Case 14-M-0094, Proceeding on Motion of the Commission to Consider a Clean Energy Fund

Clean Energy Fund Investment Plan: Resource Acquisition Transition Chapter

Submitted by the New York State Energy Research and Development Authority

Revised February 22, 2016

1 Introduction

Pursuant to the Order Authorizing the Clean Energy Fund Framework issued by the New York State Public Service Commission (the "Commission") on January 21, 2016 (the "CEF Order"), the New York State Energy Research and Development Authority (NYSERDA) files this Clean Energy Fund (CEF) Investment Plan.[1]

The CEF is the next evolution of state clean energy programs and is part of a strategy to build a cleaner, more resilient, and affordable energy infrastructure for New York State. The CEF is a key pillar of Governor Andrew M. Cuomo's Reforming the Energy Vision (REV) strategy, which refocuses NYSERDA's strategic priorities in the energy marketplace through the deployment of new and redesigned programs and initiatives. While the REV Regulatory Proceeding, a complementary REV pillar, redirects the market by creating rules that facilitate and reward investment in a cleaner, more resilient and affordable energy system, the CEF will engage with the many market actors so they are best able to provide the clean, resilient and bill-reducing technologies that consumers will be able to choose through a REV-enabled marketplace. These two key pillars, alongside the third - New York Power Authority's (NYPA's) 'lead by example' approach to clean energy expansion- will work together to transition to the new clean energy marketplace that REV seeks to enable.

The CEF will serve as an integral component in advancing clean energy goals, as stated in the 2015 New York State Energy Plan[2] (the "2015 State Energy Plan"):

- Achieving 40% greenhouse gas (GHG) emissions reductions by 2030 in the energy sector;
- Meeting 50% of electricity demand by 2030 with renewable energy; and
- Realizing 600 TBtu of energy efficiency by 2030.

The CEF initiatives will enable NYSERDA to work with consumers and market participants to contribute to these statewide goals by managing the CEF to advance four primary outcomes:

- Reduce GHG emissions
- Reduce customer energy bills
- Increase statewide deployment of energy efficiency and renewable energy
- Mobilize private investment in clean energy technologies and solutions

The CEF's success will be apparent in the appearance of: (1) a more dynamic "supply side" of clean energy service providers, including energy service companies, financing institutions, product suppliers, and contractors/installers who develop new models (or improve existing models) for delivering and financing energy services and solutions to consumers, and (2) a better informed "demand side" customer base that seeks innovative energy services and effective energy solutions,

[1] Case 14-M-0094 – Proceeding on Motion of the Commission to Consider a Clean Energy Fund. *Order Authorizing the Clean Energy Fund Framework*, issued January 21, 2016.

[2] See http://energyplan.ny.gov/.

which collectively catalyze flourishing clean energy markets leading to clean energy investments at greater scale and impact.

This Investment Plan covers only the Market Development and Innovation & Research portfolios of the CEF; NY-Sun and New York Green Bank (NYGB) activities will continue to be described within their individual operating plan and business plan, respectively.[3]

The Market Development portfolio will focus on facilitating the market for on-site, behind-the-meter clean energy solutions including energy efficiency, distributed generation, renewable thermal, and energy storage. The Market Development portfolio will also include activities to facilitate Large-Scale Renewables (LSRs), in addition to any role(s) or activities NYSERDA may assume under successor programs to the RPS Main Tier program, which has historically provided direct individual project support.

A core premise of the Market Development portfolio is the recognition that, in the absence of a fully functioning market, initiatives are needed to spur solutions and innovations that accelerate the transition to market mechanisms. NYSERDA's new approach recognizes that different clean energy solutions face different barriers. For some clean energy technologies, high hard costs (e.g., manufacturing and equipment costs) lead to poor economics that dampen demand. For other clean energy technologies, high soft costs (e.g., customer acquisition, permitting, and financing costs) stand in the way of greater scale. Many other solutions are cost competitive today, yet remain under-deployed. This implies that the main barrier to increased penetration of clean energy may not be wholly financial, and indicates that direct grants and incentives may not always be the most effective means to spur adoption when solely aimed at overcoming financial barriers. Non-monetary barriers can include, but are not limited to:

- Burdensome permitting and local approval processes;
- Limited and uneven consumer awareness;
- Lack of trust in technology performance by customers and financial institutions;
- Inertia, capacity and implementation constraints; and
- Limited access to financing.

These barriers are unresolved, receive insufficient focus from other market actors, increase soft costs, impeded self-sustaining markets, and are high-potential opportunities to accelerate adoption if resolved.

The Market Development portfolio will address the diverse barriers to clean energy deployment. Bridge incentives, including those identified in the Resource Acquisition Transition Chapter, will be deployed alongside new techniques that spur self-sustaining clean energy markets and seek to mobilize capital to create the greatest opportunity for market penetration of energy efficiency and

[3] See CEF Order at page 26.

distributed generation. Fundamentally, Market Development initiatives will employ the following strategies to reduce soft costs and other non-monetary barriers:

- **Provide information, data, and education** for customers and service providers to raise awareness and demand, reduce customer acquisition costs, train clean energy workforces, and improve customer confidence.
- **Offer technical assistance**, and provide **standardized and simple, robust tools** for clean energy partners, including service providers, contractors, and energy-decision makers such as code officials and local government leaders to lower soft costs and address implementation constraints.
- **Provide quality assurance** for proposed clean energy solutions and deliver performance validation, monitoring, and verification of new clean energy technologies to improve customer confidence.
- **Pilot, demonstrate, and replicate** new technologies and business models to advance innovative, scalable, and cost-effective solutions.
- **Enable aggregation** of different customer types (e.g. residences, municipalities, businesses, real estate portfolios) to reduce costs through economies of scale and leverage peer pressure to break through inertia.

The Innovation and Research portfolio focuses on Technology and Business Innovation with a goal of accelerating and catalyzing the most valuable innovations that will create low-GHG solutions, system and customer benefits, and a vibrant clean energy industry in New York. The Innovation and Research portfolio will also support energy-related environmental research that provides objective information on the environmental impacts of energy technologies, helping to inform policy making and identify strategies to mitigate environmental impacts.

In delivering the Technology and Business Innovation programs, NYSERDA will be strategic, focused and capital efficient, addressing pressing needs and opportunities in New York. In particular, investments will complement the REV regulatory proceeding by advancing new clean energy solutions for a distributed energy system. The programs will address key points where commercialization can stall and the private sector is less likely to fill gaps, paying careful attention to the path to the market for new innovations.

Structure of this Investment Plan

This Investment Plan employs a chapter approach in which the portfolio is progressively built over the initial year of the CEF. Individual chapters are appended/updated and filed with the Commission as NYSERDA is prepared to initiate the activities within them.

The Budgets Accounting and Benefits Chapter provides an up to date compilation of budgets and benefits for all initiatives contained within the Investment Plan. A Resource Acquisition Transition chapter details program offerings pertaining to continued operation and transitioning of programs from legacy portfolios. A Market Characterization and Design chapter will outline market research and characterization activities that will be necessary for NYSERDA to engage in in order to adequately understand target markets and tailor offerings to them. A Low-to-Moderate Income

(LMI) chapter will outline offerings and activities developed specifically for LMI customers. An Energy-Related Environmental Research chapter will identify research activities to provide objective information on the environmental impacts of energy technologies. Multiple individual Market Transformation Intervention chapters within the Market Development and Innovation & Research portfolios will describe new initiatives that NYSERDA will offer to target particular segments of the market. An Innovation Chapter will outline strategies to advance technology and business innovation in strategic priority areas.

2 Resource Acquisition Transition

This Resource Acquisition Transition chapter provides a description of program offerings within the CEF pertaining to continued operation and transitioning of programs from legacy portfolios. Sections 2.1 through 2.10 include transition programs from the Energy Efficiency Portfolio Standard (EEPS), sections 2.11 through 2.14 include transition programs from the Renewable Portfolio Standard (RPS) Customer-Sited Tier (CST), and section 2.15 includes the transition of the CHP program from the Technology & Market Development (T&MD) portfolio.

In accordance with the CEF Order, a program level benefit cost analysis (BCA) using the Total Resource Cost (TRC) approach was performed for each energy efficiency program for informational purposes and is summarized in Table 1 and presented within. An analysis of those energy efficiency programs in aggregate resulted in a portfolio level TRC of 1.5, which meets the Commission's requirement of a portfolio level TRC greater than 1.0.

Table 1. TRC for Energy Efficiency Programs[4]

	2016 - 2018
Commercial	
Benefits (million 2015$)	$226.35
Costs (million 2015$)	$118.19
Benefit Cost Ratio	1.9
Industrial	
Benefits (million 2015$)	$456.83
Costs (million 2015$)	$117.44
Benefit Cost Ratio	3.9
Agriculture	
Benefits (million 2015$)	$11.28
Costs (million 2015$)	$9.47
Benefit Cost Ratio	1.2
Multifamily Market Rate	
Benefits (million 2015$)	$30.60
Costs (million 2015$)	$13.74
Benefit Cost Ratio	2.2
Single Family Market Rate	
Benefits (million 2015$)	$45.01
Costs (million 2015$)	$50.19
Benefit Cost Ratio	0.9
LMI Single Family	
Benefits (million 2015$)	$82.40
Costs (million 2015$)	$232.58
Benefit Cost Ratio	0.4

[4] Costs defined as all costs associated with the energy efficiency program, including program specific costs, Administration, Cost Recovery Fee (CRF), and evaluation, measurement, and verification, as well as customer costs.

LMI Multifamily	
Benefits (million 2015$)	$180.30
Costs (million 2015$)	$87.50
Benefit Cost Ratio	2.1
Commercial New Construction	
Benefits (million 2015$)	$51.61
Costs (million 2015$)	$88.51
Benefit Cost Ratio	0.6
Low Rise New Construction	
Benefits (million 2015$)	$27.05
Costs (million 2015$)	$33.11
Benefit Cost Ratio	0.8
Multifamily New Construction	
Benefits (million 2015$)	$65.49
Costs (million 2015$)	$36.48
Benefit Cost Ratio	1.8
Total Energy Efficiency Portfolio	
Total Benefits (million 2015$)	$1,176.91
Total Costs (million 2015$)	$787.20
Portfolio Benefit Cost Ratio	1.5

2.1 Commercial

2.1.1 Program Description

The 2016-17 Commercial Facilities Technical and Implementation Assistance Programs aim to provide a statewide commercial offering for existing buildings that increases market uptake of high-impact, comprehensive projects, and emerging clean energy technologies and systems in the commercial sector through support for credible and objective technical assistance and installation of projects aiming to achieve deep energy savings.

Flexible Technical Assistance (FlexTech) will offer cost-sharing up to 50%, or $250,000 (whichever is less), of eligible technical assistance study costs. This program is expected to run through the end of 2017 or until all funds are committed.

Commercial Implementation Assistance will offer cost-sharing up to 50% or $150,000 per project for all commercial/institutional customers who have applied for utility incentives for eligible energy efficiency measures and need additional financial support to implement more comprehensive savings projects than their utility supports. This program will run through the end of 2016 or until all funds are committed, whichever comes first. If funds remain they will be utilized for FlexTech.

This program is a continuation of the current FlexTech Program with modifications on project caps and eligibility updates enacted in Q3 2015 and replaces the previous Existing Facilities Program at NYSERDA.

Program Delivery

Applicants include both eligible customers and service providers on behalf of eligible customers. Service providers have historically represented the majority of applicants and this is expected to continue. Applicants will submit required documentation to be reviewed by NYSERDA to determine eligibility of the project. Each project will receive a purchase order prior to execution of work. Cost-sharing will be administered by NYSERDA after proof of project completion.

This commercial offering will be open-enrollment. Funding will be provided on a first-come first-served basis.

Personnel and Roles

- **NYSERDA staff**: Program management, project eligibility review, general project management, and project payments.
- **Third party technical reviewers**: Technical documentation review, any measurement and verification (M&V) needed for projects.

2.1.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market for the FlexTech Program includes all commercial/ institutional customers who need additional information to:

- Explore an advanced technology or system
- Create a long-term energy plan for their facility, and/or
- Develop diverse and/or deep energy savings projects

The target market for the Commercial Implementation Assistance Program includes all commercial/institutional customers who have applied for available utility incentives for eligible energy efficiency measures and are pursuing diverse and/or deeper energy savings projects with additional project elements not eligible to be funded through the utility program that achieve incremental energy savings.

Eligibility

Eligible participants include New York State commercial facilities which include but are not limited to: office buildings, retail, colleges and universities, health care facilities, state and local governments, not-for-profit and private institutions, and public and private K-12 schools who are New York State electricity distribution customer of a participating utility company who pay into the System Benefits Charge (SBC). Fuel switching is not eligible. On-site and renewable generation are not eligible for installation incentives through this offering. Inquiries and applications regarding these types of projects will be referred to other programs as appropriate.

The following additional new eligibility requirements will apply to the Commercial Implementation Assistance Program:

- Projects that are eligible for funding through their electric or gas distribution utility program are required to apply to the utility program prior to application to this Program. A copy of the utility application is required. NYSERDA will work in close coordination with the respective utility to review the project details and avoid overlap.

- Project elements listed on previous NYSERDA Pre-Qualified Measure Worksheets will not be eligible even if a utility doesn't offer a rebate. These worksheets represent proven technologies that are highly cost effective without an incentive (e.g., Energy STAR LED exit sign, T5 and high performance T8 systems, motors meeting or exceeding the NEMA premium nominal efficiencies, high efficiency chillers). These worksheets will be available to potential applicants via the NYSERDA website and upon request to refer to.

- Projects must have a simple payback period that is ≥ 4 years AND ≤ 14 years (greater than four years, AND less than fourteen years, *excluding* NYSERDA incentives). Please see the equation below for reference:

$$SPB = \frac{PC}{ACS}$$

SPB = Simple Payback

PC = Project Cost

ACS = Annual Cost Savings

- Only one site is allowed per application. Master-metered campuses will be reviewed for possible eligibility on a case-by-case basis.
- New facilities, those that have undergone substantial renovations, or change of use, must be occupied for more than one year to be eligible for this Program. Major renovation projects are eligible under the NYSERDA Commercial New Construction Program.

2.1.3 Incentives/Services Offered

The existing FlexTech Program will be extended past its current end date of February 29, 2016 to December 31, 2017. The Program will offer cost-sharing, up to 50% or $250,000 per technical assistance study or project. The program will run through the end of 2017 or until all funds are committed, whichever comes first. The previous Program provided cost-sharing up to 50% or $500,000 per technical assistance study or project, whichever was lower. This revised program reduces the cost-share cap to $250,000.

The Commercial Implementation Assistance Program will launch in March 2016. The Program will offer cost-sharing, up to 50% or $150,000 per project for all commercial/institutional customers who have applied for utility incentives for eligible energy efficiency measures and need additional

financial support to implement more comprehensive savings projects than their utility supports. The program will run through the end of 2016 or until all funds are committed, whichever comes first. The retired Existing Facilities Program incentives are shown in Table 2. Program revisions made in 2015 previously retired pre-qualified, fluorescent lighting, and gas efficiency measure incentives and required a minimum of two energy conservation measures, with no single measure allowed to be responsible for more than 75% of energy savings. These changes removed highly cost-effective eligible measures.

Table 2. Incentives for the Retired Existing Facilities Program

Performance-Based Electric Efficiency Incentives		
Tier	***Description***	***Incentive Rate***
1	The electric efficiency improvements cause annual kWh reductions less than or equal to 30% of current annual usage at the Facility.	$0.10/kWh
2	The electric efficiency improvements cause annual kWh reductions greater than 30% but less than or equal to 50% of current annual usage at the Facility.	$0.12/kWh
3	The electric efficiency improvements cause annual kWh reductions greater than 50% of current annual usage at the Facility.	$0.15/kWh

Applicants may not obtain financial support for the same energy efficiency measure through other NYSERDA programs or from programs offered by their local utility. No single entity (e.g. service provider, building owner, etc.) can receive or apply for more than 5% of total available incentives. With the requested budget herein, this would represent a $1,000,000 cap in the FlexTech offer and $550,000 cap in the Commercial Implementation Assistance Program. The entirety of the customer's portion of the cost-share must be a cash contribution. In-kind contributions of any type are not allowed as matching funds.

2.1.4 Performance Management

Overall, NYSERDA will regularly review program participation and project performance to determine whether changes in incentives, caps or eligible projects are needed to improve efficacy of program implementation.

For the FlexTech Program, NYSERDA Project Managers review all proposed scopes of work prior to approval to ensure eligibility. NYSERDA contracted Technical Reviewers review completed reports to ensure completion of scope of work and quality of recommendations.

For the Commercial Implementation Assistance Program, NYSERDA Project Managers and NYSERDA contracted Technical Reviewers will review application materials prior to approval to ensure eligibility, overlap avoidance and quality of each proposed project. The NYSERDA contracted Technical Reviewer reviews estimated energy savings and confirms project installation. Across the program, a sample of participants with large potential energy savings will be subject to NYSERDA inspection, data collection, and M&V. The size of the sample will be determined based on type of project proposals received.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in

CEF reporting. For FlexTech, metrics have been initially estimated and estimated impacts will be reported based on a historical NYSERDA FlexTech adoption rate of 65%.

For the FlexTech Program, independent evaluation efforts will focus on determining the actual adoption rate of recommended measures and the associated energy savings and other benefits. The actual adoption rate will be used to adjust reported values. Methods will include surveys and may also include site visits of a sample of program participants. Evaluation surveys will also inquire whether adoption was supported by utility incentive programs.

For the Commercial Implementation Assistance Program, an independent evaluation effort will review data from program site inspections, data collection and M&V to verify energy benefits as needed. Additional impact evaluation work, such as verification site visits, metering and monitoring, will only occur as needed to verify energy and other benefits.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation measurement and verification (EM&V) has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.1.5 Relationship to Utility Programs

The FlexTech Program provides technical assistance services across the state to eligible entities and works alongside utility technical assistance programs. Participants are able to apply to utility implementation programs for installation funds.

The Commercial Implementation Assistance Program will work alongside proposed utility programs/rebates to support: (1) project elements that are not eligible for utility incentives but that offer incremental energy/GHG emission reduction savings; and (2) deeper energy savings additive to what utilities are supporting.

Projects that are eligible for funding through their electric distribution utility program are required to apply to the utility program prior to application to this Program. A copy of the application is required. NYSERDA will work in close collaboration with the respective utility to review the project eligibility to offer the most effective incentive package. Upon applying to the Program the Applicant will authorize the NYSERDA and its designated representatives to access any utility program application pertaining to the facility and engage in conversations with the utility for the purpose of discussing and confirming project eligibility. Eligible projects will vary depending on the specific project element's potential energy savings and costs and the customer's utility territory program offerings. NYSERDA incentives will not be provided for project elements that utility incentives support.

2.1.6 Budgets & Expenditures[5,6]

Budget		2016	2017	2018	Total
FlexTech	Incentives & Services	$11,000,000	$9,000,000	-	$20,000,000
	Program Implementation	$2,000,000	$1,000,000	-	$3,000,000
	Sub-Total	$13,000,000	$10,000,000	-	$23,000,000
Commercial Implementation Assistance	Incentives & Services	$11,000,000	-	-	$11,000,000
	Program Implementation	$3,000,000	-	-	$3,000,000
	Sub-Total	$14,000,000	-	-	$14,000,000
Total		$27,000,000	$10,000,000	-	$37,000,000

Expenditures	2016	2017	2018	2019	2020
Total	4%	16%	32%	36%	12%

2.1.7 Performance Metrics[7]

Primary Metrics[8]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	77,000	44,000	-	121,000
	MWh Lifetime	1,152,000	660,000	-	1,811,000
	MMBtu Annual	729,000	384,000	-	1,113,000
	MMBtu Lifetime	13,113,000	6,919,000	-	20,032,000
	MW	-	-	-	
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		79,000	44,000	-	123,000
CO2e Emission Reduction (metric tons) Lifetime		1,302,000	714,000	-	2,016,000
Customer Bill Savings Annual		$14,800,000	$8,340,000	-	$23,140,000
Customer Bill Savings Lifetime		$222,000,000	$125,000,000	-	$347,000,000
Private Investment		$88,000,000	$36,000,000	-	$124,000,000

[5]Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[6] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

[7] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life for electric and 18-year measure life for heating.

[8] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

Additional Performance Tracking Metrics		2016	2017	2018	Total
Participants	Technical Assistance	176	144	-	320
	Implementation Assistance	70	-	-	70
	Total	246	144	-	390

2.1.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[9] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity, and social cost of carbon.[10] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, Cost Recovery Fee (CRF), and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

	2016 - 2018
Commercial	
Benefits (million 2015$)	$226.35
Costs (million 2015$)	$118.19
Benefit Cost Ratio	1.9

Consistent with the CEF, NYSERDA intends to offer this commercial transition program in a fuel neutral manner, offering cost-sharing to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $302, compared to a cost of $405 in an electric only scenario.[11]

[9] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

[10] The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

[11] To determine the cost-effectiveness, it was assumed all program incentives would achieve MWh savings in an electric-only scenario. In a fuel-neutral scenario some program funds achieve MMBtu savings and some achieve MWh. The cost to achieve the MWh savings remains the same as there is adequate demand for electric only projects.

2.2 Industrial

2.2.1 Program Description

The Industrial Transition program offering provides technical and financial support to assist industrial and data center facilities with process improvement projects to help link energy and their core mission.

Industrial and Process Efficiency (IPE) Program will offer performance-based incentives to manufacturers and data centers implementing cost effective process efficiency improvements capped at 50% of the project cost with maximum incentives of $1 million per electric project, $500,000 per non-electric fuel project and $2 million per facility. IPE's goal is to help manufacturers and data centers increase product output and improve data processing as efficiently as possible. This program is expected to run through the end of 2017 or until all funds are committed.

FlexTech will offer cost-sharing up to 50%, or $250,000 (whichever is less), of eligible technical assistance study costs that evaluate the energy savings associated with potential process improvements. This program is expected to run through the end of 2018 or until all funds are committed.

This is a continuation of the current IPE and FlexTech Programs with modifications on incentive rates, project caps, and eligibility updates.

Program Delivery

Applicants will submit required documentation to be reviewed by NYSERDA to determine eligibility of the project. Each project will receive a purchase order upon approval. Installation is completed by firms/ vendors that the customer retains on their own. Technical Review is conducted by NYSERDA contracted Technical Reviewers. Cost-sharing or incentives will be administered by NYSERDA after proof of project completion and collection of final deliverables.

The Industrial Transition offerings will be open-enrollment. Applications will be accepted on a first-come, first-served basis dependent on funding availability.

Personnel and Roles

- **NYSERDA staff**: Program management, key account management, project eligibility review, general project management, and project payments
- **Third party technical reviewers**: Technical documentation analysis and review, and M&V as needed for projects
- **Implementation contractors**: NA
- **Outreach contractors**: Program outreach, lead development, application assistance, key account management

2.2.2 Target Market & Customer/Project Eligibility Rules

Target Market

The IPE Program targets industrial and manufacturing facilities within the plastics and rubber, computer and electronics, packaging, chemicals, petrochemicals, metals, paper and pulp, transportation, pharmaceutical, food and beverage, mining and mineral processing sectors and data centers in identifying ways to improve energy efficiency through capital investments and process improvements by offering capital incentives and technical assistance while recognizing the importance of sustaining reliability and maximizing uptime. The IPE program offering focuses on projects that improve manufacturing process productivity and data center efficiency.

The target market for the FlexTech Program includes all manufacturing, industrial, and data center customers who need additional information to:

- Explore an advanced technology or process
- Create a long-term energy plan for their facility, and/or
- Develop diverse and/or deep energy savings projects
- Address energy as a component of process efficiency improvements for companies engaged in Lean, 6-Sigma, Total Quality Management (TQM) or other continuous improvement activities

Eligibility

Eligible participants include:

- All New York State manufacturing, industrial, and data center facilities who are New York State electricity distribution customers of a participating utility company who pay into the SBC.
- Both existing and new facilities are eligible to participate.
- Industrial projects may receive incentives for process improvement projects (metric links the process to energy consumption), including expansion projects.
- Data center projects may receive incentives for process and process-related projects.
- All non-process implementation projects are referred to the appropriate utility.

2.2.3 Incentives/Services Offered

The IPE Program will launch in March 2016 and will run through end of 2017 or until all funds are committed, whichever comes first. Incentive rates of $0.10/kWh (upstate), $0.16/kWh (downstate) and $6/MMBtu per annual energy savings for capital process improvements will be offered. Operational & Maintenance (O&M) improvement incentives of $0.04/kWh and $3/MMBtu for measures such as, but not limited to, repairing steam traps and leaks in compressed air systems will also be provided. Incentives are capped at 50% of project cost. Additionally, electric incentives are capped at $1,000,000 per project and non-electric fuel incentives are capped at $500,000 per project. Each single entity (e.g. service provider, building owner, etc.) is subject to a total program incentive cap of $2,000,000 for any combination of electric and non-electric fuel projects.

The previous Program provided a higher upstate electric incentive rate ($0.12/kWh), a higher natural gas incentive rate ($15/MMBtu upstate; $20/MMBtu downstate), higher O&M improvement incentive rates ($0.05/kWh and $6/MMBtu), higher project caps ($5 million per electric project and $1 million per natural gas project), and a higher total program cap of $5 million per facility per year. A Program revision made in Q3 2015 removed lighting and non-process space conditioning as eligible measures and concluded the Super-Efficient Chiller Bonus incentive offering.

The existing FlexTech Program will be extended past its current end date of February 29, 2016 to December 31, 2018. The program will run through 2018 or until all funds are committed, whichever comes first. Cost-shared support of site-specific technical assistance is capped at 50% up to $250,000. The previous Program provided cost-sharing up to 50% or $500,000 per technical assistance study or project, whichever was lower.

2.2.4 Performance Management

For the IPE portion of the program, NYSERDA will assign a technical reviewer to assist in the NYSERDA process and calculate the energy savings for each project. A pre-installation inspection is conducted to understand the project and document the base case. Energy savings calculations are completed based upon data supplied by the customer. For process efficiency projects, production data is also collected. An M&V plan is developed by the technical reviewer, customer, and NYSERDA project manager for:

- Electric efficiency projects saving more than 500,000 kWh annually
- Non-electric fuel efficiency projects saving more than 20,000 MMBtu annually

Upon approval of all final deliverables, NYSERDA issues the full incentive payment for projects not requiring M&V to the Applicant, and partial incentive payment for projects requiring M&V. At NYSERDA's discretion, M&V may be required or waived for any project.

For the FlexTech portion of the program, NYSERDA Project Managers review all proposed scopes of work prior to approval to ensure eligibility. NYSERDA contracted Technical Reviewers review completed reports to ensure completion of scope of work and quality of recommendations.

Overall, NYSERDA will regularly review program participation and project performance to determine whether changes in incentives, caps or eligible projects are needed to improve efficacy of program implementation.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting. For the FlexTech portion of the program, metrics have been developed and estimated impacts will be reported based on a historical NYSERDA FlexTech adoption rate of 65%. An independent evaluation effort will review data from program site inspections and program M&V to verify energy benefits. Additional impact evaluation work, such verification site visits, metering and monitoring, will only occur as needed to verify energy and other benefits. NYSERDA will also continue to conduct targeted pre-installation evaluation M&V for a small sample of projects, as has been done in the past for the EEPS IPE Program, to support accurate baseline and other estimates.

For the FlexTech portion of the program, independent evaluation efforts will focus on determining the actual adoption rate of recommended measures and the associated energy savings and other benefits. The actual adoption rate will be used to adjust reported values. Methods will include surveys and potentially site visits of a sample of program participants. Evaluation surveys will also inquire whether adoption was supported by utility incentive programs.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.2.5 Relationship to Utility Programs

Utility Energy Efficiency Transition Implementation Plans (ETIPs) for Commercial/Industrial sector include prescriptive and custom paths for electric and gas efficiency improvements. Typical utility programs focus on building system improvements such as lighting, heating, ventilation, and air conditioning (HVAC), variable frequency drives (VFDs), and have shied away from process efficiency improvements and data center efficiency projects. It is anticipated that some of the customers in the industrial and data center market may take advantage of the utility Self Direct programs in 2017. NYSERDA will coordinate with utilities as they develop and evolve their ETIPs for the industrial and data center marketplace.

Energy projects involving basic building system improvements such as lighting, HVAC, building controls would be referred to existing utility offerings for their support. Established collaboration with the utilities will ensure proper transition for the customer. Utility offerings for 2017 may differ from 2016, given the onset of Self-Direct, however referrals will be made to utilities as appropriate.

Coordination with Con Edison on data center offerings has been successful and collaborative efforts would continue with this program. Regular communication with fairly consistent representation from each side has minimized market confusion and has matched the customer with the best program for their needs.

The FlexTech Program provides technical assistance services to eligible entities and works alongside utility technical assistance programs. Participants are able to apply to utility implementation programs for installation funds. NYSERDA's cost-shared technical assistance or development of M&V plans would support utility Self-Direct programs that are anticipated in 2017.

2.2.6 Budgets & Expenditures[12,13]

Budget		2016	2017	2018	Total
Industrial & Process Efficiency	Incentives & Services	$27,000,000	$4,000,000	-	$31,000,000
	Program Implementation	$3,900,000	$500,000	-	$4,400,000
	Sub-Total	$30,900,000	$4,500,000	-	$35,400,000
FlexTech	Incentives & Services	$3,000,000	$3,000,000	$2,000,000	$8,000,000
	Program Implementation	$300,000	$150,000	$250,000	$700,000
	Sub-Total	$3,300,000	$3,150,000	$2,250,000	$8,700,000
Total		$34,200,000	$7,650,000	$2,250,000	$44,100,000

Expenditures	2016	2017	2018	2019	2020	2021
Total	7%	15%	29%	29%	16%	4%

[12]Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[13] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

2.2.7 Performance Metrics[14]

Primary Metrics[15]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	201,000	65,000	27,000	292,000
	MWh Lifetime	3,012,000	968,000	408,000	4,387,000
	MMBtu Annual	1,944,000	641,000	276,000	2,861,000
	MMBtu Lifetime	29,160,000	9,610,000	4,140,000	42,910,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		209,000	68,000	29,000	306,000
CO2e Emission Reduction (metric tons) Lifetime		3,132,000	1,019,000	434,000	4,586,000
Customer Bill Savings Annual		$11,684,000	$3,850,000	$1,659,000	$17,193,000
Customer Bill Savings Lifetime		$175,000,000	$58,000,000	$25,000,000	$258,000,000
Private Investment		$174,240,000	$36,240,000	$8,160,000	$218,640,000

Additional Performance Tracking Metrics		2016	2017	2018	Total
Participants	IPE	250	35	-	285
	Technical Assistance	120	120	80	320
	Total	370	155	80	605

2.2.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[16] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity,

[14] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[15] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[16] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

and social cost of carbon.[17] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

	2016 - 2018
Industrial	
Benefits (million 2015$)	$456.83
Costs (million 2015$)	$117.44
Benefit Cost Ratio	3.9

Consistent with the CEF, NYSERDA intends to offer the Industrial Transition program in a fuel neutral manner, offering incentives to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $144/ton, compared to a cost of $212/ton in an electric only scenario.[18]

2.3 Agriculture

2.3.1 Program Description

The Agriculture Energy Audit Program will provide farms and on-farm producers with no-cost energy audits containing information on specific energy efficiency measures, including estimated energy savings, implementation costs and payback, enabling the farms to make well-informed investment and implementation decisions. In addition, the audits will include information on implementation incentives available for recommended measures through utility or federal programs.

The Agriculture Energy Audit Program will provide no-cost energy audits to eligible farms and on-farm producers based upon the level of complexity desired by the applicant. The energy audits are segmented by three levels:

- Level 1 – Walk thru energy audit
- Level 2 – Detailed energy audit

[17]The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

[18]To determine the cost-effectiveness, it was assumed all program incentives would achieve MWh savings in an electric-only scenario. In a fuel-neutral scenario some program funds achieve MMBtu savings and some achieve MWh. It is assumed that the cost would be the same for an electric-only program as a fuel-neutral program.

- Level 3 – System Specific energy audit

This program is expected to operate through the end of 2017 or until all funds are committed, whichever comes first.

This program modifies the Agriculture Energy Efficiency Program (AEEP) which closed in January 2014. AEEP consisted of providing outreach and customer enrollment, no-cost energy audits and hard cost incentives to off-set the cost for implementing energy efficiency measures. NYSERDA will continue to provide outreach and customer enrollment and no-cost energy audits but will eliminate hard cost incentives and refer farms to utility and federal programs for possible implementation assistance.

Program Delivery

Applicants will submit required documentation to be reviewed by NYSERDA to determine eligibility. Each applicant would be assigned a FlexTech Consultant to perform the audit. NYSERDA will pay the cost of the audit directly to the FlexTech Consultant.

This agriculture offering will be open-enrollment. Funding will be provided on a first-come first-serve basis.

Personnel and roles

- **NYSERDA staff:** Application acceptance, eligibility review, FlexTech Consultant assignments and payments, general program management, management of implementation contractor
- **Implementation Contractor:** Outreach, education and marketing; direct program implementation including: program enrollment assistance, customer support and participant tracking; technical review and quality assurance of audits; audit follow-up and assistance to farms accessing utility, federal or other implementation programs.

2.3.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market for this offering will initially be dairy farms. Milk processing is energy intensive and responsible for the majority of energy consumption, primarily electricity, on dairy farms. Greenhouses would follow due to the energy consumed by lighting and heating the growing space.

Eligibility

Eligible participants include all farms and on-farm producers, including but not limited to dairies, orchards, greenhouses, vegetables, vineyards, grain dryers, and poultry/egg, that are New York State electricity distribution customers of a participating utility company who pay into the SBC.

2.3.3 Incentives/Services Offered

The Agriculture Energy Audit Program will launch in March 2016 as a revised component of FlexTech. The Program will provide no-cost energy audits to eligible farms and on-farm producers

based upon the level of complexity desired by the applicant. The energy audits are segmented by three levels.

- **Level 1:** The FlexTech Consultant will visit farm to conduct a walk thru audit and provide a limited evaluation of energy conservation measures and energy efficiency recommendations. A simple payback and cost estimate range will be provided for measures. The deliverable is a summary letter of feasible energy efficiency measures. This level has a funding cap of $1,500 and energy audit dollars are to be paid directly to the FlexTech Consultant completing the farm energy audits.

- **Level 2:** The FlexTech Consultant will visit the farm and provide a detailed energy audit with calculated evaluations of appropriate energy conservation measures including simple payback. The deliverable is an energy audit report. This level has a funding cap of $2,500 and energy audit dollars are to be paid directly to the FlexTech Consultant completing the farm energy audits.

- **Level 3:** The FlexTech Consultant will conduct an energy audit focused on specific systems or measures with a more detailed analysis of such measures, including renewable energy production. The deliverable is a system specific energy analysis report. This level has a funding cap of $6,000 and energy audit dollars are to be paid directly to the FlexTech Consultant completing the farm energy audits.

The previously offered AEEP provided hard cost incentives up to 75% of eligible project costs, capped at $250,000 for farms to implement electric and natural gas energy efficiency measures.

2.3.4 Performance Management

NYSERDA will regularly review program participation to determine whether changes are needed to improve efficacy of program implementation.

Metrics associated with recommended energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting. Metrics have been initially estimated and estimated impacts will be reported based on a historical NYSERDA FlexTech adoption rate of 65%. Independent evaluation efforts will focus on determining the actual adoption rate of recommended measures and the associated energy savings and other benefits. The actual adoption rate will be used to adjust reported values. Evaluation methods will include surveys and potentially site visits of a sample of program participants, depending on the level of adoption found in surveys. Where hard cost incentives are covered by another NYSERDA offering, those projects will be included in the population of projects evaluated within the incentive program. Evaluation surveys will also inquire whether adoption was supported by utility incentive programs.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit.

Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.3.5 Relationship to Utility Programs

Farm energy audits will reference utility incentive programs for installation funds on recommended energy efficiency measures.

2.3.6 Budgets & Expenditures[19,20]

Budget	2016	2017	2018	Total
Incentives & Services	$1,100,000	$1,100,000	-	$2,200,000
Program Implementation	$700,000	$700,000	-	$1,400,000
Total	$1,800,000	$1,800,000	-	$3,600,000

Expenditures	2016	2017	2018
Total	23%	49%	27%

[19]Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[20] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

2.3.7 Performance Metrics[21]

Primary Metrics[22]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	6,000	6,000	-	12,000
	MWh Lifetime	91,000	91,000	-	182,000
	MMBtu Annual	21,000	21,000	-	41,000
	MMBtu Lifetime	308,000	308,000	-	615,000
	MW	-	-	-	
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		4,000	4,000	-	9,000
CO2e Emission Reduction (metric tons) Lifetime		64,000	64,000	-	128,000
Customer Bill Savings Annual		$1,200,000	$1,200,000	-	$2,401,000
Customer Bill Savings Lifetime		$18,005,000	$18,005,000	-	$36,010,000
Private Investment		$5,429,000	$5,429,000	-	$10,857,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants[23]	330	330	-	660

2.3.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[24] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity, and social cost of carbon.[25] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

[21] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[22] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[23] Participants are the number of applicants (audits provided).

[24] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

[25] The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

	2016 - 2018
Agriculture	
Benefits (million 2015$)	$11.28
Costs (million 2015$)	$9.47
Benefit Cost Ratio	1.2

Consistent with the CEF, NYSERDA intends to offer the Agriculture Energy Audit Program in a fuel neutral manner, offering technical assistance to encourage more efficient use of all fuel types. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $421 compared to a cost of $565 in an electric only scenario[26].

2.4 Multifamily Market Rate

2.4.1 Program Description

The Multifamily Performance Program (MPP) – Market Rate (MR) will continue under the CEF as Version 7.0. MPP will continue to provide support to market rate building owners and the service providers who serve them. This version of MPP will include two (2) components designed to accomplish the following objectives:

- A Targeted Option that will support single measure installations with no minimum energy reduction target. This Option will provide building owners a set of minimum performance criteria for a variety of building improvements that can be used to choose more efficient equipment than they may have been considering. The Targeted Option is expected to:
    - Introduce building owners that have not traditionally pursued energy efficiency and may not be ready to engage in comprehensive improvements to NYSERDA and the benefits of energy efficient equipment.
    - Connect NYSERDA to the contractors and businesses that typically work with these types of building owners to perform these system and equipment upgrades, i.e. HVAC installers, electricians, plumbers, etc.
    - Support enhanced customer service by working with these building owners and contractors to explore additional opportunities in their buildings by considering other, deeper improvements.
    - Work with the utilities to include program incentives for measures they do not currently support. The Targeted Option will not provide incentives on any measure supported by a utility program and will work closely with all utilities to understand which measures they do encourage and why they might not assist others. The purpose of this Option is to determine what type of demand might exist for measures utilities do

[26] Program is only audits, therefore the assumption is that the cost would be the same for an electric only program as the fuel neutral program.

not currently support and work to collect the information they need to incorporate those measures into their programs.

- A High Performance Offering that will support deep energy retrofit projects by offering significant incentives capped at 50% of the project cost. Owners will work with NYSERDA-approved energy consultants to help assess their building and develop a proposal that meets the requirements of the Program. This Option is expected to:
    - Create new opportunities for cutting edge building owners and energy professionals to demonstrate deep energy retrofit possibilities in existing multifamily buildings.
    - Gain experience with deep energy projects that can be used to encourage greater adoption of successful strategies and efforts.
    - Collect data to highlight successful deep energy projects to convince building owners, regulatory agencies, and financial institutions about the benefits and performance of deep energy projects.

This program is expected to run through the end of 2017 or until all funds are committed.

This program is a continuation of the current Multifamily Performance Program with modifications to project eligibility requirements and the incentive schedule. Market rate projects will no longer be required to meet a minimum energy target.

Program Delivery

The Targeted Option will be delivered through building owners, contractors, and energy consultants. Participants will be educated on the Option's minimum performance requirements and any building owner or their designated representative may submit applications requesting incentives for work done. The High Performance Offering will be delivered through a network of Multifamily Building Solution Providers. This network builds upon the previous Multifamily Performance Partner Network and will include energy firms, consultants, engineering firms, and others vetted and pre-approved by NYSERDA. These firms will be selected through an open, on-going application process and building owners will be required to use a network Provider in order to submit a proposal to the High Performance Offering.

The Targeted Option will be open-enrollment. Funding will be provided on a first-come first-served basis. The High Performance Offering will be offered through an annual competitive solicitation requesting proposals for deep energy retrofit projects.

Personnel and Roles

- **NYSERDA staff**: Program management, project eligibility review, general project management, and project payments.
- **Multifamily Building Solutions Providers (previously MPP Partners)**: Customer recruitment, building assessment and project development, Program paperwork and documentation submittals, and installation oversight.

- **Implementation contractor**: Project management and oversight, document review/desk audit, Solutions Provider support, and program document development and maintenance.
- **Quality Assurance/Technical Assistance contractor**: Support industry standards development, conduct field verification for designated percentage of projects, savings analysis, prepare technical guidance on new systems and equipment for Solutions Providers, analysis of the effectiveness of Program rules and processes, and provision of building baselining services (development of weather-normalized building energy consumption based on utility data to be used by Solutions Providers in project development).
- **Marketing contractor**: Development of branded promotional materials, outreach events, communications strategies, and technical transfer efforts, e.g. case studies, press releases, etc.

2.4.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes owners and management companies of market rate properties defined as those that do not meet the definition of affordable housing. The two program components are designed to support multiple sub-segments of the multifamily market, i.e. building owners interested in only single measure replacements and those building owners who want to push the envelope of possible existing building energy retrofits.

Eligibility

Eligible participants include owners and management companies of properties that do not meet the definition of low-to-moderate income and that are New York State electricity distribution customers of a participating utility company who pay into the SBC.

Specific to the Targeted Option, measures that are not supported by the local utility program are eligible for incentives under this Option. Applications can be initiated by any entity approved by the building owner, including, but not limited to, the building owner, a management company, a Multifamily Building Solution Provider or an installation contractor.

For the High Performance Offering, projects will be selected through a competitive solicitation based on a variety of criteria including, but not limited to, the cost-effectiveness of the project, the depth of the projected energy savings, and its potential impact on the knowledge gained regarding deep energy, existing building retrofits. If any of the measures included in a project proposal receive incentives under another program (either NYSERDA or utility), the value of that incentive will be deducted from the MPP High Performance Offering incentive.

2.4.3 Incentives/Services Offered

NYSERDA intends to launch MPP V7.0 in the second quarter of 2016 with the Targeted Option. The solicitation for the High Performance Offering is projected to be released in the fourth quarter of 2016.

For the Targeted Option, incentives will be provided to support installation of high-efficiency equipment. There are no requirements to meet a specific energy reduction target as long as the new equipment meets the Program's efficiency standards. The initial incentives will be $3/MMBtu and $0.03/kWh, capped at $100/unit per building.

For the High Performance Offering, incentives will be provided to cost-share improvements needed to achieve deep energy savings in existing multifamily buildings. Projects will be selected competitively through an annual solicitation. Projects will be eligible to receive a payment of $2,500/unit capped at 50% of the project cost.

If a project receives an incentive from another program (NYSERDA or utility), the value of that incentive will be subtracted from the MPP incentive.

Each subsequent solicitation will assess the response to the previous solicitation to determine if a modification to this incentive level is warranted.

2.4.4 Performance Management

Overall, NYSERDA will regularly review program participation and project performance to determine whether changes in incentives or eligible projects are needed to improve efficacy of program implementation.

Application packets for the Targeted Option will be reviewed for completeness and accuracy. NYSERDA and its implementation contractor may review proposals submitted to the High Performance pathway in an initial effort to normalize the proposals in preparation for review and selection by a Technical Evaluation Panel. During the installation phase, these projects will be inspected periodically to ensure that work is progressing appropriately.

Projects using the Targeted Option will be sample inspected to ensure that the application submittals are sufficient representations of the projects. Additionally, Data Release Authorization Forms, which authorize NYSERDA to collect utility consumption data on the project, will be submitted with the application packet for these projects (limited to forms for the owner accounts) and with proposals for the High Performance projects (including forms for all owner accounts as well as forms from a 10% sample of apartments). These forms will be used to assess building performance post-installation on an annual basis to gauge building performance before and after participation in the Program.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting. An independent evaluation effort will verify energy benefits using methods such as engineering review and analysis, pre/post billing analysis, modeling and on-site metering and monitoring, as needed. Independent impact evaluation will first utilize program data from technical reviews and other sources as a means to offset primary data collection or additional analysis where possible.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with

the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.4.5 Relationship to Utility Programs

To prevent direct conflict between MPP's incentives associated with the Targeted Option and the utility's incentives, MPP will not provide an incentive on any measure supported by a utility program. NYSERDA and the utilities will collaborate to cross-promote their programs with the purpose of directing customers towards the appropriate resource for the work they intend to do. NYSERDA will also work with the utilities to encourage support of additional measures in their programs if demand for such measures is demonstrated through MPP.

To further avoid customer confusion, NYSERDA proposes working with each utility to fully coordinate MPP and their respective programs exploring solutions such as co-branded promotional or marketing materials.

2.4.6 Budgets & Expenditures[27,28]

Budget	2016	2017	2018	Total
Incentives & Services	$2,078,345	$2,078,345	-	$4,156,690
Program Implementation	$1,039,172	-	-	$1,039,172
Total	$3,117,517	$2,078,345	-	$5,195,862

Expenditures	2016	2017	2018	2019	2020
Total	16%	29%	22%	21%	11%

[27] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[28] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

2.4.7 Performance Metrics[29]

Primary Metrics[30]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	1,000	1,000	-	3,000
	MWh Lifetime	20,000	20,000	-	39,000
	MMBtu Annual	142,000	167,000	-	309,000
	MMBtu Lifetime	2,130,000	2,498,000	-	4,628,000
	MW	-	-	-	
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		8,000	10,000	-	18,000
CO2e Emission Reduction (metric tons) Lifetime		125,000	144,000	-	269,000
Customer Bill Savings Annual		$2,300,000	$2,700,000	-	$5,000,000
Customer Bill Savings Lifetime		$34,500,000	$40,500,000	-	$75,000,000
Private Investment		$13,000,000	$14,000,000	-	$27,000,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants	38000	68000	-	106000

2.4.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[31] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity, and social cost of carbon.[32] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

[29] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[30] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[31] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

[32] The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

	2016 - 2018
Multifamily Market Rate	
Benefits (million 2015$)	$30.60
Costs (million 2015$)	$13.74
Benefit Cost Ratio	2.2

Consistent with the CEF, NYSERDA intends to offer the Multifamily Performance Program – Market Rate program in a fuel neutral manner, offering incentives to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $288, compared to a cost of $475 in an electric only scenario[33].

2.5 Single Family Market Rate

2.5.1 Program Description

NYSERDA's Single Family Residential Program is designed to reduce the energy use in the State's existing one-to-four family and low-rise multifamily residential buildings and to capture heating fuel and electricity-related savings. NYSERDA is a sponsor of the national Home Performance with ENERGY STAR® Program, which helps homeowners improve the energy efficiency and comfort of their homes by using a whole house diagnostic approach to identify and address needed building shell, heating and cooling system, lighting and appliance improvements. NYSERDA will offer incentives under this Program for the first two years of the CEF, or through February 28, 2018. Incentives will be reduced over time as NYSERDA focuses on market transformation initiatives.

The Single Family Residential Program deployed under the CEF will replace the existing Home Performance with ENERGY STAR® (HPwES) Program implemented under EEPS and the Regional Greenhouse Gas Initiative (RGGI).

Program Delivery

The Program uses a network of home performance contractors to complete home energy audits, which includes diagnostic testing and an inventory of the home's current conditions. The audit allows the contractors to recommend improvements that are comprehensive, and that maximize the energy savings in each home. The contractor and customer will review the recommendations and come to agreement on the final project scope based on the priorities and needs of the customer. Participating contractors are trained and certified to complete the audits and energy efficiency upgrades.

This residential offering will be open-enrollment for customers and home performance contractors. Funding for incentives will be provided on a first-come, first-served basis and will be reduced over time as market transformation activities become NYSERDA's focus in this sector. Third party

[33]The electric only scenario assumes that only the Targeted Option would be offered as comprehensive projects would not be feasible without fuel savings. In order to attract sufficient applicants without a fuel incentive, the electric only incentive would need to be increased to $0.15/kWh.

implementers and technical support services will be procured through a competitive solicitation, and will be cost-shared with the low-income components of the program.

Personnel and Roles

- **NYSERDA staff**: Program management, general project management, and project payments.
- **Independent Home Performance Contractors**: Customer recruitment, energy audits, installation, program paperwork and documentation submissions, installation oversight.
- **Implementation contractors**: Customer eligibility review and application processing, review of project submissions for technical and eligibility review, incentive processing
- **Software support:** Maintains program management database for project processing (automated to the extent possible) and program tracking
- **Technical support:** Technical support for contractors (desk audit and limited field support)
- **Standards & Quality Assurance:** Support industry standards development, conduct field verification of completed projects
- **Marketing contractor**: Development of branded promotional materials, communications strategies, and technical transfer efforts, e.g. case studies, press releases, etc.

2.5.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes owners of one-to four-family and low-rise residential buildings in service territories of electric utilities contributing to the CEF. The secondary target market is home performance contractors.

Eligibility

Projects must include measures approved by NYSERDA and deemed to be cost effective or have important health, safety, or comfort benefits. Projects must be installed by a participating home performance contractor accredited by the Building Performance Institute, and must follow all applicable code and standards. Participants must be New York State electricity distribution customers of a participating utility company who pay into the SBC.

2.5.3 Incentives/Services Offered

For the initial 6-month period through August 2016, the program incentive offerings will include the incentives offered under the legacy incentive programs, including:

- Free/Reduced-cost audits.[34]
- Consumer incentive of 10% of the cost of the approved energy efficiency measures

[34] Funding for free/reduced-cost home energy audit for the moderate income sector will be funded through CEF once RGGI funds are exhausted.

- Contractor incentive of 5% of the cost of the approved energy efficiency measures
- Contractor incentive of 2% of the cost of approved energy efficiency measures that are referred to another participating contractor of a different trade
- Contractor incentives for targeted electric reduction measures.
- Midstream contractor incentives including – Cooperative advertising, equipment incentives, Building Performance Institute (BPI) certification and accreditation reimbursement

NYSERDA will implement the first set of programmatic changes on September 1, 2016, or after all processes and systems are updated to support the changes. These changes include:

- Streamlined application and project approval processes
- Retirement of the following incentives:
    - Consumer incentive of 10% of the cost of the approved energy efficiency measures
    - Contractor incentive of 2% of the cost of approved energy efficiency measures that are referred to another participating contractor of a different trade
    - Contractor incentives for targeted electric reduction measures
    - Midstream contractor incentives including – Cooperative advertising and equipment incentives
- An increase of the project-based contractor incentive to 10% of project cost. This change shifts the incentive from the customer (who may also be eligible for utility incentives) to the contractor, to give contractors flexibility in their business models. This can enable contractor to use these funds as needed to increase their business, such as offering discounts to customers or undertaking marketing and outreach activities. NYSERDA anticipates this will increase the conversion rate from audits to completed retrofit work.

The remaining incentives will be evaluated over the course of the first two years of the CEF and adjusted/reduced as appropriate in response to NYSERDA's market transformation efforts.

The Program is also supported by the Green Jobs – Green New York Residential Financing Program and contractor reimbursement for a free/reduced cost home audit, funded through the Regional Greenhouse Gas Initiative, outside of the CEF.

2.5.4 Performance Management

Overall, NYSERDA will regularly review program participation, customer motivation factors and project performance to determine whether changes in incentives, eligible projects, or program processes are needed to improve efficacy of program implementation. In addition to program metric and performance tracking, stakeholder input will be solicited and discussed on a periodic basis.

It is anticipated that quality assurance will be provided to 10% of completed market rate projects. Contractors with high quality score and who prove to have well defined and effective internal quality assurance and quality control practices may have the program inspection rate reduced to not less than 5%.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in

CEF reporting. Independent evaluation efforts will focus on determining the adoption rate of recommended measures for those customers who do not go through the incentive program and the associated energy savings and other benefits. Methods will include surveys and potentially site visits of a sample of program participants. Evaluation surveys will also inquire whether adoption was supported by utility incentive programs.

For projects receiving direct incentives, an independent evaluation effort will verify energy benefits using methods such as pre/post billing analysis and site visits as needed. Billing analysis typically includes a census of customers whose utility usage data meets the requirements of the analysis method (e.g., adequate number of actual meter reads during the pre and post periods). Where methods other than billing analysis are used, a sampling approach is expected to be employed.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.5.5 Relationship to Utility Programs

The Single Family Residential Program will seek to coordinate projects with utility rebates and programs when they are available. The NY Home Performance Portal offers a flexible project tracking and management tool that is available to participating contractors, customers, constituency based organizations (CBOs), implementation contractors and financing providers. We will explore coordinating utility rebates through the Portal to complement NYSERDA's program and financing options. This coordination will ensure no consumer incentives will be paid for by both NYSERDA and utility programs.

2.5.6 Budgets & Expenditures[35,36]

Budget	2016	2017	2018	Total
Incentives & Services	$7,739,490	$5,765,040	-	$13,504,530
Program Implementation	$5,185,150	$200,000	-	$5,385,150
Total	$12,924,640	$5,965,040	-	$18,889,680

Expenditures	2016	2017	2018
Total	44%	46%	10%

[35]Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[36] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

2.5.7 Performance Metrics[37]

Primary Metrics[38]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	1,000	2,000	-	3,000
	MWh Lifetime	20,000	24,000	-	44,000
	MMBtu Annual	98,000	118,000	-	215,000
	MMBtu Lifetime	2,448,000	2,938,000	-	5,386,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		7,000	8,000	-	15,000
CO2e Emission Reduction (metric tons) Lifetime		159,000	191,000	-	349,000
Customer Bill Savings Annual		$1,715,000	$2,058,000	-	3,773,000
Customer Bill Savings Lifetime		$40,778,000	$48,933,000	-	89,711,000
Private Investment		$34,027,000	$45,371,000	-	79,398,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants[39]	4080	4896	-	8976

2.5.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[40] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity, and social cost of carbon.[41] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

[37] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life for electric and 25-year measure life for heating.

[38] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[39] Completed energy efficiency projects.

[40] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

[41] The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

	2016 - 2018
Single Family Market Rate	
Benefits (million 2015$)	$45.01
Costs (million 2015$)	$50.19
Benefit Cost Ratio	0.9

Consistent with the CEF, NYSERDA intends to offer the Single Family Residential program in a fuel neutral manner, offering incentives to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $1,295, compared to a cost of $3,102 in an electric only scenario[42].

2.6 LMI Single Family

2.6.1 Program Description

NYSERDA's Single Family Residential Low-to-Moderate Income Program (Single Family LMI Program) will build on and replace the EmPower NY and Assisted Home Performance with ENERGY STAR programs administered under EEPS) and RGGI to provide incentives that address the first cost barrier for low and moderate income customers to reduce their energy consumption and improve the health, safety, and comfort of their homes.

The Single Family LMI Program is designed to reduce the energy use burden (percentage of the household income spent on energy bills) on lower to moderate income households and to capture heating fuel and electricity-related savings in the State's existing one-to-four family and low-rise multifamily residential buildings.

The low income component (defined as less than 60% of the State Median Income) provides no-cost electric reduction and home performance measures. In-home energy-use education provides customers with additional strategies for managing their energy costs. If the Program determines that additional measures are needed beyond the no-cost services, then cost-shared measures will be available through the moderate income component.

The moderate income component (defined as up to 80% of the State or Area Median Income) provides cost-sharing for approved electric reduction and home performance measures that are chosen by the homeowner.

NYSERDA will merge the administration of the two existing programs to provide a more seamless experience for customers as they seek to qualify for incentives based on their income. NYSERDA will also align program technical and performance standards to meet requirements of the national Home Performance with ENERGY STAR® program. NYSERDA is a sponsor of the Home

[42] The residential market rate segment offers limited demand for a program designed to only achieve electric savings without rich consumer incentives. Historic program data was used to calculate the energy savings that could be achieved in the market for a program focused on lighting improvements, select cost-effective appliance replacements, and shell work on homes with central air conditioning.

Performance with ENERGY STAR® Program, which helps homeowners improve the energy efficiency and comfort of their homes by using a whole house diagnostic approach to identify and address needed building shell, heating and cooling system, lighting and appliance improvements.

Program Delivery

The Program uses a network of home performance contractors to complete home energy audits, which includes diagnostic testing and an inventory of the home's current conditions. The audit allows the contractors to recommend energy efficiency upgrades that are comprehensive, and that maximize the energy savings in each home. Participating contractors are trained and certified to complete the audit and energy efficiency upgrades.

For the Low Income component and based on the customer's energy usage and energy audit, the program will determine which measures are installed in the home at no-cost. Additional measures may be needed and offered to the customer through the moderate-income cost-shared Program.

For the Moderate Income component, the participating contractor will recommend energy efficiency, health, and safety improvements to the homeowner. The Program will share the cost of approved measures selected by the customer, with the incentive being paid directly to the contractor to reduce the customer's contract amount.

Funding for incentives will be provided on a first-come, first-served basis.

For the Low Income component, utilities will send referrals to NYSERDA for enrollment. Contractors and other organizations- such as constituency-based organizations, community action agencies, local government agencies, weatherization agencies, and neighborhood housing services- may also bring customers to the Program as funding is available.

The Moderate Income component will be open-enrollment for customers as funding is available.

Personnel and Roles

- **NYSERDA staff**: Program management, general project management, and project payments.
- **Independent Home Performance Contractors**: Customer recruitment, energy audits, installation, program paperwork and documentation submissions, installation oversight.
- **Implementation contractors**: Customer eligibility review and application processing, review of project submissions for technical and eligibility review, incentive processing
- **Software support:** Maintains program management database for project processing, automated to the extent possible, and program tracking
- **Technical support**: Technical support for contractors (desk audit and limited field support)
- **Standards & Quality Assurance:** Support industry standards development, conduct field verification of completed projects
- **Marketing contractor**: Development of branded programmatic materials, communications strategies, and technical transfer efforts, e.g. case studies, press releases, etc.

2.6.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes owners and renters of one-to-four family and low-rise residential buildings.

Eligibility

The Low Income component is eligible to households with income at or below 60% of State Median Income (SMI), or that participate in a utility payment assistance program, that have demonstrated high energy usage or a health, safety, or comfort need that can be addressed through energy efficiency upgrades. Participants must be New York State electricity distribution customers of a participating utility company who pay into the SBC or for 2016, Keyspan Energy Delivery Long Island (KEDLI) customers. The Moderate Income component is eligible to households with income up to 80% of Area Median Income (AMI) or SMI, whichever is higher, and that are New York State electricity distribution customers of a participating utility company who pay into the SBC.

Projects must include measures approved by NYSERDA and deemed to be cost effective or have important health, safety, or comfort benefits. Projects must be installed by a participating home performance contractor accredited by the Building Performance Institute, and must follow all applicable code and standards.

2.6.3 Incentives/Services Offered

For the initial 6-month period through August 2016, the program incentive offerings will include the incentives offered under the legacy incentive programs including:

- For Low Income:
  - A free home energy audit
  - No cost electric reduction, home performance, and health and safety measures
  - Consumer education and energy savings tips
- For Moderate Income:
  - A free home energy audit[43]
  - Consumer incentive of 50% of the cost of the approved energy efficiency measures, up to $5,000 for a single family unit, or $10,000 for a qualified building with two to four units
  - Contractor incentive of 5% of the cost of the approved energy efficiency measures
  - Contractor incentive of 2% of the cost of approved energy efficiency measures that are referred to another participating contractor of a different trade
  - Contractor incentives for targeted electric reduction measures
  - Midstream contractor incentives including – Cooperative advertising, equipment incentives, BPI certification and accreditation reimbursement

[43] Funding for free home energy audit for the moderate income sector will be funded through CEF once RGGI funds are exhausted.

After the initial 6-month transition period, on or around September 1, 2016 the following incentives will be retired for the moderate income component of the program:

- Contractor incentive of 2% of the cost of approved energy efficiency measures that are referred to another participating contractor of a different trade
- Contractor incentives for targeted electric reduction measures
- Midstream contractor incentives including – Cooperative advertising, equipment incentives, BPI certification and accreditation reimbursement

NYSERDA will implement the first set of programmatic changes, described below, around September 1, 2016, or after all processes and systems are updated to support the changes. These changes include:

- Streamlined application and project approval processes
- Retirement of the incentives described above
- Updated pricing for low income services offered at no cost to the customer
- Reduced incentive structure for moderate income services

The effectiveness of efficiency measures and incentives will be evaluated regularly and adjusted as appropriate to best serve the LMI market. Further changes to incentive levels will be announced at least 90 days in advance of implementation.

The Program is also supported by the Green Jobs – Green New York Residential Financing Program and contractor reimbursement for a free/reduced cost home audit, funded through the Regional Greenhouse Gas Initiative, outside of the CEF. Customers may also be eligible for incentives for the installation of rooftop solar PV through the Affordable Solar program. NYSERDA staff is actively seeking opportunities to cross promote the solar and efficiency programs, integrating them where possible.

2.6.4 Performance Management

Overall, NYSERDA will regularly review program participation and project performance to determine whether changes in incentives or eligible projects are needed to improve efficacy of program implementation. In addition to program metric and performance tracking, stakeholder input will be solicited and discussed on a periodic basis.

It is anticipated that quality assurance will be provided at a 20% inspection rate for Low Income home performance services, and a 15% inspection rate for moderate-income home performance services, and a 5% inspection rate for low-income, electric reduction only services. Contractors with high quality scores and who prove to have well defined and effective internal quality assurance and quality control practices may have the program inspection rate reduced to not less than 5%.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting. Independent evaluation efforts will focus on determining the adoption rate of recommended measures for those customers who do not go through the incentive program and the

associated energy savings and other benefits. Methods will include surveys and potentially site visits of a sample of program participants.

For projects receiving direct incentives, an independent evaluation effort will verify energy benefits using methods such as pre/post billing analysis and site visits on a sampling basis, or as needed. Billing analysis typically includes a census of customers whose utility usage data meets the requirements of the analysis method (e.g., adequate number of actual meter reads during the pre and post periods). Where methods other than billing analysis are used, a sampling approach is expected to be employed.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.6.5 Relationship to Utility Programs

Through EmPower NY, NYSERDA has served as the default provider for low-income energy efficiency services. Utilities refer their payment-troubled low-income customers to EmPower NY for energy efficiency services and in most cases, these customers are also enrolled in the utility rate discount program. NYSERDA expects to continue to receive customer referrals for low-income energy efficiency services and will work with the utilities and New York State Department of Public Service (DPS) Staff to enhance the current referral process with the goal of increasing the impact of utility referrals with regard to reducing customer's energy bills and level of arrears, where applicable.

NYSERDA will also work with the utilities to assess the current approaches for providing clean energy services to low-income customers and explore alternate approaches to improve the value of the services to the customer.

Additionally, the NY Home Performance Portal offers a flexible project tracking and management tool that is available to participating contractors, customers, CBOs, implementation contractors and financing providers. We will explore offering utilities access to the portal to manage participation of referrals and monitor program participation. This would ensure that customer incentives are not provided on the same measure by both NYSERDA and the utility.

2.6.6 Budgets & Expenditures[44,45]

Budget	2016	2017	2018	Total
Low Income Incentives & Services	$23,871,600	$23,170,000	$23,170,000	$70,211,600
Moderate Income Incentives & Services	$9,421,790	$7,219,200	$7,219,200	$23,860,190
Program Implementation	$10,591,190	$1,352,940	$1,355,480	$13,299,610
Total	**$43,884,580**	**$31,742,140**	**$31,744,680**	**$107,371,400**

NYSERDA intends to monitor progress of the LMI portfolio and will actively consider adjustments for the years 2017 and 2018 in order to maintain best production and effectiveness.

Expenditures	2016	2017	2018	2019
Total	27%	33%	32%	8%

2.6.7 Performance Metrics[46]

Low Income

Primary Metrics[47]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	5,000	5,000	5,000	14,000
	MWh Lifetime	70,000	73,000	73,000	217,000
	MMBtu Annual	109,000	114,000	114,000	336,000
	MMBtu Lifetime	2,713,000	2,844,000	2,844,000	8,401,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		9,000	9,000	9,000	27,000
CO2e Emission Reduction (metric tons) Lifetime		190,000	199,000	199,000	587,000
Customer Bill Savings Annual		$2,047,000	$2,146,000	$2,146,000	$6,338,000
Customer Bill Savings Lifetime		$43,802,000	$45,912,000	$45,912,000	$135,626,000
Private Investment		-	-	-	-

[44]Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[45] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

[46] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life for electric and 25-year measure life for heating.

[47] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

Moderate Income

Primary Metrics[48]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	1,000	1,000	1,000	2,000
	MWh Lifetime	9,000	8,000	8,000	24,000
	MMBtu Annual	43,000	38,000	38,000	120,000
	MMBtu Lifetime	1,079,000	960,000	960,000	2,999,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		3,000	2,000	2,000	8,000
CO2e Emission Reduction (metric tons) Lifetime		65,000	58,000	58,000	182,000
Customer Bill Savings Annual		$613,000	$546,000	$546,000	$1,704,000
Customer Bill Savings Lifetime		$14,404,000	$12,818,000	$12,818,000	$40,040,000
Private Investment		$7,223,000	$5,714,000	$5,714,000	$18,650,000

Additional Performance Tracking Metrics		2016	2017	2018	Total
Participants	Low Income[49]	8,348	8,750	8,750	25,848
	Moderate Income	1,798	1,600	1,600	4,998
	Total	10,146	10,350	10,350	30,846

Low-Income Households Served and Anticipated Utility Referrals

As the default provider for low-income energy efficiency services, NYSERDA has relied on utility referrals to identify customers in need of energy efficiency services through EmPower NY. Historically, the conversion rate or the proportion of referrals that result in completed energy efficiency projects, for utility referrals has been lower than the conversion rate of non-utility referrals. For this reason, NYSERDA anticipates that approximately 35% of the households served through EmPower NY in 2016 will be the result of utility generated referrals. The balance of the projected households served will be referred from several sources including local Departments of Social Service, Offices for the Aging, community-based organizations, and energy efficiency and weatherization contractors.

The table below provides the estimated number of low-income households that NYSERDA expects to serve in 2016, by utility service territory, in addition to the anticipated number of unique customer referrals by each utility territory. NYSERDA will monitor utility and non-utility referrals

[48] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[49] Includes both projects focused on electric reduction only and home performance services.

on a regular basis and will work with the utilities and other partners to adjust the level of customer referrals as needed, to meet production and budgetary goals.

Low-Income Households Served and Anticipated Utility Referrals, March 2016- December 2016[50]

Utility Territory	Anticipated Utility Referrals	Low-Income Households Served through Utility Referrals	Low-Income Households Served through other Referral Sources	Total Low-Income Households Served
Central Hudson	562	112	180	292
Con Ed[51]	6,401	760	953	1,713
National Grid	3,200	641	2,692	3,333
NYSEG	6,422	800	905	1,705
O&R	1,300	150	90	240
RG&E	4,200	450	510	960
KEDLI[52]	400	80	24	104
Total	**22,485**	**2,993**	**5,354**	**8,348**

Throughout 2016, NYSERDA will work with the utilities and DPS Staff to enhance the customer referral process with the goals of increasing the number of households served through utility referrals; exploring opportunities to prioritize referrals based on the customer's energy consumption, level of arrears, or other indicator of need; and reducing the administrative burden associated with current the referral process. Customer referral estimates for 2017 and 2018 will be developed based on the work between NYSERDA, DPS Staff, and the utilities.

2.6.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[53] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity, and social cost of carbon.[54] Costs are defined as all costs associated with the energy efficiency

[50]NYSERDA anticipates serving approximately 1,600 National Fuel Gas (NFG) customers through the CEF-low-income program, based on the historic distribution of EEPS 2 gas customers served in the National Grid (upstate), NYSEG, and RG&E electric territories, of which 28% were NFG customers. In addition, NYSERDA implements the National Fuel Gas Low Income Usage Reduction Program, which NYSERDA anticipates receiving approximately 3,000 customer referrals for in 2016.

[51] Includes an estimated 300 customer referrals from KEDNY.

[52] Given that CEF is an electric surcharge, a CEF surcharge will not be applied to KEDLI customers. However, NYSERDA will operate EmPower NY in KEDLI territory in 2016 to avoid a gap in energy efficiency services for low-income energy customers in KEDLI territory. NYSERDA will work with KEDLI and Staff to identify an alternative for providing energy efficiency services for these customers in 2017 and beyond.

[53]Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

[54]The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

	2016 - 2018
LMI Single Family	
Benefits (million 2015$)	$82.40
Costs (million 2015$)	$232.58
Benefit Cost Ratio	0.4

Consistent with the CEF, NYSERDA intends to offer the Single Family Residential Low- to- Moderate Income program in a fuel neutral manner, offering incentives to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $3,145, compared to a cost of $3,249 in an electric only scenario.[55] Additionally, the fuel neutral scenario provides annual bill savings of $8,042,495, compared to $5,025,243 in an electric only scenario.

2.7 LMI Multifamily

2.7.1 Program Description

The Multifamily Performance Program (MPP) – Low-to-Moderate Income (LMI) will continue under the CEF as Version 7.0. MPP will continue to seek to address first cost barriers experienced by owners of low-to-moderate income properties, reduce the disparity between LMI and market-rate properties in terms of awareness of and access to energy efficient solutions, and provide foundational support for the launch of various CEF market transformation initiatives. This version of MPP will include three (3) components designed to specifically target certain objectives:

- A Targeted Option that will support single measure installations with no minimum energy reduction target. This Option will provide building owners a set of minimum performance criteria for a variety of building improvements that can be used to choose more efficient equipment than they may have been considering. The Targeted Option is expected to:
  - Introduce building owners that have not traditionally pursued energy efficiency and may not be ready to engage in comprehensive improvements to NYSERDA and the benefits of energy efficient equipment.
  - Connect NYSERDA to the contractors and businesses that typically work with these types of building owners to perform these system and equipment upgrades, i.e. HVAC installers, electricians, plumbers, etc.

[55] The electric reduction component of the LMI residential program offers targeted electric reduction measures, such as lighting and appliances, to households with high electric usage. Historic program data on low income electric reduction projects was used in this analysis.

    - Support enhanced customer service by working with these building owners and contractors to explore additional opportunities in their buildings by considering other, deeper improvements.
    - Work with the utilities to include program incentives for measures they do not currently support. The Targeted Option will not provide incentives on any measure supported by a utility program and will work closely with all utilities to understand which measures they do encourage and why they might not assist others. The purpose of this Option is to determine what type of demand might exist for measures utilities do not currently support and work to collect the information they need to incorporate those measures into their programs.
- A Comprehensive Option that will support scopes of work designed to achieve at least 25% whole-building source energy savings. NYSERDA-approved energy consultants will work with building owners to identify the most appropriate building improvements to achieve the minimum reduction target. NYSERDA will review the proposed improvements to ensure that the savings and cost projections are reasonable and that the owner can feel confident in the outcome of the project. The Comprehensive Option is expected to:
    - Continue providing support for comprehensive projects as a means of supporting the previously developed delivery infrastructure and encouraging building owners to consider holistic solutions to their building's needs.
    - Recognize past market achievements by encouraging deeper building savings.
    - Increase private investment in energy efficiency projects by increasing minimum performance targets and moderating program incentives.
- A High Performance Offering that will support deep energy retrofit projects by offering significant incentives capped at 50% of the project cost. Owners will work with NYSERDA-approved energy consultants to help assess their building and develop a proposal that meets the requirements of the Program. This Option is expected to:
    - Create new opportunities for cutting edge building owners and energy professionals to demonstrate deep energy retrofit possibilities in existing multifamily buildings.
    - Gain experience with deep energy projects that can be used to encourage greater adoption of successful strategies and efforts.
    - Collect data to highlight successful deep energy projects to convince building owners, regulatory agencies, and financial institutions about the benefits and performance of deep energy projects.

This program is expected to run through the end of 2018 or until all funds are committed. This program is a continuation of the current MPP with modifications to the incentive schedule previously offered by the Program.

Program Delivery

The Targeted Option will be delivered through building owners, contractors, and energy consultants. Participants will be educated on the Option's minimum performance requirements and any building owner or their designated representative may submit applications requesting incentives for work done. The Comprehensive Option will be delivered through a network of

Multifamily Building Solution Providers. This network builds upon the previous Multifamily Performance Partner Network and will include energy firms, consultants, engineering firms, and others vetted and pre-approved by NYSERDA. These firms will be selected through an open, on-going application process and building owners will be required to use a network Provider in order to participate in the Comprehensive Option. The High Performance Offering will also be delivered through network Providers who will be responsible for identifying and assessing potential applicants to this offering.

The Targeted and Comprehensive Options will be open-enrollment. Funding will be provided on a first-come first-served basis. The High Performance Offering will be offered through an annual competitive solicitation requesting proposals for deep energy retrofit projects. These proposals will be reviewed and selected by a Technical Evaluation Panel for compliance with the solicitation and audit of the merits of the project.

Personnel and Roles

- **NYSERDA staff:** Program management, project eligibility review, general project management, and project payments.
- **Multifamily Building Solutions Providers (previously MPP Partners):** Customer recruitment, building audit and project development, Program paperwork and documentation submittals, and installation oversight.
- **Implementation contractor:** Project management and oversight, document review/desk audit, Solutions Provider support, and program document development and maintenance and analysis of the effectiveness of Program rules and processes.
- **Quality Assurance/Technical Assistance contractor:** Support industry standards development, conduct field verification for designated percentage of projects, savings analysis, prepare technical guidance on new systems and equipment for Solutions Providers, building baselining services (development of weather-normalized building energy consumption based on utility data to be used by Solutions Providers in project development).
- **Marketing contractor:** Development of branded promotional materials, outreach events, communications strategies, and technical transfer efforts, e.g. case studies, press releases, etc.

2.7.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes multifamily building owners and management companies of low-to-moderate income properties defined as those where at least 25% of the tenants earn 80% or less of AMI or SMI, whichever is less. The various components are designed to support multiple sub-segments of the multifamily market, i.e. building owners interested in only single measure replacements, those willing to consider comprehensive building improvements, and those building owners who want to push the envelope of possible existing building energy retrofits.

Eligibility

Eligible participants include low-to-moderate income, existing multifamily buildings consisting of five (5) or more units, who are New York State electricity distribution customers of a participating utility company who pay into the SBC. Projects will be deemed income eligible if they meet the definition described above or meet the requirements of a number of low-to-moderate income proxies, including, but not limited to:

- HUD-Regulated Affordable Housing
- DHCR-Regulated Affordable Housing
- Low Income Housing Tax Credits
- NYCHPD-Regulated Affordable Housing (or other local housing agency)
- SONYMA Mortgage Insurance
- Weatherization Assistance Program
- HFA's 80/20 Program
- NYCHDC's 80/20 or Mixed Income Programs

Specific to the Targeted Option, measures that are not supported by the local utility program are eligible for incentives. Applications can be initiated by any entity approved by the building owner, including, but not limited to, the building owner, a management company, a Multifamily Building Solution Provider or an installation contractor.

Specific to the Comprehensive Option, a project that agrees to install any set of building improvements that collectively achieve a minimum of 25% whole-building source energy savings will be eligible to receive the MPP incentive. If any of the measures included in that set of improvements receive incentives under another program (either NYSERDA or utility), the value of that incentive will be deducted from the MPP Comprehensive Option incentive. Applications may only be initiated by a Multifamily Building Solutions Provider chosen by the building owner. Solutions Providers are approved by NYSERDA through an objective, open application process based on a firm's multifamily experience, energy efficiency and building science expertise, and demonstration of general sound business practices.

For the High Performance Offering, projects will be selected through a competitive solicitation based on a variety of criteria including, but not limited to, the cost-effectiveness of the project, the depth of the projected energy savings, and its potential impact on the knowledge gained regarding deep energy, existing building retrofits. If any of the measures included in a project proposal receive incentives under another program (either NYSERDA or utility), the value of that incentive will be deducted from the MPP High Performance Offering incentive.

2.7.3 Incentives/Services Offered

NYSERDA intends to launch MPP V7.0 in the second quarter of 2016 with the Targeted and Comprehensive Options. The solicitation for the High Performance Offering is projected to be released in the fourth quarter of 2016.

For the Targeted Option, incentives will be provided to support installation of high-efficiency equipment. There are no requirements to meet a specific energy reduction target as long as the new

equipment meets the Program's efficiency standards. The initial incentives will be $5/MMBtu and $0.05/kWh, capped at $150/unit per building.

For the Comprehensive Option, incentives will be provided to support comprehensive projects that improve a building's energy performance by 25% or more based on whole-building source energy. The Comprehensive Option incentive schedule consists of a base incentive and a performance payment. The performance payment is paid to projects who achieve their projected savings one year after installation of the improvements. The initial incentive schedule will be:

Existing Buildings			
Savings Range	Base Incentive (per unit)	Performance Payment	Total Incentive
25% - 30%	$150	+$75/unit	$225
31% - 35%	$300	+$175/unit	$475
36% +	$500	+$325/unit	$825

For this Comprehensive Option, if a project receives an incentive from another program (NYSERDA or utility), the value of that incentive will be subtracted from the available MPP incentive. NYSERDA will assess market response to this incentive schedule on a rolling, three-month basis to ensure that incentive funds will be available to projects through 2018. If market response is either greater than or less than projected, NYSERDA will submit a modification to adjust the incentive schedule.

For the High Performance Offering, incentives will be provided to cost-share improvements needed to achieve deep energy savings in existing multifamily buildings. Projects will be selected competitively through an annual solicitation. Projects will be eligible to receive a payment of $3,500/unit, capped at 50% of the project cost. If a project receives an incentive from another program (NYSERDA or utility), the value of that incentive will be subtracted from the available MPP incentive. Each subsequent solicitation will assess the response to the previous solicitation to determine if a modification to this incentive level is warranted.

2.7.4 Performance Management

Overall, NYSERDA will regularly review program participation and project performance to determine whether changes in incentives or eligible projects are needed to improve efficacy of program implementation.

Application packets for the Targeted Option will be reviewed for completeness and accuracy. NYSERDA and its implementation contractor will review the audits submitted through the Comprehensive Option for accuracy and compliance with the Program's requirements. This review may be conducted on a sample basis depending upon the status of the designated firm and the familiarity of the building owner with energy efficiency projects. Projects accessing the Comprehensive Option will be inspected upon final completion. NYSERDA and its implementation contractor may review proposals submitted to the High Performance pathway in an initial effort to normalize the proposals in preparation for review and selection by a Technical Evaluation Panel. During the installation phase, these projects will be inspected periodically to ensure that work is progressing appropriately.

Projects using the Targeted Option will be sample inspected to ensure that the application submittals are sufficient representations of the projects. Projects in the Comprehensive Option will also be sample inspected and reviewed to ensure that the technical review protocols are adequate. A designated percentage of projects accessing the Comprehensive Option will also be inspected upon final completion. Additionally, Data Release Authorization Forms, which authorize NYSERDA to collect utility consumption data on the project, will be submitted with the application packet for the Targeted Option (limited to forms for the owner accounts), in the analysis submitted with the Comprehensive Option (including forms for all owner accounts as well as forms from a 10% sample of apartments), and with proposals for the High Performance projects (including forms for all owner accounts as well as forms from a 10% sample of apartments). These forms will be used to assess building performance post-installation on an annual basis to gauge building performance before and after participation in the Program.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting. An independent evaluation effort will verify energy benefits using methods such as engineering review and analysis, pre/post billing analysis, modeling and on-site metering and monitoring, as needed. Independent impact evaluation will first utilize program data from technical reviews and other sources as a means to offset primary data collection or additional analysis where possible.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.7.5 Relationship to Utility Programs

To prevent direct conflict between MPP's incentives associated with the Targeted Option and the utility's incentives, MPP will not provide an incentive on any measure supported by a utility program. NYSERDA and the utilities will collaborate to cross-promote their programs with the purpose of directing customers towards the appropriate resource for the work they intend to do. NYSERDA will also work with the utilities to encourage support of additional measures in their programs if demand for such measures is demonstrated through MPP. To further avoid customer confusion, NYSERDA proposes working with each utility to fully coordinate MPP and their respective programs exploring solutions such as co-branded promotional or marketing materials.

2.7.6 Budgets & Expenditures[56,57]

Budget	2016	2017	2018	Total
Incentives & Services	$8,804,122	$7,749,768	$10,536,110	$27,090,000
Program Implementation	$6,772,500	-	-	$6,772,500
Total	$15,576,622	$7,749,768	$10,536,110	$33,862,500

Expenditures	2016	2017	2018	2019	2020	2021
Total	9%	16%	23%	24%	17%	10%

2.7.7 Performance Metrics[58]

Primary Metrics[59]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	21,000	16,000	25,000	62,000
	MWh Lifetime	309,000	240,000	374,000	923,000
	MMBtu Annual	461,000	402,000	517,000	1,380,000
	MMBtu Lifetime	6,915,000	6,024,000	7,758,000	20,697,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		35,000	29,000	40,000	105,000
CO2e Emission Reduction (metric tons) Lifetime		524,000	441,000	603,000	1,568,000
Customer Bill Savings Annual		$10,000,000	$8,400,000	$11,500,000	$29,900,000
Customer Bill Savings Lifetime		$150,000,000	$126,000,000	$172,500,000	$448,500,000
Private Investment		$76,000,000	$79,000,000	$146,000,000	$301,000,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants[60]	73,000	70,000	77,000	220,000

[56] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[57] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

[58] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[59] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[60] Number of units.

2.7.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[61] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity, and social cost of carbon.[62] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

	2016 - 2018
LMI Multifamily	
Benefits (million 2015$)	$180.30
Costs (million 2015$)	$87.50
Benefit Cost Ratio	2.1

Consistent with the CEF, NYSERDA intends to offer the Multifamily Performance Program – Low-to-Moderate Income program in a fuel neutral manner, offering incentives to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $317, compared to a cost of $792 in an electric only scenario[63].

2.8 Commercial New Construction

2.8.1 Program Description

The 2016-17 Commercial New Construction Program will provide an offering for new buildings, and for substantial renovations to existing buildings, that increases market uptake of high-impact, comprehensive projects, and emerging clean energy technologies and systems through support for credible and objective technical assistance and installation of projects designed to achieve deep energy savings. The program will:

- Increase awareness of and demand for design and construction of highly efficient buildings, targeting deep energy savings and net zero energy
- Strengthen the capacity of the design and construction community to deliver highly efficient buildings, targeting deep energy savings and net zero energy

[61] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

[62] The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

[63] The electric only scenario assumes that only the Targeted Option would be offered as comprehensive projects would not be feasible without fuel savings. In order to attract sufficient applicants without a fuel incentive, the electric only incentive would need to be increased to $0.25/kWh.

- Extend the existing Commercial New Construction Program through 2017 or until all funds are committed, whichever comes first.[64]

Program Delivery

The program is offered as an open enrollment solicitation where NYSERDA staff and an implementation and support contractor (Outreach Project Consultant) provide program development, maintenance and applicant support. Cost-shared technical support is provided through Energy Modeling Partners, who engage with the applicant and the applicant's design team to provide energy guidance and analysis. Financial support is provided to help cover the design, construction, and commissioning costs for achieving higher levels of comprehensive building and energy performance, up to and inclusive of net zero energy, for tenants, owners, developers, and design teams.

2.8.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes owners, tenants, developers, and design teams for non-residential new building and substantial renovation projects, which include, but are not limited to, office buildings, retail, colleges and universities, health care facilities, state and local governments, not-for-profit and private institutions, and public and private K-12 schools.

Eligibility

To be eligible for program participation an applicant must be, or be capable of and intend to be, a New York State electricity distribution customer of a participating utility company who pays into the SBC.

Projects must be for new construction or substantial renovation and for participation in the whole building design path, projects must be no later in development than the schematic design phase. To be eligible for enhanced technical assistance, applicants must be willing to pursue and incorporate deep energy savings or zero net energy goals into their project programming.

Project design targets are at least 10% better than State Energy Code requirements for standard assistance or zero net energy; and approximately 40% better than code for deep energy savings projects.

[64]Major program modifications were made in March 2015, including: elimination of prequalified and low-energy savings custom incentives, consolidation of and reduction in LEED® incentives, an increase in the energy analysis baseline for determining incentives from ASHRAE 90.1-07 to ASHRAE 90.1-13, and additional support for deep energy savings and net zero energy projects.

2.8.3 Incentives/Services Offered

Technical Support

A NYSERDA approved Energy Modeling Partner works with the applicant and the applicant's design team to identify opportunities and equipment choices for improving the energy efficiency of their new building or substantial renovation project.

The Energy Modeling Partner services are cost-shared based on a negotiated scope of work with the applicant. For basic services NYSERDA covers the first $5,000 and cost shares the balance 50-50 with the applicant. NYSERDA's contribution for basic services is capped at $75,000 (plus $25,000 if the applicant is interested in demand response energy analysis). Applicants who are pursuing deep energy savings or zero net energy projects typically require additional early technical support to guide the early project programming, design concept and operational decisions that are critical to the success of the project. To encourage these projects NYSERDA offers additional technical support at a higher NYSERDA cost share of 80-20 (capped at an additional $35,000 or $60,000 depending upon project square footage).

Design Team Support

For larger projects, deep savings projects and zero net energy projects that require whole building energy analysis, NYSERDA offers support for the additional services of the applicant's design team to promote high performance design and interface with Energy Modeling Partners. The design team support is through a multi-tiered incentive structure, tied to the projected energy performance of the building. Each tier is capped, with the lowest tier capped at $3,400 for designs at least 3% above the energy analysis baseline, through the highest tier capped at $15,000 for designs better than 30% above the baseline.

Financial Support

NYSERDA offers financial support to offset a portion of the applicant's incremental additional costs for high performance equipment and systems, building commissioning services and sustainable (green) building certification (LEED® or NY-CHPS).

Capital financial support is based upon the projected energy performance of the building above an energy analysis baseline (currently ASHRAE 90.1-2013) as identified through energy modeling provided through the Technical Support. Incentives are grouped into two types and include both an energy and a summer peak demand savings component:

- Custom Measure for single and system measures or for projects that have progressed beyond the design development phase. Each measure must exceed the energy analysis baseline by 3%.
- Whole Building Design for comprehensive and complex projects with multiple measures. Projects must not have gone beyond the schematic design phase. Each measure must exceed the energy analysis baseline by 3%. Whole Building Design incentives are tiered, based on the identified ranges of % savings projected above the energy analysis baseline.

Capital Financial Support Incentives[65]				
Con Edison Territory		Incentive Type	Non-Con Edison Territory	
$/kWh Saved	$/Summer Peak KW Saved		$/kWh Saved	$/Summer Peak KW Saved
0.10	275	Custom Measure[66]	0.10	225
0.11	300	Whole Building Design: 3-9% above baseline[67]	0.11	230
0.12	310	Whole Building Design: 9.1-16% above baseline[68]	0.12	240
0.13	320	Whole Building Design: 16.1-23% above baseline[69]	0.13	250
0.14	330	Whole Building Design: 23.1-30% above baseline[70]	0.14	260
0.16	350	Whole Building Design: 30.1% or more above baseline[71]	0.16	280

Commissioning is required if the capital financial support award is more than $100,000. Commissioning also is required for all lighting systems that incorporate advanced day lighting dimming or switching controls. NYSERDA will provide financial support for the applicant's commissioning consultant for projects seeking commissioning assistance. Applicants may use a commissioning provider of their choice, or NYSERDA can help identify a consultant for these services. NYSERDA will increase its capital financial support by 10% to offset the applicant's cost of commissioning, up to a maximum NYSERDA contribution of $25,000.

NYSERDA will provide a Green Building Bonus for projects following the Whole Building Design approach, which achieve LEED® or NY-CHPS certification. The certification must include at least 3 EAc-1 LEED® points, or at least 2 Energy 3.1.3 NY-CHPS points. The Green Building Bonus is $0.20 per square foot of project floor area subject to application, with a maximum of $75,000.

The total Financial Support caps including capital financial support, commissioning and Green Building Bonus are $850,000 in non-Con Edison territory and $1,600,000 in Con Edison territory.

On-site and/or renewable generation are <u>not</u> eligible for capital financial support through this offering, and are not restricted by participation in this offering from receiving incentives from NY-Sun or other renewable offerings.

Prequalified incentives were removed in March 2015. LEED® incentives were reduced by approximately 20% as a result of the LEED® incentive consolidation. Incentives for smaller, low energy savings custom measure projects (less than $30K incentive) were eliminated.

[65] With the exception of lighting systems, financial support is not available for measures that reduce paybacks to less than one year.

[66] Minimum custom measure incentive of $30,000. Custom measure incentive capped at 50% of incremental cost. For Con Edison territory, custom measure incentive also capped at $500,000 a single measure and $1,000,000 a project. For outside Con Edison territory, custom measure incentive also capped at $200,000 a project.

[67] Whole building design incentive capped at 60% of incremental cost. For Con Edison territory, whole building design incentive also capped at $500,000 a single measure and $1,500,000 a project. For outside Con Edison territory, whole building design incentive also capped at $200,000 a single measure and $750,000 a project.

[68] Ibid.

[69] Ibid.

[70] Ibid.

[71] Ibid.

2.8.4 Performance Management

Overall, NYSERDA will regularly review program participation and project performance to determine whether changes in incentives, caps or eligible projects are needed to improve efficacy of program implementation. NYSERDA staff and contractors will provide guidance and technical review of assistance provided through the energy modeling partners. Through the Outreach Project Consultant, NYSERDA will provide quality assurance of equipment and systems installation as described in the technical support report and NYSERDA offer letter.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting. An independent evaluation effort will review data from projects in order to verify energy benefits. Additional impact evaluation work, including potentially engineering analysis, site visits and building modeling, will occur as needed to further verify energy and other benefits. Validating baseline assumptions and as-built conditions will be important aspects of ensuring rigorous and defensible energy savings for new construction.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.8.5 Relationship to Utility Programs

Utilities currently do not offer new construction programs, and only National Grid has possibly identified introducing a new construction program in 2017. Utilities offer rebates and incentives for equipment on existing buildings. For substantial renovation projects, there is potential for replacement of existing equipment to receive capital incentives through a utility incentive program.

To the extent utility companies support activities in these areas, NYSERDA will collaborate to identify synergistic approaches that move the construction market towards higher performance, minimize market disruption, and avoid market confusion.

2.8.6 Budgets & Expenditures[72,73]

Budget	2016	2017	2018	Total
Incentives & Services	$12,879,000	$10,972,908	-	$23,851,908
Program Implementation	$449,280	$382,787	-	$832,067
Total	$13,328,280	$11,355,695	-	$24,683,975

[72]Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[73] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

Expenditures[74]	2016	2017	2018	2019	2020	2021
Total	5%	21%	32%	27%	13%	2%

2.8.7 Performance Metrics[75]

Primary Metrics[76]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	20,000	17,000	-	38,000
	MWh Lifetime	409,000	349,000	-	758,000
	MMBtu Annual	27,000	23,000	-	50,000
	MMBtu Lifetime	541,000	462,000	-	1,004,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		12,000	10,000	-	23,000
CO2e Emission Reduction (metric tons) Lifetime		244,000	208,000	-	452,000
Customer Bill Savings Annual		$3,486,000	$2,970,000	-	$6,455,000
Customer Bill Savings Lifetime		$69,713,000	$59,395,000	-	$129,109,000
Private Investment		$28,630,000	$24,393,000	$53,023,000	$106,046,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants	54	46	-	100

2.8.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[77] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity,

[74] Expenditures are estimated based on the typical design and construction schedules for commercial sector projects, and on the timing of NYSERDA application within that process. While it is anticipated the vast majority of projects will be completed within the time frame shown, the expenditure projections do not indicate a 5-year project completion requirement.

[75] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 20-year measure life.

[76] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[77] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

and social cost of carbon.[78] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

	2016 - 2018
Commercial New Construction	
Benefits (million 2015$)	$51.61
Costs (million 2015$)	$88.51
Benefit Cost Ratio	0.6

The significant change in the benefit cost ratio from previous commercial new construction programs stems from the roughly 20% increase in the energy code, anticipated mid-year 2016, the elimination of prequalified and smaller custom measure projects, and the additional cost-shared technical assistance for deep energy and net zero energy projects.

Consistent with the CEF, NYSERDA intends to offer the Commercial New Construction Program in a fuel neutral manner, offering incentives to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $1,092/ton, compared to a cost of $1,238/ton in an electric only scenario.[79] The drivers for the high carbon savings costs per ton are the same as those identified for the low benefit cost ratio result.

2.9 Low Rise New Construction

2.9.1 Program Description

The 2016-2017 Low-rise Residential New Construction Program focuses on:

- Increasing information on, awareness of, and demand for deep energy savings and zero net energy construction for new and gut rehab in, generally, building up to three-stories in height, in both the market-rate and LMI sectors
- Strengthening the capacity of clean energy partners in the building design, construction and performance verification.
- Supporting New York State (NYS) and New York City (NYC) housing agencies, funding authorities, and municipalities in their efforts to secure the most efficient, durable, resilient and healthy housing, based on technical and economic feasibility, while striving to maximize

[78] The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

[79] The electric only scenario was calculated by deducting the impacts of gas savings measures from the program. The program budget is likely to remain the same since no gas incentives are offered and the cost for the technical analysis to support gas measures is minimal once a whole building energy model has been created.

effective use of the resources available to achieve those goals. These activities are significantly but not exclusively targeting the LMI housing sector.

- Identifying and promoting integrated design solutions which are replicable, with a focus on cost optimization analysis, financing strategies which recognize operational costs and savings, and management of perceived risks.
- Extending the existing Low-rise Residential New Construction Program, with renamed and slightly modified dwelling unit categories, lower Building Home Incentive amounts, and Cooperative Advertising Incentives offered only to the highest performing projects.

Program Delivery

- An open enrollment approach that utilizes an implementation and support contractor to support technical oversight and administrative services
- Technical assistance to projects seeking to achieve high performance energy efficiency.
- Program incentives to housing developers and builders, Home Energy Rating System (HERS)Rating Providers, and HERS Raters as direct recipients.
- Targeted technical support, available to architects, engineers, designers, and 3rd party verifiers or other technical consultants. More extensive support will be targeted to developers, design professionals and projects willing to pursue higher building performance, inclusive of net zero energy (NZE) performance.
- Technical support and collaboration with other NYS agencies and entities.
- Program Quality Assurance (QA) services through third party (Partner-HERS Rating Providers). NYSERDA staff responsibilities include: oversight for tracking participant status, co-operative advertising incentive process and final determination of project eligibility.

2.9.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes market rate and LMI single family homes and multi-unit residential buildings, generally up to three-stories in height, across the Market-Rate and LMI sectors, and inclusive of gut rehab projects.

Eligibility

Eligible participants includes builders, developers who have executed a partnership agreement with NYSERDA and deliver projects that meet the Program Minimum Performance Standards; HERS Rating Providers who have executed a partnership agreement with NYSERDA and who provide services on eligible projects; and HERS Raters (for cooperative advertising only). To be eligible for program participation an applicant must be, or be capable and intend to be a New York State electricity distribution customer of a participating utility company who pays into the SBC.

2.9.3 Incentives/Services Offered

Builder Home Incentives

Builder home incentives will be provided in three tiers:

- Tier 1: U.S. Environmental Protection Agency (EPA) ENERGY STAR Homes Version 3.0, plus Minimum kWh savings and Air Leakage minimum requirements. Tier 1 performance criteria meets the anticipated 2016 energy code. For certain gut rehabilitation projects, requirements not deemed economically justified may be waived and the modified performance requirements would support the Energy $mart[80] designation. Builder home incentives will no longer be provided for Tier 1, however the Tier is being maintained to provide Program technical support, oversight and verification on projects to validate performance, thereby increasing confidence by housing agencies and financial underwriting institutions that projects will deliver as promised. The co-operative advertising incentive for this tier is also being retired.
- Tier 2: EPA ENERGY STAR Homes Version 3.1, plus Minimum kWh savings and Air Leakage minimum requirements. For certain gut rehabilitation projects, requirements not deemed economically justified may be waived and the modified performance requirements would support the Energy $mart designation. Tier 2 performance criteria is 12% to 15 % above the anticipated 2016 energy code. The co-operative advertising incentive for this tier is being retired.
- Tier 3: Tier 2 requirements, plus a HERS Index of ≤ 10 inclusive of installed photovoltaics. Dwelling units of >1,500 sq. ft. must achieve a HERS index of ≤ 40. Dwelling units ≤ 1,500 sq. ft. must achieve a HERS index of ≤ 50. Tier 3 performance criteria qualifies as a deep energy savings or near net-zero performance.[81]

Projected Market Rate Builder Home Incentive Levels[82]						
2016				2017		
Multi-unit		1-2 family & attached townhouses (up to 10)		Multi-unit		1-2 family & attached townhouses (up to 10)
First 50 units	Unit 51-100			First 50 units	Unit 51-100	
			Tier 1			
$ 550	$ 300	$ 1,250	Tier 2	$ 450	$ 200	$ 950
$ 2,600	$ 2,200	$ 4,500	Tier 3	$ 1,600	$1,400	$ 4,000

[80]The Energy $mart designation is a Program designation for gut rehabilitation projects, where meeting the New York ENERGY STAR Certified Homes envelope and water management requirements may not be economically justified. All other requirements for the Energy $mart are identical to the US Environmental Protection Agency based New York ENERGY STAR Certified Homes designation.

[81]On-site and/or renewable generation are not eligible for installation incentives through this offering, and are not restricted by participation in this offering from receiving incentives through NY-Sun or other renewable offerings.

[82] Incentive may be modified from stated levels to reflect the integrated approach with Multifamily New Construction, including mid- and high rise units.

Projected LMI Builder Home Incentive Levels[83]						
2016				2017		
Multi-unit		1-2 family & attached townhouses (up to 10)		Multi-unit		1-2 family & attached townhouses (up to 10)
First 50 units	Unit 51-100			First 50 units	Unit 51-100	
			Tier 1			
$ 1,000	$ 600	$ 1,800	Tier 2	$ 1,000	$ 600	$ 1,700
$ 3,500	$ 3,100	$ 4,300	Tier 3	$ 3,500	$ 3,100	$ 4,200

Other Incentives

A First Rating Incentive of $1,000 is offered to Partner-Builders. This additional incentive is offered in support of their HERS Rater's completion of the first plan review and a confirmed Home Energy Rating for the Partner-Builder, which addresses the EPA's most recent version of the ENERGY STAR Certified Homes Program requirements

A HERS Provider Incentive of $100 per qualified dwelling unit is offered to Partner- HERS Rating Providers in support of their delivery of services to affiliated Partner- HERS Raters, and to NYSERDA.

For Tier 3 projects only, Cooperative Advertising Incentives are offered to Partner-Builders, Partner-HERS Rating Providers, and Partner-HERS Raters for qualified advertising within eligible service territory. Incentive levels are a percentage of qualified costs, depending on type of marketing content used. Maximum incentive amount paid is based on production (dwelling units) in a calendar year.

2.9.4 Performance Management

NYSERDA will monitor a sampling of projects and analyze the resulting data. The results of this monitoring and analysis, as well as any changes to NYS energy code, and participation levels, will inform if/when adjustments to the Program are necessary.

As part of the Implementation services contract, technical assistance will be offered to participating builders, developers and to HERS raters involved in the construction of high-performance projects.

Program QA services will be performed by participating HERS Rating Providers based on Residential Energy Services Network (RESNET) technical standards.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in

[83] Ibid.

CEF reporting. An independent evaluation effort will review data from projects in order to verify energy benefits. Additional impact evaluation work, including potentially engineering analysis, site visits and modeling, will occur as needed to further verify energy and other benefits. Validating baseline assumptions and as-built conditions will be important aspects of ensuring rigorous and defensible energy savings for new construction.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.9.5 Relationship to Utility Programs

Utilities currently do not offer new construction programs for this sector. No utilities have identified introducing a new construction program for this sector in 2016 or 2017.

Utilities offer rebates and incentives for equipment on existing buildings. For gut rehabilitation projects, there is potential for replacement of existing equipment to receive capital incentives through a utility incentive program. Utility rebates are paid to the homeowner, incentives available through the Program are paid to the builders and developers.

To the extent utility companies support activities in these areas, NYSERDA will collaborate to identify synergistic approaches that move the construction market towards higher performance, minimize market disruption, and avoid market confusion.

2.9.6 Budgets & Expenditures[84,85]

Budget		2016	2017	2018	Total
Market Rate	Incentives & Services	$1,276,987	$1,018,213	-	$2,295,200
	Program Implementation	$754,763	$562,037	-	$1,316,800
	Sub-Total	$2,031,750	$1,580,250	-	$3,612,000
LMI	Incentives & Services	$2,962,000	$2,987,000	-	$5,949,000
	Program Implementation	$650,000	$625,000	-	$1,275,000
	Sub-Total	$3,612,000	$3,612,000	-	$7,224,000
Total		$5,643,750	$5,192,250	-	$10,836,000

[84] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[85] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

Expenditures[86]	2016	2017	2018	2019
Total	17%	33%	33%	16%

2.9.7 Performance Metrics[87]

Market Rate

Primary Metrics[88]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	2,000	2,000	-	5,000
	MWh Lifetime	47,000	44,000	-	91,000
	MMBtu Annual	27,000	20,000	-	47,000
	MMBtu Lifetime	547,000	400,000	-	948,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		3,000	2,000	-	5,000
CO2e Emission Reduction (metric tons) Lifetime		54,000	45,000	-	99,000
Customer Bill Savings Annual		$900,000	$700,000	-	$1,600,000
Customer Bill Savings Lifetime		$18,000,000	$14,000,000	-	$32,000,000
Private Investment		$2,780,000	$2,210,000	-	$4,990,000

[86] Expenditures are estimated based on the typical design and construction schedules for single family and low-rise multifamily projects, and on the timing of NYSERDA application within that process. While it is anticipated the vast majority of projects will be completed within the time frame shown, the expenditure projections do not indicate a 2-year project completion requirement.

[87] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 20-year measure life.

[88] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

LMI

Primary Metrics[89]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	4,000	4,000	-	8,000
	MWh Lifetime	75,000	77,000	-	152,000
	MMBtu Annual	35,000	31,000	-	66,000
	MMBtu Lifetime	707,000	618,000	-	1,325,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		4,000	4,000	-	8,000
CO2e Emission Reduction (metric tons) Lifetime		77,000	74,000	-	151,000
Customer Bill Savings Annual		$1,000,000	$1,000,000	-	$2,000,000
Customer Bill Savings Lifetime		$20,000,000	$20,000,000	-	$40,000,000
Private Investment		$6,460,000	$6,510,000	-	$12,970,000

Additional Performance Tracking Metrics		2016	2017	2018	Total
Participants[90]	Market Rate	993	797	-	1,790
	LMI	1,814	1,808	-	3,622
	Total	2,807	2,605	-	5,412

2.9.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[91] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity, and social cost of carbon.[92] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

[89] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[90] Dwelling units.

[91] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

[92] The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

	2016 - 2018
Low Rise New Construction	
Benefits (million 2015$)	$27.05
Costs (million 2015$)	$33.11
Benefit Cost Ratio	0.8

Consistent with the CEF, NYSERDA intends to offer incentives in a fuel neutral manner, with the intent to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $865, compared to a cost of $1,046 in an electric only scenario.[93]

2.10 Multifamily New Construction

2.10.1 Program Description

The 2016-2017 Multifamily New Construction program focuses on:

- Increasing awareness of, information about, and demand for deep energy savings and zero net energy performance in the multifamily new construction and gut rehabilitation markets.
- Strengthening the capacity of clean energy professionals to deliver design and construction services to this market sector.
- Support NYS and NYC housing agencies, funding authorities, and municipalities in their efforts to secure the most efficient, durable, resilient and healthy housing, based on technical and economic feasibility, while striving to maximize effective use of the resources available to achieve those goals. These activities are significantly but not exclusively targeting the LMI housing sector.
- Identify and promote integrated design solutions which are replicable, with a focus on cost optimization analysis, financing strategies which recognize operational costs and savings, and management of perceived risks.

Offering technical assistance, a multi-tiered incentive structure separated into two "per dwelling unit" categories, and potentially offering targeted incentives to support development of market-based quality assurance. The Program will replace the MPP component that previously served high-rise residential new construction and gut rehabilitation projects. Like MPP, the Program will continue to work with partners serving multifamily high-rise new construction and gut rehab projects, providing technical support and guidance. The multi-tiered incentive structure, which replaces the MPP singular "per dwelling unit" incentive, focuses support and incentives toward promotion of higher levels of comprehensive building and energy performance, up to and inclusive

[93]Electric only cost scenario figure was calculated by deducting the Gas portion of the proposed Builder Home Incentive total from the combined Market Rate and LMI Program budgets (exclusive of admin and CRF) and program budget to calculate the $/MWh .

of new zero performance. The addition of the "per dwelling unit" incentive category for larger buildings, along with the addition of incentive caps, allow broader market participation and assure a small number of very large projects won't drain the Program's resources. In contrast to MPP, the Program also encourages photovoltaics and other renewables to be layered onto a project to achieve savings thresholds. The Program more closely aligns with the Low-rise Residential New Construction program, which includes low-rise multifamily, creating a more unified market signal for multifamily construction and eliminating the opportunity for potential gaming between programs.

Program Delivery

The Program will be open enrollment program, utilizing an implementation and support contractor to support technical oversight and administrative services. Housing developers and builders will be direct recipients of program incentives.

Targeted technical support will be available to architects, engineers, designers, and third party verifiers or other technical consultants. More extensive support will be targeted to developers, design professionals and projects willing to pursue higher building performance, inclusive of NZE performance. Technical support and collaboration with other NYS agencies and entities will be offered.

Validated performance thresholds and third party standards will be incorporated by explicit and implicit reference within NYSERDA's program structure.

Capital Incentives will be provided.

2.10.2 Target Market & Customer/Project Eligibility Rules

Target Market

According to recent U.S. Census data, building permits for low-, mid- and high-rise multifamily housing reached an all-time high of 50,000 dwelling units through the 3rd quarter of 2015, more than double the number issued in all of 2014. Mid- and high-rise multifamily buildings, defined as buildings 4 or more stories in height, incorporate approximately 60 percent of that total, or 30,000 dwelling units. Program activities and efforts will focus on both market rate and LMI buildings and projects within this market sector which are capable of achieving a higher level of performance.

Eligibility

Housing developers and builders will be required to execute a partnership agreement with NYSERDA, and deliver completed buildings and projects which meet the minimum performance criteria outlined below, in the Incentives/Services section. Project eligibility will be fuel-neutral. To be eligible for Program participation, an applicant must be, or be capable of and intend to be, a New York State electricity distribution customer of a participating utility company which pays into the SBC.

2.10.3 Incentives/Services Offered

Incentives will be provided in three tiers:

- Tier 1: EPA ENERGY STAR Multifamily High Rise program requires 15% utility cost savings above current NYS commercial energy code. For certain gut rehabilitation projects, requirements not deemed economically justified may be waived and the modified performance requirements would support the Energy $mart designation. Technical support and access to NYSERDA's compliance review would be available for LMI projects but no direct incentives will be offered. Tier 1 is being maintained to provide Program technical support, oversight and verification on projects to validate performance, thereby increasing confidence by housing agencies and financial underwriting institutions that projects will deliver as promised.
- Tier 2: Align with the EPA ENERGY STAR Multifamily High Rise program requirements and additionally require a minimum of 20% utility cost savings above ASHRAE 90.1 2010, or 15% above the relevant NYS commercial energy code, whichever is greater. For certain gut rehabilitation projects, requirements not deemed economically justified may be waived and the modified performance requirements would support the Energy $mart designation. Technical support and direct incentives will be available, with LMI projects eligible for higher levels of incentives.
- Tier 3: Projects must meet or exceed performance criteria which qualifies as deep energy savings, inclusive of near net-zero performance. This level of performance will be established by demonstrating the building will achieve a NYSERDA-determined minimum percentage of energy cost savings above current NYS commercial energy code, by application of ASHRAE 90.1 2010 Appendix G. As alternatives, certification under high performance third-party energy performance standards such as PHIUS+ or the German-based Passive House Institute, may be deemed to be acceptable by NYSERDA. Technical support and direct incentives will be available, with LMI projects being eligible for higher levels of incentives.[94]

[94]Although on-site and/or renewable generation are not eligible for installation incentives through this offering, integration or use of renewable generation will be strongly encouraged for projects aiming to meet Tier 3 NYSERDA-determined energy performance thresholds. The resulting on-site and and/or renewable generation solutions are not restricted by participation in this Program from receiving incentives through NY-Sun or other renewable offerings.

Low and Moderate Income Incentives (per dwelling unit)[95]				
2016			2017	
10 – 49 dwelling units	50+ dwelling units	Performance Tier	10 – 49 dwelling units	50+ dwelling units
$ 0	$ 0	Tier 1	$ 0	$ 0
$ 1000	$ 600	Tier 2	$ 1000	$ 500
$ 3,500	$ 3,000	Tier 3	$ 3,500	$ 3,000

Market Rate Incentives (per dwelling unit)[96]				
2016			2017	
10 – 49 dwelling units	50+ dwelling units	Performance Tier	10 – 49 dwelling units	50+ dwelling units
$ 0	$ 0	Tier 1	$ 0	$ 0
$ 500	$ 300	Tier 2	$ 400	$ 200
$ 2,500	$ 2,000	Tier 3	$ 1,400	$ 1,200

2.10.4 Performance Management

Overall, NYSERDA will regularly review program participation and project performance, as well as expected updates to the New York State Energy Conservation Construction Code, to determine whether changes in incentives, caps or eligible projects are needed to improve efficacy of program implementation. Program staff and contractors will provide guidance and review of building designs, energy models, and construction practices; while also directing support toward and leveraging third party verifiers and certification organizations which target high performance design and construction.

[95] Incentive levels are intended to better align with the revised structure for NYSERDA's Low-rise Residential New Construction Program, particularly for multifamily buildings, although performance thresholds will differ. To reflect lower costs and the economies of scale associated with larger projects and buildings, the total per project incentives will be capped as follows: LMI – Tier 2 capped at $100,000; Tier 3 capped at $300,000 in 2016; Market Rate – Tier 2 capped at $50,000; Tier 3 capped at $200,000 in 2016; and Market Rate – Tier 2 cap reduced to $40,000 and Tier 3 cap reduced to $120,000 in 2017. Multifamily buildings with less than 10 dwelling units will be served through NYSERDA's Low-rise Residential New Construction Program. Incentives will be calculated by applying the higher incentive until the per dwelling unit limit has been reached, and the balance of incentives will be calculated at the lower incentive amount. In addition to the per dwelling unit incentives offered to developers & builders, third party verifiers and certification organizations may be offered targeted incentives to support development of market-based Quality Assurance.

[96] Ibid.

Directed quality assurance and support will be provided by program staff and contractors, while leveraging third party verifiers and certification organizations which target high performance building design and construction.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting. An independent evaluation effort will review data from projects in order to verify energy benefits. Additional impact evaluation work, including potentially engineering analysis, site visits and modeling, will occur as needed to further verify energy and other benefits. Validating baseline assumptions and as-built conditions will be important aspects of ensuring rigorous and defensible energy savings for new construction.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.10.5 Relationship to Utility Programs

Utilities currently do not offer new construction programs. Only National Grid has identified introducing a new construction program in 2017. Utilities do offer rebates and incentives for equipment on existing buildings. For gut rehabilitation projects, there is potential for replacement of existing equipment to receive capital incentives through a utility incentive program.

To the extent utility companies support activities in these areas, NYSERDA will collaborate to identify synergistic approaches that move the construction market towards higher performance, minimize market disruption, and avoid market confusion.

2.10.6 Budgets & Expenditures[97,98]

Budget		2016	2017	2018	Total
Market Rate	Incentives & Services	$881,586	$623,502	-	$1,505,088
	Program Implementation	$438,600	$310,200	-	$748,800
	Sub-Total	$1,320,186	$933,702	-	$2,253,888
LMI	Incentives & Services	$3,715,000	$2,786,250	-	$6,501,250
	Program Implementation	$800,000	$600,000	-	$1,400,000
	Sub-Total	$4,515,000	$3,386,250	-	$7,901,250
Total		$5,835,186	$4,319,952	-	$10,155,138

[97] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[98] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

Expenditures[99]	2016	2017	2018	2019	2020
Total	14%	25%	25%	25%	11%

2.10.7 Performance Metrics[100]

Market Rate

Primary Metrics[101]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	4,000	3,000	-	7,000
	MWh Lifetime	76,000	57,000	-	132,000
	MMBtu Annual	28,000	20,000	-	48,000
	MMBtu Lifetime	562,000	395,000	-	957,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		3,000	3,000	-	6,000
CO2e Emission Reduction (metric tons) Lifetime		70,000	51,000	-	120,000
Customer Bill Savings Annual		800,000	600,000	-	$1,400,000
Customer Bill Savings Lifetime		16,000,000	12,000,000	-	$28,000,000
Private Investment		10,200,000	7,300,000	-	$17,500,000

[99] Expenditures are estimated based on the typical design and construction schedules for multifamily projects, and on the timing of NYSERDA application within that process. While it is anticipated the vast majority of projects will be completed within the time frame shown, the expenditure projections do not indicate a 4-year project completion requirement.

[100] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 20-year measure life.

[101] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

LMI

Primary Metrics[102]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	10,000	9,000	-	19,000
	MWh Lifetime	208,000	170,000	-	378,000
	MMBtu Annual	77,000	59,000	-	137,000
	MMBtu Lifetime	1,545,000	1,185,000	-	2,731,000
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		10,000	8,000	-	17,000
CO2e Emission Reduction (metric tons) Lifetime		191,000	152,000	-	344,000
Customer Bill Savings Annual		2,200,000	1,800,000	-	$4,000,000
Customer Bill Savings Lifetime		44,000,000	36,000,000	-	$80,000,000
Private Investment		28,100,000	22,000,000	-	$50,100,000

Additional Performance Tracking Metrics		2016	2017	2018	Total
Participants[103]	Market Rate	2,000	1,500	-	3,500
	LMI	5,500	4,500	-	10,000
	Total	7,500	6,000	-	13,500

2.10.8 Benefit Cost Analysis

The BCA summarized in the table below represents a total resource cost test, consistent with the benefit cost analysis framework described in the January 21, 2016 Order.[104] The benefit estimate includes avoided energy (electricity, natural gas, and oil), generation capacity, distribution capacity, and social cost of carbon.[105] Costs are defined as all costs associated with the energy efficiency program, including program specific costs, Administration, CRF, and evaluation, measurement, and verification, as well as customer costs. The analysis calculated the following benefit cost ratios:

[102] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[103] Dwelling units.

[104] Case 14-M-0101, Proceeding on the Motion of the Commission in Regard to Reforming the Energy Vision. Order Establishing the Benefit Cost Analysis Framework. Issued and Effective January 21, 2016.

[105] The social cost of carbon is an estimate of the monetized damages to global society associated with an incremental increase in carbon emissions in a given year. It is intended to include changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change, etc.

	2016 - 2018
Multifamily New Construction	
Benefits (million 2015$)	$65.49
Costs (million 2015$)	$36.48
Benefit Cost Ratio	1.8

Consistent with the CEF, NYSERDA intends to offer incentives in a fuel neutral manner, with the intent to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State's clean energy goals. Offering the program on a fuel neutral basis will allow us to achieve a ton of carbon savings at a cost of $445, compared to a cost of $470 in an electric-only scenario. The costs for the electric-only scenario costs were determined by calculating weighted average of the electric-only LMI and Market Rate $/MWh values, and an assumed incentive level which targets a comprehensive building approach to achieving electric-only savings, ensuring electric space conditioning and other end uses were incorporated, while relying on the full program budget to estimate MWh savings potential.

2.11 Anaerobic Digesters

2.11.1 Program Description

The Anaerobic Digester Gas (ADG)-to-Electricity Incentive program offering provides financial support to assist typically rural facilities with projects to install on-site renewable distributed generation equipment to help reduce their energy expenses as well as their carbon footprint.

This program will be an extension of the previous RPS CST ADG-to-Electricity program through at least 2017.

Program Delivery

Applicants will submit required documentation to be reviewed by NYSERDA to determine eligibility of the project (the program requires use of commercially-mature equipment). Each project will receive a purchase order upon approval. Installation is completed by firms/vendors that the customer retains on their own. Technical Review is conducted by NYSERDA staff, and occasionally supplemented by third party technical reviewers. Cost-sharing or incentives will be administered by NYSERDA after proof of successful completion of project milestones (installation milestones, and annual operating performance milestones).NYSERDA incentive payments can be made to the project developer/installer, the host customer, or a third party.

The ADG-to-Electricity program offering will be open-enrollment. Applications will be accepted on a first-come, first-served basis dependent on funding availability.

Personnel and Roles

- **NYSERDA staff**: Program management, project eligibility review, general project management, and project payments.

- **Third party technical reviewers**: Technical Review is conducted by NYSERDA staff, and occasionally supplemented by third party technical reviewers as needed based on project complexity and/or workload.
- **Outreach contractors**: Through a competitive solicitation, NYSERDA has previously selected a team led by Cornell University to provide Anaerobic Digester Assistance (also referred to as ADG Ombudsman services). The remaining term of this contract, including an option for a one-year extension, will enable this service into late 2018.

NYSERDA has provided many years of incentive support to ADG-to-Electricity systems, but, for various reasons, ADG systems continue to have very low penetration in the marketplace and relatively high costs. For example, the adoption of NYSERDA's Anaerobic Digester Gas-to-Electricity program has progressed slowly despite multiple potential applications and business model solutions. NYSERDA has established an ADG Ombudsman (contract awarded to Cornell University) to provide guidance to dairy farmers during their exploration and implementation of ADG-to-Electricity. In order to provide some market stability and bridge until acquisition of market insights can pinpoint meaningful intervention strategies (such as a pending report from the Clean Energy for Agriculture Task Force), the general features of the historic incentive program structure (rolling admission first-come-first-served incentives) for ADG-to-Electricity will continue, subject to the outcome of current discussions with stakeholders and the pending report from the Clean Energy for Agriculture Task Force. The budget level will be commensurate with the recent historic actual uptake experienced during the planning cycle of the CEF.

By 2018, NYSERDA anticipates shifting strategy to initiatives and pioneering projects that offer the prospect of reducing soft costs, improving performance and value, and developing and demonstrating sustainable business models through demonstration projects and best practices studies (such efforts will strive to determine and inform marketplace participants of ADG-to-Electricity project attributes that can maximize the value to be available via REV[106]) -- in 2016 and 2017 NYSERDA will conduct a small amount of initial exploration of these opportunities. If, in consultation with stakeholders, NYSERDA determines that such an adjustment will provide more impact toward CEF goals, we will file an amendment outlining the new strategies.

NYSERDA will coach the utilities to each establish a utility employee to serve as a Distributed Generation Ombudsman for their territory, an important role that has been successfully demonstrated at Con Edison.

[106]In a broader perspective, New York State is pursuing the Reforming the Energy Vision (REV) strategies, an effort which, through regulatory reform, is intended to provide appropriate compensation for the value that distributed energy resources bring to the localized and overall management of the electric grid. Distributed generation, including but not limited to ADG-to-Electricity systems, are a type of distributed energy resource that will find opportunities for improved value propositions under REV. NYSERDA is engaged with the REV proceeding, and will provide information and insights throughout the process to help establish a marketplace where distributed energy resources can leverage their particular values. In particular, through REV, the standby tariff, and the rules for electrical interconnection (Standard Interconnection Requirement -- SIR) are being assessed for improvements, and this is expected to provide important benefits to distributed generation, including but not limited to ADG-to-Electricity systems.

2.11.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes all eligible customers seeking to have an ADG-to-Electricity system installed in a grid-connected manner. The ADG-to-Electricity system must consist of commercially-available technologies and the system design must be well-conceived (e.g., the digester portion is appropriate for the amount and type of organic feedstock, and the electric generator portion is appropriate for the producible quantity and characteristic of biogas), and the ADG biogas fuel must be derived from eligible biomass feedstocks.

Eligibility

Participants with farm-related projects or waste water treatment plant (WWTP)-related projects who are New York State electricity distribution customers of a participating utility company who pay into the SBC are eligible. The available incentive budget in 2016 and 2017 is $4,000,000 per year, of which, in each year, half will be earmarked for projects in the Farm-related sector, and the other half will be earmarked for projects in the WWTP sector.

2.11.3 Incentives/Services Offered

There will be no significant changes in 2016 and 2017 to the previous NYSERDA offering. Changes to the program for 2018 will be detailed in a subsequent plan, to be issued prior to such changes.

For 2016 and 2017, the NYSERDA incentive will be a combination of capacity incentives, interconnection support incentives, and performance-based incentives. The maximum incentive available is $2,000,000 per project/site.

2.11.4 Performance Management

NYSERDA will regularly monitor market interest and uptake of available funds and will make adjustments as needed based on market response. NYSERDA will also monitor project completion timelines to ensure installation and commissioning of all equipment generally occurs within 14 months of a fully executed contract with NYSERDA (projects failing to meet this timeline may be subject to termination). Metrics associated with energy generation, capacity installed, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting.

All implementation assistance projects, as part of this program, will be reviewed by a NYSERDA technical reviewer prior to approval and payment. This Program is not intended to provide technical review services for in-eligible projects.

Program plans include a NYSERDA site inspection for each project, hourly-interval data collection on system performance, and project-level measurement and verification. This data will be used to monitor performance of installed systems and to support performance-based incentive payments. An independent evaluation effort will review data from the program site inspections, data collection and M&V to verify energy benefits. Additional impact evaluation work will only occur as needed to verify energy and other benefits.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.11.5 Relationship to Utility Programs

In the past, utilities have not administered programs to incentivize installation of ADG-to-Electricity systems, and it is expected that in 2016 and 2017 utilities will not commence administration of programs to incentivize installation of ADG-to-Electricity systems.

2.11.6 Budgets & Expenditures[107,108]

Budget	2016	2017	2018	Total
Incentives & Services	$4,000,000	$4,000,000	$4,000,000	$12,000,000
Program Implementation	$50,000	$50,000	$50,000	$150,000
Total	$4,050,000	$4,050,000	$4,050,000	$12,150,000

Expenditures	2016	2017	2018	2019	Further Out Years[109]
Total	5%	13%	13%	12%	58%

[107] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[108] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

[109] The program has, and intends to, disburse a portion of the award in the form of performance-based payments that will occur over a ten-year duration.

2.11.7 Performance Metrics[110]

Primary Metrics[111]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MMBtu Annual	-	-	-	-
	MMBtu Lifetime	-	-	-	-
	MW	-	-	-	-
Renewable Energy	MWh Annual	10,000	10,000	10,000	30,000
	MWh Lifetime	100,000	100,000	100,000	300,000
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		5,000	5,000	5,000	16,000
CO2e Emission Reduction (metric tons) Lifetime		53,000	53,000	53,000	158,000
Customer Bill Savings Annual		$300,000	$300,000	$300,000	$900,000
Customer Bill Savings Lifetime		$3,000,000	$3,000,000	$3,000,000	$9,000,000
Private Investment		$3,000,000	$3,000,000	$3,000,000	$9,000,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants	2	2	2	6

2.11.8 Fuel Neutrality

The majority of program efforts in 2016 and 2017 will be electric focused (i.e., incentives for installation of ADG-to-Electricity systems). In 2016 and 2017, the program may conduct a small amount of initial exploration of market transformation activities, which may, or may not, involve fuel-neutral-type projects. If fuel-neutral type projects are considered, they will be assessed on a case-by-case basis to ensure conformance with CEF requirements regarding fuel neutrality.

2.12 Fuel Cells

2.12.1 Program Description

The Fuel Cell Incentive program offering provides financial support to assist facilities with projects to install on-site renewable distributed generation equipment to help reduce their energy expenses as well as their carbon footprint.

[110] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[111] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

This program will be an extension of the previous RPS CST Fuel Cell program and will continue to support both Small Fuel Cells and Large Fuel Cells.

Program Delivery

Applicants will submit required documentation to be reviewed by NYSERDA to determine eligibility of the project (a list of Eligible Equipment is maintained by NYSERDA). Each project will receive a purchase order upon approval. Installation is completed by firms/vendors that the customer retains on their own. Technical Review is conducted by NYSERDA staff. Cost-sharing or incentives will be administered by NYSERDA after proof of successful completion of project milestones (installation milestones, and annual operating performance milestones). NYSERDA incentive payments can be made to the project developer/installer, the host customer, or a third party.

The Fuel Cell program offering will be open-enrollment. Applications will be accepted on a first-come, first-served basis dependent on funding availability.

Personnel and Roles

- **NYSERDA staff**: Program management, project eligibility review, general project management, and project payments.

NYSERDA has provided many years of incentive support to stationary power fuel cells, but, for various reasons, fuel cells continue to have very low penetration in the marketplace and relatively high costs. For example, there are currently a very limited number of vendors for commercially available fuel cells and fuel cells remain significantly more expensive than comparable commercially available "resilient" on-site power production solutions, such as engine and microturbine-based generators. In order to provide some market stability and bridge until acquisition of market insights can pinpoint meaningful intervention strategies, the general features of the historic incentive program structure (rolling admission first-come-first-served incentives) for Fuel Cells will continue, subject to the outcome of current discussions with stakeholders. The budget level will be commensurate with the recent historic actual uptake experienced during the planning cycle of the CEF.

By 2017, NYSERDA anticipates shifting strategy to initiatives and pioneering projects that offer the prospect of reducing soft costs, improving performance and value, and developing and demonstrating sustainable business models through demonstration projects and best practices studies (such efforts will strive to determine and inform marketplace participants of fuel cell project attributes that can maximize the value to be available via REV[112]) - in 2016 and 2017 NYSERDA will conduct a small amount of initial exploration of these opportunities. If, in

[112]In a broader perspective, New York State is pursuing the Reforming the Energy Vision (REV) strategies, an effort which, through regulatory reform, is intended to provide appropriate compensation for the value that distributed energy resources bring to the localized and overall management of the electric grid. Distributed generation, including but not limited to fuel cells, are a type of distributed energy resource that will find opportunities for improved value propositions under REV. NYSERDA is engaged with the REV proceeding, and will provide information and insights throughout the process to help establish a marketplace where distributed energy resources can leverage their particular values. In particular, through REV, the standby tariff, and the rules for electrical interconnection (Standard Interconnection Requirement -- SIR) are being assessed for improvements, and this is expected to provide important benefits to distributed generation, including but not limited to fuel cells.

consultation with stakeholders, NYSERDA determines that such an adjustment will provide more impact toward CEF goals, we will file an amendment outlining the new strategies.

NYSERDA will coach the utilities to each establish a utility employee to serve as a Distributed Generation Ombudsman for their territory, an important role that has been successfully demonstrated at Con Edison.

2.12.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes all eligible customers seeking to have an eligible fuel cell installed in a grid-connected manner and operated continuous-duty. A list of eligible fuel cells is (and will be) maintained by NYSERDA.

Eligibility

The Fuel Cell Incentive program is eligible to all sectors, including but not limited to residential, commercial, industrial, agricultural, institutional, educational, not-for-profit, and government-owned facilities. Participants must be New York State electricity distribution customers of a participating utility company who pay into the SBC.

2.12.3 Incentives/Services Offered

The only significant change in 2016, compared to the previous NYSERDA offering, is that there will no longer be a budgetary set-aside for Small Fuel Cells.[113] Changes to the program for 2017 will be detailed in a subsequent plan, to be issued prior to such changes.

For 2016, the NYSERDA incentive will be a combination of basic capacity incentive, stand-alone capability capacity incentive, and performance-based incentive. The maximum incentive available is $1,000,000 per eligible customer utility billing meter at a given site where the fuel cell system will be installed.

2.12.4 Performance Management

NYSERDA will regularly monitor market interest and uptake of available funds and will make adjustments as needed based on market response. NYSERDA will also monitor project completion timelines to ensure installation and commissioning of all equipment generally occurs within 15 months of a fully executed contract with NYSERDA (projects failing to meet this timeline may be subject to termination).

Metrics associated with energy generation, capacity installed, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting.

[113] There has been no uptake of continuous-duty Small Fuel Cells over the previous program's entire history therefore NYSERDA believes it would be imprudent to continue to carve-out a budgetary set-aside; Small Fuel Cells will continue to be eligible for the program.

All implementation assistance projects, as part of this program, will be reviewed by a NYSERDA technical reviewer prior to approval and payment. This Program is not intended to provide technical review services for in-eligible projects. In addition to the technical review services stated above, all participants will be subject to NYSERDA inspection, and a sampling of projects will undergo project-level data collection and M&V.

Program plans include a NYSERDA site inspection for each project, hourly-interval data collection on system performance, and project-level measurement and verification. This data will be used to monitor performance of installed systems and to support performance-based incentive payments. An independent evaluation effort will review data from site inspections, data collection and M&V to verify energy benefits. Additional impact evaluation work will only occur as needed to verify energy and other benefits.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.12.5 Relationship to Utility Programs

In the past, utilities have not administered programs to incentivize installation of fuel cells, and it is expected that utilities will not commence administration of programs to incentivize installation of fuel cells.

2.12.6 Budgets & Expenditures[114,115]

Budget	2016	2017	2018	Total
Incentives & Services	$2,000,000	$2,000,000	$2,000,000	$6,000,000
Program Implementation				$0
Total	$2,000,000	$2,000,000	$2,000,000	$6,000,000

Expenditures	2016	2017	2018	2019
Total	17%	33%	33%	17%

[114] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[115] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

2.12.7 Performance Metrics[116]

Primary Metrics[117]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MMBtu Annual	-	-	-	-
	MMBtu Lifetime	-	-	-	-
	MW	-	-	-	-
Renewable Energy[118]	MWh Annual	5,000	5,000	5,000	15,000
	MWh Lifetime	50,000	50,000	50,000	150,000
	MW	0.6	0.6	0.6	1.8
CO2e Emission Reduction (metric tons) Annual		3,000	3,000	3,000	8,000
CO2e Emission Reduction (metric tons) Lifetime		26,000	26,000	26,000	78,000
Customer Bill Savings Annual		$500,000	$500,000	$500,000	$1,500,000
Customer Bill Savings Lifetime		$5,000,000	$5,000,000	$5,000,000	$15,000,000
Private Investment		$4,000,000	$4,000,000	$4,000,000	$12,000,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants	2	2	2	6

2.13 Small Wind

2.13.1 Program Description

The Small Wind Incentive program offering provides financial support to assist typically rural facilities with projects to install on-site renewable distributed generation equipment to help reduce their energy expenses as well as their carbon footprint.

This program will be an extension of the previous RPS CST Small Wind program.

Program Delivery

Applicants will submit required documentation to be reviewed by NYSERDA to determine eligibility of the project (a list of Eligible Equipment is maintained by NYSERDA). Each project will receive a purchase order upon approval. Installation is completed by firms/vendors (on NYSERDA's list of Eligible Installers) that the customer retains on their own. Technical Review is conducted by NYSERDA staff. Cost-sharing or incentives will be administered by NYSERDA after proof of

[116] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[117] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[118] For the purposes of this program, fuel cells operating on fossil fuel pipeline natural gas will nevertheless be tracked as producing renewable energy, consistent with treatment of fuels under the RPS CST.

successful completion of project milestones. NYSERDA incentive payments will be made to the project's Eligible Installer, who must pass the incentive along in its entirety to the host customer).

The Small Wind program offering will be open-enrollment. Applications will be accepted on a first-come, first-served basis dependent on funding availability.

Personnel and Roles

- **NYSERDA staff**: Program management, project eligibility review, general project management, and project payments.

NYSERDA's experience with small wind turbines over the past eight years confirms the persistence of a long time horizon until these solutions approach cost-competitiveness. In order to provide some market stability and bridge until acquisition of market insights can pinpoint meaningful intervention strategies, the general features of the historic incentive program structure (rolling admission first-come-first-served incentives) for Small Wind will continue, subject to the outcome of current discussions with stakeholders. The budget level will be commensurate with the recent historic actual uptake experienced during the planning cycle of the CEF.

By 2017, NYSERDA anticipates shifting strategy to initiatives and pioneering projects that offer the prospect of reducing soft costs, improving performance and value, and developing and demonstrating sustainable business models through demonstration projects and best practices studies (such efforts will strive to determine and inform marketplace participants of small on-site wind turbine project attributes that can maximize the value to be available via REV[119]) -- in 2016 and 2017 NYSERDA will conduct a small amount of initial exploration of these opportunities. If, in consultation with stakeholders, NYSERDA determines that such an adjustment will provide more impact toward CEF goals, we will file an amendment outlining the new strategies.

NYSERDA will coach the utilities to each establish a utility employee to serve as a Distributed Generation Ombudsman for their territory, an important role that has been successfully demonstrated at Con Edison.

2.13.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes all eligible customers seeking to have an eligible wind turbine installed by an eligible installer in a grid-connected manner. A list of eligible wind turbines up to a given size is maintained by the Interstate Turbine Advisory Council (ITAC)

[119]In a broader perspective, New York State is pursuing the Reforming the Energy Vision (REV) strategies, an effort which, through regulatory reform, is intended to provide appropriate compensation for the value that distributed energy resources bring to the localized and overall management of the electric grid. Distributed generation, including but not limited to small on-site wind turbines, are a type of distributed energy resource that will find opportunities for improved value propositions under REV. NYSERDA is engaged with the REV proceeding, and will provide information and insights throughout the process to help establish a marketplace where distributed energy resources can leverage their particular values. In particular, through REV, the standby tariff, and the rules for electrical interconnection (Standard Interconnection Requirement -- SIR) are being assessed for improvements, and this is expected to provide important benefits to distributed generation, including but not limited to small on-site wind turbines.

(http://www.cesa.org/projects/ITAC/itac-unified-list-of-wind-turbines/); commercially-available turbines larger than those assessed by ITAC, but not exceeding 2,000 kW nameplate rating, will be assessed for program eligibility by NYSERDA on a case-by-case basis considering various factors including but not limited to proven record for power performance, reliability, safety, and acoustics. A list of eligible installers is maintained by NYSERDA.

Eligibility

The Small Wind Incentive program is eligible to all sectors, including but not limited to residential, commercial, industrial, agricultural, institutional, educational, not-for-profit, and government-owned facilities. Participants must be New York State electricity distribution customers of a participating utility company who pay into the SBC.

2.13.3 Incentives/Services Offered

There will be no significant changes in 2016 to the previous NYSERDA offering. Changes to the program for 2017 will be detailed in a subsequent plan, to be issued prior to such changes.

For 2016, the NYSERDA incentive will be based on the expected annual energy output (AEO) of the proposed wind energy system, at the proposed location. If multiple wind turbines are installed at a site, the NYSERDA incentive is based on the AEO of all wind turbines combined in aggregate (not to exceed 2,000 kW) and is not based on the AEO of each individual wind turbine. The AEO must be calculated by a NYSERDA-approved wind resource assessment tool. NYSERDA will apply a retro-graded formula to the AEO in order to compute the magnitude of the incentive (i.e., a higher incentive rate will be applied to the first block of production within the AEO, and a lower incentive rate will be applied to the next block of production within the AEO, etc.). The maximum incentive available is $1,000,000 per site/customer. The maximum total equipment size is 2 MW (2,000 kW) per site/customer. The NYSERDA incentive will not exceed 50% of the total installed cost of the wind energy system.

2.13.4 Performance Management

NYSERDA will regularly monitor market interest and uptake of available funds and will make adjustments as needed based on market response. NYSERDA will also monitor project construction timelines; all the wind energy system components should be delivered to the customer's site within 120 days of the NYSERDA-contract starting date (projects failing to meet this timeline may be subject to termination).

Metrics associated with energy generation, capacity installed, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting.

All implementation assistance projects, as part of this program, will be reviewed by a NYSERDA technical reviewer prior to approval and payment. This Program is not intended to provide technical review services for in-eligible projects.

In addition to the technical review services stated above, all participants will be subject to NYSERDA inspection, and a sampling of projects will undergo project-level data collection and M&V. An independent evaluation effort will review data from site inspections, project-level data

collection and M&V to verify energy benefits. Additional impact evaluation work will only occur as needed to verify energy and other benefits.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.13.5 Relationship to Utility Programs

In the past, utilities have not administered programs to incentivize installation of small on-site wind turbines, and it is expected that in 2016 utilities will not commence administration of programs to incentivize installation of small on-site wind turbines.

2.13.6 Budgets & Expenditures[120,121]

Budget	2016	2017	2018	Total
Incentives & Services	$2,000,000	$2,000,000	$2,000,000	$6,000,000
Program Implementation	$30,000	$30,000	$30,000	$90,000
Total	$2,030,000	$2,030,000	$2,030,000	$6,090,000

Expenditures	2016	2017	2018	2019
Total	17%	33%	33%	16%

[120] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[121] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

2.13.7 Performance Metrics[122]

Primary Metrics[123]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MMBtu Annual	-	-	-	-
	MMBtu Lifetime	-	-	-	-
	MW	-	-	-	
Renewable Energy	MWh Annual	2,000	2,000	2,000	7,000
	MWh Lifetime	46,000	46,000	46,000	138,000
	MW	1.0	1.0	1.0	3.0
CO2e Emission Reduction (metric tons) Annual		1,000	1,000	1,000	4,000
CO2e Emission Reduction (metric tons) Lifetime		24,000	24,000	24,000	73,000
Customer Bill Savings Annual		$400,000	$400,000	$400,000	$1,200,000
Customer Bill Savings Lifetime		$8,000,000	$8,000,000	$8,000,000	$24,000,000
Private Investment		$4,000,000	$4,000,000	$4,000,000	$12,000,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants	35	35	35	105

2.14 Solar Thermal

2.14.1 Program Description

The Solar Thermal Program provides financial incentives for the installation of new Solar Thermal hot water systems. The program is only available for electrically heated domestic hot water and will be available from March 1, 2016 to December 31, 2016. We expect to achieve an offset to energy used, savings on utility bills, and GHG reduction.

This Program replaces the Solar Thermal Program that was funded under RPS.

Program Delivery

The incentives are available on a first-come, first-served basis, and are applied to the total project cost based on displaced KWh, provided directly to the participating contractor.

[122] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[123] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

2.14.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market includes all eligible customers seeking to have a solar thermal system installed by an eligible installer.

Eligibility

The Solar Thermal program is eligible to residential, commercial, agricultural, not-for-profit, and government-owned facilities. Participants must be New York State electricity distribution customers of a participating utility company who pay into the SBC.

Projects must identify the method used for establishing the existing thermal load, and displaced energy usage calculated in kWh. System offset cannot exceed 80% of existing domestic hot water (DHW) load.

Installers must calculate all potential system output losses (kWh, or equivalent BTU for fossil fuel based systems, generated after all losses associated with shading, system orientation, tilt angle, etc. are applied. System must be installed in accordance with the design and solar hot water system components submitted in the application and approved by NYSERDA.

2.14.3 Incentives/Services Offered

This Solar Thermal Incentive program is a one-year extension, or until the money runs out, of the solar thermal program previously offered under the Renewable Portfolio Standard Customer Sited Tier (CST).Effective March 1, 2016 the Solar Thermal Incentive will be reduced to the following levels, ensuring that the NYSERDA incentive is not more than half of the system cost:

- Residential installations: $1.00/kWh offset per year up to $5,000.
- Commercial/Industrial: $0.30/kWh offset per year up to $75,000.
- Agricultural/Not-for-Profit/Government: $0.40 per kWh offset per year up to $75,000.
- Incentives may be adjusted in the future, based on market uptake, system costs and funding availability.

2.14.4 Performance Management

NYSERDA will regularly monitor market interest and uptake of available funds by end use sector and will make adjustments to the incentive offerings as needed based on market response. NYSERDA will also monitor project completion timelines. In addition, growth and geographic representation of the list of eligible installers will be monitored to ensure the installer network can support consumer demand.

All technical and implementation assistance projects, as part of this program, will be reviewed by a NYSERDA technical reviewer prior to approval and payment.

Metrics associated with energy savings, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects in development and installed and will

be included, in aggregate, in CEF reporting. An independent evaluation effort will review data from these programmatic site inspections, data collection and M&V to verify energy benefits. Additional impact evaluation work will only occur as needed to verify energy and other benefits.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.14.5 Relationship to Utility Programs

Utilities do not currently have programs supporting solar hot water installations.

2.14.6 Budgets & Expenditures[124,125]

Budget	2016	2017	2018	Total
Incentives & Services	$2,900,000	-	-	$2,900,000
Program Implementation	$100,000	-	-	$100,000
Total	$3,000,000	-	-	$3,000,000

Expenditures	2016	2017
Total	87%	13%

[124] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit. By 2017, NYSERDA anticipates shifting strategy to initiatives that offer the prospect of reducing soft costs, improving value, demonstrating sustainable business models, and potentially integrating multiple renewable heating and cooling options into one market offering. If in consultation with stakeholders, NYSERDA determines that such an adjustment will provide more Impact toward CEF goals, we will file an amendment outlining the new strategies.

[125] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

2.14.7 Performance Metrics[126]

Primary Metrics[127]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MMBtu Annual	-	-	-	-
	MMBtu Lifetime	-	-	-	-
	MW	-	-	-	-
Renewable Energy	MWh Annual	7,000	-	-	7,000
	MWh Lifetime	104,000	-	-	104,000
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		4,000	-	-	4,000
CO2e Emission Reduction (metric tons) Lifetime		55,000	-	-	55,000
Customer Bill Savings Annual		$315,000	-	-	$315,000
Customer Bill Savings Lifetime		$4,718,000	-	-	$4,718,000
Private Investment		$7,000,000	-	-	$7,000,000

Additional Performance Tracking Metrics	2016	2017	2018	Total
Participants[128]	190	-	-	190
Eligible Installers	20	-	-	20

2.15 Combined Heat & Power

While the Resource Acquisition Transition chapter was characterized in the CEF Order as to "generally reflect a merging and updating of NYSERDA's EEPS and RPS-Customer Sited Tier (CST) Operating Plans…", the CHP Program, a previous T&MD offering, is also included herein. Prior to

[126] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[127] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[128] Number of systems installed.

the CEF, the CHP program included both resource acquisition and market transformation[129] strategies; these will be continued and transitioned together under the CEF.[130]

2.15.1 Program Description

The proposed interventions will advance a modular CHP market which will reduce soft costs and development time and increase penetration of CHP. The major activity will focus on continuing to provide cost-shared incentives to support the installation of CHP equipment at eligible host site locations. Additionally, and to a lesser extent, the program will continue to provide cost-shared incentives to support site-specific feasibility studies. Also, the program will continue to procure a variety of technical outreach services to raise awareness of the opportunity for and value of CHP among good-prospect candidate sites. In order to monitor progress towards the initiative's intended outcomes, NYSERDA will conduct a Longitudinal Market Evaluation to assess the current penetration rate of CHP as a benchmark of current market conditions.

As a resource acquisition activity, the incentive program will be a continuation/modification of NYSERDA's previous CHP Acceleration and Aggregation Program and CHP Performance Program. These two separate previous programs will be merged into a single offering, and will be issued as NYSERDA's CHP Program and labeled as PON 2568.

Program Delivery

The resource acquisition activity program delivery method will consist of formula-based incentives tailored to the project's site-specific conditions (NYSERDA will provide cost sharing that will encompass implementation assistance in installing projects; for one subset of projects NYSERDA incentive payments will be made to the project developer, for another subset of projects NYSERDA incentive payments can be made to the project developer/installer, the host customer, or a third party); project procurement method will be open-enrollment; NYSERDA staff will receive applications, determine their eligibility, issue contracts, and approve and issue payments.

The market transformation activities will continue to strive to reduce soft costs, reduce cycle times, and increase monetization of values, by simplifying and accelerating customer acquisition,

[129] Market transformation approaches are ongoing and will continue to be based on a theory of change: a collection of interventions will advance a modular CHP market which will reduce soft costs and development time and increase penetration of CHP. A goal/stable end-state is to achieve a CHP market that has adequate and readily-accessible information to spur decision making, shows signs of becoming self-sustaining spanning a sufficient swath of localities and project sizes, and becomes readily deployable either for meeting the needs of an individual building or for serving as the heart of a community microgrid. A well-functioning CHP market will support State Energy Plan goals for energy, emissions and building energy use reduction. A testable hypothesis is that scale-up of market penetration of CHP will occur through migration to preference for modular CHP, which will occur by continuing to build: sufficient data proving the economic and performance value of CHP to show how it can work for prospective customers; awareness of the availability and value of using turnkey solutions for CHP of all size ranges; and a means for prospective customers to easily access qualified vendors.

[130] Market readiness for continuation of these market transformation activities is displayed by the extensiveness of existing and emerging partners, which indicates that the market is ready to take this on. There are currently 13 enrolled vendors of modular CHP packages and interest expressed by 2 additional vendors of modular CHP packages. There are also 13 Original Equipment Manufacturers of "prime mover" subcomponent of modular CHP packages, as well as 11 other CHP project developers active in NYS. Approximately two dozen consultants with expertise in site-specific CHP feasibility studies are active in NYS, some of which are currently enrolled in NYSERDA's FlexTech program. Allies providing tools and free services for CHP self-study/initial screening/detailed feasibility analysis: USDOE's Northeast Regional CHP Technical Assistance Partnership Program, USEPA's CHP Partnership Program.

facilitating project replication through standardized model contract terms and conditions, and establishing consensus-based methodologies for calculating/analyzing costs/savings data and for assigning a monetized value to the enhanced resiliency provided by CHP. Best practices studies will strive to determine and inform marketplace participants of CHP project attributes that can maximize the value to be available via REV. Key milestones/proof points will be tracked to ensure that these market transformation activities are continue to be effective[131]. Measures of success will be used to determine when market transformation has adequately occurred so as to enable NYSERDA to exit[132].

- Analysis of NYSERDA-cost-shared CHP projects shows that the marketplace has achieved a 30% reduction in average project development cycle time (from approval of project to operation date) for projects over a span of the past ten years. As a quantified projection of benefits to customers, the continuation of these market transformation activities will seek to more-quickly achieve the next 30% compression of cycle time, expected to be achieved over the next five years.
- Analysis of NYSERDA-cost-shared CHP projects shows that the marketplace has achieved a 25% reduction in installed cost (for comparable projects based on size, utilization, and capability), over a span of the past ten years (the average total cost has been reduced from $6.23 per Watt to $4.64 per Watt, in 2015 constant-year dollars). As a quantified projection of benefits to customers, the continuation of these market transformation activities will seek to more-quickly achieve the next 25% reduction of installed costs, expected to be achieved over the next five years.
- Additional benefits to customers are expected, including but not limited to the following: A continuation of improved marketplace dynamics with projects providing greater level of value and certainty to consumer, with 5-year warranty on new systems, a performance guarantee not historically provided to the market; emergence of Power Purchase Agreements among a substantial portion of projects; and customer realizes reduced payback with incentives (from 5-6 years to 3-4 years), warranty, shorter development cycle, easier decision-making, all leading to steady market growth.

---

[131] Proof Point 1: Convincing reference cases developed -- CHP Coach accelerates market by capturing, consolidating, and transferring lessons learned; NYSERDA, in coordination with industry partners, standardizes methodologies for calculating/analyzing costs and savings data; aggregated data sets are robust enough to develop technical and financial screenings to enable quick progression from Learner to Shopper, and cited as influential by decision makers. Proof Point 2: Guidance documents deliver value in customer decision making process. Proof Point 3: Qualified vendors easily accessible by customers -- Qualified vendors have customers in queue, ready for CHP installation; open qualified list attracts new vendors to the New York State market, and evolution to a regional/national list of qualified vendors further attracts additional solution providers to the New York State market. Proof Point 4: System performance/delivery of benefits -- Declining number and/or severity of deficiencies found during recommissioning efforts, indicating that vendors are internalizing lessons learned and best practices; protocols for monetization of the enhanced resiliency of CHP become accepted in the marketplace, thus improving the cost-effectiveness of CHP.

[132] NYSERDA will base exit decisions for incentives and certain other activities on progress for each of the four market segments - smaller than 50 kW, 50-500 kW, 500-5000 kW, and larger than 5000 kW. These segments align with range of focus of service providers and serve as proxies for their target customer groups. Progress will be defined as: (1) establishment of conditions that can support a well-functioning marketplace which can persist in the absence of NYSERDA-issued incentives, and (2) actual traction in the marketplace demonstrates achievement of desirable benchmarks and trends.

- Extensive stakeholder engagement was conducted to elucidate the previous launch and planned continuation of these market transformation strategies, including but not limited to messaging and coordination with stakeholders at conferences and webinars; meetings with NECHPI; meetings with CHP vendors; meeting with the Real Estate Board of New York (REBNY) (as consortium that is representative of a class of customers).

2.15.2 Target Market & Customer/Project Eligibility Rules

Target Market

The target market for Implementation Assistance includes all eligible customers seeking to have a CHP system installed in a grid-connected manner. The CHP system must consist of commercially-available technologies, the system design must be well-conceived, and the system must be fueled using pristine/unadulterated gaseous fuels (e.g., pipeline natural gas, compressed natural gas, propane).

Eligibility

Implementation Assistance is eligible to all sectors, including but not limited to residential, commercial, industrial, agricultural, institutional, educational, not-for-profit, and government-owned facilities. Participants must be New York State electricity distribution customers of a participating utility company who pay into the SBC.

In general, Market Transformation efforts and activities will continue to be broad-based and applicable throughout New York State (for example, such as the development of best practices guidebooks, and learner/shopper/buyer tutorial literature/webcasts). In general, these efforts will continue to be conducted via competitively-selected technical assistance contractors who can demonstrate expertise with identification and characterization of the target market reflecting knowledge of the technology, consumers, potential savings, market readiness, and other key market features.

2.15.3 Incentives/Services Offered

Resource Acquisition

There are a few significant changes beginning March 1, 2016 and persisting through 2018, compared to the previous NYSERDA offering: the two offerings will be merged into a single offering; the size range of the "packaged" CHP systems will consist of systems size 3 MW and smaller with no minimum size limit; the size range of the "custom engineered" CHP systems will consist of systems size 1 MW and larger with no maximum size limit; in the overlap range of 1 MW to 3 MW applicants can choose a packaged system or a custom-engineered system and the incentive will be identical regardless of chosen option; custom-engineered systems will receive all payments in the form of capacity-based incentive payments that will be disbursed in a series of milestone payments (the program will no longer format a fraction of the payments as performance-based style).

The maximum incentive available is $2,500,000 per eligible project (a site, such as a campus, may conduct one project as a centralized installation that serves the entire campus, or may conduct multiple projects for example one in each building serving just that building). Two types of bonuses

will be offered (Target Zones, and Critical Infrastructure), not to exceed the maximum cap of $2,500.000. Incentives will periodically be reduced along a declining glide path commensurate with other replacement sources of revenues (and/or project cost reductions attributable to market simplifications). Initial glide path of 5% reduction from original incentive will be applicable for complete applications received on 9/1/2016 or later; 10% reduction from original incentive for complete applications received on 3/1/2017 or later; 15% reduction from original incentive for complete applications received on 9/1/2017 or later; further visibility of reductions to be made public with approximately 6-month advance notice.

Market Transformation

Several strategies have been ongoing and will continue to be pursued, such as initiatives and pioneering projects that offer the prospect of reducing soft costs, improving performance and value, and developing and demonstrating sustainable business models, including but not limited to the following:

- Matchmaking -- further expand the existing list of qualified vendors offering vetted CHP packages (i.e., a CHP Catalog), and continue to facilitate interactions between prospective customers and vendors (e.g., Expos, etc.).
- Information for customers and vendors.
    - Publish customer-centric Learner/Shopper/Buyer Guidance document: Why is CHP good? What is right for me? How do I down-select among vendors and negotiate a contract?
    - Publish vendor-centric Targeting/Pitching/Closing Guidance document: mapping to help identify good prospects, best practices for system design and economic assessment, explanation and benchmarking of contract terms and conditions.
    - Compile/create guidance regarding equitable standard terms and conditions for CHP contracts (e.g., for various types of transactions, such as buy, lease, power purchase agreement, performance contracting, etc.).
- Technical assistance -- continue to provide free unbiased coaching to prospective customers during preliminary screening phase, provide cost-sharing and referrals for site-specific feasibility studies conducted by FlexTech consultants.
- Quality assurance -- continue to fund project recommissioning to assess and improve project persistence of performance, compile and archive performance data, and apply data analytics to the portfolio of recommissioned projects to discern and then disseminate lessons learned and thereby further raise the competency of market actors.
- Recommissioning services market capability -- demonstrate the value proposition of CHP recommissioning, and create and disseminate protocols for CHP recommissioning.
- Market research
    - Continue to discern opportunities for cost reductions (primarily across soft costs, such as permits and approvals -- e.g., interconnection, building permits, construction codes,

etc.), and opportunities for increasing revenues (such as demand response value, resiliency value, etc.),

- Maintain extensive stakeholder engagement to ensure responsiveness to needs of the marketplace and voice of customer, and
- Continue to field test and validate niche-filling emergent commercial products.

- Replication support in key market segments
  - Building Fleets – continue to conduct dedicated outreach to decision makers that own a fleet of similar buildings (e.g., a chain of supermarkets, a chain of hotels, a chain of fast-casual restaurants, etc.) to nurture their initial trial of one/few installations with intent for subsequent wider-scale rollout of replicates if initial trial proves convincing.
  - Process Fleets – continue to identify and facilitate focus on highly-replicable immediate opportunities for the marketplace (e.g., existing packages A, B, and C are each excellent fits for high-volume activity automobile car washes).
  - Other Replication Opportunities -- strategies to identify and support opportunities for replication in other key market segments will continue to be explored.

2.15.4 Performance Management

NYSERDA will regularly monitor market interest and uptake of available funds and will make adjustments as needed based on market response. NYSERDA will also monitor project completion timelines to ensure installation and commissioning of all equipment generally occurs within 12 months of a fully executed contract with NYSERDA (projects failing to meet this timeline may be subject to termination). Other indicators to be monitored by NYSERDA include:

- Number of CHP Vendors enrolled in NYSERDA program
- Number of CHP Vendors with projects and measure of projects per vendor (assess concentration/spread)
- Number of projects using modular approach
- Time compression of implementation timeline for participants
- Reduction in soft costs
- Total electrical interconnections (to be used to discern trends in broader marketplace beyond those systems directly incentivized)

Metrics associated with energy generation, capacity installed, energy bill savings, emission reductions and private investment/funds leveraged will be tracked for all projects and will be included, in aggregate, in CEF reporting.

All implementation assistance projects, as part of this program, will be reviewed by a NYSERDA technical reviewer prior to approval and payment. This Program is not intended to provide technical review services for in-eligible projects. In addition to the technical review services, program plans include a NYSERDA site inspection for each project, hourly-interval data collection

on system performance, and a sampling of projects will undergo project-level measurement and verification. This data will be used to monitor performance of installed systems. An independent evaluation effort will review data from site inspections, data collection and M&V to verify energy benefits. Additional impact evaluation work will only occur as needed to verify energy and other benefits.

Market Transformation Performance Management will also be pursued via Longitudinal Market Evaluation (secondary data and primary data collection through surveys of key market actors) to assess: (1) current penetration rate of CHP within construction of buildings in identified target markets, including identifying and quantifying (#, $, MW, etc.) replication outside of program, the proportion of modular CHP and number of portfolios implementing CHP; (2) CHP vendor market change including number of vendors, activity level (concentration/spread), revenue; (3) soft cost characterization and quantification, (4) sales process effectiveness and time compression, including trend of the number of good prospects that become aware of the value of CHP, trend of the conversion rate from awareness to action-taking, and trend of timeframes of the progression from unaware to aware, and from aware to action. NYSERDA will develop and implement an overall evaluation strategy that draws on the logic model and tests the assumptions of the intervention design against measured market results.

In order to draw a sample and conduct an analysis that is representative and robust, evaluation M&V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSERDA will employ strategies to balance the need for data with the priority to have evaluation M&V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&V review work and rolling M&V samples are two such strategies that will be applied, as appropriate to the program, in developing M&V plans.

2.15.5 Relationship to Utility Programs

In the past, utilities have not administered programs to incentivize installation of CHP systems, and it is expected that in 2016-2018 utilities will not commence administration of programs to incentivize installation of CHP systems. The one exception so far has been a recent joint partnership between NYSERDA and Con Edison for CHP projects to be installed in the Brooklyn-Queens Demand Management territory (BQDM), where Con Edison is seeking to provide supplemental incentives to CHP projects that qualify for NYSERDA incentives.

Utility-run Energy Efficiency programs (conducting a “building tune-up”) will complement subsequent consideration of CHP. There is a need to work with utilities to encourage them to:

- Furnish data on total number of CHP electrical interconnections occurring over time.
- Assist with outreach to prospective customers.
- Streamline of the customer’s access to their load data for sharing with solution providers of their choice.
- Establish utility employees serving as DG Ombudsmen.
- Map of how well the utility infrastructure will accommodate CHP (push -- emphasis is vendor vantage point -- it appears to be buildable at these sites).

- Map of where the utility infrastructure will benefit the most from CHP (pull -- emphasis is utility vantage point -- impending utility price spikes appear to make these sites more cost-competitive).
- Simplify/streamline electrical interconnection process.
- Simplify/streamline natural gas interconnection process.

NYSERDA will provide advising support for utility progress toward regulatory tariff changes on standby rates, and CHP-related components of utility DSIP plans.

2.15.6 Budgets & Expenditures[133,134]

Budget[135]		2016	2017	2018	Total
Installations	Incentives & Services	$22,000,000[136]	$9,000,000[137]	$5,400,000[138]	$36,400,000
	Program Implementation	$50,000	$50,000	$50,000	$150,000
	Sub-Total	$22,050,000	$9,050,000	$5,450,000	$36,550,000
Market Transformation of Marketplace	Market Transformation-style Project Procurements[139]	$3,950,000	$3,950,000	$3,950,000	$11,850,000
	Program Implementation	$50,000	$50,000	$50,000	$150,000
	Sub-Total	$4,000,000	$4,000,000	$4,000,000	$12,000,000
Total		$26,050,000	$13,050,000	$9,450,000	$48,550,000

Expenditures	2016	2017	2018	2019
Total	12%	37%	29%	21%

[133] Incentives & Services defined as incentives/rebates paid to customers/participants and payments made directly to contractors in lieu of payment from customers for services such as an energy audit.

[134] Program Implementation defined as all non-incentive program costs including costs associated with contractors implementing programs on NYSERDA's behalf or other costs associated with the implementation of the program. Does not include EM&V, Administrative or CRF Costs which will be represented at the portfolio level.

[135] NYSERDA reserves the right to adjust budget allocations within this CHP program among categories of efforts and/or among budget years, in response to changing market conditions, and in particular if more-impactful approaches that offer the prospect of reducing soft costs, improving performance and value, and developing and demonstrating sustainable business models are confirmed earlier than anticipated.

[136] Of the $22,000,000 budget, $19,750,000 is earmarked for incentives for installation of CHP equipment (and, no more than $9,000,000 of this is to be available for projects larger than 3 MW), and the remaining $2,250,000 is earmarked for site-specific CHP feasibility studies.

[137] Of the $9,000,000 budget, $7,200,000 is earmarked for incentives for installation of CHP equipment (none of this is to be available for projects larger than 3 MW), and the remaining $1,800,000 is earmarked for site-specific CHP feasibility studies.

[138] Of the $5,400,000 budget, $4,500,000 is earmarked for incentives for installation of CHP equipment (none of this is to be available for projects larger than 3 MW), and the remaining $900,000 is earmarked for site-specific CHP feasibility studies.

[139] Market Transformation-style Projects defined as expenditures made to increase the understanding of market forces with the intent of revealing self-sustaining business models that can be broadly shared with and adopted by market actors.

2.15.7 Performance Metrics[140]

Resource Acquisition Metrics (Direct Impacts)

Primary Metrics[141]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	170,000	30,000	20,000	220,000
	MWh Lifetime	2,500,000	450,000	270,000	3,220,000
	MMBtu Annual	(1,000)	-	-	(1,000)
	MMBtu Lifetime	(14,000)	(3,000)	(2,000)	(19,000)
	MW	30.0	5.5	3.5	39.0
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		90,000	15,000	9,000	114,000
CO2e Emission Reduction (metric tons) Lifetime		1,350,000	225,000	135,000	1,710,000
Customer Bill Savings Annual		$23,900,000	$3,400,000	$2,000,000	$29,300,000
Customer Bill Savings Lifetime		$358,500,000	$51,000,000	$30,000,000	$439,500,000
Private Investment		$95,000,000	$14,000,000	$8,000,000	$117,000,000

Market Transformation of Marketplace

Primary Metrics[142]		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	5,000	22,000	40,000	67,000
	MWh Lifetime	75,000	330,000	600,000	1,005,000
	MMBtu Annual	-	-	-	-
	MMBtu Lifetime	-	(2,000)	(3,000)	(6,000)
	MW	1.0	4.0	7.0	12.0
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		3,000	12,000	20,000	35,000
CO2e Emission Reduction (metric tons) Lifetime		45,000	180,000	300,000	525,000
Customer Bill Savings Annual		$750,000	$3,000,000	$5,000,000	$8,750,000
Customer Bill Savings Lifetime		$11,250,000	$45,000,000	$75,000,000	$131,250,000
Private Investment		$3,000,000	$12,000,000	$20,000,000	$35,000,000

[140] Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 15-year measure life.

[141] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

[142] Benefits are rounded to the nearest 1,000. Totals may not sum. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

Additional Performance Tracking Metrics		2016	2017	2018	Total
Participants	Installations	43	27	16	86
	MT Marketplace	2	8	14	24
	Total	45	35	30	110
Project Cost Reductions		Market transformation activities will seek to more-quickly achieve the next 25% reduction of installed costs, expected to be achieved over the next five years.			
Project Timeline Compressions		Market transformation activities will seek to more-quickly achieve the next 30% compression of cycle time, expected to be achieved over the next five years.			