Clean Energy Fund Quarterly Performance Report through December 2023

Final Report | February 2024

NEW YORK STATE | 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

Document Title
Clean Energy Fund Quarterly Performance Report through December 31, 2023

Revision Date	Description of Changes	Revision on Page(s)
February 29, 2024	Original Issue	

Clean Energy Fund Quarterly Performance Report through December 31, 2023

Final Report

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About The Clean Energy Fund and This Report

The Clean Energy Fund (CEF), approved by the Public Service Commission (PSC) Order on January 21, 2016[1] and later modified on September 9, 2021,[2] was established as a commitment to clean energy and efficiency measures, recognizing that deploying programs at scale has potential to address the pressing environmental and energy challenges, while providing enormous economic opportunity for New York State. The CEF supports New York State's advancement of clean energy and climate goals along with a more affordable and resilient energy system. Energy efficiency is a cornerstone of the State's strategy to promote clean energy solutions for consumers while addressing climate change. The New Efficiency New York recommendations, as advanced in the white paper, issued by the Department of Public Service (DPS) and New York State Energy Research and Development Authority (NYSERDA or the Authority) on April 26, 2018, and as adopted by the Public Service Commission in its December 13, 2019 order, establishes a new 2025 energy efficiency target of 185 trillion British thermal units (TBtu) of cumulative annual site energy savings.[3] The Climate Leadership and Community Protection Act (Climate Act), signed July 2019 and effective January 1, 2020, adopted this energy efficiency target, which puts the State on a path to complete carbon-neutrality across all sectors of the economy, including power generation, transportation, buildings, industry, and agriculture. In April 2022, the PSC approved an expansion to the NY-Sun program to further support efforts meeting the State's clean electricity goals. The Climate Act mandates the following:

- 85% Reduction in GHG Emissions by 2050
- 100% Zero-emission Electricity by 2040
- 70% Renewable Energy by 2030
- 9,000 MW of Offshore Wind by 2035
- 3,000 MW of Energy Storage by 2030[4]
- 6,000 MW of Solar by 2025 and 10,000 MW of Solar by 2030
- 22 million tons of carbon reduction through Energy Efficiency and Electrification
- Minimum 35 percent of the benefits of clean energy investments are directed to disadvantaged communities

With these goals, New York State is undertaking one of the most aggressive clean energy agendas in the nation. Through the CEF and its other portfolios, NYSERDA works to foster the transformation of markets, pushing them to accurately value clean energy, energy efficiency, and resiliency, while encouraging competition and innovation that delivers value to consumers.

The CEF is comprised of four distinct portfolios (CEF Portfolio):

- Market Development (MD)
- Innovation & Research (IR)
- NY-Sun
- NY Green Bank

This report provides a collective view of progress for all four portfolios against CEF targets (Figures 1 and 2) and further details quarterly and cumulative activity for the MD and IR portfolios through December 31, 2023 (Figure 3). The September 9, 2021, PSC Order requires quarterly reporting for the MD and IR portfolios which continue to include the following:

- Progress toward cumulative and annually-prorated incremental targets and budgets.
- Progress toward the CEF's contribution to New Efficiency: New York (NE:NY) targets.
- A performance summary discussion of key CEF initiatives.
- A summary of acquired benefits and projected benefits committed, compared to investment plan projections.

To meet these reporting requirements, this report document is accompanied by a scorecard (spreadsheet) that contains all plan and progress information related to CEF activity, also filed quarterly. This New York State Energy Research and Development Authority (NYSERDA) scorecard is consolidated with each State utility scorecard to publish data on Open NY, where it is available to all stakeholders. Finally, the publishing of these data sets coincides with a similar update to the Clean Energy Dashboard (CED), an interactive and dynamic tool first published in 2019 to improve accessibility and transparency of ratepayer-funded clean energy program reporting statewide.

NY-Sun reports progress quarterly within the NYSERDA scorecard and CED and is summarized in section 3 of this report. Quarterly reporting for NY Green Bank is similarly provided within NYSERDA's quarterly scorecard and the CED, but also within a separately filed report.[5]

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1 Clean Energy Fund Performance Overview

1.0 Progress Toward Aggregate Clean Energy Fund Goals

Figures 1 and 2 present a comprehensive picture of progress against the CEF authorized budget and associated benefit targets reflecting all four CEF Portfolios (MD, IR, NY-Sun, and NY Green Bank). Progress shown against each key performance metric represents results through December 31, 2023, and nets out overlap across portfolios where it is known to occur.

Figure 1 captures the status of CEF funding while Figure 2 depicts progress of the combined portfolios against the latest CEF ordered benefit targets. Figures 1 and 2 should be viewed together to properly relate investments to results. In each of these visuals, combining what has been expended/acquired with encumbered/committed results demonstrates NYSERDA's total progress toward CEF targets, while adding in the remaining expected (planned) values serves to illustrate the full potential in NYSERDA's programmed portfolios.

Figure 1. Clean Energy Fund Portfolio Expected Investment versus Targets

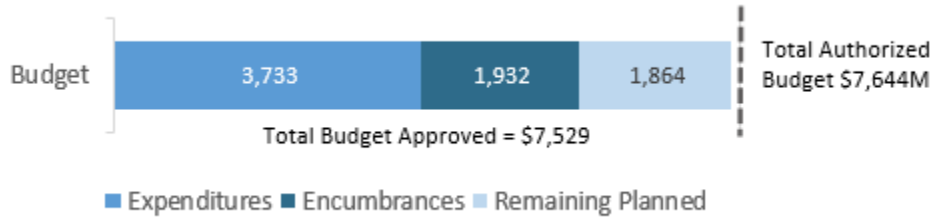


Figure 1 Supporting data		Total Authorized Budget	Budget Approved		Expended Funds		Encumbered Funds		Remaining Planned		Funding Not Yet Approved
			Current Total	% of Authorized	Current Total	% of Authorized	Current Total	% of Authorized	Total Balance	% of Authorized	
Market Development (MD)	Program Funds	$ 2,399.7 M	$ 2,332.2 M	98%	$ 1,190.2 M	50%	$ 634.5 M	26%	$ 507.4 M	22%	$ 39.8 M
	NYS Cost Recovery Fee		$ 27.7 M		$ 15.1 M		$ 0.0 M		$ 12.6 M		
Innovation & Research (IR)	Program Funds	$ 631.7 M	$ 570.2 M	91%	$ 253.6 M	41%	$ 236.3 M	37%	$ 80.2 M	13%	$ 55.0 M
	NYS Cost Recovery Fee		$ 6.5 M		$ 2.8 M		$ 0.0 M		$ 3.7 M		
MD and IR combined	Administration	$ 274.4 M	$ 265.2 M	97%	$ 190.1 M	69%	$ 0.0 M	0%	$ 75.1 M	27%	$ 9.2 M
	Evaluation	$ 124.2 M	$ 113.3 M	91%	$ 39.6 M	32%	$ 13.6 M	11%	$ 60.1 M	48%	$ 10.9 M
	MD and IR Total	**$ 3,430.0 M**	**$ 3,315.2 M**	**97%**	**$ 1,691.5 M**	**49%**	**$ 884.5 M**	**26%**	**$ 739.2 M**	**22%**	**$ 114.8 M**
NY-Sun	Program Funds	$ 3,162.8 M	$ 3,162.8 M	100%	$ 1,058.4 M	33%	$ 1,046.7 M	33%	$ 1,057.7 M	33%	$ 0.0 M
	NYS Cost Recovery Fee	$ 41.8 M	$ 41.8 M	100%	$ 10.1 M	24%	$ 0.0 M	0%	$ 31.7 M	76%	$ 0.0 M
	Administration	$ 58.8 M	$ 58.8 M	100%	$ 24.6 M	42%	$ 0.2 M	0%	$ 34.0 M	58%	$ 0.0 M
	Evaluation	$ 3.5 M	$ 3.5 M	100%	$ 1.4 M	40%	$ 0.6 M	18%	$ 1.5 M	42%	$ 0.0 M
	NY-Sun Total	**$ 3,266.8 M**	**$ 3,266.8 M**	100%	**$ 1,094.5 M**	**34%**	**$ 1,047.4 M**	**32%**	**$ 1,124.9 M**	**34%**	$ 0.0 M
NY Green Bank	Total	**$ 947.1 M**	**$ 947.1 M**	**100%**	**$ 947.1 M**	**100%**	**$ 0.0 M**	-	**$ 0.0 M**	-	-
CEF Total		**$ 7,643.9 M**	**$ 7,529.1 M**	**98%**	**$ 3,733.0 M**	**49%**	**$ 1,931.9 M**	**25%**	**$ 1,864.1 M**	**24%**	**$ 114.8 M**

- Authorized Funding per Order: Approving Clean Energy Fund Modifications, issued and effective September 9, 2021 and inclusive of the approved 10 GW Distributed Solar Roadmap in April 2022.
- NY-Sun totals shown here exclude $679 million in non-CEF NYSERDA funded solar projects (see Table 12).

The summary of benefit progress reflects evaluated totals, incorporating verified gross acquired savings where evaluations have been completed, and reflects gross savings values elsewhere. Measurement and verification activities have reduced gross savings by approximately 3.2 TBtu through the fourth quarter. Indirect benefits from market transformation are included in acquired totals where they have been quantified through evaluation (approximately 3.6 TBtu through the fourth quarter). Indirect benefits are also included in the remaining plans, discounted by 50 percent, as is consistent with other plan filings to account for uncertainty in timing and potential overlap across the portfolio that has yet to be fully evaluated.

Figure 2. Clean Energy Fund Portfolio Expected Benefits versus Targets

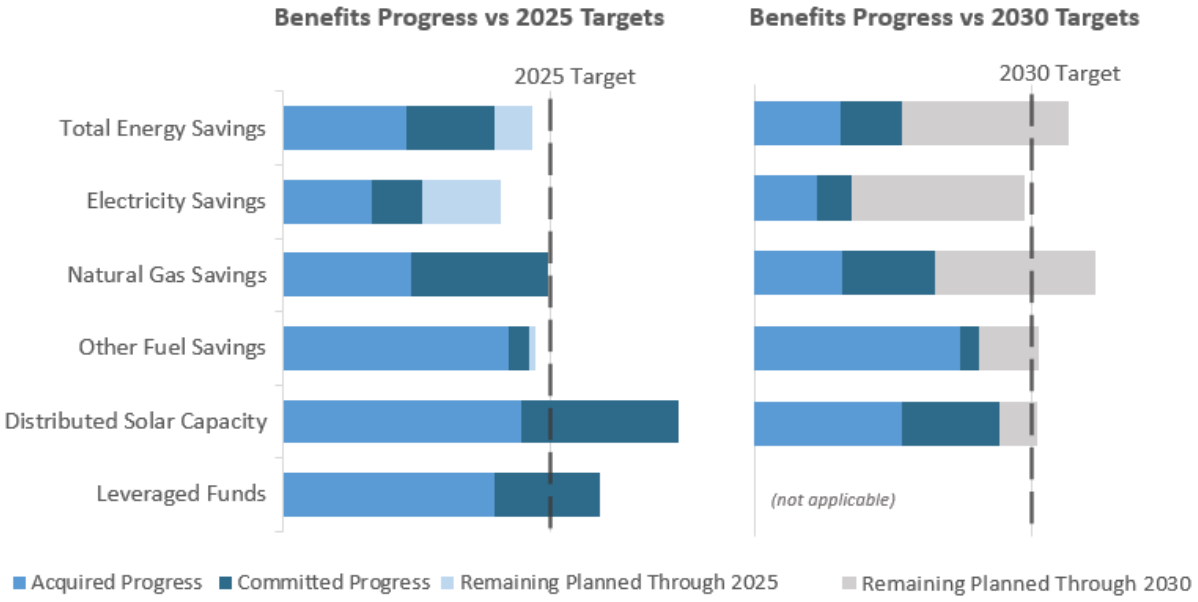


Figure 2 Supporting Data	Acquired Progress	Committed Progress	Remaining Planned Through 2025	Total Expected Through 2025	2025 Order Target	Remaining Planned Through 2030	Total Expected Through 2030	2030 Order Target
Total Energy Savings (MMBtu equivalent, millions)	24.4	17.5	7.5	49.4	53.0	47.6	89.5	79.0
Electricity Savings (MWh, millions)	2.2	1.2	2.0	5.5	6.7	6.2	9.7	10.0
Natural Gas Savings (MMBtu, millions)	12.1	12.6	(0.3)	24.5	25.0	22.1	46.8	38.0
Other Fuels Savings (MMBtu, millions)	12.7	1.1	0.4	14.1	15.0	3.7	17.4	17.0
Distributed Solar Capacity (Renewable MW)	5,346	3,503	-	8,848	6,000	1,350	10,198	10,000
Leveraged Funds ($ millions)	$15,795	$7,824	-	$23,619	$20,000	-	$23,619	n/a

Benefits Metrics Progress as Percent of Totals	Acquired + Committed (values summed from above)		Acquired + Committed as a Percentage of the Expectations / Targets				
			Total Expected Through 2025	2025 Order Target		Total Expected Through 2030	2030 Order Target
Total Energy Savings (MMBtu equivalent, millions)	41.9	→	85%	79%		47%	53%
Electricity Savings (MWh, millions)	3.5		64%	52%		36%	35%
Natural Gas Savings (MMBtu, millions)	24.7		101%	99%		53%	65%
Other Fuels Savings (MMBtu, millions)	13.7		97%	92%		79%	81%
Distributed Solar Capacity (Renewable MW)	8,848		100%	147%		87%	88%
Leveraged Funds ($ millions)	$23,619		100%	118%		100%	n/a

Table notes are on the next page

- Energy savings values are annual; Total Energy Savings measures the combined Electricity and Fuel savings net of usage; therefore, values will not sum to the total of individual electric and fuel savings values.
- CEF initiatives not dedicated to building energy efficiency (Electric Vehicles - Rebate, Combined Heat and Power, and Fuel Cells) have been excluded from progress and plans toward the first four energy saving targets shown above.
- Overlap where it is known or perceived to exist between portfolios has been removed from progress reported.
- Distributed Solar Capacity includes 1,231 MW of non-NYSERDA installations taken from the Statewide Solar Projects dashboard, which is populated with data from utility interconnection inventories. This data set includes all distributed solar interconnected in NYS, including hundreds of MWs which did not receive NYSERDA funding. Committed project data is maintained by NYSERDA independently of interconnection data. Since the two data sets define project completion date differently, some projects reported as committed may also be included as acquired under the "Non-NYSERDA Statewide Installations" (interconnection balance) figure. As the pipeline of NYSERDA commitments are drawn down over time (projects are considered acquired in both data sources), this overlap will be systematically eliminated.
- Leveraged Funds progress here includes non-CEF NYSERDA funded solar projects of $1,979 million acquired and $124 million committed, consistent with overall reporting toward CEF distributed solar targets which include all solar statewide.
- Leveraged Funds Total Expected benefit values do not currently include any anticipated indirect impacts.
- Neither Distributed Solar or Leveraged Funds Total Expected Through 2025 and 2030 values include forward-looking estimates from NY Sun or NY Green Bank portfolios at this time.
- Benefits metrics that have not been given 2030 Targets in the Order are shown as "not applicable."

As Figures 1 and 2 illustrate, NYSERDA has made significant progress positioning the collective portfolios to achieve the CEF Order Targets on both 2025 and 2030 timelines. An explanation of progress and the current portfolio mix is as follows:

- Now eight years into the ten-year CEF commitment timeline (80%), every metric with the exception of electricity savings is at or above a linear 80% measure of progress when comparing the total committed benefits through 2023, and this progress will only be bolstered as more evaluation studies enable reporting of indirect impacts from earlier years of the CEF.
- Near-term projections for Total Energy Savings (MMBtu equivalent) through 2025 continue to show the effects of current clean energy and broader market challenges (supply chain disruptions, skilled labor availability, increased construction costs) however NYSERDA maintains confidence in the ability of the CEF portfolio to deliver the overall impact outlined by CEF 2030 Targets, an expectation that extends to other key areas such as electricity savings.
- Projects delivering electricity savings remain behind the pace of fuel savings as illustrated by the Figure 2 visual, but the strong foundation of fuel-related projects, of which significant savings are already considered acquired in the portfolio, is balancing the near-term 2025 view and boosting the overall potential for 2030 achievement.
- Renewable energy capacity MW remains dominated by NY-Sun contributions, which began in 2014 and is performing well against the 2025 target, on a trajectory to achieve the target early. The portfolio is also well positioned to achieve the expanded 2030 target of 10 GW.
- Leveraged funding acquired and committed progress is outpacing other metrics due to strong NY-Sun and Innovation & Research returns.

The September 2021 CEF Order included a target regarding equity for disadvantaged communities (DACs), specifically that a minimum of 35 percent of the benefits of CEF investments would accrue to disadvantaged communities. On November 15, 2023 NYSERDA filed with the PSC its first Disadvantaged Communities Report for ratepayer funded programs, which included place-based

investments and benefits across the Clean Energy Fund portfolio covering years 2020 - 2022. Another filing spanning years 2020 – 2023 will be made in March 2024. Reporting requirements outlined by DPS are aligned with a broader statewide effort, where NYSERDA is working with other State agencies and stakeholders, including the Climate Justice Working Group, to establish a statewide benefits/metrics framework and reporting system for the Climate Act disadvantaged community mandate. This annual statewide report would include place-based investments across all funds, not just CEF, and is expected to be compiled and released later in 2024.

Additionally, NYSERDA is required to track and report other reference metrics outlined in appendix C of the CEF Order. Carbon emissions reductions and bill saving metrics are presented below for the combined CEF portfolios.

Table 1. Other Anticipated Benefits through 2025 and 2030

Annual Benefits Metrics ** Direct + Indirect Benefits ** Overlap Accounted	**Acquired Progress**	**Committed Progress**	**Total Progress as of Current Reporting Period**	**2025 Order Expectation (Anticipated Benefit)**	**2030 Order Expectation (Anticipated Benefit)**
Emissions Reductions (CO2e Metric Tons, millions)	5.8	3.6	9.5	9.0	14.0
Participant Bill Savings ($ millions)	$1,114	$757	$1,871	n/a	n/a

- These metrics reflect all the same inclusions/exclusions and assumptions, including overlap—where known or perceived—between the four CEF portfolios and their reported benefits, as is applied to Figures 1 and 2 above.

2 Market Development and Innovation & Research Performance

On May 20, 2022, NYSERDA filed a comprehensive update to all MD and IR portfolio plans in the first edition of the Compiled Investment Plans (CIP), as prescribed in the CEF Order. These plans convey expected funding and benefit progress for each initiative, which are used to gauge progress over time as outlined in these quarterly reports and elsewhere. Each fall NYSERDA completes its annual update to forecasts for all CEF initiatives, which incorporates reported historical progress and revises forward looking plans to account for that history as well as to learn from the market. On November 1, 2023, NYSERDA completed the annual filing which was approved by DPS in December and took effect on January 1, 2024. Three prior filings made in February, May and August of 2023 were also approved by DPS during the year. Progress of the CEF as measured and conveyed in this report is done so in contrast to the plans in the August 1, 2023 CIP filing.

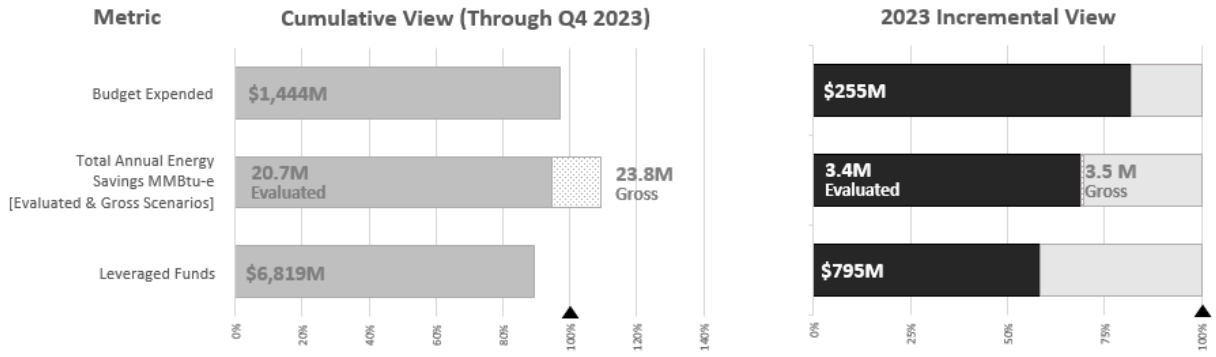
Cumulative performance against these plans remains the ultimate measure of success for delivering on the CEF benefits targets. As a secondary measure, NYSERDA also monitors incremental progress toward the current year goal to provide another viewpoint from which to assess performance, including how quickly funds are put to work in the market based on near-term expectations. Both cumulative and incremental values can be reviewed in granular detail for the portfolio and for each program and metric within the Clean Energy Dashboard.

Figure 3 provides a high-level view of NYSERDA's MD and IR portfolio performance to plan, measuring progress toward expended funding and acquired direct benefit plans through Q4 2023. Key points to interpret Figure 3 include:

- The Cumulative View (Through Q4 2023) represents years 2016–2023; 100 percent in this view represents the cumulative *planned* amounts for that timeframe, prorated to enable comparison of progress to plan.
- The 2023 Incremental View represents progress reported in the current calendar year against the current calendar year plan in total, with an expectation that 100 percent of the plan should be achieved by year-end. This secondary measure helps NYSERDA monitor and assess specific trends throughout the year. Progress illustrated in this view can be influenced by how NYSERDA finishes the previous year as those plans represent an estimate; the portfolio may start the new year either ahead or behind the forecasted finish of the previous year.
- Total Annual Energy Savings is measured in MMBtu equivalents consistent with Figure 2; Gross and Evaluated (Verified Gross) reported savings scenarios are reflected in these progress bars to illustrate both viewpoints of progress as the results from evaluation studies become more prominent in NYSERDA progress reporting.

- For each of these metrics, all CEF MD and IR initiatives are included (no exclusions); CEF Admin, Evaluation, and NYS Cost Recovery Fees are excluded from the budget totals.

Figure 3. Market Development/Innovation & Research Progress and Performance



Through 2023, NYSERDA's cumulative progress of these three benchmark measures remains strong, though the incremental view shows slower progress toward the 2023 plan. NYSERDA's leadership understands the driving forces behind the incremental lag and is continually monitoring performance across all initiatives to optimize portfolio progress over the life of the CEF, accelerating progress on funding commitments and subsequent expenditures wherever possible. Additional detail on programs contributing the largest impact to energy savings targets can be found in the next section. Reporting of leveraged funding progress is on a lag for the Innovation & Research portfolio, with expectations that the current gap to plan will close once these project updates are collected and reported.

As NYSERDA noted during the 2021 CEF review conducted by the PSC, strengthening the processes and tools used to effectively manage the portfolio has been a key focus of the organization. NYSERDA continues to employ improved process and tools, refining the focus of quarterly performance discussions and bolstering the annual planning process used to set expectations for the immediate year ahead as well as the longer-term view of individual initiative and collective portfolio goals. A more detailed assessment of the portfolio's top programs with energy saving impact can be found below.

Top Energy Impact Initiative Performance Summary

In NYSERDA's Market Development portfolio, 15 key initiatives currently account for approximately 91 percent of the expected total energy saving benefits (represented by equivalent annual MMBtu) and 47 percent of the total approved Market Development budget. These initiatives warrant special attention due to the weight they carry in terms of the overall success of the CEF in delivering expected benefits and are characterized in greater detail in Table 2 that follows.

Table 2. Performance Summary for Market Development's Top Energy Impact Initiatives

Cumulative progress to plan is measured on a prorated basis through Q4 as described in detail for Figure 3 above. Budget Percent Performance is progress against approved funding expenditure plans while Energy Percent Performance is progress against the equivalent annual MMBtu acquired plan. Benefits analysis conducted with both Gross and Verified Gross (evaluated) direct savings where applicable.

MMBtu Impact Rank	Initiative	Cumulative Progress (% Performance To Plan) Budget %	Savings Type	Energy %	Progress Narrative
1	Energy Management Technology	107%	Gross: Evaluated:	81% 34%	Progress of budget expenditures are trending favorably through Q4 2023 though energy benefits still lag plan. A verified gross savings analysis significantly reduced energy performance from the gross values reported. A notable amount of this reduction is due to delayed installation of capital improvement measures (observed across several NYSERDA initiatives) and a longer than anticipated timeline for measure installations. An update to this study was finalized in Q2 2023 with realization rates for electric savings (which represent the majority of program savings) more than doubling for more recent years. Realization rates for MMBtus remained fairly constant, however, an additional update to this study is in process now to address data challenges that have persistently made verifying historical progress difficult. The Real Time Energy Management program still has a robust pipeline of projects that are in various stages of implementation. An evaluation study is also commencing to quantify indirect benefits from this program, which have yet to be assessed. A final impact and market evaluation will be undertaken on Real Time Energy Management in 2024 and future quarterly reports will detail results.

Table 2 continued

MMBtu Impact Rank	Initiative	Cumulative Progress (% Performance To Plan) Budget %	Savings Type	Energy %	Progress Narrative
2	Building Operations and Maintenance Partnerships	108%	Gross: Evaluated:	55% 67%	In 2023, the program received more successful new projects (19) than in any prior years of the program, including the first two projects related to building electrification operations and maintenance training. NYSERDA updated the solicitation in mid-2023 to a rolling, application-based format to expedite contracting and the launch of new projects. Five projects closed in Q4 2023. Several projects originally scheduled to conclude in 2023 were extended to complete their training scopes of work, resulting in delays to reported acquired energy savings. NYSERDA remains confident that those projects will result in the savings projected and is poised for an increase in acquired savings for 2024 as a larger number of projects in the pipeline conclude. A second impact evaluation is underway and is anticipated to be complete Q2 2024.
3	Technical Services	115%	Gross: Evaluated:	141% n/a	Progress of budget expenditures and benefits remains strong. Funds may be fully committed by Q4 2024. An impact evaluation is planned to begin Q2 2024. Funding for this program in the multifamily sector was increased in the November filing to support additional programming as part of NYSERDA's optimization strategy.
4	Product and Appliance Standards	58%	Gross: Evaluated:	n/a n/a	NYSERDA successfully adopted 21 appliance standards for NYS by the 1/1/23 statutory deadline and the standards went into effect on 6/26/23. The core work to implement those standards is now underway but delays beyond NYSERDA's control resulted in lower-than-expected expenditures. Commitments and expenditures have shown progress throughout the year and are expected to further ramp up as the program is expanded. This initiative forecasts all impacts as indirect savings; those benefits will be reported in the future as evaluation studies conclude and the market impact over time is understood. Scoping has begun on evaluation activities and future quarterly reports will detail findings. Funding for this program was reduced in the November filing as part of NYSERDA's optimization strategy.
5	Market Challenges	93%	Gross: Evaluated:	85% n/a	Commercial and Industrial Carbon Challenge and Commercial and Industrial Accelerated Efficiency programs received a strong market response for competitive funding and awarded over $37 million in incentives for new projects in Q4 2023. The first projects funded under the Empire Building Challenge are in the early stage of implementation and benefits are expected to be acquired in 2024. Funding for this program was increased in the November filing as part of NYSERDA's optimization strategy..
6	Electric Vehicles – Rebate	100%	Gross: Evaluated:	139% 100%	CEF funding for this initiative has been fully committed and all rebates have been paid out as of Q1 2021. A verified gross savings analysis reduced energy performance from the gross values reported. This reduction is attributed to lower vehicle miles traveled as compared to the program assumptions. An initial assessment of indirect benefits was completed on EV-Rebates. However, given the ongoing presence of rebates through RGGI funding, and no identified sales increase beyond incentives that could be linked to program funding, no indirect savings were estimated as part of this study. Evaluation studies will continue to assess indirect impacts going forward.

Table 2 continued

MMBtu Impact Rank	Initiative	Cumulative Progress (% Performance To Plan) Budget %	Savings Type	Energy %	Progress Narrative
7	LMI Multifamily	107%	Gross: Evaluated:	127% 122%	A push for partial inspections was made in Q4 2023 to assess the Multifamily Performance Program's pipeline's progress resulting in 19 partial milestone payments for work completed to date. As expected for a program in the closeout phase, remaining project decommitments continue, particularly when the construction timeline is indefinite or financing is uncertain or at risk. The team is working in close collaboration with the project teams, State agency partners (HCR), and utility partners to provide options for the remaining projects, including directing projects to other active programs such as the Affordable Multifamily Energy Efficiency Program or Low Carbon Pathways. A final impact evaluation of MPP will be underway in 2024. Direct Injection programs continue with the New York City Housing Preservation and Development (HPD) and New York State Homes and Community Renewal (HCR). HPD retrofit programs are progressing well with expenditures expected to increase significantly in 2024. The program was able to award $4M+ in retrofit funding in Q4 to HCR existing buildings projects, and a significant pipeline of new projects are expected in 2024. The multifamily technical services offering was updated in Q4 2023 and increased the cost share for affordable housing projects from 50% to 75%. The program anticipates greater demand for LMI studies through increased outreach and partnerships in 2024. An impact evaluation is planned to begin Q2 2024. Funding for this program was increased in the November filing to support demonstration projects vital to advancing multifamily sector clean energy goals.
8	Industrial Transition	97%	Gross: Evaluated:	107% 100%	This program has been inactive since the end of 2019. The program is performing well on both budget and energy benefits, noting that NYSERDA anticipates some level of attrition over time as open projects move to closure—either completion or cancellation. In the 11/1/23 CIP filing, NYSERDA proposed removing $2M for this project attrition, which was later approved by DPS, repurposing these funds to optimize the overall impact of the portfolio. Prior gross savings analysis confirmed the energy performance of this program with a strong realization rate; a final assessment of performance will be underway Q1 2024. Funding freed up in the program was repurposed in the November filing as part of the broader optimization strategy.
9	Energy Management Practices	99%	Gross: Evaluated:	63% 68%	Strategic Energy Management market response continues to trend in the positive direction with sustained program interest and participation. The methodology behind savings assumptions for projects in this program was updated in 2023 following evaluation study analysis, requiring a reduction to the reported amount and resulting in the current lag to plan. With slow participation of On Site Energy Manager continuing, NYSERDA made a modification to the program in Q4 2023 and will carefully assess the results over the first two quarters of 2024. An evaluation study for Energy Management Practices will be complete in Q1 2024. Funding for this program was reduced in the November 2023 filing as part of a broader optimization strategy, shifted to maximize CEF impact.

Table 2 continued

MMBtu Impact Rank	Initiative	Cumulative Progress (% Performance To Plan) Budget %	Savings Type	Energy %	Progress Narrative
10	Clean Energy Communities	95%	Gross: Evaluated:	248% 100%	Progress of budget expenditures and energy benefits continues to trend favorable in Q4 2023 with more than half of the municipalities in the state participating in the program. A program update was launched on December 14, 2023. Communities remain engaged in the program and continue to work toward grant thresholds. With the shift of program impacts from direct to indirect proposed in the November CIP filing, NYSERDA is undertaking an evaluation assessment to confirm the shift from direct to indirect and to quantify indirect. Funding for this program was reduced in the November filing and shifted to support other community-based programming.
11	Codes and Standards for Carbon Neutral Buildings	103%	Gross: Evaluated:	n/a n/a	Progress of budget expenditures continued to trend favorably through Q4 2023. Core work for code advancement and training is moving forward expeditiously and proposals for the next State code update are underway. This initiative forecasts all impacts as indirect savings and through the initial study completed, indirect benefits measured exceeded plan for the period of study. The study shows that NYSERDA's long-standing engagement in this space is responsible for more than 3 TBtu of energy savings, of which approximately 1.2 TBtu is reflective of CEF-specific efforts. An update to this study is expected Q1 2024. Funding for this program was reduced in the November filing as part of NYSERDA's optimization strategy.
12	New Construction – Market Rate	120%	Gross: Evaluated:	122% 122%	The initiative continues to perform well on both budget and energy benefits, with the greatest expenditure activity this quarter coming from the New Construction-Commercial program and significant expenditures also coming from Carbon Neutral Community Economic Development, New Construction-Housing, and Buildings of Excellence as projects advance through construction stages toward completion. Expenditure activity includes 18 projects completing, milestone payments made during construction, and various implementation costs. New solicitation rounds from both large competition programs were committed by December 2023, helping the portfolio exceed commitment goals this year. Funding for this program was increased in the November filing to support additional programming and maximize CEF impact. An evaluation of Single-Family New Construction was completed in Q2 2023 and demonstrated strong realization rates and sizeable indirect impacts. A study focusing on multifamily and commercial projects is underway now and future quarterly reports will detail results.
13	REV Campus Challenge	107%	Gross: Evaluated:	46% 100%	Given prior strong evaluation results, future savings projections were adjusted accordingly through NYSERDA's annual reforecasting effort, resulting in an increase in anticipated savings and a reduction in the % of acquired savings to plan through Q4 2023. In addition, a portion of funding was used to support other programmatic activities (tools, training, study reimbursement) that were not tied to savings impacts, resulting in a disparity when comparing expenditures and % acquired savings to plan. This initiative has committed nearly all funds and reached its original CEF energy benefits goal from 2019. A market evaluation was completed in Q4 2023 and the results are presented in this quarterly report.
14	P-12 Schools	112%	Gross: Evaluated:	85% n/a	The initiative continues to progress to plan. A market evaluation will be finalized in Q1 2024.

MMBtu Impact Rank	Initiative	Cumulative Progress (% Performance To Plan) Budget %	Savings Type	Energy %	Progress Narrative
15	RetrofitNY – LMI	45%	Gross: Evaluated:	90% n/a	As of 11/1/23, the program was closed to all new proposals and was sunset at the end of 2023. In Q4 2023, NYSERDA issued an incentive letter for the remaining Round 1 project. The remaining Round 2 project is nearing the end of the design phase and drafting of construction documents and is anticipated to close in Q2-3 2024. Funding for this program was reduced in the November filing and shifted to support other community programming to maximize CEF impact. Impact evaluation activities are not planned for this initiative currently. Funding for this program was reduced in the November filing and shifted to support other LMI multifamily programming.

2.0 Quarterly Benefits Progress Versus Plan

Table 3. Market Development and Innovation & Research Portfolio—Annual Direct Benefits

The table that follows represents the Market Development and Innovation & Research initiatives and their associated direct benefits. Progress reported here is a blend of verified gross and gross savings. Where evaluation studies have been completed and yield realization rates, verified gross acquired savings are reported. Where studies are not yet complete, those initiatives and/or time periods will continue reporting gross savings. Note measurement and verification activities have reduced gross savings by approximately 3.2 TBtu through the fourth quarter.

Annual Benefits Metrics	**Evaluated Totals** (verified gross where evaluated; gross where not)								
Market Development Innovation & Research ** Direct Only **	**Planned Incremental Acquired Benefits in Current Year**	**Current Year Acquired Benefits Through Current Quarter**	**Cumulative Acquired Benefits Through Current Quarter**	**Committed Benefits as of Current Quarter** (Committed but not acquired)	**Total Progress as of Current Quarter** (Total Acquired + Committed)	**Total Expected Benefits Through 2025**	**Total Progress as % of Total Expected Benefits Thru 2025**	**Total Expected Benefits Through 2030**	**Total Progress as % of Total Expected Benefits Thru 2030**
Total Energy Savings (MMBtu)	4,958,371	3,415,745	20,667,689	17,153,520	37,821,210	33,661,171	112%	46,556,221	81%
Electricity Savings (MWh)	705,089	343,229	2,055,598	1,376,580	3,432,178	3,635,023	94%	4,346,715	79%
Total Fuel Savings (MMBtu)	3,625,835	3,023,547	23,197,769	13,741,147	36,938,916	31,551,597	117%	42,220,462	87%
Natural Gas Fuel Savings (MMBtu)	3,240,610	2,460,498	10,250,556	12,647,827	22,898,383	17,806,073	129%	27,268,154	84%
Other Fuel Savings (MMBtu)	385,225	563,049	12,947,213	1,093,320	14,040,533	13,745,524	102%	14,952,308	94%
Renewable Energy Generation (MWh)	64,262	21,023	275,452	57,686	333,138	618,455	54%	621,055	54%
Renewable Energy Capacity (MW)	65	8	435	2	436	842	52%	844	52%
Total Leveraged Funds ($M)	$1,358	$795	$6,819	$3,755	$10,574	$10,340	102%	$12,722	83%

- Verified savings as a percent of total reported direct savings varies by metric and includes electricity (59% verified), natural gas (62%), and other fuels (12%). The measurement and verification work to verify savings is done on a periodic basis, most commonly covering at least 1-2 years of program activity. This work can only begin once adequate post-installation operation has occurred. Additionally, methods and data availability vary significantly between electricity, natural gas, and other fuels, which is one of the underlying causes of varying percentages of savings verified.
- Total Energy Savings measures the combined electricity and fuel savings net of usage; therefore, may not sum to the total of individual electric and fuel savings values.
- 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.

Table 4. Market Development and Innovation & Research Portfolio—Annual Indirect Benefits

Indirect benefits are defined as long-term market effects from follow-on market activity not directly funded by NYSERDA. Progress is reported as market impacts are verified through the completion of market studies which will occur gradually and grow over time, depending upon the period of each study, which varies from one initiative to another. More information on the Evaluation, Measurement, and Verification can be found in section 4 of this report. Note approximately 3.6 TBtu of indirect benefits have been quantified through evaluation. Expected benefits shown through 2025 and 2030 are discounted by 50 percent to account for uncertainty in timing and potential overlap that has not yet been assessed across the portfolio.

Market Development ** Indirect Only **	Cumulative Indirect Benefits Evaluated Through Previous Period	Indirect Benefits Evaluated in Current Reporting Period	Total Indirect Benefits Evaluated Through Current Reporting Period	Total Indirect Benefits Expected Through 2025	Total Indirect Benefits Evaluated as % of Total Expected Through 2025	Total Indirect Benefits Expected Through 2030	Total Indirect Benefits Evaluated as % of Total Expected Through 2030
Total Energy Savings (MMBtu equivalent)	3,795,561	-	3,795,561	18,200,111	21%	49,045,772	8%
Electricity Savings (MWh)	429,741	-	429,741	2,184,122	20%	5,758,022	7%
Total Fuel Savings (MMBtu)	2,616,422	-	2,616,422	11,433,161	23%	30,955,836	8%
Natural Gas Fuel Savings (MMBtu)	1,807,402	-	1,807,402	6,649,203	27%	19,538,759	9%
Other Fuel Savings (MMBtu)	809,020	-	809,020	4,783,958	17%	11,417,077	7%
Renewable Energy Generation (MWh)	478,683	-	478,683	482,654	99%	688,757	69%
Renewable Energy Capacity (MW)	58	-	58	188	31%	313	19%

- Indirect benefits are reported for the initiatives and specific time periods for which studies have concluded; these impacts will be added over time as additional studies conclude, regularly growing these evaluated totals.
- Cumulative Indirect Benefits Evaluated Through Previous Period reflects the total reported indirect benefits as of the period, but not necessarily all indirect savings anticipated through the reporting period, since additional studies will likely conclude for past periods and add to these overall figures.
- Indirect plans as represented in the "Total Expected" columns conservatively include 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.
- Total Indirect Benefits Evaluated Through Current Reporting Period, Total Energy Savings updated to include Energy Usage which is not presented as its own metric on this table. Of reported Electricity Usage, 84,155 MWh is netted in the Total Energy Savings calculation.
- Indirect leveraged funding will be captured with future assessments.

2.1 Quarterly Budgets Progress Versus Plan

Table 5. Market Development Initiatives by Focus Area—Budgets and Spending

See endnote section for more information.[6,7,8]

Market Development Focus Area | Initiative	Current Year Expenditures Plan	Current Year Expenditures Through Current Quarter	Encumbrances as of Current Quarter	Total Progress as of Current Quarter (Expended + Encumbered)	Total Expected Expenditures Through 2025	Total Progress as % of Total Expenditures Through 2025	Total Expected Expenditures Through 2030	Total Progress as % of Total Expenditures Through 2030
Clean Heat & Cooling								
Heat Pumps Phase 1 (2017)	$2,806,508	$2,018,862	$3,196,295	$57,625,461	$57,491,685	100%	$57,491,685	100%
Heat Pumps Phase 2 (2020)	$10,691,600	$10,011,663	$17,056,159	$46,505,313	$48,117,139	97%	$63,231,181	74%
Renewable Heat NY - Clean and Efficient Biomass Heating	$452,248	$337,618	$279,471	$13,403,215	$13,410,575	100%	$13,410,575	100%
Solar Thermal Transition	-	-	-	$287,513	$287,513	100%	$287,513	100%
Clean Heat & Cooling Total	**$13,950,356**	**$12,368,143**	**$20,531,925**	**$117,821,503**	**$119,306,912**	**99%**	**$134,420,954**	**88%**
Codes and Standards, & Other Multisector Initiatives								
Codes and Standards for Carbon Neutral Buildings	$5,465,000	$4,987,416	$11,906,439	$28,061,602	$37,262,900	75%	$57,000,000	49%
Information Products and Brokering	$440,000	$532,305	$264,478	$2,697,640	$4,860,000	56%	$5,500,000	49%
Market Characterization & Design Market Development	$4,231,155	$3,038,418	$4,638,328	$22,566,090	$24,443,222	92%	$24,758,269	91%
Product and Appliance Standards	$4,443,380	$2,040,342	$8,367,422	$12,407,755	$17,481,046	71%	$25,699,000	48%
REV Connect	$1,332,000	$1,315,750	$4,414,660	$10,199,666	$13,000,000	78%	$13,000,000	78%
Codes and Standards, & Other Multisector Initiatives Total	**$15,911,535**	**$11,914,231**	**$29,591,327**	**$75,932,752**	**$97,047,168**	**78%**	**$125,957,269**	**60%**
Commercial / Industrial / Agriculture								
Advancing Agricultural Energy Technologies	$350,000	$500,640	$1,297,760	$2,104,449	$2,104,449	100%	$2,104,449	100%
Agriculture Transition	-	-	-	$3,598,821	$3,598,821	100%	$3,598,821	100%
Commercial Transition	$330,000	$434,567	$522,924	$12,359,688	$12,272,799	101%	$12,559,148	98%
Energy Management Practices	$3,539,500	$3,086,336	$7,082,431	$23,151,280	$25,391,811	91%	$28,876,778	80%
Energy Management Technology	$10,491,000	$12,003,871	$23,639,226	$79,430,018	$85,476,432	93%	$108,298,862	73%
Greenhouse Lighting and Systems Engineering	$482,648	$1,048,363	$1,018,302	$5,000,000	$4,837,785	103%	$5,000,000	100%
Industrial Transition	$1,593,925	$1,222,280	$488,611	$45,262,063	$48,223,374	94%	$48,223,374	94%
Market Challenges	$8,870,589	$7,839,782	$101,985,245	$122,373,325	$74,918,755	163%	$127,955,956	96%
P-12 Schools	$2,500,000	$2,791,659	$19,647,474	$29,226,540	$17,867,874	164%	$57,600,000	51%
Pay for Performance	$278,006	$69,980	$84,241	$1,778,747	$1,902,532	93%	$1,902,532	93%
Real Estate Tenant	$1,160,662	$761,270	$709,052	$14,717,951	$15,223,877	97%	$15,798,390	93%
REV Campus Challenge	$2,150,000	$2,591,464	$6,989,939	$20,980,814	$17,694,448	119%	$21,650,002	97%
Technical Services	$6,887,413	$11,289,345	$32,781,424	$69,017,600	$57,681,765	120%	$88,252,737	78%
Commercial / Industrial / Agriculture Total	**$38,633,743**	**$43,639,556**	**$196,246,628**	**$429,001,294**	**$367,194,720**	**117%**	**$521,821,047**	**82%**
Communities								
Clean Energy Communities	$6,527,633	$6,251,774	$12,689,799	$43,395,542	$53,293,153	81%	$81,271,963	53%
Community Energy Engagement	-	-	-	$4,388,546	$4,407,818	100%	$4,407,818	100%
Communities Total	**$6,527,633**	**$6,251,774**	**$12,689,799**	**$47,784,088**	**$57,700,971**	**83%**	**$85,679,781**	**56%**

Table 5 continued

Market Development Focus Area | Initiative	Current Year Expenditures Plan	Current Year Expenditures Through Current Quarter	Encumbrances as of Current Quarter	Total Progress as of Current Quarter (Expended + Encumbered)	Total Expected Expenditures Through 2025	Total Progress as % of Total Expenditures Through 2025	Total Expected Expenditures Through 2030	Total Progress as % of Total Expenditures Through 2030
Low-to-Moderate Income								
Healthy Homes Feasibility Study	$32,865	-	$32,865	$212,147	$212,147	100%	$212,147	100%
Heat Pumps Phase 2 (2020)	$4,580,000	$1,805,326	$3,140,888	$11,006,950	$24,587,625	45%	$30,000,000	37%
LMI Multifamily	$12,742,374	$13,490,404	$34,286,423	$75,854,844	$106,089,055	72%	$159,328,622	48%
LMI Outreach & Engagement	$1,393,525	$611,304	$1,391,081	$4,247,598	$7,419,045	57%	$8,467,401	50%
LMI Pilots	$639,499	$277,116	$106,583	$852,665	$1,648,099	52%	$2,443,533	35%
Low Rise New Construction Transition - LMI	$375,000	$340,142	$527,676	$7,899,647	$7,970,376	99%	$7,970,376	99%
Multifamily New Construction Transition - LMI	$810,000	$944,977	$1,131,608	$7,644,472	$8,420,981	91%	$8,420,981	91%
New Construction - LMI	$5,384,699	$17,689,106	$72,684,356	$112,891,275	$62,666,191	180%	$134,631,362	84%
NYS Healthy Homes Value Based Payment Pilot	$3,780,136	$633,205	$1,016,495	$3,385,105	$9,791,294	35%	$9,791,294	35%
Regional Clean Energy Hubs	$9,473,115	$3,923,194	$28,770,506	$34,347,228	$32,921,931	104%	$42,000,000	82%
RetrofitNY - LMI	$5,353,383	$418,284	$3,237,179	$7,995,178	$29,169,070	27%	$30,503,500	26%
REVitalize	-	-	-	$291,424	$291,424	100%	$291,424	100%
Single Family - Low Income	$16,631,077	$18,382,310	$1,280,478	$248,891,159	$249,028,568	100%	$249,028,568	100%
Single Family - Moderate Income	$5,535,802	$4,537,341	$1,103,690	$97,232,135	$102,751,836	95%	$102,751,836	95%
Solar for All	$1,300,000	$1,228,538	$7,155,976	$12,697,047	$8,523,937	149%	$13,011,046	98%
Low-to-Moderate Income Total	**$68,031,475**	**$64,281,247**	**$155,865,805**	**$625,448,875**	**$651,491,580**	**96%**	**$798,852,088**	**78%**
Multifamily Residential								
Energy Management Technology	$2,226,026	$430,875	$2,992,213	$9,707,748	$13,126,688	74%	$14,099,239	69%
Market Challenges	$1,327,024	$712,673	$6,996,293	$9,830,327	$9,967,046	99%	$10,000,000	98%
Multifamily Low Carbon Pathways	$3,900,954	$974,079	$6,087,698	$7,588,027	$17,018,812	45%	$24,638,016	31%
Multifamily Market Rate Transition	-	-	-	$156,214	$156,214	100%	$156,214	100%
Technical Services	$5,827,866	$4,443,262	$13,212,233	$21,748,782	$17,678,124	123%	$25,749,999	84%
Multifamily Residential Total	**$13,281,869**	**$6,560,889**	**$29,288,438**	**$49,031,098**	**$57,946,882**	**85%**	**$74,643,467**	**66%**
New Construction								
Commercial New Construction Transition	$750,000	$1,093,354	$2,358,780	$11,993,063	$13,094,630	92%	$14,645,983	82%
Low Rise New Construction Transition - Market Rate	$137,359	$55,859	$220,146	$4,327,391	$4,381,285	99%	$4,381,285	99%
Multifamily New Construction Transition - Market Rate	$124,000	$70,768	$172,033	$1,592,735	$1,626,873	98%	$1,626,873	98%
New Construction - Market Rate	$3,925,584	$7,674,636	$103,934,926	$126,159,471	$61,915,493	204%	$152,150,505	83%
New Construction Total	**$4,936,943**	**$8,894,618**	**$106,685,885**	**$144,072,660**	**$81,018,281**	**178%**	**$172,804,647**	**83%**

Table 5 continued

Market Development Focus Area | Initiative	Current Year Expenditures Plan	Current Year Expenditures Through Current Quarter	Encumbrances as of Current Quarter	Total Progress as of Current Quarter (Expended + Encumbered)	Total Expected Expenditures Through 2025	Total Progress as % of Total Expenditures Through 2025	Total Expected Expenditures Through 2030	Total Progress as % of Total Expenditures Through 2030
Renewables / Distributed Energy Resources (DER)								
Anaerobic Digesters Transition	$4,050,000	$1,092,153	$7,589,709	$13,867,691	$11,870,723	117%	$13,634,032	102%
Clean Energy Siting and Soft Cost Reduction	$1,313,777	$1,053,864	$1,476,278	$4,250,396	$6,245,732	68%	$8,795,000	48%
Combined Heat & Power Transition	$12,124,782	$2,932,881	$15,555,209	$54,868,462	$58,091,908	94%	$58,091,908	94%
Fuel Cells	$2,156,250	$1,000,000	$500,000	$4,786,644	$7,199,144	66%	$7,199,144	66%
Offshore Wind Master Plan	-	-	-	$4,965,882	$4,965,882	100%	$4,965,882	100%
Offshore Wind Pre-Development Activities	$342,809	$62,880	$181,646	$9,715,747	$9,789,462	99%	$9,789,462	99%
ORES Support	$2,250,000	$308,611	$1,653,971	$4,304,117	$8,397,053	51%	$9,000,000	48%
Reducing Barriers to Distributed Deployment	$1,330,000	$307,468	$5,170,631	$14,744,300	$13,314,716	111%	$15,450,000	95%
Small Wind Transition	-	-	-	$3,323,673	$3,557,768	93%	$3,557,768	93%
Solar Plus Energy Storage	$27,149,772	$17,499,999	$6,924,500	$36,820,771	$36,820,772	100%	$36,820,772	100%
Renewables / Distributed Energy Resources (DER) Total	**$50,717,389**	**$24,257,856**	**$39,051,944**	**$151,647,684**	**$160,253,159**	**95%**	**$167,303,968**	**91%**
Single Family Residential								
Consumer Awareness	-	-	-	$2,251,671	$2,251,671	100%	$2,251,671	100%
Heat Pumps Phase 2 (2020)	$1,700,000	$1,571,601	$2,234,751	$5,406,441	$10,749,989	50%	$12,000,000	45%
Pay for Performance	$10,000	$4,936	-	$885,489	$890,553	99%	$890,553	99%
Residential	$14,592,829	$10,682,783	$13,808,881	$36,865,034	$52,551,537	70%	$56,998,862	65%
Single Family Market Rate Transition	-	(0)	-	$23,528,344	$23,530,396	100%	$23,530,396	100%
Single Family Residential Total	**$16,302,829**	**$12,259,320**	**$16,043,632**	**$68,936,979**	**$89,974,146**	**77%**	**$95,671,482**	**72%**
Transportation								
Electric Vehicles - Rebate	$118,037	$24,939	$109,449	$39,498,889	$39,500,000	100%	$39,500,000	100%
EV Charging and Engagement	$1,250,000	-	$225,200	$225,200	$6,550,000	3%	$7,200,000	3%
Transportation Total	**$1,368,037**	**$24,939**	**$334,649**	**$39,724,089**	**$46,050,000**	**86%**	**$46,700,000**	**85%**
Workforce Development								
Building Operations and Maintenance Partnerships	$2,717,188	$3,453,747	$11,285,948	$25,458,846	$22,289,857	114%	$33,345,000	76%
Talent Pipeline	$9,303,818	$8,000,895	$16,894,882	$49,890,145	$60,385,798	83%	$75,000,000	67%
Workforce Development Total	**$12,021,005**	**$11,454,642**	**$28,180,830**	**$75,348,991**	**$82,675,655**	**91%**	**$108,345,000**	**70%**
NYS Cost Recovery Fee Market Development	$2,774,753	$2,341,563	-	$15,090,229	$22,074,165	68%	$27,727,575	54%
Total Market Development	**$244,457,567**	**$204,248,778**	**$634,510,863**	**$1,839,840,241**	**$1,832,733,640**	**100%**	**$2,359,927,278**	**78%**

Table 6. Innovation & Research Initiatives by Focus Area—Budgets and Spending

See endnote section for more information.[9,10 11]

Innovation & Research Focus Area | Initiative	Current Year Expenditures Plan	Current Year Expenditures Through Current Quarter	Encumbrances as of Current Quarter	Total Progress as of Current Quarter (Expended + Encumbered)	Total Expected Expenditures Through 2025	Total Progress as % of Total Expenditures Through 2025	Total Expected Expenditures Through 2030	Total Progress as % of Total Expenditures Through 2030
Buildings Innovation								
Climatetech Commercialization Support	$2,166,667	$855,000	$8,320,000	$9,500,000	$10,000,000	95%	$10,000,000	95%
NextGen Buildings	$8,050,000	$4,442,255	$45,055,871	$58,508,206	$43,781,786	134%	$65,000,000	90%
Buildings Innovation Chapter Total	**$10,216,667**	**$5,297,255**	**$53,375,871**	**$68,008,206**	**$53,781,786**	**126%**	**$75,000,000**	**91%**
Clean Transportation Innovation								
Electric Vehicle Innovation	$4,050,000	$2,483,900	$12,948,851	$21,636,991	$26,490,029	82%	$31,850,000	68%
Public Transportation and Mobility	$1,585,458	$2,113,054	$2,159,728	$9,605,796	$15,168,472	63%	$22,500,000	43%
Clean Transportation Innovation Total	**$5,635,458**	**$4,596,954**	**$15,108,579**	**$31,242,787**	**$41,658,500**	**75%**	**$54,350,000**	**57%**
Climate Resilience Innovation								
Hydrogen Innovation	$490,000	$161,838	$1,722,812	$1,884,650	$4,297,600	44%	$7,000,000	27%
Market Characterization & Design Innovation & Research	$900,000	$574,153	$367,586	$1,463,440	$1,750,653	84%	$1,750,653	84%
Climate Resilience Innovation Total	**$1,390,000**	**$735,991**	**$2,090,398**	**$3,348,090**	**$6,048,253**	**55%**	**$8,750,653**	**38%**
Energy Focused Environmental Research								
Energy-Related Environmental Research	$6,276,000	$6,238,125	$11,239,095	$41,064,494	$39,609,269	104%	$47,800,000	86%
Energy Focused Environmental Research Total	**$6,276,000**	**$6,238,125**	**$11,239,095**	**$41,064,494**	**$39,609,269**	**104%**	**$47,800,000**	**86%**
Gas Innovation								
Hydrogen Innovation	$1,646,000	$496,022	$8,034,068	$8,530,090	$11,492,000	74%	$20,000,000	43%
Long Duration Energy Storage	$1,800,000	$646,678	$14,171,765	$14,818,443	$10,880,000	136%	$17,000,000	87%
Utility Thermal Network Technical Support	$500,000	$48,757	$1,000,288	$1,049,045	$3,000,000	35%	$3,000,000	35%
Gas Innovation Total	**$3,946,000**	**$1,191,458**	**$23,206,120**	**$24,397,578**	**$25,372,000**	**96%**	**$40,000,000**	**61%**
Grid Modernization								
Future Grid Performance Challenge	$5,400,000	$4,176,479	$28,673,815	$38,337,450	$26,400,000	145%	$43,000,000	89%
Grid ClimateTech Ready Capital	$730,000	$115,920	$480,867	$596,787	$5,230,000	11%	$9,000,000	7%
High Performing Electric Grid	$7,345,960	$5,650,371	$18,996,274	$61,089,058	$57,933,678	105%	$64,800,000	94%
Power Electronics Manufacturing Consortium	-	-	-	$16,694,490	$16,694,490	100%	$16,694,490	100%
Grid Modernization Chapter Total	**$13,475,960**	**$9,942,771**	**$48,150,955**	**$116,717,786**	**$106,258,168**	**110%**	**$133,494,490**	**87%**
Negative Emissions Technologies								
CarbonTech Development	$1,595,995	$2,864,584	$1,857,917	$5,000,000	$4,998,980	100%	$5,113,980	98%
Natural Carbon Solutions	$562,500	$290,376	$11,684,465	$12,000,001	$5,987,500	200%	$12,500,000	96%
Negative Emissions Technologies Total	**$2,158,495**	**$3,154,960**	**$13,542,382**	**$17,000,001**	**$10,986,480**	**155%**	**$17,613,980**	**97%**
Renewables Optimization								
Energy Storage Technology and Product Development	$7,700,000	$2,668,020	$22,860,220	$35,743,610	$34,549,342	103%	$39,500,000	90%
National Offshore Wind Research & Development Consortium	$4,250,000	$4,597,548	$5,363,250	$21,985,059	$22,500,000	98%	$22,500,000	98%
Renewables Optimization Total	**$11,950,000**	**$7,265,567**	**$28,223,470**	**$57,728,669**	**$57,049,342**	**101%**	**$62,000,000**	**93%**
Technology to Market								
CarbonTech Development	$3,821,505	$5,139,584	$7,553,917	$14,146,000	$14,251,020	99%	$14,362,020	98%
Catalytic Capital for Climatetech	$1,664,179	$435,717	$1,782,564	$19,265,434	$19,360,229	100%	$19,360,229	100%
Climatetech Commercialization Support	$5,869,271	$6,502,163	$17,717,221	$54,913,457	$54,572,215	101%	$54,927,913	100%
Climatetech Expertise & Talent	$1,769,054	$169,413	$4,601,320	$11,910,469	$12,049,276	99%	$12,049,276	99%
Manufacturing Corps	$518,726	$1,029,519	$3,580,392	$16,836,465	$17,058,959	99%	$17,058,959	99%
Novel Business Models and Offerings	$1,284,717	$1,184,840	$6,169,855	$13,383,981	$13,383,394	100%	$13,383,394	100%
Technology to Market Total	**$14,927,452**	**$14,461,235**	**$41,405,268**	**$130,455,805**	**$130,675,093**	**100%**	**$131,141,791**	**99%**
NYS Cost Recovery Fee Innovation & Research	$802,060	$437,787	-	$2,806,981	$5,463,628	51%	$6,531,175	43%
Total Innovation and Research	**$70,778,092**	**$53,322,102**	**$236,342,139**	**$492,770,397**	**$476,902,519**	**103%**	**$576,682,089**	**85%**

3 NY-Sun Performance

As represented in Figure 2 above, NYSERDA's NY-Sun Portfolio continues to show strong progress toward the CEF distributed solar capacity targets. Progress in the following tables is conveyed in both capacity (megawatts direct current) and generation (megawatt-hours). Additional detail around progress by year can be found in the NYSERDA-Supported Solar Projects dashboard. Major highlights that speak to progress through the current quarter include:

- In April 2022, the PSC issued an Order expanding the NY-Sun program to target 10 GW of installed distributed solar capacity by 2030. Robust uptake of NY-Sun incentives continues through Q4 2023, as illustrated in the Quarterly Benefits Table.
- By November 17, 2022, incentive uptake achieved one of the thresholds set in the April 2022 Order (commitment of more than 50% of new Upstate capacity) to trigger a Mid-Point Review of the NY-Sun program.
- On January 17, 2023, NYSERDA and DPS jointly filed the NY-Sun Program Mid-Point Review. This report provided a status update on NY-Sun Program Activity, and an overview of recent economic and policy changes to the distributed solar industry. NYSERDA and DPS also presented several recommendations to the Commission, including adjustments to the NY-Sun Prevailing Wage incentive adder, a recommendation for launching a floating solar incentive adder, and a proposal to require the Joint Utilities to implement multiple customer discount rates for net credited community distributed generation projects.
- The Commission issued an Order on June 23, 2023, adopting most of the recommendations from the Mid-Point Review. On July 31, 2023 NYSERDA published a revised NY-Sun Operating Plan and began implementing the adjustments approved in the Mid-Point Review Order.
- New York's national leadership in community solar continued during 2023, with 525.7 MW completed during this time.

Quarterly benefit and budget progress is conveyed in the tables that follow.

3.0 Quarterly Benefits Progress

Table 7. NY-Sun—Installed Capacity and Production (NY-Sun Only)

Table 7 shows installed solar capacity (MW) and production (MWh) across major market sectors. The table includes all projects receiving NY-Sun funding, including those that are supported by the Solar Energy Equity Framework (SEEF). Projects included in SEEF benefit low- to –moderate-income (LMI) households, affordable housing providers, residents of disadvantaged communities (DACs), and public schools serving DACs. As an example, a solar installation at the residence of an eligible LMI homeowner in Albany would be included in the "Upstate-Residential" category in Table 7, as well as in the "SEEF Only" Table 8. Community solar projects are categorized based on their location and size, with most of the State's total community solar capacity categorized as "Upstate-Commercial/Industrial" for the purpose of this table.

Annual Benefits		Evaluated Totals (verified gross where evaluated; gross where not)						
NY-Sun **** Includes SEEF and non-SEEF Projects ****		**Projects Completed (Installed) through Prior Year**	**Projects Completed (Installed) in Current Year**	**Cumulative Projects Completed (Installed Units) through Current Quarter**	**Projects Approved or Contracted But Not Yet Completed (Current Pipeline)**	**Total Progress (Installed + Pipeline) through Current Quarter**	**Total Expected Installed Projects through 2030**	**Total Progress as % of 2030 Goal**
Distributed Solar Energy Capacity (MW)	Commercial/Industrial (Competitive)	117.6	-	117.6	-	117.6	117.6	100%
	Upstate - Residential	427.4	71.7	499.0	20.9	520.0	527.0	99%
	Upstate - Nonresidential	125.2	23.7	148.9	26.6	175.6	279.0	63%
	Upstate - Commercial/Industrial	1,702.5	534.2	2,236.7	3,178.7	5,415.4	6,213.0	87%
	Con Ed - Residential	270.1	71.5	341.6	24.4	365.9	441.0	83%
	Con Ed - Nonresidential	134.6	26.0	160.6	208.1	368.7	735.0	50%
	Capacity Total	**2,777.4**	**727.0**	**3,504.4**	**3,458.7**	**6,963.1**	**8,312.6**	84%
Distributed Solar Energy Production (MWh)	Commercial/Industrial (Competitive)	136,652	-	136,652	-	136,652	n/a	
	Upstate - Residential	445,887	70,614	516,501	20,427	536,928		
	Upstate - Nonresidential	141,487	26,161	167,648	29,989	197,637		
	Upstate - Commercial/Industrial	2,039,924	768,202	2,808,126	4,193,168	7,001,294		
	Con Ed - Residential	287,344	73,329	360,673	24,969	385,642		
	Con Ed - Nonresidential	156,232	30,692	186,924	249,318	436,242		
	Production Total	**3,207,526**	**968,999**	**4,176,524**	**4,517,871**	**8,694,395**		

Table 8. NY-Sun—Installed Capacity and Production (NY-Sun SEEF Only)

Table 8 is limited to projects that are supported by SEEF, which includes "adder" incentives for qualifying projects that are offered in additional to the "base" NY-Sun incentives received by all qualifying projects in the applicable market sector. The projects included in Table 8 are a subset of those in Table 7.

Annual Benefits		**Evaluated Totals** (verified gross where evaluated; gross where not)				
NY-Sun ** Solar Energy Equity Framework ONLY **		**Projects Completed (Installed Units) Through Prior Year**	**Projects Completed (Installed Units) in Current Year**	**Cumulative Projects Completed (Installed Units) Through Current Quarter**	**Projects Approved or Contracted But Not Yet Completed (Current Pipeline)**	**Total (Installed + Pipeline) Through Current Quarter**
Distributed Solar Energy Capacity (MW)	Upstate - Residential	5.5	0.9	6.4	0.6	7.0
	Upstate - Nonresidential	0.8	0.1	0.9	1.2	2.1
	Upstate - Commercial/Industrial	15.5	48.3	63.7	382.1	445.8
	Con Ed - Residential	1.6	2.6	4.1	1.2	5.3
	Con Ed - Nonresidential	17.1	2.6	19.6	19.2	38.8
	Capacity Total	**40.4**	**54.4**	**94.7**	**404.3**	**499.0**
Distributed Solar Energy Production (MWh)	Upstate - Residential	6,013	921	6,934	564	7,498
	Upstate - Nonresidential	828	55	883	1,317	2,200
	Upstate - Commercial/Industrial	17,956	107,411	125,367	511,199	636,566
	Con Ed - Residential	1,729	2,737	4,466	1,284	5,750
	Con Ed - Nonresidential	19,985	3,449	23,433	23,244	46,677
	Production Total	**46,512**	**114,573**	**161,084**	**537,607**	**698,691**

Table 9. All Other Solar—Installed Capacity and Production Beyond NY-Sun

Table 9 tracks all other reported progress toward the statewide solar deployment goals of 6 GW by 2025 and 10 GW by 2030. It includes projects that received non-CEF NYSERDA funding as well as projects installed independent of NYSERDA funding. NYSERDA utilizes data from utility interconnection inventories published by the Department of Public Service to determine non-NYSERDA reported installations. Since the two data sets can define project completion date differently, some overlap may exist between the two, however the totals presented here (MW, MWh) will never exceed the reported interconnected totals. As the pipeline of NYSERDA commitments are drawn down over time (projects are considered acquired in both data sources), this overlap is systematically eliminated.

Annual Benefits		**Evaluated Totals** (verified gross where evaluated; gross where not)				
Other Solar Installations		**Projects Completed (Installed Units) Through Prior Year**	**Projects Completed (Installed Units) in Current Year**	**Cumulative Projects Completed (Installed Units) Through Current Quarter**	**Projects Approved or Contracted But Not Yet Completed (Current Pipeline)**	**Total (Installed + Pipeline) Through Current Quarter**
Distributed Solar Energy Capacity (MW)	NYSERDA (non-CEF) Installations	588.7	21.3	610.1	45.2	655.2
	Non-NYSERDA Statewide Installations			1,231.1		1,231.1
	Capacity Total	**588.7**	**21.3**	**1,841.1**	**45.2**	**1,886.3**
Distributed Solar Energy Production (MWh)	NYSERDA (non-CEF) Installations	649,743	23,232	672,975	53,977	726,952
	Non-NYSERDA Statewide Installations			1,376,872		1,376,872
	Production Total	**649,743**	**23,232**	**2,049,847**	**53,977**	**2,103,823**

3.1 Quarterly Budgets Progress

Table 10. NY-Sun—Budgets and Spending

Table 10 shows encumbrances and expenditures across major market sectors and programmatic areas with the NY-Sun initiative. The "MW Block Incentives & Adders" section breaks down encumbrances and expenditures across the major market sectors, excluding funding with the Solar Energy Equity Framework. All SEEF encumbrances and expenditures, including "adder" incentives, are tracked as a line item. As an example, for a solar installation at the residence of an eligible LMI homeowner in Albany the expenditure of the "base" NY-Sun incentive would be included in the "Upstate-Residential" sub-category in the "MW Block Incentives & Adder" section, while the "adder" incentive from the SEEF budget would be included in the "Solar Energy Equity Framework (SEEF)" line item. Table 11 provides a more in-depth look at SEEF encumbrances and expenditures and tracks the total NY-Sun funding committed to SEEF-eligible projects.

NY-Sun	Expenditures through Prior Year	Current Year Expenditures through Current Quarter	Cumulative Expenditures through Current Quarter	Encumbrances as of Current Quarter	Total Progress as of Current Quarter (Expended + Encumbered	Total Expected Expenditures	Total Progress as % of Total Expected Expenditures
MW Block Incentives & Adders							
Commercial/Industrial (Competitive)	$48,616,265	$0	$48,616,265	$299,343	$48,915,609	n/a	
Upstate - Residential	$203,657,491	$21,655,166	$225,312,656	$5,061,767	$230,374,423		
Upstate - Nonresidential	$57,331,524	$8,524,211	$65,855,735	$9,651,421	$75,507,155		
Upstate - Commercial/Industrial	$345,605,430	$140,845,729	$486,451,159	$761,410,215	$1,247,861,374		
Con Ed - Residential	$91,735,655	$13,060,069	$104,795,724	$4,825,105	$109,620,829		
Con Ed - Nonresidential	$73,499,396	$16,648,496	$90,147,892	$134,713,191	$224,861,083		
MW Block Subtotal	**$820,445,760**	**$200,733,670**	**$1,021,179,431**	**$915,961,042**	**$1,937,140,473**	**$2,485,201,000**	71%
Solar Energy Equity Framework (SEEF) Adder	$12,776,814	$6,048,840	$18,825,654	$71,301,282	$90,126,936	$399,764,000	23%
Funds to Assist Transition to Prevailing Wage	$0	$0	$0	$52,923,716	$52,923,716	$238,725,000	22%
Consumer Education	$1,527,958	$19,518	$1,547,475	$1,952,525	$3,500,000	$6,500,000	54%
Implementation and Quality Assurance	$14,786,545	$2,079,223	$16,865,769	$4,521,721	$21,387,489	$32,600,000	66%
Administration	$20,880,083	$3,707,813	$24,587,896	$159,386	$24,747,282	$58,756,000	42%
Evaluation	$837,964	$552,570	$1,390,534	$629,411	$2,019,945	$3,500,000	58%
NYS Cost Recovery	$8,053,635	$2,008,754	$10,062,389	$0	$10,062,389	$41,800,000	24%
NY-Sun Total	**$879,308,760**	**$215,150,388**	**$1,094,459,147**	**$1,047,449,083**	**$2,141,908,230**	**$3,266,846,000**	66%

Table 11. NY-Sun—Solar Energy Equity Framework (SEEF) Spending Details

This table is a subset of budget and spending data reported in Table 10 intended to provide greater detail on SEEF and Other Incentive investments relative to the broader NY-Sun budget. Other Incentives shown here reflect the base MW Block and non-SEEF incentive adders and are a subset of spending shown in Table 10 under MW Block Incentives & Adders.

Solar Energy Equity Framework (SEEF)	SEEF Adder Expenditures	Other Incentive Expenditures	SEEF Adder Encumbrances	Other Incentive Encumbrances	SEEF Adder Total Progress	Other Incentive Total Progress	SEEF Total Progress
Upstate - Residential	$2,302,335	$2,316,219	$336,687	$151,495	$2,639,022	$2,467,714	$5,106,736
Upstate - Nonresidential	$260,471	$348,395	$814,341	$422,490	$1,074,811	$770,885	$1,845,696
Upstate - Commercial/Industrial	$1,636,322	$10,818,855	$53,938,946	$82,140,258	$55,575,268	$92,959,113	$148,534,381
Con Ed - Residential	$2,302,971	$845,388	$729,852	$251,861	$3,032,823	$1,097,248	$4,130,071
Con Ed - Nonresidential	$7,805,291	$9,271,233	$12,521,724	$11,931,905	$20,327,015	$21,203,138	$41,530,152
Technical Assistance and Implementation	$4,518,264	$0	$2,959,733	$0	$7,477,997	$0	$7,477,997
Total	**$18,825,654**	**$23,600,090**	**$71,301,282**	**$94,898,008**	**$90,126,936**	**$118,498,097**	**$208,625,033**

Table 12. Non-CEF NYSERDA Solar Spending

This table quantifies NYSERDA investments in solar projects that are funded outside of the Clean Energy Fund. Project costs related to other non-NYSERDA installed solar (statewide interconnections) is not available and therefore not included.

Other Solar Installations	Expenditures through Prior Year	Current Year Expenditures through Current Quarter	Cumulative Expenditures through Current Quarter	Encumbrances as of Current Quarter	Total Progress as of Current Quarter (Expended + Encumbered
NYSERDA (non-CEF) Installations	$654,764,639	$25,169,454	$679,934,094	$28,885,017	$708,819,111

4 Evaluation, Measurement, and Verification Summary

In accordance with CE-05: Evaluation, Measurement, & Verification (EM&V) Guidance, NYSERDA is required to file all final EM&V Reports in the Document and Matter Management system. This section will include a compilation of the high-level summaries of the EM&V reports due for filing within the reporting period.

For the Q4 2023 reporting period, three studies were finalized as presented in Table 13. For more information on the schedule of studies as they pertain to NYSERDA's Market Development and Innovation & Research initiatives, please reference the Compiled Investment Plan or view reporting for historical periods to see past summaries both found on NYSERDA's website.

Table 13. Evaluations Completed Q4 2023

Evaluated Program	Evaluation type	Evaluated program year(s)
Clean Green Campus	Market	2021-2022
NY Green Bank	Market	2019-2022
Shared Mobility Network Case Study	Market	N/A

The latest Compiled Investment Plans:

https://www.nyserda.ny.gov/About/Funding/Clean-Energy-Fund/

Clean Energy Fund Reports:

https://www.nyserda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/Clean-Energy-Fund-Reports

Note that NYSERDA began providing these summaries with the 2021 Annual CEF Performance Report.

4.0 Clean Green Campus Market Evaluation (2021-2022 School Year)_

Summary of Report Findings, Recommendations and NYSERDA Response to Recommendations

Key findings, conclusions, and associated recommendations from the Clean Green Campuses, 2021-2022 School Year Market Evaluation are presented by research category below.[12]

Awareness and Value of Clean Energy

Finding 1. It is generally common for campuses to collect some level of energy data, although the extent of data collection tends to correlate with a campus's demonstrated commitment to clean energy and sustainability.

Recommendation: Identify member (and nonmember, when appropriate) campuses with low awareness of clean energy opportunities to provide a roadmap for identifying clean energy opportunities on campus with steps they can take to plan new projects.

NYSERDA Response to Recommendation: Implemented. NYSERDA has shared information with member campuses about NYSERDA programs that assist with identifying clean energy opportunities and is working on a Higher Education Decarbonization Playbook.

Recommendation: Encourage member campuses to engage with organizations such as the Association for the Advancement of Sustainability in Higher Education (AASHE) or Second Nature, emphasizing the benefits such as knowledge sharing, recognition of sustainability achievements, and connection with other participating campuses.

NYSERDA Response to Recommendation: Implemented. NYSERDA has shared AASHE and Second Nature resources with member campuses and encouraged them to participate.

Recommendation: Work with campuses that do not have a good understanding of clean energy opportunities on their campus (typically Participant-level members) to identify the specific barriers to longer-term planning, project completion, and tracking of energy data and how they could be addressed.

NYSERDA Response to Recommendation: Implemented. To enhance the ability of a campus to implement clean energy projects, NYSERDA continues to engage with campuses to identify barriers and actions that can be taken to overcome them.

Clean Energy Initiatives and Influence

Finding 2. Campuses across New York State, especially Clean Green Campus members, reported Clean Green Campuses influenced clean energy-related activity across several areas. Overall, 75% of members reported at least one of several clean energy accomplishments during the 2021-2022 school year.

Recommendation: Work with members to understand their administration's priorities and how clean energy projects can fit within the campus's plans.

NYSERDA Response to Recommendation: Implemented. NYSERDA engages with a variety of campus members across levels, school types (i.e., public, private) to understand the challenges campuses face when planning for clean energy and general capital expenditure projects.

Student and Community Engagement

Finding 3. Responses collected through the student survey indicated widespread familiarity with clean energy and sustainability initiatives, with more than 60% of surveyed students reporting being familiar.

Recommendation: Engage with member campuses to understand the benefits they have recognized and apply the messaging when communicating clean energy initiatives to the broader campus community.

NYSERDA Response to Recommendation: Implemented. In its regular communications and outreach, NYSERDA encourages cross collaboration with different campuses and has shared resources to support campuses with promoting their clean energy initiatives. NYSERDA will consider highlighting case studies, templates, and best practices from member campuses.

Recommendation: Develop marketing and outreach materials for use by campuses to recruit students that focus on student's overall satisfaction, including clean energy and sustainability.

NYSERDA Response to Recommendation: Implemented. NYSERDA has shared and campuses have utilized, resources to support campuses with promoting their clean energy initiatives. NYSERDA will consider working with campuses to develop messaging related to clean energy and sustainability for use by campuses when recruiting students.

Recommendation: Consider the pursuit of local/regional collaboration among member (and ideally, also nonmember) campuses with the surrounding communities to increase knowledge sharing with respect to sustainability goals, strategies, and best practices for pursuing clean energy and sustainability initiatives.

NYSERDA Response to Recommendation: Implemented. In its regular communications and outreach, NYSERDA encourages cross collaboration with different campuses and participation in higher education peer groups like NYCSHE (NY Coalition for Sustainability in Higher Education). NYSERDA will consider highlighting case studies, templates, and best practices from member campuses.

Knowledge Sharing, Leadership Support and Recognition

Finding 4. Clean Green Campuses members are actively engaged in sharing knowledge on clean energy opportunities and finding support within their organization's management. The level of sharing was highest among Leaders (43%) and equal among Achievers and Participants (25%).

Recommendation: Consider conducting targeted outreach to campuses that have not utilized available funding to identify ways that these campuses can further their goals and receive financial support from leadership.

NYSERDA Response to Recommendation: Implemented. NYSERDA has conducted targeted outreach to member campuses that have not utilized NYSERDA funding to understand campus priorities and goals and encourage them to participate in programs that align with their institutional needs.

4.1 NY Green Bank Market Evaluation (2019-2022)

Summary of Report Findings, Recommendations and NYSERDA Response to Recommendations

Key findings and associated recommendations from NY Green Bank Financial Market Transformation Evaluation include:[13]

Finding 1: NY Green Bank's targeted investments show compelling evidence that it is playing a meaningful role in transforming a few key markets. Early community solar projects made use of the Value Stack compensation mechanism, which presented substantial uncertainty and perceived risk to private sector financiers. NY Green Bank played an early mover role in this market, helping establish a strong track record of investing in community solar PV projects that has allowed this market to grow rapidly over recent years. NY Green Bank helped lower perceived risks on transactions for commercial developers where they were party to through a variety of strategies. **Recommendation:** Develop new financial instruments and increase risk tolerance. To date, NY Green Bank's main investment strategy has been to offer risk-adjusted terms at market rates to demonstrate developers are able to carry the commercial cost of debt, primarily in the form of senior secured debt financing. Other financial instruments, such as subordinated debt, equity, and credit enhancements, can be used to leverage additional private capital.

NYSERDA Response to Recommendation: Implemented. NY Green Bank completed some of the earliest community solar transactions in the State, setting precedents and leading the way for commercial lenders to follow such that competitively priced private capital is readily available for these projects. NY Green Bank continues to address financing gaps and barriers by creating replicable and scalable products (i.e., interconnection bridge, community solar interconnection, construction revolver, and tiered pricing for LMI community solar) and actively work to design other financial tools necessary to meet market needs and support the objectives and targets outlined in New York's Climate Leadership and Community Protection Act (Climate Act).

NYGB cannot alter the risk tolerance of another party, but it can work with project owners to prepare transaction offerings, which are attractive to a wider array of capital market participants. The evaluation recognized NYGB's ability to adapt existing project finance loan instruments to meet the needs of NYS community solar borrowers. NYGB continues to seek more opportunity to apply some of the same financing instruments within other clean energy markets in NYS, particularly, energy storage, clean transportation and building decarbonization.

Recommendation: Increase outreach and expand knowledge sharing. There are financiers and developers who remain unaware or unclear of NY Green Bank's role in facilitating clean energy transactions. Extensive outreach and engagement with financiers, developers and other sector stakeholders could provide NY Green Bank with greater visibility in the market and clarify its purpose, while increasing opportunities to offer technical support and build sector-wide capacity.

NYSERDA Response to Recommendation: Implemented. NY Green Bank will develop and implement a communication outreach and engagement strategy that emphasizes NYGB's role in supporting and advancing clean energy investments, with a focus on less established clean energy markets.

Recommendation: Data transparency. An improved understanding of clean energy technologies and assets, including their revenue streams, can help expand and accelerate capital flows in less familiar markets. As such, NY Green Bank can play a role in advocating for greater transparency on transaction data to improve risk-return profiles and signal ESG impacts that align with sustainable finance disclosures, while promoting best practices and new program offerings.

NYSERDA Response to Recommendation: Implemented. NY Green Bank will advocate for greater transparency on transaction data to improve risk-return profiles and signal ESG impacts that align with sustainable finance disclosures, while promoting best practices and new program offerings.

4.2 Shared Mobility Network Case Study

The Shared Mobility Network (Network), a project funded by NYSERDA Innovation & Research and the New York State Department of Transportation (NYSDOT) and implemented by Shared Mobility, Inc. (SMI), is a network of 15 non-profits, transit agencies, municipal offices, service providers, and volunteer transit organizations that initiated and expanded a series of shared mobility programs across Upstate New York between 2015 and 2019.[14] The project supported the launch and expansion of mobility services in 6 different upstate areas such as carshare, bikeshare, vanpool, and the Volunteer Transportation Center (VTC) of Watertown, NY.[15] In service of these launch and expansion efforts across the Network, SMI worked with local governments and other non-government organizations to scope shared mobility feasibility studies and provide other types of assistance, including the development of business plans and grant applications.

Throughout the project, SMI worked with stakeholders to scope feasibility studies and provide other types of assistance, including the development of business plans and grant applications. The "ecosystem" of shared mobility services and network of partners was large, leveraging the strengths of its partners. Over the course of the project, NYSERDA invested a total of $255,073 for the Network and NYSDOT provided a cost share of $93,314.

This case study highlights the range of benefits of mobility services, programs, and partnerships developed through the Shared Mobility Network during the Phase I and Phase II project years (2015 – 2018) and beyond (2019 – 2021). Including funding for the Shared Mobility Network, total NYSERDA funding for related shared mobility service demonstration, research, projects was approximately $1.5 million between 2015 – 2019.[16]

Summary of Report Findings

Key findings from the Shared Mobility Network Case Study include:[17]

- **Leveraged funds:** Under the Shared Mobility Network, **every $1 spent by NYSERDA leveraged $14**. This value includes cost share and follow-on investment from other sources (primarily the NYS

Transportation Alternatives Program and Congestion Mitigation and Air Quality Improvement Program (TAP-CMAQ) and Independent Health).

- **Bikeshare ridership:** Across all bikeshare programs, annual ridership increased 16-fold from 2016 to 2021, or from **~9,000 ~148,300** rides taken.
- **Carshare cost savings:** Estimated annual transportation cost savings range from **~$5,400 to ~$6,600** per participant across carshare programs.
- **Vehicles shed:** An estimated cumulative total of **552 gas vehicles** were shed across all years of the program from carsharing, bike-sharing and vanpooling. Vehicles shed is an estimated metric that assumes partial substitution of carshare vehicles for personal vehicles. It is an estimation of reduced car use across an entire fleet of shared vehicles based on published and peer-reviewed studies.
- **Emission reductions:** An estimated 21,784 MT CO2e emissions were avoided between 2015-2021. CO2e gas emissions avoided were highest from carsharing (17,637 MT CO2e) when compared to bike-sharing (4,068 MT CO2e) or vanpooling (79 MT CO2e) between the years of 2015-2021.
- **Societal benefits from reduced emissions:** Estimated benefits from CO2e reductions were $2.4 million during the same period. Estimated benefits from CO2e reductions were highest from carsharing (~$2.0 million) compared to bike-sharing (~$450,000) and vanpooling (~$8,800).
- **Health and wellness:** Bikeshare riders across Reddy Bikeshare, HOPR, and CDPHP Cycle! burned over 15.5 million calories in 2021 alone.
- **Equity:** A majority of carshare and bikeshare cars, bike racks, and bike stations were located within walkable distance (0.25 miles) of disadvantaged communities, providing increased mobility access.

Endnotes

[1] Order Authorizing the Clean Energy Fund Framework, issued and effective January 21, 2016. [LINK]

[2] Order Approving Clean Energy Fund Modifications, issued and effective September 9, 2021. [LINK]

[3] http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=18-M-0084 [NYS Department of Public Service Commission Files]

[4] Governor Hochul announces new framework to achieve nation-leading energy storage target (6GW by 2030), which can be referenced in the PSC filing of the Energy Storage Roadmap https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7D4753BA-916B-483E-9E35-6749B20384A6}

[5] https://greenbank.ny.gov/Resources/Public-Filings [NY Green Bank Public Filings]

[6] If solicitations with upcoming due dates were factored into the total NYSERDA commitments in the Market Development Budgets and Spending table, an additional $63,309,894 or 81% of the total approved budget to date, would be included with total NYSERDA commitments.

[7] The Market Characterization and Design initiative includes funds to support overarching, non-initiative-specific evaluation studies.

[8] Initiative commitments that are in excess of their total budgets are in anticipation of program attrition. No initiative will have total expenditures in excess of that initiative's total budget at the close of the program.

[9] If solicitations with upcoming due dates were factored into the total NYSERDA commitments in the Innovation and Research Budget and Spending table, an additional $96,754,208 or 102.9% of the total approved budget to date, would be included with total NYSERDA commitments. NYSERDA anticipates attrition over time.

[10] The Market Characterization and Design initiative includes funds to support overarching, non-initiative-specific evaluation studies.

[11] A modification on September 9, 2022 to the Renewables Optimization Investment Plan expanded the activities and budget of the Energy Storage Technology and Product Development initiative to focus on solutions providing 10 to 100+ hours of storage for various grid applications to enable the transition away from natural gas infrastructure. In a subsequent filing on November 1, 2022 this new portion of the initiative was renamed to Long Duration Energy Storage as its own initiative the Gas Innovation focus area.

[12] The final study will be posted to NYSERDA's website Q1 2024.

[13] The final study will be posted to NYSERDA's website Q1 2024.

[14] Shared Mobility, Inc. 2019. Shared Mobility Network for New York State. *Prepared for New York State Energy Research and Development Authority and New York State Department of Transportation.* NYSERDA Contract 46831, NYSDOT Task Assignment C-14-08.

[15] The VTC works with Medicaid/Medicare to provide rides to medical appointments for qualifying individuals.

[16] Importantly, leveraged funds are associated with the Shared Mobility Network as a whole, beyond the NYSERDA funding received by SMI for this project ($255,073). For this reason, all related NYSERDA funds (including those with NYSDOT cost share) are included in the denominator of the leveraged benefits calculation.

[17] The final study will be posted to NYSERDA's website Q1 2024.

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