

New York State Energy Research and Development Authority

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# NYSERDA Technology & Market Development Program

Semiannual Report Through June 30, 2013

Final Report  
August 29, 2013



# NYSERDA's Promise to New Yorkers:

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

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

**Our Vision:** Serve as a catalyst—advancing energy innovation and technology, transforming New York's economy, empowering people to choose clean and efficient energy as part of their everyday lives.

**Our Core Values:** Objectivity, integrity, public service, partnership and innovation.

## Our Portfolios

NYSERDA programs are organized into five portfolios, each representing a complementary group of offerings with common areas of energy-related focus and objectives.

### Energy Efficiency and Renewable Energy Deployment

Helping New York to achieve its aggressive energy efficiency and renewable energy goals – including programs to motivate increased efficiency in energy consumption by consumers (residential, commercial, municipal, institutional, industrial, and transportation), to increase production by renewable power suppliers, to support market transformation and to provide financing.

### Energy Technology Innovation and Business Development

Helping to stimulate a vibrant innovation ecosystem and a clean-energy economy in New York – including programs to support product research, development, and demonstrations; clean-energy business development; and the knowledge-based community at the Saratoga Technology + Energy Park®.

### Energy Education and Workforce Development

Helping to build a generation of New Yorkers ready to lead and work in a clean energy economy – including consumer behavior, youth education, workforce development and training programs for existing and emerging technologies.

### Energy and the Environment

Helping to assess and mitigate the environmental impacts of energy production and use – including environmental research and development, regional initiatives to improve environmental sustainability and West Valley Site Management.

### Energy Data, Planning and Policy

Helping to ensure that policy-makers and consumers have objective and reliable information to make informed energy decisions – including State Energy Planning; policy analysis to support the Regional Greenhouse Gas Initiative, and other energy initiatives; emergency preparedness; and a range of energy data reporting, including *Patterns and Trends*.

**NYSERDA RECORD OF REVISION**

<p>New York State Energy Research &amp; Development Authority (NYSERDA)</p> <p>Technology &amp; Market Development Program</p> <p>Semiannual Report</p> <p>August 29, 2013</p>
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8/29/13	Original Issue	Original Issue
9/9/13	Updated the date the code compliance assessment would be available to March 2014.	3-28
9/9/13	Minor text edits to CHP Aggregation and Acceleration Program metrics in Table 3-4.	3-14

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# 1 Introduction

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## 1.1 Public Policy Context

The System Benefits Charge (SBC) Program 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 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." 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.

NYSERDA submitted the T&MD Operating Plan on May 16, 2011, and on June 8, 2011, the Commission 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, the Commission approved the T&MD Operating Plan, including a CHP initiative, for five years (January 1, 2012 through December 31, 2016), at an average annual funding rate of \$93.8 million, representing \$80 million in program costs and \$13.8 million for administration, evaluation and New York State Cost Recovery Fees. 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 NYSEDA'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. NYSEDA was directed to submit a plan for funding the balance of the CHP Initiative by March 31, 2012. Additionally by March 31, 2012, NYSEDA was also directed by the Order to submit an accounting of SBC3 funds that were uncommitted as of December 31, 2011 with the option to submit a proposal for use of those funds, as well as SBC3 that may become uncommitted in the future.

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

On March 9, 2012, NYSEDA submitted a full accounting of uncommitted SBC3 funds as directed in the October 24, 2011 Order. On March 30, 2012, NYSEDA submitted a petition proposing ways to allocate those uncommitted SBC3 funds among three primary activities:

- Develop and implement programs to reduce solar photovoltaic (PV) balance-of-system (BOS) costs and support priority PV technology development (\$10 million).
- Provide cost-sharing support to 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 the T&MD Advanced Buildings Program (\$5.76 million, including \$3 million for an Advanced Buildings Consortium and \$3.76 million for a deep energy savings initiative in commercial buildings).

NYSEDA also requested applying \$1.75 million in uncommitted SBC3 funds to New York State Cost Recovery Fee assessments applicable to SBC3. In addition, NYSEDA requested approval to allocate uncommitted SBC3 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, NYSEDA submitted petitions to provide funding for the CHP Program and to provide continued funding and expansion of NYSEDA's workforce development initiatives as directed in the October 24, 2011 Order. The 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, NYSEDA's requests in its petition regarding uncommitted SBC3 funds. The PSC approved the reallocation of SBC3 funds into the T&MD portfolio to support T&MD solar PV activities (\$10 million) and Advanced Buildings activities (\$5.76 million) as well as NYSEDA's support of the BNL proposal and NY-BEST (\$10 million, with \$2.5 million allocated to NY-BEST). The PSC also approved NYSEDA's allocation of SBC3 funds to New York State Cost Recovery fee assessments. The PSC did not approve NYSEDA's request to reallocate uncommitted SBC3 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. In this Order, the PSC approved NYSERDA reallocating \$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. The 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. With NYSERDA's submission of the revised T&MD Operating Plan on February 15, 2013, this report now comports with the December 17, 2012 Order.

## **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 marketplace to serve as a "feeder" to help achieve EEPS & 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 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 SBC3 programs (e.g., Smart Grid, Advanced Clean Power, Clean Energy Business Development, Environmental Monitoring, Evaluation and Protection) continue to accrue and are reported in more detail in the SBC3 annual report. Commercialization benefits from projects started in 2012 will take a few years to materialize and will be reflected in future reports accordingly.

### **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

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 Portfolio's mission and the output and outcome metrics established in the Operating Plan.

## 2 Portfolio-Level Reporting

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### 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 activities to put the T&MD initiatives into operation. A description of each of these activities is outlined in the following sections.

#### 2.1.1 Stakeholder Engagement

To comply with the PSC's December 30, 2010 Order, NYSERDA engaged its stakeholders to collect input and advice on the T&MD portfolio. For example, 22 outreach meetings were conducted throughout New York State in 2011 with approximately 225 organizations participating in these meetings. During these meetings, NYSERDA received input on its initial ideas for the T&MD program objectives, priority criteria, and proposed portfolio. In addition, a dedicated webpage was posted on NYSERDA's website to disseminate periodic updates on the portfolio. Lastly, a Technical Conference, open to the public, was held in March 2011. During this meeting, NYSERDA management and staff discussed stakeholder feedback and the preliminary program framework and engaged the attendees in a discussion about the future uses of the T&MD funds.

Stakeholder input will continue to be a critical component as the T&MD initiatives are implemented. A T&MD Advisory Committee was established comprised of national, state and regional experts in the energy field and held its first meeting in November 2012 to discuss the status of the portfolio and future activities. A second meeting was held June 28, 2013. The Advisory Committee provides feedback on the progress being made for the T&MD initiatives and market intelligence on trends and potential partnerships within the industry. See Appendix A for a current listing of Advisory Committee members.

Focused stakeholder meetings have been conducted for most of the initiatives supported by the T&MD portfolio. These meetings, as well as future meetings, will assist in providing additional direction and guidance to these initiatives. Stakeholder meetings, workshops and discussions have already been held for:

- Smart Grid and Electric Vehicle Infrastructure
- Clean Power Technology Innovation
- Commercial/Industrial Emerging Technology/Accelerated Commercialization (ETAC)
- Multifamily ETAC
- Residential ETAC
- Advanced Buildings Technology Development
- Advanced Buildings Consortium
- Advanced Energy Codes and Standards
- Workforce Development and Training and Career Pathways
- Seed Funding for Start Up (Clean Tech) Companies
- Innovation/Entrepreneurial Capacity Building
- Environmental Monitoring, Evaluation, and Protection (EMEP)

Future semiannual reports will continue to track these activities and the input they provide to individual initiative plans. Lastly, as directed in the PSC's October 24, 2011 Order, NYSERDA will make a progress presentation to the Commission following the submission of its 2013 annual report.

### **2.1.2 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, 2013 were included in the prior semiannual report and are omitted from Table 2-1.

**Table 2-1. Solicitations Released from January 1, 2013 through June 30, 2013**

<b>Solicitation Number</b>	<b>Solicitation Name</b>	<b>Solicitation Release Date</b>	<b>Solicitation Closing Date</b>
PON 2606	Advanced Buildings Program	1/22/13	12/3/13 Round 3
PON 2631	Behavioral Research and Energy Decision Making	1/23/13	8/8/13 Round 2
PON 2607	Accelerated Recovery and Environmental Economics of Mercury and Acidic Deposition	1/31/13	3/18/13
PON 2033	Clean Energy On-the-Job Training	2/6/13	12/31/13
PON 2568	CHP Acceleration Program	2/14/13	12/30/16*
PON 2669	Monitoring Acidification and Mercury Impacts in NY	2/15/13	4/9/13
PON 2397	Certification and Company Accreditation	2/21/13	12/31/16*
RFQ 2417	Innovation & Business Development Technical Assistance	3/15/13	4/18/13
PON 2673	Workforce Development & Training for Renewable Energy	4/2/13	5/28/13
PON 2672	Photovoltaic Balance-of-System Cost Reduction	4/4/13	7/30/13 Round 1 1/30/14 Round 2
RFP 2697	NY-Sun PV Balance of System Training & Education Program	4/5/13	6/6/13
PON 2730	Clean Tech Transition for Experienced Executives	4/22/13	6/19/13
PON 2664	Clean Energy Training for High School Students	4/24/13	6/10/13
PON 2700	CFL Sales Performance Program	4/24/13	6/12/13
PON 2701	Combined Heat and Power (CHP) Performance Program	5/2/13	12/30/16*
PON 2689	Emerging Technologies & Accelerated Commercialization	5/2/13	12/31/16*
RFP 2621	Technical Review and Program Support Contracts	5/7/13	6/27/13
RFP 2711	Data Center Market Research	5/8/13	6/17/13
RFP 2690	Implementation Support for Workforce Development and Training	5/10/13	6/18/13
PON 2715	Electric Power Transmission and Distribution (EPTD)	6/10/13	8/14/13 Round 1
PON 2781	Advanced Transportation Technologies	6/25/2013	9/18/2013

Notes: Some of the solicitations listed in Table 2-1 may have split funding sources and some solicitations may have been revised since their initial release date.

\* These solicitations are open until closing date indicated or until available funds are committed.

### 2.1.3 Implementation of T&MD Initiatives

In addition to the stakeholder engagement and solicitations, other noteworthy program implementation and progress milestones include the following activities, which are each described in greater detail in Section 3.

- The Smart Grid Program has signed three contracts for technology development, demonstration and pilot projects; signed ten contracts for research studies on technologies, market barriers and policies related to increased smart grid implementation in New York State and is supporting 14 clean energy companies. Approximately \$1.4 million has been leveraged to support smart grid infrastructure.
- The Advanced Clean Power Technologies solicitation was released July 2, 2012. This \$10.25 million solicitation has two proposal due dates: August 29, 2012 and June 13, 2013. Fifty one proposals were received in response to round one. Eleven proposals totaling \$6.9 million in NYSERDA support were approved for funding. Twenty three proposals were received for the second round requesting \$8.7 million. These proposals will be reviewed in August 2013. The program is also supporting 10 clean energy companies.
- The CHP Aggregation and Acceleration Program pre-qualified 54 pre-packaged CHP systems for its catalog. The CHP Performance Program has contracted funding on one project for an anticipated summer peak demand reduction of 2.8 MW and 25,000 MWh of annual generation.
- As part of the Advanced Buildings Program, nine advanced building technology projects have been contracted with nine clean energy companies receiving support. Approximately \$3.4 million has been leveraged to support advanced building technologies. In addition, the Advanced Buildings Enabling Demand Response (DR) and Load Management Program has supported interval meter and enabling technology installations representing approximately 34 MW of demand response in New York State.
- The Advanced Codes and Standards Program has a code compliance assessment in process focusing on existing commercial building renovation projects. This assessment will serve as the framework for all assessments conducted as part of the T&MD portfolio.
- As part of the Market Development Program, 10 new retail partners and 26 new manufacturer partners have signed onto the New York Products Program and approximately 145 special promotions have been approved in product buy-downs since January 2012. The Midstream Partner Support: Business Partners Program has recruited 64 new commercial lighting partners and 70 new HVAC partners. In addition, the program has provided lighting business partners with continuing education credits through 10 webinars and five lighting expos while HVAC partners have been provided 39 trainings across the State. The Education/Behavior Change component of the program has sponsored and supported one LIFE conference and 165 community partnerships have been supported. Lastly, three Market Research studies have been completed with an additional eight studies underway.
- The Clean Energy Business Development Program awarded a total of \$15 million to Columbia University, the Polytechnic Institute of New York University and High Tech Rochester to create three Proof-of-Concept Centers dedicated to helping inventors and scientists turn their high-tech, clean energy ideas into successful businesses. The Clean Energy Business Development Program also made an award under PON 2419, NYSERDA Entrepreneurs-in-Residence, to High Tech Rochester, Inc.
- The Workforce Development Program has trained more than 1,400 individuals on renewable and emerging technologies and has held 22 on-the-job and hands-on renewable energy/advanced technology trainings.
- EMEP has contracted 19 new research projects and conducted 12 workshops and briefings. More than \$1.3 million has been leveraged to support projects and sponsored research. In addition, five peer-reviewed scientific journal articles have been published based on program-supported research.

Table 2-2 provides a summary of anticipated T&MD portfolio benefits for the five-year funding period and out years as well as achievements to date for applicable metrics for the first eighteen months of program operation. Performance milestone tables (included for each initiative in Section 3 of this report) show progress through June 30, 2013 against the Operating Plan's expected benefits in the 2012-2013 timeframe. Benefits achieved in the first eighteen months of the T&MD program should be viewed with two important points of context:

1. All programs are competitively bid, requiring time to develop and issue solicitations, select winning bidders and negotiate contracts. Several solicitations have been issued in 2012 and early 2013 and realization of most 2012-2013 milestones is expected by the end of 2013.
2. 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.

Where such circumstances exist, program metrics are either not reported (NR) and/or relevant context/explanation are provided.

**Table 2-2. Summary of Anticipated Cumulative T&MD Benefits (at full implementation)<sup>a</sup>**

	2012 - 2016	Out Years	Total	Through June 30, 2013
On-site Electricity Savings from Energy Efficiency Projects, Technologies, Replications, and Codes & Standards (Cumulative Annual <sup>b</sup> MWh)	541,600 MWh	647,700 MWh	1,189,300 <sup>c</sup> MWh	69,914 MWh
MWh Savings from Funded Project and Technology Installations	171,600	900	172,500	69,914
MWh Savings from Anticipated Replications not Directly Funded by Program		29,800	29,800	NR
MWh Savings from Codes & Standards Activities supported by the Program	370,000	617,000	987,000	NR
On-site Fossil Fuel Savings from Energy Efficiency Projects, Technologies, Replications, and Codes & Standards (Cumulative Annual <sup>i</sup> MMBtu)	3,323,200 MMBtu	2,802,600 MMBtu	6,125,800 <sup>d</sup> MMBtu	281,589 MMBtu
MMBtu Savings from Funded Project and Technology Installations	965,200	7,800	973,000	281,589
MMBtu Savings from Anticipated Replications not Directly Funded by Program		231,800	231,800	NR
MMBtu Savings from Codes & Standards Activities supported by the Program	2,358,000	2,563,000	4,921,000	NR
On-site Demand Reduction from Energy Efficiency Projects, Technologies and Replications (Cumulative MW)	133 MW	242.4 MW	375.4 MW	34 MW
Demand Reduction from Funded Project and Technology Installations	43	5.3	48.3	34
Demand Reductions from Anticipated Replications not Directly funded by Program		30.1	30.1	NR
Demand Reductions from Codes & Standards Activities supported by the Program	90	207	297	NR
On-site Generating Capacity Installed from CHP Projects, Technologies, and Replications (Cumulative MW) <sup>e</sup>	18	29.5	47.5	NR
MWs Installed from Funded Project and Technology Installations	18	19.5	37.5	NR

**Table 2-2. (continued)**

	2012 - 2016	Out Years	Total	Through June 30, 2013
MW's Installed from Anticipated Replications not Directly Funded by Program	0	10	10	NR
On-site Electricity Generated from CHP Projects, Technologies, and Replications (Cumulative Annual MWh) <sup>f</sup>	121,000	216,250	337,250	NR
MWh's Generated from Funded CHP Project and Technology Installations	121,000	155,250	276,250	NR
MWh's Generated from Anticipated Replications not Directly Funded by Program	0	61,000	61,000	NR
Primary Energy Savings from CHP Installations (Cumulative Annual MMBtus) <sup>g</sup>	157,300	281,125	438,425	NR
MMBtu Consumed from Funded Project and Technology Installations	157,300	201,825	359,125	NR
MMBtu Consumed from Anticipated Replications not Directly Funded by Program	0	79,300	79,300	NR
System-wide CO2 Emission Reductions – On-site and Central Station (Annual Tons)	418, 512 Tons	432,209 Tons	850,721 Tons	TBD
Advanced Technologies Reaching Commercial Availability	47 Technologies	42 Technologies	89 Technologies	NR (Previous SBC-funded projects resulted in 71 technologies reaching commercial availability)
Improved Technologies Adopted by the Market or Further Supported by Deployment Programs	10 Technologies	9 Technologies	19 Technologies	NR (Progress with prior funding captured in SBC3 report)g
Commercial Sales of New and Improved Supported Technologies	\$26.5 million	\$157.7 million	\$184.2 million	NR (Progress with prior funding captured in SBC3 report) <sup>h</sup>
Funding Leveraged (co-funding and outside investment) by NYSERDA's Investment	\$696.5 million	\$103 million	\$799.5 million	\$31.2 million
Clean Energy Businesses Graduating from Incubators	90 Businesses	72 Businesses	162 Businesses	NR (Previous SBC-funded projects have graduated 31 businesses from incubators)
Clean Energy Companies Receiving Support	525 Companies	200 Companies	725 Companies	22 Companies

**Table 2-2. (continued)**

Retail and Supply Chain Businesses Partnering with NYSERDA to Increase Market Share of Energy Efficient Products	1,750 Partners		1,750 Partners	1,589 Partners
Clean Energy Training for Practitioners <sup>i</sup>	39,056 Trainees	9 Trainees	39,065 Trainees	1,462 Trainees
Supply Chain Training to Facilitate Adoption of Energy Efficient Products	1,525 Partner Employees		1,525 Partner Employees	404 Partner Employees
Adoption of Clean Energy Business Models, Practices or Strategies	Record will be maintained and reported			Outcomes to be determined through program tracking and evaluation
Policy Development and Decisions Supported by NYSERDA studies, assessments and data <sup>i</sup>	Record will be maintained and reported			Outcomes to be determined through program tracking and evaluation
Net Additional Jobs as a Result of NYSERDA Investment <sup>j</sup>	Portfolio Macroeconomic Benefits to be calculated annually and reported			Reported separately Q2 2013
Change in GSP as a Result of NYSERDA Investment <sup>j</sup>				

- <sup>a</sup> Energy savings reported in this table 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.
- <sup>b</sup> Cumulative annual savings refers to the savings that are achieved in a particular year (“annual”) from all measures installed (“cumulative”) as a result of program activities through the year of reporting; e.g., T&MD cumulative annual savings for 2016 are the energy savings achieved in 2016, as a result of energy efficiency measures installed from January 2012 through December 2016.
- <sup>c</sup> MWh associated with CHP systems have been removed from the calculation of on-site electricity savings.
- <sup>d</sup> Natural gas usage associated with CHP systems has been removed from the calculation of fossil fuel savings.
- <sup>e</sup> This benefit associated with CHP systems is included in this report for the first time.
- <sup>f</sup> This benefit associated with CHP systems is included in this report for the first time.
- <sup>g</sup> 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.
- <sup>h</sup> These metrics were reported in the 2013 year-end report as commercialization metrics generally require at least two years to be realized. Progress with prior SBC3 funding will be captured in the SBC3 annual report.
- <sup>i</sup> Individuals may participate in more than one training.
- <sup>j</sup> These benefits will accrue from past investments, as well as T&MD portfolio investments.

**2.1.4 Budget and Spending Status**

Table 2- 3 shows the T&MD program budget and financial status through June 30, 2013. Committed and spent funds are also shown as a percent of the total 2012-2016 budget. As of June 30, 2013, 18 months of T&MD activity has been completed of the five-year program (i.e., 30%); thus, as shown in Table 2-3, NYSERDA’s funding commitment level is on target at a portfolio level.

**Table 2-3 Budget and Financial Status for T&MD Programs through June 30, 2013**

	<b>2012-2016 Budget</b>	<b>Spent Funds</b>	<b>Percent of 2012-2016 Budget Spent</b>	<b>Committed Funds<sup>a</sup></b>	<b>Percent of Budget 2012-2016 Committed</b>
<b>Power Supply and Delivery</b>	<b>\$188,053,944</b>	<b>\$2,165,913</b>	<b>1.2%</b>	<b>\$56,168,511</b>	<b>29.9%</b>
Smart Grid/Electric Vehicle	\$61,281,382	\$177,051	0.3%	\$22,791,419	37.2%
Advanced Clean Power	\$51,771,962	\$1,825,843	3.5%	\$19,457,501	37.6%
Combined Heat and Power <sup>b</sup>	\$75,000,000	\$163,019	0.2%	\$13,919,591	18.6%
<b>Building Systems</b>	<b>\$92,015,954</b>	<b>\$854,700</b>	<b>0.9%</b>	<b>\$36,773,797</b>	<b>40.0%</b>
Advanced Buildings	\$75,336,160	\$841,210	1.1%	\$31,759,694	42.2%
Advanced Energy Codes & Standards	\$16,679,794	\$13,490	0.1%	\$5,014,103	30.1%
<b>Clean Energy Infrastructure</b>	<b>\$169,691,375</b>	<b>\$8,583,808</b>	<b>5.1%</b>	<b>\$69,892,114</b>	<b>41.2%</b>
Market Development	\$70,380,281	\$7,476,845	10.6%	\$20,760,362	29.5%
Clean Energy Business Development	\$41,761,046	\$501,818	1.2%	\$21,013,131	50.3%
Environmental Monitoring, Evaluation and Protection (EMEP)	\$18,550,048	\$374,421	2.0%	\$5,229,674	28.2%
Workforce Development <sup>c</sup>	\$39,000,000	\$230,724	0.6%	\$22,888,947	58.7%
<b>Total Program</b>	<b>\$449,760,673</b>	<b>\$11,604,421</b>	<b>2.6%</b>	<b>\$162,834,422</b>	<b>36.2%</b>
<b>Administration (8%)</b>	<b>\$39,765,533</b>	<b>\$9,495,491</b>	<b>23.9%</b>	<b>\$9,495,717</b>	<b>23.9%</b>
<b>NYS Cost Recovery Fee (1.7%)</b>	<b>\$7,585,944</b>	<b>\$513,786</b>	<b>6.8%</b>	<b>\$513,786</b>	<b>6.8%</b>
<b>Evaluation (5%)</b>	<b>\$26,363,458</b>	<b>\$495,585</b>	<b>1.9%</b>	<b>\$8,719,621</b>	<b>33.1%</b>
<b>Grand Total</b>	<b>\$523,475,608</b>	<b>\$22,109,283</b>	<b>4.2%</b>	<b>\$181,563,546</b>	<b>34.7%</b>

Totals may not sum exactly due to rounding.

<sup>a</sup> 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.

<sup>b</sup> Funding for the \$50M CHP performance component was not approved until the Commission's December 17, 2012 Order.

<sup>c</sup> Funding was increased in the Commission's December 17, 2012 Order.

## 3 T&MD Initiatives

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

1. All programs are competitively bid, requiring time to develop and issue solicitations, select winning bidders and negotiate contracts. Several solicitations have been issued in 2012 and early 2013 and realization of most 2012-2013 milestones is expected by the end of 2013.
2. 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.

Where such circumstances exist, program metrics are either not reported (NR) and/or relevant context/explanation are provided.

### 3.1 Power Supply and Delivery Initiatives

Table 3-1 shows the Power Supply and Delivery and Combined Heat and Power budget and financial status through June 30, 2013. Committed and spent funds are also shown as a percentage of the total 2012-2016 budgets. Later sections describe progress for each area of this initiative.

**Table 3-1. Power Supply & Delivery and Combined Heat and Power Budget and Financial Status as of June 30, 2013**

	<b>2012-2016 Budget</b>	<b>Spent Funds</b>	<b>Percent of 2012-2016 Budget Spent</b>	<b>Committed Funds<sup>a</sup></b>	<b>Percent of 2012-2016 Budget Committed</b>
<b>Smart Grid/Electric Vehicle</b>	<b>\$61,281,382</b>	<b>\$177,051</b>	<b>0.3%</b>	<b>\$22,791,419</b>	<b>37.2%</b>
Smart Grid	\$47,284,415	\$175,940	0.4%	\$21,640,329	45.8%
Electric Vehicle	\$13,996,967	\$1,111	0.0%	\$1,151,090	8.2%
<b>Advanced Clean Power</b>	<b>\$51,771,962</b>	<b>\$1,825,843</b>	<b>3.5%</b>	<b>\$19,457,501</b>	<b>37.6%</b>
Technology Innovation	\$27,826,749	\$1,517,353	5.5%	\$9,303,761	33.4%
Resource Development	\$13,945,213	\$308,490	2.2%	\$1,153,740	8.3%
Solar Cost Reduction	\$10,000,000	-	0.0%	\$9,000,000	90.0%
<b>Combined Heat and Power</b>	<b>\$75,000,000</b>	<b>\$163,019</b>	<b>0.2%</b>	<b>\$13,919,591</b>	<b>18.6%</b>
CHP Aggregation and Acceleration	\$25,000,000	\$35,840	0.1%	\$171,694	0.7%
CHP Performance	\$50,000,000	\$127,179	0.3%	\$13,747,897	27.5%
<b>Power Supply &amp; Delivery Total</b>	<b>\$188,053,344</b>	<b>\$2,165,913</b>	<b>1.2%</b>	<b>\$56,168,511</b>	<b>29.9%</b>

Totals may not sum exactly due to rounding.

<sup>a</sup> 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.

### **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 resources and increase the throughput or transfer of electric energy between regions of the State. A smarter grid will be essential to accelerating adoption of grid-powered electric vehicles (GPV) and associated infrastructure.

The following program activity has been performed as of June 30, 2013 in an effort to meet the previously-stated milestones and anticipated results:

- NYSERDA meets periodically with stakeholders consisting of the public, investor-owned, municipal and cooperative utilities in New York State and other stakeholders, including the New York Smart Grid Consortium and the New York Battery and Energy Storage Technology (NYBEST) consortium to solicit input into the new Smart Grid Program design.
- The Electric Power Transmission and Distribution (EPTD) Smart Grid Program solicitation (PON 2474) released in April 2012 resulted in 70 proposals requesting over \$35 million in funding. Fifteen smart grid projects were selected to be funded representing a commitment of \$7.95 million of NYSERDA funding leveraged by an additional \$10.88 million of private sector co-funding and investment.
- Twelve of the PON 2474 projects have been contracted to date representing \$5.33 million of NYSERDA funds and \$7.95 million in cost share.
- Three additional smart grid contracts were signed for the period representing \$135,000 of NYSERDA funds and \$50,000 in cost share. These projects included support for a Small Business Innovative Research project, sponsorship of an industry conference, and membership dues for the NYS Smart Grid Consortium.
- The EPTD Smart Grid Program solicitation (PON 2715) was released June 10, 2013. This second solicitation under the T&MD plan makes \$10 million available over two rounds. Proposals are due August 14, 2013 and February 12, 2014. The primary program objective is to support projects that improve the reliability, efficiency, quality and overall performance of the electric power delivery system in New York State. Projects 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 under this solicitation.
- Projects stemming from PON 2474 include developing a product to optimize customer site supply voltage, demonstrating utility-scale transportable energy storage, a study of the feasibility of implementing a thermal energy storage system, and developing a utility distribution automation control system.
- Fifteen contracts have been signed utilizing the smart grid funding source; this represents \$5.46 million of NYSERDA funds leveraging \$8.0 million in cost share. Five additional projects are undergoing contract negotiations.

NYSERDA has historically funded smart grid projects with SBC3 resources. Benefits from this SBC3 smart grid investment continue to accrue and were reported in the 2012 SBC3 annual report finalized in June 2013 (prior historical accomplishments can be found in the SBC3 annual report through December 31, 2011).

### **3.1.1.2 Electric Vehicle Infrastructure**

The Electric Vehicle Infrastructure efforts will include engineering studies, product development, demonstration projects and pilot programs to validate technology that minimizes negative grid impacts from GPV charging, develop GPV-to-grid communication technologies and control processes, and promote new business models to exploit the benefits of vehicle storage to the distribution system. The Electric Vehicle Infrastructure program partially funds the Behavior Research Program further discussed under Advance Buildings Technologies, section 3.2.1.2.

In late 2011, \$8 million in non-T&MD funds became available to NYSERDA to support the installation for electric vehicle charging infrastructure and explore approaches that overcome business impediments to private sector investment in publicly accessible EV charging. This funding leveraged an additional \$1 million in federal funding designated to support regional EV readiness. Based on the availability of these funds, a decision was made to delay the launch of the T&MD Electric Vehicle Infrastructure work until the non-T&MD funds were exhausted.

Using the non-T&MD funding, NYSERDA's EV Charging Infrastructure solicitation (PON 2301) was administered with two proposal due dates. Twenty eight projects using unique and innovative business models for public access charging were selected for funding. The projects will install more than 900 charging ports at over 350 locations throughout the State over the next year. Although the charging station hardware and installation costs were not SBC funded, SBC3 funds are being used to support monitoring of site utilization and reporting on business model success with the contractor selected through PON 2392 Electric Vehicle Supply Equipment (EVSE) Support. The second phase of work contracted under PON 2392 will be supported with T&MD funds and is anticipated to begin in the third quarter of 2013.

As previously noted above, NYSERDA has historically funded electric transportation projects with SBC3 resources. Benefits from this SBC3 investment continue to accrue and were reported in the 2012 SBC3 annual report finalized in June 2013 (prior historical accomplishments can be found in the SBC3 annual report through December 31, 2011).

Table 3-2 shows the performance milestones and actual results for Smart Grid and Electric Vehicle Infrastructure Program through June 30, 2013. Table 3-2 includes only those performance milestones with anticipated achievements during the first two years (2012-2013) of the five-year program; the rightmost column indicates the actual achievement to date.

**Table 3-2. Smart Grid and Electric Vehicle Infrastructure Performance Milestones and Actual Results**

		<b>2012-2013 Anticipated</b>	<b>Through June 30, 2013</b>
<b>Outputs/Leading Indicators</b>			
<b>Smart Grid</b>	Sign contracts for 29 technology development, demonstration and pilot projects, including several large flagship projects	7	5
	Sign contracts for 8 research studies on technologies, market barriers and policies related to increased smart grid implementation in New York State	2	10
	34 clean energy companies receiving support	8	3
	Facility operator agreement executed with 3rd party for Commercialization Center	Executed agreement	NR (Commercialization center funding approved in September 2012. Center is under development.)
<b>Electric Vehicle Infrastructure</b>	Sign contracts for 25 grid powered vehicle technology development, demonstration and pilot projects	4	NR (Non-T&MD funds are being used to support this effort and to further leverage limited T&MD funds in the near term. Metrics associated with T&MD funding will be included in future reports. 28 proposals were selected to install over 900 charging ports at over 350 sites.)
	Contract 8 research studies on technologies, market barriers and policies related to increased grid powered vehicle implementation in New York State	4	
	30 clean energy companies receiving support	5	

Table 3-2. (continued)

		Through June 30, 2013	2012-2013 Anticipated
<b>Outcomes/Impacts</b>			
<b>Smart Grid</b>	\$112 million in leveraged funds (co-funding and outside investment) for smart grid infrastructure	\$18M	\$8M
	\$7 million in leveraged funds (co-funding and outside investment) for the Commercialization Center	\$2M	NR (Commercialization center funding approved in September 2012. Center is under development.)
	\$10M Revenue generated from facility use of the Commercialization Center	\$150k	
	41 Product development tests (technology readiness level (TRL) 7+) in the Commercialization Center	2	
	25 tested or prototyped products commercialized from the Commercialization Center	1	
<b>Electric Vehicle Infrastructure</b>	\$42 million in leveraged funds (co-funding and outside investment) for electric vehicle infrastructure	\$4M	NR (Non-T&MD funds are being used to support this effort in the near term and to further leverage limited T&MD funds. Metrics associated with T&MD funding will be included in future reports. \$1 million in federal funding was leveraged.)

Note: NR = Not Reported. See explanation at the beginning of Section 3.

## **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 power. Cost reduction of PV installations is an initial focus. This effort is targeting the reduction of BOS costs that include all costs with the exception of the PV module. The program also supports energy storage, wind, hydro and fuel cell product development, building on projects funded in the last round of the SBC program. The following summarizes program activities during the period ending June 30, 2013.

On May 29, 2012, NYSERDA, together with the State University of New York (SUNY) at Albany and the New York Power Authority (NYPA), held a PV BOS cost reduction workshop. Nearly 50 selected key stakeholders representing all aspects of the industry including utilities, manufacturers, installers, and financing institutions attended the workshop.

In September 2012, the PSC approved the transfer of \$10 million of SBC3 funds to a PV BOS cost reduction effort. Six million dollars of that funding was allocated to an R&D solicitation designed to attract projects. The funds will focus on reducing PV BOS costs (non-module costs of solar systems), such as overall equipment and installation costs and standardization and streamlining of procedures for permitting and interconnection. The solicitation will have two proposal due dates, July 30, 2013 and January 30, 2014, and will be a collaboration with NYPA which will provide an additional \$10 million to be administered by NYSERDA.

The Advanced Clean Power Technologies solicitation (PON 2569) was released July 2, 2012. This \$10.25 million solicitation had two proposal due dates: August 29, 2012 and June 13, 2013. Fifty-one proposals were received in response to round one of Clean Power solicitation PON 2569. Eleven proposals totaling \$6.9 million in NYSERDA funds were approved for funding. The majority of the projects selected are for the development of new clean energy technologies. Some examples of these products are a hydrokinetic energy conversion system, solid oxide fuel cells, hydrogen-bromine fuel cells, and a small wind turbine. Twenty-three proposals were received for the second round and requested a total of \$8.7 million. The Technical Evaluation Panel is scheduled to review these proposals at the beginning of August.

### **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 the upstate region, this program concentrates on gap in understanding of offshore wind energy. Marine resource and site assessment activities will result in increased knowledge of coastal marine energy assets and their suitability for power development and better understanding of the capacity in

New York State to manufacture construct and service new-marine-based electrical generation projects and components.

#### Offshore Wind Research Plan Development

Program staff is collaborating with New York Department of State (DOS) in preparing a New York State Offshore Wind Information Needs (Physical and Human uses) Request for Information (RFI) to gather input/guidance on research that stakeholders identify as needs associated with the development of off-shore wind energy. The RFI release is expected to occur in the third quarter 2013. The RFI will complement another NYSERDA effort to develop a research agenda for wildlife impacts of offshore wind.

#### Offshore Wind Cost-Benefit Study

NYSERDA is conducting a comprehensive cost-benefit study for potential offshore wind projects in the Atlantic Ocean. This work will estimate costs, performance, operation and economic impacts to New York State to enable policy makers in New York State to fully evaluate competing options for meeting long-term energy and environmental objectives. Electrical system cost impacts and costs associated with a significant build-out of offshore wind capacity will be modeled as will the expected benefits to the New York State economy and environment be estimated. Important aspects of permitting, port infrastructure, and operation and maintenance service opportunities will be considered.

#### DOS Coastal Resources Offshore Amendment to Coastal Zone Management Program (CZMP)

NYSERDA continues to have close collaboration with and provide technical support to the DOS Coastal Resources program as it develops screening criteria for establishing a revised coastal zone planning process related to offshore wind energy. The Atlantic Ocean Study maps physical and biological information to aid in the study of areas off the coasts where wind development may be suitable for State and federal consideration under the U.S. Department of Interior's Smart from the Start Initiative aimed at accelerating the federal process for leasing offshore tracts for wind energy. The release of the Atlantic Ocean Study and the planned release of the joint NYSERDA/DOS RFI are expected to result in targeted research projects in the prospective wind energy areas that will promote future ocean wind energy development.

Table 3-3 shows the performance milestones and actual results for the Advanced Clean Power Program through June 30, 2013. Table 3-3 includes only those performance milestones with anticipated achievements during the first two years (2012-2013) of the five-year program; the rightmost column indicates the actual achievement to date.

**Table 3-3. Advanced Clean Power Performance Milestones and Actual Results**

		2012-2013 Anticipated	Through June 30, 2013
Outputs/ Leading Indicators			
<b>Clean Power Technology Innovation</b>	Contract 51 clean power technology projects	15	10 (2 projects currently being negotiated)
	64 clean energy companies receiving support	19	10
<b>Resource Development</b>	6 studies, surveys, and plans contracted	3	2
	6 studies, surveys, and plans completed	1	0
	3 engagements with stakeholder organizations and consortia in support of developing a research /program agenda	2	2
<b>Solar Cost Reduction</b>	200 training sessions on aspects of PV for authorities having jurisdiction, local officials and trainers	180	NR (In September 2012, the PSC approved the transfer of \$10 million of SBC3 funds to a PV BOS cost reduction effort. These metrics will be tracked in future reports.)
	2,000 trainees attending training sessions on aspects of PV for authorities having jurisdiction, local officials and trainers	1,800	
	10 Projects to develop tools/practices, studies/surveys, or workshops/engagements, to reduce PV costs contracted	7	
	10 BOS technology development or demonstration projects contracted	7	
	9 clean energy companies receiving support	6	
	10 Workshops/engagements as a result of BOS projects	1	

Table 3-3 (continued)

		2012-2013 Anticipated	Through June 30, 2013
Outcomes/Impacts			
<b>Clean Power Technology Innovation</b>	\$55M in commercial sales of supported clean power technologies	\$1M	NR (Metric will be reported in the 2013 year-end report for projects that commenced in SBC2 or SBC3 and received phase two T&MD support, as available. Commercialization metrics for projects that only received SBC3 funding will be reported in the SBC3 annual report.)
	\$65M of leveraged funds (co-funding and outside investment) for clean power technology projects	\$20M	\$5.7M (another \$2.2M associated with projects in negotiation)
<b>Resource Development</b>	\$2.5-5.0 M of leveraged funds (co-funding and outside investment)	up to \$0.5 M	0
<b>Solar Cost Reduction</b>	\$13.2M of leveraged funds (co-funding and outside investment) for BOS projects	\$5.52M	NR (In September 2012, the PSC approved the transfer of \$10 million of SBC3 funds to a PV BOS cost reduction effort. This metric will be tracked in future reports.)

Note: NR = Not Reported. See explanation at the beginning of Section 3.

### **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 in the size range of 50 kW to 1.3 MW, which is the size range covering the majority of NYSERDA's previous CHP projects. The Program will accomplish this by (1) compiling a vetted catalog of pre-qualified equipment, and (2) creating and validating rules-of-thumb for simplifying the analysis used to determine the size needs of a given site. This focus on pre-packaged 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.

In June 2012, NYSERDA issued RFI 2568, which invites vendors of packaged CHP systems to submit "equipment cut sheets" for vetting by a NYSERDA-assembled Technical Evaluation Panel. This program and RFI 2568 were highlighted during NYSERDA's CHP Conference held in New York City in June 2012 with 150 stakeholders in attendance. NYSERDA issued the catalog that specifies the eligible equipment along with each item's assigned incentive and the program's system sizing rules-of-thumb in February 2013. Upon issuance of the catalog, NYSERDA began accepting open enrollment first-come/first-served applications for the program. The program and opportunities to add items to the catalog will then remain open continuously until the end of 2016 or funds are exhausted, whichever occurs first.

NYSERDA has historically funded CHP projects with SBC3 resources. Benefits from this SBC3 investment continue to accrue and were reported in the 2012 SBC3 annual report finalized in June 2013 (prior historical accomplishments can be found in the SBC3 annual report through December 31, 2011).

#### **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 pound/MWh of NOx emissions. To quantify the performance-based payments, the program applies rigorous, multi-year system performance measurements, a groundbreaking approach for energy efficiency program administrators.

Additional incentives are tailored to favor 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. NYSERDA will work with the other investor-owned utilities to identify analogous opportunities.

The CHP Performance Program was released by Governor Cuomo on May 2, 2013. The Program has contracted funding on one project for an anticipated summer peak demand reduction of 2.8 MW and 25,000 MWh of annual generation.

The CHP Performance Program T&MD funding also assists end users developing CHP solutions with cost shared feasibility studies using the FlexTech Program.

Table 3-4 shows the performance milestones and actual results of Combined Heat and Power Program through June 30, 2013. Table 3- 4 includes only those performance milestones with anticipated achievements during the first two years (2012-2013) of the five-year program; the rightmost column indicates the actual achievement to date.

**Table 3-4. Combined Heat and Power Performance Milestones and Anticipated Results**

Performance Milestones and Anticipated Results			
		2012-2013 Anticipated	Through June 30, 2013
Outputs/Leading Indicators			
CHP Aggregation & Acceleration Program	20 Pre-packaged CHP Systems "pre-qualified" for catalog	10	54
	37 CHP Aggregation Sites – Contracted	15	NR (Program solicitation released in Q1 2013. Future reports will show progress toward this metric.)
	37 CHP Aggregation Sites – Installed	3	

Table 3-4 (Continued)

Performance Milestones and Anticipated Results			
		2012-2013 Anticipated	Through June 30, 2013
<b>CHP Aggregation &amp; Acceleration Program</b>	10 Technology transfer activities such as development and dissemination of “Best Practices” guidebooks, analyses of barriers busting policy and technology initiatives, conferences, and web-based materials	4	<p>CHP performance data website (<a href="http://chp.nyserda.ny.gov">http://chp.nyserda.ny.gov</a>) ongoing with T&amp;MD funding.</p> <p>Hosted NYSERDA CHP conference in NYC June 2012 with 150 attendees.</p> <p>Presentation at NECHPI conference in Boston held in March 2013 with 150 attendees.</p> <p>Hosted 1 webinar for NYSERDA’s Outreach Coordinators in April 2013.</p> <p>Hosted NYSDPS CHP conference in NYC May 2013 with 190 in-person attendees plus 90 web viewers.</p> <p>Presentation at NYISO Environmental Advisory Meeting in Latham held in May 2013.</p> <p>Presentation at Supportive Housing conference in NYC held in June 2013.</p>
	12.5 MW peak load electric generation- Contracted	5 MW peak load	NR (Program solicitation released in Q1 2013. Future reports will show progress toward these metrics.)
	76,250 MWh/yr peak load electric generation- Contracted	30,500 MWh	
	99,125 MMBtu/yr primary energy savings - Contracted	39,650 MMBtu	
<b>CHP Performance</b>	16 Projects Performance Based-Contracted	2	1
	16 Projects Performance Based - Installed		NR
	25 MW peak load electric generation – Contracted	3 MW peak load	2.8 MW

Table 3-4 (Continued)

Performance Milestones and Anticipated Results			
		2012-2013 Anticipated	Through June 30, 2013
CHP Performance	200,000 MWh/yr electric generation – Contracted	20,000 MWh	25,000 MWh
	260,000 MMBtu/yr primary energy savings - Contracted	26,000 MMBtu	32,500 MMBtu
Outcomes/Impacts			
CHP Aggregation & Acceleration Program	12.5 MW peak load electric generation- Installed	1 MW peak load	NR (Program solicitation released in Q1 2013. Future reports will show progress toward these metrics.)
	76,250 MWh/yr electric generation- Installed	6,100 MWh	
	99,125 MMBtu/yr primary energy savings - Installed	7,930 MMBtu	
	\$50 million in leveraged funds (co-funding and outside investment) for installed CHP systems	\$20M	
CHP Performance	25 MW peak load electric generation – Installed		NR
	200,000 MWh/yr electric generation – Installed		NR
	260,000 MMBtu/yr primary energy savings - Installed		NR
	\$250 million in leveraged funds (cofounding and outside investment)	\$30M	\$22M

Note: NR = Not Reported. See explanation at the beginning of Section 3.

<sup>a</sup> Energy savings reported in this table 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.

## 3.2 Building Systems Initiatives

Table 3-5 shows the Building Systems budget and financial status through June 30, 2013. Committed and spent funds are also shown as a percent of the total 2012-2016 budget. Later sections describe progress for each area of this initiative.

**Table 3-5. Building Systems Budget and Financial Status as of June 30, 2013**

	<b>2012-2016 Budget</b>	<b>Spent Funds</b>	<b>Percent of 2012-2016 Budget Spent</b>	<b>Committed Funds<sup>a</sup></b>	<b>Percent of 2012-2016 Budget Committed</b>
<b>Advanced Buildings</b>	<b>\$75,336,160</b>	<b>\$841,210</b>	<b>1.1%</b>	<b>\$31,759,694</b>	<b>42.2%</b>
Emerging Technology/Accelerated Commercialization	\$32,446,214	\$123,988	0.4%	\$4,328,299	13.3%
Technology Development	\$33,613,215	\$166,970	0.5%	\$23,618,332	70.3%
Demand Response	\$9,276,731	\$550,252	5.9%	\$3,813,063	41.1%
<b>Advanced Energy Codes &amp; Standards</b>	<b>\$16,679,794</b>	<b>\$13,490</b>	<b>0.1%</b>	<b>\$5,014,103</b>	<b>30.1%</b>
<b>Building Systems Total</b>	<b>\$92,015,954</b>	<b>\$854,700</b>	<b>0.9%</b>	<b>\$36,773,797</b>	<b>40.0%</b>

Totals may not sum exactly due to rounding.

<sup>a</sup> 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.

### 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 as a feeder effort to support EEPS and other New York State clean energy programs, as well as encouraging market adoption without additional ratepayer support. This effort focuses on three market sectors, commercial/institutional, multifamily and residential. Activities to date in each sector are described as follows.

#### Commercial/Institutional ETAC

NYSERDA held advisory group meetings for the Commercial/Institutional (C/I) ETAC Program in October 2012 and April 2013. Advisory group members include representatives of the design community, commercial property owners, colleges and universities, utilities, national laboratories, environmental groups and national energy efficiency organizations. Input and feedback from the group has been applied to program design and identification of promising commercially-available yet underutilized technologies and approaches.

NYSERDA has conducted market research on C/I emerging technologies (ET), and since December 2012 has met with more than a dozen technology developers to further explore the leading edge of C/I energy savings

technologies and approaches. NYSERDA is a participant in the Consortium for Energy Efficiency's bi-national ET Collaboration, and is working with NYPA to coordinate and collaborate on NYPA's new Energy Efficiency Market Acceleration Program.

NYSERDA launched an open enrollment program in May 2013, consisting of two program tracks, Energy Performance Validation and Focused Demonstrations. Both program tracks are 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 in both tracks will receive a NYSERDA-funded performance measurement and verification (M&V) study tailored to each project. Projects in the Focused Demonstration track may receive up to \$150,000 to support installation and project costs, but must fall within one of NYSERDA's identified "Targeted Categories", and must also provide prior independently-verified performance data. Project results and validated performance information will be shared through targeted, deliberate outreach to the market, other New York Program Administrators, and Department of Public Service staff.

Project developers have indicated strong interest in the open enrollment program, and applications are expected throughout the remainder of the year. A competitive solicitation, targeted at larger-impact projects, is under development for release in the fall. As part of a larger solicitation (RFP 2621) released in May 2013, NYSERDA plans to select a consultant to assist with technical and program support. Additionally, NYSERDA has a small cadre of independent technical consultants on-board to assist with performance validation and measurement and verification of energy savings in demonstration project.

#### Multifamily ETAC

- Multifamily Technology Demonstration Program

Using input from the multifamily ETAC Advisory Committee and in consultation with the NYSERDA ETAC Cross Program Committee, a final draft Multifamily ETAC solicitation was developed. The solicitation is expected to be released seeking proposals of demonstration projects in the third quarter of 2013.

- Multifamily Deep Energy Retrofit Competition

The Multifamily Deep Energy Retrofit Competition planning process began by leveraging \$50,000 from the DOE State Energy Program Base Grant to hire a planning consultant for feasibility analysis. The analysis found that a competition, structured to reward both energy savings and return on investment, would potentially entice participants from both the market rate and affordable housing sectors. Based on that effort a draft solicitation has been developed that outlines the implementation of the competition. NYSERDA anticipates a release date in early 2014.

- Multifamily Mixed-Use Pilot Program

The pilot program is still in the early design phase. A Request for Proposals is currently being developed for an implementation contractor who will assist with the pilot design and will likely be issued in the third quarter of 2013. Once an implementer is selected, program design and project screening and selection can occur.

### Residential ETAC

NYSERDA kicked off the residential ETAC effort with stakeholder meetings on June 8, 2012 and August 7, 2012. Stakeholders from the residential energy field including contractors, builders, PV installers, products manufacturers, research and design firms, and utilities were present. Input and feedback from the stakeholders will be used to develop the initiative. A program website was created in 2012 and a clearinghouse for potential demonstration participants was developed in 2013. Currently, 20 companies are listed in the clearinghouse. In addition, outreach to engage potential demonstration partners began in early 2013, with five webinars and conference calls.

NYSERDA plans to release a Program Opportunity Notice (PON) in the third quarter of 2013 to seek proposals for demonstration projects that will feature solid-state lighting in the residential sector, for both new construction and existing homes. Specific technology transfer strategies and activities will be a required element of proposals submitted to the PON, and will be the primary means of achieving program success. NYSERDA will also release a RFI in 2013 to solicit feedback on additional technologies for consideration under the residential ETAC initiative.

#### **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 of new or emerging products. As a complement to Technology Development, NYSERDA also 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 into New York State markets.

A proposed program design for Technology Development and the Advanced Building Consortium was developed and presented to a diverse group of stakeholders that included technology developers, builders, financial and real estate industries, design professionals, public and private sector building owners and operators, academic and research organizations, code agencies and organizations, manufacturers and suppliers, building trades, and utility program representatives. A total of 177 stakeholders attended meetings held in April and May 2012 in Buffalo, Syracuse, Albany, and New York City. Types of stakeholders present include technology developers, builders, financial and real estate industries, design professionals, public and private sector building owners and operators, academic and research organizations, code agencies and organizations, manufacturers and suppliers, building trades, and utility program representatives. Feedback on the proposed approach for Technology Development activities and the establishment of an Advanced Building Consortium were generally positive. Stakeholders were also in favor of

simplifying and expediting the proposal submission and award process. Stakeholder input was incorporated into the program design where possible.

NYSERDA issued PON 2606 Advanced Buildings Program for \$25 million (\$22 million T&MD, and \$3 million from R&D statutory funds) in November 2012. The solicitation is a broad solicitation with multiple rounds (six) for building related technology development and pilot demonstration projects. Rounds 1 and 2 of PON 2606 received 78 and 82 proposals for funding, respectively. The request for funding from the first two rounds totaled \$25 million: under Round 1, 14 proposals were awarded \$2.3 million. Awards for Round 2 are pending. Awarded projects from Round 1 span across research, product development, and pilot demonstrations and include activities in the solid state lighting, new building materials and construction techniques, technologies to enable smart buildings, and integration of renewable energy and energy storage technologies in buildings.

The concept and approach for soliciting for an Advanced Building Consortium were approved by senior NYSERDA management. A \$7.5 million solicitation is expected to be released in fall 2013 to establish and support one Advanced Buildings Consortium (ABC) that will introduce new and integrated building products and services that will be adopted far more rapidly into the market. The consortium will focus on building integration, whole building practices, and resiliency to infrastructure disruptions. Consortium projects will lead to buildings with high energy performance when the electric grid is available, and greater resiliency for occupants and businesses during electric grid disruptions.

#### Behavior Research Program

NYSERDA's Behavior Research Program (2010 – present) works with Action Research, Inc., and clean energy programs in New York State to implement and evaluate behavior pilots to identify successful pilot interventions that use behavior principles of decision making to influence energy-related decisions. The research pilots are documented through a series of case study reports and funding to demonstrate successful pilot interventions at a larger scale will be available through NYSERDA's separate Behavior Demonstration Program. The Behavior Research Program has conducted training on the basics of behavior research guidelines and will provide a series of instructional webinars in 2013.

#### **3.2.1.3 Enabling Demand Response (DR) 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. Such outcomes can contribute to suppressed wholesale energy costs, reduced congestion costs, increased reliability, and 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. 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/\$200 per kW Upstate/Downstate and the incentives for energy storage are \$300/\$600 per kW Upstate/Downstate. DR projects are required to enroll in a mandatory-participation DR program offered by the NYISO or local utility. The Existing Facilities Program also offers pre-qualified 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/meter or 100% of project cost, whichever is less.

Since January 2012, the program has supported interval meter and enabling technology installations representing approximately 34 MW of demand response.

NYSERDA has historically funded DR projects with SBC3 resources. Benefits from this SBC3 DR investment continue to accrue and were reported in the 2012 SBC3 annual report finalized in June 2013 (prior historical accomplishments can be found in the SBC3 annual report through December, 2011).

Table 3-6 shows the performance milestones and actual results of Advanced Buildings Program through June 30, 2013. Table 3-6 includes only those performance milestones with anticipated achievements during the first two years (2012-2013) of the five-year program; the rightmost column indicates the actual achievement to date.

**Table 3-6. Advanced Buildings Performance Milestones and Actual Results**

		2012-2013 Anticipated	Through June 30, 2013
<b>Outputs/Indicators – Quantifiable Targets</b>			
<b>Emerging Technology/Accelerated Commercialization</b>	13-22 stakeholder meetings on emerging and underused technologies and strategies	7-10	11
	38-70 knowledge/technology transfer activities across the commercial and residential sectors (webcasts, reference case studies, and other knowledge transfer mechanisms)	8-18	NR (Scoping meetings held. One solicitation issued in May 2013, others to be issued Q3 – Q4.)
	17-36 contracted reference demonstration <sup>1</sup> projects across the commercial and residential sectors (including large-scale demonstrations)	3-6	
	17-36 completed reference demonstration projects across the commercial and residential sectors (including large-scale demonstrations)	1-2	
<b>Technology Development</b>	46-74 advanced building technology projects contracted (including some large-scale projects) <sup>2</sup>	23-36	9 (Contracts for 14 additional new projects in negotiations)
	23-37 clean energy companies receiving support	12-18	9
	15-30 stakeholders engaged in the Advanced Buildings Consortium (ABC)	5-10	NR (Pre-ABC meetings held with 177 stakeholders to define scope. Following Superstorm Sandy, ABC funds were repurposed to focus on resiliency and sustainability. Program adjustments are underway.)
	16-35 ABC stakeholder meetings, advisory meetings, workshops, conferences, events, etc.	2-5	4

Table 3-6 (continued)

		2012-2013 Anticipated	Through June 30, 2013
	10-15 clean energy companies receiving support through ABC	3-5	Solicitation for the ABC expected to be released Fall 2013
Demand Response	46 MW Registered	9 MW	34 MW
<b>Outcomes/Impacts – Quantifiable Targets<sup>3</sup></b>			
Emerging Technology/Accelerated Commercialization	\$6.5 -13 million of leveraged funds (co-funding and outside investment) for demonstration projects	\$1-3M	NR (Scoping meetings have been held. One solicitation issued in May 2013, others to be issued Q3 – Q4.)
	10,500 MWh of energy savings from supported demonstration projects <sup>4</sup>	2,000 MWh	
	78,000 MMBtus of energy savings from supported demonstration projects <sup>4</sup>	5,000 MMBtu	
	2,300 Peak kW reduction	550	
Technology Development	\$14-23 million in leveraged funds (co-funding and outside investment) for advanced building technologies	\$7-10M	\$3.4M

Note: NR = Not Reported. See explanation at the beginning of Section 3.

<sup>1</sup> For this program, a demonstration project is defined as highly visible, large-scale demonstration of a technology or technologies at one or more sites. For example, a demonstration of load-shedding ballast in a number of different building locations would be considered one demonstration.

<sup>2</sup> Using a stage-gate process, technology opportunities will be explored and only the most promising technologies (select few) will be advanced to large-scale projects.

<sup>3</sup> Estimates based on savings per program dollar invested in projects.

<sup>4</sup> It is difficult to estimate savings for these new feeder programs. Estimates are conservative given the difficulty of assessing replication impacts. Estimates are based on previous NYSERDA evaluation studies of replication from demonstration projects.

### **3.2.2 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 towards state and national appliance and equipment standards and specification setting processes for various equipment types. Activities within the four major areas are described in the following sections.

#### **3.2.2.1 Annual Statewide Compliance Assessments**

Statewide compliance assessment studies, an important component of the Advanced Energy Codes and Standards Initiative, provide a means to track compliance (or non-compliance) trends associated with changing codes and standards. These assessment studies help to identify where program intervention may be needed. Compliance assessments will occur as a phased effort. The first effort, currently underway, concentrates on existing commercial building renovation projects and establishing the overall framework for all assessments during the T&MD period. The current compliance assessment is in the data gathering phase and the results of the assessment are expected in March 2014. Future efforts, built upon this framework, will evaluate commercial new construction, and residential new construction and renovation, and will update the initial commercial renovation assessment study for the latter periods of the T&MD funding cycle. The final compliance assessment study will also provide findings based on all studies undertaken within the five-year assessment period, including data from the T&MD and NYSERDA's American Recovery and Reinvestment Act (ARRA) compliance assessment studies.

#### **3.2.2.2 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 upon those developed using ARRA funds, with new or enhanced approaches and topics that address areas of low compliance or code change.

Stakeholder meetings with DOS, Pace Energy and Climate Center, and various contractors performing work under ARRA occurred to review overall concept for T&MD activities. Further meetings were held in June 2013 with code officials representing the statewide membership organization and select municipalities. Release of the first solicitation associated with this task is anticipated for late summer 2013 and will include the following initiatives classroom training:

Traditional, classroom training specific to the International Energy Conservation Code (IECC) 2012 and New York State-specific changes (scheduled for October 2013 (commercial) and May 2014 (residential)).

The T&MD plan also identifies that a solicitation will be issued specific to the following tasks related to Website:  
Host/Support:

- Enhanced mechanisms for public contact (hotline, forum, FAQ)
- Design website upgrade
- Manage and host additional website content prepared by NYSERDA and others
- Overall program marketing

It is anticipated that a solicitation specific to the aforementioned website tasks will be issued in early 2014.

### **3.2.2.3 Technical Support, Studies, and Resources**

Technical consulting and other research firms will be competitively selected to provide technical and administrative support associated with codes and standards changes, to implement new strategies, and to conduct other activities supporting the codes and standards efforts, including assistance in providing proactive responses to federal standard proposals and national energy code changes.

Initial efforts leading to the first solicitation in this area are in progress. Release of this solicitation is anticipated for first quarter 2014 and will include the following tasks related to:

Studies and Support (Technical and Administrative):

- Regulatory and administration studies (e.g., third party energy enforcement)
- Technical studies (e.g., Building Science, New Materials) in support of proposed code changes

### **3.2.2.4 Pilots and Expanded Implementation Assistance**

This solicitation will focus on providing direct support to municipalities. Release of the solicitation is anticipated in fall 2014 and will include the following tasks:

Municipal Support:

- Pilot Programs for select communities (Plan Review, Specialized Training, Inspection Support, Database Creation).
- Development of Enforcement Tool Manual.
- Development of guidelines for adoption of advanced (above-minimum) codes.

Table 3-7 shows the performance milestones and actual results of Advanced Energy Codes Program through June 30, 2013. Table 3-7 includes only those performance milestones with anticipated achievements during the first two years (2012-2013) of the five-year program; the rightmost column indicates the actual achievement to date.

**Table 3-7. Advanced Energy Codes Performance Milestones and Actual Results**

		2012-2013 Anticipated	Through June 30, 2013
<b>Outputs/ Leading Indicators</b>			
<b>Annual Statewide Compliance Assessments</b>	Conduct 5 annual code compliance assessments	2	1 in progress
	Conduct 3 compliance efforts with appliance and equipment vendors to assess conformance to State and federal standards	1	NR
<b>Development and Delivery of Advanced Training and Tools</b>	Develop 12-16 new or expanded code training modules	6-8	NR (Solicitation development in progress for new training modules)
	Train 15,000 individuals on code requirements	7,000	NR
	Develop or update educational or other tools to help support code compliance and NYS appliance/equipment standards		NR (Code/Commentary to 2013 Commercial/2014 Residential ECCCNY updates in progress; solicitation for Code Enforcement Manual expected for issue fall 2014.)
<b>Technical Support, Studies and Resources</b>	Issue 2 competitive solicitations to hire consulting and market research firms to provide program support	1	NR (Solicitation expected for release early 2014.)
	Participation by NYSERDA and DOS in rulemaking, code development hearings and codes and standards development workshops		NR (NYSERDA and DOS will attend applicable events in 2013 as available.)
<b>Pilots and Expanded Implementation Assistance</b>	Issue 2 competitive solicitations for pilots and program implementation assistance	1	Solicitation expected for release in fall 2014.

Table 3-7 (continued)

		2012-2013 Anticipated	Through June 30, 2013
Outcomes/Impacts			
<b>Annual Statewide Compliance Assessments</b>	Information from code compliance assessments and standards research supports policy decisions on future code/standard changes		Results of compliance assessment focusing on commercial renovation and alteration expected to be made available March 2014.
<b>Development and Delivery of Advanced Training and Tools and Technical Support, Studies and Resources</b>	Code compliance efforts lead to 631 GWh of cumulative annual electricity savings	84 GWh/yr	NR (Not yet measured. Compliance study underway.)
	Code compliance efforts lead to 129 MW of cumulative annual peak demand savings	18 MW/yr	
	Code compliance efforts lead to 4,921,000 MMBtu of cumulative annual fossil fuels savings	575,000 MMBtu/yr	

Note: NR = Not Reported. See explanation at the beginning of Section 3.

### 3.3 Clean Energy Infrastructure Initiatives

Table 3-8 shows the Clean Energy Infrastructure budget and financial status through June 30, 2013. Committed and spent funds are also shown as a percent of the total 2012-2016 budget. Later sections describe progress for each area of this initiative.

**Table 3-8. Clean Energy Infrastructure Budget and Financial Status as of June 30, 2013**

	<b>2012-2016 Budget</b>	<b>Spent Funds</b>	<b>Percent of 2012-2016 Budget Spent</b>	<b>Committed Funds<sup>a</sup></b>	<b>Percent of 2012-2016 Budget Committed</b>
<b>Market Development</b>	<b>\$70,380,281</b>	<b>\$7,476,845</b>	<b>10.6%</b>	<b>\$20,760,362</b>	<b>29.5%</b>
Market Research	\$4,640,140	250,606	5.4%	\$1,476,850	31.8%
Market Pathways	\$55,710,000	\$5,669,705	10.2%	\$14,931,443	26.8%
Education/Behavior	\$10,030,140	\$1,556,535	15.5%	\$4,352,069	43.4%
<b>Clean Energy Business Development</b>	<b>\$41,761,046<sup>b</sup></b>	<b>\$501,818<sup>c</sup></b>	<b>1.2%</b>	<b>\$21,013,131<sup>d</sup></b>	<b>50.3%</b>
Innovation Entrepreneurial Capacity	\$36,761,046	\$51,000	0.1%	\$18,780,524	51.1%
Market Intelligence	\$1,688,584	\$181,792	10.8%	\$414,676	24.6%
Direct Support for Business	\$2,400,000	\$66,669	2.8%	\$1,236,000	51.5%
<b>EMEP</b>	<b>\$18,550,048</b>	<b>\$374,421</b>	<b>2.0%</b>	<b>\$5,229,674</b>	<b>28.2%</b>
<b>Workforce Development</b>	<b>\$39,000,000</b>	<b>\$230,724</b>	<b>0.6%</b>	<b>\$22,888,947</b>	<b>58.7%</b>
Workforce Development-Renewable Energy/Advanced Technologies	\$15,000,000	\$193,224	1.3%	\$4,834,947	32.2%
Workforce Development – Energy Efficiency	\$24,000,000	\$37,500	0.2%	\$18,054,000	75.2%
<b>Clean Energy Infrastructure Total</b>	<b>\$169,691,375</b>	<b>\$8,583,808</b>	<b>5.1%</b>	<b>\$69,892,114</b>	<b>41.2%</b>

Totals may not sum exactly due to rounding.

<sup>a</sup> 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.

<sup>b</sup> Dollars spent for CEBD initiatives do not sum to the total CEBD 2012-2016 budget because \$911,416 in CEBD 2012-2016 budget marketing funds were added to the total.

<sup>c</sup> Dollars spent for CEBD initiatives do not sum to the total CEBD dollars spent because \$202,357 in spent CEBD marketing funds were added to the total.

<sup>d</sup> Dollars committed for CEBD initiatives do not sum to the total CEBD dollars committed because \$581,931 in committed CEBD marketing funds were added to the total.

### **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 works to identify market and institutional barriers to technology and product adoption, obtain critical early stage information and insights to guide investment decisions, and further advance the reach of T&MD and EEPS programs and other public policy goals. The goal is to amass specific market intelligence and identify program opportunities that will increase program implementation efficiency and effectiveness.

In 2012, a multi-organization supported research project was completed with the American Council for an Energy-Efficient Economy (ACEEE) to review next generation energy efficiency program designs and approaches. Specific programs designed to achieve a greater number of participants and greater savings for each participant were examined and case studies of promising program designs were developed. The research was published in a technical report in early 2013 and offers insight on how NYSERDA's energy efficiency programs could be tailored to incorporate new strategies that would allow the programs to go broader and deeper.

A second multi-organization supported research project with ACEEE began in early 2013 to explore the opportunities for scaling up savings from commercial and residential retrofits. The project includes a review of comprehensive commercial retrofit efforts to date including efficiency program activity as well as State and local programs targeting the commercial sector. In addition, the project includes a review of recent data on commercial retrofits to develop estimates of the savings potential of a shift to more comprehensive retrofits. For the residential sector, the project will review existing deep retrofit programs, and analyze cost and savings data to better understand the most promising opportunities for savings in terms of technical and economic potential and consumer and builder acceptance.

To support the development of the New York Green Bank (Green Bank), NYSERDA has initiated three market research activities. The first study, completed during the second quarter of 2013, characterized the market demand for financing resiliency related energy projects in the healthcare and large multifamily housing customer sectors located within the Superstorm Sandy affected counties. The second study, also completed during the second quarter of 2013, assessed the current landscape for PV financing in New York, utilizing interviews with New York PV installers and financiers. The study summarized financing options currently available for the residential,

small/medium commercial, and large commercial segments of the marketplace. The study also characterized the current market for PV battery backup systems and associated financing options.

The third Green Bank market research study builds from previous financing market research, in order to develop a comprehensive assessment to support the launch of the Green Bank during the second half of 2013. One of the primary goals of this market research project is to assess the existing market demand for clean energy financing products in New York. Building from this assessment, NYSERDA will evaluate the benefits of different products and outline a set of near-term and long-term activities for the newly created Green Bank.

Market research on the NYSERDA Residential Point-of-Sale Lighting Program is underway to provide information on how resources could be best used to market and deploy the program in the most efficient and effective way as the lighting market transforms under market forces and external regulations. This market research effort is also examining the Products Program and exploring ways to continue to increase use of energy-efficient products. A series of focus groups was completed during the first quarter of 2013, assessing the consumer experience while shopping for lighting and providing insight into what aspects of the purchasing process are confusing or frustrating to consumers. Additionally, a consumer survey was completed in the second quarter of 2013. The survey assessed and characterized consumer knowledge of various lighting and energy efficient products, as well consumer behavior while shopping for the various products, and their feelings regarding the shopping experience.

A data center market research study is underway, and Request for Proposal (RFP) 2711 “Data Center Market Research” was issued in May 2013. The primary goal of this study is to understand the data center market in New York State and identify opportunities for maximizing energy efficient technologies and practices in that market. This study will also assess energy use and savings potential, assess major market trends driving demand for information technology computing in New York State, and assess opportunities to implement energy efficient data center technology and best practices. Unlike previous work, this study will conduct primary research in the data center market across New York State looking from the server level up to free standing dedicated data center buildings.

A new market research study was initiated during the second quarter of 2013, which focuses on an assessment of growth opportunities for New York’s Clean Energy Economy (CEE). This study will characterize the unique strengths of New York’s CEE, including regional clusters and core competencies, and consider the national and international market potential of various CEE segments to identify high growth opportunities. This study is designed to help provide information to further advance the T&MD Clean Energy Business Development Initiative goal to catalyze an entrepreneurial environment for energy innovation, and will create a detailed geo-coded inventory of entities within various segments (e.g., wind, solar PV, bio-energy, smart grid) of New York’s CEE. An advisory group is being convened to help further scope the study, and a solicitation is anticipated to be released in the second half of 2013.

As a follow-up to the National Renewable Energy Laboratory (NREL) 2011 Solar PV Balance of System (BOS) cost survey, a new national survey is being conducted to assess BOS costs. In collaboration with NREL, NYSEDA has developed a New York State-specific PV BOS cost survey to gather state specific information to help establish a New York State baseline for non-hardware PV costs. Work on this effort is currently underway and will be completed in 2013. Work is also underway on a second NYSEDA/NREL survey collaboration. This effort will survey homeowners with installed PV systems to determine economic and other decision making factors that drive PV installations, particularly for third party owned systems. Results from these survey efforts will inform program and policy design that serve to further develop the New York State PV market in support of the NY-Sun Initiative .

To support the electric vehicle program activities, a multi-state research project is under development to study awareness, knowledge, motivation, intention, and behavior of new light-duty motor vehicle buyers' with respect to electric vehicle technologies. The project would include a statewide survey of new car buying households potentially followed by in-depth interviews with a subset of survey respondents to measure consumer awareness and knowledge of, as well as motivation and intention toward electric vehicles. The results will inform program and policy design that serve to grow a New York State electric vehicle market in support of the Charge NY Plan .

Additional market research options are being explored for energy efficiency programs in the commercial and industrial sectors. Research areas under discussion and consideration include successful program precedents integrating delivery of demand response and renewable energy programs with energy efficiency programs, trends in owner versus renter occupied facilities by region and energy intensity, and the role of tax and accounting practices in decision making processes related to energy efficiency.

### **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. NYSEDA provides tools, business strategies, and business and marketing materials to manufacturers, suppliers, distributors, retailers, service providers, designers, specifiers, contractors, and builders. Progress in key areas is described in the following sections.

#### New York Products Program

The New York Products Program was formerly known as the Energy Smart<sup>SM</sup> Products Program. The Program assists businesses that supply emerging, underutilized, or high first cost/high efficiency products. The Program currently has 812 retail and 61 manufacturer partners. Since January 2012, 10 new retailer partners and 26 new manufacturer partners have signed onto the program. The new manufacturer partners include 20 lighting, three appliance, two HVAC and one consumer electronics manufacturer. Through the partner network, NYSEDA has approved approximately 145 Special Promotions for a total of \$1,403,058 in product buy-downs. These promotions are expected to save more than 7 million kWh and 24,141 MMBtu annually. The buy-down promotions provide a

lower cost to the consumer at the point-of-purchase for a range of products including, but not limited to, informational energy usage displays, advanced power strips, energy management devices, lighting, appliances, and electronics. Promotional displays for these products feature educational messaging for consumers to help them choose the right product for the application, in addition to providing information on energy and environmental benefits of the promoted products.

NYSERDA has historically funded activities in this area with SBC3 resources under the Market and Community Support Program. Benefits from this SBC3 investment continue to accrue and were reported in the 2012 SBC3 annual report finalized in June 2013 (prior historical accomplishments can be found in the SBC3 annual report through December 31, 2011).

#### Midstream Partner Support: The Business Partners Programs

The Business Partners Programs help NYSERDA's service providers in the commercial midmarket supply chain address the primary factors affecting customers' operations, business models, and energy decisions. The programs help these service providers understand energy decision making processes, barriers, attitudes, and opportunities. 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 energy efficiency options to their customers.

As a result of the July 2012 issuance of the solicitation for implementation contractors for the Lighting, HVAC and Motors Business Partners Programs, ICF Resources and DNV KEMA were selected to manage the Lighting and HVAC Programs, respectively. No proposer was chosen to implement the Motors Business Partners Program.

Across all sectors, the scopes of work are or will be structured such that the implementation contractor has a more active role as change agent for these sectors. The contractor's role will be one of identifying opportunities, recommending strategies to NYSERDA, establishing the program design, and implementing the new activities such that NYSERDA's goals for recruitment, training and energy savings are met. At the same time, the contractors' activities will provide the Partners opportunities to expand their business services and increase their profitability.

The core elements of the previous Lighting Program focused on providing educational and technical support to Lighting Business Partners (lighting contractors, distributors, manufacturer representatives, architects, engineers, and ESCOs) who incorporated lighting quality elements into their interior energy-efficient lighting projects. In their proposal, ICF identified other elements of lighting that provide opportunities to expand the program. ICF will prepare a program design to introduce quality lighting criteria for outdoor lighting projects, allowing Business Partners to expand their business to include these activities. Another strategy that Partners will be encouraged to adopt will be a "start-to-finish" business model. Elements of this strategy will include delivery of lighting audits, effective design strategies, proper installation techniques, and successful commissioning approaches.

The core elements of the HVAC Business Partners Program, prior to the issuance of the recent solicitation, focused on providing HVAC Business Partners (commercial HVAC firms, refrigeration firms, and large scale institutional, government, and commercial entities providing in-house RTU maintenance services) quality maintenance strategies and tools. In accordance with ASHRAE/ACCA Quality Maintenance Standard 180, partners learned to evaluate and upgrade commercial RTU units beyond what is typically offered as standard practice. Moving forward, KEMA has recommended innovations to program design to include economizer repair, replacement and upgrades, variable refrigerant flow systems, cooling system terminal unit inspections, diagnostics and maintenance, advanced RTU controllers and fault detection diagnostics. Additional considerations include strategic incentive structure modifications, RTU auditing and commissioning elements, and ductwork testing and redesign either in stand-alone applications or as part of a replacement RTU installation.

The core elements of the previous Motors Program focused 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 Program included these activities as part of a comprehensive approach to motor management services and plans.

From research performed while revising the solicitation for the Motors Program (solicitation to be re-issued in July 2013), staff recognized the opportunity to expand the Motors Program to one of Motor Systems that will include other motor-driven systems, applications, and best practice motor repair. Proposers will be required to identify the motor-driven systems prevalent in New York State (e.g., distribution via application, electric load, building sector, etc.). Approaches to market interventions, scopes, services, and products will be identified that, if adopted by the motors and motor systems and repair supply chain, will lead to higher quality installations and services that expand energy savings opportunities. The contractor for the Motor and Motor Systems Business Partners Program will be selected in fall 2013.

Current program scopes of work for the Lighting and HVAC Programs require the contractors to provide NYSERDA with a semiannual review and assessment of program goals, progress to date, market research results and recommended adjustments to Program offerings. These adjustments will help differentiate the NYSERDA Business Partners Programs from utility trade ally programs. NYSERDA staff is currently reviewing recommendations for program adjustments and incentive strategies. Recruitment efforts have been on-going with the Commercial Lighting Business Partners Program recruiting 64 new Partner firms since January 2012, and the HVAC Program with 70 new Partners. Project activity in both programs has been limited in 2013, resulting in less energy savings achieved than originally projected. To achieve energy savings goals, outreach and marketing activity will be increased for the remainder of 2013 and into 2014.

### Innovative Strategies

Innovative Strategies will assess and confirm innovative approaches to achieving energy savings and 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.

Conventional financing methods often do not meet the needs or business decisions of all sectors who wish to finance energy efficiency improvements. Other types of proven financing vehicles are available but are not as well known in the marketplace. And new and innovative financing approaches are being developed that may hold promise in meeting market needs but have not yet been proven. Under Innovative Strategies, NYSERDA plans to improve access to financing for the Commercial/Industrial/Institutional (C&I) sectors and effect change in the financing sector by improving awareness of alternative financing approaches through outreach, facilitating proof of concepts for innovative energy-efficiency financing strategies, and identifying and addressing gaps in sectors being served. To date, this has included development of projects to identify and assess these innovative approaches to ensure their credibility and to compare them to conventional financing structures to clarify and identify a range of factors including, for example, differences in accounting and tax treatments. Gaps and opportunities for further NYSERDA research and activities will also be identified.

Efforts are also underway to evaluate the findings of the recent pilot program that introduced an energy-aligned lease (EAL) clause to stakeholders in the commercial real estate sector in New York City during 2012. The EAL pilot, co-funded by NYSERDA, Urban Green, the New York City Mayor's Office of Long Term Planning and Sustainability, and others, sought to examine the barriers and opportunities for incorporating energy-aligned lease EAL clauses into commercial leases. Presentations were made to landlords, tenants, brokers / management companies, engineers and attorneys, during which information was collected to understand the likelihood these entities would use some form of an EAL. Follow-up with these stakeholders will be conducted to determine if they have adopted the EAL or another form of energy-aligned or green lease language, and describe other strategies they may have taken to overcome the split-incentive issue, off-balance sheet financing opportunities, and differences in tax treatments. Future Innovative Strategies activities will seek to address gaps and opportunities identified by this effort.

It is expected that such activities will serve to inform NYSERDA in terms of financing availability, needs and opportunities as well as informing Green Bank development to improve access to C&I Energy Efficiency Financing.

### **3.3.1.3 Education to Change Behavior and Influence Choices Component**

#### Economic Development Growth Extension Program

The Economic Development Growth Extension (EDGE) Program, facilitated by Regional Outreach Contractors (ROCs), perform outreach, education, and promotion of NYSERDA program opportunities to residents, businesses, institutions and local governments across the state. Formerly known as the Energy Smart Communities Program, EDGE will educate 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 Andrew M. 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 new alignment with the Regional Councils, NYSERDA can provide 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 whose team includes regionally-based economic development organizations to provide on-the-ground outreach support. Through June 30, 2013, EDGE Program ROCs have established 165 new partnerships that have led to 112 referrals from these new relationships. They have also participated in more than 100 public outreach events including the Consolidated Funding Application Workshops held across the state to support the efforts of the Regional Economic Development Council initiative.

#### Behavioral Demonstrations (formerly Behavioral Pilots)

Behavioral Demonstrations will support further penetration of new products and practices through behavior change strategies. Emerging informational platforms will be demonstrated and tactics will be explored and tested in order to demonstrate how large-scale adoption of energy-efficient behavior can be achieved with little or no financial incentives.

Based on the advisory group feedback from the meeting held July 2012, a solicitation has been drafted that stresses the following key items:

1. Eligible projects must build upon already tested, successful behavioral strategies. The goal of this program is demonstrate at a larger scale the efficacy of strategies applied at the research or pilot level.
2. Proposals must include strict implementation plans that detail the adoption of experimental groups, control groups, and baselines to statistically analyze the impact of the applied behavioral intervention.
3. Demonstrations will also be required to examine the persistence of the impact of the behavioral intervention up to one year after its withdrawal. This requirement will start to address the lack of persistence data related to behavioral strategies.

The program design has received NYSERDA management approval and NYSERDA expects an early 2014 release date for the solicitation.

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, and community-based organizations, the program undertakes several initiatives to increase awareness of low-income energy issues. In 2013, a series of six Regional Meetings across the state featuring presentations on energy affordability, consumer protections, emerging energy issues, best practices, and program updates was held. The meetings were attended by 374 individuals from 170 different organizations. In addition, the LIFE program presented six webinars to 228 attendees and distributed eight electronic newsletters to a network of more than 5,000 individuals.

Table 3-9 shows the performance milestones and actual results for Market Development Performance Program through June 30, 2013. Table 3 9 includes only those performance milestones with anticipated achievements during the first two years (2012-2013) of the five-year program; the rightmost column indicates the actual achievement to date.

**Table 3-9. Market Development Performance Milestones and Actual Results<sup>a</sup>**

		2012-2013 Anticipated	Through June 30, 2013
Outputs/ Leading Indicators			
Market Pathways	Enlist 1,240 Energy Smart Products partners participants	940 Includes approximately 840 of NYSERDA's current program partners expected to renew their participation agreements and 400 new partners signed up by the end of the program.	873 (812 retailers and 61 manufacturers)
	Enlist 510 Midstream Partner participants	430 <sup>b</sup>	716 (of which 134 are new partners)
	Train 500 Product Partner employees on sales of high efficiency equipment	200	NR
	Train 1,025 Midstream Partner business owners or their staff on advanced strategies and technologies (Midstream Partner business owners and their staff may participate in more than one training.)	375	404

Table 3-9 (continued)

		2012-2013 Anticipated	Through June 30, 2013
Market Pathways	Investigate, catalog and communicate innovative energy efficiency investment strategies through 6-9 fact sheets and 10 seminars	3-4 fact sheets; 4 seminars & webinars	NR (On-Bill Recovery launched in 2012. Future T&MD activities will be reported.)
	Facilitate 30-45 customers accessing innovative energy efficiency investment strategies	20-25 projects	
	Energy-aligned leasing (EAL) arrangements (10-15) and other approaches to split incentive issue	4-6 EAL evaluations; 4 seminars & webinars	1 EAL pilot
	Provide supply chain with tools, strategies, marketing materials, and information to incorporate into their businesses operations (9-12 factsheets; 9-12 seminars)	4-5 fact sheets; 4-5 seminars & webinars	Lighting: 10 webinars and 5 expos; HVAC: 2 fact sheets and 39 training seminars
Education/Behavior Change	Sponsor and support 5 annual LIFE conferences	2	1
	Support 600 community partnerships	250	165
	Sponsor up to 8-12 behavioral pilots	5-8	NR (A solicitation to select behavioral demonstrations will be released in early 2014)
<b>Outcomes/Impacts</b>			
Market Research	Conduct 4-6 research studies	2-3	3 studies completed, 8 additional studies underway
Market Pathways	125 GWh saved through supporting emerging technologies and higher efficiency products with Energy Smart Partners (some savings may overlap with end user incentive programs)	50 GWh	69 GWh
	895,000 MMBtu saved through supporting emerging technologies and higher efficiency products with Energy Smart Partners	254,000 MMBtu	281,589 MMBtu

**Table 3-9 (continued)**

		2012-2013 Anticipated	Through June 30, 2013
Market Pathways	Increase market share of 3-6 technologies and higher efficiency products	1-3	NR (Program data and evaluation studies will be used to retrospectively examine change in market share.)
	37 GWh saved through Midstream Partner projects	15 GWh	914 MWh
	Complete 20–35 customer projects that accessed innovative energy efficiency investment strategies	5-8 projects	NR (Evaluation research underway to assess attitudes towards financing. Future T&MD outcomes will be reported.)

Note: NR = Not Reported. See explanation at the beginning of Section 3.

<sup>a</sup> Energy savings reported in this table 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.

<sup>b</sup> Includes approximately 400 current program partners expected to renew their participation agreements and 110 new partners signed up by the end of the program.

### 3.3.2 Clean Energy Business Development

#### 3.3.2.1 Innovation/Entrepreneurial Capacity Building

##### Proof of Concept Centers

The mission of a Proof-of-Concept Center (POCC) is to accelerate the translation of research into marketable products. 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.

The objectives of the NYSERDA 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; and,
- Establish sustainable regional innovation ecosystems of potential investors and entrepreneurs in clean energy technologies and solidify the POCC linkages to them.

During January 2012, stakeholder meetings on the POCC Initiative were held with representatives from 28 academic or technology-based economic development organizations. Feedback was specifically requested in three areas: level and duration of funding necessary to establish a sustainable program; appropriate performance metrics to measure and determine success at the different stages of development, implementation and operation; and, the

benefit of regional or team collaboration to provide access to a wider pool of research and the possible impact of this approach on program sustainability.

PON 2537 was issued in May 2012 with a mandatory Letter of Intent to propose form required to be submitted by June 6, 2012 and a proposal due date of July 18, 2012. An informational webinar was held on May 23, 2012. The Technical Evaluation Panel met on September 11, 2012 to review the submitted proposals. Following the Technical Evaluation Panel's (TEP's) recommendation, NYSERDA awarded a total of \$15 million to Columbia University, the Polytechnic Institute of New York University and High Tech Rochester to create three POCCs dedicated to helping inventors and scientists turn their high-tech, clean energy ideas into successful businesses. NYSERDA will invest \$5 million in seed money at each center over a five-year period, with cost sharing required. The centers are expected to operate on their own after NYSERDA funding ends.

The three POCCs will be created by:

- Columbia University (New York City), partnering with Brookhaven National Laboratory, Stony Brook University and Cornell University's NYC Tech, a new campus located in New York City.
- High Tech Rochester Inc., (HTR) a non-profit venture development organization based in the Rochester area, which will open the NYSERDA POCC to serve western and central New York. HTR will work with a number of academic partners including: University of Rochester, Rochester Institute of Technology, SUNY Research Foundation, Alfred University, Cornell University, Clarkson University and the University at Buffalo, as well as multiple industry and investor partners.
- Polytechnic Institute of New York University (NYU-Poly), which will partner with the City University of New York (CUNY) to create the New York City Clean Economy Center for Proof-of-Concept.

#### Emerging Clean Energy Business Development

The Clean Energy Business Incubator program was initiated in 2009 with funding from SBC3. The purpose of these incubators is to foster the viability and growth of young early stage clean energy companies, most of which are still in the process of developing new products and have yet to earn revenue from commercial operation. To date, the program has been funded with SBC3 resources alone and benefits were reported in full in the 2012 SBC3 Annual Report finalized in June 2013. (Prior historical accomplishments can be found in the SBC3 annual report through December 31, 2011). The program is currently transitioning to T&MD funding, and once that process is complete, benefits will be reported only in the T&MD semiannual reports.

#### Clean Energy Cluster Development

This program will work to convene multi-disciplinary market participants to promote new networks of interrelated clean energy firms, or clusters that can accelerate the development of new products and services and create new business models. These clusters can drive productivity and innovation and serve as an important driver of regional competitiveness.

The first initiative under this program is the development of an Energy Infotech cluster in New York City. The objectives of this cluster development include the formation of more startup companies in energy infotech; attraction of venture capital to New York City-based companies in this sector; and development of a community to facilitate recruiting, marketing, and strategic partnering. Energy Infotech NYC (EITNYC) is a newly formed organization to promote this cluster. EITNYC will perform strategic planning, outreach to the energy infotech community, and event sponsorship. EITNYC sponsored a successful Cleanweb Hackathon in January 2012 and was the lead organizer of a follow-up event in September 2012. Although current cluster activities have been funded with SBC3 funds, work in this area will be used to inform future T&MD programs.

### **3.3.2.2 Market Intelligence**

#### New York State Clean Energy Innovation Metrics

Under RFP 2266, NYSERDA has selected a contractor to define and promote New York State's environment conducive to innovation, entrepreneurship and technology-led growth. Specifically targeted to the clean energy space, information and metrics will be gathered for business owners, entrepreneurs and investors who are deciding where and how to invest. The current lack of such information is a barrier to business start up, expansion and attraction. These clean energy indicators that can be used for policy purposes—to gauge progress and weaknesses in the development of the State's clean economy, and to identify policy gaps that need to be addressed. Although this effort has been funded with SBC3 funds, work in this area will be used to inform future T&MD programs.

### **3.3.2.3 Direct Support for Business Acceleration**

The NYSERDA Entrepreneurs-in-Residence (EIR) program provides business mentoring to companies receiving NYSERDA R&D funding, NYSERDA incubator clients, and other select companies supported by NYSERDA. The mentors are selected for their senior executive or entrepreneurial experience and provide strategy level guidance. A pilot program was funded under SBC3.

PON 2419, NYSERDA Entrepreneurs-in-Residence, was issued in May 2012 with a proposal due date of June 20, 2012. High Tech Rochester Inc., the original contractor for the program, submitted the proposal that was selected for contract award.

In the fourth quarter of 2011, NYSERDA issued a PON seeking proposals to develop a multi-year clean energy education program to educate experienced entrepreneurs interested in seeking opportunities in the clean technology (clean tech) and renewable energy industries. Increasing the knowledge and awareness of clean energy business operations for experienced and successful executives in New York State will likely increase the number of successful clean technology businesses and create the opportunity for increased hiring in the clean tech sector within the State. No contracts resulted from the proposals received under the solicitation. Stakeholder meetings were held in early 2013. The solicitation was re-issued soon after and awards are expected during the third quarter of 2013.

In an effort to assist clean tech companies and their management in the development of the business capabilities necessary to commercialize and launch their innovations, a PON will be released in the third quarter of 2013 for the development of a Cleantech Commercialization Toolkit. This toolkit will be publicly available and will guide businesses through the process for commercializing clean tech innovations. As such, the toolkit will include templates, references, and instructions for each stage of commercialization. The contractor selected to perform this development will also provide an up-to-date list of business mentorship and assistance resources available, and will provide guidance and feedback to the companies that choose to use the toolkit.

Table 3-10 shows the performance milestones and actual results for Clean Energy Business Development Program through June 30, 2013. Table 3-10 includes only those performance milestones with anticipated achievements during the first two years (2012-2013) of the five-year program; the rightmost column indicates the actual achievement to date.

**Table 3-10. Clean Energy Business Development Performance Milestones and Actual Results**

		2012-2013 Anticipated	Through June 30, 2013
<b>Outputs/ Leading Indicators</b>			
<b>Innovation/ Entrepreneurial Capacity</b>	Support 405 clients in incubators or POCCs <sup>a</sup>	65	NR (Contracting for 3 POCCs underway. Contracting for 3 new incubator agreements, continuing on SBC3 work, underway.)
<b>Market Intelligence</b>	Create 5 annual "benchmark reports" on clean energy business and financial indicators for New York State	2	NR (Indicators being developed using SBC3 funds. Draft report under review.)
	Support dissemination of clean energy benchmark information through 500 website downloads	100	

Table 3-10 (continued)

		2012-2013 Anticipated	Through June 30, 2013
<b>Direct Support for Business Acceleration</b>	Provide support for 150 companies with new and improved products serving New York State markets	59	NR (Contractor to deliver EIR services has been selected.)
<b>Outcomes/Impacts</b>			
<b>Innovation/ Entrepreneurial Capacity</b>	Help clean energy businesses attract \$150 million in leveraged funds (co-funding and outside investment)	\$40M	NR (Previous SBC funded projects have generated approximately \$100M in leveraging)
	Graduate 162 businesses from incubators	36	NR (Previous SBC funded projects have graduated 31 businesses from incubators)
	40 advanced technologies reaching commercial availability	5	NR (Previous SBC funded projects have generated 71 new products offered by incubator clients for commercial sale)
	\$20 million in commercial sales of new and improved supported technologies <sup>1</sup>	\$2.5M	NR (Metric will be reported in the 2013 year-end report for projects that commenced in SBC3 and received phase two T&MD support, as available. Commercialization metrics for projects that only received SBC3 funding will be reported in the SBC3 annual report.)
	486 Incremental FTEs associated with incubator graduates	108	NR

Note: NR = Not Reported. See explanation at the beginning of Section 3.

<sup>a</sup> Because POCCs are a new NYSERDA initiative, estimating program outcomes requires the use of surrogates. One leading example is the Deshpande Center at MIT. Since beginning operation in September 2002, through the end of 2010, the Center reviewed over 500 proposals and funded 80 projects with \$11 million in grants. This investment has resulted in the creation of 23 companies that raised over \$300 million in funding and have over 400 employees. The Center funds approximately 18 projects per year. Translating these outcomes to New York's new POCCs must take into account the limited technology/market focus of the New York program and the time required to establish a program and build momentum.

<sup>1</sup> This estimate is only for sales dollars. The program will support a variety of technologies making it difficult to forecast the value of sales. In addition, some of the products developed through incubators may participate in other NYSERDA product development efforts.

Table 3-11 highlights business development progress from the pipeline of NYSERDA’s pre-T&MD SBC investments. Over time, each of the companies listed has achieved substantial private/outside funding support to leverage the NYSERDA investment made. These highlights illustrate the time frame often required to achieve business development impacts of the type expected from the T&MD portfolio.

**Table 3-11. SBC Funded Business Development – Pre-T&MD Achievements**

<b>Company</b>	<b>Product</b>	<b>Private/Outside Investment</b>	<b>NYSERDA SBC Funding</b>
American Aerogel – Rochester, NY (Founded in 1995)	Aerogel-based materials for insulation used in shipping containers and energy systems.	In 2011, the company received \$2.5 million in venture capital financing.	\$400,000
Applied Nanoworks/Auterra – Malta, NY (Founded in 2003)	Technology removes oil contaminants and can reduce refining cost/energy by 30-50%.	Reported up to \$10 million in venture funding received.	\$503,000
Crystal IS – Green Island, NY (Founded in 1997)	Substrates for UV LEDs used in energy efficient water and air purification products.	Received several million dollar private investments and was acquired in 2012; still based in Green Island.	\$399,000
Ener-g-Rotors – Rotterdam, NY (Founded in 2004)	Device to recapture industrial waste heat and convert it into electricity.	Several private investments including \$1.5 million from Bright Capital in 2012.	\$1.5 million in NYSERDA SBC funding plus Entrepreneur-in-Residence services.
Ephesus Technologies – Syracuse, NY (Founded in 2011)	First LED light both designed and manufactured in New York State.	Awarded a \$50,000 technology development grant from Syracuse Center of Excellence and \$1 million in NYS tax incentives.	\$100,000 in NYSERDA SBC funding, plus business incubation services.
Honest Buildings – New York, NY	Online network of buildings and building professionals to promote energy efficiency measures.	\$750,000 in seed and venture capital investment.	Business incubation and Entrepreneur-in-Residence services.
Ioxus – Oneonta, NY (Founded in 2007)	Advanced Ultracapacitors used in wind turbines and hybrid vehicles.	Raised \$21 million with its second round of investment.	\$450,000 for product development and \$1.5 million for manufacturing scale-up paid as product is produced.

**Table 3-11 (continued)**

<b>Company</b>	<b>Product</b>	<b>Private/Outside Investment</b>	<b>NYSERDA SBC Funding</b>
OptiCool Technologies – Rochester, NY	Energy-efficient refrigerant based data center cooling system.	More than \$4 million in private investment.	Business incubation services.
Paper Battery Company (Founded in 2009)	Flexible, thin batteries with potential applications including computer servers and electronics.	Raised over \$1 million in angel investments.	\$1.5 million in NYSERDA SBC funding, plus business incubation services.
ThinkEco – New York, NY	Plug-load management devices and cloud-based systems for low cost energy management and demand response.	More than \$11 million in private investment.	\$350,000 in NYSERDA SBC funding, plus business incubation services.
United Environment and Energy – Horseheads, NY (Founded in 2003)	Environmentally friendly, energy efficient, renewable/recycled materials used in roof coatings, energy-efficient windows, bioasphalt, and renewable energy.	\$1 million Federal Small Business Innovation Research (SBIR) grants to continue technology development.	\$568,000

### **3.3.3 The Workforce Development Initiative**

New York’s ambitious energy and environmental goals will be met only with an adequate supply of trained workers with applied skills in energy efficiency, renewable energy, and advanced technologies. The Workforce Development (WFD) Initiative activities focus directly on practitioners who are a critical link to ensuring quality installations, services and maintenance for these technologies. The Program is designed to address the on-going need for workers with skills that will result in quality installs and thus energy efficiency and energy production. The Public Service Commission Order in Case 10-M-0457, Order Continuing the System Benefit Charge and Approving an Operating Plan for a Technology and Market Development (T&MD) Portfolio of System Benefits Charge Programs (the Order), authorized NYSERDA to use \$24 million of EEPS program funds that were uncommitted as of December 31, 2011, to fund a WFD energy efficiency initiative within the T&MD portfolio.

The Order also authorized the use of \$15 million in T&MD funds to support renewable energy and advanced technologies. The average annual budget is \$7.8 million. Activities for the renewable energy and advanced technologies components began in 2012 while activities related to the energy efficiency component began in 2013 and ramped up quickly with the issuance of multiple solicitations.

NYSERDA is in the process of designing programs and solicitations to expand the training network in targeted areas and integrate new technology education into existing programs. NYSERDA also designed a high school technical training initiative.

Through June 30, 2013, NYSERDA has issued a total of six solicitations for WFD under T&MD including the following:

- PON 2033 Clean Energy On-the-Job Training: Originally issued under Green Jobs Green New York in June 2011, this solicitation added \$750,000 in T&MD funds to expand program eligibility beyond energy efficiency and solar thermal technologies to include all renewable and advanced technologies. Under the program, eligible businesses can apply to receive 50% wage reimbursement for new hires as well as 100% reimbursement for necessary classroom training for new workers and incumbent workers being advanced.
- PON 2397 Certification and Company Accreditation: This \$400,000 open enrollment solicitation offers financial incentives for energy efficiency training organizations in NYS to help offset the costs associated with obtaining Interstate Renewable Energy Council (IREC) Institute for Sustainable Power Quality (ISPQ) accreditation for energy efficiency training programs. The PON also includes financial support for Renewable Energy training program accreditation, photovoltaic (PV) and solar thermal installer certification, PV company accreditation, energy efficiency certifications and energy efficiency company accreditation.
- PON 2664 Clean Energy Training for High School Students: This PON, closed on June 10, 2013, provided \$1.5 million for the development and implementation of educational training programs in energy efficiency, renewable energy, and advanced technology for high school students. Proposers were asked to develop and implement programs that prepare students for careers and/or post-secondary education, with a focus on Science, Technology, Engineering, and Mathematics (STEM) skills.
- PON 2673 Renewable Energy and Advanced Technology Training: Closed on May 28, 2013, this \$2.5 million competitive solicitation sought proposals for training to support installation and operation of renewable energy (RE) systems and advanced or emerging energy technologies (AT) in the State. The solicitation sought programs designed to train workers to better design, install, inspect, operate, maintain, and monitor systems, technologies, and measures on the customer side of the meter. Funding was available in two other categories (new certifications and credentials) and for training solar thermal inspectors.
- RFP 2690 Implementation Support for Workforce Development and Training: This competitive solicitation which was closed on June 18, 2013 offered \$1.2 million for implementation and support services for WFD Program. The Implementation Contractor, in coordination with NYSERDA, will be responsible for various implementation activities to help clean energy training and standards to gain wide-scale market acceptance. These activities include, but are not limited to:
  - Coordination and effective communication across a statewide network of training providers.
  - Assisting with reviewing and processing NYSERDA training incentives and open enrollment program applications.
  - Collecting, analyzing and reporting a wide range of WFD program metrics.
  - Assisting with coordinating NYSERDA WFD initiatives.
  - Conducting informational sessions and webinars for training providers.
  - Identifying case studies and testimonials.
  - Evaluating and updating training partner information that will be available on the NYSERDA website.

- PON 2697 NY-Sun PV Balance of System Training and Education Program: This competitive solicitation, which closed June 6, 2013, offered \$3.5 million to proposers to support education and training on PV for local officials. Targeted audiences include code enforcement officers; building and electrical third party inspectors; fire inspectors; commissioners of public safety; building department plan examiners; village engineers and other public officials who might have a role in the permitting; inspection or approval process for a PV system or who might encounter a PV system in their work environment (e.g., firefighters and other first responders). This solicitation is part of a comprehensive strategy to streamline the permitting and approval process and ultimately reduce the costs of purchasing and installing PV systems.

**Table 3-12. Workforce Development Performance Milestones and Anticipated Results**

Performance Milestones and Anticipated Results			
		2012-2013 Anticipated	Through June 30, 2013
Outputs/Leading Indicators			
Renewable Energy & Advanced Technology	Technical training on RE/AT for 2,000 incumbent workers and high school students preparing for technical careers	500	1,462
	Support 480 disadvantaged, unemployed or underemployed individuals seeking entry-level employment	90	NR (RE/AT Disadvantaged workers will be served through training partnerships under PON 2774 to be issued in late July. Proposals are due September 23, 2013 and training is slated to begin in early 2014. We expect to meet or exceed all training goals.)

Table 3-12 (continued)

Performance Milestones and Anticipated Results			
		2012-2013 Anticipated	Through June 30, 2013
Renewable Energy & Advanced Technology	OJT and Hands-on RE/AT Training for 680 individuals	150	22
	Develop advanced courses to be integrated components of college certificate and degree programs & trades trainings	2	NR (These programs and partnerships are to be solicited under PON 2673 issued in July 2013.)
	Additional Community Colleges and training organizations added to training network	2	NR (These partnerships are to be solicited under PON 2774 issued in July and closing on September 23.)
Energy Efficiency	Technical training on EE for 13,793 incumbent workers and high school students preparing for technical careers	3,448	Activities for EE component began in 2013. It is expected that contracts under closed solicitations will be negotiated throughout the fall and that training metrics will rapidly ramp up throughout 2013-2014.
	Support 3,200 disadvantaged, unemployed, or underemployed individuals seeking entry-level employment	800	
	OJT and Hands-on EE Training for 1,867 individuals	467	
	Community Colleges and other training organizations added to training network <sup>a</sup>	2	

<sup>a</sup> Community Colleges may offer RE, AT and EE courses.

### **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 citizens, 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.

As planned, the EMEP program has initiated the updating of the multi-year environmental research plan with input from policymakers, scientists and stakeholders. Four meetings have been conducted to date: Ecosystem Response to the Deposition of Sulfur, Nitrogen and Mercury; Greenhouse Gas Reduction Strategies; Environmental Issues Related to Kinetic Hydropower, and Air Quality and Health. Meetings targeting Wind Energy Impacts, Climate Change Adaptation, and possibly High-Volume Hydraulic Fracturing for Natural Gas Extraction are yet to be conducted. A comprehensive assessment of ecosystem monitoring activities in New York State, funded with SBC3 funds, continues to guide a more efficient and coordinated approach to environmental monitoring activities in the state, some of which are now being supported through EMEP. In addition, seven new research projects with a focus on acid deposition and mercury monitoring have been contracted and 10 workshops and briefings have been conducted. Two new solicitations were issued that focused on comprehensive monitoring of atmospheric deposition, and ecosystem recovery and economic evaluation. Eight new projects from these efforts are currently being contracted.

As noted earlier, NYSERDA has historically funded EMEP projects with SBC3 resources and benefits were reported in the 2012 SBC3 annual report finalized in June 2013. Prior historical accomplishments can be found in the SBC3 annual report through December 31, 2011.

Table 3-13 shows the performance milestones and actual results of Environmental Monitoring and Protection Program through June 30, 2013. Table 3-13 includes only those performance milestones with anticipated achievements during the first two years (2012-2013) of the five-year program; the rightmost column indicates the actual achievement to date.

**Table 3-13. Environmental Monitoring Evaluation and Protection Performance Milestones and Actual Results**

		2012-2013 Anticipated	Through June 30, 2013
<b>Outputs/ Leading Indicators</b>			
Environmental Monitoring Evaluation and Protection	Update multi-year EMEP research plan with input from policymakers, scientists, and stakeholders		EMEP has initiated an update of the multi-year environmental research plan with input from policymakers, scientists and stakeholders. Four meetings have been conducted to date. Additional meetings covering other topics are being planned.
	Sign 60 contracts for research studies, including several large flagship projects	23	19
	Hold 5 Program Advisory Group meetings	2	2
	Hold 5 Science Advisory Committee meetings	2	2
	Sponsor 14 workshops, conferences or seminars	5	2
	Complete 65 research studies	5	NR
	Convene 30 briefings on research projects with policymakers or other stakeholders	12	12
<b>Outcomes/Impacts</b>			
	\$11 M in leveraged funds (co-funding and outside investment) to support projects and sponsored research	\$3.5M	\$2.1M
	Publish 119 peer-reviewed scientific journal articles based on program-supported research	10	5

Note: NR = Not Reported. See explanation at the beginning of Section 3.

## 4 T&MD Program Evaluation Activities

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NYSERDA evaluation staff has engaged its long-standing process evaluation contractor, Research Into Action, to conduct the early logic model and evaluability assessment work. These activities began in June 2012 and will be undertaken according to the time line outlined in the T&MD Evaluation Plan.

As identified in the Plan, these early evaluation tasks have included development of program theory and logic models, and assessment of each major program to ensure readiness for future evaluation. By identifying and documenting inputs, activities, outputs, outcomes and external influences relevant to the program, theory and logic models are a good practice that will help to guide program implementation and program evaluation. Evaluability assessments will help ensure early on that the necessary program tracking or other data is being collected and recorded in a manner that will support examination, through a robust evaluation, of the ultimate outcomes and indicators identified for each program.

Through June 30, 2013, program theory and logic modeling activities have been completed for the Advanced Codes and Standards and Clean Energy Business Development programs and are underway for Market Development, Advanced Buildings, Smart Grid, and CHP programs. Evaluability assessments will be developed for these programs upon completion of the theory and logic models.

During the early part of 2013, NYSERDA undertook a competitive solicitation process to hire a contractor to conduct process, market and impact evaluation on the T&MD portfolio. Attention was placed on hiring a contractor, or team of contractors, with expertise in evaluating technology and market development program impacts. Contract negotiations with the selected contractor are underway and it is expected that the new contractor will be under contract by the end of the third quarter of 2013. Further development of a detailed multi-program evaluation plan will begin at that time. As previously noted, given the near-term need for this information, early logic modeling and evaluability assessment activities are being conducted by NYSERDA's existing process/market evaluation contractor and this new contractor will conduct subsequent logic modeling and evaluability assessment activities as well as future process, market and impact evaluations. This work will be closely coordinated such that data is collected from market actors in the most efficient and least burdensome manner and findings from formative evaluations are incorporated into subsequent studies.

As previously noted, and in addition to the logic modeling and evaluability assessments already underway, other key evaluation activities that will be conducted as part of the T&MD evaluation include process, market and impact evaluation. The 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 program's stated outcomes and impacts. Process evaluations typically include an assessment of

customer and stakeholder satisfaction with programs. The goal of process evaluation is to inform real time adjustments and maximize program efficiency and effectiveness through actionable recommendations. These studies will mainly be 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 internal processes may also be conducted.

Process evaluation work will likely begin in early 2014. The first process evaluations expected to be undertaken include:

- Advanced Clean Power Technology Innovation component.
- Advanced Buildings Technology Development component.
- Market Development Education to Change Behavior and Influence Choices component.
- Clean Energy Business Development Direct Support for Business Acceleration.

The new contractor will also assist NYSERDA in evaluating the T&MD portfolio's near-and long-term impacts through full-scale impact and market evaluations. Early impact and market evaluation activities will include collecting baseline information to identify the program effects on the number and knowledge base of market participants and 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, case studies, on-site measurement and verification of energy savings for certain technologies, technology commercialization tracking, technology transfer, bibliometric tracking and citation analysis.

In addition to the impact, market and process evaluation activities described above, NYSERDA has contracted with ICF Consulting (ICF) to conduct economic and environmental analyses on its program portfolios, including the T&MD portfolio. In particular, ICF will help assess the cost-effectiveness of NYSERDA's investment in its T&MD programs. A Task Work Order has been initiated under which ICF will conduct a literature review of current best practices for assessing the cost-effectiveness of programs similar to T&MD and offer specific recommendations for NYSERDA to undertake to apply these practices in examining the cost-effectiveness of the T&MD portfolio in the future.

# Appendix A

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## NYSERDA T&MD Program Advisory Committee Members

**Richard Adams**

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

**Anthony Collins**

President  
Clarkson University

**Mark Duvall**

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Electric Transportation and Energy Storage  
Electric Power Research Institute (EPRI)

**Kate Fish**

Executive Director  
Adirondack North Country Association

**Colleen Gerwitz**

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Office of Energy Efficiency and the Environment  
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**Maria Gotsch**

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**Jeff Harris**

Senior Vice President for Programs  
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**Dave Hewitt**

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**Franz Litz**

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The New York Academy of Sciences

**Robert Simpson**

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Andrew M. Cuomo, Governor

## NYSEERDA Technology & Market Development Program

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**New York State Energy Research and Development Authority**  
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