Annual Investment Plan and Performance Report through December 31, 2020

Final Report | March 2021

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

NYSERDA's Promise to New Yorkers:

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

Our Vision:

New York is a global climate leader building a healthier future with thriving communities; homes and businesses powered by clean energy; and economic opportunities accessible to all New Yorkers.

Our Mission:

Advance clean energy innovation and investments to combat climate change, improving the health, resiliency, and prosperity of New Yorkers and delivering benefits equitably to all.

NYSERDA Record of Revision

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Annual Investment Plan and Performance Report through December 31, 2020

Final Report

Prepared by

New York State Energy Research and Development Authority

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1 Annual CEF Metrics and Financial Report

1.1 Introduction

The New York State Energy Research and Development Authority (NYSERDA) is pleased to present the fourth Annual Metrics and Financial Report for New York State's Clean Energy Fund (CEF). This report is a component of the Annual Investment Plan and Performance Report (IPPR).[1]

The CEF was designed to support New York State's clean energy agenda by working with market participants to develop clean energy market opportunities at scale and advance progress toward the State's nation-leading clean energy goals. The CEF was envisioned to foster innovation in energy markets by (1) testing new business models and attracting private capital to New York State energy markets, (2) facilitating new customer engagement and choice for clean energy services, and (3) extracting value from distributed energy resources that improve system efficiency and reduce consumer energy costs.

Broadly speaking, the CEF offers the following solutions:

- Reduce greenhouse gas emissions
- Increase statewide deployment of energy efficiency and renewable energy
- Reduce customer energy bills
- Mobilize investment in clean energy technologies and solutions
- Accelerate growth of the State's clean energy economy

With the historic Climate Leadership and Community Protection Act (Climate Act) signed by Governor Cuomo in July 2019, the CEF continued to evolve and serve as a major vehicle to achieve the State's clean energy goals. Specifically, the Climate Act requires the State to achieve a carbon-free electricity system by 2040 and reduce greenhouse gas emissions at least 85 percent below 1990 levels by 2050. Further, the Climate Act targets investments to benefit disadvantaged communities, create tens of thousands of new jobs, improve public health and quality of life, and provide all New Yorkers with more robust clean energy choices.

The CEF is comprised of four portfolios: Market Development, Innovation and Research, NY Green Bank, and NY-Sun. These portfolios work collectively toward meeting New York State's ambitious energy, environmental, and economic goals and are expected to contribute significantly toward the broader New York State Energy Plan. The CEF Portfolio Summary Report[2] provides additional information on these portfolios and progress through 2019.

To ensure comprehensive performance reporting on all four CEF portfolios, NYSERDA was directed to file an annual CEF Metrics and Financial Report, compiling the performance across the portfolios, including key financial and metrics information in relation to the minimum goals established in the Public Service Commission's Order Authorizing the Clean Energy Fund Framework.[3] This report fulfills that requirement and provides a view of the CEF progress toward its 10-year goals through December 31, 2020.[4]

1.2 Public Policy Context

On April 20, 2018, Governor Cuomo announced the most aggressive energy efficiency strategy in New York State's history, setting the State on a path to accelerate energy efficiency and reduce greenhouse gas (GHG) emissions, decrease consumer energy costs, and create job opportunities. This initiative, known as New Efficiency: New York, will support the growth of energy efficiency businesses and clean energy jobs across the State, while delivering higher-performing buildings and helping New York to meet its ambitious climate goals.

Recommendations in the comprehensive energy efficiency initiative white paper were issued by the New York State Department of Public Service (DPS) and NYSERDA on April 26, 2018. The white paper—guided by a new 2025 energy efficiency target of 185 trillion British thermal units (TBtu) of cumulative annual site energy savings—will accelerate progress toward the State's ambitious clean energy goals, including meeting one third of the emissions necessary to achieve 40 percent reduction of GHG emissions by 2030 (commonly referred to as "40 by 30") from 1990 levels.[5]

The Climate Act adopted this energy efficiency goal as a contribution to the State target to reduce GHG emissions from all anthropogenic sources 85 percent below 1990 levels by the year 2050, along with the interim target of 40 by 30. In addition to the 185 TBtu of energy efficiency, the Climate Act mandates the following:

- Six thousand megawatts (MW) of solar by 2025
- Seventy percent renewable electricity by 2030
- Nine thousand MW of offshore wind by 2035
- Carbon-free electricity by 2040

The Climate Act also, notably, requires that no less than 35 percent of the benefits of investments accrue to disadvantaged communities. Accordingly, NYSERDA plans to invest or direct new, not yet contracted, programmatic resources in a manner designed to achieve a goal for disadvantaged communities to receive 40 percent, and no less than 35 percent, of the overall benefits of spending on clean energy and energy efficiency programs. The Climate Act brings focus to (1) equity issues that can be most directly addressed by clean energy programs including energy affordability, economic opportunity, and clean energy jobs for priority populations; (2) reduced pollution from fossil fuel combustion for environmental justice; and (3) enhanced community-level engagement and capacity building. With these goals, New York State is undertaking one of the most aggressive clean energy agendas in the nation.

At this time, the CEF is undergoing a review by the Public Service Commission, as planned to occur periodically during the CEF 10-year timeframe. The review of the CEF is intended to assess the effectiveness of CEF investments and lay the groundwork for the next phase of the CEF toward meeting the long-term portfolio goals. In this context, on December 29, 2020 NYSERDA filed a petition[6] with the Commission requesting authorization for optimization and continuation of the portfolio. Specifically, the petition presents NYSERDA's overall vision for optimizing the CEF in light of major drivers of change, focusing on specific elements of the portfolio requiring adjustment and refinement going forward, and therefore, consideration before the Commission. This vision for CEF optimization seeks to calibrate the portfolio to reflect the many noteworthy policy and market changes that have occurred since the launch of the CEF in 2016, including the historic passage of the Climate Act, while also preserving vital continuity and stability within the CEF portfolio and with New York State's broader New Efficiency: New York framework. As part of this review, the petition proposes reviewing and resetting the high-level goals of the CEF to align with achieving the Climate Act mandates. The newly proposed goals, which are part of the consideration in the CEF review, will build upon progress to date and further strengthen all four CEF portfolios and their prominent role in meeting the State's aggressive clean energy agenda.

Progress SummaryDue to the disruption caused by COVID-19, 2020 was an unpresented year. NYSERDA's customer-facing programs ceased operation for at least one quarter during 2020 while other program areas faced substantial delays advancing program activities. Although the disruption impacted NYSERDA's progress in 2020 as detailed in this report, NYSERDA still expects the portfolios

to meet or exceed most 10-year minimum targets established for the four CEF portfolios over the life of the fund. Consistent with the Commission's directives in the CEF Order, NYSERDA will continue to rigorously monitor the performance of the CEF portfolios and revise strategy where necessary to improve or maximize the potential impact and benefits of CEF efforts.

1.2.1 Market Development and Innovation and Research Portfolio Development

The CEF Market Development (MD) portfolio has a strong focus on energy efficiency and building decarbonization and works with market partners to increase the adoption of low-carbon solutions in buildings across New York State in ways that provide value to residents, businesses, and communities. While building the CEF portfolio, NYSERDA actively monitors investment and progress toward the metric for reductions in cost-per-ton of carbon dioxide equivalent (CO_2e) emissions.[7] The CO_2e cost-per-ton metric, along with other key drivers such as achievement of energy efficiency goals, helps inform the design of the CEF to support the achievement of greater impact per dollar spent. Additionally, a significant portion of the funding in this portfolio is focused on serving low- and moderate-income New Yorkers.

The CEF Innovation and Research (I&R) portfolio is helping to develop the technologies required to meet Climate Act goals while building a clean energy economy in New York State, supporting R&D projects, and working with the start-up ecosystem to develop new-and-improved, low-carbon solutions. The research program also supports critical energy-related environmental research designed to inform policy.

NYSERDA's strategies are intended to maximize longer term, market transformational effects, referred to as "indirect impacts" in the Market Development portfolio. These market effects are expected to accrue over the longer term as a result of the NYSERDA investment and follow-on market activity.

The Market Development (MD) and Innovation and Research (I&R) portfolios are currently at the five-year mark of their 10-year cycle, and a diverse and effective portfolio has been established. In the early days of the CEF a purposeful mix of transition and market-enabling activities were paired to avoid disrupting existing market momentum supported by NYSERDA and utility programs. As of December 31, 2020, NYSERDA's portfolio is dominated by market transformation offerings with 54 initiatives[8] that were considered active in the marketplace alongside several others that are no longer administering new funding commitments.

1.2.2 Energy Efficiency as Key Focus of the Market Development Portfolio

The Market Development (MD) portfolio continues to emphasize investments in energy efficiency over the CEF's 10-year life span, with goals to deliver a minimum of 10.6 million megawatt-hours (MWh) in electric savings and 13.4 million British thermal units (MMBtu) in non-electric fuel savings. Under the New Efficiency: New York framework, the CEF is also expected to contribute at least 53 TBtu toward the overall State goal of 185 TBtu of installed site energy savings by 2025.

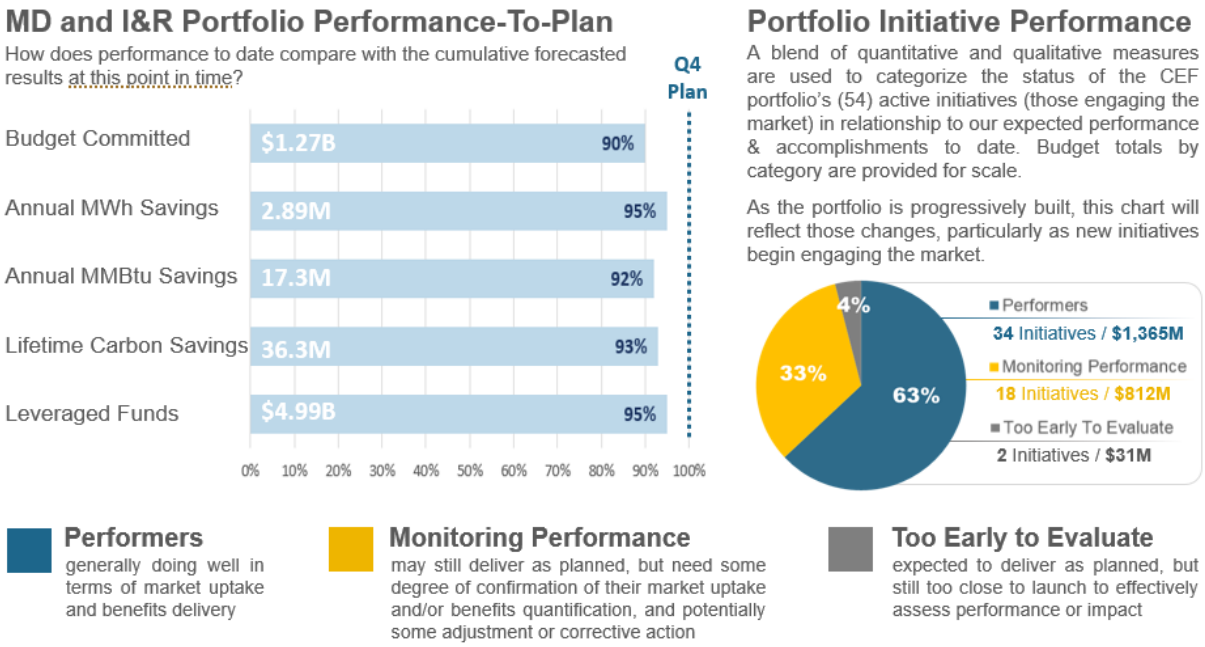
NYSERDA's approved investment plans comprise more than $1.8 billion of investment in energy efficiency across the commercial, residential, multifamily, and industrial sectors. Once entirely planned, NYSERDA expects the CEF to deliver the required 53 TBtu of site-based energy efficiency installation by 2025. Still greater impact is anticipated through 2030 as later installations and market transformation (indirect) benefits occur.

Through the MD portfolio, NYSERDA is taking action to develop a more robust and value-creating market for energy efficiency, with particular attention to (1) reducing energy efficiency retrofit and new construction costs, (2) accelerating innovative solutions that drive deeper energy retrofits, and (3) advancing targeted financial support to help overcome cost barriers to efficiency investments and ease access for private capital to allow new clean energy interventions to scale. The end goal of CEF MD interventions is to reduce the barriers to energy efficiency deployment and adoption, and ultimately, foster solutions that can scale to the level needed to achieve our clean energy and climate goals.

1.2.3 Market Development and Innovation and Research Portfolio Optimization

NYSERDA closely monitors MD and I&R portfolio performance, specifically measuring each initiative against its investment plan forecast of budget and benefits over time. With 2020 now concluded, the full impact of COVID-19 on NYSERDA's portfolio of programs is starting to become clearer and appropriate actions are being taken to reinforce support for various markets where possible. NYSERDA will continuously seek market input to refine expectations for near-term progress, incorporating what has been learned into adjusted forecasts to better serve stakeholders assessing the progress and to strengthen NYSERDA's ability to manage each individual program effectively.

Below is a high-level view of NYSERDA's MD and I&R portfolio performance-to-plan. Broadly speaking, the portfolio remains in good standing when assessing cumulative progress through the end of the year despite the economic conditions resulting from the pandemic. While the portfolio met 90 percent of the cumulative funding commitment plan in 2020, many benefit metrics actually outpaced the funding commitment metric (ranging from 92–95 percent of cumulative plan achieved), although still fell somewhat short. The majority of active initiatives are still considered performers, although the four top carbon impact initiatives are currently characterized as "monitoring performance" as a result of 2020 challenges.

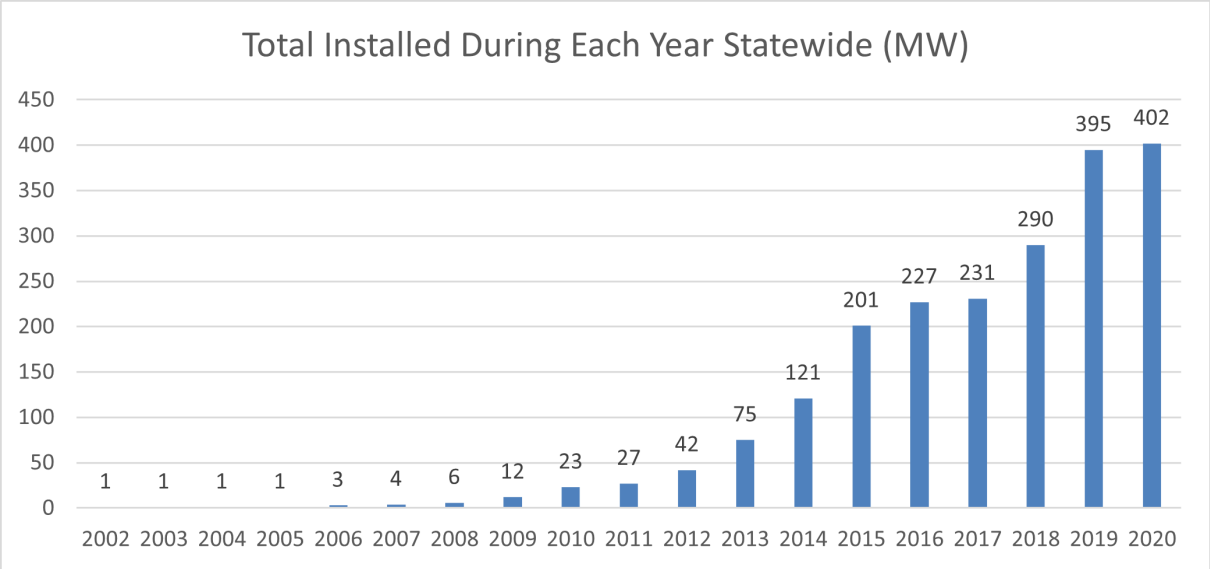


Achieving greater impact per ratepayer dollar involves experimentation with intervention approaches that have tolerance for failure, provided the approaches are addressed swiftly and the portfolio is on track to meet long-term outcomes. Accordingly, NYSERDA is using a "test-measure-adjust" approach to be as responsive to market conditions in real time as possible and to redeploy resources from underperforming efforts when appropriate. Overall, the composition of the portfolio—in terms of the criteria: Performers, Monitoring Performance, and Too Early to Evaluate—is aligned with NYSERDA's design and management expectations. To better align current plans with actual performance to date and provide increasingly accurate forecasts of future expectations, NYSERDA conducts an annual bottom-up reforecast of all investment plans based on performance to date and market intelligence gained through early and ongoing implementation efforts. Each annual reforecast also takes account of the pace of

funding approval/commitment/expenditure needed to advance NYSERDA's long-term goals for the CEF. NY-Sun represents the most mature of the four CEF portfolios. Approximately seven years into the 12-year cycle (2014–2025), the program performs well, with over $1.2 billion committed to the market. Most notably, NY-Sun is well positioned with over 2.1 gigawatts (GW) of NYSERDA-supported projects completed in support of the State's mandate to install 6 GW of distributed solar capacity by 2025. There were 402 megawatts (MW) of NYSERDA-supported solar projects installed in 2020, which represents a slight year-over-year growth from 2019 and makes 2020 NY-Sun's most successful year in terms of installed capacity. This growth is especially notable given the challenges related to the COVID pandemic. Figure 1 highlights the annual NYSERDA-supported statewide electric capacity installations by year beginning in 2002.

Recognizing the success of the State's solar policies and incentives to date, in May 2020 the Public Service Commission issued an Order Extending and Expanding Distributed Solar Incentives that authorizes an additional $573 million in funding for NY-Sun to support the new State goal of installing 6 GW of solar capacity by 2025. The Order included $135 million for projects benefitting low- to moderate-income (LMI) customers, affordable housing, environmental justice communities, and disadvantaged communities, referred to as the framework for energy equity.

Figure 1. Yearly NYSERDA-Supported Statewide Solar Electric Capacity Installations



Through December 31, 2020, a total of 2.8 GW of distributed solar capacity has been installed statewide, including approximately 732 MW installed to date without direct NY-Sun funding. NYSERDA has achieved 47 percent of the 6GW by 2025 target. Notably, the 2.1 GW completed to date with NY-Sun funding achieves 69 percent of the original 3 GW by 2023 target.

NY-Sun operates multiple programs and incentives to promote solar development which benefits low- to-moderate-income (LMI) households. Through the Affordable Solar Residential Incentive and the Multifamily Affordable Housing Adder, over $14.5 million has been committed to solar projects installed either on single-family homes owned by LMI residents or on regulated affordable housing. The total capacity of these project is 17.4 MW.

Additionally, the Affordable Solar and Storage Predevelopment and Technical Assistance Program was re-opened to new applications in June 2020. This program provides grants in support of the early-stage development costs of solar and storage projects that benefit regulated affordable housing or LMI households. Through the end of 2020, more than $2.7 million has been committed to projects benefiting LMI households across the State of New York.

The Solar for All program has enabled low-income New Yorkers to participate in community solar subscriptions that reduce their total electricity bill. In 2020, eight Solar for All projects provided electricity bill savings to almost 3,300 low-income New Yorkers.

1.2.4 NY Green Bank

NY Green Bank (NYGB) began commercial operations in summer 2014. During the first two years of the CEF, the fund achieved two key milestones. First, it generated positive annual net income (i.e., annual revenues exceeded annual expenses) a full year earlier than planned. Second, during the third calendar quarter of 2017, NYGB achieved cumulative breakeven, with cumulative revenues exceeding cumulative expenses.[9]

Since its inception, NYGB has committed and deployed more than $1.2 billion to clean energy and sustainable infrastructure projects in New York State and has brought in revenues of $108.4 million. Of the $1.2 billion NYGB has committed and deployed in total principal to date, $657.4 million has been repaid and made available for recycling into additional transactions. The $1.2 billion committed and deployed to date represents good progress toward NYGB's CEF 10-year investment projection of $1.9 billion.

NYGB's investments continue to mobilize capital in the State; at year end, the portfolio was expected to support at least $2.6 billion in project costs for clean energy and sustainable infrastructure projects. Over their lifetime impact these investments are expected to reduce GHG emissions by at least 15 million metric tons, a figure that will increase even further as NYGB's counterparties continue to draw down on capital commitments to fund new clean energy project installations and as NYGB continues to close new transactions in 2021 and beyond. By comparison to 2019 results in which NYGB's portfolio of investments was expected to involve the build-out of at least 592.0 MW of clean energy over deployment periods averaging two to three years, investment has grown to at least 832.0 MW in underlying projects. In the past year, NYGB's counterparties have delivered 92.4 MW in New York State, averaging 7.7 MW of new systems installed per month.

NYGB's affordable housing initiative kicked off in 2020 as a first step toward investing approximately $400 million from 2020–2025 in disadvantaged communities. The initiative was informed by NYGB's engagement of independent consultants to help identify financing barriers and opportunities through facilitated conversations with the State's and New York City's housing finance agencies, such as the Department of Treasury's Community Development Financial Institutions Fund and finance companies specializing in the sector; public, private, and non-profit developers, and owners of affordable housing; as well as key advocacy groups. By offering flexible capital underwritten to higher expected energy savings than is typical, NYGB will not only deliver direct benefits to affordable housing properties but will also play a role in transforming financing markets, where capital scarcity often precludes the implementation of energy-related measures.

1.2.5 Overall Performance of the Clean Energy Fund

A comprehensive view of the investment and benefit progress, inclusive of all four CEF portfolios, is provided in Figure 2. Progress is set in context of the total 10-year programmatic budget authorization[10] and the 10-year minimum goals from the Commission's authorizing order, as shown across the top of Figure 2.

Figure 2. CEF Portfolio Expected Investment and Benefits

Toward 10-year minimum goals as of December 31, 2020 (millions).[11,12]

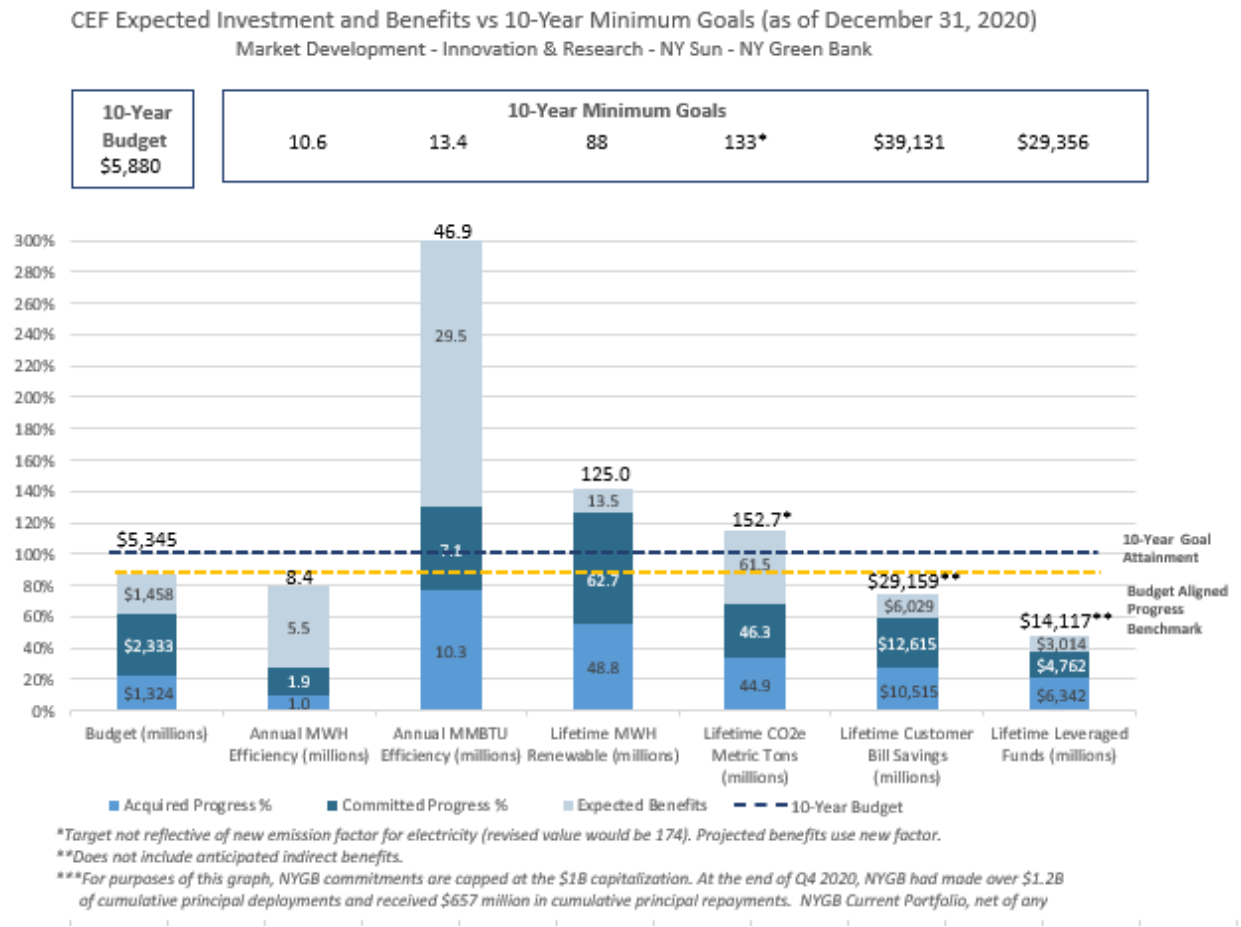


Figure 2 illustrates[13] that deployment of funds is generally well-aligned with energy and carbon key performance indicator progress. Here, the value Cumulative Progress (committed and acquired budgets or benefits) is combined with the value Expected Benefits (approved but not yet committed budgets or benefits) to demonstrate total progress toward NYSERDA's targets. While progress includes newly authorized NY-Sun funding and benefits in the committed and acquired progress, the overall 10-year budget and 10-year minimum goals have not been updated to reflect the NY-Sun expansion.

Cumulative progress data in Figure 2 currently includes estimated direct impacts only (i.e., impacts expected from pilots and projects directly funded by NYSERDA). Many CEF initiatives also anticipate accruing indirect, longer-term market effects from follow-on market activity—this is a foundational premise of the CEF. Indirect impacts are grounded in a theory of change developed for each initiative

and NYSERDA is using market evaluation approaches to quantify the indirect impacts as they accrue over time. Market evaluation approaches involve quantification of baseline adoption levels and market forecast models early in the initiative life and later assessment of market changes related to the interventions undertaken. Market evaluation approaches can include market actor surveys, Delphi panels, comparison group assessments, and other methods. NYSERDA has begun measuring indirect impacts for initiatives with enough market activity and will periodically reassess indirect impact over the duration of the initiative. As these impacts are quantified, they will be incorporated into CEF reporting, with the first quantifications expected to be reported in 2021.

CEF MD and I&R investment plans filed with the commission, NY-Sun commitments, and NY Green Bank's overall investments through December 31, 2020 represent more than 62 percent of the total CEF 10-year budget programmed at this time. Including the total authorized NY-Sun expansion funding would represent 59 percent of the total CEF 10-year budget. Approximately five years into the fund, the MD and I&R portfolios are evolving and are expected to achieve CEF goals over the 10-year horizon. With 70 initiatives in MD and I&R, NYSERDA is focused on ensuring that funds are committed and expended to deliver tangible results in the market.

As Figure 2 illustrates, progress toward realization of benefits is well aligned with overall goals and deployment of funds for most metrics. An overview of performance to these primary metrics is as follows:

- MWh and MMBtu energy efficiency goals are core to the MD portfolio in that they fulfill the "no backsliding from Energy Efficiency Portfolio Standards" achievements required by the CEF Order and help advance State energy policy goals. MMBtu expected benefits are already significantly greater than the minimum projected benefits, due largely to the expansion into all fuels and the significant potential that exists, particularly in the areas of industrial, clean transportation, industry partnerships and across multisector solutions. While MWh electricity savings acquired and committed total progress lags the pace of other benefits, the total expected (planned) benefits from approved initiatives are still well positioned against the overall goal at this time.
- Renewable energy MWh generation shows excellent progress largely due to NY-Sun, which began in 2014 and is performing strongly against its original goal. In May 2020, the Public Service Commission authorized additional funding to support the new State goal of installing 6 GW of solar capacity by 2025. While progress reporting continues in Figure 2, including the commitment of newly approved funds, the minimum performance target from the original CEF Order has not yet been officially updated.
- Carbon dioxide equivalent (CO_2e) emission reduction progress is on track, and NYSERDA is positioned to meet the original goal for the CEF.[14]

- Performance of the customer (participant) bill savings[15] metric is somewhat low, but it is not yet inclusive of *indirect* bill savings resulting from the execution of approved MD initiatives; this progress will be measured and reported later in the 10-year time frame.
- Progress on lifetime leveraged funding benefits is trending behind pace of other metrics. NYSERDA anticipates progress to ultimately fall short of the original 2016 CEF goal, largely due to a more rapid-than-anticipated decline in distributed solar costs (from hardware costs of roughly $4/watt when the CEF was planned in 2015 to roughly $2.01/watt in 2020) as well as an emphasis in the NY-Sun portfolio on larger systems (e.g., community solar) that bring greater economies of scale. CEF MD and I&R portfolios continue to make steady progress toward their anticipated contribution to this goal.

1.2.6 Low- and Moderate-Income Initiatives

Pursuant to the January 16, 2020 Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios through 2025,[16] and subsequent LMI Joint Implementation Plan, NYSERDA and New York State Utilities have developed a Statewide LMI Portfolio, inclusive of CEF and utility investments with the objectives of increasing the impact of ratepayer funds, improving customer experience, and reaching more LMI households and affordable multifamily buildings with energy efficiency services. Through this framework, NYSERDA and the State's investor-owned utilities will increase access to energy efficiency and clean energy solutions for LMI households and affordable multifamily buildings. Over the course of 2020, while still implementing current LMI programs, NYSERDA worked with the utilities to develop and refine LMI offerings with new and modified initiatives expected in 2021.

The NYSERDA portion of the LMI Implementation Plan includes: standard-offer incentive programs such as EmPower New York and the Multifamily Performance Program which provide incentives to offset the cost of accessing clean energy solutions; investments in longer-term market development through initiatives such as RetrofitNY and the Healthy Homes Value-Based Payments Pilot; and outreach and education initiatives such as the Low-Income Forum on Energy (LIFE) and new Clean Energy Hubs.

On-going CEF allocations to LMI initiatives are made as part of the Statewide LMI Portfolio in a manner that is complementary to utility investments to increase the impact of ratepayer funds allocated to the LMI market segment, and to deliver benefits to disadvantaged communities. The CEF LMI portfolio is informed by stakeholder engagements, demonstrated market needs, and the ongoing work with the New

York State utilities under New Efficiency: New York and guided by the principles in the Climate Act. As noted in the LMI Joint Implementation Plan, NYSERDA and the New York State utilities will file an Annual Report on April 1, 2021 which will provide more detail on individual program performance and progress toward developing complementary program offerings between NYSERDA and the utilities.

To date, NYSERDA has allocated $761 million across a range of investment plans to serve LMI consumers through 2025. Through 2020, the CEF LMI portfolio has committed $311 million to initiatives, providing over 104,000 LMI households and affordable housing units with clean energy services.

1.2.7 New York Clean Heat Initiatives

Pursuant to the January 16, 2020 Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios through 2025,[17] , NYSERDA[18] have developed a Statewide Clean Heating and Cooling Portfolio, inclusive of CEF and utility investments, with the objectives to provide customers, contractors, and other heat pump solution providers a consistent experience and business environment throughout New York State. Whereas prior to the NYS Clean Heat Program, NYSERDA and some utilities, offered separate and varying heat pump programs, the program represents a shift to a consistent statewide heat pump program designed to achieve the State's ambitious heat pump goals and build the market infrastructure for a low-carbon future.

The NYS Clean Heat program includes a range of initiatives to advance the adoption of efficient electric heat pump systems for space and water heating applications throughout New York State. The program offers the suite of incentives provided by the NY Electric Utilities to support customer adoption of eligible heat pump technologies—both cold climate air source and ground source systems as well as their promotion and pricing by contractors and other heat pump solution providers. The program is implemented in coordination with a portfolio of NYSERDA-led market development initiatives, which aim to build market capacity to deliver building electrification solutions. The market development efforts include support for training and qualification of contractors, processes to assure quality installations, and marketing and education to help customers understand and select among options and to operate systems optimally.

NYSERDA is investing approximately $230 million in market enabling initiatives funded through Clean Energy Fund (CEF) to support the NYS Clean Heat Market Development Plan. Through December 31, 2020, NYSERDA has committed $26.9 million to initiatives that address the critical

market needs identified in the market development plan. NYSERDA and the New York State utilities will file an Annual Report on April 1, 2021 that will provide more detail on individual program performance and progress.

1.3 Metrics Reporting

The cumulative progress and expected benefits from all four portfolios, alongside the CEF minimum projected benefits, is shown in Table 1 and reflected in Figure 2. NYSERDA removes overlap among its CEF portfolios in this roll up table while individual portfolio tables remain whole; therefore, the sum of individual portfolio tables presented later will not match the totals in Table 1. Direct overlap between NY Green Bank and NY-Sun as well as NY Green Bank and MD has been removed. Also, in terms of total expected indirect benefits in 2025, consistent with its Budget and Benefits chapter, NYSERDA conservatively includes only 50 percent of the estimated total indirect benefits from market transformation to avoid overlap in these values and to account for uncertainty associated with the forecasting and measurement of indirect benefits over time. An asterisk in the Minimum Projected Benefits columns indicates there is no commission-ordered goal for that metric.

Table 1. CEF Minimum Projected Benefits 2016–2025 and Progress to Date through December 31, 2020

		Cumulative Annual Benefits			Lifetime Benefits		
		Cumulative Progress through December 31, 2020[a]	Total Expected Benefits as of December 31, 2020[b]	Minimum Projected Benefits 2016-2025[c]	Cumulative Progress through December 31, 2020[a]	Total Expected Benefits as of December 31, 2020[b]	Minimum Projected Benefits 2016-2025[c]
Energy Efficiency	MWh	2,904,079	8,371,242	10,600,000	39,891,778	106,185,621	*
	MMBtu	17,370,993	46,872,883	13,400,000	254,236,450	682,047,720	*
	MW	133	125	*	133	125	*
Renewable Energy[d]	MWh	4,603,334	6,525,652	*	110,722,762	125,026,278	88,000,000
	MW	3,808	5,364	*	3,808	5,364	*
CO2e Emission Reductions (metric tons)		4,849,713	10,111,007	*	90,613,328	152,697,335	133,000,000
Customer Bill Savings[e] ($ million)		$1,188	$1,707	*	$23,027	$29,159	$39,131
Leveraged Funds ($ million)		$10,647	$14,117	*	$10,647	$14,117	$29,356

[a] Across the CEF portfolios, category Cumulative Progress through December 31, 2020 generally represents the sum of all benefits from projects that are completed as well as in the pipeline (pipeline data is not available for NY Green Bank).

[b] Across the CEF portfolio, category Total Expected Benefits as of December 31, 2020 represents all benefits associated with approved investment plans and transactions profiles.

[c] Minimum Projected Benefits, the benefits are from the Order Authorizing the Clean Energy Fund Framework, issued and effective January 21, 2016.

[d] NYSERDA makes no claim to the environmental attributes or any New York Generation Attribute Tracking System (NYGATS) certificates that may be associated with these projects.

[e] The estimated retail value of the avoided energy use or of the total clean generation produced by a renewable system.

Progress of the MD portfolio is reflected in Table 2. Cumulative progress represents benefits from all projects completed or in the pipeline and does not include any of the indirect benefits expected to accrue and be measured later in the 10-year CEF time horizon. Total expected benefits will be the result in 2025 from full implementation of NYSERDA's currently filed investment plans, including the estimated indirect benefits (in the form of energy efficiency, renewable energy, and CO_2e emission reductions) from market transformation spurred by the CEF initiatives. These expected benefits will be revised over time as the remaining CEF MD funding is approved for use in various market offerings.

Table 2. Market Development Annual and Lifetime Cumulative Progress and Expected Benefits through December 31, 2020

		Cumulative Annual Benefits		Lifetime Benefits	
		Cumulative Progress through December 31, 2020[a,c]	Total Expected Benefits from Filed Investment Plans as of December 31, 2020[b]	Cumulative Progress through December 31, 2020[a,c]	Total Expected Benefits from Filed Investment Plans as of December 31, 2020[b]
Energy Efficiency	MWh	2,890,111	8,357,366	39,722,718	105,995,743
	MMBtu	17,358,919	46,825,023	254,041,716	668,001,099
	MW	133	93	133	93
Renewable Energy[d]	MWh	312,585	2,147,780	2,450,548	15,327,836
	MW	309	1,690	309	1,690
CO2e Emission Reductions (metric tons)		2,691,014	7,900,034	36,344,539	97,925,170
Customer Bill Savings[e] ($ million)		$579	1,089	$7,697	13,746
Leveraged Funds ($ million)		$3,847	5,966	$3,847	5,966

[a] Cumulative Progress through December 31, 2020 represents the sum of all benefits from projects that are completed (installed) and in the pipeline (committed but not yet complete).

[b] Total Expected Benefits from Filed Investment Plans as of December 31, 2020 represents the sum of direct benefits from all investment plans filed with the commission prior to December 31, 2020. For MWh and MMBtu energy efficiency, MWh renewable energy, and CO_2e emission reductions, 50 percent of the indirect benefits expected by 2025 are also included, based on the sum of those benefits present in investment plans filed with the Commission prior to December 31, 2020.

[c] Energy Efficiency MWh and MMBtu values represent only energy savings. However, CO_2e emission reductions and customer bill savings from fuel usage are fully net, accounting for both the energy savings and the energy use where applicable.

[d] NYSERDA makes no claim to the environmental attributes or any NYGATS certificates that may be associated with these projects.

[e] The estimated retail value of the avoided energy use or of the total clean generation produced by a renewable system.

When viewed against cumulative commitment-based goals defined by investment plans through December 31, 2020, the Market Development portfolio is maintaining strong alignment to these metrics. Cumulative performance to plan for CEF Target metrics is as follows:[19]

- Cumulative annual energy efficiency is at 95 percent for MWh and 92 percent for MMBTU
- Lifetime CO_2e reductions is at 93 percent
- Lifetime customer (participant) bill savings is at 95 percent
- Lifetime leveraged funding is at 95 percent

However, when the performance view is isolated to reflect 2020 incremental expectations, key metrics like energy, carbon, and leveraged funding performed near the 70 percent mark, punctuating the impacts of the pandemic. Many CEF programs that involved customer-facing activities or in-facility engagement ceased operation for at least an entire quarter of 2020. While the pause and renewal of engagement varied across the portfolio, nearly all programs were impacted in terms of their progress toward goals.

Progress of the Innovation and Research portfolio for the metrics applicable to I&R, is shown in Table 3. Cumulative progress represents the benefits from all projects completed or in the pipeline. Total expected benefits will be the result in 2025 from full implementation of all NYSERDA's filed investment plans.

Table 3. Innovation and Research Annual and Lifetime Cumulative Progress and Expected Benefits through December 31, 2020[20]

		Cumulative Annual Benefits		Lifetime Benefits	
Metric	Unit	Cumulative Progress through December 31, 2020[a]	Total Expected Benefits from Filed Investment Plans as of December 31, 2020	Cumulative Progress through December 31, 2020[a]	Total Expected Benefits from Filed Investment Plans as of December 31, 2020
Leveraged Funds ($ million)		$1,151	$1,770	$1,151	$1,770

[a] Cumulative Progress through December 31, 2020 represents the sum of all benefits from projects that are completed (installed) and in the pipeline (committed, but not yet complete).

When the I&R portfolio is assessed against cumulative commitment-based goals through December 31, 2020, the leveraged funding goal remains well aligned with investment plan expectations to this point in time at 92%. However, the incremental view of 2020 alone illustrates performance just under 70 percent to plan. As with MD operations noted above, I&R activity was also paused and restarted as a result of the pandemic, and so too were the realization of investment benefits associated with those projects.

Progress of the NY-Sun portfolio is shown in Table 4. Cumulative progress represents benefits from all projects completed or in the pipeline. Unlike the other portfolios of the CEF, NY-Sun does not have a progressive build format; therefore, Total Expected Benefits as of December 31, 2020 equals Cumulative Progress through December 31, 2020.

Table 4. NY-Sun Annual and Lifetime Cumulative Progress and Expected Benefits through December 31, 2020

		Cumulative Annual Benefits		Lifetime Benefits	
		Cumulative Progress through December 31, 2020[a,c]	Total Expected Benefits as of December 31, 2020[b]	Cumulative Progress through December 31, 2020[a,c]	Total Expected Benefits as of December 31, 2020[b]
Energy Efficiency	MWh	-	*	-	*
	MMBtu	-	*	-	*
	MW	-	*	-	*
Renewable Energy	MWh	4,218,564	4,218,564	105,464,094	105,464,094
	MW	3,535	3,535	3,535	3,535
CO2e Emission Reductions (metric tons)		2,114,656	2,114,656	52,867,294	52,867,294
Customer Bill Savings[d] ($ million)		$594	$594	14,842	$14,842
Leveraged Funds[e] ($ million)		$5,649	$5,649	$5,649	$5,649

[a] Cumulative Progress through December 31, 2020 represents the sum of all benefits from projects that are completed (installed) and in the pipeline (contracted but not yet completed as well as applications approved, but not yet contracted).

[b] Unlike the other portfolios of the CEF, NY-Sun does not have a progressive build and approval format; therefore, Total Expected Benefits as of December 31, 2020 equals Cumulative Progress through December 31, 2020.

[c] NYSERDA makes no claim to the environmental attributes or any NYGATS certificates that may be associated with these projects.

[d] The estimated retail value of the avoided energy use or of the total clean generation produced by a renewable system.

[e] The sum of all PV project costs reported to NYSERDA by participating contractors, minus the total NYSERDA incentives paid on these projects.

The cumulative installed capacity of solar projects that have been completed or are in the pipeline through December 31, 2020 exceeds the original 3 GW of solar capacity goal by 2023 and advances progress toward the 6 GW goal by 2025. As for incremental progress, the year 2020 represented a new record for MW capacity installed by NY-Sun, beating the prior record of capacity installed in 2019 by a small margin, even in the midst of the global pandemic. As noted earlier, cumulative progress as shown in Table 4 now includes benefits associated with the expanded NY-Sun program, and NYSERDA has proposed through its recent Clean Energy Fund petition a more complete update to the original CEF renewable energy goals, officially adopting the 6 GW goal as the main CEF renewable energy metric, in the near future.

Progress of the NY Green Bank portfolio is shown in Table 5. Cumulative Progress through December 31, 2020 represents benefits from clean energy measures deployed in New York State. Total Expected Benefits from Executed Transactions as of December 31, 2020 will be the result, no later than 2025, from full implementation of all NY Green Bank transactions executed by this date.[21]

Table 5. NY Green Bank Annual and Lifetime Cumulative Progress and Expected Benefits through December 31, 2020

		Cumulative Annual Benefits		Lifetime Benefits	
		Cumulative Progress through December 31, 2020[a,c]	Overall Investments as of December 31, 2020[b]	Cumulative Progress through December 31, 2020[a,c]	Overall Investments as of December 31, 2020[b]
Energy Efficiency	MWh	13,968	39,375	169,060	572,468
	MMBtu	12,074	923,670	194,734	14,046,621
	MW	-	32	-	32
Renewable Energy[e]	MWh	468,637	1,203,249	11,713,798	28,338,188
	MW	406	832	406	832
CO2e Emission Reductions (metric tons)		250,644	705,580	6,067,263	15,495,656
Customer Bill Savings[f] ($ million)		$71	$174	$1,756	$3,904
Total Project Costs[g,h] ($ million)		$1,120	$2,606	$1,120	$2,606

[a] Cumulative Progress is the Actual Clean Energy system deployed in NYS, reported by NYGB's clients, as a result of NYGB's participation in financing these projects in the State.

[b] Overall Investments as of December 31, 2020 represents the sum of the low end of the range for all First-Year estimated energy savings, energy generation, and GHG emissions reductions (as also reported in NYGB Quarterly Metrics Reports).

[c] Energy Efficiency values represent MWh savings from the use of CHP systems; natural gas required to run CHP systems is 1,700 MMBtu cumulative annual and 41,000 MMBtu lifetime. Expected emission reductions and customer bill savings are net, including both MWh that add to the benefits and additional natural gas required to run CHP systems that subtract from the benefits.

[d] Cumulative Progress and Overall Investments are the same measure as reflected in the corresponding Cumulative Annual Benefits calculations, but for each NYGB investment, the relevant annual measure is multiplied by the expected measure life and summed to total cumulative progress or overall investments.

[e] NYSERDA makes no claim to the environmental attributes or any NYGATS certificates that may be associated with these projects.

[f] The estimated retail value of the avoided energy use or of the total clean generation produced by a renewable system.

[g] Total Project Costs representing Overall Investments in the Lifetime Benefits section, reflect the low end of the range for estimated system deployment to be achieved by the end of the availability period for each transaction, aggregated across all NYGB investments.

[h] The NYGB Metrics, Reporting & Evaluation Plan and in this table, define Total Project Costs to include fair market value (FMV) data for a subset of NYGB's investments. FMV is an estimated market valuation of fully installed energy projects provided by NYGB's counterparties and is often required for federal income tax purposes, by institutional investors and for certain grant program purposes unconnected with NYGB. As projects progress and the cost of installed equipment and labor are known and reported to NYGB by its counterparties, NYGB will seek to adjust reported values and replace FMV in its aggregated data sets and periodic reporting with those actual costs.

NY Green Bank has worked in synergy with many other CEF initiatives, attracting new private investment in the State. Through all its executed transactions to date, NY Green Bank has mobilized over $2.6 billion of leveraged funding and expects at least 13.3 million metric tons of CO_2e reductions upon full implementation of these transactions. Despite the impacts of the pandemic which slowed progress in other areas, projects deployed by NYGB's counterparties delivered a 25.6 percent increase in annual metric tons of greenhouse gas emissions year-over-year.

1.4 Financial Reporting

Portfolio-level financial status information for the MD, I&R, and NY-Sun portfolios is provided in Table 6.

Table 6. Market Development, Innovation and Research, NY-Sun Portfolio Level Budgets and Spending[22] ($ million)

Initiative	Total Authorized Budget[a]	Budget Approved as of Dec 31, 2020[b]	Expended Funds[d]	Committed Funds[e]	Total Progress[f]	% of Approved Budget Committed[g]	Budget Approved Remaining Balance[h]
Market Development (2016-2025)							
Program Funds	$2,400	$2,198	$562	$504	$1,065	48%	$1,133
NYS Cost Recovery Fee							
Innovation & Research (2016-2025)							
Program Funds	$632	$388	$94	$126	$220	57%	$168
NYS Cost Recovery Fee							
NY-SUN (2014-2025)							
Program Funds	$1,409	$1,409	$529	$691	$1,220	87%	$189
NYS Cost Recovery Fee							
Total Program Funds and CRF	$4,440	$3,995	$1,184	$1,321	$2,505	63%	$2,505
Administration	$313	$270	$131	$0.3	$131	48%	$139
Evaluation	$127	$79	$9	$12	$21	26%	$58
Total	**$4,880**	**$4,345**	**$1,324**	**$1,333**	**$2,657**	**61%**	**$2,703**

a CEF and NY-Sun Order authorized funding. NY-Sun total authorization includes $230 million of the total $573 million funds approved by PSC in May 2020 Order for expanded program through 2025, which was the amount authorized by the Commission for use at this time.

b Represents funds approved in Market Development and Innovation and Research investment plans as of December 31, 2020, as well as the total authorized budget for NY-Sun.

c Invoices processed for payment by NYSERDA.

d Remaining funding obligated under a contract, purchase order, or incentive award and planned funding for contracts awarded and under negotiation.

e The sum of Expended and Committed Funds.

f The percentage of the committed budget.

g The difference between Budget Approved and Committed funds.

Funding and financial status of NY Green Bank is provided in Tables 7 and 8. NY Green Bank is presented separately from the other CEF portfolios to accurately represent NY Green Bank's unique characteristics (e.g., funds invested by NY Green Bank are ultimately returned and recycled, and revenues are generated to continue to support self-sufficiency and reinvestment). Table 8 shows NY Green Bank's overall investments to date against the aggregate NY Green Bank CEF 10-year investment goal, which includes the expected recycling of funds.

Table 7. NY Green Bank Portfolio Level Funding and Financial Status ($ million)

	Budgeted Funds	Cumulative Principal Deployed	Cumulative Principal Repaid	Deployed Funds[a] (drawn)	Committed Funds (undrawn)	Approved Investments	Current Portfolio[b]	Available Capital[c]
Program Costs & Revenue								
NY Green Bank	$ 978.4	$ 1,226.9	$ 657.4	$ 568.2	$ 164.9	N/A	$ 733.1	$ 245.3
	Budgeted Funds	Cumulative Principal Deployment	Cumulative Principal Repaid	Cumulative Expenses	Open Encumbrances	Pre-Encumbrances	Committed Funds	Remaining Balance[d]
Other Costs								
Operating Expenses (Program Administrat	$ 17.0			$ 17.0			$ 17.0	$ -
Program Evaluation	$ 4.0	N/A		$ 0.6	N/A		$ 0.6	$ 3.4
New York State Cost Recovery Fee	$ 0.6			$ 0.8			$ 0.8	$ -
OTHER COSTS TOTAL	$ 21.6	N/A		$ 18.4	N/A		$ 18.4	$ 3.4
	Budgeted Funds	Cumulative Principal Deployment	Cumulative Principal Repaid	Deployed Funds plus Expenses	Committed Capital plus Open Encumbrances	Pre-Encumbrances	Current Portfolio plus Committed Funds	Available Capital plus Remaining Balance
TOTAL	$ 1,000.0	$ 1,226.9	$ 657.4	$ 586.6	$ 164.9	N/A	$ 751.5	$ 248.7

a. Deployed Funds include capitalized interest and fees; as such the value does not reflect the difference between Cumulative Principal Deployed and Cumulative Principal Repaid.

b. Sum of Deployed Funds and Committed Capital.

c. Available Capital reflects the amount of NYGB's initial $1.0 billion capitalization confirmed in the CEF Order that is not currently deployed or committed. As NYGB investments mature and are redeployed into new projects, Available Capital gives a snapshot in time of the funds available for clean energy investment.

d. Remaining Balance shows the net of expenses against Budgeted Funds consistent with the CEF Order. As NYGB is required to be self-sufficient, revenue is expected to fund operating expenses.

e. NYGB Operating Expenses reflect reporting of the budget and actual expenses from "start-up" administrative funding approved through Public Service Commission Order. Operating expenses in excess of the originally approved amount are being funded from NYGB revenues and are not reported in this table but are reflected in its annual financial statement.

Table 8. NY Green Bank Investments to Date ($ million)

CEF 10-Year Investment Goal	Overall Investments to Date	Remaining ($)	Remaining (%)
$ 1,900.0	**$ 1,213.0**	**$ 687.0**	**36%**

Endnotes

[1] In May 2020, the Department of Public Service (Matter 20-01201) released the Performance Management & Improvement Process plan which revised the deliverables and timeframe for NYSERDA's Annual Investment Plan Performance Report (IPPR). Under this new plan NYSERDA's performance report must be submitted March 31 annually, up from May 1 as defined in the original CEF framework. An annual update to investment plans must also be submitted, but this deliverable is now separately due in October/November per the plan.

[2] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={FC3FBD53-FBAC-41FB-A40E-3DA0A5E0866A}

[3] Cases 14-M-0094, et al., Order Authorizing the Clean Energy Fund Framework, issued January 21, 2016.

[4] Implementation of the CEF Market Development and Innovation and Research portfolios are currently at the 5-year mark of their 10-year authorized timeline. The NY-Sun Program began prior to the launch of the CEF and is at approximately the 7-year mark its 12-year authorized timeline (2014-2025). Similarly, pursuant to Case 13-M-0412, Order Establishing New York Green Bank and Providing Initial Capitalization, NY Green Bank was established in December 2013, and began commercial operations in Summer 2014.

[5] NYSERDA and DPS. 2018. "New Efficiency: New York". NYSERDA. https://www.nyserda.ny.gov/About/Publications/New-Efficiency.

[6] Petition Regarding Clean Energy Fund Triennial Review http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4E13BDD5-2FB9-4F65-B7E5-C2D25A20F2DD}

[7] For MD specifically, based on available programmatic funding (approximately $2.5 billion, exclusive of evaluation) and minimum goals for the 10-year CEF period (approximately 97 million lifetime metric tons CO_2e, based on the most current emission factor), the portfolio must achieve CO_2e reductions at or below a cost of $27/$CO_2e$ lifetime metric ton.

[8] As of December 31, 2020 NYSERDA, had 70 Market Development and Innovation & Research investment plans, a Market Characterization and Design Chapter, and a Budget Accounting and Benefits Chapter approved by the NYS Department of Public Service.

[9] Cumulative breakeven is defined as the point in time when NYGB's cumulative revenues exceeded cumulative expenses.

[10] Less Administration and Evaluation for all portfolios.

[11] Beginning with Q4 2016, NYSERDA updated emission factors for natural gas, #2 oil, #6 oil, kerosene, propane, wood, and steam to be consistent with emission factors used in the updated NYS Greenhouse Gas Inventory (nyserda.ny.gov/About/Publications/EA-Reports-and-Studies/Energy-Statistics). These factors are derived from EPA's February 2016 State Inventory Tool release (https://www.epa.gov/statelocalclimate/state-inventory-and-projection-tool). Steam emission factors have been updated to be consistent with New York City's updated Greenhouse Gas Inventory. (http://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/NYC_GHG_Inventory_2014.pdf)

[12] Includes the original 3 GW NY-Sun goal and associated metrics. Future reports will be updated to include the new 6GW goal and associated metrics.

[13] Beginning with Q4 2016, NYSERDA updated emission factors for natural gas, #2 oil, #6 oil, kerosene, propane, wood, and steam to be consistent with emission factors used in the updated NYS Greenhouse Gas Inventory (nyserda.ny.gov/About/Publications/EA-Reports-and-Studies/Energy-Statistics). These factors are derived from EPA's February 2016 State Inventory Tool release (https://www.epa.gov/statelocalclimate/state-inventory-and-projection-tool). Steam emission factors have been updated to be consistent with New York City's updated Greenhouse Gas Inventory. (http://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/NYC_GHG_Inventory_2014.pdf)

[14] Per the Clean Energy Advisory Council (CEAC) Metrics, Tracking and Performance Assessment (MTPA) Working Group, NYSERDA has adopted a marginal electricity grid emission factor of 1,103 pounds CO_2e/MWh for projects completed after 2015. (http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=190731&MatterSeq=50399). Projects completed prior to 2016 will maintain the 1,160 pounds CO_2e/MWh previously used, based on analysis of grid emissions at that time. http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterSeq=49636&MNO=15-E-0703

[15] Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA programs.

[16] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={51100786-2EFC-49AD-8ED3-8D836FC2A8B9}

[17] http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7B06B0FDEC-62EC-4A97-A7D7-7082F71B68B8%7D

[18] Central Hudson Gas & Electric Corporation ("Central Hudson"); Consolidated Edison Company of New York, Inc. ("Con Edison"); Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid"); New York State Electric & Gas Corporation ("NYSEG"); Orange and Rockland Utilities, Inc. ("Orange & Rockland"); and Rochester Gas and Electric Corporation ("RG&E") (collectively, "NY Electric Utilities")."

[19] NYSERDA's CEF Quarterly Performance Report for Q4 2020 was filed in the Department of Public Service's Document Matter Management System under case 14-M-0094 on March 1, 2021, and can also be found at: Clean Energy Fund Quarterly Performance Report (Quarter 4, 2020).

[20] Performance of the Innovation and Research Portfolio is assessed against the single metric of leveraged funding.

[21] NYSERDA's NY Green Bank Metrics, Reporting and Evaluation Report through December 31, 2020 was filed in the Department of Public Service's Document Matter Management System under case 13-M-0412 on February 16, 2021 and can also be found at: https://greenbank.ny.gov/Resources/Public-Filings

[22] The total Budget has changed from prior amounts reported to reflect the original Public Service Commission Ordered funding authorization less a reduction of $68.3M to the 10-year CEF funding authorization resulting from reduced RGGI funds approved in the 3-year Operating Plan (FY 18-19 through FY 20-21) approved in January 2018.

APPENDIX A

Clean Energy Fund Investment Plan Performance Summaries:
Market Development and Innovation and Research Portfolios

Investment Plan Performance Summaries

The fundamental purpose of the Annual Investment Plan and Performance Report (IPPR) is to highlight the link between the performance of an initiative and the plan for continuation, modification, or termination of those initiatives. Following the Clean Energy Fund (CEF) principles of "test-measure-adjust," the performance of each Market Development (MD) and Innovation and Research (I&R) initiative is carefully assessed, along with other information, to adjust future plans, including future budget and benefit estimates defined in each CEF investment plan.

The performance summaries that follow are organized into their respective MD or IR portfolios and chapters, consistent with New York State Energy Research and Development Authority's (NYSERDA) investment plan filings. Performance to date represents a cumulative look back at the period from program launch through December 31, 2020. Therefore, all planned values represent those contained in NYSERDA's approved investment plans as of December 31, 2020. Where applicable (for non-transition programs) performance includes milestones completed during the calendar year 2020 and progress toward output/outcome metrics reported through 2020. A summary of current program evaluation activity and findings is presented for over 20 active CEF initiatives, providing deeper insight on the impact of these programs since they were launch.

This report rectifies incorrect table labeling identified during its preparation within appendix A of the 2018 and 2019 annual reports. The Results to Date—Metrics tables wrongly identified Participant Bill Savings as "Annual" when the tables were actually presented as Lifetime values.

Appendix Contents by Portfolio Chapter

Innovation and Research Portfolio

Market Development Portfolio

Clean Energy Fund:

Buildings Innovation

Portfolio: Innovation and Research

NextGen HVAC

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start									End

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	15,030,795	13,599,832	90%
Leveraged Funds ($)	75,961,950	68,828,645	91%

Summary of Performance and Future Plans
This initiative is generally performing well with respect to planned activities and progress to date. A number of completed product development projects and associated revenue from commercialized projects are lagging targets due to a few protracted contract negotiations and COVID related delays. To expediate and capture promising project opportunities the NextGen HVAC Innovation Challenge solicitation/round cycle will transition to every six months versus the current nine months, and a standalone “Technology Transfer Challenge” open enrollment solicitation will be issued Summer 2021.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Issue awards following release of fourth Innovation Challenge	The awards have been issued and are expected be contracted by the end of 2020.

Summary of Current Evaluation Findings
A study assessing the benefits and impacts of metrics including product commercialized, replication, and energy effects across product development initiatives is in the scoping phase with plans to be underway in 2021.

NextGen HVAC continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*		
	Indicators	**Before/Current**	**2020**	**2019**	**2022**	**2025**
Outputs	Number of product development projects initiated	0	17	15	30	30
	Number of product development projects completed	0	3	6	17	30
	Number of demonstration projects	0	22	6	20	20
	Number of companies supported or other partnerships (Joint Development, Joint Venture) with established manufacturers	0	27	20	40	45
Outcomes	Number of products commercialized	0	5	4	6	10
	Revenue to companies commercializing products (millions)	0	$1.6	$3.0	$18	$40
	Number of replications from demonstration projects	0	147	30	60	85

Table notes

a. A zero (0) as the baseline denotes that NYSERDA will not count any activities, outputs, and outcomes supported with prior resources (e.g., pre CEF) towards the achievement of the stated goal in this table.

b. Replications are defined as known incidences where the innovation was deployed without NYSERDA funding. Reported progress is based on programmatic data and will be validated through an upcoming evaluation study assessing demonstration projects

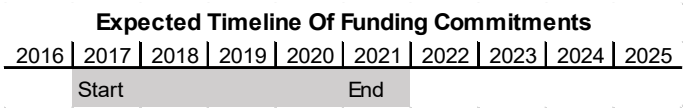
Clean Energy Fund:

Clean Transportation

Portfolio: Innovation and Research

Electric Vehicles—Innovation

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	9,749,996	9,528,480	98%
Leveraged Funds ($)	24,304,060	23,806,482	98%

Summary of Performance and Future Plans

This initiative is generally performing well with respect to planned activities and progress to date. Product development projects, demonstration projects, and research studies are underway. The program is seeing strong progress toward reducing the cost of installing charging stations.

Moving forward, NYSERDA plans to modify the program to focus more on removing barriers to medium- and heavy-duty vehicle electrification.

Summary of Current Evaluation Findings

A market baseline and a key indicator update were previously conducted on Electric Vehicles. The baseline study, completed in Q2 2017, is posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Clean-Transportation-Market-Characterization-Study-Vol3.pdf
The key indicator update, completed in Q3 2018, is posted publicly: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={DAE5AE68-D90B-4AEA-BEE2-3152376CFB5F}

A comprehensive evaluation encompassing Clean Transportation (and serving as an update to the Electric Vehicles baseline) is currently underway and expected to be completed during 2021. Key research objectives include measuring the growth of EV charging station availability across the State and understanding the public perception of EVs among personal vehicle owners. This evaluation also includes an impact evaluation of the Electric Vehicles initiative. Early findings from the evaluation, utilizing data collected during program implementation and secondary data sources, have been incorporated into this IPPR filing.

Electric Vehicles—Innovation continued

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Complete bench-scale prototypes of economically viable technologies that enable smart charging.	Projects are underway and expected to produce prototypes in 2021.
Fast-charging station network expanded to 30 locations statewide along major interstate corridors.	The number of fast-charging stations continues to increase along major interstate corridors. There are now more than 30 such locations in NYS. NYSERDA launched a new solicitation supporting Direct Current Fast Charging (DCFC) development in Q4 2020, which will expand charging options in Upstate New York.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Number of product development and demonstration projects initiated	0	20	28	50
	Number of product development and demonstration companies supported	0	19	18	30
	Number of industry stakeholders engaged in consumer awareness programs	0	53	20	50
	Number of aggregate charging station purchase participants	0	423	150	400
Outcomes	Number of charging stations installed in NYS	1,639	7,200	3,000	4,500
	Avg. installed cost of Level 2 charging station per port	$8,774	$6,749	$7,500	$6,500
	Products commercialized	0	0	2	4
	Revenue ($millions)	0	0	$1	$5
	Replications from demonstration projects	0	0	2	6

Table notes

a. N/A denotes that NYSERDA has not yet measured or been able to measure the indicator. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Updated baseline metrics reflect the final Clean Transportation Market Characterization study located here: https://www.nyserda.ny.gov//media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Clean-Transportation-Market-Characterization-Study-Vol2.pdf. Additional volumes of this study, including the Executive Summary, Electric Vehicles and Transportation Demand Management Market Characterization and Baseline Assessments and report appendices can be found under the Clean Transportation Market Characterization Study heading here: https://www.nyserda.ny.gov/About/Publications/Program-Planning-Status-and-EvaluationReports/Evaluation-Contractor-Reports/2017-Reports.

c. Note that the rebate program is currently anticipated to end by 2020, not 2022. This limits Activity/Output metrics, while Outcome metrics are anticipated to continue growing beyond the end of the rebate program because of momentum generated in the EV market.

Public Transportation and Electrified Rail

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start						End			

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	9,552,025	10,131,139	106%
Leveraged Funds ($)	22,613,188	22,485,163	99%

Summary of Performance and Future Plans

This initiative is generally performing well with respect to planned activities and progress to date. NYSERDA's collaborations with public transportation organizations have become even more important to help define the future of public transportation, post-COVID.

The program is expected to continue working with transit operators on innovative approaches to public transportation in line with current and future needs.

Summary of Current Evaluation Findings

An indicator tracking memo for the Public Transportation and Electrified Rail initiative documented values for key indicators and was completed in Q3 2018. This memo is posted publicly and available: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={6479E721-FCA2-46F1-B30B-B8D5865E6B4A}

Case studies supporting NYSERDA's Clean Transportation activity were completed in 2020 and focused on two projects: KLD Engineering, a company that has successfully piloted and developed adaptive traffic lights and ClearVu, a company that successfully demonstrated a networked solid-state lighting in subways. The KLD Engineering case study can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/NYSERDA-CleanTransportation-KLD-EvaluationCaseStudyReport-June2020.pdf
The ClearVu case study is also on the website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/NYSERDA-CleanTransportation-ClearVu-EvaluationCaseStudyReport-June2020.pdf

A comprehensive evaluation encompassing Clean Transportation is currently underway and expected to be completed during 2021. The key research objective of this study will be to measure the progress of electrifying public transit systems across the State, including bus and railway systems. Early findings from this evaluation utilizing data collected during program implementation and secondary data sources have been incorporated into this IPPR filing.

Public Transportation and Electrified Rail continued

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Issue awards for third competitive solicitation for the development and demonstration of public transportation technologies.	NYSERDA made three awards in Q3 2020 from PON 4448, the Transit Tech Lab Partnership Program. These awards support demonstrations of innovative technologies in partnership with the Metropolitan Transportation Authority (MTA), Port Authority of New York and New Jersey, and New York City Department of Transportation.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Number of projects initiated	0	24	18	47
	Number of companies supported	0	24	14	28
	Number of transit procurements assisted	0	5	2	5
	Number of third-party partnerships facilitated	0	1	2	5
Outcomes	Private Investment/ Leveraged Funds acquired ($ millions)	$0	$2.3	$16	$42
	Products Commercialized	0	2	1	4
	Revenue ($ millions)	$0	$0.39	$0.5	$5
	Replications from demonstration projects	0	0	2	10

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

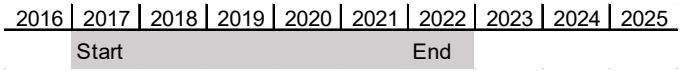
Clean Energy Fund:

Energy Related Environmental Research

Portfolio: Innovation and Research

Energy Related Environmental Research

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	24,587,019	25,054,850	102%
Leveraged Funds ($)	7,796,414	6,316,878	81%

Summary of Performance and Future Plans

Leveraged funds are lagging as the program has been advancing less traditional environmental research projects, such as offshore wind pre-development—including Metocean FLiDAR buoy deployment to measure wind speeds and oceanographic conditions—and Geophysical surveys in the New York Bight.

Program emphasis continues to evolve based on policy needs. It is anticipated that the program will continue to shift focus away from lower priority issues (e.g., acidic deposition) and toward emerging research and data needs relating to renewable energy (offshore wind, large-scale renewables) and support for equitable policies for disadvantaged communities (e.g., air quality and climate resilience.

Summary of Current Evaluation Findings

A citation analysis, completed in Q4 2018, was conducted on the Energy-Related Environmental Research initiative and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2018-Environmental-Research-Citation-Analysis.pdf
Given the importance this initiative places on information dissemination, the study was designed to obtain evidence that program-supported publications influence subsequent research, decision-making and policy—as well as to quantify the number of citations from program-supported efforts. Using an analytical tool that matches author records with a bibliographic database, selected key findings from the study included:

- Funded papers continue to be cited and referenced in journal articles at an increasing rate and the intellectual reach of funded papers continues to expand.
- The cumulative number of citations has increased each year between 1999–2018; by 2018, funded papers had been cited over 12,000 times.
- Funded research is reaching more journals than ever: from 43 journals in 2009 to 102 in 2018; additionally, more journals are representing the bulk of citations, suggesting greater diffusion of funded papers in the literature.

An update to this analysis is planned for 2022.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Issues awards from solicitations released in 2020	A total of 46 contracts were executed by the program in 2020 from solicitations and other procurement processes. The program has expanded its reliance on mini-bid awards as research and policy needs have become more specifically defined and timelines accelerated.

Energy Related Environmental Research continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2021**
Outputs	Update multi-year Research Plan components with input from policymakers, scientists, and other stakeholders	0	3	3	6
	Sponsored workshops, conferences, seminars or facilitated meetings to inform decision making	0	29	15	25
Outcomes	$9.5M in leveraged funds (co-funding and outside investment) to support projects and sponsored research	0	$6,316,878	$6,255,107	$9,567,644

Clean Energy Fund:

Grid Modernization

Portfolio: Innovation and Research

High Performing Grid

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start							End		

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	60,317,740	52,340,448	87%
Leveraged Funds ($)	213,690,948	187,431,400	88%

Summary of Performance and Future Plans

This initiative is generally performing well with respect to planned activities and progress to date. PON 4074 closed in Q4 2020 with a surge of proposals just before the deadline. The increased volume of proposals required additional time to score and award projects. As a result some awards were delayed until early 2021 and contributed to 2020 progress falling short of plan for budget commitments and leveraged funds.

The program is implementing an updated strategy focused on identifying and defining specific grid-related performance gaps that slow progress toward the goals of the Climate Leadership and Community Protection Act (Climate Act). The program will then solicit projects to solve the specific performance gaps and accelerate Climate Act progress.

Summary of Current Evaluation Findings

A key indicator update, completed in Q3 2018, was completed for the High Performing Electric Grid initiative and is posted publicly: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7EECC429-F810-4053-BF04-69CAE8A80CA6}

Two case studies supporting NYSERDA's Grid Modernization activities were completed in 2020 and focused on two efforts: grid modernization improvements with Central Hudson and impacts related to a grid technology developed by Micatu. The Central Hudson case study can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/NYSERDA-GridModernization-CentralHudson-EvaluationCaseStudyReport-July2020.pdf
The Micatu case study is also on the website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/NYSERDA-GridModernization-Micatu-EvaluationCaseStudyReport-July2020.pdf

A study assessing the benefits and impacts of metrics including product commercialized, replication, and energy effects across product development initiatives is in the scoping phase with plans to be underway in 2021.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Issue awards following release of solicitation number 6.	PON 4128 round 3 to be issued in 2021

High Performing Grid continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Number of studies, demonstrations, and product development projects initiated	0	50	52	109
	Number of studies, demonstrations, and product development projects completed	0	13	19	67
	Number of companies supported, utility touchpoints/ partnerships, other partnerships with established manufacturers or grid technology companies	0	50	31	64
Outcomes	Application of advanced distribution management system (ADMS) to increase system (enterprise level) intelligence by predicting failures, preventing disruptions, and supporting self-healing.	Partial application of ADMS controls in 2 NY utilities	Model-centric ADMS controls used at one NY utility.	Full application of ADMS controls in 1 NY utility	Full application of ADMS controls in 2+ NY utilites
	Tests and pilots of technologies/systems that enable system conditions prediction and restoration	Early stage products/no pilots	One new line segmentation and restoration process in use at a utility.	1 product/service in pilot or general use at 1 utility	2+ products/servies in general use at 1 utility
	Application of power flow optimization systems (combination of computer systems and hardware to dynamically manage power flow)	Partial use in 1 utility/planned near-term pilot	Active pilot project for power flow optimization at one utility.	1 pilot at 1 utility	in progress* at 1 utility
	Advanced control/integration of DER in electric grid (ability to monitor and control DER in system, ability to take action on DER resources in system)	Mid-stage research	Full functionality pilot project with integration of multiple DER sources at one utility.	1 pilot using multiple DER sources	Full scale deployment in progress* at 1+ utility

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Full scale deployment in progress means that the utility has presented its rate case to DPS, and is in the process of using that money to deploy power flow optimization systems

c. Full scale deployment in progress means that the utility has presented its rate case to DPS, and is in the process of using that money to deploy DER control and integration systems.

Power Electronics Manufacturing Consortium (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	16,700,000	16,694,490	100%
Leveraged Funds ($)	135,000,000	135,000,000	100%

Summary of Performance and Future Plans

The project has been completed with building of $1.7B CREE Wolfspeed Chip Fab facility in Utica, NY.
The Power Electronics Manufacturing Consortium assets and processes were acquired by CREE Wolfspeed as part of the agreement. Therefore, the consortium will no longer operate as a consortium, but rather as a commercial facility, and no additional partner companies/customers will be added.

Progress to date and future milestones on Wolfspeed chip fabrication facility at Marcy Nano Center in Utica, NY:

- Facility building in progress
- New York State and local governments committing $640M of total project $1.7B
- CREE Wolfspeed has committed to 620 direct jobs for 'Fab 1' phase
- The facility will be ready for fabrication line equipment from PEMC May/June 2021
- First production ramp expected winter 2022

As of 12/31/20 this initiative is no longer an "active" CEF program; reporting of output/outcome indicators will cease as a result of the acquisition.

Key Milestones Completed During 2020

All milestones have been completed.

Power Electronics Manufacturing Consortium continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Number of consortium members	2	N/A	12	18
	Number of discrete development projects initiated	0	N/A	5	9
Outcomes	In-field demonstrations of devices/systems developed at PEMC	0	N/A	3	8
	# of products commercialized	0	N/A	5	15
	Revenue for PEMC SiC Process Line	0	N/A	$25M	$45M
	Production Capacity	0	N/A	4,500	11,000

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. This project has been completed with the building of a $1.7B Cree Wolfspeed Chip Fabrication facility in Utica, NY. This will operate as a commercial facility and not a consortium. Due to these changes, the originally planned outputs and outcomes are no longer relevant.

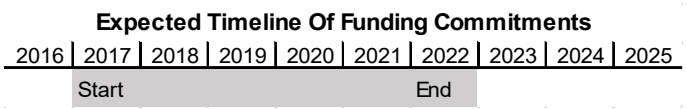
Clean Energy Fund:

Innovation Capacity and Business Development

Portfolio: Innovation and Research

Cleantech Startup Growth

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	63,052,977	52,337,275	83%
Leveraged Funds ($)	433,752,569	483,979,562	112%

Summary of Performance and Future Plans

Cleantech Startup Growth has been reasonably consistent with the plan. This portfolio has achieved excellent leverage, among the highest of all CEF programs, and has committed most of planned budget. Under-commitment of planned budget in 2020 is largely due to multiple staff transitions over the 2019–2020 budget period and COVID-related portfolio impacts.

Of notable interest, the growth-stage technology accelerator *The Clean Fight* is exceeding first-year expectations by recruiting 9 leading buildings technology companies, including 6 from outside the State, to partner with a dozen strategic customers in the New York market.

NYSERDA plans to build on the Cleantech Startup Growth program through a variety of investment plan modifications to be filed in 2021, supporting later-stage companies and researchers and innovators in sectors related to New York State's nation-leading climate goals.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study was competed in Q3 2018 and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2018-08-CleantechStartup-MarketEvaluation-Report.pdf Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports, which are posted publicly and linked above.

The first longitudinal update to the baseline study will be underway in 2021.

A case study detailing NYSERDA's incubator activity and associated impacts was completed in 2021 and focused on the NYC ACRE/Urban Future Lab, a NYSERDA-funded incubator. The case study can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/NYSERDA-Cleantech-Startup-Incubator-EvaluationCaseStudyReport-June2020.pdf

Cleantech Startup Growth continued

Key Milestones Completed During 2020

COVID-19 Response Program (New York Climate Progress Convertible Note program)

Milestone	Explanation of Progress
Formal Voice of Customer exercise completed.	Over 100 start-ups and investors were interviewed to determine optimal program design.
Solicitation launched	The solicitation was launched November 13, 2020. Scoring for applicants who have applied to the first program deadline is nearing completion and a formal partnership with the Green Bank is being finalized to ensure the first awards can be made in the coming months.

Ignition Grants

Milestone	Explanation of Progress
Begin demonstration projects.	Executed ignition contract projects—include demonstration projects that have begun.

Proof-of-Concept Centers (POCCs)

Milestone	Explanation of Progress
Executive director hired to oversee POCCs.	Executive directors/program director hired for both the upstate and downstate POCC programs. Venture for ClimateTech (the $10m upstate program) and The Clean Fight ($6m downstate program) have both launched. Venture for ClimateTech is currently accepting its first program cohort (from a pool of over 550 applicants from around the world) and The Clean Fight is completing year 1 of its program focused on retrofit solutions for Class A buildings. The Clean Fight is planning a second cohort focused on retrofit and decarbonization solutions for Class B and C buildings. Both programs have built diverse, nationally recognized advisory boards which have succeeded in raising the profile of these initiatives.

Cleantech Startup Growth continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Incubators - Companies Engaged	0	135	119	146
	Incubators - Companies Graduated (Graduates)	0	31	12	21
	Geographic Coverage - Companies Engaged	0	4	24	24
	EIR - Companies Engaged	0	176	520	130
	76West - Companies Engaged	12	38	24	24
	POCCs - Teams Engaged	0	9	15	75
	POCCs - Businesses Formed	0	0	10	40
	ICC Engagement - Companies Engaged	0	400	141	496
	Innovation Advisors - Advisors Deployed	3	1	7	19
	COVID Response - Companies Engaged	0	0	0	20
Outcomes	Products Commercialized	293	149	93	193
	Investor Agreements Executed	0	53	5	25
	Corporate and Strategic Partnerships Formed	0	0	3	18
	Customer Agreements Executed	0	15	1	10

Table notes

a. There may be some overlap in the Activity/Outputs and/or Outcomes that are achieved and reported through this set of initiatives. For example, a company that is a client of an Incubator may also receive support from the Entrepreneurs-In-Residence program or one of the Investor, Corporate, and Customer Engagement activities.

b. 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

c. Revised baseline values are based on preliminary research and will be updated upon completion of a market evaluation study still underway. Once finalized, this study will be available publicly on NYSERDA's website and in the DPS Document and Matter Management system.

Manufacturing Corps

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Start			End					

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	12,000,000	9,708,293	81%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	64,342,000	51,675,300	80%

Summary of Performance and Future Plans

Activities are generally consistent with the plan, but the program fell behind planned pace—mainly on budget commitments and leveraged funds. This being said, the program has exceeded expectations on outcomes and continues to perform well. Broadly, the program is unlocking accelerated manufacturing milestones critical to scaling up innovations and has become a name brand program for later stage companies in the technology-to-market portfolio and an. n important tool in the innovation toolbox.

A new PON for the program will be released by Q3 2021 following an investment plan modification. The program is contracted to operate through mid-2022, and adjustments to plan timeline for market engagement will reflect this after NYSERDA files an update to its investment plan for the initiative.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study was completed in Q3 2018 and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2018-08-CleantechStartup-MarketEvaluation-Report.pdf Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports, which are posted publicly and linked above.

The first longitudinal update to the baseline study is anticipated in 2021.

Key Milestones Completed During 2020

No milestones were completed in 2020.

Manufacturing Corps continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2023**
Outputs	Manufacturing strategies developed for cleantech products	0	42	66
	Manufacturing agreements signed between startups & manufacturers	0	85	66
Outcomes	Cleantech products manufactured total	221	41	66
	Agreements to invest in cleantech startup companies signed	70	16	14

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. An engaged market actor is one who is accessing a specific M-Corps Initiative intervention. All activities, outputs, and outcome metrics outlined in this initiative are stated and will be measured using engaged actors.

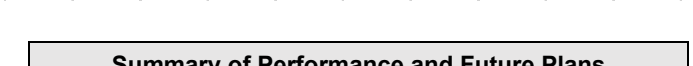
c. NYSERDA recognizes that not all cleantech products will be manufactured in NYS. For those engaged in the M-Corps Initiative, NYSERDA will track both the total number of cleantech products manufactured and the subset of those that are manufactured in NYS.

d. In this instance, "Number of agreements to invest in cleantech startup companies signed" refers to the number of agreements between engaged cleantech startup companies and private capital investors and/or strategic corporate partnerships. The value of these agreements depends on the exact mix of cleantech startup companies and cleantech products. This assumes a 3-5-year lag from the time agreements are committed toward realizing the target.

e. The baseline outcome numbers above include market activity prior to the official start of CEF and thus include actions taken outside of NYSERDA initiatives; target outcome numbers represent only activity expected to occur as a result of the associated NYSERDA initiatives.

Novel Business Models and Offerings

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	11,987,660	6,184,384	52%
Leveraged Funds ($)	125,377,036	64,022,176	51%

Summary of Performance and Future Plans

The first PON under the Novel Business Models program was undersubscribed, with just over $6 million awarded out of $8 million available. In addition, some of these awards did not go to contract in a timely way because of contract contingencies that could not be met. Finally, all of those that did go to contract experienced a slowdown due to COVID-19-related factors, and most have requested contract extensions. Upon review of this program, the technology-to-market team has decided to terminate the novel business model program model as initially structured in the first PON in exchange for an 'insurance accelerator' program to be launched in 2021.

As part of active portfolio management, NYSERDA will close down this PON and reallocate capital to funding finance and insurance initiatives to drive climate outcomes. A new PON is planned for Q3 2021.

Key Milestones Completed During 2020

All milestones have been completed.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Number of companies supported	0	14	16	33
	Number of validation and scaling projects initiated	0	11	19	46
	Number of validation and scaling projects completed	0	2	14	46
Outcomes	Number of supported companies raising additional capital	0	7	0	11
	Number of new business models successfully scaled by supported companies	0	2	4	8
	Number of new business relationships formed with utilities by supported companies	0	0	2	6

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

Clean Energy Fund:

Renewables Optimization

Portfolio: Innovation and Research

Energy Storage Technology and Product Development

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Start								End

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	14,060,002	10,194,194	73%
Leveraged Funds ($)	70,249,930	48,866,330	70%

Summary of Performance and Future Plans

Engagement with companies has been strong through the end of 2020, nearly reaching the target set for 2022. The program fell behind planned budget and leveraged funding plans in 2020, however, because new solicitations were paused in the second half of 2019 for a strategic review of the program's objectives (to be informed by Climate Act priorities and program learning to date). A formal voice-of-customer study and interviews were led by NYBEST in Q3-Q4 2020 and are providing input to a program modification expected to be completed in Q2 2021. The proposed modification will emphasize Long Duration Energy Storage Innovation.

Summary of Current Evaluation Findings

A market baseline and updates have been conducted on the Energy Storage initiatives: Reducing Barriers to Deploying Distributed Energy Storage and Energy Storage Technology and Product Development. The baseline study was completed in Q4 2017 and is posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Baseline-Market-Evaluation-Metrics-Energy-Storage-FinalReport.pdf
The most recent update to the baseline study was completed in Q3 2020 and is also posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/NYSERDA-2019-Energy-Storage-Market-Evaluation-Report-Final.pdf

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports which are posted publicly and linked above. Key findings from the Q3 2020 report include:

- Average total installed system costs and the proportional percentage of soft costs for BTM projects in New York State continues to increase since 2017, while average hardware costs have decreased. The median installed system costs, including hardware cost percentage, have also decreased since 2017, indicating that fewer, more costly projects may be driving up the average installed system cost for 2019.
- On average, survey responses indicated that FTM systems with durations shorter than three hours cost roughly 15 percent more than FTM systems with durations longer than three hours.
- While total installed costs for FTM systems were consistent across the primary data collection and literature review findings, BTM system costs from the survey were higher than the literature review findings, particularly for labor and soft costs. Specifically, the costs associated with permitting and interconnection were the two largest contributors to soft costs according to survey data.

It is important to note that these studies represent a nascent market; the population of projects and associated sample sizes may be very small, and findings related to cost and other data points could be affected by outlier or unique projects. However, these time series evaluations are still valued and serve as an important reference source to strategy development and planning.

A third update is anticipated to be completed in Q3 2021 and will be posted on NYSERDA's website upon finalization.

A case study highlighting NYSERDA's Energy Storage Innovation and Research activities was completed in 2020 and focused on two projects: Urban Electric Power and Ecolectro. The case study can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Other-Technical-Reports/20-15-NYSERDA-Innovation-and-Technology-Energy-Storage-Case-Study.pdf

A comprehensive market and impact evaluation of Energy Storage is in development and is anticipated to be underway mid-2021.

Energy Storage Technology and Product Development continued

Key Milestones Completed During 2020

No milestones were completed in 2020.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Number of studies, demonstrations, and product development projects initiated	0	30	30	60
	Number of studies, demonstrations, and product development projects completed	0	4	10	46
	Number of strategic partnerships between small/medium sized companies and large OEMs formed	0	0	5	23
	Number of companies supported	0	50	25	55
Outcomes	Number of products commercialized	0	0	3	14
	Number of test sites for new technologies	0	3	9	18
	Revenue to companies commercializing products ($millions)	0	0	$3	$23
	Number of replications from demonstration projects	0	0	10	30
	Hardware BOS cost including power electronics for energy storage systems and Hardware Installation cost	Lead acid system: $1000/kWh for 4 hr. duration. Lithium ion system: $667-$670/kW.	> 10% Cost Reduction	10% cost reduction	20% cost reduction
	Hardware cost for energy storage devices	Lead acid system: $600-$650/kWh for 4 hr. duration. Lithium ion system Hardware (excluding battery): $369-$380/kW Battery only: $350-$500/kWh	> 10% Cost Reduction	10% cost reduction	20% cost reduction
	Performance of energy storage systems (efficiency, life, energy/power density, etc.)	TBD	N/A	10% improvement	20% improvement

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

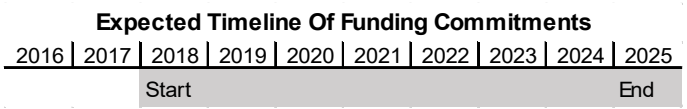
b. Revised baseline metrics reflect the recently-completed Energy Storage market baseline evaluation which included research on Renewables Optimization. This study will be available publicly on NYSERDA's website and in the DPS Document and Matter Management system in the near future

c. Baseline hardware BOS and storage device costs for Lead acid systems are found within the recently-completed Energy Storage and Renewables Optimization market baseline evaluation, these values are from New York State installations in 2016.

d. Baseline hardware BOS and storage device costs for Li-ion systems are found within the recently-completed Energy Storage and Renewables Optimization market baseline evaluation, these values are from secondary data and do not reflect New York State specific costs. Baseline data will be updated when New York State installations are available.

National Offshore Wind Research and Development Consortium

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	16,433,893	12,272,628	75%
Leveraged Funds ($)	83,905,732	58,484,232	70%

Summary of Performance and Future Plans

This program has shown strong market engagement, already exceeding the long-term (2025) target for companies supported in just the first three years of operation. The program fell behind budget commitment and leveraged funding plans in 2020 due to an outstanding response to the second consortium solicitation in Q3 2020. The solicitation received 100 project proposals seeking greater than $63 million in funding. The volume of proposals caused the review/award effort to extend into Q1 2021.

Twenty project awards totaling $10.67 million ($5.34 million CEF funding) are expected in Q1 2021, bringing the program back in line with the program's aggressive 2020 plan.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Investor and public sponsor outreach strategies approved by Board of Directors.	Investor and Public Sponsor outreach strategies have been approved by National Offshore Wind Research and Development Consortium Board of Directors and are currently being executed. New York Power Authority (NYPA), Electric Power Research Institute (EPRI) and Hitachi ABB all joined the consortium in 2020 and Maine will join the consortium in Q1 2021.
U.S manufacturing and data management plans approved by Board of Directors.	U.S. Manufacturing and Data Management Plans have been approved and are in execution.
Issue awards for projects selected through solicitations.	Twelve additional projects were awarded in 2020. Twenty additional projects totaling $10.67 million ($5.34 million CEF funding) are expected to be awarded in Q1 2021.

National Offshore Wind Research and Development Consortium continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2021**	**2025**
Outputs	Number of studies, demonstrations, and product development projects initiated	0	26	25	31
	Number of studies, demonstrations, and product development projects completed	0	0	6	31
	Number of companies supported	0	18	12	15
Outcomes	Number of products commercialized	0	0	0	3
	Non-NYSERDA revenue to companies commercializing products ($ millions)	0	0	$0.5	$10
	Number of replications from demonstration projects	0	0	0	4

Table notes

a. A 0 (zero) as the baseline value denotes that NYSERDA will not count any activities, outputs, and outcomes supported with prior resources (e.g., pre CEF) towards the achievement of the stated goals in this table.

b. Here, replications are defined as known incidences where the innovation was deployed without NYSERDA involvement.

Clean Energy Fund:

Agriculture

Portfolio: Market Development

2030 GLASE (Greenhouse Lighting and Systems Engineering)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start	End								

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	5,000,000	5,000,000	100%
Electricity Savings, Annual (MWh)	3,470	3,470	100%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	17,361	17,361	100%
Participant Bill Savings, Lifetime ($)	2,914,800	3,295,905	113%
Leveraged Funds ($)	9,460,000	9,460,000	100%

Summary of Performance and Future Plans

Consortium membership is constant with a variety of controlled environment agriculture market actors. Progress has been made at both pilot locations with the installation of Lighting Shade and System Implementation (LASSI) control software. Adjustments were made in the research focus based on input received from the Industrial Advisory Board and the changing market.

The exiting and subsequent backfill of the principal RPI in 2019 has had an impact on achieving some of the program's early targets, as did the identification of pilot greenhouses which took more time than anticipated. COVID has further exacerbated some of these delays.

The program will, however, continue as defined in the current plan.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study, completed in Q4 2019, encompassed the Advancing Agriculture Energy Technologies, Technical Services (Agriculture), and 2030 GLASE initiatives and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2019-Agriculture-Market-Evaluation_Report.pdf

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. As seen in the output/outcome table, several outcomes are showing lagged progress; the longitudinal market study referenced below will update these outcomes. Full results can be found in the evaluation report, which is posted publicly and linked above.

The first longitudinal update to this baseline market study is planned to begin in 2021 along with a first impact evaluation study.

2030 GLASE continued

Key Milestones Completed During 2020

No milestones were completed in 2020.

Results to Date—Outputs/Outcomes

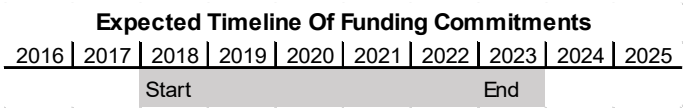
		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Number of paid Consortium memberships	0	25	20	25
	Greenhouse area used for pilot testing (sq ft)	0	34,600	26,000	26,000
	Number of services developed	0	1	2	3
	Number of product variations tested in pilot systems	0	1	5	8
	Number of case studies developed	0	0	2	4
Outcomes	Average market penetration of improved technologies in New York greenhouse acreage in the lettuce and tomato sectors	0%	0	22%	25%
	Number of provisional patents filed	0	2	2	8
	Reduction in greenhouse electricity use in New York (depending on NYS climate zone)	0	0	Up to 50%	Up to 70-86%
	Number of acres of greenhouses in New York (beyond pilot participants) adopting the improved technologies	0	0	18	23
	Consortium remains viable after NYSERDA milestones are completed	N/A	N/A	0	Projections for Year 8 financials show positive cash flow. Consortium has 25-30 paying members.

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

Advancing Agricultural Energy Technologies

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	2,846,075	2,069,665	73%
Electricity Savings, Annual (MWh)	3,150	2,900	92%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	1,739	1,791	103%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	25,567	23,749	93%
Participant Bill Savings, Lifetime ($)	8,024,250	7,525,500	94%
Leveraged Funds ($)	1,097,532	1,015,128	92%

Summary of Performance and Future Plans

The current program demonstrations/pilots continue to move toward completion with initial results expected in Q3 2021.

Beyond the current pilots, the program is otherwise paused and will be reevaluated as recommendations developed in the Agriculture and Forestry advisory panel are considered by the Climate Action Council.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study, completed in Q4 2019, encompassed the Advancing Agriculture Energy Technologies, Technical Services (Agriculture), and 2030 GLASE initiatives and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2019-Agriculture-Market-Evaluation_Report.pdf

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports which are posted publicly and linked above.

The first longitudinal update to this baseline study is planned to begin in 2021, along with a first impact evaluation study.

Key Milestones Completed During 2020

No current milestones were completed in 2020.

Advancing Agricultural Energy Technologies continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2022**
Outputs	Number of farm sites hosting demonstration projects	0	2	50
	Number of case studies developed and disseminated	0	0	10
	Number of open houses hosted	0	0	2
Outcomes	Number of farms knowledgeable of energy efficiency opportunities for underused or emerging technologies	82	N/A	100

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics. These values reflect metrics for this initiative only, and does not include any prior NYSERDA demonstration project efforts which focused on different technologies.

b. Range of awareness levels from 7% for energy-free livestock watering systems to 94% for LED lighting/LED lighting controls.

Clean Energy Fund:

Clean Heating and Cooling

Portfolio: Market Development

Heat Pumps Phase 1 (2017)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Start				End				

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	61,162,984	56,326,042	92%
Electricity Savings, Annual (MWh)	3,321	3,237	97%
Beneficial Electrification, Annual (MWh)	(98,798)	(74,401)	75%
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	1,699,760	1,261,573	74%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	1,304,908	971,538	74%
Participant Bill Savings, Lifetime ($)	288,374,839	251,664,275	87%
Leveraged Funds ($)	266,637,317	212,817,762	80%

Summary of Performance and Future Plans

Reporting of the ASHP Incentive Program is now included under this Initiative. The ASHP and GSHP Incentive Programs were formally closed and transitioned to the Utilities in Q2 2020 under NYS Clean Heat. Other components of the program fell behind planned savings pace in 2020 due to (1) only three of 10 state agency Geothermal Clean Energy Challenge recipients indicating serious interest in installation due to budget constraints and cost and (2) Heat Smart Communities correcting a duplicative reporting of energy savings that overlapped with ASHP.

The disposition of the Geothermal Clean Energy Challenge program, which focused on state agency facilities, will be reassessed after opportunities for additional state and federal funding are resolved. Additional energy savings may be reported as a result of Technical Assistance funds to support system design and energy analysis resulting from interest in the Community Heat Pump System initiative.

The conversion rate for Clean Heating and Cooling Community campaign participants has been about 18%. Heat pump sales cycles are long and were impacted further by COVID-19. 2021 efforts will be focused on driving more enrollments into campaigns while maintaining similarly high conversion rates.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. However, while a market baseline was completed for this initiative in 2020, future market evaluation studies will be examined to take into account the comprehensive delivery of the program among NYSERDA and NY utilities. The initial market baseline study is posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2020-Heat-Pump-Market-Evaluation-Report.pdf
The comprehensive assessment is in development now and will be underway by late 2021.

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports which are posted publicly and linked above.

Findings from a recent energy efficiency soft-cost study conducted by NYSERDA and completed in 2020 serve as a source for additional information regarding customer acquisition time and cost for Clean Heating & Cooling installers and the possible reduction in cost per installed systems. The study can also be found on the NYSERDA website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2020/1602180-NYSERDAEnergyEfficiencySoftCostMarketEvaluationReportOctober2020.pdf

Heat Pumps Phase 1 (2017) continued

A two-phase impact evaluation is currently underway for air source heat pumps (ASHPs) and ground source heat pumps (GSHPs). Key research objectives include verifying the annual gross energy impacts of ASHPs and GSHPs and calculating a realization rate; characterizing usage of ASHPs and GSHPs seasonally and through displacement/replacement of existing heating and cooling systems; and characterizing equipment performance issues. Data will be collected through reviews of program data, surveys of customers and installers; analysis of energy consumption data; and metering and monitoring of equipment.

Phase 1 of the study was completed in 2020 and phase 2, with a comprehensive summarization of all Phase 1 and Phase 2 findings, will be completed mid-2021. A statewide technical study assessing heat pump technology is in development and will be underway in 2021 in coordination with NYSERDA, DPS, and NY utilities.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
ASHP case studies developed and deployed in the market, along with current resources from regional and national organizations.	Heat Pump Case Studies are now available at https://www.nyserda.ny.gov/Researchers-and-Policymakers/Clean-Heating-and-Cooling
Close the GSHP Rebate Program in timing with the launch of the utility statewide heat pump program.	GSHP Rebate Program closed 3/31/2020; NYS Clean Heat Program opened 4/1/2020.

Heat Pumps Phase 1 (2017) continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*		
	Indicators	**Before/Current**	**2020**	**2019**	**2020**	**2022**
Outputs	# of community campaigns	1	46	8		72
	# of community campaign enrollees	200	3497	800		2,900
	# of program-qualified GSHP consultants and designers	0	84	10		15
	# of installers and drillers qualified by community campaigns and GSHP incentive program	0	119	40		50
	# of large commercial/institutional facility and campus screening studies completed	0	91	30		75
	# of large commercial/institutional facility and campus schematic designs completed	0	3	30		72
	# of large commercial/institutional facility and campus installations completed	0	0	7		36
	# of projects completed by community campaign participants	90	638	240		3660
	# of completed projects through the GSHP incentive program	0	1700	1000		1100
	# of case studies demonstrating successful cost reduction strategies and/or customer value	0	9	5		20
	Vendors trained (ASHP)	0	600		400	
	Upstream ASHP Incentives offered on individual units	0	19,967		11,433	
	Count of completed ASHP control pilot projects related to managing dual systems	0	0		2	
Outcomes	Increased awareness of RH&C technologies in communities with campaigns	0%	N/A	10%		20%
	Cost ($ per ton) in installed systems in community campaigns and for college and university campuses is reduced	0%	N/A	10% decrease		20% decrease
	# of communities continuing campaigns without NYSERDA direct financial support	0	N/A	0		8
	# of International Ground Source Heat Pump Association (IGSHP) - certified designers, installers and drillers active in NYS	82	986	100		110
	ASHPs sold annually	32,000	91,979		53,000	
	ASHPs as percentage of installed residential HVAC base	7%	18%		15%	
	Average decrease in first cost	0%	-19.9%		15%	
	Vendor use of NYSERDA co-op assistance in promoting ASHPs	0	82		25	

Table notes

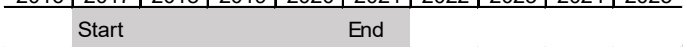
a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. In 2020 the Air Source Heat Pump sub-initiative of the Underutilized Product Support initiative was relocated (combined) with this Phase 1 set of sub-initiatives to that all heat pump related activity would be grouped and reported together despite their original filings being separate.

c. Three Outputs previously associated with Heat Pumps Phase 1 were mistakenly excluded from the relocation to Product and Appliances Standards. Progress against these Outputs is reported in the Product and Appliances Standards table in this report. These targets will be formally relocated in the upcoming refiling.

Renewable Heat NY—Clean and Efficient Biomass Heating

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	12,238,243	11,090,780	91%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	64,623	54,322	84%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	69,700	38,220	55%
Participant Bill Savings, Lifetime ($)	26,110,645	16,439,506	63%
Leveraged Funds ($)	11,650,390	10,438,746	90%

Summary of Performance and Future Plans

The majority of RHNY applications received were for wood pellet stove incentives, 40% of which served residential LMI customers. This strong uptake has enabled the program to exceed all three air quality outcomes a year ahead of schedule. Several large pellet boiler projects are in development, though no applications have yet been received.

RHNY is slated to end 12/31/2021 or when funds run out; whichever occurs first. Estimates indicate that program funds will be exhausted mid-2021 at which time RHNY will close to new applications. Discussions are in progress for NYSERDA to continue offering incentives for pellet stoves to the LMI community.

A wood chip market report is in progress and will be shared with the NYS forestry industry upon completion. A RHNY overview report will be generated covering progress made from the beginning of the program in 2014 through 2021.

Summary of Current Evaluation Findings

NYSERDA's market evaluation included a baseline study of the Renewable Heat NY initiative which was completed in 2020. Results of this market evaluation identified that high-efficiency, low-emission biomass systems are being installed by participating and non-participating RHNY installers. Since program funds will be exhausted in 2021, no further market evaluations are currently planned for this initiative.

The study is available on the NYSERDA website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2020-Renewable-Heat-NY-Market-Evaluation-Report-Final.pdf

Key Milestones Completed During 2020

All milestones have been completed.

Renewable Heat NY—Clean and Efficient Biomass Heating continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2021**
Outputs	Large commercial Projects (>88 kW)	4	0	9
	Residential / Small Commercial Projects (<88 kW)	23	58	170
	Residential Pellet Stove Projects	89	3303	1450
	Workforce Development – Training (Individuals Trained)	279	137	400
	Supply Chain Support – R&D (Projects Completed)	0	0	20
Outcomes	Reduction in PM2.5 from funded systems	15.8 tons/yr	227	140.5 tons/yr
	Reduction in CO from funded systems	114.8 tons/yr	1506	981.8 tons/yr
	Reduction in SO2 from funded systems	0.087 tons/yr	1.185	0.7 tons/yr

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Baseline values include projects that precede CEF funding.

c. Baseline value for reductions in PM2.5, CO, and SO2 reflect reductions achieved through Renewable Heat New York to date. 2021 cumulative value reflects reductions based on targeted program activity.

Heat Pumps Phase 2 (2020)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
		Start							End

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	16,068,470	12,178,677	76%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans
Funding for Heat Pump Phase 2 initiatives was approved in May 2020 through the Clean Heating and Cooling Chapter and is one of several CEF initiatives approved to support the NYS Clean Heat Market Development plan. Progress reported to date is driven by commitments for Marketing and Consumer Awareness activity. Awareness has been identified as a top critical market need to influence updates in clean heating and cooling solutions. Additional development work is underway for areas of the plan such as Supply Chain and LMI-Electrification. The first Community Heat Pump Systems solicitation (which was delayed in 2020 due to COVID) will be released in 2021, along with a Cost Compression strategic plan and field metrics associated with Cooperative Advertising and Training solicitation. Collaboration in 2020 has paved the way for The NYS Clean Heat statewide marketing framework, the most comprehensive joint Utility-NYSERDA consumer awareness campaign of the CEF, slated to launch Q2 2021.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Launch NYS Clean Heat Contractor Resource Landing Page.	NYS Clean Heat contractor resources landing page is live: https://saveenergyny.ny.gov/NYScleanheat/
Launch revised Co-op Advertising offering to clean heat industry partners.	Co-op Advertising has been relaunched under Program Opportunity Notice (PON) 4482.
Initial LMI incentives (supplemental to utility incentives) are made available.	This incentives pilot launched in Dec 2020.

Heat Pumps Phase 2 (2020) continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*					
	Indicators	**Before/Current**	**2020**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Outputs	Number of leads generated for contractors	1	7969	30,000	140,000	250,000	430,000	680,000	1,000,000
	Customer acquisition costs offset, in dollars	0	492,379	185,000	600,000	1,000,000	1,600,000	2,250,000	3,000,000
	Coop advertising campaign costs offset, in dollars	0	492,379	600,000	3,150,000	5,850,000	8,250,000	9,500,000	
	Number of Clean Thermal District System projects supported by NYSERDA	0	0				2		
	Businesses provided with tools, technical support and business development assistance	TBD	0		50	75	125	150	200
	Number of LMI households with heat pump installations (demonstrations and direct installations)	TBD	0	2,300	5,650	7,500			
	Number of energy-efficient electrified space and water heating technologies installed through NYS Clean Heat	0	5,718	3,900	18,200	32,500	55,900	88,400	130,000
Outcomes	Increase in awareness of CH&C technologies*	TBD	N/A			15%			50%
	Replication of Clean Thermal District System projects beyond NYSERDA supported projects	0	N/A					1	2
	Reduce the cost of heat pump installations in New York*	0%	N/A			10%			25%
	Increase stocking of heat pumps above HARDI 2019 shipments*	0%	N/A			20%			50%
	Increase penetration of high-performance cold climate heat pumps as a percent of all heat pumps shipped for space conditioning in New York (baseline 2018 HARDI ASHP data)*	61%	N/A			70%			90%

Table notes

* This investment plan includes broader market progress metrics, for example overall heat pump market size and market penetration of cold climate heat pumps. These market progress metrics will be supported collectively by all of NYSERDA's market development activities that extend beyond this singular investment plan. NYSERDA will measure market progress broadly, rather than for each specific investment plan. Progress will be reported collectively within the Statewide Heat Pump Program

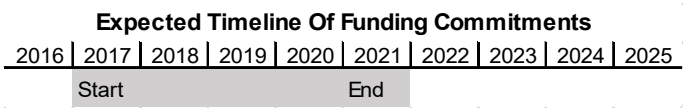
Clean Energy Fund:

Clean Transportation

Portfolio: Market Development

Electric Vehicles—Rebate

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	34,212,980	37,265,582	109%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	(72,459)	(78,259)	108%
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	1,250,178	1,427,006	114%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	533,450	631,164	118%
Participant Bill Savings, Lifetime ($)	316,570,549	363,571,472	115%
Leveraged Funds ($)	760,935,000	804,755,000	106%

Summary of Performance and Future Plans

Program is performing well with respect to expected activities and impact. The pace of EV rebates accelerated in Q4 2020, setting a new high for a calendar quarter at 5,200 rebates, a 50% increase over the previous high. The fast pace of EV sales in Q4 helped New York State increase its EV sales significantly in 2020 compared to 2019.

The program is expected to exhaust its CEF funding in Q1 2021. No additional CEF funding is expected to be added to the program.

Summary of Current Evaluation Findings

A market baseline and a key indicator update were previously conducted on Electric Vehicles. The baseline study, completed in Q2 2017, is posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Clean-Transportation-Market-Characterization-Study-Vol3.pdf
The key indicator update, completed in Q3 2018, is posted publicly: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={DAE5AE68-D90B-4AEA-BEE2-3152376CFB5F}

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports which are posted publicly and linked above.

A comprehensive evaluation encompassing Clean Transportation (and serving as an update to the 2018 Electric Vehicles baseline) is currently underway and expected to be completed during mid-2021. Key research objectives include measuring the growth of EV charging station availability across the State and understanding the public perception of EVs among personal vehicle owners. In addition, since NYSERDA's EV Rebate offering will soon end, this study will collect data to assist in future program planning. An impact evaluation of the Electric Vehicles initiative is also included in this study and will evaluate the gross energy impacts and assess the realization rate for verified savings. Early findings from this evaluation utilizing data collected during program implementation and secondary data sources have been incorporated into this IPPR filing.

Electric Vehicles—Rebate continued

Key Milestones Completed During 2020

All milestones have been completed.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2022**
Outputs	Number of rebates issued	N/A	35,245	33,000	46,000
	% of rebate recipients completing follow-up surveys	N/A	27%	20%	25%
Outcomes	Number of EVs registered in NYS	16,131	61,081	52,000	150,000
	EV market share (EV sales as a percentage of total car sales in NYS	0.6%	2%	2%	5%

Table notes

a. N/A denotes that NYSERDA has not previously administered a similar program, so no baseline is available, or the amount is not yet measured. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Updated baseline metrics reflect the final Clean Transportation Market Characterization study located here: https://www.nyserda.ny.gov//media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Clean-Transportation-Market-Characterization-Study-Vol2.pdf. Additional volumes of this study, including the Executive Summary, Electric Vehicles and Transportation Demand Management Market Characterization and Baseline Assessments and report appendices can be found under the Clean Transportation Market Characterization Study heading here: https://www.nyserda.ny.gov/About/Publications/Program-Planning-Status-and-EvaluationReports/Evaluation-Contractor-Reports/2017-Reports

c. Note that the rebate program is currently anticipated to end in 2021, not 2022. This limits Activity/Output metrics, while Outcome metrics are anticipated to continue growing beyond the end of the rebate program because of momentum generated in the EV market.

Clean Energy Fund:

Codes

Portfolio: Market Development

Code to Zero

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start						End			

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	11,919,203	9,657,455	81%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans

Activities are generally consistent with plan, but training far exceeded targets in 2020, even with a delayed launch of the new code cycle. Training goals were achieved one year ahead of schedule. The pace of budget commitments fell behind plan in 2020 due to COVID-related delays and staffing shortfalls, leading to delays in developing and launching two pilots.

NYSERDA is developing a modification to this investment plan that addresses several market needs, as well as takes account of direction from the Energy Efficiency & Housing panel of the Climate Action Council (CAC) on future codes and standards. The modification will allow NYSERDA to address the next two State code cycles and the expanded scope from CAC. In advance of that refiling, two pilots are in development for launch in 2021, and the development of NYStretch 2023 has kicked off, continuing through 2022.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. The baseline study was completed in Q2 2020 and is posted to NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2020-NYSERDA-Code-to-Zero-Market-Evaluation-Report.pdf
Select findings from the study include:

- The overall weighted panelist estimate of energy code compliance for commercial new construction in New York State was 83%, and the overall estimate of compliance for alterations and additions was 70%, both showing significant increases from the 2015 evaluation estimates.
- The panelists' overall weighted estimate of energy code compliance for single-family residential new construction in NYS was 77%, showing no improvement over the 2015 evaluation estimate.
- The panelists' overall weighted estimate of compliance for single-family alterations and additions was 71%, which is in the range of compliance estimated in the 2015 evaluation (62% to 71%).

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports which are posted publicly and linked above.

The first longitudinal update to the baseline study is in development and will be underway in 2021.

Code to Zero continued

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Contracts for audience-specific training content and approaches.	NYSERDA contracted with four service providers to deploy audience-specific training statewide, resulting in more than 13,000 seats trained in 2020.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2021**
Outputs	Number of individuals receiving NYSERDA-supported code training by market segment and building type	7,000	13967	13,250
	Number of pilots	0	0	6
	Number of entities NYSERDA supports in the enactment of energy codes	0	4	5
Outcomes	Percentage of market complying with the energy code	Commercial NC 83%; Residential NC 77%	Commercial NC 83%; Residential NC 77%	%Δ = 10%
	Number of jurisdictions (outside of the pilots) adopting alternative enforcement business structures	0	0	8
	Number of jurisdictions (outsid of the pilots) adopting stretch code	3	3	10

Table notes

a. TBD denotes that NYSERDA requires more data in order to quantify baseline/market metrics to the degree needed to measure against in the future. Baseline measurements of key market indicators are anticipated to occur soon following initiative approval and NYSERDA will update the information in this table as the information becomes available, which is anticipated within 9-12 months of initiative approval. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Target for percentage of market complying with the energy code is informed by a study by Pacific Northwest National Laboratory indicates that for commercial codes, compliance in the first year when a new code is adopted is estimated at 50%. This rate increases asymptotically every year to near 80% after 10 years. For residential codes, compliance in the first year is estimated at 80%, going to 100% (asymptotically) after 10 years. "Impacts of Model Building Energy Codes," p. iv and 9, PNNL-25611 Rev. 1, October 2016, Pacific Northwest National Laboratory.

Clean Energy Fund:

Commercial

Portfolio: Market Development

Energy Management Technology

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start						End			

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	70,013,069	73,497,252	105%
Electricity Savings, Annual (MWh)	826,093	802,082	97%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	1,193,365	934,659	78%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	4,237,885	4,508,779	106%
Participant Bill Savings, Lifetime ($)	1,102,159,966	1,309,230,296	119%
Leveraged Funds ($)	740,094,021	637,620,418	86%

Summary of Performance and Future Plans

Program continues to perform well with respect to expected activities and impact. Budget commitments and many impact metrics are meeting or exceeding plan expectations. Solution provider progress and engagement far exceeded goals.

NYSERDA filed a modification to this initiative in early 2021 that expands the budget and transitions the focus of this program to supporting RTEM market adoption in commercial tenant spaces, multifamily buildings and hard-to-reach sectors, and away from commercial and industrial buildings.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study was completed in Q4 2018 and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2018-12-CEM-Market-Baseline-Evaluation-Report.pdf
The first longitudinal update to the baseline study was completed in Q3 2019 and can also be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2019-Commercial-Energy-Market-Evaluation-Report.pdf

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports which are posted publicly and linked above.

A second longitudinal update is underway with results expected mid-2021.

In addition, an impact evaluation of the RTEM initiative began in 2020, and the comprehensive evaluation of the initiative is planned to be competed by mid-2021.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
NYSERDA issues a challenge to entrepreneurs and innovators to explore RTEM data sets to advance efforts at demand reduction and peak load shaping (Q4, 2020).	NYSERDA is supporting a PropTech challenge for entrepreneurs and innovators to explore granular data on office tenant energy consumption and to propose solutions.

Energy Management Technology continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2022**	**2025**
Outputs	Number of buildings participating in incentive program	0	1160	2000	
	Number of pilots	0	12	15	
	Number of qualified providers on NYSERDA list	0	150	90	
	Extent of use of qualified provider list by the market (%increase in NY EM revenue by listed vendors)	0	85%	90%	
	Participation of building owners/ managers in peer-to-peer exchanges (from incentive progam)	0	100	120	
	Number of Comprehensive building specific data sets submitted to NYSERDA	0	210	400	
	Number of downloads of EM technical guidance document	0	1200	1000	
	Percent of EM providers using the programmatic criteria & technical guidance document (as reported through annual survey)	0	99%	90%	
	Number of qualified EMIS providers	6	25		10
	Number of EMISs deployed in NYS as a result of this initiative	0	32		50
	EMIS subscription renewal rate	75%	80%		85%
	Number of EMIS assessments/audits as a result of this initiative	0	70		60

Energy Management Technology continued

Results to Date—Outputs/Outcomes

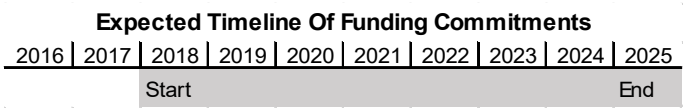
Outcomes	Awareness of EM among building owners/managers	23.6%	N/A	40%	
	Percent of EM projects that are a part of a larger building management portfolio	0	65%	50%	
	Persistence of EM service contracts (i.e how many customers extend their subscription with an RTEM provider beyond 5 years)	0	75%	60%	
	Percent in RTEM soft costs and operational costs	0	4%	25%	
	Percentage of EM projects that institute an energy efficiency goal	0	60%	65%	
	Size of market as indicated by vendor sales	$10M	N/A	$40M	
	Percent of decision-makers using EM data to assess operational risk (as reported through annual survey)	4.1%	55%	45%	
	Number of BMS offerings with integrated RTEM	TBD	10	50%	
	Percent of EM projects that use services for non-energy benefits (e.g long-term asset management, capital investment strategies, risk mitigation analyses)	0	60%	25%	
	Number of facility-wide EMIS deployments as a result of this initiative	0	2		45
	Number of enterprise-wide EMIS deployments as a result of this initiative	0	N/A		4
	Qualified EMISs with industrial operational control	0	4		3-5

Table notes

a. Because the market transformation efforts with these initiatives, additional time is needed to assess the persistence of adoption. TBD denotes that NYSERDA requires more data in order to quantify baseline/market metrics to the degree needed to measure against in the future. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline metrics.
b. Baseline measurements of the Commercial Energy Management initiatives were evaluated and reported in 2018. The report is available on the NYSERDA website - https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2018-12-CEM-Market-Baseline-EvaluationReport.pdf
c. Cumulative values provided for 2019 are outputs measured and reported using program data.
d. In the 2018 baseline evaluation, all responding BMS providers indicated that their products have the hardware/software features necessary for RTEM (100%). However, most market actors indicated that only a small percentage of installations currently are used in such a manner. Market actors were unable to provide rigorous, quantitative estimates of what percentage of systems are used for RTEM purposes, but most market actors indicated that this would be a very small percentage. The baseline evaluation report is available on the NYSERDA website - https://www.nyserda.ny.gov/- /media/Files/Publications/PPSER/Program-Evaluation/2018-12-CEM-Market-Baseline-Evaluation-Report.pdf
e. Four Outputs and three Outcomes previously associated with Energy Management Practices were mistakenly excluded from the relocation of the EMIS program to Energy Management Technology. Progress against these Indicators is reported in the Energy Management Technology table in this report. These targets will be formally relocated in the upcoming refiling.

P-12 Schools

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	6,274,044	6,616,398	105%
Electricity Savings, Annual (MWh)	17,166	21,630	126%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	106,225	218,431	206%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	218,794	340,033	155%
Participant Bill Savings, Lifetime ($)	47,862,795	64,469,652	135%
Leveraged Funds ($)	14,133,348	14,155,540	100%

Summary of Performance and Future Plans

Program is performing well with respect to expected activities and is exceeding planned budget commitments and impact goals through 2020, primarily due to achieving results more cost effectively than planned. Program achieved school engagement goals one year ahead of schedule.

NYSERDA anticipates a significant modification to this investment plan in 2021 to address the addition of funding to support a P12 green schools effort that is focused on disadvantaged communities.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline market study and impact study is in development with results anticipated in 2022.

Key Milestones Completed During 2020

There were no milestones to complete for 2020.

P-12 Schools continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2021**
Outputs	Number of schools engaging with NYSERDA to conduct clean energy benchmarking	0	351	310
	Number of NYS K-12 schools that receive NYSERDA funding	0	220	45
	Number of schools that receive energy efficiency funding from IOUs.	0	N/A	500
	Number of projects implemented as a result of Gap Assistance offered	0	N/A	4
	Number of information downloads from website	0	N/A	1000
	Number of case studies developed and disseminated	0	0	20
Outcomes	Number of NYS K-12 schools utilizing clean energy case studies to make informed decisions towards future clean energy projects	0	N/A	150
	Number of NYS K-12 schools utilizing benchmarking data and energy master plans to make informed decisions towards future clean energy projects	0	N/A	75
	Number of NYS K-12 schools reporting a greater understanding of benefits of clean energy at their school	0	N/A	800
	Number of NYS K-12 schools receiving recognition	0	N/A	3

Table notes

a. A 0 (zero) is set for the majority of the baseline/market metrics to reflect that these indicators will be tracked and reported from the time the effort begins and are not reporting activities prior to its launch.

b. This metric represents funding that is delivered to schools from other relevant NYSERDA Programs such as those listed in the Dissemination of Resources activity (i.e., technical services, energy management, renewable heating and cooling).

Real Estate Tenant

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start									End

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	11,378,738	15,176,369	133%
Electricity Savings, Annual (MWh)	70,253	92,931	132%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	37,425	89,312	239%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	297,108	409,940	138%
Participant Bill Savings, Lifetime ($)	89,597,759	127,788,417	143%
Leveraged Funds ($)	20,045,064	29,692,803	148%

Summary of Performance and Future Plans

After several prior adjustments in response to market conditions, this initiative continues to perform very well. The program is exceeding plan expectations for budget commitments and impact metrics. Furthermore, market uptake continues to be very strong, far exceeding goals for tenant spaces, buildings and square footage participating, thanks in part to strong participation from commercial building portfolio owners.
.

The investment plan for this initiative was recently refiled, reducing the scope of the plan in order to shift emphasis to supporting RTEM in tenant spaces; the timeline for market engagement and targets for outputs/outcomes were also revised to reflect the reduced budget and scope.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study was completed in Q1 2019 and is posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2019-Commercial-Real-Estate-Tenant-Initiative-Baseline-Market-Evaluation.pdf

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports, which are posted publicly and linked above.

A measure adoption rate (MAR) study was conducted on Commercial Tenant and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/CRE-tenant-2019-MAR-interim-report.pdf
A key research objective included assessing participant self-reported adoption of measures. Among Commercial Tenant program participants, approximately 45% of recommended savings have been installed from inception of the program in 2016 through April 30, 2019.

A second MAR survey and impact evaluation round is currently underway for Commercial Tenant and is anticipated to be completed by Q4 2021. Key research objectives include assessing and verifying adoption of measures, evaluating gross energy impacts and assessing the realization rate for verified savings. Data will be collected through participant survey, program data, and through analyses such as on-site metering and monitoring.

Real Estate Tenant continued

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Launch training to educate stakeholders about energy-efficient tenant spaces.	NYSERDA has launched a long-term effort to educate and train key stakeholders on energy-efficient tenant spaces.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2019**
Outputs	Number of tenant spaces participating in the program	0	1000	130
	Number of buildings participating in the program	0	537	110
	Square footage of participating tenant spaces in the program	0	63,025,393	6,500,000
	Percent of energy saved above code (for participants)	0	TBD	15-20%
	Partner engagement: Number of CRE building owners and managers that offer building specific packages	0	69	130
	Number of case studies developed	0	7	7
	Partner engagement: number of brokers and A&E firms trained	0	50	20
	Partner engagement: number of brokers and A&E firms that include in depth energy models and package development in their standard practice	0	TBD	12
Outcomes	Package Development costs of building specific package per square foot	$0.13/SF	N/A	$0.06/SF
	Market Engagement: Number of Brokers and A&E firms that include in depth energy models and package development in their standard practice	6	N/A	20
	Percent of the total addressable square footage in NYS that is covered by a building specific package	0	N/A	7%
	Tenant Spaces completed by the market without NYSERDA funding	141	N/A	286
	Percentage of Real Estate Broker firms trained on energy efficient space design and including energy in the leasing dialogues with tenant	<5%	N/A	10%
	Percentage of Architecture and Engineering firms trained to better incorporate energy efficiency options into tenant space designs and providing packages as standard practice	0	N/A	<10%

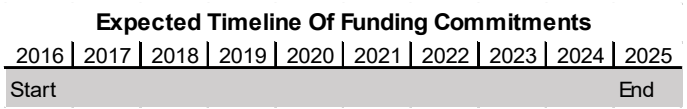
Table notes

a. TBD denotes that NYSERDA requires more data in order to quantify baseline/market metrics to the degree needed to measure against in the future. Baseline measurements of key market indicators are anticipated to occur soon following initiative approval and NYSERDA will update the information in this table as the information becomes available, which is anticipated within 9-12 months of initiative approval. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics

b. For 2017 progress to Package development costs, responses varied widely from survey respondents. This may be due to different-sized projects affecting the average cost per square foot. Future evaluations will assess this metric further.

Reforming the Energy Vision (REV) Campus Challenge

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	15,445,457	16,107,574	104%
Electricity Savings, Annual (MWh)	80,850	85,291	105%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	491,600	506,339	103%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	2,615	1,048	40%
Renewable Energy Capacity (MW)	2	-	0%
CO2e Emission Reductions, Lifetime (Metric Tons)	1,019,028	1,052,931	103%
Participant Bill Savings, Lifetime ($)	207,764,618	216,419,127	104%
Leveraged Funds ($)	49,781,850	73,874,607	148%

Summary of Performance and Future Plans

This initiative is performing well with budget commitments and most impact metrics at or above plan at the close of 2020. This initiative continues to attract new members, offer cost-shared technical assistance and peer sharing. An energy committee with CICU (Commission of Independent Colleges and Universities) was formed at the end of 2020 with an aim to increase participation from private universities and drive progress toward Climate Act goals. Similar work with SUNY and NYPA is underway.

Program continuing as defined in the current plan.

Summary of Current Evaluation Findings

A market evaluation for REV Campus Challenge is currently underway. This evaluation incorporates quantitative and qualitative approaches to achieve the following objectives:

- Characterize and track progress among the State's 250 institutions of higher education
- Cement the market baseline and track program market progress indicators
- Understand the current levels of institutional and student participation and engagement, along with participation drivers and barriers, and identify opportunities to increase market impact
- Estimate indirect benefits resulting from program activities

The study is anticipated to be completed in Q2 2021 and will be posted to NYSERDA's website upon finalization.

An impact evaluation of REV Campus Challenge is underway and is anticipated to be completed in 2021. Key research objectives include verifying the gross energy impacts and estimating a realization rate to verify impacts. Data will be collected through review of program data, energy consumption analysis, and on-site metering and monitoring to assess performance.

An early impact assessment of participating campus investments in clean energy was undertaken in early 2019. The impact evaluation study described above will further analyze and verify measure installation and performance.

Key Milestones Completed During 2020

All milestones have been completed.

REV Campus Challenge continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2023**
Outputs	Number of REV Campus Challenge Members	0	134	120	120
	Number of NYS institutions participating in AASHE STARS	44 (21 with STARS rating)	80	60	60
	Number of NYS institutions attending existing clean energy events/conferences	22 institutions (2015 baseline)	98	48	52
	Percentage (%) of NYS institutions participating in REV Campus Challenge initiatives/competitions	0	39%	70	75
	Number of REV Campus Challenge Members collecting and reporting energy usage (as reported through annual survey)	0	105	71	75
	Number of REV Campus Challenge Members reporting new clean energy projects on campus(as reported through annual survey)	0	83	63	68
	Number of REV Campus Challenge Members reporting new clean energy curricula or curriculum integration (as reported through annual survey)	0	49	27	35
	Number of REV Campus Challenge Members reporting new or improved community partnerships to expand clean energy goals (as reported through annual survey)	0	48	28	32
	Number of REV Campus Challenge Members receiving recognition	0	36	26	32
Outcomes	Number of REV Campus Challenge Members with new or updated climate action plans, energy master plans, or GHG inventories	0	73	52	58
	Number of REV Campus Challenge Members with staff assigned to manage sustainability/clean energy goals (as reported through annual survey)	82% (18/22)	91	63	68
	Number of REV Campus Challenge Members reporting a greater understanding of clean energy opportunities on their campus (as reported through annual survey)	0	71	54	60
	Number of REV Campus Challenge Members reporting greater student engagement with clean energy initiatives (as reported through annual survey)	0	38	38	44
	Number of REV Campus Challenge Members reporting greater buy-in and support from management for clean energy projects and initiatives (as reported through annual survey)	0	52	53	58
	Number of REV Campus Challenge Members reporting improved community relations as a result of clean energy strategies (as reported through annual survey)	0	46	33	36

Table notes

a. TBD denotes that NYSERDA requires more data in order to quantify baseline/market metrics to the degree needed to measure against in the future. Baseline measurements of key market indicators are anticipated to occur soon following initiative approval and NYSERDA will update the information in this table as the information becomes available, which is anticipated within 9-12 months of initiative approval. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics

Clean Energy Fund:

Communities

Portfolio: Market Development

Clean Energy Communities

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start									End

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	44,423,072	22,832,608	51%
Electricity Savings, Annual (MWh)	196,237	200,593	102%
Beneficial Electrification, Annual (MWh)	(1,306)	(1,336)	102%
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	903,489	997,925	110%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	494,849	241,747	49%
Renewable Energy Capacity (MW)	470	305	65%
CO2e Emission Reductions, Lifetime (Metric Tons)	3,429,164	2,816,508	82%
Participant Bill Savings, Lifetime ($)	903,414,662	736,921,295	82%
Leveraged Funds ($)	69,969,041	58,134,584	83%

Summary of Performance and Future Plans

NYSERDA's Clean Energy Communities program has consistently been a top performer in recent years. After a major modification was filed late 2019, and later approved, the program suffered several delays in program element launch due to COVID impacts and the inability of local governments to participate. Renewable energy progress under the new initiative has fallen behind the pre-COVID plan as result of launch delays, while other elements of the initiative that were largely committed prior to COVID continue to show
strong performance.

The next phase of the program, the Clean Energy Communities Leadership Round, is expected to be launched in Q1 2021. The program is expected to revise its timeline for engaging the market as plans are updated in 2021.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study was completed in Q3 2017 and can be found on NYSERDA's website at https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/CEC-Baseline-Memo.pdf
In addition, the first longitudinal update to the baseline study was completed in Q1 2019 and is also posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2019-CEC-Market-Evaluation-Final-Report.pdf

Results of this market evaluation help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports, which are posted on NYSERDA's website and linked above.

The second longitudinal update to the baseline study is in development and is anticipated to be completed by Q4 2021. This analysis will assess attribution for indirect impacts and refine forecasting assumptions and methodologies.

An impact evaluation of the Clean Energy Communities initiative was partially completed in 2020 to verify the direct energy benefits. However, additional reviews of this study are underway to further bolster the per-unit impacts for each high-impact action. These additional reviews are expected to be complete by mid-2021.

Clean Energy Communities continued

Key Milestones Completed During 2020

All milestones have been completed.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2025**
Outputs	Number of communities that are aware of the Clean Energy Communities Program	0	N/A	1200
	Number of communities that have completed: 1 or more High-Impact Action	467	1,376 (909 since initiative began)	1067 (600 since initiative began)
	Number of communities that have completed: 2 or more High-Impact Actions	248	797 (549 since initiative began)	798 (550 since initiative began)
	Number of communities that have completed: 3 or more High-Impact Action	128	628 (500 since initiative began)	578 (450 since initiative inception)
	Number of communities that have completed: 4 or more High-Impact Action	10	471 (472 since initiative began)	410 (400 since initiative began)
	Number of Designated Clean Energy Communities	0	315	400
Outcomes	Number of communities that indicate clean energy is a priority	473	N/A	900
	Number of communities regularly accessing the Clean Energy Communities Toolkits	0	N/A	200
	Number of communities participating in Community Choice Aggregation	0	0	70

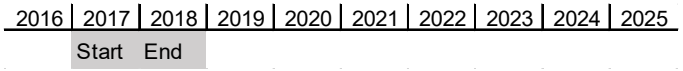
Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. At the time of the baseline measurement for Number of Designated Clean Energy Communities, some communities had completed High Impact Actions, but since these actions took place prior to the program start, these communities would not have been designated clean energy communities. Thus, the metric value is zero.

Community Energy Engagement

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	4,407,818	4,250,308	96%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	1,181,415	1,168,019	99%

Summary of Performance and Future Plans

Program is generally performing well with respect to expected activities and impact. Budget commitments and leveraged funding impacts nearly matched plans through 2020.

Program continuing operation as defined in the current plan. The program is expected to be extended through Q2 2021.

Summary of Current Evaluation Findings

A market evaluation for Community Energy Engagement is currently underway and expected to be completed by mid-2021. Key research objectives include estimating leveraged investments, number of completed projects, and performing a process evaluation to determine areas in which program effectiveness can be improved. This study will be posted on NYSERDA's website upon finalization.

Key Milestones Completed During 2020

All milestones have been completed.

Community Energy Engagement continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2020**
Outputs	Amount of funding received by customers (including NYSERDA and non-NYSERDA funding)	$5,190,000	$12,008,515	$9,750,000
	Number of new partnerships developed with other locally-based organizations	0	27	10
	Number of customers assisted with clean energy applications (audit, grant, and finance applications)	5,230	7,401	9,650
	Number of completed (closed) loans	726	60	2,020
	Number of case studies on regional-specific pilot projects and other support provided through the base activities	0	2	1
Outcomes	Number of organizations promoting clean energy and other benefits to households and communities	0	10	10
	Number of projects completed with NYSERDA and non-NYSERDA funding	726	1,992	2,020

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Baseline value shown here is total cumulative Home Performance with ENERGY STAR® audits and incentives and GJGNY financing associated with CBO activity from January 1, 2014 through September 30, 2016, and is not discounted based on a percent attributable to the CBO program versus the GJGNY program.

Clean Energy Fund:

Energy Storage

Portfolio: Market Development

Reducing Barriers to Distributed (Storage) Deployment

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start								End	

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	15,343,975	11,309,139	74%
Electricity Savings, Annual (MWh)			
Beneficial Electrification, Annual (MWh)			
Electricity Peak Demand Reductions, (MW)			
Fuel Savings, Annual (MMBtu)			
Fuel Switching, Annual (MMBtu)			
Renewable Energy Generation, Annual (MWh)			
Renewable Energy Capacity (MW)			
CO2e Emission Reductions, Lifetime (Metric Tons)			
Participant Bill Savings, Lifetime ($)			
Leveraged Funds ($)			

Note: reporting of benefits for this program and all other storage-related programs have been combined within the annual State of Storage report. Funding reported here for reference.

Summary of Performance and Future Plans

The successes of this work were witnessed within the uptick in participation for the Bulk and Retail Incentive offerings. In anticipation of the Energy Storage Roadmap and incentive offerings, the efforts here were pushed forth utilizing storage incentives, the siting team, and other activities within the current plan.

In 2020 major energy storage topics of Buyer Side Mitigation and the Allocated Cost of Service were actively pursued by NYSERDA staff.

Key research in areas of soft cost reduction, hardware cost and balance of system needs is expected to continue per the current plan.

Summary of Current Evaluation Findings

A market baseline and updates have been conducted on the Energy Storage initiatives: Reducing Barriers to Deploying Distributed Energy Storage and Energy Storage Technology and Product Development. The baseline study was completed in Q4 2017 and is posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Baseline-Market-Evaluation-Metrics-Energy-Storage-FinalReport.pdf
The most recent update to the baseline study was completed in Q3 2020 and is also posted on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/NYSERDA-2019-Energy-Storage-Market-Evaluation-Report-Final.pdf

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports which are posted publicly and linked above. Key findings from the Q3 2020 report include:

- Average total installed system costs and the proportional percentage of soft costs for BTM projects in New York State continues to increase since 2017, while average hardware costs have decreased. The median installed system costs, including hardware costs, have also decreased since 2017, indicating that fewer, more costly projects may be driving up the average installed system cost for 2019.
- On average, survey responses indicated that FTM systems with durations shorter than three hours cost roughly 15% more than FTM systems with durations longer than three hours.
- While total installed costs for FTM systems were consistent across the primary data collection and literature review findings, BTM system costs from the survey were higher than the literature review findings, particularly for labor and soft costs. Specifically, the costs associated with permitting and interconnection were the two largest contributors to soft costs according to survey data.

A third update is anticipated to be completed in Q3 2021 and will be posted on NYSERDA's website upon finalization.

A comprehensive market and impact evaluation of Energy Storage is in development and is anticipated to be underway mid-2021.

Reducing Barriers to Distributed Deployment continued

All milestones have been completed.

Results to Date—Outputs/Outcomes

Reporting of benefits and activity for this program and all other storage-related programs have been combined within the annual State of Storage report.

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2021**
Outputs	Total number of projects by project size and technology type seeking approval by authorities having jurisdiction such as local fire and building departments (AHJs)	approx. 15 lead acid and li-ion batteries and thermal storage	Approximate pipeline: 428 commercial projects equaling 8,313 MW. 96 projects equaling 7,321 MW in the NYISO; 332 distribution level commercial and 1,500 single family residential equaling 992 MW. All believed to be lithium ion.	150 systems including lead acid, li-ion, flow, and other chemistries and thermal storage
	Number of projects and type of energy storage systems approved by AHJs	5 lead acid battery systems and 2 thermal storage	121 commercial projects equaling 66 MW. 20 MW flywheel. 77 thermal approximately equal to 20 MW. 39 chemical equaling 26 MW, lithium ion and some lead acid. Additionally, ~360 single family residential, lithium ion or unknown technology, equaling 3 MW.	100 systems including lead acid, li-ion, flow, and other chemistries and thermal storage
Outcomes	Cycle time of projects from customer proposal to commissioning	Lead acid median of 19.5 months. Thermal storage not provided.	20-22 months	6-18 months
	Soft costs $ decline per kWh of battery storage based on CEF strategies	Lead Acid: Min. $50/kWh; Max. $100/kWh (Median of 20% of average soft cost of installed lead acid systems). Lithium ion and other storage types not provided.	Lithium ion, BTM avg increase $113/kWh, FTM avg decrease $135, BTM median increase $50/kWh, FTM median decrease $127/kWh	Reduce soft costs by up to $50 per kWh for a distribution/bulk storage system and up to $150 per kWh afor a customer sited system by 2025 compared to a 2017-18 baseline
	MWs of energy storage deployed from value stacking pilots	$3,716,899 in NYSERDA funding and $3,954,101 in co-funding to deploy a total 6 MW, 12 MWh of energy storage at three community solar installations.	5.96 MW	6 MW
	Percentage of distributed energy storage installations deployed throughout the New York market that provide value to two or more parties (customer, distribution utility, load serving entity, NYISO)	<10%	Excluding single family residential: ~15% of operational projects	50%

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Revised baseline metrics reflect the recently-completed Energy Storage market baseline evaluation. This study will be available publicly on NYSERDA's website and in the DPS Document and Matter Management system in the near future

c. The separate internal NYSERDA program-led distributed storage soft cost baseline utilized a GTM Research study and then augmented that data with pricing from New York State deployments under the Demand Management Program and inquiries.

d. This value is based on internal discussions with developers as part of the separate NYSERDA program-led distributed storage soft cost baseline.

Solar Plus Energy Storage

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
			Start	End					

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	40,000,000	39,968,693	100%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	20,152,010	20,152,010	100%

Summary of Performance and Future Plans

As of 2020 close, 16 projects were funded and are at varying stages of planning and construction.

Since these funds have been fully committed, all storage incentives are now funded through both the Renewable Portfolio Standard funds authorized in December 2018 by the New York Public Service Commission and the Regional Greenhouse Gas Initiative specific to Long Island.

This program remains on track to meet the commitment goals outlined in the investment plan.

Key Milestones Completed During 2020

No current milestones were completed in 2020.

Results to Date—Outputs/Outcomes

Reporting of benefits and activity for this program and all other storage-related programs have been combined within the annual State of Storage report.

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2025**
Outputs	Number of NY-Sun projects awarded support for storage	0	16	16
	MW of storage capacity awarded for support	0	38.3	40
	MWh of storage awarded support	0	123.8	130

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

Clean Energy Fund:

Industrial

Portfolio: Market Development

Energy Management Practices

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Start								End

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	13,812,631	11,475,294	83%
Electricity Savings, Annual (MWh)	175,563	161,244	92%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	1,409,229	1,025,881	73%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	2,029,597	1,788,291	88%
Participant Bill Savings, Lifetime ($)	281,281,337	251,728,425	89%
Leveraged Funds ($)	124,377,585	117,795,298	95%

Summary of Performance and Future Plans

Activities are generally consistent with plan but budget commitments and impact metrics have fallen somewhat behind planned pace in 2020. Program uptake is slower than expected for Industrial On-Site Energy Manager and SEM on-demand; therefore, a marketing campaign to bolster awareness was developed in Q4 2020 with anticipated launch in Q1 2021. In 2020, to address the change in the market due to COVID, the SEM Program launched two new components—Virtual Treasure Hunts and SEM On Demand—to offer flexibility in program delivery to the market. These new offerings are open to the industrial and commercial sectors which is in line with the expanded investment plan that was filed in November 2019 and will continue in 2021.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study was completed in Q3 2017 and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/2017-Continuous-Energy-Improvement-Baseline-Market-Evaluation.pdf
The first longitudinal update to the baseline study was completed in Q3 2018 and can also be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/CEI-Market-Evaluation-Report-Year2.pdf
It is important to note that this update study included the EMIS component of Energy Management Practices as well as a review and refinement of evaluation methods.

A second longitudinal update, comprehensively updating metrics for the entirety of Energy Management Practices, was completed in 2019 and is available on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/CEI-Market-Evaluation-Report-Year2.pdf
A third longitudinal market update was completed in 2020 and included process evaluation research objectives. This evaluation was completed in Q4 2020 and will be made is available on NYSERDA's website soon.

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports which are posted publicly and linked above.

The fourth longitudinal market update, comprehensively updating metrics for the entirety of Energy Management Practices, is currently underway with results expected in Q4 2021.

An impact evaluation of the Energy Management Practices initiative is in progress and will incorporate an incremental sampling approach, which will provide frequent assessments between 2021 and 2023. The first phase of this evaluation is anticipated to be complete by Q4 2021. Key research objectives include assessing and verifying adoption of measures, evaluating gross energy impacts and assessing the realization rate for verified savings.

Energy Management Practices continued

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Launch self-serve, web-based SEM training as an alternative option to the cohort-based offering.	This program launched in July of 2020.

Energy Management Practices continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2020**	**2025**
Outputs	Number of energy management plans with energy reduction target developed	0	18	30	30
	Number of energy efficiency projects identified and completed during pilot engagement (likely starts with low/no cost and Operations & Maintenance type measures)	0	210	30	30
	Number of case studies, testimonials developed, webinars or knowledge transfer sessions conducted	0	10	30	30
	Number of qualified SEM providers	0	2	5	5
	Number of C-suite executives who engage in SEM	0	34	27	110
	Number of facilities providing internal SEM staff trainings	0	34	27	110
	Number of facilities evaluating projects using an SEM energy intensity metric	0	34	27	110
	Number of requests for standardized SEM resources	0	5	9	85
Outcomes	Number of energy managers hired/retained within pilot facilities	0	5 of 7	20	20
	Market penetration of on-site Energy Managers: % of the addressable market participating in this strategy; nonparticipant industrial sites hiring an OsEM	15%	22%	16.5%	16.5%
	Number of projects implemented involving more complex CapEx and process improvements as a result of this strategy	0	44	40	40
	Number of industrial plants (beyond pilot participants) adopting on-site Energy Manager role	110	218	30-45 (10 – 15 per yr.)	30-45 (10 – 15 per yr.)
	Number of energy teams maintained beyond the cohort (indicating executive support for SEM)	0	7 of 15	27	110
	Number of facilities that have adopted a system for monitoring, tracking, and making decisions based on their energy use to assist with their SEM activities as a result of this strategy	1,886 facilities	1,005	1,913	1,996
	Number of industrial facilities (beyond pilot participants) that have adopted SEM	0	0	11	30

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Baseline value shown here is total cumulative Home Performance with ENERGY STAR® audits and incentives and GJGNY financing associated with CBO activity from January 1, 2014 through September 30, 2016, and is not discounted based on a percent attributable to the CBO program vs. the GJGNY program.

c. Baseline values for post-pilot performance will be measured after the first round of pilot offerings are complete.

d. Baseline values for energy teams mantained beyond the cohort will be measured after the first round of pilot offerings are complete.

e. A total of 1,886 facilities, representing 27% of the addressable market, reported having adopted SEM, indicating there is still a large market potential to capture for SEM. The additional 27 facilities adopting a system for monitoring reflect the direct results of the initiative, and does not include anticipated indirect impacts.

f. Reduction in Number of facilities due to revised methodology.

g. Four Outputs and three Outcomes previously associated with Energy Management Practices were mistakenly excluded from the relocation of the EMIS program to Energy Management Technology. Progress against these Indicators is reported in the Energy Management Technology table in this report. These targets will be formally relocated in the upcoming refiling.

Clean Energy Fund:

Large-Scale Renewables

Portfolio: Market Development

Offshore Wind Master Plan (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start				End					

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	5,000,000	4,990,051	100%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans

NYSERDA filed the Master Plan in early 2018 and was honored by the American Planning Association (APA) with its 2020 Environmental Planning Silver Award and the Clean Energy States Alliance (CESA) 2020 State Leadership in Clean Energy (SLICE) Award.

The program wrapped up activities under this initiative in 2020 with a suite of port infrastructure studies and support for the Technical Working Groups (TWG).

As of 12/31/20 this program ceased market engagement activities and is no longer considered an “active” CEF program. Program support for offshore wind has now pivoted entirely to PSC authorized rate-based collections for ongoing work to advance the Master Plan’s goals and the expanded goals for offshore wind under the Climate Leadership and Community Protection Act.

Key Milestones Completed During 2020

All milestone have been completed.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2019**
Outputs	OSW Master Plan Blueprint published	0	1	1
	Stakeholder meetings to review Blueprint and solicit input for OSW Master Plan	0	3	3
	OSW Master Plan published, providing a comprehensive roadmap to reduce the costs of OSW and accelerate the development of OSW for New York and identifies additional potential offshore wind energy areas.	0	1	1

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

Offshore Wind Pre-Development

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Start			End					

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	10,000,000	9,921,179	99%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans

This program will no longer commit new funding beyond 2020. Ongoing data collection campaigns anticipating completion in 2022. Published data from campaigns (metocean, geotechnical, and geophysical) will support New York State's offshore wind portfolio by helping to lower costs and reducing risks associated with private development.

Key Milestones Completed During 2019

Milestone	Explanation of Progress
Reports providing site-specific data needed to support detailed siting, design, and permitting of offshore wind project(s).	Two metocean buoys were deployed in mid-2019 to measure wind, wave, and other data. They will be active in the New York Bight for approximately two years. Data will be published for broad private and public use by the industry upon completion.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2019**
Outputs	Report validating NYS OSW wind resource	0	1	1
	Reports providing site-specific data needed to support detailed siting, design, and permitting of an offshore wind project	0	3	3
Outcomes	Reduction of site assessment time required for a developer (the Site Assessment Term in BOEM's typical Commercial Leases for Renewable Energy Development on the Outer Continental Shelf)	5 years	N/A	4 years

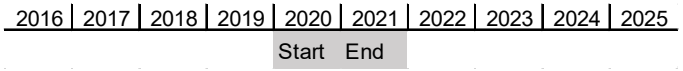
Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Metocean campaign ongoing; geophysical survey contracted and conducted in 2020. Final reporting due in 2022 and 2021 respectively.

ORES Support

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	8,500,000	2,823,358	33%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans

Activities are generally consistent with plan, but pace of funding commitments fell behind in 2020 due to extra time needed to fully develop the ORES regulations.

The ORES regulations became effective 3/3/2021. ORES has issued draft permits for three Article 10 transferred applications in March 2021. In 2021, ORES anticipates over 40 complete applications as well as at least 15 pre-application requests. At least 10 out of 40 applications are expected to be submitted by May 2021.

Program plan will be adjusted to reflect revised timeline of expected funding commitments during next annual filing.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Issue award(s) from solicitation for consultant support.	Awards from the solicitation for consultant support have been issued.
Issue draft regulations and uniform standards and conditions for public comment.	The draft regulations were issued for public comment in Q3 2020.

Results to Date—Outputs/Outcomes

n/a

Clean Energy Fund:

Low-to-Moderate Income Housing

Note: with Case 18-M-0084, NYSERDA and Joint Utilities, Statewide Low- and Moderate-Income Portfolio Implementation Plan (Joint Plan) filed July 27, 2020 and with NYSERDA's subsequent December 14, 2020 filing, the LMI chapter has been formally closed and replaced by the Joint Plan. All reporting will continue quarterly and within the Budget and Benefits Chapter, containing both history and forward-looking Joint Plan details. The following performance tables are included for reference only, while all other reporting of budgets and benefits can be found with the annual Joint Plan report. This reporting of progress remains consistent with all previous reporting of budgets and benefits to this point in time in that it represents committed values. The Joint Plan transitions reporting to expenditures and acquired benefits.

Portfolio: Market Development

Healthy Homes Feasibility Study

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	212,147	212,147	100%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

LMI Multifamily

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	28,837,271	36,077,465	125%
Electricity Savings, Annual (MWh)	29,288	54,306	185%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	11	11	101%
Fuel Savings, Annual (MMBtu)	448,875	446,533	99%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	551,290	680,501	123%
Participant Bill Savings, Lifetime ($)	106,308,753	146,044,757	137%
Leveraged Funds ($)	92,331,448	111,707,897	121%

LMI Pilots

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	126,000	-	0%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Low Rise New Construction Transition—LMI

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	8,487,000	8,432,514	99%
Electricity Savings, Annual (MWh)	8,899	8,485	95%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	78,162	98,626	126%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	180,404	204,477	113%
Participant Bill Savings, Lifetime ($)	35,983,352	38,992,288	108%
Leveraged Funds ($)	24,004,768	23,549,389	98%

Low-Income Forum on Energy

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	1,155,145	853,441	74%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Multifamily New Construction Transition—LMI

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	10,879,000	10,055,525	92%
Electricity Savings, Annual (MWh)	13,602	12,298	90%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	76,109	83,238	109%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	218,509	212,816	97%
Participant Bill Savings, Lifetime ($)	52,280,825	48,562,592	93%
Leveraged Funds ($)	44,253,123	40,965,150	93%

New Construction—LMI

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	42,238,956	43,837,390	104%
Electricity Savings, Annual (MWh)	34,687	21,988	63%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	0	0	71%
Fuel Savings, Annual (MMBtu)	296,773	140,048	47%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	834,642	461,323	55%
Participant Bill Savings, Lifetime ($)	204,445,063	103,709,090	51%
Leveraged Funds ($)	115,560,512	82,092,940	71%

NYS Healthy Homes Value Based Payment Pilot

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	8,472,921	3,141,102	37%
Electricity Savings, Annual (MWh)	240	-	0%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	8,000	-	0%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	10,850	-	0%
Participant Bill Savings, Lifetime ($)	2,572,160	-	0%
Leveraged Funds ($)	-	-	-

RetrofitNY—LMI

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	4,407,812	4,382,993	99%
Electricity Savings, Annual (MWh)	136	-	0%
Beneficial Electrification, Annual (MWh)	(1)	(1)	100%
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	5,343	2,910	54%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	7,233	3,085	43%
Participant Bill Savings, Lifetime ($)	1,088,919	274,200	25%
Leveraged Funds ($)	19,408,324	13,177,324	68%

REVitalize

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	310,924	311,008	100%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	9,000	9,000	100%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	952	352	37%
Renewable Energy Capacity (MW)	1	0	30%
CO2e Emission Reductions, Lifetime (Metric Tons)	19,095	13,091	69%
Participant Bill Savings, Lifetime ($)	3,993,564	2,397,564	60%
Leveraged Funds ($)	4,979,714	4,629,714	93%

Single Family—Low Income

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	133,382,755	137,880,045	103%
Electricity Savings, Annual (MWh)	19,300	19,588	101%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	567,036	607,695	107%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	920,582	969,399	105%
Participant Bill Savings, Lifetime ($)	211,648,217	221,299,003	105%
Leveraged Funds ($)	-	-	-

Single Family—Moderate Income

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	48,824,970	52,954,475	108%
Electricity Savings, Annual (MWh)	5,375	3,944	73%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	223,931	236,539	106%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	362,141	368,144	102%
Participant Bill Savings, Lifetime ($)	75,709,237	75,041,380	99%
Leveraged Funds ($)	40,849,992	48,746,517	119%

Solar for All

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	16,690,232	12,694,821	76%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

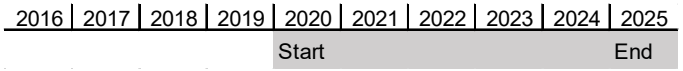
Clean Energy Fund:

Multifamily

Portfolio: Market Development

Multifamily

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	3,739,178	337,725	9%
Electricity Savings, Annual (MWh)	-	1,380	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	14,457	672	5%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	9,591	11,429	119%
Participant Bill Savings, Lifetime ($)	1,288,320	3,508,854	272%
Leveraged Funds ($)	99,000	1,039,372	1050%

Summary of Performance and Future Plans

Implementation support represented close to 80% of the funds that were expected to be committed later in 2020. The rollout of the initiatives outlined in the Chapter has been delayed, leading to much lower than anticipated commitments in Q4 2020. In parallel, NYSERDA has continued to support a small number of projects that were already in the pipeline, exceeding the limited CO2e savings that had been projected for 2020.

NYSERDA is finalizing research and initiative implementation design and will be implementing the strategies outlined in the plan starting in Q1 2021: five Low Carbon Retrofit Playbooks were published in March 2021, and will be supporting low-carbon retrofits starting in Q2 2021.

Key Milestones Completed During 2020

No milestones were completed in 2020.

Multifamily continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2023**
Outputs	Number of capital planning resource packages developed	0	0	5 playbooks
	Number of low carbon technology demonstrations	0	0	10,217 units
	Number of non-energy benefit pilot projects	0	0	TBD
	Number of non-energy benefit pilot case studies	0	0	TBD
	Number of heating system efficiency projects	0	0	TBD
Outcomes	Awareness of low carbon implementation pathways and non-energy benefits of high-performance technologies	0	N/A	7.5% of all multifamily buildings
	Adoption of High-Performance Retrofits in Market-rate Multifamily Buildings	0	N/A	1.2% of all multifamily buildings

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

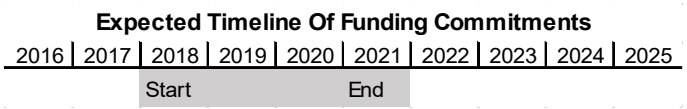
Clean Energy Fund:

Multi-Sector Solutions

Portfolio: Market Development

Clean Energy Siting and Soft Cost Reduction

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	4,418,122	2,379,323	54%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans

Budget commitments fell short of plan at the close of 2020. Market engagement was stalled in 2020 due to local governments focusing on COVID-19 response, with activities expected to pick back up in 2021.

Despite these pandemic-related delays, engagement in many areas remains strong. For example, the number of regional LSR community meetings and AHJ's receiving technical assistance have already been exceeded 2021 targets, one year early.

A significant ramp up in activity is expected for 2021 as the Clean Energy Siting team works to procure technical assistance contractors and provide additional support for communities adopting solar and energy storage laws.

Key Milestones Completed During 2020

No milestones were completed in 2020.

Clean Energy Siting and Soft Cost Reduction continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2021**
Outputs	Number of NYSERDA-led meetings on soft costs with market stakeholders	0	12	12
	Number of soft cost solutions created	3	10	12
	Number of outreach and education campaigns	1	3	3
	Number of soft cost reduction incentive grants awarded	0	0	50
	Number of regional LSR community meetings	0	68	50
	Number of Distributed Solar Soft Cost Innovation awards made	0	0	5
Outcomes	Percentage of working group members reporting improved communication and collaboration among market stakeholders, based on a pre- and post- intervention survey	N/A	N/A	50%
	Number of AHJs receiving up to 100 hours of direct technical assistance on distributed solar projects and battery energy storage projects	0	273	80
	Number of AHJs receiving direct technical assistance on LSR wind and solar projects	0	81	20
	Number of AHJs completing additional Clean Energy Community-specified steps to reduce soft costs	0	N/A	50
	Number of research projects and pilot projects completed	0	N/A	5
	Reduce distributed solar soft costs in New York State 20% by 2020	2016 Baseline Soft Costs:40 Residential: Con Ed: $2.46/W Long Island: $2.00/W Rest of State (ROS): $2.18/W Commercial Roof-Mount: Con Ed: $0.97/W Long Island: $0.42/W ROS: $1.66/W Commercial Ground-Mount: ROS Fixed: $1.01/W ROS Tracking: $1.03/W	N/A	20% reduction in average distributed solar soft costs relative to baseline data
	Percentage of developers that experience a reduction in project delays and failures due to local issues as compared to prior development experiences in NYS	N/A	N/A	80%
	Percentage of AHJs expressing satisfaction with hosting an LSR energy project, based on a pre- and post- intervention survey	N/A	N/A	80%

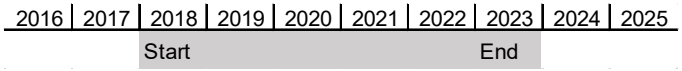
Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Baseline Soft Costs found in Manson, Cynthia. "Solar Balance-Of-System Costs Baseline Cost Study." Prepared for NYSERDA by Industrial Economics, Incorporated (IEc). May 2017

Market Challenges

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	38,720,217	23,423,895	60%
Electricity Savings, Annual (MWh)	117,494	61,382	52%
Beneficial Electrification, Annual (MWh)	(5,664)	(1,864)	33%
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	1,777,183	1,260,129	71%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	2,503	588	23%
Renewable Energy Capacity (MW)	2	1	23%
CO2e Emission Reductions, Lifetime (Metric Tons)	2,322,424	1,481,984	64%
Participant Bill Savings, Lifetime ($)	348,005,116	207,540,103	60%
Leveraged Funds ($)	141,771,489	71,391,489	50%

Summary of Performance and Future Plans

The C&I Carbon Challenge program was paused in 2020 due to COVID, therefore, impacting the level of budget commitments and impact metrics to show lower than expected progress versus plans.

The C&I Carbon Challenge program is anticipated to be released in Q2 2021.

The Empire Building Challenge is on track with its activities and making progress to key milestones and has exceeded its market engagement goals, achieving its 2022 goals in 2020.

The Empire Building Challenge will be updated to include a third funding round for low-carbon retrofits, with a focus on supporting retrofits in disadvantaged communities.

Key Milestones Completed During 2020

Commercial and Industrial Carbon Challenge

Milestone	Explanation of Progress
Issue awards following release of competitive solicitation.	Eight proposals have been issued; five commercial and three industrial.

Empire Building Challenge

Milestone	Explanation of Progress
Publish preliminary results from global scan of low carbon technologies and publish market data that provides OEMs and other solution providers better visibility into New York State retrofit market needs and opportunities.	The global low-carbon technologies scan was completed in 2020; results have been presented to real estate industry as well as networks of global solution providers.

Market Challenges continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*					
	Indicators	**Before/Current**	**2020**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Outputs	Number of sites impacted	0	10	2	3	6			
	Solution providers serving big, tall buildings in the NY market	TBD	0		10	20	50		
	Number of portfolio owners with a public commitment to achieving carbon neutral buildings by 2035	0	0		5	10	15		
Outcomes	Lifetime carbon savings from selected participants in C&I Carbon Challenge meet or exceed CEF program benchmark	$22/ton	$12/ton	$22/ton					
	Replication projects within portfolios (number of, in sqft)	0	0				1,000,000	5,000,000	10,000,000

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. The CEF program benchmarks is $22/ton or less, so "exceeding" return-on-investment benchmark implies a lower cost per ton

Consumer Awareness

Expected Timeline Of Funding Commitments

2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	2,803,610	2,803,610	100%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans

Funding for this program was fully committed in 2019 but activities did not begin until late 2020 due to the pandemic.

The Consumer Awareness campaign is generating interest, visits to the landing environment, and interest in weatherproofing and heat pumps.

NYSERDA is currently evaluating the intake process in order to simplify and streamline the consumer experience and encourage more quiz completes, ultimately leading to more contractor leads.

First wave of 2021 activities is expected to kick off Q2 2021.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Buy and execute media placements.	Campaign launched on 9/21/20. Media through 11/30/20 has been purchased and is in market.
Develop an inbound communications strategy and architecture including appropriate referral destinations and responses for anticipated areas of interest.	Potential participants complete an online quiz to determine eligibility of programs and financing solutions. At quiz completion participants are given specific contact information for the programs/financing they are eligible for.
Develop communications strategy for contractor, manufacturing, and distributor engagement.	Contractors, manufactures, and distributors have been alerted to the campaign launch and increased business they may see. Each has also been encouraged to participate in NYSERDA's Cooperative Advertising program to increase marketing exposure in the area.
Develop Landing Environment.	Landing environment is live: SaveEnergy.ny.gov
Develop messaging and creative content.	Messaging and creative content have been finalized and are reflected on the media that is in market.
Measure/Analyze assets, adjust to optimize campaign performance.	Optimization opportunities were reviewed on a daily basis. An extensive report out is being assembled to drive initial media selections when the spring 2021 effort begins.
Media and landing environment go live in market.	Media is in market and landing environment is live: SaveEnergy.ny.gov

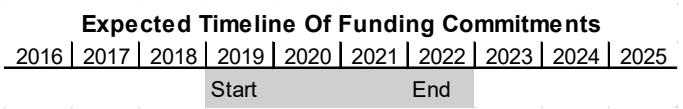
Consumer Awareness continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2022**
Outputs	Increase in consumer awareness of clean heating and cooling technology	ASHP 31% GSHP 38%	ASHP 38%, GSHP 61.5%, Able to name at least one 68.5%	80%
	Increase in consumer familiarity of energy efficiency	Not at all/Slightly = 37.6% Very/Extremly= 36.6%	Not at all/Slightly = 29.5% Very/Extremly= 43.5%	tbd after baseline established
	Increase in consumer familiarity of clean heating and cooling technology	extremely/very 22.3% not very/not at all 36.3%	Extremely/Very 34%, Not very/Not at all 32.5%	extremely/very 44.6% not very/not at all 20.0%
	Increase in interest in making homes energy efficient	extremely/very 24.3% not very/not at all 38.3%	Extremely/Very 5.5%, Not at all/Slightly 78.5%	extremely/very 46.6% not very/not at all 23.0%
	Increase in interest in adopting clean heating and cooling technology	extremely/very 20%	Extremely/Very 13%	extremely/very 40%
	Maintain energy efficiency service provider base in Westchester County	25	25	25
	Increase in number of service providers offering ground-source heat pump technology in Westchester County	45	28	59
	Increase in number of service providers offering air-source heat pump technology in Westchester County	29	69	38

Information Products and Brokering

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	3,156,387	1,439,386	46%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans

The pace of budget commitments fell short of plan in 2020. Market engagement was significantly stalled in 2020 due to COVID-19. Planned activities to support tools and resources for adoption of energy efficiency in small-medium businesses were put on hold due to economic challenges this sector is currently facing.

Benefits plans were revised in 2020 to shift impact metrics from direct to indirect, more accurately reflecting the nature of market impact. NYSERDA is anticipating a modification to the plan and reduction in the scope of work in 2021.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Initial Asset Data Pilot(s) is(are) complete.	NYSERDA has reviewed the results of this analysis with market stakeholders and expects the project findings to be made public by end of year.
Asset Data Matching pilots and DER pilot platform testing have been completed with recommendations.	The final reports are being reviewed and relevant data will be published on Open NY in Q1 2021.
Host second hackathon, with a focus on identifying solutions that overcome barriers to adoption of energy efficiency and clean energy for small-to-medium commercial owners. Attract 175 proposals. Issue one to four awards to support market demonstration of solutions developed by winners.	The second hackathon is focusing on tenant energy management. The competition launched in November 2020 and winners are expected to be announced by March 2021.

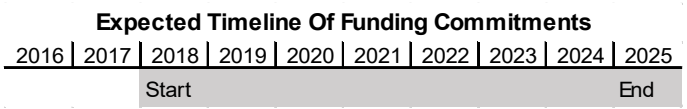
Information Products and Brokering continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2021**	**2022**
Outputs	Number of awards issued from hackathons	0	3	6	9
	Number of companies/entities participating in hackathons	0	141	350	500
	Number of value proposition calculators developed for customers and vendors	0	2	2	3
	Number of customer targeting tools developed for vendors	0	2	2	3
	Number of visits to web-based tools by customers and vendors leading to a value proposition being generated	0	1410	20000	60000
	Number of vendors utilizing customer targeting tools	0	143	200	300
Outcomes	Percent reduction in customer acquisition costs for energy efficiency projects due to use of targeting tools and value proposition calculators	0	N/A	20%	30%
	Web-based tool and platform developers and solutions providers (companies/firms) serving NY energy markets without support from NYSERDA	0	N/A	12	20

Pay for Performance

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	11,714,306	12,109,417	103%
Electricity Savings, Annual (MWh)	22,168	22,155	100%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	44,645	44,443	100%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	175,036	174,902	100%
Participant Bill Savings, Lifetime ($)	41,532,197	50,761,393	122%
Leveraged Funds ($)	25,430,070	24,420,000	96%

Summary of Performance and Future Plans

While installations did not begin in 2020 due to COVID-19 response, contracts were signed with two portfolio managers for a commercial pilot, thus keeping the program aligned with its budget and impact commitment plans. Additionally, the RFP was launched for a residential pilot.

The performance period will shift out into the future given delays in launch and program rollout.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Release procurement for portfolio managers targeting the residential sector with utility co-administrator.	The solicitation was released November 5, 2020.

Pay for Performance continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2022**
Outputs	Number of participating aggregators	0	2	8
	Total number of projects implemented (by sector)	0	0	Residential: 7,000 Commercial: 5,575
	Number of Utility Administrators with an executed MOU participating in P4P pilot	0	3	3
	Number of data sets published on OpenNY	0	0	4
Outcomes	Number of additional market actors involved in P4P pilot (nonaggregator involvement such as financial institutions, subcontractors, etc.)	0	26	8
	Number of utilities committed to offering P4P programs postpilot	0	0	3

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

Technical Services

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Start								End

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	20,504,300	35,412,784	173%
Electricity Savings, Annual (MWh)	96,335	131,780	137%
Beneficial Electrification, Annual (MWh)	-	(1,874)	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	671,900	1,088,922	162%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	1,335	1,972	148%
Renewable Energy Capacity (MW)	1	0.2	22%
CO2e Emission Reductions, Lifetime (Metric Tons)	1,443,130	2,112,579	146%
Participant Bill Savings, Lifetime ($)	285,327,772	410,369,454	144%
Leveraged Funds ($)	70,961,163	115,185,294	162%

Summary of Performance and Future Plans

Program continues to exceed its plans with respect to commitment of budget and associated impact metrics, remaining a top performer despite COVID impacts. There was strong response and support of pilot indoor air quality assessments. Eleven pre-qualified FlexTech Consultants began conducting 50 building studies to evaluate, document, and disseminate to the public the energy impacts of introducing Ultraviolet Germicidal Irradiation (UVGI) and advanced air filtration methods with COVID-safe operating procedures, as described in ASHRAE and Illuminating Engineering Society (IES) guidelines. The FlexTech Program Addendum offer, which provides 100% cost-share reimbursement upon implementation, increased study activity in 2020.

No major changes are expected to the initiative. Focus will continue to be on supporting customers through providing clean energy information and increasing awareness about electrification opportunities.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study, completed in Q4 2019, encompassed the Advancing Agriculture Energy Technologies, Technical Services (Agriculture) and 2030 GLASE initiatives and can be found on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2019-Agriculture-Market-Evaluation_Report.pdf
The first longitudinal update to this Agriculture baseline study is planned to begin in 2021, along with a first impact evaluation study.

Results of these market evaluations help assess progress toward the program theory of change and are documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation reports, which are posted publicly and linked above.

Impact evaluation activities are planned for the overarching Technical Services program and are anticipated to be underway later in 2021. NYSERDA has a long history of conducting impact evaluations on its FlexTech program, and this study will build upon that history.

Technical Services continued

Key Milestones Completed During 2020

There were no milestones to complete for 2020.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2023**
Outputs	Number of buildings participating in the pilots	0	301	26	525
	Number of qualified and active energy-focused firms (FlexTech Consultants and/or Multifamily Performance Partners)	39	73	49	71
	Number of case studies developed	0	9	2	20
	Number of best practice guides delivered	0	N/A	2,330	2,330
Outcomes	Number of energy-focused firms participating in pilots	0	29	5	25
	Increase or maintain the rate at which clean energy technologies are adopted by participants	65%	65%	65%	65%
	Increase the rate at which clean energy technologies are adopted by non-participants through sharing of best practices and case studies	25%	N/A	30	30%

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. The FlexTech Program has had the highest measure adoption rate (MAR) in the nation for individual cost-shared energy studies. Technical Services strives to maintain, and hopefully increase, this notable MAR through various cost-effective pilots.

c. The FlexTech Program has a current spillover rate of 25%, this initiative will strive to improve

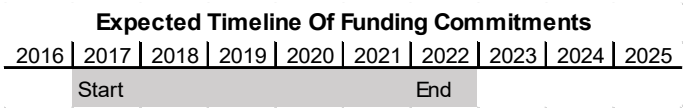
Clean Energy Fund:

New Construction

Portfolio: Market Development

New Construction—Market Rate

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	71,680,702	46,814,304	65%
Electricity Savings, Annual (MWh)	69,605	30,679	44%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	0	2	4156%
Fuel Savings, Annual (MMBtu)	51,532	70,588	137%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	33,852	3,495	10%
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	1,229,625	646,623	53%
Participant Bill Savings, Lifetime ($)	327,826,326	155,322,653	47%
Leveraged Funds ($)	55,676,313	48,853,558	88%

Summary of Performance and Future Plans

New construction activity was shut down for several months in 2020 due to COVID with limited market and building types proceeding with both new construction and gut rehab projects. Though the market is now restarting, two of the main programs—Net Zero Energy for Economic Development (NZEED) and Buildings of Excellence—did not launch or were delayed in 2020. Therefore, program budget commitments and associated impact metrics generally fell short of plan.

The program will be modified in 2021. Future program priorities are already planning to take advantage of single-family market strength and continuing to strength in multifamily, mixed use, and several other commercial types. There will continue to be opportunity in large portfolio owners, campuses and community planning, and gut rehab as well. The single-family opportunity will require a new program opportunity, which will be submitted in the next chapter update. The continued opportunities in commercial and large portfolio owner markets are already addressed in changes made to programs that relaunched in the beginning of 2021. The Consolidated Funding Application is expected to launch again in 2021, enabling the next iteration of NZEED to be in market.

Summary of Current Evaluation Findings

A comprehensive evaluation covering the New Construction program is expected to begin in Q1 2021 and anticipated to be completed in late 2021. This evaluation will include a market and impact evaluation for the New Construction program, inclusive of RAT and LMI chapter New Construction initiatives. Key research objectives of this study will include assessing market actor awareness and knowledge of new construction practices, measuring customer adoption rates, verified gross savings, and realization rates. Longitudinal studies are currently planned for 2022 and 2023. Upon finalization, reports will be posted to the NYSERDA website.

Key Milestones Completed During 2020

No milestones were completed in 2020 (COVID delays).

New Construction—Market Rate continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*						
	Indicators	**Before/Current**	**2020**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Outputs	Number of housing units recognized through Buildings of Excellence competition	0	359	0	1359	2359				
	Number of advanced clean energy housing units in NYS	1,584	6047	6017	8610	12610	13910			
	Number of advanced clean energy commercial buildings in NYS	9	194	69	178	208	215			
	Number of projects awarded through the Net Zero Energy/Carbon Competition	0	21	32	33	45				
	Number of participants attending workshops and trainings	0	3344	660	2400	3400				
	Number of case studies developed and distributed	0	56	9	38	48				
	Number of model measure packages available	0	0	9	5	10				
	Number of Projects that utilize coach/advisor	0	14	60	12	22				
	Number of projects that complete a Performance Analysis through the program	0	13	17	10	20				
	Incremental cost of building a Net Zero Energy building over standard construction practices	5-10% cost above standard construction	0	3-8% cost above standard construction	8%	8%	7%	7%	6%	5%
	Number of attendees at sponsored conferences	0	9958	0	5000	10000				
Outcomes	Percent market penetration of projects utilizing integrated design and construction practices to achieve Net Zero Energy and Net Zero Energy-capable performance	TBD	N/A	4%	2%	3%	3%	4%	4%	5%
	Projects that utilize model measure packages outside of the program	0	0	22	5	15				
	Discrepancies between predicted and actual savings	TBD	N/A	Within 18% accuracy for more than 50% of projects	Within 18% accuracy for more than 50% of projects	Within 18% accuracy for more than 50% of projects	Within 15% accuracy for more than 50% of projects	Within 15% accuracy for more than 50% of projects	Within 12% accuracy for more than 50% of projects	Within 10% accuracy for more than 50% of projects

Table notes

a. TBD denotes that NYSERDA requires more data in order to quantify baseline/market metrics to the degree needed to measure against in the future. Baseline measurements of key market indicators are anticipated to occur soon following initiative approval and NYSERDA will update the information in this table as the information becomes available, which is anticipated within 9-12 months of initiative approval. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Progress values for participants attending workshops includes LMI customers.

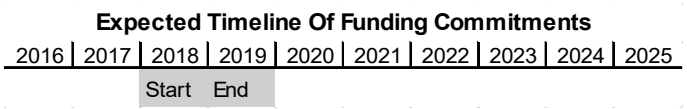
Clean Energy Fund:

On-Site Power

Portfolio: Market Development

Fuel Cells (Inactive)

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	11,310,030	10,618,474	94%
Electricity Savings, Annual (MWh)	200,706	194,880	97%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	24	23	97%
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	(1,563,498)	(1,518,119)	97%
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	345,969	335,928	97%
Participant Bill Savings, Lifetime ($)	512,374,069	497,004,238	97%
Leveraged Funds ($)	103,341,133	101,785,338	98%

Summary of Performance and Future Plans

In 2019, fourteen customer-specific applications and three Community Distributed Generation (CDG) applications were received. At the close of 2020, four of the customer-specific projects and one of the CDG projects were installed and operational.

As of 12/31/19 this program ceased market engagement activities and is no longer considered an “active” CEF program.

Key Milestones Completed During 2020

No milestones were completed in 2020.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2019**
Outputs	Number of fuel cell project incentives provided through program	0	14	27
Outcomes	Number of OEMs active in NYS	3	2	3

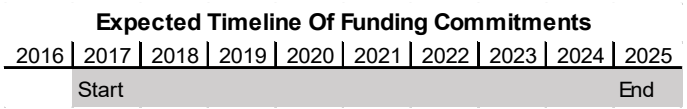
Clean Energy Fund:

Product and Appliance Standards

Portfolio: Market Development

Product and Appliance Standards

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	5,544,000	432,659	8%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	-	-	-

Summary of Performance and Future Plans

Program activity and budget commitments fell significantly short of plan. Program launch continues to be on hold pending the introduction and passage of appliance standards legislation. Reporting for this program was separated from ASHP sub-initiatives (now reported under Heat Pumps Phase 1).

Research and engagement in this area continues. Preparation for program implementation continues, including ongoing work and partnerships with the U.S. Climate Alliance, Northeast Energy Efficiency Partnership, Appliance Standards Awareness Project, California Energy Commission, and Washington State.

Key Milestones Completed During 2020

No milestones were completed in 2020.

Product and Appliance Standards continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2020**	**2021**
Outputs	# of new state-level product standards passed, by product type	0	0	20	25
	Number of technical requirements and protocols finalized	0	34	20	0
	Number of cost/benefit studies completed	0	34	30	0
	Number of compliance and enforcement processes established	0	1	1	0
Outcomes	Adoption of new state level product standards, by product type	0	0	10	10
	Unit sales of products and appliances meeting new state level product standards	0	N/A	TBD	TBD

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Outcomes associated with state level products and standards include energy and carbon savings which are provided in Appendix B for this initiative

c. Three Outputs previously associated with Heat Pumps Phase 1 were mistakenly excluded from the relocation to Product and Appliances Standards. Progress against these Outputs is reported in the Product and Appliances Standards table in this report. These targets will be formally relocated in the upcoming refiling.

Clean Energy Fund:

Residential

Portfolio: Market Development

Residential

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	Start								End

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	18,393,616	7,172,785	39%
Electricity Savings, Annual (MWh)	1,298	650	50%
Beneficial Electrification, Annual (MWh)	-	(193)	-
Electricity Peak Demand Reductions, (MW)	0	-	0%
Fuel Savings, Annual (MMBtu)	84,856	29,294	35%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	138,699	45,034	32%
Participant Bill Savings, Lifetime ($)	35,859,296	9,986,111	28%
Leveraged Funds ($)	9,272,960	2,918,142	31%

Summary of Performance and Future Plans

Budget commitments and associated impact metrics fell short of plan in 2020. The program was significantly impacted by COVID, due to the nature of the in-home work activity. Additionally, contractors had limited staff capacity during this time and many focused efforts in other areas and programs.

NYSERDA has begun working on remote and virtual assessment strategies to allow for low- or no-touch customer engagement; this will be expanded in 2021. In addition, NYSERDA is working toward building contractor capacity and broadening a network of qualified installation contractors.

Summary of Current Evaluation Findings

To support its Green Jobs Green New York (GJGNY) audit effort, and to quantify energy savings through audits undertaken outside of NYSERDA programming, an impact evaluation survey was conducted to assess the measure adoption rate and gross energy impacts from the audits and to assess customer satisfaction and contractor attitudes with the audit offering. The study found that GJGNY Audit participants have installed approximately 46% of the energy savings recommended in audits conducted between January 1, 2016 – December 31, 2018. Data was collected from program files and through surveys of audit customers and contractors.

The study was completed in 2020 and is available on NYSERDA's website: https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016-2018-GJGNY-Audit-Only-MAR-Impact-Evaluation-Report.pdf

A Measure Adoption Rate (MAR) study of the Home Energy Ratings Pilot, GJGNY Residential Audit, and Comfort Home Assessments is currently planned to commence Q2 2021. This evaluation will incorporate an incremental sampling approach, which will provide frequent assessments between 2021 and 2024. The first phase of this evaluation is anticipated to be complete by Q1 2022. Key research objectives include assessing and verifying adoption of measures resulting from the energy audit, rating or assessment, evaluating gross energy impacts and assessing the realization rate for verified savings.

Residential continued

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Deploy standard package approach for energy load reduction measures.	Deployed standard packages to air seal and insulate homes; air sealing (basic), attic insulation and basement rim joists (good), wall insulation added to good package (better) and low emissivity (Low-E) windows added to the better package (best).
Deploy revised GJGNY energy audit standards.	Revised GJGNY energy audit standards were deployed on January 1st, 2020. The revised standards included a new audit tool with simple data inputs and a streamlined customer facing report as well as new technical standards for in-field energy audits.

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2020**	**2025**
Outputs	Number of residential contractors whose staff have been trained and/or certified in new skills as a result of this initiative	0	37	25	288
	Number of home inspectors providing home energy ratings in NYS as a result of this initiative	0	8	10	20
	Number of home energy ratings delivered in NYS as a result of this initiative	0	353	500	3,844
	Number of energy efficiency projects contracted, as a result of this initiative	0	409	5,000	76,000
	Number of homes that reduce energy loads in their homes to prepare for heat pump installations	0	119	800	8,775
Outcomes	Increase in certified/qualified residential energy efficiency contractors or home energy auditors/raters compared to total residential contractor market	4%	5%	5%	10%
	Real estate market actors offer energy efficiency basics and home energy training	0	N/A	3	3
	Improvements to customer sales process as demonstrated by participating contractor reported reduced customer acquisition costs	Customer acquisition soft costs represents 27% of total soft cost	N/A	10% decrease	20% decrease

Table notes

a. TBD denotes that NYSERDA requires more data in order to quantify baseline/market metrics to the degree needed to measure against in the future. Baseline measurements of key market indicators are anticipated to occur soon following initiative approval and NYSERDA will update the information in this table as the information becomes available, which is anticipated within 9-12 months of initiative approval. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Certified and qualified contractors refers to those with professional credentials, training certifications, or other evidence of manufacturer or professional trade association-approved training. Such credentials may include, but are not limited to, Building Performance Institute (BPI) certifications or completion of training that supports those certifications, North American Technician Excellence (NATE) certifications, training to become a Residential Energy Services Network (RESNET) auditor or rater, and manufacturer training certificates.

Clean Energy Fund:

Resource Acquisition Transition

Portfolio: Market Development

Agriculture Transition (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start			End						

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	3,600,000	3,598,086	100%
Electricity Savings, Annual (MWh)	13,546	14,301	106%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	29,623	30,840	104%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	1,138	1,137	100%
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	134,803	141,441	105%
Participant Bill Savings, Lifetime ($)	38,102,897	40,062,389	105%
Leveraged Funds ($)	15,033,841	15,390,233	102%

Summary of Performance and Future Plans

As of 12/31/19 this transition initiative ceased market engagement activities and is no longer considered an "active" CEF program. NYSERDA's Agriculture Technical Assistance, captured in the Multi-Sector Technical Services Investment Plan, continues to provide no-cost engineering studies to farms.

Anaerobic Digesters Transition (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start			End						

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	13,916,258	13,663,969	98%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	60,775	58,789	97%
Renewable Energy Capacity (MW)	1	1	100%
CO2e Emission Reductions, Lifetime (Metric Tons)	304,063	294,129	97%
Participant Bill Savings, Lifetime ($)	102,918,302	99,483,163	97%
Leveraged Funds ($)	10,897,717	10,828,384	99%

Summary of Performance and Future Plans

Expectations for this initiative remain consistent with planned impact.

As of 12/31/19 this transition initiative ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well.

Combined Heat and Power Transition (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start			End						

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	59,486,517	59,488,149	100%
Electricity Savings, Annual (MWh)	253,169	253,671	100%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	47	46	98%
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	(1,492,266)	(1,454,900)	97%
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	929,803	957,865	103%
Participant Bill Savings, Lifetime ($)	651,053,491	654,813,653	101%
Leveraged Funds ($)	238,297,239	266,614,868	112%

Summary of Performance and Future Plans

Expectations for this initiative remain consistent with planned impact.

As of 12/31/19 this transition initiative ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well.

Commercial New Construction Transition (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start			End						

Results to Date—Metrics

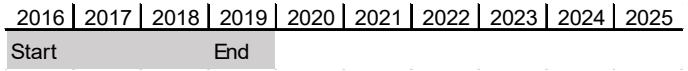
Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	24,600,762	17,579,543	71%
Electricity Savings, Annual (MWh)	39,239	30,719	78%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	10	7	74%
Fuel Savings, Annual (MMBtu)	374,252	83,596	22%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	801,638	401,827	50%
Participant Bill Savings, Lifetime ($)	157,426,340	102,461,547	65%
Leveraged Funds ($)	32,432,653	25,178,215	78%

Summary of Performance and Future Plans

As of 12/31/19 this transition initiative ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future at which time reporting will be final as well. *NYSERDA's New Construction—Market Rate initiative will continue to provide market support.*

Commercial Transition (Inactive)

Expected Timeline Of Funding Commitments



Results to Date—Metrics

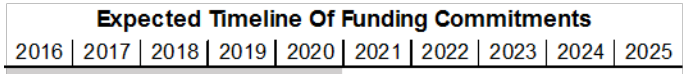
Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	12,576,271	12,630,892	100%
Electricity Savings, Annual (MWh)	40,691	40,213	99%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	1	1	91%
Fuel Savings, Annual (MMBtu)	345,005	313,263	91%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	628,295	594,176	95%
Participant Bill Savings, Lifetime ($)	124,007,200	124,178,103	100%
Leveraged Funds ($)	37,748,880	37,150,048	98%

Summary of Performance and Future Plans

As of 12/31/19 this transition initiative ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well. *NYSERDA's Technical Services initiative will continue to provide market support*.

Industrial Transition (Inactive)

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	66,004,580	59,846,892	91%
Electricity Savings, Annual (MWh)	446,839	399,263	89%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	43	-
Fuel Savings, Annual (MMBtu)	4,200,916	4,035,175	96%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	11,854,277	11,309,025	95%
Participant Bill Savings, Lifetime ($)	1,022,211,793	905,689,226	89%
Leveraged Funds ($)	698,223,251	664,682,321	95%

Summary of Performance and Future Plans

As of 12/31/19 this transition initiative ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well. NYSERDA's Technical Services, Energy Management Practices, and Market Challenges initiatives will continue to provide industrial market support.

Low-Rise New Construction Transition—Market Rate (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start			End						

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	4,538,388	4,493,206	99%
Electricity Savings, Annual (MWh)	9,463	7,165	76%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	176,357	139,859	79%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	312,270	235,758	75%
Participant Bill Savings, Lifetime ($)	54,938,337	41,408,436	75%
Leveraged Funds ($)	14,661,199	13,474,318	92%

Summary of Performance and Future Plans

As of 12/31/19 this transition program ceased market engagement activities and is no longer considered an "active" CEF program.Approved projects will be completed in the near future, at which time reporting will be final as well. *NYSERDA's New Construction—Market Rate initiative will continue to provide market support.*

Multifamily Market Rate Transition (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start		End							

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	156,214	156,214	100%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	829	829	100%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	661	661	100%
Participant Bill Savings, Lifetime ($)	59,732	59,732	100%
Leveraged Funds ($)	70,547	70,547	100%

Summary of Performance and Future Plans

The initiative stopped accepting applications as of July 17, 2017. The program received less funding applications but more housing units than anticipated. The energy conservation measures implemented were low-cost and yielded less savings than initially projected.

This transition program is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well. *NYSERDA's new Multifamily initiative launched in 2020 will continue to provide market support.*

Multifamily New Construction Transition—Market Rate (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start			End						

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	2,487,777	2,081,676	84%
Electricity Savings, Annual (MWh)	2,333	1,561	67%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	20,590	102,706	499%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	48,764	126,856	260%
Participant Bill Savings, Lifetime ($)	10,221,465	16,163,900	158%
Leveraged Funds ($)	7,384,702	5,224,853	71%

Summary of Performance and Future Plans

NYSERDA is reviewing program-modeled energy savings as compared to code; projected energy savings may be adjusted in future reporting.

As of 12/31/19 this transition program ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well. *NYSERDA's New Construction—Market Rate initiative will continue to provide market support*.

Single-Family Market Rate Transition (Inactive)

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start			End						

Results to Date—Metrics

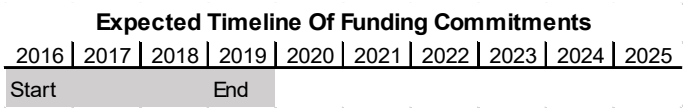
Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	24,079,440	23,810,304	99%
Electricity Savings, Annual (MWh)	4,261	4,263	100%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	209,619	210,064	100%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	348,972	351,401	101%
Participant Bill Savings, Lifetime ($)	86,871,942	88,182,084	102%
Leveraged Funds ($)	86,538,401	87,323,915	101%

Summary of Performance and Future Plans

As of 12/31/19 this transition program ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well. *NYSERDA's Residential initiative will continue to provide market support.*

Small Wind Transition (Inactive)

Expected Timeline Of Funding Commitments



Results to Date—Metrics

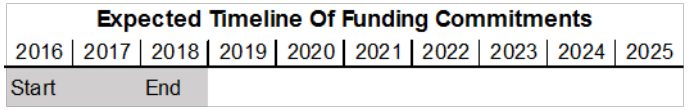
Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	3,587,089	3,570,356	100%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	2,984	3,334	112%
Renewable Energy Capacity (MW)	2	2	125%
CO2e Emission Reductions, Lifetime (Metric Tons)	29,861	33,358	112%
Participant Bill Savings, Lifetime ($)	8,587,404	9,613,803	112%
Leveraged Funds ($)	5,013,786	5,195,868	104%

Summary of Performance and Future Plans

As of 12/31/19 this transition program ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well.

Solar Thermal Transition (Inactive)

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	293,770	287,513	98%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	128	123	97%
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	958	925	97%
Participant Bill Savings, Lifetime ($)	245,900	237,758	97%
Leveraged Funds ($)	85,568	82,288	96%

Summary of Performance and Future Plans

As of 12/31/19 this transition program ceased market engagement activities and is no longer considered an "active" CEF program. Approved projects will be completed in the near future, at which time reporting will be final as well.

Clean Energy Fund:

REV Technical Assistance

Portfolio: Market Development

REV Connect

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start							End		

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	8,500,000	6,717,034	79%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	6,000,400	2,120,900	35%

Summary of Performance and Future Plans

Activities are generally consistent with plan, but program is behind funding and benefit metrics pace because no innovation sprints were held in 2020 due to contract delays and COVID-19 impacts. Additionally, some operating projects were put on hold also due to COVID-19, which delayed realizing benefits.

Program expected to continue as defined in the current plan. An innovation assessment completed in 2020 will shape the direction of sprints planned for 2021 and is expected to generate significant project activity.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Contract with platform partner.	A contract with the platform partner has been executed.
Release NYSERDA market test PON.	PON released June 23, 2020.

REV Connect continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*
	Indicators	**Before/Current**	**2020**	**2023**
Outputs	Number of market solution providers participating in webinars	241	1074	541
	Number of market solution provider submissions to utility identified areas of interest	122	408	272
	Number of utility/solution provider workshops/Sprints	2	17	5
	Number of market solution provider submissions to NYSERDA market test funding opportunity	0	55	10
Outcomes	Number of innovation, value-producing utility partnerships or demonstration projects in place	8	8	31
	Number of NYSERDA-supported market tests	0	0	15
	Number of new grid modernization technologies and business models	0	0	6

Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. Before the REV Connect initiative began, utilities had initiated 12 REV Demonstration Projects which similarly pursue business model innovation in partnership with DER providers

Clean Energy Fund:

Workforce Development

Portfolio: Market Development

Building Operations and Maintenance Partnerships

Expected Timeline Of Funding Commitments

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Start								End	

Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	15,059,486	12,878,270	86%
Electricity Savings, Annual (MWh)	223,827	202,064	90%
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	1,994,643	1,806,709	91%
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	1,744,166	1,577,291	90%
Participant Bill Savings, Lifetime ($)	326,234,893	294,863,657	90%
Leveraged Funds ($)	13,485,685	13,080,454	97%

Summary of Performance and Future Plans

Program is generally performing well with respect to expected activities and impact. Where budget commitment and associated impact metrics fell short of plan is attributable to COVID impact—and the inability to conduct and complete on-site training.

Program is expected to continue as defined in the current plan, with some minor revisions to the solicitation, as NYSERDA has recognized some increasingly complex challenges associated with following the lifecycle of progress in building portfolios. Parallel efficiency investments, changes in training models, and a shifting economic and occupancy landscape in the aftermath of COVID are all factors.

Summary of Current Evaluation Findings

NYSERDA's market evaluations are comprised of a baseline study with a series of longitudinal updates. A baseline study for the Building Operations and Maintenance Partnerships initiative was completed in Q1 2019 and can be found on NYSERDA's website:
https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2019-WFD-Industry-Partnerships-Mkt-Eval-03-8-19-Report.pdf

Results of this market evaluation helps assess progress toward the program theory of change and is documented as key outcome measurements in the output/outcome table. Full results can be found in the evaluation report, which is posted on NYSERDA's website and linked above.

An update to this study is underway and is anticipated to be completed in Q1 2022. This study also includes an impact evaluation for BOM as well as a market baseline and impact assessment for Talent Pipeline. Key research objectives of this comprehensive study include:

- Assess the benefits of utilizing an industry partnership to address building operations and maintenance workforce needs
- Demonstrate the effectiveness of training efforts and associated trainee learning in achieving targeted job outcomes
- Assess the direct and indirect verified gross savings for the partnerships program, as well as assess the indirect impacts for the Talent Pipeline

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Issue and periodically modify solicitations to support the development of building operations and maintenance training initiatives that address skills gaps and facilitate career paths with multiple due dates, as appropriate.	The Building O and M PON was modified Q1 and has multiple due dates into 2021.

Building Operations and Maintenance Partnerships continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2019**	**2024**
Outputs	Increase in number of workers trained (electrification target shown in parenthisis)	20	1928 (0)	435	9,600 (1,000 electrification)
	Increase in the percent of trainees obtaining national certifications	15%	23%. 437 certifications total	20%	30%
Outcomes	Increase number of staff qualified to train others	4322	N/A	90	200
	Increase in number of industry partnerships	1	3	3	3
	Increase number of organization developing new curricula	370 organizations	N/A	3	20
	Improve performance and efficiency of building systems	0%	N/A	5%	10%
	Increase square footage of buildings whose owners invest in training infrastructure without NYSERDA funding	0	N/A	108	125 million sqft
	Number of individuals placed into paid internships/OJT/apprenticeships	3169	N/A	136	210
	Number of disadvantaged (LMI) workers placed in building operations and maintenance jobs	263	N/A	35	60

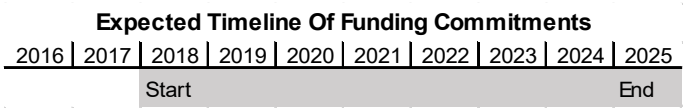
Table notes

a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

b. The progress value reported for Increase in number of industry partnerships in the 2019 version of this report was incorrectly stated as 36. This value has been corrected to 3.

Talent Pipeline

Expected Timeline Of Funding Commitments



Results to Date—Metrics

Cumulative Plan vs. Progress Thru 2020	Planned	Progress	% To Plan
Budget Commitments ($)	17,578,830	13,834,414	79%
Electricity Savings, Annual (MWh)	-	-	-
Beneficial Electrification, Annual (MWh)	-	-	-
Electricity Peak Demand Reductions, (MW)	-	-	-
Fuel Savings, Annual (MMBtu)	-	-	-
Fuel Switching, Annual (MMBtu)	-	-	-
Renewable Energy Generation, Annual (MWh)	-	-	-
Renewable Energy Capacity (MW)	-	-	-
CO2e Emission Reductions, Lifetime (Metric Tons)	-	-	-
Participant Bill Savings, Lifetime ($)	-	-	-
Leveraged Funds ($)	18,124,030	15,120,362	83%

Summary of Performance and Future Plans

The program fell behind planned pace of budget and benefits commitment in 2020 due to the pandemic impacting many hands-on training plans and initiatives. Ongoing projects were suspended for varying periods of time, and there was a delay in submissions of new proposals. Budget impacts at colleges, universities, and other training organizations also impacted proposals in the planning stages.

To address 2020 shortfall, NYSERDA has made revisions to several solicitations based on market feedback and current market conditions.

Key Milestones Completed During 2020

Milestone	Explanation of Progress
Work with SUNY, NYSDOL, and Empire State Development to issue training infrastructure and capacity building solicitation focused on OSW.	Several meetings have been held with the Governor's Office, SUNY, NYSDOL, and other stakeholders to determine administrative roles and to develop a solicitation for the Offshore Wind Training Institute.
Issue an open enrollment program(s), or address needs through training providers under umbrella agreements, to provide financial incentives to offset training and certification costs related to heat pump and other high-priority energy efficiency technologies, including support for manufacturer training.	The open enrollment solicitation was issued in 2019. To date, nine contracts have been executed and six are in contract negotiations. Three additional proposals have been received and are being evaluated by a scoring committee.
Issue a career pathway solicitation, with multiple due dates, if needed, focused on heat pump training that places a priority on training for disadvantaged communities, low-income workers, and veterans.	Due to delays in relaunching the workforce Consolidated Funding Application, the Career Pathway was released as a traditional NYSERDA solicitation on September 29, 2020. Proposals were received on December 17, 2020.

Talent Pipeline continued

Results to Date—Outputs/Outcomes

		Baseline	*Cumulative Progress*	*Cumulative Targets by Year*	
	Indicators	**Before/Current**	**2020**	**2022**	**2025**
Outputs	Students placed in internships by training providers as part of training through this initiative	0	76 (0)	400 (150 electrification)	600 (300 electrification)
	Interns hired directly by businesses through Internship Program	0	427 (23)	900 (200 electrification)	2,000 (500 electrification)
	New hires through OJT Program	0	371 (111)	950 (500 electrification)	2,050 (1,200 electrification)
	Total workers trained through this initiative	0	4,809 (918)	14,000 (5,000 electrification)	25,000 (11,000 electrification)
	Curriculum developed or modified through this initiative	0	82	12	16
	Number of trainers trained through this initiative	0	50	80	120
Outcomes	Reduced time to hire and train new workers	0	N/A	20%	20%
	Reduced cost to recruit and hire new workers	0	N/A	30%	30%
	Decreased time for new workers to reach full productivity (i.e. work independently, fewer errors, increased job retention)	0	N/A	20%	20%
	Create new businesses and training provider partnerships through this initiative	0	N/A	20	25

Table notes

a. NYSERDA will update the information in this table as the information becomes available. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics

b. Interns hired directly by business through the Internship Program will be separate and unique from students placed in internships by training providers.

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

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New York State Energy Research and Development Authority

17 Columbia Circle
Albany, NY 12203-6399

toll free: 866-NYSERDA
local: 518-862-1090
fax: 518-862-1091

info@nyserda.ny.gov
nyserda.ny.gov

State of New York
Andrew M. Cuomo, Governor

New York State Energy Research and Development Authority
Richard L. Kauffman, Chair | Doreen M. Harris, Acting President and CEO