



NYSERDA

**NYSERDA Technology and
Market Development Program
Semiannual Report through June 30, 2017**

Final Report

NYSERDA's Promise to New Yorkers:

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

Mission Statement:

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

Vision Statement:

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

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Final Report

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Albany, NY

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1 Introduction

The mission of the Technology and Market Development (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 the following:

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

A Public Service Commission Order, issued on October 24, 2011, approved NYSERDA's T&MD Operating Plan, and the program commenced operation in 2012.¹ A January 2016 Public Service Commission Order approved NYSERDA's Clean Energy Fund, which subsumed the final year of T&MD, leading NYSERDA's commitment of funds to T&MD to cease in February 2016.² This report summarizes the financial status and progress of T&MD implementation after this close date.

¹ Public Service Commission. Case 10-M-0457 – *In the Matter of the System Benefits Charge IV*. Issued and effective October 24, 2011.

² Case 14-M-0094 – Proceeding on Motion of the Commission to Consider a Clean Energy Fund, Ordering Authorizing the Clean Energy Fund Framework. Issued and effective January 21, 2016.

2 Portfolio-Level Reporting

2.1 Budget and Spending Status

Table 2-1 shows the T&MD Program budget and financial status through June 30, 2017. Committed and spent funds are also shown as a percent of the total 2012–2016 budget.

Table 2-1. Budget and Financial Status for T&MD Programs through June 30, 2017

| | 2012-2016 Budget ^a | Spent Funds | Percent of 2012-2016 Budget Spent | Committed Funds ^b | Percent of Budget 2012-2016 Committed |
|--|----------------------------------|----------------------|---|---------------------------------|---|
| Power Supply and Delivery | | | | | |
| Smart Grid/Electric Vehicle | \$31,807,955 | \$20,123,858 | 63% | \$31,695,234 | 100% |
| Advanced Clean Power | \$31,080,664 | \$21,482,457 | 69% | \$31,002,552 | 100% |
| Combined Heat and Power | \$40,467,239 | \$10,252,057 | 25% | \$40,476,266 | 100% |
| Total Power Supply & Delivery | \$103,355,859 | \$51,858,372 | 50% | \$103,174,052 | 100% |
| Building Systems | | | | | |
| Advanced Buildings ^c | \$41,414,776 | \$18,848,568 | 46% | \$38,849,843 | 94% |
| Advanced Energy Codes & Standards | \$9,235,965 | \$6,008,799 | 65% | \$9,214,205 | 100% |
| Total Building Systems | \$50,650,741 | \$24,857,367 | 49% | \$48,064,048 | 95% |
| Clean Energy Infrastructure | | | | | |
| Market Development | \$42,681,367 | \$38,708,020 | 91% | \$42,596,234 | 100% |
| Clean Energy Business Development | \$25,175,663 | \$20,619,933 | 82% | \$25,271,663 | 100% |
| Environmental Monitoring, Evaluation and Protection (EMEP) | \$16,419,997 | \$9,377,295 | 57% | \$16,417,744 | 100% |
| Workforce Development ^c | \$15,460,747 | \$12,987,679 | 84% | \$14,812,047 | 96% |
| Total Clean Energy Infrastructure | \$99,737,773 | \$81,692,926 | 82% | \$99,097,687 | 99% |
| Total of All Program Areas | \$253,744,373 | \$158,408,665 | 62% | \$250,335,788 | 99% |
| Administration (8%) | \$39,765,533 | \$38,735,165 | 97% | \$38,792,623 | 98% |
| NYS Cost Recovery Fee (1.7%) | \$7,175,497 | \$4,115,624 | 57% | \$4,115,624 | 57% |
| Evaluation (5%) | \$22,363,455 | \$6,527,221 | 29% | \$10,630,052 | 48% |
| Grand Total - Portfolio | \$323,048,858 | \$207,786,676 | 64% | \$303,874,087 | 94% |

* Totals may not sum exactly due to rounding.

^a Pursuant to the January 21, 2016 Clean Energy Fund Order, the budget figures presented herein reflect removal of uncommitted funds in the amount of \$200.4 million as of December 31, 2016.

^b 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.

^c Committed program funds may decrease from period to period and equate to less than 100% of the 2012-2016 budget, as a result of contract cancellations, or due to the actual award amount(s) resulting from a due date solicitation that is less than the planned award.

2.2 Program Implementation Status

The following program activities and accomplishments have occurred during this reporting period. Given that the T&MD funding has ended and many performance metrics are tracked on a calendar year basis, the summary of activity and accomplishments included here represents highlights in areas where the more significant spending has occurred. Other programs not highlighted in the report also made progress toward their targets. NYSERDA's December 2017 semiannual report will include a more complete accounting of progress across all programs.

2.2.1 Advanced Building Technologies

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

- A total of 72 contracts were awarded and approximately 25 projects remain active. Completed projects have provided informative research on energy savings in buildings and resulted in several commercialized projects including:
 - solid state disinfection lighting for environmental decontamination
 - supersonic nozzle for pumping efficiency in steam-heated hydronic systems
 - extended plate and beam wall system for residential construction
 - high-performance organic light-emitting diode panel and luminaires
- Technology advancements have been made in the following areas:
 - natural gas and electric-fired heat pump technology
 - low-swirl burners for on-demand water heaters
 - large-scale condensing boilers
 - flame-assisted fuel cell integrated into a residential sized boiler (resulted in the establishment of the NYS company–FirePower)

Additional commercialized products are expected as the balance of remaining projects are completed.

2.2.2 Advanced Energy Codes and Standards

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

- Classroom training included delivery of 110 training sessions to a total of 4,358 attendees.
- For municipal services, the volume of plan review and support services delivered during this period was high, with an influx of projects brought in through NYSERDA's Clean Energy Community program. A total of 733 plan reviews and 455 site inspection events were performed during this period.
- The Code & Commentary to the Energy Conservation Construction Code of New York State – 2016, developed with and published by the International Code Council, was published during this period and distributed to local building departments.

- NYStretch-Energy underwent public comment during this period. Public comments were vetted and addressed in the language of the draft where appropriate. NYSERDA expects to publish NYStretch-Energy in the fourth quarter of 2017.
- Progress was made in developing a website to support NYSERDA's energy code market intervention strategies. The site is expected to launch in the fourth quarter of 2017.

2.2.3 Clean Energy Business Development

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

- During the first two quarters of 2017, the Entrepreneurs-In-Residence (EIR) program served 30 clean energy companies. Services ranged from coaching in general business planning to commercialization and sales strategy. For companies seeking investments, EIRs provided assistance with valuation, developing investor pitches, and identifying funding opportunities and appropriate investors. Marketing and sales strategies helped at least three companies attain their first customer and achieve revenue-positive status for the first time.
- To further enhance the effectiveness of the EIR program, NYSERDA conducted an EIR recertification project. EIRs were surveyed and interviewed and were recertified only if they achieved new, higher qualification standards. As the program launches new initiatives, certified EIRs are expected to play an increasing role in helping clean energy companies develop the business skills required to commercialize products and scale their businesses.
- New York University's ACRE incubator graduate EV-Box, a New York-based clean energy company that provides charging points for electric vehicles, was acquired by Engie, a leading global electric utility company and energy solutions provider, and continues to operate in the U.S. and Europe.
- Rochester Institute of Technology's Venture Creations incubator graduate ClearCove Systems, a Victor-based renewable energy company, raised an additional \$700,000 from investors to commercialize its water treatment process that harvests organic matter from wastewater, providing energy and cost reductions in wastewater treatment processes.

2.2.4 Combined Heat and Power (CHP)

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

- In the first half of 2017, eight projects with T&MD funding have been installed for a total T&MD peak kilowatt (kW) reduction of 232 kW (each of these projects received split-funding; the total nameplate capacity of this batch of projects is 2320 kW, of which 232 kW is credited to T&MD, and 2088 kW is credited to Indian Point Energy Center).
- Various projects have financial partnerships with the NY Green Bank, the Dormitory Authority of the State of New York, as well as the New York City Energy Efficiency Corporation. Such arrangements have bridged financing gaps for applicants who seek an opportunity in replacing existing infrastructure with cleaner, more efficient CHP systems, thus generating substantial energy and greenhouse gas savings throughout the 20+ year lifetime of their equipment.
- Seven projects, representing over 30 megawatts (MW) of installed nameplate capacity, are under construction. As they prepare for their respective measurement and verification periods, the aggregated peak-load reduction commitments exceed 20 MW.

2.2.5 Environmental Monitoring, Evaluation, and Protection (EMEP)

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

- The Environmental Research Program continues to be heavily involved in the development of the New York State Offshore Wind Master Plan. In addition to the ongoing digital aerial survey for Marine Wildlife, the program is leading 13 desktop studies ranging in subject area including sand and gravel, aviation, archeology and recreational uses, birds, mammals, turtles, fisheries, and the cumulative effects and environmental sensitivity.
- Outreach activities included sponsoring the New York City Metro Area Energy and Air Quality Data Gaps Workshop; co-sponsoring a day-long green-infrastructure symposium with CUNY and others; the DOH staff presentation of information on a live-streamed talk show: *Public Health Live: Preparing for Extreme Heat in NYS* that included work from a NYSERDA-funded project, studying population vulnerability to climate change in New York State; and working with The Nature Conservancy to assist three Hudson Valley communities with vulnerability planning as they prepare for climate change.

2.2.6 Smart Grid and EV Infrastructure

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

- Program Opportunity Notice (PON) 3397 High Performing Grid, round one, awarded eleven projects on April 11, 2017 with a total value of approximately \$7.5 million. This included three research studies investigating the distribution of state estimation challenges, transmission control equipment performance, monitoring and distributing energy resources operation and planning tools; three engineering studies analyzing super-capacitor energy storage, advanced transmission stability controls, and distributed energy resource interconnection integration; one product development award for a transformer monitoring software tool; and four demonstration projects that included optical sensors, wayside energy storage, end-use technologies and an advanced distribution operation software system.
- As of June 30, 2017, T&MD funds were used to track the installation of more than 730 electric, vehicle-charging stations installed through NYSERDA programs.
- NYSERDA's contractor, Energetics Inc., compiled updated reports on the use of NYSERDA-supported electric vehicle (EV) charging stations installed through the EV Charging Station Demonstration Program. The reports show quarterly use of the stations broken down by geographic region, type of location, and business model.

- NYSERDA has led a team of three contractors (E3, ICF, and MJ Bradley) who are conducting a benefit-cost analysis of EVs and their impacts on the electric grid, utilities, and ratepayers. The team is working with utilities and the Department of Public Service on this project and results are expected by the end of 2017.
- Energetics, Inc. is currently performing testing on used batteries to investigate suitability for various second-life uses. The duration testing takes about six months.
- Clean Communities of Central New York launched an EV showcase at Drivers Village, a major Syracuse-area car dealership. They continue to plan and host events at the dealership site.
- Long Road Enterprises continues to develop their innovative switched-reluctance motor. They expect to have a working prototype by the end of 2017.
- Green Charge Networks is moving forward with a demonstration of EV fast chargers co-located with battery storage systems to reduce peak loads. They are currently selecting demonstration sites.

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

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

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