. (IEc), March 2015

Program Summary

As part of NYSERDA's Advanced Clean Power initiative, the Solar Cost Reduction (SCR) program aims to improve the competitiveness of solar-generated electricity in New York State by reducing balance-of-system (BOS) costs of solar photovoltaic (PV) installations. BOS costs of PV systems include everything other than the PV panels themselves, such as non-module hardware, labor, design, permitting interconnection, inspection, financing and customer acquisition. The SCR program is also a component of the NY-Sun initiative, which seeks to significantly expand customer-sited PV capacity across the state, advance PV technologies, and reduce the cost of PV systems.

Evaluation Objectives, Approach and High Level Findings

The primary goal of this process evaluation was to provide a rapid assessment of the effectiveness of SCR's project solicitation processes, to inform the focus and structure of future solicitations. The evaluation is framed around seven evaluation questions that address three key topics of concern: whether the program is addressing the correct barriers to BOS cost reduction; whether the structure of funding awards encourages high-quality project applications; and how the program might target innovative projects and improve processes going forward. Several recommendations for improving program processes emerged from the findings of this evaluation, as outlined below.

IEc employed a mixed-methods approach for this evaluation that includes the following:

- A targeted literature review on BOS cost reduction barriers, emphasizing information that has emerged since Program Opportunity Notice (PON) 2672 was issued in 2012;
- A review of SCR program documentation;
- A review of program documentation from the Department of Energy (DOE) SunShot Initiative and, to a lesser extent, other comparable programs;
- Key informant interviews with participants in New York's solar industry; and
- A survey of relevant organizations that chose not to apply for funding under previous rounds of the PON.

Overall findings by evaluation question can be summarized as follows:

1. **Is the SCR program targeting significant barriers to BOS cost reduction?** The SCR program is targeting significant barriers to BOS cost reduction through its broad-based approach to funding projects that address all types of BOS costs, as all five BOS categories identified continue to contribute significantly to overall system costs.
2. **Is the SCR program targeting barriers to BOS cost reduction that can be effectively reduced at the state level?** Each of the five BOS cost categories, all of which SCR is currently targeting, can be addressed in some form at the state level. However, several cross-cutting ideas emerged about how the program could target each of these barriers most effectively in New York State. Considering the areas in which New York State has particular leadership potential, the maturity of existing solutions, and state-level flexibility might help NYSERDA to identify the most effective approaches for reducing BOS costs, either by testing innovative approaches or by implementing best practices.
3. **Is the SCR program funding projects in a manner that avoids duplicating efforts of other programs, including but not limited to DOE's SunShot Initiative?** SCR is funding projects in a manner that largely avoids duplicating the efforts of DOE's SunShot Initiative, though it may be useful to consider methods of consistently ensuring coordination between the two programs during their review of applications.
4. **Is the scale of SCR-funded projects appropriate for generating sustained cost reductions and/or project replication?** IEc found incomplete and conflicting information regarding the appropriateness of the scale of SCR's funding awards for generating sustained cost reductions and/or project replication. Further comparison of the funding levels of successful and unsuccessful projects may be useful as part of a future impact evaluation. Demonstration projects in particular may need to employ larger-scale or different project structures in order to achieve market impacts.
5. **What barriers hinder potential applicants from applying for program funding, and how can they be reduced?** None of the potential deterrents to applying for NYSERDA funding that IEc evaluated appear to have a significant and consistent effect in preventing potential funding applicants from submitting project proposals. However, potential applicants with hardware projects, an area where SCR has struggled to attract high-quality proposals, identified NYSERDA's cost sharing and cost recoupment requirements as significant issues. Industry experts also suggested that certain types of applicants, such as non-profits and municipalities, might find cost sharing to be especially burdensome. However, industry experts also indicated that cost sharing in general can enable larger-scale project impacts by leveraging additional resources.
6. **Are there innovative approaches to reducing BOS costs that the SCR program should be aware of when marketing its PON?** Several innovative approaches to reducing BOS costs are being tested by SunShot and other organizations. These efforts address BOS cost components across all categories, using a variety of program structures.
7. **Are there any recommendations for improving the program's project solicitation processes?** Based on its analysis, IEc developed several recommendations for the SCR program to improve program processes.

Evaluation Recommendations

Evaluators identified the following recommendations for SCR program staff based on the tasks completed in this evaluation. As program staff take action on these recommendations, updates will be provided in future semi-annual reports.

Recommendation 1: NYSERDA should carefully target "innovative" projects based on its assessment of New York State's leadership potential in a given area, the maturity of existing solutions, and state-level flexibility. In areas where New York State has leadership potential, NYSERDA should continue its current approach of piloting innovative ideas in the market. Likewise, in areas where existing approaches to reducing BOS costs are relatively immature, SCR's approach of funding a variety of innovative approaches is appropriate.

Response to Recommendation 1: While there is still a need for innovation in soft cost reduction, future NYSERDA investments should be carefully considered and targeted. In many cases, innovation in areas such as project business models may not be well matched to the process, timeframe, and requirements of NYSERDA funding.

Recommendation 2: NYSERDA should identify areas where adoption of best practices is a primary barrier, and fund projects that target this particular issue. Areas where replication is the major challenge are likely those where existing solutions are already well established and no longer require proof of concept in a context similar to New York State, but have not yet been widely adopted by the market. NYSERDA may also determine that different project structures than those funded to date are more effective at addressing barriers to replication.

Response to Recommendation 2: Adoption of best practices and replication of models that have been demonstrated to be effective are anticipated to be central to NYSERDA's ongoing SCR strategy. As noted in the recommendation, different project structures will likely be necessary to advance best practices and replication.

Recommendation 3: NYSERDA should examine its cost recoupment and cost sharing requirements, especially in the context of other programs (outside of NYSERDA) to determine whether these provisions are in line with industry best practices. If SCR's cost recoupment and cost sharing prove atypical, the program should consider amending these program specifications. NYSERDA should examine these issues particularly for different types of applicants and non-module hardware projects, as well as consider alternative program structures.

Response to Recommendation 3: Program structures should be considered even more generally, in order to best match the SCR needs and potential solutions/strategies. Cost recoupment and cost sharing requirements should be specifically considered, but in the context of a broader program strategy. NYSERDA has reviewed its recoupment requirements and will shortly be implementing new recoupment policies and requirements.

Appendix D: Target Ranges

Program	Reportable Item	2012-2013	2014-2015	2016	2017-2020	Total
Advanced Energy Codes	Code Training Modules	6-8	6-8			12-16
Education Behavior	Behavioral Pilots	5-8	3-4			8-12
ETAC	Knowledge/Tech Transfer Activities	8-18	17-26	10-18	3-8	38-70
ETAC	Projects Installed	1-2	5-14	6-12	5-8	17-36
ETAC	Stakeholder Meetings	7-10	5-9	1-3		13-22
Market Pathways	Completed Projects	5-8	10-15	3-7	2-5	20-35
Market Pathways	EAL Agreements	4-6	4-6	2-3		10-15
Market Pathways	Fact Sheets	3-4	2-3	1-2		6-9
Market Pathways	Fact Sheets	4-5	4-5	1-2		9-12
Market Pathways	Market Adoption	1-3	1-3	1		3-6
Market Pathways	Projects	20-25	5-10	5-10		30-45
Market Pathways	Seminars, Webinars	4-5	4-5	1-2		9-12
Market Research	Research Studies	2-3	1-2	1		4-6
Resource Development	Leveraged Funds	0 - .5M	1-1.5M	1.5-3.0M		2.5-5.0M
Technology Development	Projects Contracted		23-36	18-29	5-9	46-74
Technology Development	Commercial Sales			8-20M	75-100M	83-120M
Technology Development	Commercially Available Technologies		1-3	4-6	1-2	6-11
Technology Development	Leveraged Funds	7-10M	5-10M	2-3M		14-23M
Technology Development	Projects Installed		23-36	18-29	5-9	46-74
Technology Development	Stakeholder Meetings	2-5	8-20	6-10		16-35
Technology Development	Supported Companies	12-18	9-14	2-4		23-37
Technology Development ABC	Commercial Sales			1-2M	3-4M	4-6M
Technology Development ABC	Leveraged Funds		2-3M	2-3M		4-6M
Technology Development ABC	Products Demo'd ABC		1-2	1-2	1	3-5
Technology Development ABC	Projects Installed ABC		1-2	1-2	1	3-5
Technology Development ABC	Publications, Policy Research, etc.		5-9	6-10		11-19
Technology Development ABC	Stakeholders Engaged in ABC	5-10	10-15	0-5		15-30
Technology Development ABC	Supported Companies ABC	3-5	6-8	1-2		10-15

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.

To learn more about NYSERDA's programs and funding opportunities, visit nyserda.ny.gov or follow us on Twitter, Facebook, YouTube, or Instagram.

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EA-T&MD-2015-Semiannual-r-1-v2
10/15