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

Portfolio: Market Development

Submitted by:

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15 Low- to Moderate-Income

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.[1] 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.[2] Many of these households spend a disproportionate share of their annual income on energy bills[3] relative to higher income New Yorkers. In addition, LMI households often lack the time, financial resources[4], and information necessary to invest in or gain access to energy efficiency upgrades or renewable energy systems, despite the fact that 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. In order 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 component of the strategy is meaningful NYSERDA coordination with other state agencies to

[1] 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.

[2] 2013 American Community Survey.

[3] 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.

[4] Including credit profiles.

maximize the impact and reach of various publically-funded LMI energy and housing programs currently administered by New York State[5].

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[6], 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.[7] 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[8]

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 addition, NYSERDA will be developing a program offering to encourage the development of community-shared solar projects to support LMI

[5] 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.

[6] The $234.5 million investment includes costs associated with program implementation, incentives, NYSERDA administration, and the associated New York State Cost Recovery Fee.

[7] 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.

[8] 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.

customers and communities. For additional detail on the NY-Sun LMI investments, please refer to the NY-Sun Operating Plan.

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 Resource Acquisition Chapter includes detail 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[9] 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. For additional detail on the Single Family, Multifamily, and New Construction LMI programs, please refer to the Resource Acquisition Transition Chapter, available at http://www.nyserda.ny.gov/About/Clean-Energy-Fund.

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 $107 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 three options for buildings to improve their energy performance: a targeted option, which provides incentives for single measure installations with no minimum energy reduction target; a comprehensive option that will provide incentives for work scopes designed to achieve at least 25% 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 $34 million for the period 2016-2018 across the three options.

[9] 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.

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[10] and the fact that the transactions occur on a project by 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 located 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 publically-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

[10] For example, a whole-house energy efficiency retrofit can exceed $4,000.

other New York State activities for the LMI market segment.[11] NYSERDA will explore these opportunities with stakeholders and the Clean Energy Advisory Council (CEAC) [12] 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[13] 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 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.

[11] 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.

[12] 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).

[13] 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.

Table 1. Summary of Statewide Coordination Efforts

Organizations	Nature of Coordination
Low-Income Energy Program Interagency Task Force[14]	• 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.
NYS Department of Environmental Conservation	• Explore opportunities to improve energy and health outcomes in environmental justice communities.
NYS Department of Health (DOH)	• Develop an approach to quantify the health outcomes and healthcare cost reductions associated with energy efficiency improvements. • Explore opportunities for developing a programmatic approach for addressing energy efficiency and healthy homes improvements for low-income customers.
NYS Department of Public Service (DPS)	• 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.
NYS Homes and Community Renewal (HCR)	• 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: ○ exploring opportunities to increase energy performance requirements associated with the Low-Income Housing Tax Credit and the Qualified Allocation Plan; ○ the development of a Green Physical Needs Assessment, in coordination with other key stakeholders including housing authorities; ○ exploring the development of underwriting criteria for high performance new construction projects, based on reduced operational costs; and ○ piloting model based utility allowances in New York, in coordination with other key stakeholders. • Alignment between WAP and EmPower NY to reduce overlap and administrative burden for the agencies, service providers, and customers.
NYS Office of Temporary and Disability Assistance	• Maximize the reach of HEAP[15] funds through increased consumer education and targeted efficiency services.
Utilities	• 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. • Exploring alternate models for providing service to LMI customers, while adding customer value.

[14] 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.

[15] 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[16]

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, NYSERDA 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 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

[16] This section will be updated as additional market development initiatives are developed under the CEF.

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

Intervention Strategy	• 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. • 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. • To create this market, NYSERDA will: o Define high-level criteria that the architecture, engineering, and construction industry will need to meet to create the retrofit solutions. o 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. o 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. o 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. o 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. • For a visual representation of this strategy, please reference the flow chart entitled "Logic Model: RetrofitNY," which can be found in Appendix A
Goals	• 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: o To ensure that affordable housing is prioritized when it comes to developing solutions for enabling the adoption of clean energy solutions. o 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. o 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. o To identify and address any regulatory issues that could hinder the implementation of the solutions.

Target Market Characterization

Target Market Segment(s)	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. 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.
Market Participants	Market participants include: • Public Housing Authorities • NYS Affordable Housing regulatory agencies including HCR and HPD • Housing Finance Agencies including New York State Housing Finance Agency, and HDC • Private building owners • Tenants of affordable housing buildings and LMI communities • Builders, developers, architects, suppliers, engineers, building scientists, and other service providers • Private financing companies, insurance and re-insurance companies, and energy service companies • Philanthropic organizations
Market Readiness	• 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. • 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 savings. Major financing and issuance actors have also expressed interest in financing deep-energy retrofits and guaranteeing energy savings for these projects. • 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. • 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.

	• 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.
Customer Value	Value to LMI Tenants: • The tenants of the retrofitted units will benefit from an improved quality of life. Their apartments will be more comfortable thermally and acoustically. • The indoor air quality will also be improved, providing health benefits like a reduction in the frequency and severity of respiratory afflictions. • 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. Value to Affordable Building Owners: • 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. • Maintenance and operation costs (e.g., utility costs) will be reduced. • The comfort of the tenants will be improved, which will likely reduce tenant complaints and tenant turn over. Value for Public Housing Authorities and Affordable Housing Regulatory and Financing Agencies: • 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: o Significantly improve the quality of the renovations they conduct on distressed buildings for a similar or lower cost per unit. o Improve the quality and value of the buildings in their portfolio. o Benefit from reduced maintenance and operation costs. o Offer new opportunities to renew existing or sign additional regulatory agreements. Value to the Architecture, Engineering, and Construction Industry and Other Trades Involved in the Retrofits: • 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. • Designing and implementing innovative solutions will also provide them with the opportunity to differentiate themselves from their competitors.

Stakeholder/Market Engagement

Stakeholder/Market Engagement	Engagement To-Date: • Conducted an in-depth assessment of the Stroomversnelling program, after which this initiative is modeled. • 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.

	• 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. • Further assessed feasibility through discussions with Passive House NY, Passive House Institute US, Urban Green Council and Enterprise Community Partners. • 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. • Held preliminary discussions on potential financing solutions with key actors from the financing, insurance, and re-insurance sectors. <u>Further Engagement:</u> • Conduct research with building owners and tenants to confirm the key criteria to be met by deep-energy retrofit solutions. • Conduct outreach to ensure that qualified companies and individuals participate in the design competition. • 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. • NYSERDA will also utilize the CEAC LMI Working Group as a way to engage with stakeholders, as appropriate.

Theory of Change

Market Barriers Addressed	• Deep-energy retrofits in multifamily buildings are currently not cost effective, are complex, not easily replicable, and are highly disruptive for tenants. • High-efficiency building components necessary for conducting retrofits are not readily available in the US. • 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. • 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.
Testable Hypotheses	• If simplified solutions to conduct deep-energy retrofit are developed, then more buildings will be retrofitted to a high level of efficiency. • 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. • If solutions are built and tested through pilots, then the industry will streamline the solutions reducing costs and improving performance.
Activities	To create a self-sustaining marketplace for the deep-energy retrofits of tenanted multifamily buildings in New York State, NYSERDA will:

	1. <u>Define the Criteria Needed for Retrofits</u> • 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. • Criteria could include[17]: 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. 2. <u>Create Demand by Aggregating a Large Number of Units to be Renovated</u> • 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. • 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. 3. <u>Organize and Run the Design-Build Competition</u> • 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. • 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. • NYSERDA will carefully monitor implementation and results in terms of energy savings, construction costs, comfort, and disruption to tenants during construction. • 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. • 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 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.

[17] 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.

	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. 4. Develop Supply Chain of High Efficiency Components • 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. 5. Identify and Address Regulatory Barriers • NYSERDA will identify regulatory issues such as restrictive building codes and owner/tenant split incentive concerns. • 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. 6. Develop Financial Solutions to Finance the Retrofits • 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. 7. Leverage Philanthropic Funding and Other Grants • 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.
Key Milestones	Milestone 1(2016) • Criteria to be met by technical solutions are defined. Milestone 2 (2017) • Sufficient potential demand for deep energy retrofits is aggregated. Milestone 3 (2017) • Competitive solicitation for the first round of the design-build competition is released. Milestone 4 (2018) • One or more solutions are built and tested through the design-build competition. Milestone 5 (2020) • Solution(s) are adapted to additional building typologies. Milestone 6 (2020) • 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. Milestone 7 (2022) • Retrofit solutions are integrated in the public housing authorities' and affordable housing regulators' preservation strategies.

	Milestone 8 (2025) • Retrofit solutions are cost effective and NYSERDA subsidies are no longer necessary. Milestone 9 (2025) • Building components and systems required for deep energy retrofits are readily available in the New York market. Milestone 10 (2025) • Financing solutions exists for building owners to purchase these solutions with minimal upfront cost. Milestone 11 (2025) • Solutions are implemented on non-Affordable Housing buildings without subsidy.[18]
Goals Prior to Exit	• Solutions meeting all defined criteria are available for building owners to purchase and install. • Financing solutions exist for building owners to purchase these solutions with minimal upfront cost. • As a result, a self-sustaining market for retrofit packages exists and NYSERDA financial incentives are no longer needed to implement the retrofits.

Relationship to Utility/REV

Utility Role/Coordination Points	• 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. • NYSERDA will also engage utilities on the potential to leverage the work done through RetrofitNY to inform REV Demonstration projects as follows: o 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; o 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, o potentially play a central role in developing mechanisms to address owner/tenant split incentive issues. • 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.
Utility Interventions in Target Market	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.

[18] 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.

Fuel Neutrality

Fuel Neutrality	• 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. • 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. • The fuel neutral approach outlined in this document is expected to deliver a metric ton of lifetime carbon savings for every $105 spent. If this program were shifted to an electric only approach, the cost would be closer to $310 per metric ton of carbon.

Performance Monitoring and Evaluation Plans

Performance Monitoring & Evaluation Plan	NYSERDA's approach to monitoring and assessing the effectiveness of the initiative and overall market development is described below. <u>Test-Measure-Adjust Strategy</u> • 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. • The solutions will then be tested on specific buildings through demonstration projects. • 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. <u>Measurement & Verification (M&V) Strategy</u> • Validate projected energy performance of the selected industry designed solutions. • 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. • Test and monitor pre and post retrofit thermal comfort and indoor air quality. • Assess tenant and building owner satisfaction. <u>Market Evaluation</u> Surveys and interviews will be conducted to provide real-time insights and support systematic evaluation of the intervention, including its effectiveness for 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. 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.

	Impact Evaluation/Field Verification • Evaluation M&V will be conducted for a sample of participating buildings, according to the International Performance Measurement & Verification Protocol (IPMVP) method(s) most appropriate given the retrofits made. Evaluation M&V will rely heavily on the program M&V strategy, data, and findings to validate program estimated savings. • 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. • Data from Field Verification/Impact Evaluation can be used to help lend confidence in the market, especially among other end users.

15.2.2 REVitalize[19]

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

Intervention Strategy	• 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.[20] • NYSERDA will issue a competitive Request for Proposals (RFP) for five LMI communities to receive funding for technical assistance[21] 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. • 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.

[19] 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.

[20] 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.

[21] 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.

	• 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. • For a visual representation of this strategy, please reference the flow chart entitled "Logic Model: REVitalize," which can be found in Appendix A.
Goals	The primary goals of REVitalize are to: • 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; • develop a replicable framework for conducting LMI community energy planning, focused on a cornerstone community-scale clean energy project; • to develop templates and toolkits to aid in the project planning process and ensure best practice adoption statewide; and • 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.

Target Market Characterization

Target Market Segment	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.
Market Participants[22]	Market participants include: • Community-based organizations • LMI residents and customers • Technical consultants • Project developers • Financiers and foundations
Market Readiness	The following indicators signal that the REVitalize initiative will have success in spurring clean energy planning and development in LMI and EJ communities: • Regulatory developments in New York State encourage and allow for community net metering and local ownership of DER; • Community Choice Aggregation is generating significant interest in the development of locally-sourced and owned distributed generation; • 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

[22] 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.

	to NYSERDA for the purposes of informing the further development of REVitalize. • 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; • the feasibility phase of NY Prize resulted in 83 proposals, indicating an interest in community-scale energy projects, focused on microgrids; • 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.
Customer Value	• 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: o an opportunity to receive funding for the technical assistance necessary to conduct community-level planning and project development; and o a toolkit to aid in the planning for a community-scale clean energy project.; and o support to develop models for innovative project finance and ownership.

Stakeholder/Market Engagement

Stakeholder/Market Engagement	• NYSERDA has engaged several market actors on the concept of community-led clean energy planning within LMI and EJ communities, as follows: o 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; o 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. o 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. • NYSERDA will also utilize the CEAC LMI Working Group as a way to engage with stakeholders, as appropriate.

Theory of Change

Market Barriers Addressed	• 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.

	• 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. • Finance and ownership models for community-scale clean energy projects are still relatively unknown and untested in the context of LMI and EJ communities. • 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.

Testable Hypothesis	• 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.
	• If a replicable framework for community energy planning and project development, including finance and ownership models, can be developed, then
	  o LMI and EJ communities will be empowered to undertake and implement community-scale clean energy projects, and
	  o external funding will be invested in clean energy project implementation.
	• 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.

Activities	<u>Provision of technical support.</u> • 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. • 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. <u>Development of tools and replicable models.</u> • 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. • Models for finance and community ownership of DER will be developed as a result of the community energy planning and project implementation efforts. <u>Technology transfer of tools and models.</u> • NYSERDA will open source the tools, resources, and models developed through this initiative. • 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.
Key Milestones	<u>Milestone 1 (2016)</u> • Issue a competitive solicitation seeking proposals for a community energy planning effort that benefits LMI communities and residents. <u>Milestone 2 (2017)</u> • Selection of five communities to receive financial and technical support, contract development, and contract execution by Q2 2017. <u>Milestone 3 (2017)</u> • Commencement of community planning activities, development of community plan, testing of the toolkit.

	Milestone 4 (2017) • Community-scale clean energy project development and implementation started. Milestone 5 (2017) • NYSERDA receives feedback from community groups and on the toolkit. Milestone 6 (2018) • Completion of five community energy projects. Milestone 7 (2019) • NYSERDA refines toolkit and conducts technology transfer to communicate effective models of finance and ownership, as well as the toolkit.
Goals Prior to Exit	• 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. • The potential for community-led clean energy planning and project development is realized by community groups, developers, and financiers. • 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.

Relationship to Utility/REV

Utility Role/Coordination Points	• To effectively plan for a community-energy project, communities will need access to energy data and load characteristics for the community. • 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. • Utilities may also be able to identify LMI communities or community-based organizations that have an interest in developing a community DER project. • 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.
Utility Interventions in Target Market	The New York utilities do not have any similar offering to this market.

Performance Monitoring and Evaluation Plans

Performance Monitoring & Evaluation Plan	NYSERDA's approach to monitoring and assessing the effectiveness of the initiative and overall market development is described below. Test-Measure-Adjust Strategy • 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.

	• The method of technology transfer will be assessed regularly and adjusted to identify and reach the most LMI and EJ communities. <u>Market Evaluation</u> 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: • 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 • 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. <u>Impact Evaluation/Field Verification</u> • Impact evaluation will involve M&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.

15.2.3 Low-Income Forum on Energy (LIFE)[23]

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 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

[23] 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.

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

Intervention Strategy	• 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. • 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. • 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.
Goals	The goals of the LIFE initiative are to: • Encourage an interactive exchange of information and collaboration among the programs and resources that serve LMI energy customers. • 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. • Identify the full range of low-income energy issues, and best practices and innovative solutions for addressing them.

Target Market Characterization

Target Market Segment	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.
Market Participants	LIFE workshop, webinar, and conference participants include: • Social service workers • Utility representatives • Community-based organizations • Advocates • Contractors • Weatherization agencies • Installers • Affordable housing developers • Representatives from local and state government • Program administrators
Market Readiness	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.
Customer Value	• No other professional development opportunities focused specifically on the breadth of low-income energy issues covered by LIFE currently exist. • According to participant evaluations of the 2016 LIFE Statewide Conference, 89% of respondents would attend a LIFE event in the future and nearly ¾ of the 42 workshops were rated a 4 out of 5. In addition, the following comments were provided by participants: o "The sessions I attended were very informative a lot of information to share with low-income residents."

	○ "Thank you for another wonderful LIFE Conference. It is always an inspiring, energizing gathering of committed professionals! Everything was wonderful." ○ "Each year the workshops seem to be getting better and better." ○ "This was the best conference I have attended in several years!"

Stakeholder/Market Engagement

Stakeholder/Market Engagement	• 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. • 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. • NYSERDA will also utilize the CEAC and the CEAC LMI Working Group as a way to engage with stakeholders, as appropriate.

Theory of Change

Market Barriers Addressed	• Knowledge gaps on LMI energy issues among service providers, program administrators, policy makers, and advocates. • A changing energy policy landscape with uncertainty amongst service providers, administrators, policy makers, and advocates. • Limited resources for providing solutions for LMI energy consumers. • Program and resources that are administered independently from one another and often require coordination at the community or household level. • High degree of staff turnover in the human service field and few sources of professional development and education on low-income energy issues available.
Testable Hypothesis	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.
Activities	The activities that will be undertaken through the LIFE initiative include: • 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. • Host a monthly webinar series to feature content on emerging energy issues, best practices, program updates, and consumer protections. • Develop and distribute an electronic newsletter on a monthly basis to highlight LMI energy issues.
Key Milestones	<u>Milestone 1 (2016)</u> • Issue a competitive solicitation for program support. <u>Milestone 2 (2017)</u> • Implement a series of regional meetings across the state in Q2 of 2017. <u>Milestone 3 (2018)</u> • Implement a statewide conference in Q2 of 2018.

	Milestone 4 (2019) • Issue a competitive solicitation for program support or issue a contract extension for existing implementation services. Milestone 5 (2019) • Implement a series of regional meetings across the state in Q2 of 2019. Milestone 6 (2020) • Implement a statewide conference in Q2 of 2020. Milestone 7 (2021) • Implement a series of regional meetings across the state in Q2 of 2021. Milestone 8 (2022) • Issue a competitive solicitation for program support or issue a contract extension for existing implementation services. Milestone 9 (2022) • Implement a statewide conference in Q2 of 2022. Milestone 10 (2023) • Implement a series of regional meetings across the state in Q2 of 2023. Milestone 11 (2024) • Issue a competitive solicitation for program support or issue a contract extension for existing implementation services. Milestone 12 (2024) • Implement a statewide conference in Q2 of 2024.
Goals Prior to Exit	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

Utility Role/Coordination Point	• All of the Investor-Owned Utilities are members of the LIFE Steering Committee and provide insight and guidance on the development of LIFE activities. • Utilities use the initiative as a platform for communicating information on their bill payment assistance and other programs to service providers. • 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. • 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.
Utility Interventions in Target Market	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

Performance Monitoring & Evaluation Plan	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.

15.2.4 Healthy Homes Feasibility Study [24]

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

Intervention Strategy	• 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 and overall return on investment related to healthcare and administrative cost savings. • 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. • 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.

[24] 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.

Goals	• Establish joint energy and health benefits as primary considerations when undertaking an energy or housing improvements in LMI communities. • Reduce the administrative barriers associated with publically 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. • Validate healthcare cost savings and other health impacts associated with an integrated delivery model so that these cost savings are recognized. • Identify additional funding mechanisms, including direct Medicaid funding as well as social impact financing mechanisms, to support an integrated model.

Target Market Characterization

Target Market Segment	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.
Market Participants	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.
Market Readiness	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

Stakeholder/Market Engagement	• 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. • The Governor's Office, HCR and DOH have joined NYSERDA in expressing an interest to explore the feasibility of implementing a statewide energy, housing, and health initiative. HCR and DOH will be primary partners with NYSERDA on the feasibility work and any potential pilot that results from the feasibility study. • A number of foundations have expressed interest in supporting NYSERDA's work should the feasibility research justify a pilot intervention. • NYSERDA will also utilize the CEAC LMI Working Group as a way to engage with stakeholders, as appropriate.

Theory of Change

Market Barriers Addressed	The feasibility study will assess the statutory and infrastructure barriers associated with the development of an integrated service delivery model including: • New York's Medicaid 1115 Waiver and the state's ability to offer in-home health education via non clinicians. • Lack of infrastructure to support an integrated energy, housing, and health services delivery model. • Lack of funding to support capital improvements required prior to energy or health interventions. • Lack of skilled workers to deliver a holistic suite of energy and health education services.
Activities	• 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. • Conduct the following research: o 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. o Collect medical cost data and energy and housing intervention cost data provided by State of New York agencies. o 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. o 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. o 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. o 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. o 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. o Identify and assess other possible funding mechanisms and project resources for preventive health-based housing interventions to reduce home-based environmental health hazards such as Pay For Success, Social Impact Bonds, Title V funding, Aging in Place Initiatives, etc. o 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. o 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.

	○ 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. ○ 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. ○ Research, in cooperation with NYSERDA, HCR, DOH, and other agencies, additional funding resources that could be leveraged and integrated with a pilot project. • Development of a pilot for testing a statewide integrated service delivery model, based on the findings of the feasibility study. [25]
Key Milestones	<u>Milestone 1 (2016)</u> • Complete feasibility study and make a determination on whether to continue with the pilot design and implementation phase. <u>Milestone 2 (2016)</u> • Begin the pilot design phase, if NYSERDA and NYS agency partners decide to go forward.[26] <u>Milestone 3 (2017)</u> • Pilot design is complete. <u>Milestone 4 (2017)</u> • Commencement of pilot activities. <u>Milestone 5 (2018)</u> • Preliminary determination of health benefits and healthcare cost savings. <u>Milestone 6 (2021)</u> • 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.

Relationship to Utility/REV

Utility Role/Coordination Points	• 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.

[25] 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.
[26] Ibid.

	• 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.
Utility Interventions in the Target Market	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
RetrofitNY											
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	$216,000	$672,000	$652,000	$417,750	$417,750	$569,500	$469,500	$469,500	$469,500	$150,000	$4,503,500
Sub-Total	$216,000	$6,197,000	$6,177,000	$5,417,750	$4,817,750	$3,869,500	$2,219,500	$969,500	$469,500	$150,000	$30,503,500
REVitalize											
Direct Incentives and Services	$325,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$325,000
Tools, Training, and Replication	$75,000	$200,000	$125,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$400,000
Sub-Total	$400,000	$200,000	$125,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$725,000
LIFE											
Implementation Support	$195,000	$60,000	$120,000	$135,000	$195,000	$60,000	$120,000	$145,000	$195,000	$75,000	$1,300,000
Sub-Total	$195,000	$60,000	$120,000	$135,000	$195,000	$60,000	$120,000	$145,000	$195,000	$75,000	$1,300,000
Healthy Homes Initiative											
Research and Technology Studies/ Development/ Demos	$215,000	$-	$-	$-	$-	$-	$-	$-	$-	$-	$215,000
Sub-Total	$215,000	$-	$-	$-	$-	$-	$-	$-	$-	$-	$215,000
Total	**$1,026,000**	**$6,457,000**	**$6,422,000**	**$5,552,750**	**$5,012,750**	**$3,929,500**	**$2,339,500**	**$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
RetrofitNY	0%	19%	20%	18%	16%	13%	7%	3%	2%	2%	0%	0%	100%
REVitalize	10%	28%	38%	17%	7%	0%	0%	0%	0%	0%	0%	0%	100%
LIFE	3%	9%	10%	9%	10%	9%	10%	9%	11%	9%	8%	0%	100%
Healthy Homes Feasibility Study	47%	53%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%

15.2.1 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[27]		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	500	100,000
Outcomes	Number of cost effective retrofit solutions available in the market	0	0	2 or more

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

Table 5. Initiative Specific Metrics- REVitalize

Indicators[28]		Baseline (Before/Current)	2019 (Cumulative)	2025 (Cumulative)
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

[28] 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

Indicators		Baseline (Before/Current)	2019 (Cumulative)	2025 (Cumulative)
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	2,133	7,296
	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

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

Benefits shown in Tables 8 through 10 are direct, near term benefits associated with the LMI initiatives.[29] 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.

[29] 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[30]		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	TOTAL
Energy Efficiency	MWh Annual	-	230	230	297	743	1,620	17,600	37,800	56,700	71,800	187,100
	MWh Lifetime	-	4,590	4,590	5,940	14,900	32,400	351,000	757,000	1,130,000	1,440,000	3,741,000
	MMBtu Annual	-	4,120	4,120	5,330	13,300	29,100	315,000	678,000	1,020,000	1,290,000	3,353,000
	MMBtu Lifetime	-	82,300	82,300	107,000	266,000	581,000	6,300,000	13,600,000	20,300,000	25,700,000	67,060,000
	MW	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-	-	-	-	-	-	-	-
	MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-
	MW	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		-	356	356	461	1,150	2,510	27,200	58,600	88,000	111,000	290,000
CO2e Emission Reduction (metric tons) Lifetime		-	7,120	7,120	9,220	23,000	50,300	545,000	1,170,000	1,760,000	2,230,000	5,800,000
Customer Bill Savings Annual ($ million)		$0	$0.07	$0.07	$0.09	$0.22	$0.49	$5.3	$11	$17	$22	$56
Customer Bill Savings Lifetime ($ million)		$0	$1.38	$1.38	$1.78	$4.46	$9.73	$105	$227	$340	$431	$1,122
Private Investment ($ million)		$0	$0	$0	$0.61	$2.55	$6.23	$77	$210	$450	$664	$1,411

[30] 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[31]		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

[31] 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[32]	Number of communities undertaking clean energy projects	-	5	-	-	-	-	-	-	-	-	5
LIFE	Number of individuals reached	748	763	778	794	810	826	842	859	876	-	7,296
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.[33] 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 NYSERDA initiatives may not be additive due to multiple initiatives operating within market sectors. The values presented below are not discounted, however NYSERDA 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

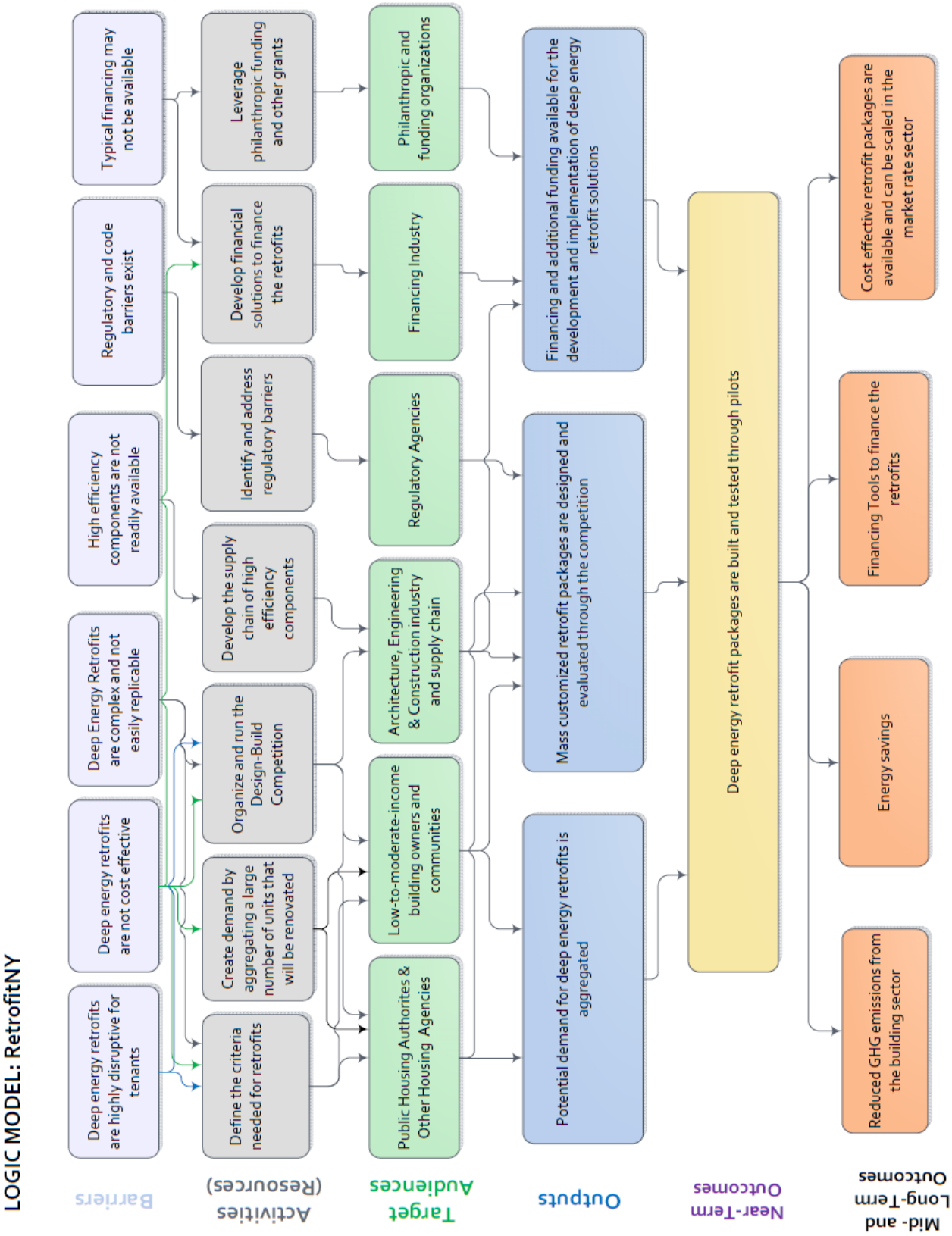
Table 12. Estimated Indirect Market Impact - REVitalize

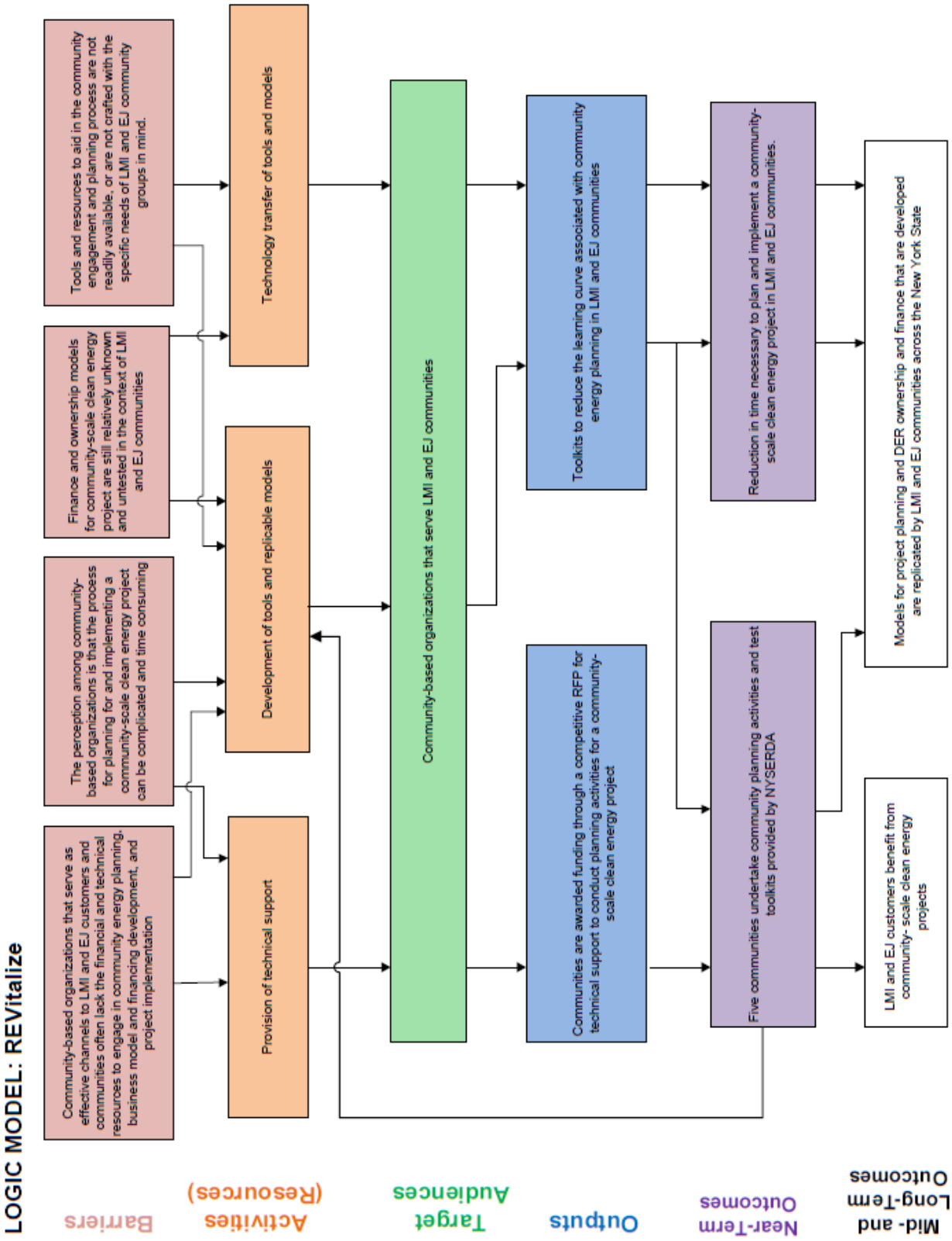
Indirect Impact		2020	2025	2030
Energy Efficiency	MWh Cumulative Annual	-	-	-
	MMBTu Cumulative Annual	-	-	-
Renewable Energy	MWh Cumulative Annual	18,000	44,900	44,900
	MW	14	36	36
CO2e Emission Reduction (metric tons) Cumulative Annual		9,450	23,600	23,600

[32] NYSERDA expects that an additional 75 community energy projects will be supported through replication.

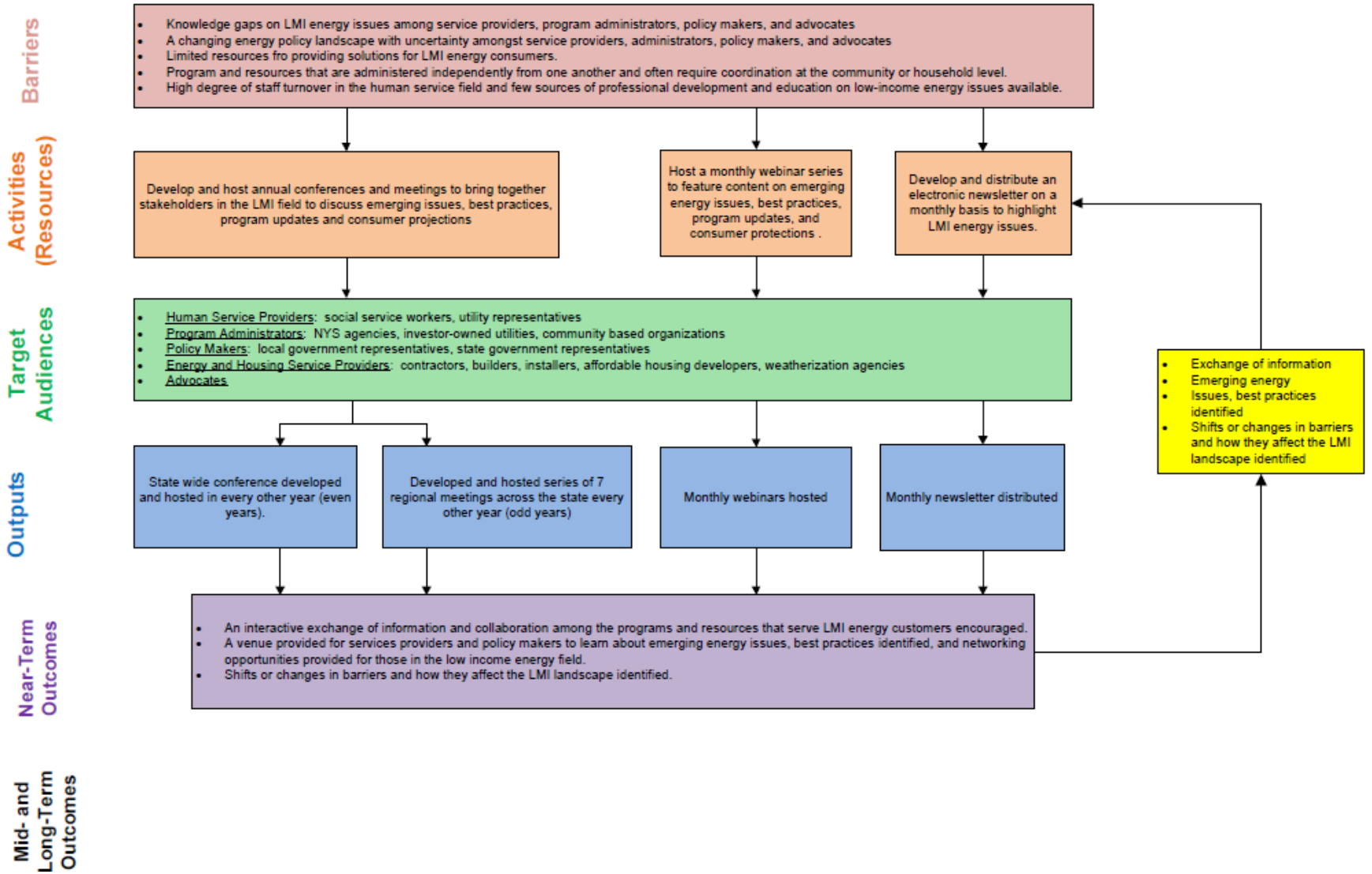
[33] The Low-Income Forum on Energy and Healthy Homes Initiative do not have attributable indirect energy impacts.

Appendix A – Logic Models

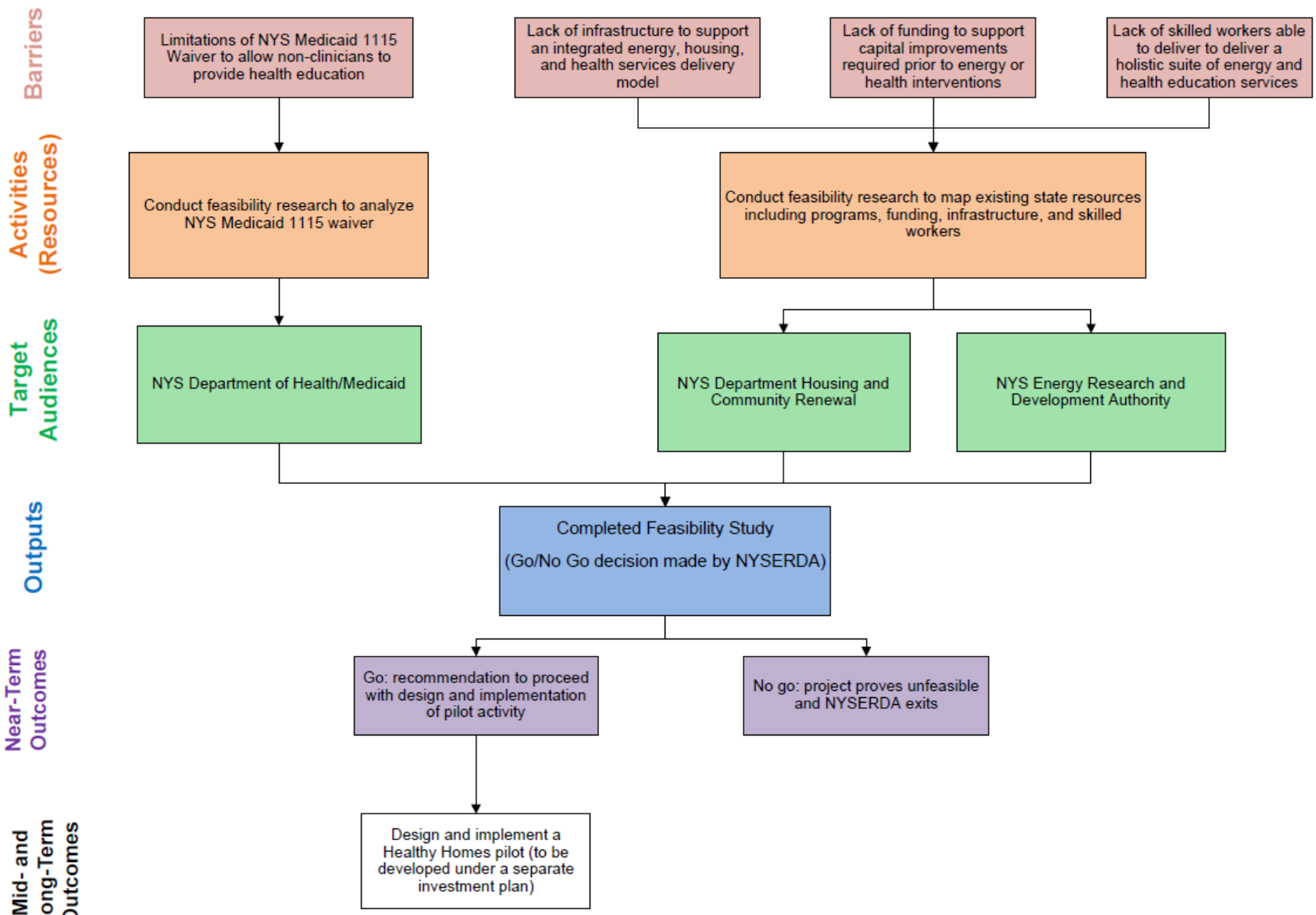



LOGIC MODEL: REVitalize
Barriers
Activities (Resources)
Target Audiences
Outputs
Near-Term Outcomes
Mid- and Long-Term Outcomes
Community-based organizations that serve as effective channels to LMI and EJ customers and communities often lack the financial and technical resources to engage in community energy planning, business model and financing development, and project implementation
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
Finance and ownership models for community-scale clean energy project are still relatively unknown and untested in the context of LMI and EJ communities
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.
Provision of technical support
Development of tools and replicable models
Technology transfer of tools and models
Community-based organizations that serve LMI and EJ communities
Communities are awarded funding through a competitive RFP for technical support to conduct planning activities for a community-scale clean energy project
Toolkits to reduce the learning curve associated with community energy planning in LMI and EJ communities
Five communities undertake community planning activities and test toolkits provided by NYSERDA
Reduction in time necessary to plan and implement a community-scale clean energy project in LMI and EJ communities.
LMI and EJ customers benefit from community- scale clean energy projects
Models for project planning and DER ownership and finance that are developed are replicated by LMI and EJ communities across the New York State

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



LOGIC MODEL: Healthy Homes Feasibility Study



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.34 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. 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.

CEF Investment	**2016**	**2017**	**2018**	**3 Year Total**
Resource Acquisition Transition Programs[35]	$70,940,138	$49,004,110	$42,280,790	$162,225,038
Single Family LMI	*$43,884,580*	*$31,742,140*	*$31,744,680*	*$107,371,400*
Multifamily LMI	*$15,576,622*	*$ 7,749,768*	*$10,536,110*	*$ 33,862,500*
New Construction LMI	*$11,478,936*	*$ 9,512,202*	*$-*	*$ 20,991,138*
Market Development Initiatives	$1,026,000	$6,457,000	$6,422,000	$13,905,000
Retrofit NY	*$216,000*	*$6,197,000*	*$6,177,000*	*$12,590,000*
REVitalize	*$400,000*	*$200,000*	*$125,000*	*$725,000*
Low-Income Forum on Energy	*$195,000*	*$60,000*	*$120,000*	*$375,000*
Healthy Homes Feasibility Study[36]	*$215,000*	*$-*	*$-*	*$215,000*
Total	**$71,966,138**	**$55,461,110**	**$48,702,790**	**$176,130,038**

[34] 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.

[35] Filed as part of the Resource Acquisition Transition Chapter on February 22, 2016.

[36] 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	40,330	34,100	30,650	105,080
	MWh Lifetime	670,700	572,390	459,390	1,702,480
	MMBTu Annual	725,700	648,320	673,120	2,047,140
	MMBTU Lifetime	12,967,000	11,710,300	11,642,300	36,319,600
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	1,760	1,230	2,990
	MWh Lifetime	-	35,200	24,700	59,900
	MW	-	1.4	1	2
CO2e Emission Reduction (metric tons) Annual		60,040	53,392	52,605	166,037
CO2e Emission Reduction (metric tons) Lifetime		1,047,400	949,320	880,120	2,876,840
Customer Bill Savings Annual ($ million)		$ 15.9	$ 13.9	$ 14.2	$ 43.9
Customer Bill Savings Lifetime ($ million)		$ 272.2	$ 240.7	$ 231.7	$ 744.6
Private Investment($ million)		$ 117.8	$ 113.2	$ 151.7	$ 382.7
LMI Units Served		90,630	87,828	87,550	266,008