

Matter Number 16-00681, In the Matter of the Clean Energy Fund  
Investment Plan

# Clean Energy Fund Investment Plan: Low- to Moderate-Income Chapter

Portfolio: Market Development

**Submitted by:**

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

Revised October 5, 2017

Clean Energy Fund Investment Plan: LMI Chapter		
Revision Date	Description of Changes	Revision on Page(s)
August 18, 2016	Original Issue	Original Issue
December 30, 2016	<u>Single Family LMI Residential</u> : Revised Table 16 to correct error due to rounding of MWh annual target values for 2016, 2017 and 2018, implying a measure life that is significantly less than the actual measure life.	Multiple
June 23, 2017	<p><u>RetrofitNY</u>: Tables 2, 3, 4, 8 and 10 have been revised to reflect shift in timing of budget and benefits.</p> <p><u>REVitalize</u>: Tables 2 and 3 have been revised to reflect shift in timing of budget. Milestones 1, 5, and 6 have been updated to reflect updated timeframe for completion.</p> <p><u>LIFE</u>: Tables 6 and 10 have been updated to reflect 2016 actual participants, and to add a participant value for 2025, which was left blank in error in the original filing, increasing the total number of participants.</p> <p><u>Single Family LMI Residential</u>: Program was moved from Resource Acquisition Transition Chapter; additional content has been added to align with the format of the LMI Chapter. Program has been extended through 2021, with increased funding for the additional years. Additional funds have also been added to meet increasing demand, and to support improvement data management and marketing and outreach, and the benefit estimates have increased accordingly. Tables 13, 14, 15, 16, and 17 have been updated to reflect these revisions and 2016 actual values.</p> <p><u>LMI Multifamily</u>: Program was moved from Resource Acquisition Transition Chapter; additional content has been added to align with the format of the LMI Chapter. Program has been extended through 2021, with funding for the additional years. The program has been revised to remove the Targeted Option due to lack of market demand, and to increase the incentive level and lower the project minimum savings threshold for the Comprehensive Option. Additional funds have also been added to support the Solutions Provider Network. Tables 18, 19, 20 and 21 have been updated to reflect these revisions, 2016 actual values, and a shift in timing of the budget and benefits for the High-Performance offering.</p> <p><u>Appendices B and C</u>: Revised to reflect the revised budget and benefit values in 2016, 2017, and 2018 in line with the changes described above.</p>	Multiple
July 17, 2017	<u>LMI Multifamily</u> : Table 18 updated to reflect revised 2016 budget value.	Page 53
October 5, 2017	Added Low Income Community Solar initiative	Multiple

## 15 Low- to Moderate-Income

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For the purpose of targeting CEF investments and maintaining alignment with state and federal energy and housing programs, NYSERDA defines the low-income market segment as households with annual incomes at or below 60% of the State Median Income (SMI), and the moderate-income market segment as households with an annual income between 60% and 80% of the SMI or the Area Median Income (AMI), whichever is greater.<sup>1</sup> Together these form the Low- to Moderate-Income (LMI) market segment, which in New York State is large and diverse. Approximately 40% of households (more than 3 million) in the state have an annual income that is less than 80% of SMI, and nearly 2.3 million of these households have incomes below 60% of the SMI.<sup>2</sup> Many of these households spend a disproportionate share of their annual income on energy bills<sup>3</sup> relative to higher income New Yorkers. In addition, LMI households often lack the time, financial resources<sup>4</sup>, and information necessary to invest in or gain access to energy efficiency upgrades or renewable energy systems, even though they often stand to benefit the most from them. Affordable housing providers, community organizations, and other actors that serve LMI customers face similar obstacles. For instance, affordable housing owners and developers often lack the capital to invest in high performance or clean energy improvements to their buildings, while community-based organizations often do not have access to resources and technical expertise necessary to develop solutions for addressing the energy affordability issues faced by community members. In addition to energy affordability issues, LMI customers and communities can face challenges associated with the health impacts of inefficient and deteriorating building stock that stem from the lack of resources to invest in regular maintenance and improvement. For the State to accomplish the broad goals of its Reforming the Energy Vision (REV) strategy, it is important that solutions to increase adoption of clean energy options for LMI customers be developed.

Under the CEF, NYSERDA will implement a comprehensive, three-pronged strategy for improving energy affordability and access to clean energy solutions for LMI communities, customers, and building owners. The first two components of the strategy are 1) traditional incentive, or standard offer programs and 2) market development interventions, which together are aimed at addressing the financial, informational, and technical barriers associated with LMI projects and enable LMI communities to gain greater access to clean energy through service providers and community organizations. In addition to reducing energy burden and increasing access to clean energy solutions for LMI customers, NYSERDA will seek to capture the important co-benefits of clean energy, such as health and environmental impacts, through these interventions. The third

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<sup>1</sup> WAP, HEAP, and utility bill payment assistance programs have established an income eligibility threshold of 60% of the SMI, while eligibility for housing assistance under the United States Department of Housing and Urban Development (HUD) extends to 80% of the SMI or AMI.

<sup>2</sup> 2013 American Community Survey.

<sup>3</sup> According to the 2015 Home Energy Affordability Gap, by Fisher, Sheehan, and Colton, energy burdens can exceed 30% of annual income for many low-income New Yorkers compared to 6% or less for higher income New Yorkers.

<sup>4</sup> Including credit profiles.

component of the strategy is meaningful NYSERDA coordination with other state agencies to maximize the impact and reach of various publicly-funded LMI energy and housing programs currently administered by New York State<sup>5</sup>.

## 15.1 The LMI Portfolio Overview

Over the first three years of the CEF, NYSERDA will invest a minimum of \$234.5 million in the LMI market segment<sup>6</sup>, per the CEF Order. The CEF investments include funding for the standard offer incentive programs, filed as part of the Resource Acquisition Transition Chapter, and funding for market development initiatives that will advance innovative approaches to scale the market for clean energy improvements, provide communities with resources necessary to reduce costs of service delivery, and improve awareness and education among customers and service providers.

The CEF LMI portfolio builds on established LMI energy efficiency and renewable energy programs administered under the Energy Efficiency Portfolio Standard (EEPS) and NY-Sun. As NYSERDA transitioned from EEPS to the CEF, these standard offer programs were approved for a March 1, 2016 start date by the Public Service Commission to maintain continuity of services to LMI customers as the CEF was developed.<sup>7</sup> Under the CEF, the standard offer programs will be supplemented with market development initiatives that will seek to further increase the adoption of clean energy solutions in the LMI market segment and increase energy affordability for LMI customers. The following sections provide a comprehensive overview of the CEF LMI portfolio, however NYSERDA also expects that CEF investments in the Communities, Single Family, Multifamily, and New Construction portfolios will also make positive contributions to LMI communities and customers.

### 15.1.1 NY-Sun<sup>8</sup>

In April 2014, the Public Service Commission provided NYSERDA authorization to allocate \$13 million in NY-Sun funding to increase opportunities for low and moderate-income customers to participate in solar photovoltaic (PV) programs. In November 2015, NYSERDA launched the Affordable Solar initiative, which provides financial incentives to LMI customers to offset the installation costs associated with rooftop PV. In December 2016, NYSERDA launched the Affordable Solar Predevelopment and Technical Assistance Program, which provides funding to address resource gaps and solve market barriers, including the development of solar installations serving

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<sup>5</sup> Including the Weatherization Assistance Program (WAP) and Low-Income Housing Tax Credit, administered by NYS Homes and Community Renewal, and the Home Energy Assistance Program (HEAP), administered by NYS Office of Temporary and Disability Assistance.

<sup>6</sup> The \$234.5 million investment includes costs associated with program implementation, incentives, NYSERDA administration, and the associated New York State Cost Recovery Fee.

<sup>7</sup> Case Numbers 14-M-0094, 10-M-0457, 07-M-0548, 03-E-0188; Order Extending Clean Energy Programs, Issued and Effective December 11, 2015.

<sup>8</sup> Case Number 03-E-0188: Order Authorizing Funding and Implementation of the Solar Photovoltaic MW Block Programs, Issued and Effective April 24, 2014. While NY-Sun operates as a distinct portfolio within the CEF, its LMI component description is included here to provide a complete picture of the current LMI initiatives funded during this timeframe. The \$13 million in NY-Sun funding identified is in addition to the minimum 3-year CEF investment mentioned above.

multifamily affordable housing, as well as community solar installations serving LMI households. For additional detail on these NY-Sun LMI investments, please refer to the NY-Sun Operating Plan.

The Low-Income Community Solar initiative proposes a direct intervention in the community solar market to ensure significant low-income customer participation with meaningful benefits. In addition, NYSERDA will continue to engage stakeholders and develop interventions to support community solar projects and business models that are more broadly inclusive of low income customers, moderate income customers and affordable housing providers to encourage the development of a community solar market that is accessible to these customer segments. NYSERDA's planning has been and continues to be informed by the Clean Energy Advisory Council (CEAC) LMI Clean Energy Initiatives Working Group Report, CDG Low Income Collaborative Report, Value of DER LMI Working Group, and other stakeholder processes.

Broadly, NYSERDA will continue to implement the Affordable Solar Predevelopment and Technical Assistance Program, and will apply the lessons learned from these early efforts and seek to scale up models that are demonstrated effective.<sup>9</sup> Further interventions to be considered for implementation will include:

- Targeted support for community solar projects that serve LMI customers and/or affordable housing providers and meet customer benefit requirements (such as cost savings and favorable subscription terms).
- Customer education to LMI households and affordable housing providers.
- Collaboration with the New York Green Bank and other financing providers to reduce the perceived risk of offering community solar subscriptions to LMI customers, and mobilize the investment of capital in community solar projects serving LMI customers.

### 15.1.2 Standard Offer Programs

On February 29, 2016, the Department of Public Service approved the continued operation of programs from legacy portfolios to the CEF as detailed in the CEF Resource Acquisition Transition Chapter, filed on February 22, 2016. The programs have been moved into the LMI chapter in this revision, which include details on \$162.2 million of standard offer LMI programs that NYSERDA is administering to provide financial support to overcome first cost and incremental cost barriers experienced in the single family, multifamily, and new construction market segments. By addressing critical cost barriers to adopting energy efficiency improvements, these programs will further the goals of the Affordability Policy<sup>10</sup> to improve the energy affordability for low-income energy consumers. These programs, which are application based and open to all eligible customers, are summarized below.

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<sup>9</sup> Affordable Solar Predevelopment and Technical Assistance webpage: [www.nyserda.ny.gov/aspta](http://www.nyserda.ny.gov/aspta)

<sup>10</sup> Case 14-M-0565, Proceeding on Motion of the Commission to Examine Programs to Address Energy Affordability for Low Income Utility Customers; Order Adopting Low Income Program Modifications and Directing Utility Filings; May 20, 2016.

### ***Single Family***

NYSERDA's single family residential LMI program provides incentives for whole-house energy efficiency improvements for low and moderate-income homeowners and tenants. The low-income component, EmPower NY, serves households with an annual income less than 60% SMI and provides no-cost energy efficiency upgrades and in-home energy education to eligible customers. The moderate-income component, Assisted Home Performance with ENERGY STAR, serves households with an annual income up to 80% SMI or AMI, whichever is higher, provides incentives for energy efficiency upgrades. This initiative allocates \$134 million for the period 2016-2018 across the two components.

### ***Multifamily***

NYSERDA's LMI component of the Multifamily Performance Program (MPP) addresses cost barriers experienced by owners of low-to-moderate income properties and increases the awareness of and access to energy efficient solutions for LMI properties. MPP offers two options for buildings to improve their energy performance: a comprehensive option that will provide incentives for work scopes designed to achieve at defined threshold for whole-building source energy savings; and a high performance offering that will provide incentives for deep energy retrofit projects. This initiative allocates a total of \$48 million for the period 2016-2021 across the two options.

### ***New Construction***

NYSERDA's new construction program promotes high performance for affordable low-rise and high-rise multifamily new construction projects. Support includes financial incentives to overcome the incremental cost of building to a higher performance threshold, such as passive house or net zero energy standards; providing technical assistance, tools and resources to builders, developers, architects, and engineers on high performance new construction techniques, with an emphasis on integrated design solutions and pre development cost reductions; and strengthening the capacity of clean energy partners in the building design, construction, and performance verification. This initiative allocates a total of \$21 million for the period 2016-2018.

## **15.1.3 Market Development Initiatives**

As demonstrated by the continuation of its standard offer programs, NYSERDA will maintain incentive programs to address first cost and other barriers associated with LMI clean energy projects throughout the CEF. These programs will be continuously assessed and modified, where necessary to increase impact, enhance operational efficiencies, and leverage other LMI focused initiatives administered in New York State. While standard offer incentive programs will continue to be important to reduce energy burdens and increase access to clean energy options for LMI customers and communities, a sole focus on incentive programs that buy down the cost associated with clean energy improvements will not lead to scale in the LMI market segment, due to the relatively high cost of clean energy projects<sup>11</sup> and the fact that the transactions occur on a project by

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<sup>11</sup> For example, a whole-house energy efficiency retrofit can exceed \$4,000.

project basis. As such, NYSERDA will administer a series of market development initiatives targeted at scaling clean energy adoption in the LMI market segment; reducing soft costs associated with clean energy projects, such as those connected to customer acquisition and project planning; developing innovative models for project finance and community ownership of distributed energy resources (DER); and increasing energy awareness amongst customers and service providers. Detail on the market development initiatives identified to-date is in section 15.2; additional initiatives will be included in later revisions to this Chapter.

To ensure that CEF interventions effectively deliver clean energy solutions to LMI customers and communities and that the State is best able to leverage coordination across publicly-funded programs, NYSERDA will work to improve the collective understanding of the LMI energy landscape including customers, building owners, and service providers. As included in the Market Characterization and Design Chapter, filed on April 1, 2016, this will include: research on relevant demographic, housing, and energy end-use and cost information; information gathering and integration of data efforts with New York State agencies that maintain relevant data to better understand program penetration and the unmet need for energy services; and research on the motivations and barriers associated with building owners and service providers to understand where CEF investments can help to overcome obstacles in deploying clean energy solutions more broadly. This effort will help to identify trends, gaps, and opportunities for CEF investments and other New York State activities for the LMI market segment.<sup>12</sup> NYSERDA will explore these opportunities with stakeholders and the Clean Energy Advisory Council (CEAC)<sup>13</sup> LMI Clean Energy Initiatives Working Group (CEAC LMI Working Group) and file a supplement to this Chapter when LMI interventions and associated investments become ready for deployment.

#### 15.1.4 Enhanced Statewide Coordination

In addition to the standard offer energy efficiency programs administered by NYSERDA, New York State administers energy bill payment assistance and weatherization programs for low and moderate-income customers, which all together total roughly \$500 million a year. The recent Energy Affordability policy<sup>14</sup> is expected to provide an additional \$248 million a year in utility bill reductions to low-income customers. On average, these programs provide service to approximately 1.5 million households a year, far fewer than the 2.3 million households that are income eligible. NYSERDA will work with New York State agencies and utilities to develop cohesive strategies, aligning the CEF with these programs and deploying public funds in a manner that will result in the

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<sup>12</sup> As outlined in the Market Characterization and Design Chapter, NYSERDA expects that the initial research and data gathering activities to be complete by Q1 in 2017. The research on motivations and barriers of service providers and building owners will commence in 2017.

<sup>13</sup> The Clean Energy Advisory Council was established by the Public Service Commission through an Order in the Clean Energy Fund Proceeding (Case 14-M-0094. et al, Proceeding on Motion of the Commission to Consider a Clean Energy Fund, Order Authorizing the Clean Energy Fund Framework, filed January 21, 2016).

<sup>14</sup> Case 14-M-0565, Proceeding on Motion of the Commission to Examine Programs to Address Energy Affordability for Low Income Utility Customers; Order Adopting Low Income Program Modifications and Directing Utility Filings; May 20, 2016.

greatest number of households served and maximize energy, bill cost reduction, and environmental impacts.

In addition, NYSERDA will work with state and public housing agency partners to leverage housing programs and policies to advance clean energy solutions in affordable housing stock, and to achieve important health and environmental justice benefits through CEF investments.

Table 1 provides a summary of the key coordination activities that NYSERDA will undertake.



**Table 1. Summary of Statewide Coordination Efforts**

<b>Organizations</b>	<b>Nature of Coordination</b>
Low-Income Energy Program Interagency Task Force <sup>15</sup>	<ul style="list-style-type: none"> <li>• Development of a cohesive approach to serve low-income energy customers across the programs administered by New York State agencies to reduce redundancy and increase coordination, effectiveness, and impact for the customer.</li> </ul>
NYS Department of Environmental Conservation	<ul style="list-style-type: none"> <li>• Explore opportunities to improve energy and health outcomes in environmental justice communities.</li> </ul>
NYS Department of Health (DOH)	<ul style="list-style-type: none"> <li>• Develop an approach to quantify the health outcomes and healthcare cost reductions associated with energy efficiency improvements.</li> <li>• Explore opportunities for developing a programmatic approach for addressing energy efficiency and healthy homes improvements for low-income customers.</li> </ul>
NYS Department of Public Service (DPS)	<ul style="list-style-type: none"> <li>• Alignment of the CEF initiatives with the goals of the Energy Affordability policy, which may include further targeting of energy efficiency services to high use utility customers.</li> </ul>
NYS Homes and Community Renewal (HCR)	<ul style="list-style-type: none"> <li>• Exploring systematic improvements to policies and processes that will ensure the benefits of clean energy are embedded upstream of tenants and building owners, such as: <ul style="list-style-type: none"> <li>◦ exploring opportunities to increase energy performance requirements associated with the Low-Income Housing Tax Credit and the Qualified Allocation Plan;</li> <li>◦ the development of a Green Physical Needs Assessment, in coordination with other key stakeholders including housing authorities;</li> <li>◦ exploring the development of underwriting criteria for high performance new construction projects, based on reduced operational costs; and</li> <li>◦ piloting model based utility allowances in New York, in coordination with other key stakeholders.</li> </ul> </li> <li>• Alignment between WAP and EmPower NY to reduce overlap and administrative burden for the agencies, service providers, and customers.</li> </ul>
NYS Office of Temporary and Disability Assistance	<ul style="list-style-type: none"> <li>• Maximize the reach of HEAP<sup>16</sup> funds through increased consumer education and targeted efficiency services.</li> </ul>
Utilities	<ul style="list-style-type: none"> <li>• Enhancement of the customer referral process for energy efficiency services through EmPower NY, to prioritize customers with highest consumption history and greatest potential for impact.</li> <li>• Exploring alternate models for providing service to LMI customers, while adding customer value.</li> </ul>

<sup>15</sup> The Low-Income Energy Program Task Force was formed by the Office of the Governor in May 2016 to bring together the New York State agencies responsible for administering low-income energy programs for the purpose of developing a cohesive strategy for serving LMI energy customers, increasing coordination, and sharing information.

<sup>16</sup> The Home Energy Assistance Program (HEAP) is a federally funded program that assists low-income New Yorkers with the cost of heating their homes. HEAP also offers an emergency benefit for households in a heat or heat related energy emergency.

## 15.2 LMI Market Development Initiatives<sup>17</sup>

The RetrofitNY and REVitalize initiatives did not meet their 2016 projected targets due to a later than anticipated program start date. It is anticipated the initiatives will still achieve their total projected benefits, however the projected budget and benefits have been updated to reflect 2016 activity and a shifting of activity into future years. In addition, LIFE participants for 2016 have been updated to reflect actual numbers and a number has been added for 2025 as that year was left blank in error in the original filing. The result is an increase in the total number of participants in the LIFE initiative.

### 15.2.1 RetrofitNY

New York State's existing affordable multifamily buildings offer great potential for energy savings and greenhouse gas emissions reductions. While traditional energy efficiency programs targeted at multifamily buildings have been able to reduce on-site energy consumption by up to 30%, these efforts have been unable to unlock the full potential for improving the energy performance of these buildings. Greater building performance, on the order of 70% of on-site energy consumption reductions, can be achieved by undertaking a deep energy retrofit, which consists of super-insulating the shell, installing high efficiency heating, ventilation, and air-conditioning (HVAC) equipment, and lighting, among other upgrades.

Despite the significant benefits of conducting deep energy retrofits on multifamily buildings, there are several barriers to scaling deep energy retrofits in the affordable multifamily building market segment. The deep energy retrofits currently being done are complex, not replicable, and are not cost effective. Many affordable building owners face capital constraints that result in tradeoffs between basic structural and operational improvements against improvements to energy performance, making it difficult to undertake significant energy efficiency improvements. In addition, deep energy retrofits can be highly disruptive for tenants, making it difficult for building owners undertake such a project because most multifamily affordable housing units in the State are occupied.

Retrofitting occupied buildings on a large scale requires innovative solutions that enable deep energy retrofits while the tenants remain in their apartments. However, cost effective solutions that can be implemented on a large scale currently do not exist in the United States. Through RetrofitNY, NYSEERDA will seek to develop simplified, scalable solutions for conducting deep energy retrofits in tenanted multifamily units through a design competition and market development activities, such as the development of financing and business models to foster deep energy retrofits in New York State's affordable multifamily building market segment.

Affordable multifamily housing is a logical starting point for the implementation of RetrofitNY because the regulated housing portfolio in New York State is large and provides for a natural aggregation of similarly constructed buildings, relative to market rate building stock, which tends

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<sup>17</sup> This section will be updated as additional market development initiatives are developed under the CEF.

to be more diverse. Approximately 660,000 affordable housing units in the state are either publicly owned or subsidized by a regulatory or financing agencies, presenting a unique opportunity to create demand for retrofit solutions by aggregating a large number of units to be renovated, as further described in the Intervention Strategy and Activities section of this document. The fact that the affordable housing building stock tends to be more uniform, further enables the design of retrofit solutions that will be replicable. In addition, the development of retrofit solutions to achieve deep energy savings and associated finance models will provide the potential for affordable building owners to avoid the tradeoff between structural or operational improvements and energy upgrades by providing a mechanism for including the value of the energy savings in the capital refinance process, allowing building owners to finance a retrofit package through the energy savings.

In addition to building performance and the potential for innovative finance solutions, the solutions implemented will have positive impacts on building resiliency and tenant comfort and health. As a result, RetrofitNY will put the affordable housing sector at the forefront of the New York clean energy revolution, and allow LMI communities to first benefit from more a more comfortable and healthier living environment.

## Overview

<b>Intervention Strategy</b>	<ul style="list-style-type: none"> <li>• NYSERDA seeks to harness the collective market power of affordable housing organizations in New York to entice the architecture, engineering, and construction industry to collaborate on the cutting-edge design and widespread deployment of cost-effective deep retrofit solutions in multifamily buildings.</li> <li>• The goal of this initiative is to create a self-sustaining marketplace for these retrofits in tenanted multifamily buildings in New York. While public subsidies will be needed to develop, build, and test the initial retrofit packages, it is anticipated that once tested and proven, these solutions will be implemented on a large scale with little to no subsidy.</li> <li>• To create this market, NYSERDA will: <ul style="list-style-type: none"> <li>○ Define high-level criteria that the architecture, engineering, and construction industry will need to meet to create the retrofit solutions.</li> <li>○ Create the demand side of a new market for deep-energy retrofits by aggregating a large number of units that will commit to implement the solutions to be designed.</li> <li>○ Organize a design-build and implementation competition to select and test the best solutions through implementation. Using lessons learned from the first installation, NYSERDA will organize subsequent rounds of the competition to improve the solutions until they meet all predefined criteria, and adapt them to additional building types. To ensure replicability, scale and impact, NYSERDA is analyzing New York's affordable housing portfolios to identify the most prevalent building typologies in the state.</li> <li>○ In parallel with the development of the technical solutions, NYSERDA will help create an enabling environment for large scale implementation by identifying and addressing regulatory issues, facilitating the development of new private sector financing products, and developing the New York supply chain for high-efficiency building components.</li> <li>○ NYSERDA will promote broad adoption of these deep-retrofit solutions as preservation strategies for the affordable housing stock, and encourage their adoption across the multifamily housing market.</li> </ul> </li> </ul>
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	<ul style="list-style-type: none"> <li>For a visual representation of this strategy, please reference the flow chart entitled “Logic Model: RetrofitNY,” which can be found in Appendix A</li> </ul>
<b>Goals</b>	<ul style="list-style-type: none"> <li>The overall goal of this initiative is to create a self-sustaining market for deep-energy retrofits in New York State to ensure the mass implementation of deep-energy retrofit solutions across building types and different housing market segments. Sub-goals are: <ul style="list-style-type: none"> <li>To ensure that affordable housing is prioritized when it comes to developing solutions for enabling the adoption of clean energy solutions.</li> <li>To assist the architecture, engineering and construction industry in the development of innovative solutions to significantly improve the energy performance (on the order of a 70% site energy consumption reductions) and the comfort of tenanted multifamily buildings, while limiting disruption to tenants during the construction phase.</li> <li>To assist with the development of financing mechanisms and new business models enabling building owners to purchase these solutions with little to no upfront costs.</li> <li>To identify and address any regulatory issues that could hinder the implementation of the solutions.</li> </ul> </li> </ul>

### ***Target Market Characterization***

<b>Target Market Segment(s)</b>	<p>The initial target market consists of affordable housing buildings owned by Public Housing Authorities, and privately owned multifamily affordable housing buildings regulated, financed or subsidized by affordable housing agencies or housing finance agencies such as HCR, New York City Housing and Preservation Development (HPD), the New York State Housing Finance Agency, and the New York City Housing Development Corporation (HDC). NYSERDA will subsequently expand its target market to privately owned unsubsidized multifamily affordable housing buildings.</p> <p>NYSERDA defines existing multifamily affordable housing as buildings in which at least 25% of the units are occupied by households earning not more than 80% of the area or state median income, whichever is higher. Ultimately, NYSERDA expects that market rate multifamily buildings will implement the solutions developed and tested through RetrofitNY. However, NYSERDA will not subsidize the installation of these solutions in market rate buildings.</p>
<b>Market Participants</b>	<p>Market participants include:</p> <ul style="list-style-type: none"> <li>Public Housing Authorities</li> <li>NYS Affordable Housing regulatory agencies including HCR and HPD</li> <li>Housing Finance Agencies including New York State Housing Finance Agency, and HDC</li> <li>Private building owners</li> <li>Tenants of affordable housing buildings and LMI communities</li> <li>Builders, developers, architects, suppliers, engineers, building scientists, and other service providers</li> <li>Private financing companies, insurance and re-insurance companies, and energy service companies</li> <li>Philanthropic organizations</li> </ul>
<b>Market Readiness</b>	<ul style="list-style-type: none"> <li>New York counts a number of qualified professionals capable of designing and building innovative deep energy retrofit solutions, and a nascent demand for high-efficiency building systems and components has already emerged.</li> <li>An increasing number of private and public lenders are willing to finance energy efficiency projects in New York by underwriting to a portion of the energy cost</li> </ul>

	<p>savings. Major financing and issuance actors have also expressed interest in financing deep-energy retrofits and guaranteeing energy savings for these projects.</p> <ul style="list-style-type: none"> <li>• The main affordable housing organizations in the state (HCR, HPD, HDC, NYS Public Housing Authority Directors Association (NYSPHADA) and New York City Housing Authority (NYCHA)) have expressed a strong interest in participating in this new approach and in implementing the solutions to be designed.</li> <li>• The process and key components of this initiative have been successfully implemented in the Netherlands through a program called Stroomversnelling, also referred to as Transition Zero. Interviews of numerous New York based industry actors and stakeholders indicate that this approach can be successfully implemented in New York.</li> <li>• A number of deep-energy retrofits have been successfully implemented in the US. However, there are no clear retrofit techniques to deliver deep energy savings for tenanted multifamily buildings at scale. Deep-energy retrofits are one-off custom projects and costs per unit remain prohibitively high.</li> </ul>
<b>Customer Value</b>	<p><u>Value to LMI Tenants:</u></p> <ul style="list-style-type: none"> <li>• The tenants of the retrofitted units will benefit from an improved quality of life. Their apartments will be more comfortable thermally and acoustically.</li> <li>• The indoor air quality will also be improved, providing health benefits like a reduction in the frequency and severity of respiratory afflictions.</li> <li>• Rents will be more likely to remain at affordable levels because building owners implementing the retrofit solutions with the assistance of Affordable Housing Regulatory and Financing Agencies will have an incentive to sign or renew a regulatory agreement.</li> </ul> <p><u>Value to Affordable Building Owners:</u></p> <ul style="list-style-type: none"> <li>• Participating building owners will see the quality and value of their buildings increase while bearing only a fraction of the cost of the improvements implemented on their buildings.</li> <li>• Maintenance and operation costs (e.g., utility costs) will be reduced.</li> <li>• The comfort of the tenants will be improved, which will likely reduce tenant complaints and tenant turn over.</li> </ul> <p><u>Value for Public Housing Authorities and Affordable Housing Regulatory and Financing Agencies:</u></p> <ul style="list-style-type: none"> <li>• The retrofit solutions developed will serve as an important tool for the preservation of affordable housing units throughout the State by lowering and stabilizing energy costs and improving building quality. They will allow Public Housing Authorities and Affordable Housing Agencies to: <ul style="list-style-type: none"> <li>○ Significantly improve the quality of the renovations they conduct on distressed buildings for a similar or lower cost per unit.</li> <li>○ Improve the quality and value of the buildings in their portfolio.</li> <li>○ Benefit from reduced maintenance and operation costs.</li> <li>○ Offer new opportunities to renew existing or sign additional regulatory agreements.</li> </ul> </li> </ul> <p><u>Value to the Architecture, Engineering, and Construction Industry and Other Trades Involved in the Retrofits:</u></p> <ul style="list-style-type: none"> <li>• These companies and professionals will benefit from the creation of a new, long-term multi-billion-dollar market that will provide new business opportunities less dependent on the economic cycles affecting the current real estate market.</li> <li>• Designing and implementing innovative solutions will also provide them with the opportunity to differentiate themselves from their competitors.</li> </ul>

## Stakeholder/Market Engagement

<b>Stakeholder/Market Engagement</b>	<p><u>Engagement To-Date:</u></p> <ul style="list-style-type: none"> <li>• Conducted an in-depth assessment of the Stroomversnelling program, after which this initiative is modeled.</li> <li>• Confirmed interest for this initiative at the highest level of the key affordable housing organizations in the state: HCR, Public Housing Authorities throughout the state and NYSPHADA, HPD, HDC, and NYCHA.</li> <li>• Interviewed several dozen key actors in the architecture, engineering, and construction industry, as well as building science experts and developers to confirm interest and readiness to design the necessary solutions.</li> <li>• Further assessed feasibility through discussions with Passive House NY, Passive House Institute US, Urban Green Council and Enterprise Community Partners.</li> <li>• Gathered feedback on the initiative and the strategy from key organizations with a focus on energy efficiency and energy policy the American Council for an Energy-Efficient Economy (ACEEE), the Environmental Defense Fund (EDF), the Natural Resources Defense Council (NRDC), the Rocky Mountain Institute (RMI), and the Pace Climate and Energy Center.</li> <li>• Held preliminary discussions on potential financing solutions with key actors from the financing, insurance, and re-insurance sectors.</li> </ul> <p><u>Further Engagement:</u></p> <ul style="list-style-type: none"> <li>• Conduct research with building owners and tenants to confirm the key criteria to be met by deep-energy retrofit solutions.</li> <li>• Conduct outreach to ensure that qualified companies and individuals participate in the design competition.</li> <li>• Continue working with Public Housing Authorities that are not covered under System Benefit Charge (SBC) programs (e.g., NYCHA) to implement solutions on their portfolio of buildings via their utilities and partners.</li> <li>• NYSERDA will also utilize the CEAC LMI Working Group to engage with stakeholders, as appropriate.</li> </ul>
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## Theory of Change

<b>Market Barriers Addressed</b>	<ul style="list-style-type: none"> <li>• Deep-energy retrofits in multifamily buildings are currently not cost effective, are complex, not easily replicable, and are highly disruptive for tenants.</li> <li>• High-efficiency building components necessary for conducting retrofits are not readily available in the US.</li> <li>• Regulatory and code barriers exist: This makes the implementation of deep-energy retrofits more complex and costly. For example, building or retrofitting a building to a high-level of efficiency might require obtaining a number of code variances.</li> <li>• Typical financing may not be available: The more comprehensive scopes of work required to reduce the energy consumption of a multifamily building beyond 50% typically have a longer payback period. Traditional lenders are not yet ready to bear this risk over 20 years.</li> </ul>
<b>Testable Hypotheses</b>	<ul style="list-style-type: none"> <li>• If simplified solutions to conduct deep-energy retrofit are developed, then more buildings will be retrofitted to a high level of efficiency.</li> </ul>

	<ul style="list-style-type: none"> <li>• If potential demand for deep-energy retrofits is aggregated, clearly demonstrating to the industry that a large potential market exists for deep-energy retrofits in existing multifamily buildings, then the industry will invest the time and resources required to develop comprehensive deep-energy retrofit solutions.</li> <li>• If solutions are built and tested through pilots, then the industry will streamline the solutions reducing costs and improving performance.</li> </ul>
<b>Activities</b>	<p>To create a self-sustaining marketplace for the deep-energy retrofits of tenanted multifamily buildings in New York State, NYSERDA will:</p> <ol style="list-style-type: none"> <li>1. <u>Define the Criteria Needed for Retrofits</u> <ul style="list-style-type: none"> <li>• In cooperation with Affordable Housing and LMI stakeholders, NYSERDA will determine basic criteria to be met by retrofit packages to be created by the industry.</li> <li>• Criteria could include<sup>18</sup>: very high level of building energy performance; enhanced health, comfort and building aesthetic; limited disruption to tenants during construction; cost effectiveness; guaranteed energy savings over a long period of time.</li> </ul> </li> <li>2. <u>Create Demand by Aggregating a Large Number of Units to be Renovated</u> <ul style="list-style-type: none"> <li>• Through direct engagement of Public Housing Authorities and owners of large portfolios or affordable buildings, NYSERDA will create the demand side of the market by aggregating a large number of units, starting with the affordable housing sector where regulatory agencies can play a facilitating role, that will commit to implementing the solutions.</li> <li>• NYSERDA will work with HCR, HPD and HDC as well as other agencies, Public Housing Authorities, and private owners of large portfolio across the state to secure the appropriate demand.</li> </ul> </li> <li>3. <u>Organize and Run the Design-Build Competition</u> <ul style="list-style-type: none"> <li>• The potential for a large, new market will motivate the industry to answer a competitive solicitation and engage in several rounds of a design-build and implementation competition focused on predetermined buildings from affordable housing portfolios in New York.</li> <li>• The best solutions will be selected and tested through implementation on the specified buildings. Initial demonstration projects will be implemented on building types that have a large number of similar buildings (in terms of size, age, construction materials, etc.) located in the State.</li> <li>• NYSERDA will carefully monitor implementation and results in terms of energy savings, construction costs, comfort, and disruption to tenants during construction.</li> <li>• Using lessons learned from the first round of installations, NYSERDA will organize subsequent rounds of the competition to improve the solutions until they meet all predefined criteria, and adapt them to additional building types. The number of rounds of the competition will be based on the progress of the solution designs.</li> <li>• NYSERDA will fund part of the incremental implementation costs for the selected solutions: Part of the typical capital improvements currently funded or financed by Affordable Housing agencies for the preservation of multifamily buildings very often include energy related improvements such as facade and roof repairs, as well as boiler and window replacement. The funds dedicated to these improvements can be reallocated to cover part of costs of the</li> </ul> </li> </ol>

<sup>18</sup> The criteria will be finalized with the affordable housing and LMI stakeholders, as part of the development of this initiative. It is critical that the owners and managers of affordable housing portfolios provide input on the design criteria because the design solutions must be acceptable to them.

	<p>solutions designed through the design-build competition. NYSERDA will also seek to utilize existing and new financing products to finance part of the incremental costs with the energy savings. NYSERDA will then fund the share of the incremental costs not covered by financing products available at the time of the retrofit. NYSERDA's financial contribution will decrease over time as the cost of the solutions is reduced and more financing products become available, until NYSERDA financial support is no longer needed.</p> <p>In parallel to the development of technical solutions, NYSERDA will help create an enabling environment for large scale implementation of the designed solutions through activities 4, 5 and 6.</p> <p>4. <u>Develop Supply Chain of High Efficiency Components</u></p> <ul style="list-style-type: none"> <li>Building components and systems required for a deep energy retrofit are not always readily available in New York and are often imported from Europe. NYSERDA will work with manufacturers and distributors of the components and systems used in the implemented deep energy retrofit solutions to ensure their availability in the New York market.</li> </ul> <p>5. <u>Identify and Address Regulatory Barriers</u></p> <ul style="list-style-type: none"> <li>NYSERDA will identify regulatory issues such as restrictive building codes and owner/tenant split incentive concerns.</li> <li>In collaboration with the relevant state and city agencies as well as utility companies, NYSERDA will work to minimize or eliminate these barriers, and facilitate a streamlined installation of the designed retrofit solutions.</li> </ul> <p>6. <u>Develop Financial Solutions to Finance the Retrofits</u></p> <ul style="list-style-type: none"> <li>In conjunction with the New York Green Bank, NYSERDA will convene a Financing Working Group and will work closely with stakeholders from the financing industry to develop private sector financing products that can be integrated with the existing affordable housing financing programs to provide project level support.</li> </ul> <p>7. <u>Leverage Philanthropic Funding and Other Grants</u></p> <ul style="list-style-type: none"> <li>NYSERDA will engage philanthropic organizations and other potential partners to broaden application of this initiative to non-SBC customers, and allow for a faster implementation.</li> </ul>
<b>Key Milestones</b>	<p><u>Milestone 1(2016)</u></p> <ul style="list-style-type: none"> <li>Criteria to be met by technical solutions are defined.</li> </ul> <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> <li>Sufficient potential demand for deep energy retrofits is aggregated.</li> </ul> <p><u>Milestone 3 (2017)</u></p> <ul style="list-style-type: none"> <li>Competitive solicitation for the first round of the design-build competition is released.</li> </ul> <p><u>Milestone 4 (2018)</u></p> <ul style="list-style-type: none"> <li>One or more solutions are built and tested through the design-build competition.</li> </ul> <p><u>Milestone 5 (2020)</u></p> <ul style="list-style-type: none"> <li>Solution(s) are adapted to additional building typologies.</li> </ul> <p><u>Milestone 6 (2020)</u></p>



	<ul style="list-style-type: none"> <li>Financial products that are adapted to affordable housing entities' processes and are compatible with federal and state rules that apply to affordable housing are developed and made available.</li> </ul> <p><u>Milestone 7 (2022)</u></p> <ul style="list-style-type: none"> <li>Retrofit solutions are integrated in the public housing authorities' and affordable housing regulators' preservation strategies.</li> </ul> <p><u>Milestone 8 (2025)</u></p> <ul style="list-style-type: none"> <li>Retrofit solutions are cost effective and NYSERDA subsidies are no longer necessary.</li> </ul> <p><u>Milestone 9 (2025)</u></p> <ul style="list-style-type: none"> <li>Building components and systems required for deep energy retrofits are readily available in the New York market.</li> </ul> <p><u>Milestone 10 (2025)</u></p> <ul style="list-style-type: none"> <li>Financing solutions exists for building owners to purchase these solutions with minimal upfront cost.</li> </ul> <p><u>Milestone 11 (2025)</u></p> <ul style="list-style-type: none"> <li>Solutions are implemented on non-Affordable Housing buildings without subsidy.<sup>19</sup></li> </ul>
<b>Goals Prior to Exit</b>	<ul style="list-style-type: none"> <li>Solutions meeting all defined criteria are available for building owners to purchase and install.</li> <li>Financing solutions exist for building owners to purchase these solutions with minimal upfront cost.</li> <li>As a result, a self-sustaining market for retrofit packages exists and NYSERDA financial incentives are no longer needed to implement the retrofits.</li> </ul>

### ***Relationship to Utility/REV***

<b>Utility Role/Coordination Points</b>	<ul style="list-style-type: none"> <li>The investor owned utilities are integral to the initiative and will be involved in the development of the initiative. NYSERDA anticipates having utility representation on each of the working groups to be formed: technical, financing and regulatory. Lessons learned from this effort could also be applied by the New York Power Authority (NYPA), the Long Island Power Authority (LIPA), and PSEG Long Island in their service territories.</li> <li>NYSERDA will also engage utilities on the potential to leverage the work done through RetrofitNY to inform REV Demonstration projects as follows: <ul style="list-style-type: none"> <li>Demonstrate the benefits that deep-energy retrofits can provide to the grid through reduced load in capacity constrained areas, active demand management, peak load reduction, and potential distributed generation opportunities;</li> <li>Help develop new utility revenue streams and business models based on the deep energy retrofit solutions that will be designed and deployed through the initiative; and,</li> </ul> </li> </ul>
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<sup>19</sup> As retrofit solutions become more advanced and cost effective to the point where they can be widely implemented without public subsidy, they will become applicable to a number of building types, including market rate multifamily buildings.

	<ul style="list-style-type: none"> <li>○ Potentially play a central role in developing mechanisms to address owner/tenant split incentive issues.</li> <li>• NYSERDA will work with the CEAC LMI Working Group Clean Energy Implementation and Coordination Working Group to coordinate planning and implementation with the New York State utilities.</li> </ul>
<b>Utility Interventions in Target Market</b>	The New York utilities offer multiple programs to improve the energy efficiency of multifamily affordable housing buildings. However, no utility program currently exists to enable deep energy retrofits as defined for this initiative.

### ***Fuel Neutrality***

<b>Fuel Neutrality</b>	<ul style="list-style-type: none"> <li>• Energy use and carbon emissions associated with heating and hot water represent the majority of potential savings in the multifamily sector. Approximately 75% of the sector relies on gas or oil for heat and hot water.</li> <li>• Except for the 25% of the multifamily buildings across New York State that use electricity for heat, an electric only initiative would not entice the industry to create solutions that will significantly reduce heating and domestic hot water consumption. GHG emissions reduction would therefore be limited.</li> <li>• Offering Retrofit NY on a fuel neutral basis will allow NYSERDA to achieve savings at a cost of \$105 per ton of carbon, compared to a cost of \$310 per ton of carbon in an electric only scenario.</li> </ul>
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### ***Performance Monitoring and Evaluation Plans***

<b>Performance Monitoring &amp; Evaluation Plan</b>	<p>NYSERDA's approach to monitoring and assessing the effectiveness of the initiative and overall market development is described below.</p> <p><u>Test-Measure-Adjust Strategy</u></p> <ul style="list-style-type: none"> <li>• The solutions proposed by the industry through the design-build competition will be carefully evaluated. They will be implemented only if there is a strong degree of confidence that they will perform as projected.</li> <li>• The solutions will then be tested on specific buildings through demonstration projects.</li> <li>• The frequency and number of design-build competition rounds and demonstration projects will be adjusted, depending on how the tested solutions perform as compared to the pre-defined criteria to be met.</li> </ul> <p><u>Measurement &amp; Verification (M&amp;V) Strategy</u></p> <ul style="list-style-type: none"> <li>• Validate projected energy performance of the selected industry designed solutions.</li> <li>• Validate energy savings through pre-construction energy consumption assessment of the buildings on which solutions will be tested, at least one (1) year of post-retrofit energy monitoring, and several years of post-retrofit utility bill analysis.</li> <li>• Test and monitor pre-and post-retrofit thermal comfort and indoor air quality.</li> <li>• Assess tenant and building owner satisfaction.</li> </ul> <p><u>Market Evaluation</u></p> <p>Surveys and interviews will be conducted to provide real-time insights and support systematic evaluation of the intervention, including its effectiveness for</p>
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	<p>participating buildings and the number of owners using the solutions available in the market. The effects of NYSERDA's activities to build up the supply chain of high efficiency components, develop financing solutions, and address the identified regulatory barriers will also be assessed through market evaluation.</p> <p>A sample of multifamily LMI and market rate buildings and industry players will be selected for surveys to determine if barriers to retrofitting multifamily buildings have been overcome.</p> <p><u>Impact Evaluation/Field Verification</u></p> <ul style="list-style-type: none"> <li>• Evaluation M&amp;V will be conducted for a sample of participating buildings, according to the International Performance Measurement &amp; Verification Protocol (IPMVP) method(s) most appropriate given the retrofits made. Evaluation M&amp;V will rely heavily on the program M&amp;V strategy, data, and findings to validate program estimated savings.</li> <li>• Depending on the extent of replication identified in Market Evaluation, impacts will be examined for a sample of replication projects to ascertain the level of savings.</li> <li>• Data from Field Verification/Impact Evaluation can be used to help lend confidence in the market, especially among other end users.</li> </ul>
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### 15.2.2 REVitalize<sup>20</sup>

Governor Cuomo's REV initiative is providing New York consumers and communities with new opportunities to participate in their energy future. Policy and regulatory developments such as community distributed generation and Community Choice Aggregation (CCA) will result in the proliferation of DER and provide consumers and communities with unprecedented control over how they use and source energy, including community ownership of DER. However, LMI and environmental justice (EJ) communities often lack the technical expertise and financial resources to plan for, develop, and implement a community-scale clean energy project, preventing these communities from fully taking advantage of the opportunities provided by REV and necessary to realizing its success. In addition, these communities are often disproportionately affected by the risks of climate change and have lacked avenues to address problems of resiliency and environmental justice posed by traditional electric power infrastructure.

#### **Overview**

<b>Intervention Strategy</b>	<ul style="list-style-type: none"> <li>• Through the REVitalize initiative, NYSERDA will support LMI and EJ communities across the state with the tools and information they need to implement a community-scale clean energy project and participate in a REV-enabled future.<sup>21</sup></li> </ul>
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<sup>20</sup> The Fuel Neutrality section that is included in other CEF Investment Plan Chapters is not included for the REVitalize initiative because it is not relevant for a community-energy planning effort.

<sup>21</sup> As a compliment to the Clean Energy Communities initiative, REVitalize provides an avenue for community-based organizations to receive assistance with the implementation of community-scale clean energy projects, while the Clean Energy Communities initiative is targeting clean energy adoption at the municipal level.

	<ul style="list-style-type: none"> <li>• NYSERDA will issue a competitive Request for Proposals (RFP) for five LMI communities to receive funding for technical assistance<sup>22</sup> for the development of a community planning model and to implement a flagship community-scale clean energy project, such as a community shared solar array or local micro grid.</li> <li>• NYSERDA will also provide toolkits for the communities to use, which will be refined based on the results of the community planning and project implementation efforts.</li> <li>• Results from REVitalize projects will be used to foster technology transfer and replication of planning and implementation processes in similar communities so that best practices are scaled statewide.</li> <li>• For a visual representation of this strategy, please reference the flow chart entitled “Logic Model: REVitalize,” which can be found in Appendix A.</li> </ul>
<b>Goals</b>	<p>The primary goals of REVitalize are to:</p> <ul style="list-style-type: none"> <li>• encourage a bottoms-up approach to community energy planning that integrates considerations for the community’s energy needs, e.g., energy affordability, environmental justice, and economic and workforce development;</li> <li>• develop a replicable framework for conducting LMI community energy planning, focused on a cornerstone community-scale clean energy project;</li> <li>• to develop templates and toolkits to aid in the project planning process and ensure best practice adoption statewide; and</li> <li>• identify innovative models for community ownership and finance of DER, which can be applied to similar community energy projects; and build capacity of community-based organizations to carry out local clean energy priorities in the context of REV-enabled programs and projects.</li> </ul>

### ***Target Market Characterization***

<b>Target Market Segment</b>	The REVitalize initiative will target community-based organizations representing LMI or EJ communities as project leads, who in turn are expected to engage with renewable energy and clean energy service providers to develop and implement a community-based project. LMI customers and communities themselves are also expected to participate in locally-developed energy planning processes funded by REVitalize.
<b>Market Participants<sup>23</sup></b>	<p>Market participants include:</p> <ul style="list-style-type: none"> <li>• Community-based organizations</li> <li>• LMI residents and customers</li> <li>• Technical consultants</li> <li>• Project developers</li> <li>• Financiers and foundations</li> </ul>
<b>Market Readiness</b>	The following indicators signal that the REVitalize initiative will have success in spurring clean energy planning and development in LMI and EJ communities:

<sup>22</sup> Technical assistance may include community engagement activities, identification of community energy needs and existing resources, development of the implementation plan and business model, testing of tools, and selection of a project developer.

<sup>23</sup> NYSERDA expects that community-based organizations will organize a proposal for a community energy project and hire a technical consultant to aid in the project planning process, including community engagement activities, identification of community energy needs and existing resources, development of the implementation plan and business model, testing of tools, and selection of a project developer. Project developers will work with the community-based organization and technical consultant to deliver the project, and work to attract interest from the financing and foundation communities to help finance the project.

	<ul style="list-style-type: none"> <li>Regulatory developments in New York State encourage and allow for community net metering and local ownership of DER;</li> <li>Community Choice Aggregation is generating significant interest in the development of locally-sourced and owned distributed generation;</li> <li>The Governor's Office and NYSERDA have worked with four community-based organizations, the New York City Environmental Justice Alliance, PUSH Buffalo, the Point, and UPROSE, to develop a first phase REVitalize concept for philanthropic funding, which has been awarded to the community groups by the New York Community Trust. New York Community Trust awarded the funding to the community groups in June 2016. Based on their planning process, these community groups will provide feedback and recommendations to NYSERDA for the purposes of informing the further development of REVitalize.</li> <li>LMI and EJ communities have demonstrated their interest in participating in their clean energy future, as evidenced by their active party status in many of the REV proceedings;</li> <li>the feasibility phase of NY Prize resulted in 83 proposals, indicating an interest in community-scale energy projects, focused on microgrids;</li> <li>the RMI eLab LEAP initiative on LMI energy issues drew significant interest from LMI stakeholders and community groups; the concept of LMI community-led clean energy planning and project development was highlighted as a priority for stakeholders.</li> </ul>
<b>Customer Value</b>	<ul style="list-style-type: none"> <li>While LMI and EJ communities are interested in taking greater control over their energy use and protecting against the risks of climate change, they are often under-resourced and lack the technical expertise to effectively develop and implement a community-scale clean energy project that addresses a wide range of community priorities, from environmental justice to workforce and economic development. Through REVitalize, LMI and EJ community groups will be provided with: <ul style="list-style-type: none"> <li>An opportunity to receive funding for the technical assistance necessary to conduct community-level planning and project development; and</li> <li>A toolkit to aid in the planning for a community-scale clean energy project; and</li> <li>Support to develop models for innovative project finance and ownership.</li> </ul> </li> </ul>

### ***Stakeholder/Market Engagement***

<b>Stakeholder/Market Engagement</b>	<ul style="list-style-type: none"> <li>NYSERDA has engaged several market actors on the concept of community-led clean energy planning within LMI and EJ communities, as follows: <ul style="list-style-type: none"> <li>As part of the RMI eLab LEAP initiative, stakeholders from across the LMI energy landscape in New York identified the lack of financial resources and technical expertise as the primary barrier preventing community-based organizations from undertaking community-scale energy projects;</li> <li>NYSERDA staff engaged several community-based and EJ organizations, including the New York City Environmental Justice Alliance, PUSH Buffalo, the Point, and UPROSE, on the need for community-led energy planning activities and the lack of financial and technical resources available in their communities.</li> <li>Philanthropic organizations, such as the New York Community Trust, and the JPB Foundation, have expressed interest in supporting community groups to undertake planning and implementation for a community-scale clean energy project and a desire to leverage NYSERDA's activities.</li> </ul> </li> </ul>
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	<ul style="list-style-type: none"> <li>• NYSERDA will also utilize the CEAC LMI Working Group to engage with stakeholders, as appropriate.</li> </ul>
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### *Theory of Change*

<b>Market Barriers Addressed</b>	<ul style="list-style-type: none"> <li>• Community-based organizations that serve as effective channels to LMI and EJ customers and communities often lack the financial and technical resources to engage in community energy planning, business model and financing development, and project implementation.</li> <li>• The perception among community-based organizations is that the process for planning for and implementing a community-scale clean energy project can be complicated and time consuming.</li> <li>• Finance and ownership models for community-scale clean energy projects are still relatively unknown and untested in the context of LMI and EJ communities.</li> <li>• Tools and resources to aid in the community engagement and planning process are not readily available, or are not crafted with the specific needs of LMI and EJ community groups in mind.</li> </ul>
<b>Testable Hypothesis</b>	<ul style="list-style-type: none"> <li>• If LMI community based organizations gain access to technical assistance and planning resources for flagship clean energy projects, then those projects are more likely to be implemented.</li> <li>• If a replicable framework for community energy planning and project development, including finance and ownership models, can be developed, then <ul style="list-style-type: none"> <li>○ LMI and EJ communities will be empowered to undertake and implement community-scale clean energy projects, and</li> <li>○ External funding will be invested in clean energy project implementation.</li> </ul> </li> <li>• If NYSERDA-funded templates and standardized tool kits provide an actionable path for community energy planning, then more community-based organizations will undertake community-scale projects and LMI project implementation can be scaled across the state.</li> </ul>
<b>Activities</b>	<p><u>Provision of technical support.</u></p> <ul style="list-style-type: none"> <li>• Funding will be made available to community-based organizations through a competitive RFP for technical support to undertake community energy planning efforts and develop a community-scale clean energy project. It is expected that funding will be awarded to five community-based organizations through the RFP process.</li> <li>• The technical assistance provided will include support for community engagement processes, assist in identifying the community's energy needs and available resources, and identify possible business models for project ownership and finance, and assist in project implementation.</li> </ul> <p><u>Development of tools and replicable models.</u></p> <ul style="list-style-type: none"> <li>• NYSERDA will develop tools and resources, such as case studies and guides, to aid in the community planning efforts, which will be tested by the five community groups.</li> <li>• Models for finance and community ownership of DER will be developed as a result of the community energy planning and project implementation efforts.</li> </ul> <p><u>Technology transfer of tools and models.</u></p> <ul style="list-style-type: none"> <li>• NYSERDA will open source the tools, resources, and models developed through this initiative.</li> <li>• NYSERDA will conduct technology transfer activities such as hosting webinars, presentations, and working with associations and other channels to communicate the results and potential for community energy projects to LMI or EJ communities, financiers, and project developers.</li> </ul>
<b>Key Milestones</b>	<u>Milestone 1 (2017)</u>

	<ul style="list-style-type: none"> <li>Issue a competitive solicitation seeking proposals for a community energy planning effort that benefits LMI communities and residents.</li> </ul> <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> <li>Selection of five communities to receive financial and technical support, contract development, and contract execution by Q4 2017.</li> </ul> <p><u>Milestone 3 (2017)</u></p> <ul style="list-style-type: none"> <li>Commencement of community planning activities, development of community plan, testing of the toolkit.</li> </ul> <p><u>Milestone 4 (2017)</u></p> <ul style="list-style-type: none"> <li>Community-scale clean energy project development and implementation started.</li> </ul> <p><u>Milestone 5 (2018)</u></p> <ul style="list-style-type: none"> <li>NYSERDA receives feedback from community groups and on the toolkit.</li> </ul> <p><u>Milestone 6 (2019)</u></p> <ul style="list-style-type: none"> <li>Completion of five community energy projects.</li> </ul> <p><u>Milestone 7 (2019)</u></p> <ul style="list-style-type: none"> <li>NYSERDA refines toolkit and conducts technology transfer to communicate effective models of finance and ownership, as well as the toolkit.</li> </ul>
<b>Goals Prior to Exit</b>	<ul style="list-style-type: none"> <li>Tools and resources to facilitate the planning and development of replicable community-scale energy projects in LMI and EJ communities are developed and widely available.</li> <li>The potential for community-led clean energy planning and project development is realized by community groups, developers, and financiers.</li> <li>The models for project planning, ownership, and finance demonstrated by the five communities are replicated by 75 additional LMI or EJ communities across the state.</li> </ul>

### ***Relationship to Utility/REV***

<b>Utility Role/Coordination Points</b>	<ul style="list-style-type: none"> <li>To effectively plan for a community-energy project, communities will need access to energy data and load characteristics for the community.</li> <li>Utilities will be able to identify preferential sites for community DER projects, based on load characteristics within the utility territory. Based on input from the utilities, NYSERDA will include a preference for projects that provide load reduction and system benefits to the local grid in service of REV policy objectives in the RFP.</li> <li>Utilities may also be able to identify LMI communities or community-based organizations that have an interest in developing a community DER project.</li> <li>NYSERDA will also take advantage of the CEAC LMI Working Group Clean Energy Implementation and Coordination Working Group to coordinate planning and implementation with the New York State utilities.</li> </ul>
<b>Utility Interventions in Target Market</b>	The New York utilities do not have any similar offering to this market.

## ***Performance Monitoring and Evaluation Plans***

<b>Performance Monitoring &amp; Evaluation Plan</b>	<p>NYSERDA's approach to monitoring and assessing the effectiveness of the initiative and overall market development is described below.</p> <p><u>Test-Measure-Adjust Strategy</u></p> <ul style="list-style-type: none"><li>• The tool kits developed will be tested and improved through the five community energy planning projects. The toolkits will be further refined by NYSERDA based on the experiences and results of the communities during implementation phases of REVitalize.</li><li>• The method of technology transfer will be assessed regularly and adjusted to identify and reach the most LMI and EJ communities.</li></ul> <p><u>Market Evaluation</u></p> <p>Market Evaluation draws on the theory of change of the related logic model and will include a longitudinal measurement of key progress indicators. In these areas, NYSERDA will first utilize existing information and will fill gaps in information as needed and feasible. NYSERDA will attempt to measure the influence of the technology transfer activities to determine:</p> <ul style="list-style-type: none"><li>• The number of LMI and EJ communities that undertake community energy planning activities and implement community-scale clean energy projects as a result of the technology transfer; and</li><li>• The number of LMI customer that benefit from the community-scale clean energy projects supported directly through pilots and that result from the technology transfer activities.</li></ul> <p><u>Impact Evaluation/Field Verification</u></p> <ul style="list-style-type: none"><li>• Impact evaluation will involve M&amp;V of the energy impacts of the five community-scale clean energy projects that are supported directly through this pilot, according to the IPMVP method(s) most appropriate given the retrofit design implemented. Data from Field Verification/Impact Evaluation can be used to help lend confidence to the market.</li></ul>
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### **15.2.3 Low-Income Forum on Energy (LIFE)<sup>24</sup>**

The Low-Income Forum on Energy (LIFE) was created in 1998 to provide a venue for the consideration of low-income energy issues during the Public Service Commission's policy shift to a deregulated electric industry. For 18 years, the LIFE initiative has supported information exchange and collaboration amongst the organizations and individuals that serve low-income consumers through a series of efforts including meetings, conferences, webinars, and newsletters. Many of these organizations and individuals serve moderate income consumers as well, so LIFE effectively supports LMI consumers.

The LMI energy landscape in New York State is complex, with nearly 3 million LMI households in New York State, with 2.3 million households considered low-income; several publicly funded programs and initiatives that provide services to these customers; and an expansive network of

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<sup>24</sup> The Fuel Neutrality section that is included in other CEF Investment Plan Chapters is not relevant to the LIFE initiative, as it is an awareness and outreach initiative, and is therefore not included.



service professionals that work to help LMI energy customers make ends meet. In addition, New York's electricity industry is undergoing a dramatic transformation under Governor Cuomo's REV initiative. Regulatory and policy changes to the energy marketplace promise new opportunities for energy customers and communities to gain more control over how they use and source energy. However, many LMI customers and service providers are currently unaware of how they can participate in REV and how it will benefit them.

As New York State continues to seek opportunities to improve energy affordability and access to clean energy for LMI customers and communities, the dynamic and expansive LMI landscape warrants a venue for stakeholders to discuss the State's evolving energy policy, updates to programs, and to share best practices and innovative solutions to serving low-income consumers.

### ***Overview***

<b>Intervention Strategy</b>	<ul style="list-style-type: none"> <li>• NYSERDA will partner with the NYS DPS to provide a venue for information exchange, hands on workshops, and collaboration amongst individuals and organizations that serve low-income energy customers in a REV enabled clean energy future.</li> <li>• Monthly webinars and newsletters will provide stakeholders with an opportunity for continuous engagement, regional meetings and statewide conferences provide stakeholders with the opportunity to engage in hands-on workshops, information sharing, and networking.</li> <li>• For a visual representation of this strategy, please reference the flow chart entitled "Logic Model: LIFE: Low-Income Forum on Energy (Education and Awareness Initiative)," which can be found in Appendix A.</li> </ul>
<b>Goals</b>	<p>The goals of the LIFE initiative are to:</p> <ul style="list-style-type: none"> <li>• Encourage an interactive exchange of information and collaboration among the programs and resources that serve LMI energy customers.</li> <li>• Provide a venue for service providers and policy makers to learn about emerging energy issues, identify best practices, and provide networking opportunities for those in the low-income energy field.</li> <li>• Identify the full range of low-income energy issues, and best practices and innovative solutions for addressing them.</li> </ul>

### ***Target Market Characterization***

<b>Target Market Segment</b>	The target market segments include individuals and organizations that either provide service directly to LMI energy customers or administer programs or set policies that have implications for low-income energy customers.
<b>Market Participants</b>	<p>LIFE workshop, webinar, and conference participants include:</p> <ul style="list-style-type: none"> <li>• Social service workers</li> <li>• Utility representatives</li> <li>• Community-based organizations</li> <li>• Advocates</li> <li>• Contractors</li> <li>• Weatherization agencies</li> <li>• Installers</li> <li>• Affordable housing developers</li> <li>• Representatives from local and state government</li> <li>• Program administrators</li> </ul>

<b>Market Readiness</b>	As evidenced by the level of attendance at LIFE events, there is a sustained and growing level of interest from the target market for the information provided. Regional meetings draw an average of 50 attendees and statewide conferences draw over 300 attendees.
<b>Customer Value</b>	<ul style="list-style-type: none"> <li>• No other professional development opportunities focused specifically on the breadth of low-income energy issues covered by LIFE currently exist.</li> <li>• According to participant evaluations of the 2016 LIFE Statewide Conference, 89% of respondents would attend a LIFE event in the future and nearly <math>\frac{3}{4}</math> of the 42 workshops were rated a 4 out of 5. In addition, the following comments were provided by participants: <ul style="list-style-type: none"> <li>○ “The sessions I attended were very informative a lot of information to share with low-income residents.”</li> <li>○ “Thank you for another wonderful LIFE Conference. It is always an inspiring, energizing gathering of committed professionals! Everything was wonderful.”</li> <li>○ “Each year the workshops seem to be getting better and better.”</li> <li>○ “This was the best conference I have attended in several years!”</li> </ul> </li> </ul>

### ***Stakeholder/Market Engagement***

<b>Stakeholder/Market Engagement</b>	<ul style="list-style-type: none"> <li>• The LIFE contact list contains over 5,000 individuals that represent human service providers, contractors, builders, developers, installers, community-based organizations, state and local government, and program administrators that have indicated an interest in LMI energy issues.</li> <li>• There is great interest in LMI energy issues, in the context of REV, as is evidenced by the active participation of LMI energy and environmental justice stakeholders in the PSC proceedings.</li> <li>• NYSEDA will also utilize the CEAC and the CEAC LMI Working Group to engage with stakeholders, as appropriate.</li> </ul>
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### ***Theory of Change***

<b>Market Barriers Addressed</b>	<ul style="list-style-type: none"> <li>• Knowledge gaps on LMI energy issues among service providers, program administrators, policy makers, and advocates.</li> <li>• A changing energy policy landscape with uncertainty amongst service providers, administrators, policy makers, and advocates.</li> <li>• Limited resources for providing solutions for LMI energy consumers.</li> <li>• Program and resources that are administered independently from one another and often require coordination at the community or household level.</li> <li>• High degree of staff turnover in the human service field and few sources of professional development and education on low-income energy issues available.</li> </ul>
<b>Testable Hypothesis</b>	If a venue for information exchange and collaboration among individuals and organizations that provide services to LMI energy consumers is provided, then knowledge transfer will occur and service providers will increase their knowledge and improve the quality of service provided to LMI energy consumers.
<b>Activities</b>	<p>The activities that will be undertaken through the LIFE initiative include:</p> <ul style="list-style-type: none"> <li>• Develop and host annual conferences and meetings to bring together stakeholders in the LMI energy field to discuss emerging issues, best practices, program updates, and consumer protections.</li> <li>• Host a monthly webinar series to feature content on emerging energy issues, best practices, program updates, and consumer protections.</li> <li>• Develop and distribute an electronic newsletter monthly to highlight LMI energy issues.</li> </ul>

<b>Key Milestones</b>	<p><u>Milestone 1 (2017)</u></p> <ul style="list-style-type: none"> <li>• Issue a competitive solicitation for program support.</li> </ul> <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> <li>• Implement a series of regional meetings across the state in Q2 of 2017.</li> </ul> <p><u>Milestone 3 (2018)</u></p> <ul style="list-style-type: none"> <li>• Implement a statewide conference in Q2 of 2018.</li> </ul> <p><u>Milestone 4 (2019)</u></p> <ul style="list-style-type: none"> <li>• Issue a competitive solicitation for program support or issue a contract extension for existing implementation services.</li> </ul> <p><u>Milestone 5 (2019)</u></p> <ul style="list-style-type: none"> <li>• Implement a series of regional meetings across the state in Q2 of 2019.</li> </ul> <p><u>Milestone 6 (2020)</u></p> <ul style="list-style-type: none"> <li>• Implement a statewide conference in Q2 of 2020.</li> </ul> <p><u>Milestone 7 (2021)</u></p> <ul style="list-style-type: none"> <li>• Implement a series of regional meetings across the state in Q2 of 2021.</li> </ul> <p><u>Milestone 8 (2022)</u></p> <ul style="list-style-type: none"> <li>• Issue a competitive solicitation for program support or issue a contract extension for existing implementation services.</li> </ul> <p><u>Milestone 9 (2022)</u></p> <ul style="list-style-type: none"> <li>• Implement a statewide conference in Q2 of 2022.</li> </ul> <p><u>Milestone 10 (2023)</u></p> <ul style="list-style-type: none"> <li>• Implement a series of regional meetings across the state in Q2 of 2023.</li> </ul> <p><u>Milestone 11 (2024)</u></p> <ul style="list-style-type: none"> <li>• Issue a competitive solicitation for program support or issue a contract extension for existing implementation services.</li> </ul> <p><u>Milestone 12 (2024)</u></p> <ul style="list-style-type: none"> <li>• Implement a statewide conference in Q2 of 2024.</li> </ul>
<b>Goals Prior to Exit</b>	The LIFE initiative will be administered throughout the full term of the CEF. The topics addressed through the forum will continually evolve, based on regulatory and market developments.

### ***Relationship to Utility/REV***

<b>Utility Role/Coordination Point</b>	<ul style="list-style-type: none"> <li>• All the Investor-Owned Utilities are members of the LIFE Steering Committee and provide insight and guidance on the development of LIFE activities.</li> <li>• Utilities use the initiative as a platform for communicating information on their bill payment assistance and other programs to service providers.</li> <li>• Through their participation in the initiative, utilities can engage and coordinate with the other program administrators and service providers that sit on the Steering Committee.</li> </ul>
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	<ul style="list-style-type: none"> <li>• NYSERDA will also take advantage of work with the CEAC LMI Working Group Clean Energy Implementation and Coordination Working Group to coordinate planning and implementation with the New York State utilities.</li> </ul>
<b>Utility Interventions in Target Market</b>	The New York utilities do not have any similar offering to this market, however all utilities have bill payment programs serving low-income consumers which are integrated into the information sharing conducted through LIFE.

### *Performance Monitoring and Evaluation Plans*

<b>Performance Monitoring &amp; Evaluation Plan</b>	To monitor the progress of the LIFE initiative, NYSERDA staff solicit feedback from stakeholders attending LIFE events using participant surveys. Results from the surveys are used to refine the structure of the meetings and to develop content for future meetings. In addition, NYSERDA periodically surveys newsletter recipients and webinar attendees to assess the effectiveness of the outreach.
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#### 15.2.4 Healthy Homes Feasibility Study <sup>25</sup>

Energy, housing, and health services for LMI households and communities are rarely synchronized to realize the potential co-benefits associated with healthy homes interventions, which would include measures such as air sealing and ventilation to improve air quality and control moisture and mold. When implemented, these interventions can improve occupant health, reduce energy bills, and improve the comfort and safety of the home. In addition to the positive outcomes for occupants, statewide administrative efficiencies may be achievable by braiding energy and health program resources in service of joint outcomes, such as reductions in health care costs incurred by Medicaid and administrative costs associated with disparate LMI energy and housing programs.

To facilitate an integrated approach to addressing energy, housing, and health improvements, more work is necessary to quantify and validate the health benefits and healthcare cost savings associated with healthy homes interventions; to evaluate the statewide infrastructure available to deliver an integrated approach; and to assess currently available funding and identify alternative sources of funding that can be used for integrated energy, housing, and health projects. To advance this concept in New York State, NYSERDA will conduct a feasibility study to explore the potential for developing an integrated energy, housing, and health service delivery model for LMI customers in New York.

#### *Overview*

<b>Intervention Strategy</b>	<ul style="list-style-type: none"> <li>• NYSERDA will conduct a feasibility study to assess the implementation of an integrated energy, housing, and health services delivery model. If the study reveals the potential for a successful implementation of an integrated model, NYSERDA will advance a CEF initiative for funding the implementation of a series of pilots to test the administration of an integrated model and to validate the benefits to the occupants</li> </ul>
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<sup>25</sup> Due to the nature of this initiative, elements described in other CEF Investment Plan Chapters such as: Customer Value Goals Prior to Exit, Utility Intervention in Target Market, Fuel Neutrality, and Performance Monitoring & Evaluation Plan are either addressed through the description of the Feasibility Study or are not relevant and therefore not included.

	<p>and overall return on investment related to healthcare and administrative cost savings.</p> <ul style="list-style-type: none"> <li>• Through this initiative, NYSERDA expects to explore and validate the health benefits and healthcare cost savings associated with clean energy and housing improvements; the identification of options for implementing a statewide energy, housing, and health intervention strategy; and the identification of potential innovative funding mechanisms that could support an integrated model.</li> <li>• For a visual representation of this strategy, please reference the flow chart entitled “Logic Model: Healthy Homes Feasibility Study,” which can be found in Appendix A.</li> </ul>
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Establish joint energy and health benefits as primary considerations when undertaking an energy or housing improvements in LMI communities.</li> <li>• Reduce the administrative barriers associated with publicly funded energy, housing and health programs to allow for an integrated approach to serving LMI homes with a comprehensive set of energy and housing interventions.</li> <li>• Validate healthcare cost savings and other health impacts associated with an integrated delivery model so that these cost savings are recognized.</li> <li>• Identify additional funding mechanisms, including direct Medicaid funding as well as social impact financing mechanisms, to support an integrated model.</li> </ul>

### ***Target Market Characterization***

<b>Target Market Segment</b>	The market actors that the feasibility study and potential pilot will target include New York State agencies (NYSERDA, NYS Homes and Community Renewal, and New York State Department of Health), service providers such as energy efficiency and home improvement contractors, affordable housing owners and managers, and medical service providers including hospitals and care providers.
<b>Market Participants</b>	The primary participants in the feasibility study will be NYSERDA, NYS Homes and Community Renewal, and NYS Department of Health. The participation of additional participants in a pilot project – including target communities and participating homes, funders, and service providers - will be determined in the feasibility study.
<b>Market Readiness</b>	A window of opportunity for this initiative has been provided with the New York State Medicaid Redesign Team (MRT) establishing a goal of reducing healthcare costs by 25% by May 2019. Reducing healthcare costs associated with chronic conditions, such as asthma, through healthy home interventions will contribute to the MRT’s goals under the Delivery System Reform Incentive Program (DSRIP).

### ***Stakeholder/Market Engagement***

<b>Stakeholder/Market Engagement</b>	<ul style="list-style-type: none"> <li>• There are several community-scale pilots across New York State that are working to coordinate existing resources to implement healthy homes improvements for LMI communities. NYSERDA hosts quarterly meetings with the organizations involved in these pilots to understand the barriers and opportunities associated with implementation, which will inform a statewide energy, housing, and health initiative. Feedback from the organizations that are involved in the community-scale pilots indicates that it is time consuming and difficult to coordinate resources that are administered separately. This results in additional administrative time and completion of projects at a slower pace. Furthermore, current pilots lack common measures of success and would benefit from an integrated approach across the state.</li> <li>• The Governor’s Office, HCR and DOH have joined NYSERDA in expressing an interest to explore the feasibility of implementing a statewide energy,</li> </ul>
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	<p>housing, and health initiative. HCR and DOH will be primary partners with NYSEERDA on the feasibility work and any potential pilot that results from the feasibility study.</p> <ul style="list-style-type: none"> <li>• A number of foundations have expressed interest in supporting NYSEERDA's work should the feasibility research justify a pilot intervention.</li> <li>• NYSEERDA will also utilize the CEAC LMI Working Group to engage with stakeholders, as appropriate.</li> </ul>
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### *Theory of Change*

<b>Market Barriers Addressed</b>	<p>The feasibility study will assess the statutory and infrastructure barriers associated with the development of an integrated service delivery model including:</p> <ul style="list-style-type: none"> <li>• New York's Medicaid 1115 Waiver and the state's ability to offer in-home health education via non-clinicians.</li> <li>• Lack of infrastructure to support an integrated energy, housing, and health services delivery model.</li> <li>• Lack of funding to support capital improvements required prior to energy or health interventions.</li> <li>• Lack of skilled workers to deliver a holistic suite of energy and health education services.</li> </ul>
<b>Activities</b>	<ul style="list-style-type: none"> <li>• Conduct project feasibility research including the identification and assessment of the key opportunities and barriers to the implementation of an integrated health and energy services delivery model in New York and the likelihood of the project's eventual success.</li> <li>• Conduct the following research: <ul style="list-style-type: none"> <li>○ The possibility and likelihood of Medicaid reimbursement for an initial pilot project, including health and energy efficiency home improvements, and the opportunities for a longer-term model.</li> <li>○ Collect medical cost data and energy and housing intervention cost data provided by State of New York agencies.</li> <li>○ Prepare medical cost savings projections and aggregate return on investment calculations for the State of New York for in-home asthma resident education and combined energy efficiency and asthma trigger reduction housing interventions as well as for other housing interventions to reduce home-based environmental health hazards.</li> <li>○ The technical feasibility of the agreed upon prescriptive interventions having the desired benefits in terms of reductions in asthma episodes, asthma related doctor visits, hospitalizations and emergency room visits, reductions in household injuries and other illnesses, reductions in medical and energy costs, or other positive outcomes.</li> <li>○ The economic feasibility of the intervention operation on a per unit basis and at scale based on projections of medical and energy cost-savings derived from medical cost data and housing and energy intervention cost estimates provided by the state agencies.</li> <li>○ Payment mechanism feasibility through various payment mechanisms which may utilize public funds from state Medicaid or others that require federal approval for matching dollars in their use for a pilot or full program operations.</li> <li>○ Project linkage and possible integration with New York State Medicaid Redesign Team (MRT), MRT Supportive Housing Initiative, and New York State DSRIP among other programs.</li> <li>○ Identify and assess other possible funding mechanisms and project resources for preventive health-based housing interventions to reduce</li> </ul> </li> </ul>

	<p>home-based environmental health hazards such as Pay For Success, Social Impact Bonds, Title V funding, Aging in Place Initiatives, etc.</p> <ul style="list-style-type: none"> <li>○ An assessment of current Green and Healthy Homes Initiative (GHHI) projects in New York and elsewhere, as a basis for informing the development of a statewide delivery model.</li> <li>○ Research to assess New York’s capacity to implement a statewide program under which public and private insurers reimburse costs associated with preventive health education and environmental hazard and asthma trigger reduction.</li> <li>○ Research existing health, safety, housing, and energy efficiency programs in New York and make recommendations for inclusion of the programs in a pilot project based upon their available funding; services offered; geographic target areas; client eligibility requirements, compatibility of client enrollment and referral processes as it pertains to coordinating energy, health, and housing programs; contractor accreditation and certification requirements; and contractor and inspector training capacity among other key factors.</li> <li>○ A gap analysis of the data collected by health, safety, housing, and energy efficiency programs intended to identify opportunities to create consistency in data collected to support an integrated health, energy, and housing delivery model.</li> <li>○ Research, in cooperation with NYSERDA, HCR, DOH, and other agencies, additional funding resources that could be leveraged and integrated with a pilot project.</li> <li>• Development of a pilot for testing a statewide integrated service delivery model, based on the findings of the feasibility study.<sup>26</sup></li> </ul>
<b>Key Milestones</b>	<p><u>Milestone 1 (2017)</u></p> <ul style="list-style-type: none"> <li>• Complete feasibility study and decide on whether to continue with the pilot design and implementation phase.</li> </ul> <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> <li>• Begin the pilot design phase, if NYSERDA and NYS agency partners decide to go forward.<sup>27</sup></li> </ul> <p><u>Milestone 3 (2017)</u></p> <ul style="list-style-type: none"> <li>• Pilot design is complete.</li> </ul> <p><u>Milestone 4 (2017)</u></p> <ul style="list-style-type: none"> <li>• Commencement of pilot activities.</li> </ul> <p><u>Milestone 5 (2018)</u></p> <ul style="list-style-type: none"> <li>• Preliminary determination of health benefits and healthcare cost savings.</li> </ul> <p><u>Milestone 6 (2021)</u></p> <ul style="list-style-type: none"> <li>• Dissemination of pilot results which may include peer-reviewed papers, presentations at conferences, and a white paper to share with potential long-term funders including Medicaid, HUD, Foundations, and others.</li> </ul>

<sup>26</sup> If NYSERDA and its partners decide to pursue the implementation of a statewide pilot, NYSERDA will file a supplement to this Investment Plan to include specific activities, outcomes, and funding commitments associated with the pilot.

<sup>27</sup> Ibid.

### ***Relationship to Utility/REV***

<b>Utility Role/Coordination Points</b>	<ul style="list-style-type: none"> <li>Utilities are aware of which low-income customers rely on medical or life-sustaining equipment. This information may serve as a way to target homes that are good candidates for a healthy homes improvement. The potential for utility coordination in a healthy homes pilot, including assessing potential customer confidentiality issues, will be assessed in the feasibility study.</li> <li>NYSERDA will utilize the CEAC LMI Working Group and Clean Energy Implementation and Coordination Working Group to coordinate planning and implementation with the New York State utilities.</li> </ul>
<b>Utility Interventions in the Target Market</b>	The New York utilities do not have any similar offering to this market.

### **15.2.5 Budgets & Expenditures**

An annual commitment budget for all activities included in this chapter is shown in Table 2. The annual expenditure projection is included in Table 3. Budgets and expenditures do not include Administration, Evaluation, or Cost Recovery Fee; these elements are addressed in the Budget Accounting and Benefits chapter filing. The budget as presented in the Budget Accounting and Benefits Chapter will serve as the basis for any subsequent reallocation request. The additional level of detail presented within the table below is intended for informational purposes only. See Appendix B for a compilation of LMI budgetary allocations for the first three years of the CEF, including the market development initiative budgets presented below as well as the standard offer LMI initiative budgets filled as part of the Resource Acquisition Transition Chapter.

**Table 2: Annual Market Development Budget Allocation – Commitment Basis**

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
<b>RetrofitNY</b>											
Direct Incentives and Services	\$0	\$5,525,000	\$5,525,000	\$5,000,000	\$4,400,000	\$3,300,000	\$1,750,000	\$500,000	\$0	\$0	\$26,000,000
Implementation Support	0	\$888,000	\$652,000	\$417,750	\$417,750	\$569,500	\$469,500	\$469,500	\$469,500	\$150,000	\$4,503,500
Sub-Total	\$0	\$6,413,000	\$6,177,000	\$5,417,750	\$4,817,750	\$3,869,500	\$2,219,500	\$969,500	\$469,500	\$150,000	\$30,503,500
<b>REVitalize</b>											
Direct Incentives and Services	\$-	\$325,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$325,000
Tools, Training, and Replication	\$-	\$275,000	\$125,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$400,000
Sub-Total	\$-	\$600,000	\$125,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$725,000
<b>LIFE</b>											
Implementation Support	\$0	\$245,000	\$75,000	\$184,000	\$162,000	\$97,000	\$122,000	\$145,000	\$195,000	\$75,000	\$1,300,000
Sub-Total	\$0	\$245,000	\$75,000	\$184,000	\$162,000	\$97,000	\$122,000	\$145,000	\$195,000	\$75,000	\$1,300,000
<b>Healthy Homes Initiative</b>											



Research and Technology Studies/ Development / Demos	\$-	\$215,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$215,000
Sub-Total	\$-	\$215,000	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$215,000
Total	\$-	\$7,473,000	\$6,377,000	\$5,601,750	\$4,979,750	\$3,966,500	\$2,341,500	\$1,114,500	\$664,500	\$225,000	\$32,743,500

**Table 3: Annual Expenditures Projection**

Expenditures	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
<b>RetrofitNY</b>	0%	19%	20%	18%	16%	13%	7%	3%	2%	2%	0%	0%	100%
<b>REVitalize</b>	0%	21%	37%	35%	7%	0%	0%	0%	0%	0%	0%	0%	100%
<b>LIFE</b>	0%	10%	11%	11%	10%	9%	10%	12%	10%	10%	7%	0%	100%
<b>Healthy Homes Feasibility Study</b>	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%

### 15.2.6 Progress and Performance Metrics

Tables 4 through 7 provide program Activity/Output indicators representing measurable, quantifiable direct results of activities undertaken in each initiative. Outputs are a key way of regularly tracking progress, especially in the early stages of an initiative, before broader market changes are measurable. Outcome indicators can encompass near-term through longer-term changes in market conditions expected to result from the activities/outputs of an intervention. Outcome indicators will have a baseline value and progress will be measured periodically through Market Evaluation.

**Table 4. Initiative Specific Metrics- RetrofitNY**

Indicators <sup>28</sup>		Baseline (Before/Current)	2019 (Cumulative)	2025 (Cumulative)
Activity/ Outputs	Number of units committed by affordable housing organizations and private owners	0	50,000	100,000
	Number of valid solutions evaluated by the competition jury	0	5	15
	Funding and financing committed by the private sector	\$0	\$605,000	\$1,410,680,000
	Number of retrofit packages tested through pilots	0	1	4
	Number of units retrofitted or in the pipeline	0	430	100,000
Outcomes	Number of cost effective retrofit solutions available in the market	0	0	2 or more

<sup>28</sup> A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

**Table 5. Initiative Specific Metrics- REVitalize**

<b>Indicators<sup>29</sup></b>		<b>Baseline (Before/Current)</b>	<b>2019 (Cumulative)</b>	<b>2025 (Cumulative)</b>
Activity/ Outputs	Number of LMI and EJ communities undertaking clean energy planning efforts	0	5	80
	Number of toolkits developed to reduce the learning curve associated with community energy planning in LMI and EJ communities	0	1-3	1-3
Outcomes	Use of tools by LMI and EJ communities in community energy planning	0	1-3	1-3
	Reduction in time necessary to plan and implement a community-scale clean energy project in LMI and EJ communities	1-2 years	6-12 months	6-12 months
	Number of LMI/EJ customers benefitting from community-scale clean energy projects	0	1,000	16,300

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<sup>29</sup> A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

**Table 6. Initiative Specific Metrics- Low-Income Forum on Energy**

<b>Indicators</b>		<b>Baseline (Before/Current)</b>	<b>2019 (Cumulative)</b>	<b>2025 (Cumulative)</b>
Activity/ Outputs	Number of meetings and conferences	1 conference every other year and 7 annual meetings occurring in the alternate years	1 conference and 14 regional meetings	4 biennial conferences and 35 regional meetings
	Number of monthly webinars completed	10 per year	33	93
	Number of monthly newsletters circulated	10 per year	33	93
Outcomes	Number of organizations participating in LIFE initiatives on an annual basis	456	1,317	3,951
	Number of individuals participating in LIFE initiatives on an annual basis	748	2,522	7,629
	Number of unique organizations participating in LIFE initiatives on an annual basis	300	900	2,700
	Number of unique individuals participating in LIFE initiatives on an annual basis	504	1,667	4,536

**Table 7. Initiative Specific Metrics- Healthy Homes Feasibility Study**

<b>Indicators</b>		<b>Baseline (Before/Current)</b>	<b>2019 (Cumulative)</b>	<b>2025 (Cumulative)</b>
Activity/Outputs	Feasibility Study	0	1	1

Benefits shown in Tables 8 through 10 are direct, near term benefits associated with the LMI initiatives.<sup>30</sup> These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation. See Appendix C for a compilation of LMI direct impacts for the first three years of the CEF, including the market development initiative impacts presented below as well as the standard offer LMI initiative impacts filled as part of the Resource Acquisition Transition Chapter.

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<sup>30</sup> Due to the nature of the Low-Income Forum on Energy and the Healthy Homes Initiatives, they do not have attributable direct impacts.

**Table 8. Direct Impacts - Retrofit NY**

Primary Metrics <sup>31</sup>		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	TOTAL
Energy Efficiency	MWh Annual	-	-	270	342	743	1,620	17,600	37,800	56,700	72,000	187,100
	MWh Lifetime	-	-	5,400	6,840	14,900	32,400	351,000	757,000	1,130,000	1,440,000	3,742,000
	MMBtu Annual	-	-	4,840	6,130	13,300	29,100	315,000	678,000	1,020,000	1,290,000	3,354,000
	MMBtu Lifetime	-	-	96,900	123,000	266,000	582,000	6,300,000	13,600,000	20,400,000	25,800,000	67,130,000
	MW	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-	-	-	-	-	-	-	-
	MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-
	MW	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		-	-	419	530	1,150	2,510	27,200	58,600	88,000	112,000	291,000
CO2e Emission Reduction (metric tons) Lifetime		-	-	8,380	10,600	23,000	50,300	545,000	1,170,000	1,760,000	2,230,000	5,800,000
Customer Bill Savings Annual (\$ million)		\$0	\$0	\$0.08	\$0.10	\$0.22	\$0.49	\$5.3	\$11	\$17	\$22	\$56
Customer Bill Savings Lifetime (\$ million)		\$0	\$0	\$1.6	\$2.1	\$4.5	\$10	\$105	\$227	\$340	\$432	\$1,122
Private Investment (\$ million)		\$0	\$0	\$0	\$0.6	\$2.6	\$6.2	\$77	\$210	\$450	\$664	\$1,411

<sup>31</sup> Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 20-year measure life. Benefits are rounded to three significant figures. Totals may not sum due to rounding. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

**Table 9. Direct Impacts - REVitalize**

Primary Metrics <sup>32</sup>		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	TOTAL
Energy Efficiency	MWh Annual	-	-	-	-	-	-	-	-	-	-	-
	MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-
	MMBTU Annual	-	-	-	-	-	-	-	-	-	-	-
	MMBTU Lifetime	-	-	-	-	-	-	-	-	-	-	-
	MW	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy	MWh Annual	-	1,760	1,230	-	-	-	-	-	-	-	2,994
	MWh Lifetime	-	35,200	24,700	-	-	-	-	-	-	-	59,880
	MW	-	1.4	1	-	-	-	-	-	-	-	2.4
CO2e Emission Reduction (metric tons) Annual		-	926	649	-	-	-	-	-	-	-	1,575
CO2e Emission Reduction (metric tons) Lifetime		-	18,500	13,000	-	-	-	-	-	-	-	31,500
Customer Bill Savings Annual (\$ million)		\$-	\$ .28	\$ .20	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$.48
Customer Bill Savings Lifetime (\$ million)		\$-	\$5.56	\$3.90	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$9.46
Private Investment (\$ million)		\$-	\$3.75	\$2.13	\$-	\$-	\$-	\$-	\$-	\$-	\$-	\$5.88

<sup>32</sup> Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 20-year measure life. Benefits are rounded to three significant figures. Totals may not sum due to rounding. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

**Table 10. Annual Projected Initiative Participation**

Initiative	Description	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
RetrofitNY	Number of units retrofitted	-	170	170	200	500	1,000	10,000	20,000	30,000	37,960	100,000
REVitalize <sup>33</sup>	Number of communities undertaking clean energy projects	-	5	-	-	-	-	-	-	-	-	5
LIFE	Number of individuals reached	187	763	778	794	810	826	842	859	876	894	7,629
Healthy Homes Feasibility Study	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Benefits shown in Tables 11 and 12 represent the estimated indirect market effects expected to accrue over the longer term as a result of these investments and follow on market activity.<sup>34</sup> The indirect benefits that accrue from this investment will be quantified and reported based on periodic Market Evaluation studies to validate these forecasted values. Market Evaluation may occur within one year (-/+) of the years noted in the table and projected future indirect benefits and/or budgets necessary to achieve them may be updated based on the results of market evaluation. Indirect impact across NYSEERDA initiatives may not be additive due to multiple initiatives operating within market sectors. The values presented below are not discounted, however NYSEERDA has applied a discount of 50% to the overall portfolio values in the Budget Accounting and Benefits chapter.

**Table 11. Estimated Indirect Market Impact - Retrofit NY**

Indirect Impact		2020	2025	2030
Energy Efficiency	MWh Cumulative Annual	-	28,400	407,000
	MMBTU Cumulative Annual	-	509,000	7,290,000
Renewable Energy	MWh Cumulative Annual	-	-	-
	MW	-	-	-
CO2e Emission Reduction (metric tons) Cumulative Annual			44,000	630,000

**Table 12. Estimated Indirect Market Impact - REVitalize**

Indirect Impact		2020	2025	2030
Energy Efficiency	MWh Cumulative Annual	-	-	-
	MMBTU Cumulative Annual	-	-	-
Renewable Energy	MWh Cumulative Annual	18,000	44,900	44,900
	MW	14	36	36
CO2e Emission Reduction (metric tons) Cumulative Annual		9,450	23,600	23,600

<sup>33</sup> NYSEERDA expects that an additional 75 community energy projects will be supported through replication.

<sup>34</sup> The Low-Income Forum on Energy and Healthy Homes Initiative do not have attributable indirect energy impacts.

## 15.3 Standard Offer Programs

### 15.3.1 Single Family LMI Residential

NYSERDA's Single Family Residential Low-to-Moderate Income Program (Single Family LMI Program) standard offer program initiative was originally described in the Resource Acquisition Transition Chapter. As LMI efforts will be continuing beyond the near-term timeframe outlined in that chapter, the initiative has been moved here to provide a comprehensive picture of NYSERDA's LMI activities. The program has also been extended through 2021, with corresponding budget and benefit increases.

The values in the budget and performance sections have been updated to reflect 2016 actuals, as well as updating the timing for the overall budget and performance metrics to reflect actual program uptake rates. Additional funding has been added for increased projects for both low income and moderate income based on increasing demand, and to meet Governor Cuomo's goal of serving 20,000 low income households in 2017. Additional funding has also been added to support improved data management and program evaluations as well as consumer education and awareness activities. Overall MWh and MMBTU savings are expected to increase in accordance with this increase in funding, and the revised benefit values are reflected herein.

The 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 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 may be available through the low-income program component. Currently, cost-shared measures are available to low income customers through the moderate-income program.

The moderate-income component (defined as up to 80% of the State or Area Median Income, whichever is higher) 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 and will meet requirements of the national Home Performance with ENERGY STAR® program. NYSERDA is a sponsor of the 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, while addressing energy-related health and safety needs of the building occupants.

## Overview

<b>Intervention Strategy</b>	<p>The Program uses a network of home performance contractors designated as Gold Star Contractors by the Building Performance Institute 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.</p> <p>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 with a cost share.</p> <p>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.</p> <p>Funding for incentives will be provided on a first-come, first-served basis.</p> <p>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.</p> <p>The Moderate-Income component will be open-enrollment for customers as funding is available.</p>
<b>Goals</b>	<p>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.</p> <p>The low-income portion of the program is a critical component of Governor Cuomo's goal of serving 20,000 low income households with weatherization work in 2017.</p>

## Target Market Characterization

<b>Target Market Segment(s)</b>	<p>The target market includes owners and renters of one-to-four family and low-rise residential buildings.</p> <p>The Low-Income component is available 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.</p> <p>The Moderate-Income component is available 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.</p>
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	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 designated a GoldStar Contractor by the Building Performance Institute, and must follow all applicable codes, standards and laws.
<b>Market Participants</b>	<ul style="list-style-type: none"> <li>• Independent Home Performance Contractors: Customer recruitment, energy audits, installation, program paperwork and documentation submissions, installation oversight.</li> <li>• Utilities: Provide referrals of low income participants who need energy efficiency services.</li> <li>• Community groups and human services organizations: Provide referrals of LMI participants who need energy efficiency services.</li> <li>• Implementation contractors: Customer eligibility review and application processing, review of project submissions for technical and eligibility review, incentive processing</li> <li>• Software support: Maintains program management database for project processing, automated to the extent possible, and program tracking</li> <li>• Technical support: Technical support for contractors (desk audit and limited field support)</li> <li>• Standards &amp; Quality Assurance: Support industry standards development, conduct field verification of completed projects</li> <li>• Marketing contractor: Development of branded programmatic materials, communications strategies, and technical transfer efforts, e.g. case studies, press releases, etc.</li> </ul>
<b>Market Readiness</b>	The Single Family Residential LMI Programs have been in existence for many years and there are more than 200 qualified contractors providing energy efficiency services through the Program. They continue to be willing and eager to participate in this offering.
<b>Customer Value</b>	Customers who participate in the program receive the benefits of reduced energy bills and increase comfort in their homes.

### ***Stakeholder/Market Engagement***

<b>Stakeholder/Market Engagement</b>	NYSERDA regularly engages with the network of participating contractors and other stakeholders to continuously improve administrative processes for easy participation and to lower implementation costs. NYSERDA works closely with sister agencies to provide information about the LMI energy efficiency offerings.
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### ***Theory of Change***

<b>Market Barriers Addressed</b>	<b>Financial barriers.</b> As mentioned in the opening of this chapter, many of the more than 3 million LMI households in the State spend a disproportionate share of their annual income on energy bills relative to higher income New Yorkers, and lack the financial resources, including credit profiles, to invest in energy efficiency upgrades. This program provides financial support to overcome those first cost and incremental cost barriers.
<b>Testable Hypotheses</b>	<ul style="list-style-type: none"> <li>• If financial support is provided to LMI customers, then it will enable them greater access to energy efficiency and associated co-benefits, reducing their energy use and preserving affordability.</li> </ul>

<b>Activities</b>	<p>For the initial 6-month period through August 2016, the program incentive offerings included the incentives offered under the legacy incentive programs including:</p> <ul style="list-style-type: none"> <li>• For Low Income: <ul style="list-style-type: none"> <li>○ A free home energy audit</li> <li>○ No cost or low cost electric reduction, home performance, and health and safety measures</li> <li>○ Consumer education and energy savings tips</li> </ul> </li> <li>• For Moderate Income: <ul style="list-style-type: none"> <li>○ A free home energy audit</li> <li>○ 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</li> <li>○ Contractor incentive of 5% of the cost of the approved energy efficiency measures</li> <li>○ Contractor incentive of 2% of the cost of approved energy efficiency measures that are referred to another participating contractor of a different trade</li> <li>○ Contractor incentives for targeted electric reduction measures</li> <li>○ Midstream contractor incentives including – Cooperative advertising, equipment incentives, BPI certification and accreditation reimbursement</li> </ul> </li> </ul> <p>On September 1, 2016, the following incentives were retired for the moderate-income component of the program:</p> <ul style="list-style-type: none"> <li>• Contractor incentive of 2% of the cost of approved energy efficiency measures that are referred to another participating contractor of a different trade</li> <li>• Contractor incentives for targeted electric reduction measures</li> <li>• Midstream contractor incentives including – Cooperative advertising, equipment incentives, BPI certification and accreditation reimbursement</li> </ul> <p>NYSERDA implemented the first set of programmatic changes, described below in the Fall of 2016. These changes include: Retirement of the incentives described above</p> <ul style="list-style-type: none"> <li>• Updated pricing for low income services offered at no cost to the customer (effective September 2016)</li> <li>• Reduced incentive structure for moderate income services to \$4,000 for a single-family home and \$8,000 for a 2-4 family home. (effective October 2016)</li> <li>• Streamlined application and project approval processes (additional changes are anticipated to be completed mid 2017)</li> </ul> <p>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 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.</p>
<b>Key Milestones</b>	<p><u>Milestone 1(2017)</u></p> <ul style="list-style-type: none"> <li>• Host regional contractor meetings to gather stakeholder input</li> </ul> <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> <li>• Competitive solicitation for technical implementation services</li> </ul> <p><u>Milestone 3 (2017)</u></p>

	<ul style="list-style-type: none"> <li>Deploy new low-income referral tracking database</li> </ul> <p><u>Milestone 4 (2017)</u></p> <ul style="list-style-type: none"> <li>Update policies and procedures manual</li> </ul> <p><u>Milestone 5 (2018)</u></p> <ul style="list-style-type: none"> <li>Host regional contractor meetings to gather stakeholder input</li> </ul>
<b>Goals Prior to Exit</b>	Due to the nature of this work and the societal benefits it provides, NYSERDA envisions continuing to pursue this effort for the duration of the CEF or until the need is met by other market participants.

### ***Relationship to Utility/REV***

<b>Utility Role/Coordination Points</b>	<p>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 regarding reducing customer's energy bills and level of arrears, where applicable.</p> <p>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.</p> <p>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.</p> <p>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. 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.</p>
<b>Utility Interventions in Target Market</b>	NYSERDA's Program is the primary provider of residential LMI energy efficiency services in CEF territory. Various utilities are considering options serve the LMI sector. NYSERDA will work with utilities on opportunities to coordinate offerings.

### ***Fuel Neutrality***

<b>Fuel Neutrality</b>	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
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	basis will allow us to achieve a ton of carbon savings at a cost of \$3,059, compared to a cost of \$3,157 in an electric only scenario. <sup>35</sup>
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### ***Performance Monitoring and Evaluation Plans***

<b>Performance Monitoring &amp; Evaluation Plan</b>	<p>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.</p> <p><b><u>Test-Measure Adjust Strategy</u></b></p> <p>It is anticipated that quality assurance will be provided at a 15% inspection rate for Low Income home performance services and moderate-income home performance services, and a 10% 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 benefit from a lower inspection rate. The Program average inspection rate will not be reduced to less than 5%</p> <p><b><u>Program M&amp;V</u></b></p> <p><b><u>Market Evaluation</u></b></p> <ul style="list-style-type: none"> <li>• Market Evaluation will include baseline and longitudinal measurement of key indicators of programmatic and broader market success.</li> <li>• Baseline measurements of key market indicators will occur within one year following initiative approval and will provide additional insights that will allow NYSERDA to adjust the strategy. These include but are not limited to: number of households served and consumer education activities developed.</li> <li>• Regular (e.g., annual or biennial) updates to key performance indicators and measurement of market change, including but not limited to: reduced energy use burden on LMI households and increased comfort in their homes.</li> <li>• Sources of data include intervention data, public and commercially available data, and primary data collection through surveys of key market actors.</li> </ul> <p><b><u>Impact Evaluation /Field Verification</u></b></p> <p>Evaluation M&amp;V will be conducted according to the International Performance Measurement and Verification Protocol (IPMVP) method(s) most appropriate.</p> <ul style="list-style-type: none"> <li>• For projects receiving direct incentives, an independent evaluation effort will verify energy benefits using methods such as pre/post billing analysis (IPMVP Option C). 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 or in addition to</li> </ul>
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<sup>35</sup> 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.

	<p>billing analysis are used, a sampling approach is expected to be employed.</p> <ul style="list-style-type: none"> <li>To draw a sample and conduct an analysis that is representative and robust, evaluation M&amp;V has traditionally been conducted after enough project completions and post-installation operating time have occurred. NYSEDA will employ strategies to balance the need for data with the priority to have evaluation M&amp;V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&amp;V review work and rolling M&amp;V samples are two such strategies that may be applied, as appropriate to the program, in developing M&amp;V plans.</li> <li>Consideration will be given to determining the adoption rate of recommended measures for those customers receiving an audit but who do not go through NYSEDA's incentive program. Methods would include surveys and potentially site visits of a sample of program participants.</li> </ul> <p>Data from Field Verification/Impact Evaluation can be used to help lend confidence in the market, especially among other end users.</p>
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### 15.3.1.1 Budgets & Expenditures

An annual commitment budget for all activities is shown in Table 13. The annual expenditure projection is included in Table 14. Budgets and expenditures do not include Administration, Evaluation, or Cost Recovery Fee; these elements are addressed in the Budget Accounting and Benefits chapter filing. The budget as presented in the Budget Accounting and Benefits Chapter will serve as the basis for any subsequent reallocation request. The additional level of detail presented within the table below is intended for informational purposes only. See Appendix B for a compilation of LMI budgetary allocations for the first three years of the CEF.

**Table 13: Annual Market Development Budget Allocation – Commitment Basis**

Budget		2016	2017	2018	2019	2020	2021	Total
SFR Low Income	Direct Incentives and Services	\$21,885,276	\$33,000,000	\$33,000,000	\$23,170,000	\$23,170,000	\$23,170,000	\$157,395,276
	Implementation Support	\$1,411,601	\$8,483,750	\$100,000	\$790,119	\$790,110	\$790,110	\$12,365,699
	Sub-Total	\$23,296,877	\$41,483,750	\$33,100,000	\$23,960,119	\$23,960,119	\$23,960,110	\$169,760,975
SFR Moderate Income	Direct Incentives and Services	\$7,473,933	\$11,835,000	\$11,835,000	\$7,219,200	\$7,219,200	\$7,219,200	\$52,801,533
	Implementation Support	\$431,747	\$4,591,250	\$400,000	\$425,449	\$425,449	\$425,449	\$6,699,344
	Sub-Total	\$7,905,680	\$16,426,250	\$12,235,000	\$7,644,649	\$7,644,649	\$7,644,649	\$59,500,877
Total		\$31,202,557	\$57,910,000	\$45,335,000	\$31,604,768	\$31,604,768	\$31,604,759	\$229,261,852

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

**Table 14: Annual Expenditures Projection**

Expenditures	2016	2017	2018	2019	2020	2021	2022
<b>Total</b>	9%	22%	22%	22%	14%	6%	5%

### 15.3.1.2 Progress and Performance Metrics

Benefits shown in Tables 15 and 16 are direct, near term benefits associated with the LMI initiatives. These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation. See Appendix C for a compilation of LMI direct impacts for the first three years of the CEF.

**Table 15. Direct Impacts - Low Income**

Primary Metrics		2016	2017	2018	2019	2020	2021	TOTAL
Energy Efficiency	MWh Annual	3,760	6,030	6,030	4,600	4,600	4,600	29,620
	MWh Lifetime	56,400	90,400	90,400	69,100	69,100	69,100	444,500
	MMBTU Annual	111,000	144,000	144,000	110,000	110,000	110,000	729,000
	MMBTU Lifetime	2,770,000	3,610,000	3,610,000	1,660,000	1,660,000	1,660,000	14,970,000
	MW	-	-	-				-
Renewable Energy	MWh Annual	-	-	-				-
	MWh Lifetime	-	-	-				-
	MW	-	-	-				-
CO2e Emission Reduction (metric tons) Annual		8,220	11,300	11,300	8,650	8,650	8,650	56,750
CO2e Emission Reduction (metric tons) Lifetime		186,000	251,000	251,000	130,000	130,000	130,000	1,078,000
Customer Bill Savings Annual (\$ million)		\$1.94	\$2.70	\$2.70	\$2.07	\$2.07	\$2.07	\$13.55
Customer Bill Savings Lifetime (\$ million)		\$ 42.5	\$58.0	\$58.0	\$31.0	\$31.0	\$31.0	\$251.5
Private Investment (\$ million)		\$-	\$0.75	\$1.5	\$1.15	\$1.15	\$1.15	\$5.69

**Table 16. Direct Impacts – Moderate Income**

<b>Primary Metrics</b>		<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>TOTAL</b>
Energy Efficiency	MWh Annual	1,190	789	790	489	489	489	4,236
	MWh Lifetime	17,800	11,800	11,900	7,340	7,340	7,340	63,520
	MMBTU Annual	57,400	58,300	58,300	36,100	36,100	36,100	282,300
	MMBTU Lifetime	1,440,000	1,460,000	1,460,000	542,000	542,000	542,000	5,986,000
	MW	-	-	-				-
Renewable Energy	MWh Annual	-	-	-				-
	MWh Lifetime	-	-	-				-
	MW	-	-	-				-
CO2e Emission Reduction (metric tons) Annual		3,890	3,700	3,700	2,290	2,290	2,290	18,160
CO2e Emission Reduction (metric tons) Lifetime		91,300	86,900	87,000	34,400	34,400	34,400	368,400
Customer Bill Savings Annual (\$ million)		\$0.89	\$0.83	\$0.83	\$0.51	\$0.51	\$0.51	\$4.08
Customer Bill Savings Lifetime (\$ million)		\$20.4	\$19.5	\$19.5	\$7.7	\$7.7	\$7.7	\$82.50
Private Investment (\$ million)		\$9.5	\$8.7	\$8.7	\$5.4	\$5.4	\$5.4	\$43.06

**Table 17. Annual Projected Initiative Participation**

<b>Additional Performance Tracking Metrics</b>		<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>Total</b>
Participants	Low Income <sup>36</sup>	7,636	10,781	10,781	8,250	8,250	8,250	53,948
	Moderate Income	1,884	2,429	2,430	1,505	1,505	1,505	11,258
	Total	9,520	13,210	13,211	9,755	9,755	9,755	65,206

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<sup>36</sup>Includes both projects focused on electric reduction only and home performance services.

### 15.3.2 LMI Multifamily

The LMI Multifamily initiative was originally described in the Resource Acquisition Transition Chapter. As LMI efforts will be continuing beyond the near-term timeframe outlined in that chapter, the initiative has been moved here to provide a comprehensive picture of NYSERDA's LMI activities.

The Multifamily Performance Program (MPP) – LMI did not meet its 2016 projected targets. Programmatic changes reflected herein include the removal of targeted option due to lack of customer interest and a modification of the comprehensive option incentive level and minimum savings threshold to better align with LMI market needs.

The Targeted Option was intended to help owners of market rate buildings implement single measure upgrades that were not incentivized through energy efficiency programs offered by utility companies. However, as evidenced by lack of participation and customer interest in this program component, this program is not aligned with current customer needs. As such, NYSERDA is eliminating the Targeted Option.

The Comprehensive Option will continue with modifications. A significant risk to LMI projects is access to capital. NYSERDA worked with the market to identify a minimum level of support and will initially increase the incentive level to support a larger portion of project cost to support the needs of the LMI community. NYSERDA will adjust the incentive level based on market reaction. NYSERDA will also decrease lower the program's minimum savings threshold. Market feedback highlighted a risk associated with the previous 25% savings threshold target and impacts to scope changes during the life of a project. NYSERDA has decreased the savings threshold to increase the potential market opportunity for participation and reduce the risk associated with scope change during the life of a project. The High-Performance Offering will remain to support deeper and comprehensive energy retrofits that are not currently supported by utility programs. However, due to a later than anticipated program launch, budgets and benefits have been adjusted out in time. In addition, NYSERDA may offer this component through either through a competitive or an open enrollment solicitation based on additional market intelligence currently being gathered by program staff.

NYSERDA is also adding funding to support the Solutions Provider Network. As noted in the original filing, the Providers work with building owners and NYSERDA to act as program liaisons to design and implement projects. The funding added is necessary to support the Provider Network in its current state to maintain support for the MPP Comprehensive Program.

#### **Overview**

<b>Intervention Strategy</b>	<p>The Multifamily Performance Program (MPP) – Low-to-Moderate Income (LMI) will continue under the CEF. 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 two (2) components designed to specifically target certain objectives:</p> <ul style="list-style-type: none"><li>• A Comprehensive Option that will support scopes of work designed to achieve a minimum threshold of whole-building source energy savings. NYSERDA-approved</li></ul>
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	<p>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:</p> <ul style="list-style-type: none"> <li>○ 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.</li> <li>○ Recognize past market achievements by encouraging deeper building savings.</li> <li>○ Increase private investment in energy efficiency projects by increasing minimum performance targets and moderating program incentives.</li> </ul> <ul style="list-style-type: none"> <li>● 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: <ul style="list-style-type: none"> <li>○ Create new opportunities for cutting edge building owners and energy professionals to demonstrate deep energy retrofit possibilities in existing multifamily buildings.</li> <li>○ Gain experience with deep energy projects that can be used to encourage greater adoption of successful strategies and efforts.</li> <li>○ 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.</li> </ul> </li> </ul> <p>This program is expected to run through the end of 2021 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.</p> <p>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 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.</p> <p>The Comprehensive Option will be open-enrollment. Funding will be provided on a first-come first-served basis. The High-Performance Offering may be offered through either a competitive solicitation requesting proposals or as an open-enrollment solicitation 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.</p>
<b>Goals</b>	<ul style="list-style-type: none"> <li>● The overall goal of this initiative is to create a self-sustaining market for energy retrofits in New York State to ensure the mass implementation of energy retrofit solutions across building types and different housing market segments. Sub-goals are: <ul style="list-style-type: none"> <li>○ To ensure that affordable housing is prioritized when it comes to developing solutions for enabling the adoption of clean energy solutions.</li> <li>○ To assist with the development of financing mechanisms and new business models enabling building owners to purchase these solutions with little to no upfront costs.</li> <li>○ To identify and address any regulatory issues that could hinder the implementation of the solutions.</li> </ul> </li> </ul>

## Target Market Characterization

<b>Target Market Segment(s)</b>	<ul style="list-style-type: none"> <li>• The target market includes multifamily building owners and management companies of low-to- moderate income properties, as defined on NYSERDA's Comprehensive website.<sup>37</sup> The various components are designed to support multiple sub- segments of the multifamily market, i.e. building owners interested in comprehensive building improvements and those building owners who want to push the envelope of possible existing building energy retrofits.</li> <li>• 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 found in the program guidelines on the NYSERDA website,<sup>38</sup></li> <li>• Specific to the Comprehensive Option, a project that agrees to install any set of building improvements that collectively achieve a minimum threshold 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.</li> <li>• 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.</li> <li>• For the High-Performance Offering, projects will be selected 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.</li> </ul>
<b>Market Participants</b>	<ul style="list-style-type: none"> <li>• New York State multifamily building owners</li> <li>• Multifamily Building Solutions Providers (previously MPP Partners): Customer recruitment, building audit and project development, Program paperwork and documentation submittals, and installation oversight.</li> <li>• Implementation contractor(s): 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.</li> <li>• Quality Assurance/Technical Assistance contractor(s): 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).</li> </ul>

<sup>37</sup> <https://www.nyserda.ny.gov/All-Programs/Programs/MPP-Existing-Buildings/Comprehensive-Option>

<sup>38</sup> <https://www.nyserda.ny.gov/-/media/Files/Programs/MPP-Existing-Buildings/MPP-Comprehensive-Option-Program-Guidelines.pdf>

	<ul style="list-style-type: none"> <li>Marketing contractor: Development of branded promotional materials, outreach events, communications strategies, and technical transfer efforts, e.g. case studies, press releases, etc.</li> </ul>
<b>Market Readiness</b>	<ul style="list-style-type: none"> <li>NYSERDA has engaged this market for 10 years and has an established network of Providers to deliver these types of services. They continue to be willing and eager to participate in this offering.</li> </ul>
<b>Customer Value</b>	<p><u>Value to LMI Tenants:</u></p> <ul style="list-style-type: none"> <li>The tenants will benefit from an improved quality of life. Their apartments will be more comfortable thermally and acoustically.</li> <li>The indoor air quality will also be improved, providing health benefits like a reduction in the frequency and severity of respiratory afflictions.</li> </ul> <p><u>Value to Affordable Building Owners:</u></p> <ul style="list-style-type: none"> <li>Participating building owners will see the quality and value of their buildings increase while bearing only a fraction of the cost of the improvements implemented on their buildings.</li> <li>Maintenance and operation costs (e.g., utility costs) will be reduced.</li> <li>The comfort of the tenants will be improved, which will likely reduce tenant complaints and tenant turn over.</li> </ul>

### ***Stakeholder/Market Engagement***

<b>Stakeholder/Market Engagement</b>	<ul style="list-style-type: none"> <li>NYSERDA has engaged with market participants to understand the existing market needs through voice of customer calls. Through these calls, NYSERDA learned there is an increase in perceived risk to building owners as the minimum performance threshold increases. LMI building owners have expressed the need for access to capital throughout the lifetime of the project. NYSERDA has adjusted the Comprehensive Program by decreasing the minimum performance threshold and increasing the incentive levels to better support LMI building owners.</li> <li>NYSERDA has worked with sister agencies (HCR, HPD) to offer complementary strategies to the market.</li> </ul>
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### ***Theory of Change***

<b>Market Barriers Addressed</b>	<ul style="list-style-type: none"> <li>As mentioned in the opening of this chapter, many of the more than 3 million LMI households in the State spend a disproportionate share of their annual income on energy bills relative to higher income New Yorkers, and lack the financial resources, including credit profiles, to invest in energy efficiency upgrades. This program provides financial support to overcome those first cost and incremental cost barriers.</li> </ul>
<b>Testable Hypotheses</b>	<ul style="list-style-type: none"> <li>If financial support is provided to LMI customers, then it will enable them greater access to energy efficiency and the co-benefits it can provide and help to reduce their energy use to preserve affordability.</li> </ul>
<b>Activities</b>	<p>Should a project receive 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 basis to ensure that incentive funds will be available to projects through 2021. NYSERDA will track market response statewide and regionally to monitor program activity. If market response statewide or for a specific region(s) is greater than projected, NYSERDA will to decrease the incentive schedule for the respective region(s). Advanced notice will be</p>

	<p>given to Providers and posted to NYSERDA's website; program materials will be updated.</p> <p>For the Comprehensive Option, incentives will be provided to support comprehensive projects that improve a building's energy performance by a minimum threshold 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 that achieve their projected savings one year after installation of the improvements. The incentive schedule can be found on NYSERDA's website.<sup>39</sup></p> <p>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 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.</p>
<b>Key Milestones</b>	<p><u>Milestone 1 (2017)</u></p> <ul style="list-style-type: none"> <li>• Increase incentive levels, and decrease minimum threshold</li> </ul> <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> <li>• Host annual Provider Summit understand market impacts and future needs</li> </ul> <p><u>Milestone 3 (2018-2021)</u></p> <ul style="list-style-type: none"> <li>• Continue to evaluate market response to incentive levels and threshold and adjust as needed.</li> </ul>
<b>Goals Prior to Exit</b>	Due to the nature of this work and the societal benefits it provides, NYSERDA envisions continuing to pursue this effort for the duration of the CEF or until such time as the need is met by other market participants.

### ***Relationship to Utility/REV***

<b>Utility Role/Coordination Points</b>	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.
<b>Utility Interventions in Target Market</b>	The New York utilities offer multiple programs to improve the energy efficiency of multifamily affordable housing buildings. However, no utility program currently exists to enable deep energy retrofits as defined for this initiative.

### ***Fuel Neutrality***

<b>Fuel Neutrality</b>	<ul style="list-style-type: none"> <li>• Energy use and carbon emissions associated with heating and hot water represent the majority of potential savings in the multifamily sector. Approximately 75% of the sector relies on gas or oil for heat and hot water.</li> <li>• Except for the 25% of the multifamily buildings across New York State that use electricity for heat, an electric only initiative would not entice the industry to create</li> </ul>
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<sup>39</sup> <https://www.nyserdera.ny.gov/All-Programs/Programs/MPP-Existing-Buildings/Comprehensive-Option>

	<p>solutions that will significantly reduce heating and domestic hot water consumption. GHG emissions reduction would therefore be limited.</p> <ul style="list-style-type: none"> <li>Offering MPP LMI on a fuel neutral basis will allow NYSERDA to achieve savings at a cost of \$796 per ton of carbon, compared to a cost of \$1,455 per ton of carbon in an electric only scenario.</li> </ul>
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### ***Performance Monitoring and Evaluation Plans***

<b>Performance Monitoring &amp; Evaluation Plan</b>	<p>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.</p> <p><b><u>Test-Measure-Adjust Strategy</u></b></p> <p>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 may be inspected upon 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, projects will be inspected periodically to ensure that work is progressing appropriately.</p> <p>Projects in the Comprehensive Option will 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 completion. Additionally, Data Release Authorization Forms, which authorize NYSERDA to collect utility consumption data on the project, will be submitted as part of program deliverables 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.</p> <p><b><u>Program M&amp;V</u></b></p> <p><b><u>Market Evaluation</u></b></p> <ul style="list-style-type: none"> <li>Market Evaluation will include baseline and longitudinal measurement of key indicators of programmatic and broader market success.</li> <li>Baseline measurements of key market indicators will occur within one year following initiative approval and will provide additional insights that will allow NYSERDA to adjust the strategy. These include but are not limited to: number of households served and number of building owners using the solutions available in the market.</li> <li>Regular (e.g., annual or biennial) updates to key performance indicators and measurement of market change, including but not limited to: reduction in barriers to retrofitting multifamily buildings, increased comfort for tenants, and development of new financing solutions for building owners.</li> <li>Sources of data include intervention data, public and commercially available data, and primary data collection through surveys of key market actors.</li> </ul> <p><b><u>Impact Evaluation/Field Verification</u></b></p>
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	<ul style="list-style-type: none"> <li>• Evaluation M&amp;V will be conducted for a sample of participating buildings, according to the International Performance Measurement &amp; Verification Protocol (IPMVP) method(s) most appropriate given the retrofits made. Evaluation M&amp;V will rely heavily on the program M&amp;V strategy, data, and findings to validate program estimated savings.</li> <li>• To draw a sample and conduct an analysis that is representative and robust, evaluation M&amp;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&amp;V work done on a timely basis to produce the greatest benefit. Pre-retrofit M&amp;V review work and rolling M&amp;V samples are two such strategies that may be applied, as appropriate to the program, in developing M&amp;V plans.</li> <li>• Depending on the extent of replication identified in Market Evaluation, impacts will be examined for a sample of replication projects to ascertain the level of savings.</li> <li>• Data from Field Verification/Impact Evaluation can be used to help lend confidence in the market, especially among other end users.</li> </ul>
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#### 15.3.2.1 Budgets & Expenditures

An annual commitment budget for all activities is shown in Table 18. The annual expenditure projection is included in Table 19. Budgets and expenditures do not include Administration, Evaluation, or Cost Recovery Fee; these elements are addressed in the Budget Accounting and Benefits chapter filing. The budget as presented in the Budget Accounting and Benefits Chapter will serve as the basis for any subsequent reallocation request. The additional level of detail presented within the table below is intended for informational purposes only. See Appendix B for a compilation of LMI budgetary allocations for the first three years of the CEF.

**Table 18: Annual Market Development Budget Allocation – Commitment Basis**

	2016	2017	2018	2019	2020	2021	Total
Direct Incentives and Services	\$725,583	\$5,200,500	\$8,056,000	\$7,544,417	\$8,250,000	\$8,250,000	\$38,026,500
Implementation Support	\$123,041	\$8,239,877	\$-	\$-	\$3,400,000	\$-	\$11,762,918
Tools, Training, and Replication	\$-	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$400,000
<b>Total</b>	<b>\$848,624</b>	<b>\$13,520,377</b>	<b>\$8,136,000</b>	<b>\$7,624,417</b>	<b>\$11,730,000</b>	<b>\$8,330,000</b>	<b>\$50,189,418</b>

**Table 19: Annual Expenditures Projection**

Expenditures	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
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<b>LMI Multifamily</b>	0%	10%	11%	16%	16%	15%	14%	10%	8%	100%
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### 15.3.2.2 Progress and Performance Metrics

Benefits shown in Table 20 are direct, near term benefits associated with the LMI initiatives. These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation. See Appendix C for a compilation of LMI direct impacts for the first three years of the CEF.

**Table 20. Direct Impacts - LMI Multifamily**

<b>Primary Metrics<sup>40</sup></b>		<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>TOTAL</b>
Energy Efficiency	MWh Annual	1,000	4,140	9,380	10,400	11,400	11,400	47,720
	MWh Lifetime	15,000	62,100	141,000	156,000	171,000	171,000	716,100
	MMBtu Annual	13,600	56,500	128,000	142,000	155,000	155,000	650,100
	MMBtu Lifetime	205,000	847,000	1,920,000	2,130,000	2,330,000	2,330,000	9,762,000
	MW	-	-	-	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-	-	-	-
	MWh Lifetime	-	-	-	-	-	-	-
	MW	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		1,320	5,470	12,400	13,800	15,000	15,000	62,990
CO2e Emission Reduction (metric tons) Lifetime		19,800	82,100	186,000	206,000	226,000	226,000	945,900
Customer Bill Savings Annual (\$ million)		\$0.28	\$1.14	\$2.58	\$2.87	\$3.14	\$3.14	\$13.15
Customer Bill Savings Lifetime (\$ million)		\$4.14	\$17.10	\$38.80	\$43.00	\$47.00	\$47.00	\$197.00
Private Investment (\$ million)		\$3.53	\$19.40	\$35.90	\$36.70	\$40.20	\$40.20	\$175.50

<sup>40</sup> Impacts are expressed on a commitment-year basis, and are incremental additions in each year. Assumes a 20-year measure life. Benefits are rounded to three significant figures. Totals may not sum due to rounding. Customer Bill Savings are calculated as direct energy bill savings realized by customers participating in NYSERDA's programs.

**Table 21. Annual Projected Initiative Participation**

Description	2016	2017	2018	2019	2020	2021	Total
Number of units served	835	3,251	7,708	8,682	9,494	9,494	39,464



## 15.4 NY-Sun

### 15.4.1 Low-Income Community Solar

#### Overview

<b>Present Situation</b>	<ul style="list-style-type: none"><li>• The NY-Sun Initiative has included program measures supporting rooftop solar installations for low-to-moderate income homeowners since 2015. However, barriers have limited uptake of rooftop PV for LMI customers compared to middle and upper income customers, including:<ul style="list-style-type: none"><li>○ Lower homeownership rates among LMI households</li><li>○ Higher proportion of LMI households living in multifamily buildings</li><li>○ Higher proportion of houses owned by LMI homeowners requiring roof repairs or other maintenance work that adds cost and difficulty to rooftop PV installations</li><li>○ High upfront cost of rooftop PV purchases</li><li>○ Limited access to financing</li><li>○ Inability to take full value of federal and state tax credits for PV due to lower taxable income</li></ul></li><li>• In July 2015, the Public Service Commission initiated a community distributed generation program in New York,<sup>41</sup> which allows groups of customers to participate in solar PV projects that are sited anywhere in their utility service territory and load zone (commonly referred to as community solar).</li><li>• Community solar has drawn considerable interest from solar developers. As of July 31, 2017, 295 community solar projects totaling 735.5 MW have been approved for NY-Sun incentives. However, only 9 projects totaling 3.18 MW have been completed for reasons including lengthy utility interconnection queues and local permitting challenges. NYSERDA anticipates that a significant portion of the projects currently in the NY-Sun pipeline will be completed in 2018-2019.<sup>42</sup></li><li>• Community solar is a more flexible model than rooftop solar for solar project developers and customers alike, addressing many of the barriers noted above that have limited low income participation in NY-Sun. Community solar customers (commonly referred to as subscribers) can be switched out monthly, reducing risk to the project owner in the case of a subscriber moving out of the utility zone, nonpayment or other breach of the subscription terms. Project developers<sup>43</sup> can also include both individual residential subscribers and larger non-residential subscribers, commonly referred to as anchor subscribers.</li><li>• Community solar presents the best option for LMI customers to access solar, as both renters and homeowners can participate and it offers flexible solutions for a variety of customers. Subscription terms can be customized to individual customers or market segments, including the amount of energy purchased, the length of the subscription, and any moving or cancellation fees.</li><li>• However, community solar is still new and relatively untested in New York. Based on NYSERDA's market engagement to date the market has indicated that</li></ul>
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<sup>41</sup> <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=15-E-0082&submit=Search+by+Case+Number>

<sup>42</sup> Public information on the NY-Sun pipeline is available in Open NY: <https://data.ny.gov/Energy-Environment/Solar-Electric-Programs-Reported-by-NYSERDA-Beginn/3x8r-34rs/data>

<sup>43</sup> The terms “project developer” is here used interchangeably with “project sponsor”, with “developer” generally referring to the entity responsible for project finance and construction, and “sponsor” referring to the entity responsible for ongoing operation of the project and management of subscribers. Frequently, the developer and sponsor are the same entity.

	<p>it may have difficulty adequately serving LMI customers, particularly low-income customers (households with incomes below 60% of state median income) for reasons including:</p> <ul style="list-style-type: none"> <li>○ Community solar subscriptions and underwriting terms that are overly restrictive for many low-income customers.</li> <li>○ Community solar subscriptions that offer limited energy cost savings compared to many low-income customers' overall energy cost burden.</li> <li>○ High expected customer acquisition and management costs for all customer segments by project owners, which can discourage marketing to low income customers.</li> </ul>
<b>Intervention Strategy</b>	<ul style="list-style-type: none"> <li>• To ensure that low income customers specifically, with their heightened market barriers, are sufficiently served by the community solar market, NYSERDA will: <ul style="list-style-type: none"> <li>○ Develop a community solar subscription model specifically for low income (HEAP eligible) customers. Under this model, subscriptions will be offered to income-eligible customers at no cost.<sup>44</sup></li> <li>○ Issue a solicitation for community solar projects to commit project capacity to subscriptions for low income customers. NYSERDA will allocate the committed capacity to low income customers using the program's subscription model, and manage customer enrollment and subscription allocation on an ongoing basis.</li> <li>○ Work with low income energy efficiency programs, utilities, community agencies, solar project developers, investors and other market actors to market the program to low income customers and develop a strategy for a post-initiative transition.</li> </ul> </li> <li>• For a visual representation of this strategy, please reference the flow chart entitled "Logic Model: Low-Income Community Solar," which can be found in Appendix A.</li> </ul>
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Enable up to 10,000 low income New Yorkers to participate in community solar subscriptions that reduce their total electricity bill.</li> <li>• Reduce community solar project implementation and financing costs to maximize savings to low income participants.</li> <li>• Transition program to post-initiative state that sustains low income participation in community solar at comparable levels.</li> <li>• Support the development of a successful and inclusive community solar market, directly contributing to the fulfillment of the NY-Sun goal to add 3 GW of solar capacity by 2023 while achieving a robust, self-sustaining solar market.</li> </ul>
<b>State Energy Plan/Clean Energy Standard Link</b>	<ul style="list-style-type: none"> <li>• Broadly, this initiative will play an important role in achieving the 2015 State Energy Plan (SEP) and Clean Energy Standard (CES) goal that renewable energy sources generate 50% of New York State's electricity by 2030 by increasing participation of LMI customers in community solar projects.</li> <li>• It will also support the SEP's "desire to ensure the economic, environmental, and health benefits of clean energy are accessible to New Yorkers most in need" by increasing shared renewables such as community solar. As stated in the SEP, shared renewables will "serve as a particularly valuable tool to enhance access to clean energy in LMI communities and will help to ensure all New Yorkers can participate in the State's growing clean energy economy."</li> </ul>

<sup>44</sup> NYSERDA may permit project developers or sponsors to propose models where low-income participants pay a portion of their savings to the sponsor to receive other benefits, such as a longer-term subscription beyond the period of NYSERDA's contract with the project. NYSERDA will define specific requirements and circumstances where this is permissible.

## Target Market Characterization

<b>Target Market Segment(s)</b>	The target market includes low income residents (households with incomes below 60% of the State Median Income).
<b>Market Participants</b>	<p>Market participants include:</p> <ul style="list-style-type: none"> <li>• Community solar developers</li> <li>• Utilities</li> <li>• Agencies and energy efficiency contractors implementing low income energy programs that can be used in conjunction with the proposed program</li> <li>• Housing and social services providers with low income clients and residents</li> <li>• Local governments</li> <li>• Non-profit and community organizations with low income constituents</li> </ul>
<b>Market Readiness</b>	<ul style="list-style-type: none"> <li>• The residential solar market has grown 800% since 2011, demonstrating increased demand and value to residential customers.</li> <li>• The community solar market, while relatively nascent, also shows promising growth. As of July 31, 2017, 295 community solar projects totaling 735.5 MW have been approved for NY-Sun incentives<sup>45</sup>, demonstrating a solid supply of community solar credits during the initiative. Robust stakeholder participation in the Low-Income Community Distributed Generation Collaborative<sup>46</sup>, Value of Distributed Energy Resources Phase 2 LMI Working Group<sup>47</sup>, and related stakeholder processes indicates strong interest from market actors serving the low-income community.</li> <li>• Regulatory and utility changes are also laying the groundwork for community solar. The Phase One Value of Distributed Energy Resources proceeding<sup>48</sup> is now in implementation provides clarity on community solar project compensation. Additionally, the issuance of the revised Standardized Interconnection Requirements<sup>49</sup> will speed the deployment of commercial-scale solar projects, including community solar. REV Demonstration Projects and Pilots proposed or underway by Con Edison and National Grid also demonstrate the readiness of utilities to engage in low income solar.<sup>50</sup></li> <li>• Similar state-level program and policy approaches in California, Massachusetts, and Colorado have led to demand for community solar from low income customers, and have provided valuable lessons learned to consider in program design and implementation.<sup>51</sup></li> </ul>
<b>Customer Value</b>	<ul style="list-style-type: none"> <li>• Access to community solar subscriptions will allow low income households to participate in the growing clean energy economy while also seeing a reduction in energy costs.</li> </ul>

<sup>45</sup> Public information on the NY-Sun pipeline is available in Open NY: <https://data.ny.gov/Energy-Environment/Solar-Electric-Programs-Reported-by-NYSERDA-Beginn/3x8r-34rs/data>

<sup>46</sup> CDG Low Income Collaborative.

<http://www3.dps.ny.gov/W/PSCWeb.nsf/All/8A75B07F45E1672485257EDD00602D7C?OpenDocument>

<sup>47</sup> In the Matter of Value of Distributed Energy Resources.

<http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=15-E-0751&submit=Search+by+Case+Number>

<sup>48</sup> Ibid.

<sup>49</sup> Distributed Generation Information. <http://www.dps.ny.gov/distgen.htm>

<sup>50</sup> National Grid, the host of the Fruit Belt Project, aims to offer benefits by offering energy bill savings and for low-to-moderate income customers, and grid efficiency benefits to the local distribution system. The Commission recently approved Con Edison's Shared Solar Pilot Program for Low Income Customers and Con Edison is reviewing proposals it received from its RFI for Energy Solutions for LMI Customers.

<sup>51</sup> For a discussion of low income community solar programs and practices, please see Bringing the Benefits of Solar Energy to Low-Income Consumers: A Guide for States and Municipalities: <http://www.cesa.org/assets/2017-Files/Bringing-the-Benefits-of-Solar-to-Low-Income-Consumers.pdf>

	<ul style="list-style-type: none"> <li>• By acting as a large, creditworthy purchaser of community solar subscriptions on behalf of low income participants for the community solar projects selected via the solicitation, this initiative will increase the ability of those projects to gain financing and help the community solar market scale up in New York.</li> <li>• By acting as a large purchasers of community solar subscriptions, and managing low income customer acquisition and management, this initiative will reduce community solar project costs, in turn increasing the savings that can be provided to low income participants.</li> </ul>
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### ***Stakeholder/Market Engagement***

<b>Stakeholder/Market Engagement</b>	<p>Engagement to date:</p> <ul style="list-style-type: none"> <li>• There has been extensive stakeholder engagement around LMI community solar, including the Low-Income Community Distributed Generation Collaborative, which was convened by the New York Public Service Commission to identify barriers to low income customer participation in community distributed generation, including community solar.<sup>52</sup> Additionally, on July 17, 2017, DPS hosted the first meeting of the Value of Distributed Energy Resources Phase 2 LMI Working Group, which included a discussion of the proposed NYSERDA LMI Community Solar Initiative as well as other topics related to providing access to community solar for LMI customers. This initiative seeks to address many of the barriers to low income participation in community solar that were identified through this process.</li> <li>• In the Report on Alternative Approaches to Providing Low and Moderate Income Clean Energy Services, filed on February 3, 2017, the Clean Energy Advisory Council Low-to Moderate Income Working Group recommended that among other things to increase access to CDG for LMI customers, NYSERDA continue seeking ways to use CEF investments to enable LMI access to CDG projects that provide meaningful savings. In addition, the Working Group recommended that NYSERDA, DPS, and the utilities continue to explore options to increase customer participation in CDG projects through regulatory requirements or the provision of incentives. This program design considers the recommendations made by the Working Group to enable access to CDG projects through CEF investments.</li> <li>• On April 13, 2017 DPS hosted a Value of DER Technical Conference that focused on LMI participation in CDG projects. NYSERDA presented preliminary initiative details and gathered feedback from attendees which helped to refine this initiative.</li> <li>• NYSERDA has held ongoing discussions with solar developers regarding high customer management costs and difficulty with financing projects in general, with greater challenges identified for potentially serving LMI customers through their regular business model.</li> </ul> <p>Further engagement:</p> <ul style="list-style-type: none"> <li>• In addition to any formal DPS stakeholder processes, NYSERDA will engage regularly with market participants as the initiative is further developed and implemented. NYSERDA will also work with market</li> </ul>
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<sup>52</sup> CDG Low Income Collaborative.

<http://www3.dps.ny.gov/W/PSCWeb.nsf/All/8A75B07F45E1672485257EDD00602D7C?OpenDocument>

	<p>participants to develop a post-initiative transition strategy, as described in the activities section.</p> <ul style="list-style-type: none"> <li>• This initiative will be closely coordinated with ongoing LMI activities (e.g. the Low-Income Forum on Energy) as part of the broader CEF LMI strategies and will leverage existing LMI outreach, enrollment, and administrative infrastructure to increase participation and reduce program costs.</li> </ul>
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### *Theory of Change*

<b>Market Barriers Addressed</b>	<ul style="list-style-type: none"> <li>• <b>Typical community solar subscription terms are too restrictive for many low-income customers.</b> Primarily due to perceived risk by solar financiers, who have limited experience in the new community solar market, community solar subscription terms will often include lengthy terms, penalties, or relatively high customer credit requirements. By directly securing community solar subscriptions for low income customers, NYSERDA can set terms that are appropriate and accessible.</li> <li>• <b>Low income customers are unlikely to be able to access community solar subscriptions that offer adequate savings.</b> Typical community subscription models offer limited energy costs savings, and the expectation of high customer acquisition and management costs is anticipated to limit marketing to low income customers by developers. This initiative will address this barrier by directly securing community solar subscription that will be offered to low income customers at no cost, providing greater cost savings and more reliable access than would otherwise be available.</li> <li>• <b>Community solar developers face high customer acquisition costs, and do not typically focus marketing efforts on low income customers.</b> This initiative will address this barrier by marketing program offerings to the low-income market segment, leveraging other low-income energy programs and outreach channels.</li> </ul>
<b>Testable Hypotheses</b>	<ul style="list-style-type: none"> <li>• If NYSERDA secures community solar subscriptions for low income customers through a solicitation process and offers them to low income customers at no-cost, then these subscriptions will provide a cost-effective way to provide low income customers access to the benefits of community solar that can be adapted and expanded in the future.</li> <li>• If program marketing is designed to address segment-specific concerns and is delivered in coordination with other low-income outreach channels, then low income customers will enroll in the program.</li> </ul>

Activities	<p><b>Solicit for community solar project capacity for subscriptions for low-income customers</b></p> <ul style="list-style-type: none"> <li>• NYSERDA will solicit for and contract with community solar project developers to dedicate capacity in community solar projects to low income customers.</li> <li>• NYSERDA anticipates at least two rounds of the solicitation. The solicitation structure, requirements, and targets will be developed based on: <ul style="list-style-type: none"> <li>○ Lessons learned from successful solar procurement examples,</li> <li>○ Analysis of CDG project economics and industry cost data</li> <li>○ Input from solar project developers and financiers</li> <li>○ Policy factors, including geographic diversity and local-level project support</li> <li>○ Insight from the ongoing implementation of the NY-Sun Initiative and the Community Distributed Generation program</li> </ul> </li> </ul> <p><b>Enroll and engage low income participants</b></p> <ul style="list-style-type: none"> <li>• NYSERDA will develop customer education and program marketing materials targeted to low income customers.</li> <li>• In collaboration with low income energy programs, utilities, participating solar developers, community agencies, and other partners, NYSERDA will engage potential customers, provide program information, verify customer income-eligibility, and enroll participants in the program. NYSERDA and its partners will use a range of outreach and marketing activities to engage potential customers, and NYSERDA will develop customer education materials to be used for this purpose.</li> <li>• NYSERDA may prioritize outreach to specific low-income customer sub-segments that are less likely to fully benefit from low income efficiency programs, such as renters and electric heating customers.</li> <li>• Participants will be provided with no-cost community solar subscriptions, with no fees for ending participation. Standard subscriptions will be structured and sized to not interfere with the customer receiving the full value of the Energy Affordability bill discount, HEAP benefit (if electric heating customer), or typical electrical efficiency measures.</li> <li>• NYSERDA will direct participating community solar project sponsors, per the terms of their contracts with NYSERDA, to allocate community solar subscriptions to low income program participants as specified by NYSERDA (e.g. to customers in the appropriate utility zone).</li> </ul> <p><b>Develop a post-initiative transition strategy</b></p> <ul style="list-style-type: none"> <li>• NYSERDA will develop a strategy to transition efforts to ensure low income customer participation to sustainable, long-term, models. <ul style="list-style-type: none"> <li>○ This strategy will seek to leverage the expertise and resources of a range of market participants, including utilities, investors, project developers, and community agencies.</li> <li>○ The strategy will consider models for long-term community management and/or ownership, utility management, community development and philanthropic investment, and other approaches to cost-effectively provide community solar access for low income customers. During the initiative, these models will be tested as appropriate, including through the Affordable Solar Predevelopment and Technical Assistance program, which is funded through the NY-Sun Initiative.<sup>53</sup></li> <li>○ The strategy will also address the transition of the individual low-income participants in the program after the end of NYSERDA’s contracts with project sponsors.</li> </ul> </li> </ul>
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<b>Key Milestones</b>	<p><b><u>Milestone 1 (2017)</u></b></p> <ul style="list-style-type: none"> <li>Issue solicitation for community solar projects to dedicate generation to low-income customers with a standard offer subscription.</li> </ul> <p><b><u>Milestone 2 (2018)</u></b></p> <ul style="list-style-type: none"> <li>Execute agreements with community solar projects for capacity dedicated to low income subscriptions.</li> </ul> <p><b><u>Milestone 3 (2018)</u></b></p> <ul style="list-style-type: none"> <li>Initiate low income customer outreach and enrollment.</li> </ul> <p><b><u>Milestone 4 (2018-2020)</u></b></p> <ul style="list-style-type: none"> <li>Issue additional solicitation(s) for community solar projects, if needed.</li> </ul> <p><b><u>Milestone 5 (2018-2020)</u></b></p> <ul style="list-style-type: none"> <li>Execute additional agreements with community solar projects for low income subscriptions, in needed.</li> </ul> <p><b><u>Milestone 6 (2020)</u></b></p> <ul style="list-style-type: none"> <li>Finalize post-initiative transition strategy.</li> </ul>
<b>Goals Prior to Exit</b>	<ul style="list-style-type: none"> <li>Demonstrate successful model for low-income customer participation in community solar.</li> <li>Develop strategy to transition program to post-initiative state that sustains low income participation in community solar at 10% or more of overall participation by residential customers in community solar.</li> </ul>

### ***Relationship to Utility/REV***

<b>Utility Role/Coordination Points</b>	<ul style="list-style-type: none"> <li>This initiative anticipates a growing role for the utilities as the initiative progresses, in particular as the policies adopted by the New York Public Service Commission in the May 2016 Order Adopting Low Income Program Modifications<sup>54</sup> regarding low income customer bill discounts are implemented by the utilities, greater coordination on customer outreach, referral, and management will become possible.</li> <li>Utility collaboration will initially be sought for LMI customer outreach and engagement. Opportunities will also be sought to reduce administrative costs through coordination with the utilities (for example, by program staff providing low income CDG customer allocation forms directly to the utility rather than indirectly through the CDG project sponsor).</li> <li>In addition, community solar cost reduction efforts initiated by the March 2017 Value of DER order will encourage utility coordination on this initiative, particularly on customer billing and management.</li> </ul>
<b>Utility Interventions in Target Market</b>	<ul style="list-style-type: none"> <li>Two utilities have developed demonstration projects and pilots under REV that address low income customer access to community solar, described below. NYSEDA will work utilities both to learn from their interventions in this market, and to more effectively implement and transition the intervention described in this investment plan.</li> </ul>

<sup>53</sup> <https://www.nyserda.ny.gov/aspta>

<sup>54</sup> <http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=14-M-0565&submit=Search+by+Case+Number>

	<ul style="list-style-type: none"> <li>The National Grid Fruitbelt Neighborhood Solar Demonstration aims to help low-to moderate-income customers access clean energy while reducing arrears through a neighborhood solar project in an economically distressed area, and test how solar can be paired with communications technologies to deliver benefits to the overall electricity system<sup>55</sup>.</li> <li>On August 2, 2017, the Public Service Commission approved a Shared Solar Pilot Program by Con Edison with significant similarities to the program described in this investment plan. In the pilot phase, Con Edison will offer up to 1,600 of their low-income customers participation in 3 MW of community solar projects sited on property owned by the utility. Participants will pay no costs and will receive approximately \$5 per month in savings.</li> <li>In approving the Con Edison program, the Public Service Commission noted that “The Department of Public Service and the New York State Energy Research and Development Authority (NYSERDA) will continue their work with solar energy developers, low-income advocates, utilities and others to develop similar shared solar systems across the state.”<sup>56</sup></li> </ul>
<b>Fuel Neutrality</b>	<ul style="list-style-type: none"> <li>This program will not be offered on a fuel-neutral basis.</li> </ul>

#### 15.4.1.1 Budgets & Expenditures

An annual commitment budget for all activities included in this chapter is shown in Table 22. The annual expenditure projection is included in Table 23. Budgets and expenditures do not include Administration, Evaluation, or Cost Recovery Fee; these elements are addressed in the Budget Accounting and Benefits chapter filing. The budget as presented in the Budget Accounting and Benefits Chapter will serve as the basis for any subsequent reallocation request. The additional level of detail presented within the table below is intended for informational purposes only.

This initiative will also commit and expend approximately \$750,000 in RGGI funds for community-level outreach and customer engagement. This \$750,000 is in addition to the CEF funding requested in Table 22.

**Table 22: Annual Market Development Allocation – Commitment Basis**

<b>Commitment Budget</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Total</b>
Direct Incentives and Services	\$0	\$9,900,000	\$5,940,000	\$3,960,000	\$19,800,000
Implementation Support	\$1,445,000	\$0	\$0	\$0	\$1,445,000
<b>Total</b>	<b>\$1,445,000</b>	<b>\$9,900,000</b>	<b>\$5,940,000</b>	<b>\$3,960,000</b>	<b>\$21,245,000</b>

**Table 23: Annual Expenditures Projection**

<b>Expenditures</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>Total</b>
<b>Total</b>	1%	20%	15%	13%	6%	6%	6%	6%	6%	6%	6%	6%	3%	1%	100%

<sup>55</sup> <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/B2D9D834B0D307C685257F3F006FF1D9?OpenDocument>

<sup>56</sup> <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={6822F974-4B4E-4300-9BD6-FEA0F573DC58}>



#### 15.4.1.2 Progress and Performance Metrics

Table 24 provides program Activity/Output indicators representing measurable, quantifiable direct results of activities undertaken in the initiative. Outputs are a key way of regularly tracking progress, especially in the early stages of an initiative, before broader market changes are measurable. Outcome indicators can encompass near-term through longer-term changes in market conditions expected to result from the activities/outputs of an intervention. Outcome indicators will have a baseline value and progress will be measured periodically through Market Evaluation.

**Table 24. Initiative Specific Metrics**

<b>Indicators<sup>57</sup></b>		<b>Baseline (Before/Current)</b>	<b>2020 (Cumulative)</b>
Activity/Outputs	Capacity of community solar projects contracted by NYSERDA for low income customer subscriptions (MW DC).	0	16 <sup>58</sup>
	Number of program participants enrolled through outreach and marketing <sup>59</sup> activities.	0	24,000
Near-Term Outcomes	Number of community solar subscriptions provided to low income customers through the initiative	0	10,000
	Low income customer acquisition costs <sup>60</sup>	\$1000 <sup>61</sup>	\$175
	Low income customer management costs <sup>62</sup>	\$75 <sup>63</sup>	\$15
	Cost savings to low income program participants	0	\$5 million
Mid- and Long-term Outcomes	Participation of low income customers in community solar projects post-initiative	0%	10%

The LMI Community Solar initiative will support NY-Sun and its efforts to achieve 3 GW of solar by 2023. This investment plan does not claim direct benefits in addition to those already accounted for by NY-Sun. Accordingly, benefits are not included herein.

<sup>57</sup> A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

<sup>58</sup> 16 MW DC will generate approximately 18.78 MWh per year.

<sup>59</sup> The program targets 10,000 subscriptions for low income customers. However, it is anticipated that as participants move or otherwise leave the program, replacement customers will be enrolled. For planning purposes, NYSERDA is assuming that 20% of participants will leave the program each year, and that up to 24,000 individual households will participate over the course of the program.

<sup>60</sup> Per participant.

<sup>61</sup> This number reflects a best estimate of average residential customer acquisition costs based on interviews with community solar projects developers conducted by NYSERDA.

<sup>62</sup> Per participant, per year.

<sup>63</sup> This number reflects a best estimate of average residential customer management costs based on interviews with community solar projects developers conducted by NYSERDA.

**Table 25. Annual Projected Initiative Participation<sup>64</sup>**

<b>Participants</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Total</b>
Low Income Residential Customers	3,000	4,000	3,000	10,000

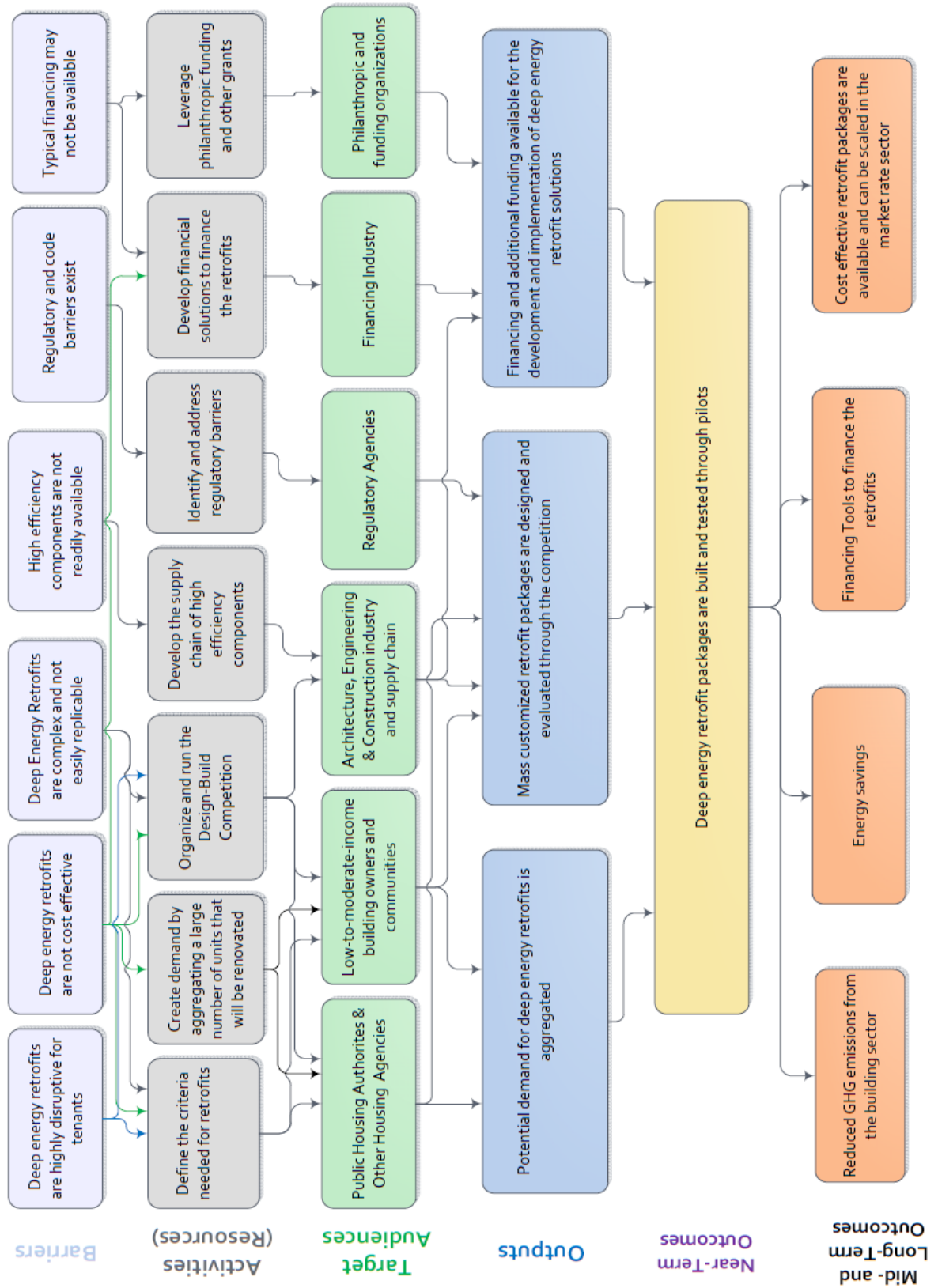
***Performance Monitoring and Evaluation Plans***

<b>Performance Monitoring &amp; Evaluation Plan</b>	<p>NYSERDA’s approach to monitoring and assessing the effectiveness of the initiative and overall market development is described below.</p> <p><b><u>Test-Measure-Adjust Strategy</u></b></p> <ul style="list-style-type: none"> <li>• NYSERDA will monitor the output metrics of all activities described above, segmented by targeted customer type. Marketing messages, incentive levels/structure, administrative process, and other program activities will be adjusted based on periodic review of these metrics.</li> <li>• Based on the solicitation response and outcome of the contracting and implementation processes, NYSERDA may revise and reissue the solicitation as needed over the course of the initiative. Factors to be considered include: <ul style="list-style-type: none"> <li>○ Number of responding solar project owners/developers, and quantity of projects/capacity proposed</li> <li>○ Pricing presented in the solicitation responses</li> <li>○ Range of project geography, size, and business models presented in the solicitation responses</li> <li>○ Rate of completion, delay, and/or attrition of projects selected</li> </ul> </li> <li>• Insights as to how the initiative can be optimized will be gathered and applied to future initiative design to ensure greatest market impacts within the identified market sectors.</li> </ul> <p><b><u>Market Evaluation</u></b></p> <ul style="list-style-type: none"> <li>• Market Evaluation draws on the theory of change of the related logic model and will include baseline and longitudinal measurement of key indicators of success.</li> <li>• Baseline measurements of key market indicators will occur within one year following initiative approval and will provide additional insights that will allow NYSERDA to adjust the strategy. These include but are not limited to: the number of community solar projects contracted by NYSERDA for low income customer subscriptions and number of outreach and marketing campaigns by NYSERDA focused on low income community solar customers.</li> <li>• Regular (e.g., annual or biennial) updates to key performance indicators and measurement of market change, including but not limited to: number of community solar subscriptions, and customer acquisition/management and financing costs for LMI solar projects.</li> <li>• Sources of data will include public and commercially available data, Salesforce, and primary data collection through surveys of key market actors.</li> </ul> <p><b><u>Impact Evaluation/Field Verification</u></b></p> <ul style="list-style-type: none"> <li>• Impact Evaluation will be completed for the NY-Sun portfolio, and will include projects developed under this program.</li> </ul>
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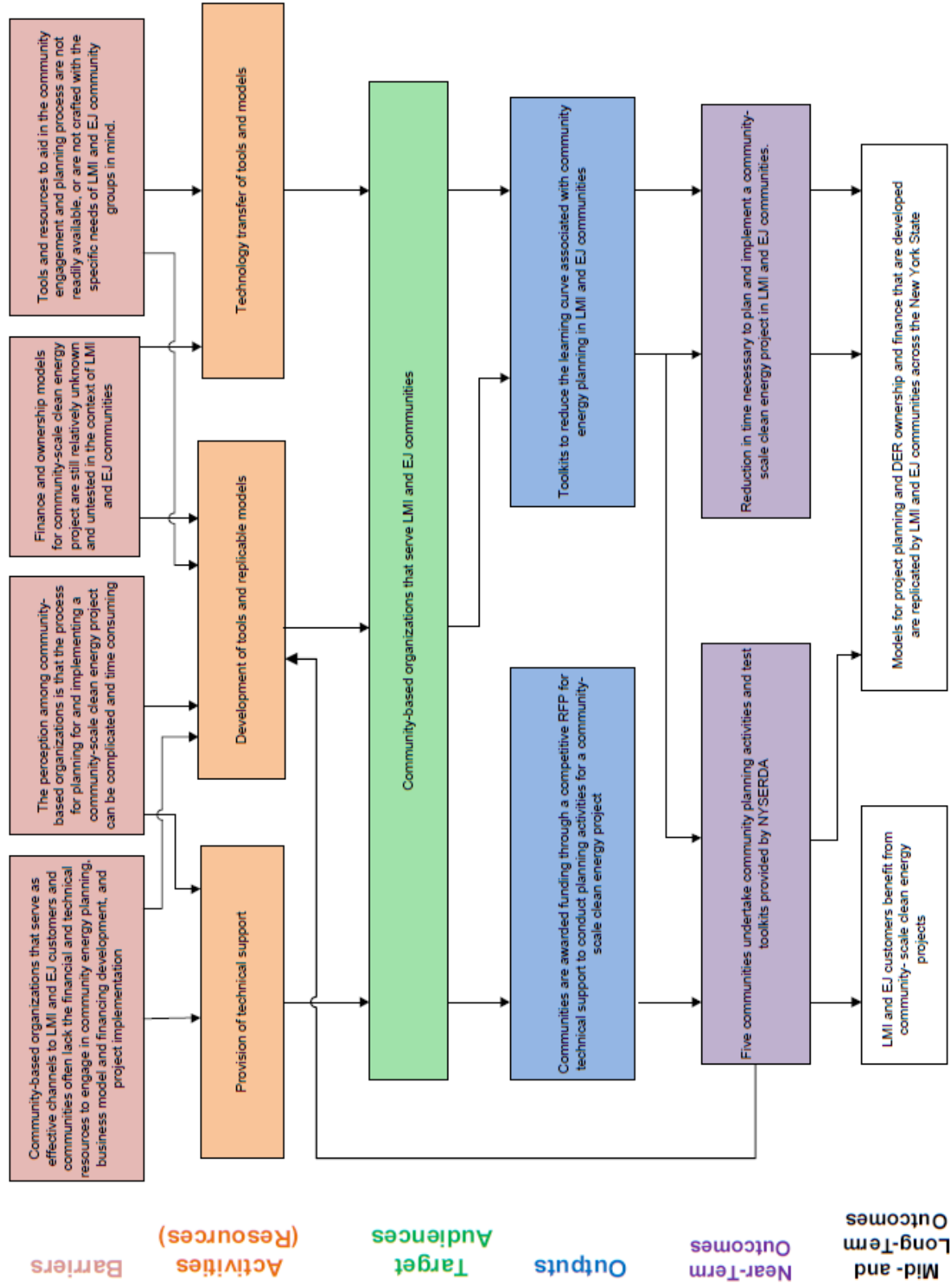
<sup>64</sup> Table 25, counts newly filled subscriptions (up to the program goal of 10,000). However, it is anticipated that as participants move or otherwise leave the program, replacement customers will be enrolled. For planning purposes, NYSERDA is assuming that 20% of participants will leave the program each year, and that up to 24,000 individual households will participate over the course of the program.

## Appendix A – Logic Models

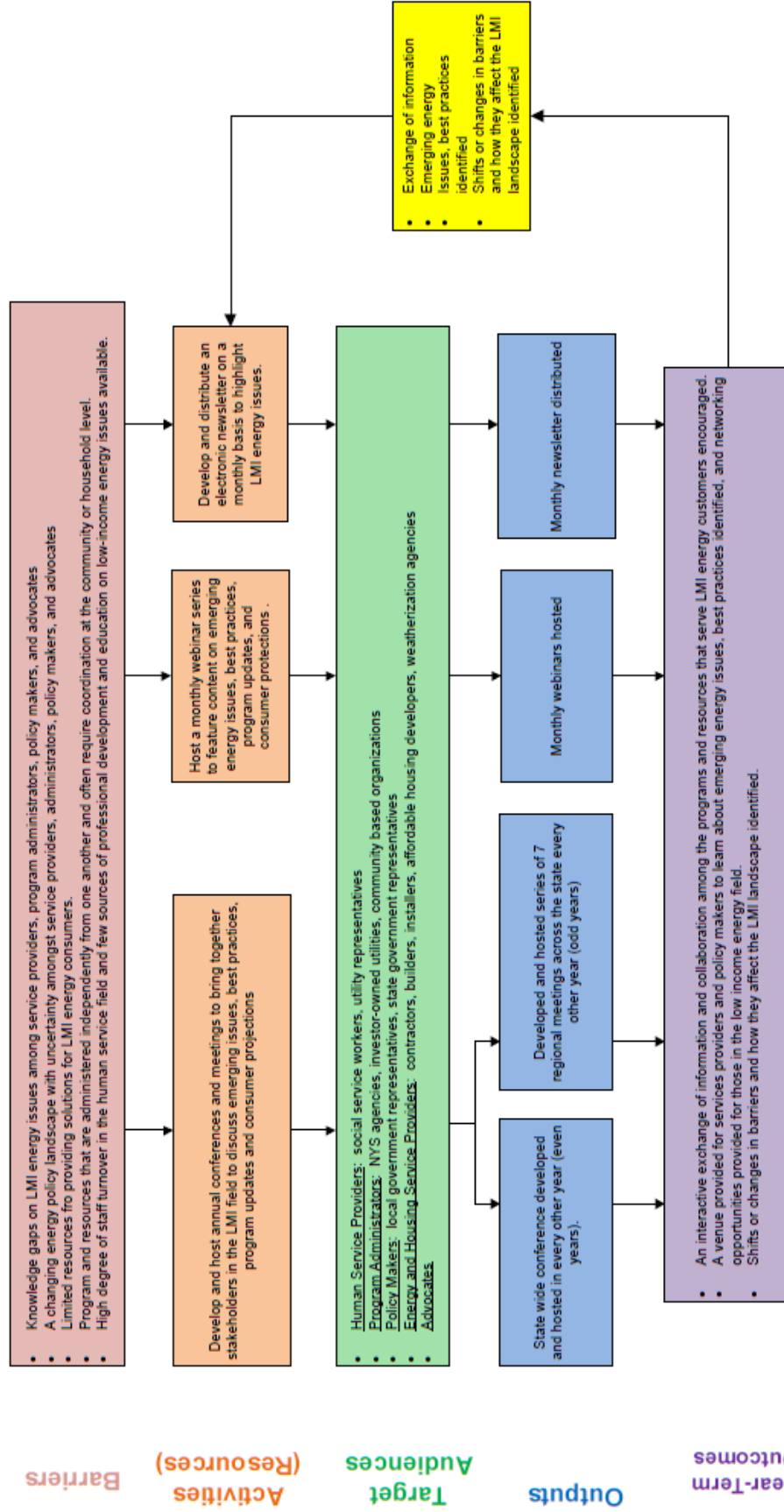
### LOGIC MODEL: RetrofitNY



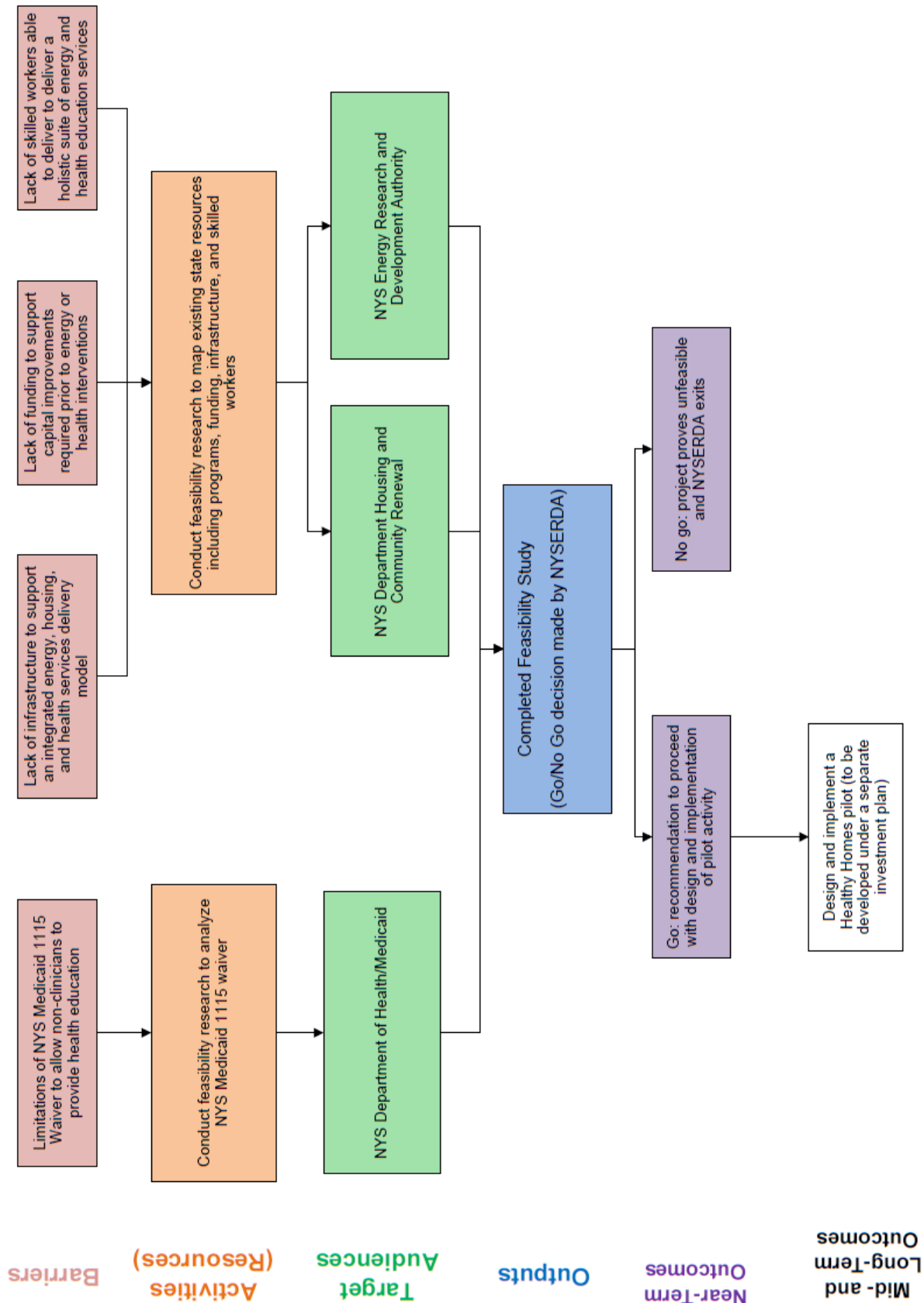
## LOGIC MODEL: REVitalize



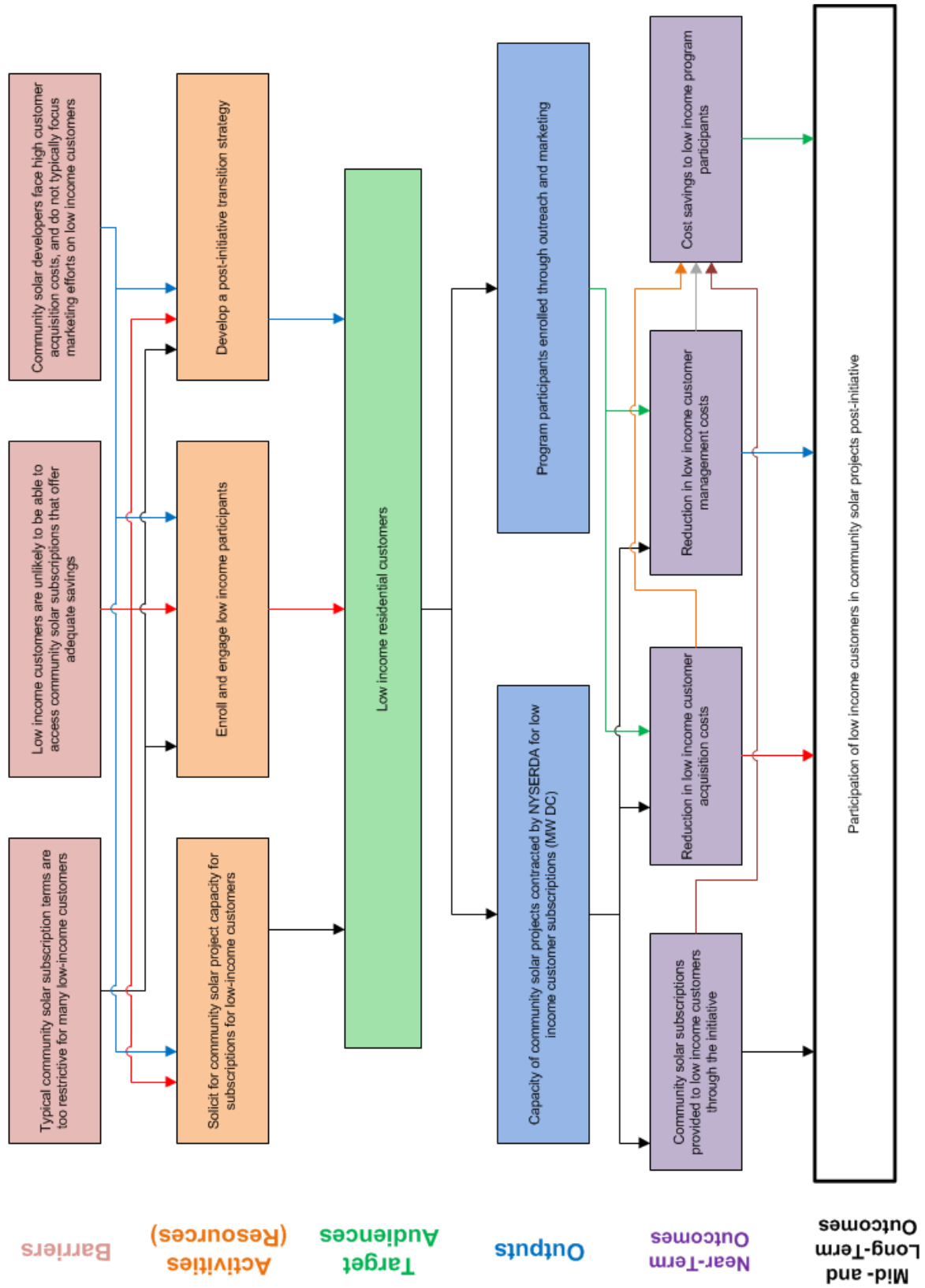
# LOGIC MODEL: LIFE: Low-Income Forum on Energy (Education and Awareness Initiative)



# LOGIC MODEL: Healthy Homes Feasibility Study



## LOGIC MODEL: Low Income Community Solar



## Appendix B – CEF LMI Portfolio 3 Year Budgets

The following table represents all programmatic LMI CEF budgetary allocations for the first three years of the CEF, as of the date of this filing.<sup>65</sup> The budgets do not include Administration, Evaluation, or Cost Recovery Fee; these elements are addressed in the Budget Accounting and Benefits chapter filing. The CEF Order directs NYSERDA to allocate a minimum of \$234.5 million to LMI initiatives over the first three years of the CEF.<sup>66</sup> The allocation of the balance of funds, net Administration and Cost Recovery Fee, will be informed through stakeholder engagements and recommendations from the CEAC LMI Working Group.

<b>CEF Investment</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>3 Year Total</b>
Resource Acquisition Transition Programs <sup>67</sup>	\$36,707,184	\$77,785,377	\$61,826,000	\$176,318,567
<i>Single Family LMI</i>	\$31,202,557	\$57,910,000	\$45,335,000	\$134,447,557
<i>Multifamily LMI</i>	\$848,624	\$13,520,377	\$8,136,000	\$22,505,001
<i>New Construction LMI</i>	\$4,656,000	\$ 6,355,000	\$8,355,000	\$ 19,366,000
Market Development Initiatives	\$0	\$7,373,000	\$6,377,000	\$13,850,000
<i>Retrofit NY</i>	\$0	\$6,413,000	\$6,177,000	\$12,590,000
<i>REVitalize</i>	\$0	\$600,000	\$125,000	\$725,000
<i>Low-Income Forum on Energy</i>	\$0	\$245,000	\$75,000	\$320,000
<i>Healthy Homes Feasibility Study</i> <sup>68</sup>	\$0	\$215,000	\$-	\$215,000
NY-Sun Initiatives	\$0	\$1,445,000	\$9,900,000	\$11,345,000
<i>Low-Income Community Solar</i>	\$0	\$1,445,000	\$9,900,000	\$11,345,000
<b>Total</b>	<b>\$36,707,181</b>	<b>\$86,703,377</b>	<b>\$78,103,000</b>	<b>\$201,513,567</b>

<sup>65</sup> As outlined in Section 15.2.5, funds beyond the initial three years of the CEF have been committed, however this table is intended to present a summary of budget commitments over the first three years of the CEF to compare with the CEF order requirements to commit \$234.5 million over the first three years of the CEF.

<sup>66</sup> The \$234.5 million is inclusive of Administration and Cost Recovery Fee funding; the total net Administration and Cost Recovery Fee is \$210.6 million.

<sup>67</sup> Filed as part of the Resource Acquisition Transition Chapter on February 22, 2016.

<sup>68</sup> The Healthy Homes Feasibility study will take place in Q4 2016. Based on the outcome of the Healthy Homes Feasibility study, NYSERDA will determine whether to proceed with the implementation of a pilot. The 2017 budget includes funds for pilot design. If NYSERDA determines that the pilot should be implemented, a supplemental investment plan will be filed to account for the pilot implementation.



## Appendix C – CEF LMI Portfolio 3 Year Direct Impacts

The following table presents the direct impacts associated with the LMI portfolio for the first three years of the CEF, including the standard offer and market development initiatives, as of the date of this filing.

Primary Metrics		2016	2017	2018	TOTAL
Energy Efficiency	MWh Annual	12,670	18,464	25,784	56,918
	MWh Lifetime	223,100	314,090	434,890	972,080
	MMBTU Annual	224,600	305,325	399,465	929,390
	MMBTU Lifetime	5,284,000	6,832,592	8,359,492	20,476,084
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		19,230	26,843	36,102	82,175
CO2e Emission Reduction (metric tons) Lifetime		413,000	547,755	698,135	1,658,890
Customer Bill Savings Annual (\$ million)		\$4.3	\$6.1	\$8.0	\$18.4
Customer Bill Savings Lifetime (\$ million)		\$91.7	\$122.9	\$154.4	\$368.9
Private Investment (\$ million)		\$40.9	\$59.3	\$81.5	\$181.7
LMI Units Served		17,334	26,709	28,094	72,137