

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

Clean Energy Fund Investment Plan:
Innovation Capacity and Business
Development Chapter

Portfolio: Innovation & Research

Submitted by:

The New York State Energy Research and Development Authority

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Clean Energy Fund Investment Plan:
Innovation Capacity and Business Development Chapter

Revision Date	Description of Changes	Revision on Page(s)
May 20, 2016	Original Issue	Original Issue
January 26, 2017	Added Manufacturing Corps Initiative	Multiple
November 1, 2017	<p><u>Cleantech Startup Growth</u>: Added additional activities, and associated budget and benefit. Tables 1-5 were updated to reflect these changes. Updated the baseline values in Table 3 to reflect latest data available and adjusted cumulative targets accordingly to incorporate baseline findings.</p> <p><u>Manufacturing Corps</u>: Shifted timing of budget and benefits to reflect slower than anticipated start to the program and to remove milestone for a Request for Qualifications (RFQL) that is no longer applicable. Tables 6-10 have been updated accordingly. Updated baseline values in Table 3 to reflect latest data available and adjusted cumulative targets accordingly to incorporate baseline findings.</p> <p><u>Novel Business Models and Offerings</u>: Added initiative.</p>	Multiple
September 17, 2018	<p><u>Cleantech Startup Growth</u>: Added additional activities and associated budget and benefits. Tables 1-5 were updated to reflect these changes and correct figures for private investment.</p> <p><u>Manufacturing Corps</u>: Updated milestones to reflect more accurate timing and remove activities that were determined to be unnecessary.</p>	Multiple

10 Innovation Capacity and Business Development

NYSERDA seeks to support a vibrant, self-sustaining clean energy technology innovation ecosystem that will accelerate the growth and scale of new business ventures focused on serving the clean energy market in New York State. Activities are designed to catalyze innovative and entrepreneurial activity in the State from the ideation stage and accelerate it toward the development of solutions to meet market-defined clean energy technology needs and opportunities, while also providing the support infrastructure and mentorship to build the entrepreneurial and management skills necessary to increase the likelihood of the commercial success of the ventures. The broad objectives of the program include:

- Translate innovations from research institutions into market-validated and scalable businesses.
- Increase the number and success rate of early-stage clean energy technology companies in New York State.
- Improve the pool of human capital available to companies and grow the number of successful clean energy technology entrepreneurs in New York State.
- Stimulate and connect quality investment opportunities at New York State clean energy technology companies with the investment community.
- Mobilize the capital necessary to commercialize innovative clean energy technologies and bring them to market.
- Accelerate commercialization of clean energy technologies through the manufacturing stage and to a first customer.
- Facilitate strategic relationships between companies and investors, corporate partners, and customers.

The first initiative described in this Chapter is Cleantech Startup Growth, which is targeted at accelerating the time to market for early-stage clean energy technology companies by providing support and assistance across the State through this portfolio of complementary activities which address the largest market gaps facing the entrepreneurs that are looking to grow these companies. These gaps include, but are not limited to, access to capital, executive expertise, strategic relationships, and business support. This initiative was updated in November 2017 and again in September 2018 to add new components to assist clean energy technology companies, with associated budget and benefits.

The second initiative described in this chapter, Manufacturing Corps, is aimed at increasing private capital investment in manufacturing build-out and scale-up activities through a series of offerings geared toward optimizing the manufacturability of clean energy technologies and supporting progression through early manufacturing activities. This initiative was modified in November 2017 to provide additional clarity to the broad outcomes being tracked, update the logic model to more clearly align with the language in the investment plan, and to shift the timing of the budget and benefits to reflect the current program schedule. The initiative was updated again in September 2018 to remove a milestone that will no longer be completed as its goal was achieved in a prior milestone.

The third initiative described in this chapter, Novel Business Models and Offerings, will support promising companies in making business model investments to accelerate the deployment of these models. NYSERDA will provide these companies financial resources to assist with validation, implementation, and scaling of new business models and offerings

Program investments and activities will be informed via ongoing engagement with customers, subject matter experts, and other stakeholders.

10.1 Cleantech Startup Growth

10.1.1 Overview

<p>Present Situation</p>	<ul style="list-style-type: none"> • Early-stage companies and research institutions frequently face difficulty transferring technologies and research findings to the broader commercial market. Universities across New York State are conducting a significant amount of energy-related research and development that does not transition to the market through scalable business enterprises or corporate partnerships. Additionally, many early-stage companies commercializing clean energy technologies continue to face a difficult path to market due to the capital intensity and long lead times associated with the cleantech commercialization process, which makes fundraising increasingly difficult for these companies. • Clean energy technology (cleantech¹) companies are typically founded and managed by entrepreneurs who have superior technical skills but lack the business and commercialization experience that is often necessary to successfully bring a new technology or product to market. • Most early-stage cleantech companies do not have the resources to compete with entrenched players in the market. Rather than acting as competitors, these established companies can serve as potential corporate or strategic partners that help smaller companies get to market much more efficiently, both in terms of time and capital. • Engaging customers and making the first commercial sale can be a challenge for early-stage companies because the firm and the product they are selling does not have a track record of performance. • Incubators, which are organizations that help entrepreneurs and new ventures develop and grow, can dramatically improve the success rate of these early-stage companies by providing access to executive mentoring and other resources. Proof-of-Concept Centers (POCC), can perform a similar function for universities, by helping to turn cleantech research into a successful business.
<p>Intervention Strategy</p>	<p>NYSERDA will launch a coordinated suite of interventions targeted at accelerating the time to market for early-stage cleantech companies. NYSERDA will:</p> <ul style="list-style-type: none"> • Augment its successful cleantech incubator strategy by continuing to support the State’s top incubators for cleantech ventures and making additional, competitively awarded funding available for incubator client companies through ignition grants. • Expand business incubation services to cleantech startup companies in the Southern Tier and southern Western New York regions. • Build on the initial success of the POCC initiative with the addition of activities that will: <ul style="list-style-type: none"> ○ Increase program awareness across New York State academic institutions. ○ Leverage existing innovation and entrepreneurship programs. ○ Provide a strategic connection to corporate partners and the broader investment community. ○ Develop and implement programs to provide targeted support to POCC graduates.

¹ Here, cleantech refers to hardware technologies, software technologies, services, or processes that broadly reduce energy consumption and greenhouse gas emissions and/or enable the transition to a sustainable and clean energy economy by increasing the supply of renewable energy and distributed energy resources, improving the efficiency of energy utilization at the consumer and industrial scale, improving the processes and systems that use energy, or more effectively enabling energy solutions to permeate the marketplace.

	<ul style="list-style-type: none"> • Launch a portfolio of programs to mentor and coach the management teams of early-stage companies to strengthen their business skills and address strategic or tactical needs on a company-by-company basis. • Coordinate engagement and outreach to investors, corporate and strategic partners, and initial customers to drive relationships with early-stage cleantech companies in New York State, while simultaneously developing programs to improve the commercial readiness of early-stage cleantech companies and their ability to engage these larger, more complex counterparties. • Administer the 76 West Clean Energy Competition - a focused cleantech business accelerator program which has returned strong results to date, as described further herein - with the following primary programmatic purposes: (1) attracting companies from all over the world to build clean energy businesses and jobs in New York’s Southern Tier region; (2) accelerating commercialization and time to market for technologies and companies participating in the program; and (3) enhancing their ability to have a meaningful energy and environmental impact to help meet New York’s clean energy goals. • In addition to the targeted interventions, NYSERDA will scale up a successful pilot approach to managing its cleantech startup support interventions through deployment of “NYSERDA Innovation Advisors.” These Innovation Advisors are business and technology experts with extensive experience in corporate management, commercialization, and entrepreneurship that serve as a connection between NYSERDA and the academic, startup, investor, and entrepreneurial communities. The Innovation Advisors directly assist and inform the development of promising startups and will direct hands-on efforts to improve NYSERDA’s programmatic offerings to improve their rates of success. • The individual activities that make up this initiative will focus on maximizing the flexibility of NYSERDA’s commercialization resources and assets to meet the needs of entrepreneurs and companies in near real-time. • For a visual representation of this strategy, please reference the flow chart entitled “Logic Model: Cleantech Startup Growth,” which can be found in Appendix A.
<p>Goals</p>	<ul style="list-style-type: none"> • Increase the number of new cleantech businesses formed. • Accelerate the time to market for cleantech companies in New York State, which can range the full spectrum of hardware and software technologies in various stages of development. • Evolve the operations and programming of the cleantech incubators so they are more focused on client-driven milestones and quickly able to address client company needs. • Enhance the pool of human capital available to early-stage companies and increase the number of successful cleantech entrepreneurs. • Increase the ability of early-stage cleantech companies to raise seed and follow-on capital from investors, secure commercialization assistance from development partners, enter into strategic partnerships, and engage customers in New York State. • Provide greater visibility for NYSERDA-supported entrepreneurs and companies to potential investors, corporate and strategic partners, and customers. • Increase the awareness of NYSERDA’s program offerings and funding opportunities to drive more entrepreneurs, investors, corporate and strategic partners, and customers to the State. • Establish the Southern Tier of New York State as a premier destination for high-growth potential cleantech companies to develop and grow their businesses.

<p>State Energy Plan/Clean Energy Standard Link</p>	<ul style="list-style-type: none"> • The 2015 State Energy Plan indicates the need to accelerate market transformation via initiatives that identify, mitigate, and remove common barriers to clean energy technology deployment. This initiative directly impacts the State’s ability to deliver on these goals, which are unattainable without the innovative clean energy technologies being developed by early-stage companies that target the specific needs of customers in the State. • The 2015 State Energy Plan also calls for supporting the development of next-generation clean energy technology solutions and innovative business models. This initiative will increase the likelihood that technologies which can help New York State meet its energy and environmental goals will be commercialized. Examples of these that are currently being developed and commercialized by cleantech incubator client companies and graduates include LED lighting systems, advanced energy storage systems and components, energy efficiency solutions for buildings, smart grid and microgrid technologies, wind turbines and components, next-generation solar technologies, biofuels, and advanced transportation technologies. • The 2015 State Energy Plan also speaks to how research and development support will accelerate adoption of tomorrow’s energy solutions and attract jobs and investment in this area to New York State. In addition, it calls on use of this type of support to facilitate and reduce the cost of transitioning to a REV-based energy system. Going forward, the combination of the evolved cleantech incubators and ignition grants, as well as those focused on human capital and building relationships with investors, corporate and strategic partners, and customers, will have a foundational role to play in helping to achieve these goals.
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10.1.2 Target Market Characterization

<p>Target Market Segment(s)</p>	<ul style="list-style-type: none"> • The target market segment is entities working with and investing in seed-stage through growth-stage cleantech companies in New York State, as listed below. • The initiative is sector/technology agnostic for all areas of the clean energy and clean technology space.
<p>Market Participants</p>	<p>Market Participants include:</p> <ul style="list-style-type: none"> • Entrepreneurs and Early-Stage Companies, including incubator client companies • NYSERDA Innovation Program Partners, including but not limited to: <ul style="list-style-type: none"> ○ NYSERDA Incubators <ul style="list-style-type: none"> ▪ Western New York – Directed Energy at University at Buffalo ▪ Finger Lakes – Venture Creations at Rochester Institute of Technology ▪ Central New York – Clean Tech Center at The Tech Garden ▪ Capital Region – iClean at SUNY Polytechnic Institute ▪ New York City – ACRE at New York University ▪ Long Island – Clean Energy Business Incubator Program at Stony Brook University ▪ Southern Tier – Southern Tier Clean Energy Incubator at Binghamton University ○ NYSERDA Proof-of-Concept Centers <ul style="list-style-type: none"> ▪ Upstate New York – NEXUS-NY at High Tech Rochester ▪ Downstate New York – PowerBridgeNY at Columbia University ▪ Downstate New York – PowerBridgeNY at New York University ○ NYSERDA Entrepreneurs-In-Residence Program ○ NYSERDA Manufacturing Corps ○ 76West • Venture Development Organization Partners, including but not limited to:

	<ul style="list-style-type: none"> ○ Advanced Research Projects Agency-Energy (ARPA-E) ○ Empire State Development (ESD) Innovation Hot Spots and Certified Business Incubators ○ ESD Centers of Excellence ○ ESD Centers for Advanced Technology ○ ESD Regional Technology Development Centers ○ Launch NY ○ Northeast Clean Energy Council ○ Upstate Venture Association of New York ○ Upstate Venture Connect ○ Mentors, including but not limited to: ● Mentors, including but not limited to: <ul style="list-style-type: none"> ○ Serial entrepreneurs ○ Seasoned executives ○ Subject matter experts ○ Service providers, including but not limited to, attorneys, accounting and tax professionals, bankers, financial planning professionals, human resources professionals, and venture development professionals ● Investors, including but not limited to: <ul style="list-style-type: none"> ○ Angel investors ○ Venture capital funds ○ Impact investors ○ Family offices² ○ Foundations and philanthropic investors ○ Government agencies ○ Corporate and strategic investors ● Corporate and Strategic Partners, including but not limited to: <ul style="list-style-type: none"> ○ Industrial companies ○ Technology companies ○ Utilities ○ Suppliers ● Customers ● Academic Institutions ● Innovation Advisors
Market Readiness	<ul style="list-style-type: none"> ● New York State’s clean energy market is steadily growing, especially given Reforming the Energy Vision (REV) and the aggressive energy and emissions goals that have been established. Early-stage cleantech companies have an important role to play in achieving the State’s clean energy goals and the investment community is essential to the continued growth of the sector and benefit greatly from the commercialization support and collaboration that is characteristic of incubators and venture development organizations. ● Technical entrepreneurs develop technologies that support REV, but they frequently do not possess or have access to the business skills to turn technologies into products and products into companies to drive those products into the marketplace. Increasingly, entrepreneurs from all backgrounds recognize that they need additional support, as evidenced by the high demand for NYSERDA Innovation and Research programs such as incubators and entrepreneurs-in-residence. This commercialization support provided by NYSERDA significantly increases the probability of success for entrepreneurs and leads to more early-stage companies deploying cleantech products in the State.

² Family offices perform centralized management or oversight of investments, tax planning, estate planning, and philanthropic planning for high net worth individuals.

	<ul style="list-style-type: none"> • NYSERDA’s engagements with market actors indicate a strong need and opportunity for interventions that better connect NYSERDA-supported companies with investors, corporate and strategic partners, and customers. Corporate and strategic partners are particularly interested in business development opportunities with early-stage companies that NYSERDA and the greater investment community have validated. • As a result, the time is ripe for NYSERDA to continue and expand its investments in proof-of-concept centers, cleantech incubators, and ignition grants, through additional operational and programming support, including entrepreneur mentoring and activities that reduce risk for investors, corporate and strategic partners, and customers looking to engage cleantech entrepreneurs and early-stage companies in the State.
Customer Value	<ul style="list-style-type: none"> • NYSERDA will continue to provide commercialization and business development support through the proof-of-concept centers, cleantech incubators, and ignition grants to entrepreneurs and early-stage companies to best position them to gain access to development partners and service providers, raise capital, commercialize new products, and generate revenue. The cleantech incubators do this by providing high-impact, targeted assistance that looks to improve the technical, market, and investor readiness of client companies. • This initiative will contribute towards the commercialization of cleantech products and mobilization of capital in a way that would most likely not occur in the absence of these programs. • For an entrepreneur or early-stage company who needs specific technical, commercialization, or management assistance, NYSERDA’s entrepreneurs-in-residence initiative provides specialized matchmaking to pre-screened, highly qualified mentors at no cost to the entrepreneur or company. • For an entrepreneur or early-stage company who has achieved initial success, this initiative provides an array of opportunities for them to identify, engage, and connect with investors, corporate and strategic partners, and customers. • For an investor who is looking for quality companies to invest in that can lead to profits, this initiative provides various formats for them to connect with entrepreneurs and companies that are validated by NYSERDA and others. • For an investor who is looking for other quality investment firms to potentially co-invest with in New York State, this initiative provides a series of different venues for them to meet and network with other investors with the same risk and return profiles. • For a corporate or strategic partner who is seeking companies in a specific technology vertical or stage of development, this initiative offers opportunities to identify and evaluate entrepreneurs and companies that fit its specifications. • For a customer who would like to assess new cleantech products or meet new potential vendors, this initiative provides the ability to find, meet, and engage qualified companies that meet their sourcing criteria. • For a company who would like to initiate or expand its presence in New York State, this initiative provides financial resources and programmatic support to attract them to the Southern Tier and help build their business. • It is expected that through the successful deployment of this set of initiatives, an investment leverage ratio of \$7³ of outside investment secured by participant companies for every \$1 of NYSERDA funding will be achieved.

³ The investment leverage ratio of \$7 of outside investment secured by participant companies for every \$1 of NYSERDA funding represents a blended, weighted rate based on the expected investment leverage ratio of the various activities and the amount of funding allocated to each respective activity. Expected investment leverage ratios include: 15:1 for

10.1.3 Stakeholder/Market Engagement

Stakeholder/Market Engagement and Customer Discovery	<ul style="list-style-type: none"> • NYSERDA has conducted extensive, ongoing customer discovery and market validation work to refine and evolve the activities that make up Cleantech Startup Growth. This has resulted in NYSERDA conducting more than 200 unique interviews with leading market actors, including entrepreneurs, investors, corporate and strategic partners, customers, and service providers. • The POCC initiative includes an external advisory board managed through third-party contractor. The advisory board is comprised of national leaders in energy research and entrepreneurship from corporate and academic institutions. • This set of initiatives has been designed to leverage best practices and lessons learned through a comprehensive customer discovery and market validation process with companies who have successfully scaled up their business, other leading public and private organizations across the country that support cleantech innovation and entrepreneurship, past NYSERDA programs, past and present Empire State Development programs, and the collective expertise of NYSERDA’s Innovation program partners and portfolio companies. • NYSERDA will continue to engage with market actors and stakeholders throughout the course of these initiatives. NYSERDA recognizes that ongoing customer discovery and market validation is needed to ensure the program adjusts to meet the dynamic needs of the marketplace. • Incubator directors report there are many entrepreneurs and startup companies that do not have the entrepreneurial and/or commercialization expertise necessary to successfully bring technologies to market, and that NYSERDA’s cleantech incubators fill a gap by providing commercialization and business development assistance. • Investors report the incubator program provides them with a direct pipeline of quality, curated cleantech deal flow and are in strong support of the addition of the ignition grants program. • Entrepreneurs and companies actively engaged with NYSERDA report that while the organization currently is more market-facing and moves much more quickly than it has historically, it can continue to improve upon its funding and programmatic approaches to serving startups by incorporating private sector best practices to better serve these stakeholders and ensure their lasting success.
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10.1.4 Theory of Change

Technology Opportunities and Barriers Addressed	<ul style="list-style-type: none"> • Entrepreneurs and early-stage companies often lack the commercialization and business development expertise necessary to successfully bring clean energy technologies to market. The problem is even more prevalent for cleantech startup companies developing advanced hardware technologies that are located outside of metropolitan New York. This initiative will provide continued commercialization support to cleantech entrepreneurs and early-stage companies through incubators and executive mentoring programs, which will
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Incubators and Ignition Grants; 10:1 for Entrepreneurs-In-Residence; and 3:1 for Investor, Corporate, and Customer Engagement, 5:1 for POCCs, and 2:1 for 76West.

	<p>help equip entrepreneurs and companies with the management skills and business assets they need to be successful in the market.</p> <ul style="list-style-type: none"> • Many early-stage cleantech companies in New York State do not have active relationships or deep connections with the investment community, potential corporate and strategic partners, or customers. This creates an opportunity for NYSERDA to continue to build networks and increase the potential for productive, meaningful interactions between early-stage companies and investors and development partners. This initiative will provide better, curated matchmaking and opportunities for cleantech entrepreneurs and early-stage companies in the State to connect with investors, corporate and strategic partners, and customers.
<p>Testable Hypotheses</p>	<ul style="list-style-type: none"> • If NYSERDA provides additional commercialization and business development support to companies, then the private and follow-on capital raised by participant companies will result in \$7 of private capital being leveraged for every \$1 of NYSERDA’s investment in this set of initiatives. • Incubators – If incubators are performing successfully, then they will be able to attract funding from other sponsors to help sustain their operations and programs while retaining a focus on NYSERDA’s clean energy goals. Over time, this may allow NYSERDA to step down the level of its investment in cleantech incubators and ignition grants. • Ignition Grants – If there are highly targeted and timely infusions of capital through the introduction of ignition grants, then the incubator client companies will be in a better position to attract follow-on capital from investors and secure commercialization support from development partners. • Geographic Coverage – If NYSERDA provides business incubation and entrepreneurial support services to cleantech startup companies and potential entrepreneurs in the Southern Tier and southern Western New York regions through competitively selected organizations, then it will develop and grow the environment for innovation and entrepreneurship throughout the regions, leading to more startup activity, more investments secured, and more commercial products coming out of technology developed in the regions. • Proof-of-Concept Centers – If research teams developing technologies receive intensive cohort-based commercialization training and seed funding to help them better understand the value proposition and customer segments for their innovations, then more intellectual property will be transitioned from the laboratory to the market, • Entrepreneurs-In-Residence – If NYSERDA provides cleantech entrepreneurs and early-stage companies with expert advice at identified risk points in their lifecycle until these companies have the expertise required internally, then the companies will avoid many common startup mistakes, take advantage of opportunities, and require less capital on the path to becoming technically and commercially viable and ready for the market. • Investor, Corporate, and Customer Engagement – If high potential early-stage cleantech companies are better connected with qualified investors, corporate and strategic partners, and customers, then it will increase the attainment of key business development milestones, such as securing investments, joint development agreements, channel partnerships, joint ventures, and initial customers. • 76West – If NYSERDA continues administering the accelerator program and offering prize money to winners of the competition, then it will continue to attract high-growth potential companies to participate in the program, and to develop and expand their businesses in the Southern Tier. • Innovation Advisors – If NYSERDA deploys highly skilled, top tier management and technical talent as advisors to participate in, evaluate and help execute

	<p>NYSERDA's cleantech startup support offerings, then it will strengthen NYSERDA's ability to improve the success rates of these offerings by better identifying and responding to emerging investment challenges, opportunities, and changing market needs.</p>
<p>Activities (Resources)</p>	<p>NYSERDA will launch a set of activities that work together to accelerate the time to market for cleantech startup companies. Specific activities include:</p> <p>Incubators</p> <ul style="list-style-type: none"> • NYSERDA founded its incubator program in 2009 to foster the viability and growth of the state's most promising cleantech startup companies by providing ready access to investors, mentors, development partners, and commercialization resources. NYSERDA's six cleantech incubators will re-compete for funds through competitive solicitations, which will be open to other incubators and venture development organizations in New York State that are not currently supported by NYSERDA. Some or all of the existing cleantech incubators may be awarded funding and new cleantech incubators may be awarded through the competitive process. This process will capture the lessons and best practices from developing and growing the incubator program over the past six years and apply them to the next round of cleantech incubators. Funding will be provided to the selected incubators for: <ul style="list-style-type: none"> ○ Operations – Activities related to the operational administration of the incubator. For example, quarterly or annual reporting for NYSERDA. ○ Programs – Activities related to the programming and services that the incubator provides to client companies. For example, networking events, boot camps, mentor office hours, advisory board meetings, hackathons, etc. ○ Client-Driven Milestones – Activities related to incubator client company success, including private capital raised, non-NYSERDA grants awarded, new commercial products tested/introduced, revenue generated, and jobs created/retained, etc. These client-driven milestones, which ensure that compensation for the cleantech incubators is aligned with the performance and success of their client companies and graduates, will be the primary focus of NYSERDA's continued support for the incubator program. <p>Ignition Grants</p> <ul style="list-style-type: none"> • Moving forward, the cleantech incubators will evolve to include the ignition grants program, which will allow them to offer timely, highly targeted infusions of capital to qualified client companies. Activities funded by the ignition grants (up to \$100,000 per ignition grant) may include, but not be limited to intellectual property work, market validation work, testing services, manufacturing development, etc. The ultimate goal of the ignition grants program is to best position the client companies working with the cleantech incubators to attract and secure sufficient follow-on capital to commercialize clean energy technologies and bring them to market. <p>Geographic Coverage</p> <ul style="list-style-type: none"> • Business incubation services will be provided through a competitive process to selected cleantech startup companies in the Southern Tier and southern Western New York regions, which are unserved by NYSERDA's existing cleantech startup growth program offerings. These services may be provided through existing incubators that are not yet members of NYSERDA's cleantech incubator network or other venture development organizations providing similar services. Some candidate existing incubators are located in Binghamton, Ithaca, Corning, Alfred, Fredonia, and Olean. Complementary programming aimed at building a business environment in the region that supports the growth of cleantech startup companies may include entrepreneurship training,

corporate/investor and university connection activities, startup community development activities, and mentoring programs. Client companies of NYSERDA's cleantech incubator that is located in the Southern Tier will also be eligible to compete for the ignition grants.

Proof-of-Concept Centers (POCCs)

- NYSERDA has operated a POCC program since 2013. POCCs aid research institutions in moving their innovations to market through the formation new businesses or corporate partnerships.
- The POCCs use a cohort-based system where teams apply to participate in the program. In the application process, teams outline the relevance of the core technology in addressing clean energy objectives and offer a preliminary identification of the target market. An independent judging panel that includes representatives from the energy industry and venture investment community evaluate the applications. Selected teams are assigned a mentor and participate in an approximately 8-week training program based on the Lean Launchpad methodology. Teams then provide a business pitch in front of another panel of independent judges. This is down-select event and selected teams receive funding for additional customer discovery, prototype development, or testing.
- NYSERDA will continue the POCC effort under this initiative by releasing a competitive solicitation to select entities to serve as POCCs in New York. The solicitation will be open to any academic institution or venture development organization; NYSERDA's three POCCs will also re-compete for funding through the new solicitation. Some or all of the existing POCCs may be selected for continuation of support. The new program will capture the lessons learned from the first four years of the POCC initiative, and include activities to assist with:
 - Operations – This includes reporting, team recruitment, application review, management of judges and mentors, and tracking team progress. The next round of the program will look for an increased emphasis on communicating the outcomes of the POCC to increase program awareness and build interest on the part of new teams and potential corporate and foundation partners.
 - Program – Tasks focused on entrepreneurship training, market validation using voice-of-customer techniques and networking. The next round of the program will look for an increased emphasis on the design and implementation of regional and campus-based entrepreneurial workshops, academic courses or other programs targeting clean energy technology innovators to increase the level and quality of applications to the POCCs.
 - Team-Driven Milestones – Tasks focused on the legal aspects of business formation, development and implementation of go-to-market strategies that will result in sales, targeted networking to develop strategic and investor partnerships, and management team formation. The next round of the program will include an increased emphasis on the management team and interventions that will identify and address leadership gaps critical to the new business reaching scale.
- NYSERDA will also release a competitive solicitation to identify and select a support contractor to assist with the recruitment and management of an advisory board for the overall POCC initiative and to continue program evaluation. The evaluation will include a focus on the impact of the investment in the POCC program to stimulate sustained interest in clean energy-related research and entrepreneurship at the institutional level.

Entrepreneurs-In-Residence (EIR)

- NYSERDA has operated the EIR program through a third-party program administrator since 2010. EIRs are serial entrepreneurs who have a strong background in executive-level management and commercialization at technology-based companies. EIRs guide early-stage companies through specific projects and issues, such as raising capital, executing complex agreements, staffing for growth, resource planning, strategic partnering, and board management. The EIRs will provide:
 - **Mentor Engagements** – Provide companies with specialist mentors who will offer targeted advice and assistance to companies. Areas of focus will include strategy, marketing, sales, finance, supply chain, human capital, and partnerships. These Mentor Engagements may happen at any stage of a company’s lifecycle but will happen most often before a product is fully commercialized.
 - **Company Review Engagements** – Review companies to ascertain strengths and weaknesses. The resulting reviews will be valuable to company management, NYSERDA, private investors and others.
 - **Office Hours and Expert Presentations** – Office Hours provide companies with fast one-on-one access to subject matter experts to discuss the challenges and opportunities they are facing, or simply to learn about clean energy or New York State innovation subjects and understand why they are important to them. Expert Presentations is a low-cost method of providing many cleantech entrepreneurs at one time with critical information (such as protecting intellectual property). Entrepreneurs can learn from each other’s questions and the expert presenter’s answers. The presentations can be seen live and potentially recorded and broadcast for viewing by cleantech entrepreneurs unable to attend the live broadcast due to timing or location. The presentations will help to broadcast why New York State is the place to start and grow a cleantech company.
 - **Practice Pitch, SWAT Team, and Other Engagements** – Practice Pitch will place entrepreneurs in front of EIRs acting as prospective investors or customers. Entrepreneurs will learn to handle and succeed at giving challenging pitches in a risk-free environment before attempting their pitch in front of investors or customers where they have one chance to perform. SWAT Teams are composed of multiple EIRs with various types of expertise who will collaborate over one or more days with a company’s management at highly time sensitive or other critical junctures in the company’s lifecycle, such as when considering a pivot. EIR Website will include a way for companies to obtain help in an easy, low-cost way such as by viewing presentations by experts who understand clean-energy entrepreneurship and New York State. Other information will include learning the attributes NYSERDA and private investors look for when investing in companies, finding resources within the state to help companies attain those attributes, and more.
- Investor, Corporate, and Customer Engagement (ICC Engagement)**
- NYSERDA will leverage the Innovation Advisors to help coordinate engagement and outreach to investors, corporate and strategic partners, and initial customers to drive relationships with early-stage cleantech companies in New York State, while simultaneously developing programs to improve the commercial readiness of early-stage cleantech companies and their ability to engage these larger, more complex counterparties. Specific assistance from NYSERDA will include:
 - **Network Curation** – Networking, matchmaking, and showcase events and forums to connect NYSERDA portfolio companies and other cleantech companies with investors, corporate and strategic partners, and customers.

	<p>These programs will be designed and developed around key technology and market actor verticals to provide targeted and relevant connections between companies and various types of market actors.</p> <ul style="list-style-type: none"> ○ Due Diligence and Risk Mitigation – Third-party technical and business screening and due diligence⁴ support for smaller, less capitalized investors which will also help inform regulatory risk and public benefit of target companies. This activity also includes targeted and strategic seed funding to de-risk early-stage companies that are in the advanced stages of due diligence with pre-qualified investors, corporate and strategic partners, or customers. Additional activities may include support for installation, service, and de-commissioning of innovative clean technology products and solutions. These activities mitigate a variety of commercial risks for potential customers of pre-revenue and early-revenue cleantech companies. ○ Co-Investment Support – Matching funds support for New York State cleantech companies that raise significant capital in a single round from select, pre-qualified funding sources or intermediaries. Investors and/or affiliated intermediaries will be required to provide all relevant screening, due diligence, investment decision-making, and portfolio management procedures to NYSERDA to initially qualify. ○ Pipeline Curation and Communications – Development and deployment of a multi-tiered marketing and communications strategy to better promote NYSERDA portfolio company pipeline to the broader investment community and other interested stakeholder. In addition, NYSERDA will formalize and launch a process for aggregating and inventorying NYSERDA’s portfolio of companies as part of an enhanced portfolio management process for all companies supported by NYSERDA. <p>76West</p> <ul style="list-style-type: none"> ● 76West is an accelerator program and business competition focused on growing entrepreneurs and attracting resources from the U.S. and around the world to build clean energy businesses and jobs in New York State’s Southern Tier region. The program was originally announced in the 2015 State of the State address and launched in 2016 with funding from auction proceeds from the Regional Greenhouse Gas Initiative (RGGI). ● Planned as a four-year program, NYSERDA will move the final two rounds under the CEF due to the programmatic success that has been demonstrated under the first two rounds, and the strong strategic fit with other NYSERDA activities to grow clean energy businesses and move new clean energy technology into the market. The competition will help address the funding and commercialization barriers typically faced by early-stage cleantech companies in the Southern Tier, complementing the statewide activities in this initiative. ● The first two rounds of 76West have already demonstrated strong initial results. First, the competition is directly attracting new companies to the Southern Tier. The number of out of state applicants and participants is steadily increasing (from 25 in 2016 to 59 in 2018, with increasing international participation) and exceeding initial expectations. In addition, the program is successfully accelerating the progress of companies that participate and locate in the Southern Tier after winning prize money. Winners from the first two rounds of the 76West competition have already raised more than \$28 million in
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⁴ Due diligence is research and analysis of a company or organization done in preparation for a business transaction, such as an investment, a corporate merger, or purchase of securities.

	<p>private capital for future growth and created new jobs, as well as crossed important commercialization thresholds, such as product deployment and establishing manufacturing operations in the Southern Tier.</p> <ul style="list-style-type: none"> Continuing the success of the original model, NYSERDA will provide prize money to winners of the 76West Clean Energy Competition to support and incentivize their growth and development in the Southern Tier. Awards will be distributed to winners through a direct contract with NYSERDA on a milestone basis in accordance with published competition rules. Each year, a panel of judges will award the prize money based on the following criteria: clean energy impact, customer value, business model viability, technical viability, Southern Tier job creation, and team. NYSERDA will continue to assess the effectiveness of this approach during the final two years of the pilot to determine next steps beyond 2019. <p>Innovation Advisors</p> <ul style="list-style-type: none"> NYSERDA continues to seek ways to better serve the entrepreneurs and companies it supports through various initiatives. Now in its second iteration, the Innovation Advisors provide an opportunity for top tier management and technical talent to actively contribute towards the success of NYSERDA's cleantech startup support initiatives, and to the overall growth of the clean energy market within the state. NYSERDA will contract with Innovation Advisors on an annual basis to provide hands-on assistance in the development and implementation of improvements, modifications, and extensions to new and existing NYSERDA Innovation offerings. The advisors will support NYSERDA staff in creating, integrating, and managing business development and commercialization-related tasks for awarded projects, as well as coordinate closely with staff to streamline solicitation procedures and enhance project selection, development, and management processes to improve the overall customer experience for proposers and awardees. The advisors will also provide advisory services directly to awardees of NYSERDA-funded projects, directly supporting the companies' development. This work includes assisting the companies in the execution of key technical and commercialization milestones.
Key Milestones	<p><u>Incubators</u></p> <p><u>Milestone 1 (2016)</u></p> <ul style="list-style-type: none"> First competitive solicitation launched. <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> Awards from first solicitation contracted. <p><u>Milestone 3 (2017)</u></p> <ul style="list-style-type: none"> Second competitive solicitation launched. <p><u>Milestone 4 (2018)</u></p> <ul style="list-style-type: none"> Awards from second solicitation contracted. <p><u>Milestone 5 (each year starting in 2017)</u></p> <ul style="list-style-type: none"> Networking Event held. <p><u>Milestone 6 (each year starting in 2017)</u></p> <ul style="list-style-type: none"> Entrepreneur Bootcamp held. <p><u>Ignition Grants</u></p>

	<p><u>Milestone 1 (2017)</u></p> <ul style="list-style-type: none"> • Formal Voice of Customer exercise completed. <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> • Solicitation launched. <p><u>Milestone 3 (2017)</u></p> <ul style="list-style-type: none"> • Investment Committee established. <p><u>Milestone 4 (each year starting in 2017)</u></p> <ul style="list-style-type: none"> • Investment Committee Meetings held. <p><u>Milestone 5 (starting in 2017)</u></p> <ul style="list-style-type: none"> • Ignition grant awards issued on ongoing basis. <p><u>Geographic Coverage</u></p> <p><u>Milestone 1 (2016)</u></p> <ul style="list-style-type: none"> • Competitive solicitation launched. <p><u>Milestone 2 (2017)</u></p> <ul style="list-style-type: none"> • Awards from solicitation contracted (~6 months following solicitation due date). <p><u>Milestone 3 (2017)</u></p> <ul style="list-style-type: none"> • Inventory of Entrepreneurial Assets in Southern Tier completed. <p><u>Milestone 4 (2017)</u></p> <ul style="list-style-type: none"> • Entrepreneurship Training Programs established. <p><u>Milestone 5 (each year starting in 2017)</u></p> <ul style="list-style-type: none"> • Networking Events held. <p><u>Proof-of-Concept Centers (POCCs)</u></p> <p><u>Milestone 1 (2018)</u></p> <ul style="list-style-type: none"> • Competitive solicitation for POCCs launched. <p><u>Milestone 2 (2018)</u></p> <ul style="list-style-type: none"> • Award(s) from solicitation for POCCs contracted. <p><u>Milestone 3 (2019)</u></p> <ul style="list-style-type: none"> • Competitive solicitation for POCC support services launched. <p><u>Milestone 4 (2019)</u></p> <ul style="list-style-type: none"> • Award(s) from solicitation for POCC support services contracted. <p><u>Entrepreneurs-In-Residence</u></p> <p><u>Milestone 1 (2018)</u></p> <ul style="list-style-type: none"> • Competitive solicitation launched. <p><u>Milestone 2 (2018)</u></p> <ul style="list-style-type: none"> • Award(s) from solicitation contracted. <p><u>Milestone 3 (2018)</u></p> <ul style="list-style-type: none"> • Company Reviews initiated.
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	<p><u>Milestone 4 (2018)</u></p> <ul style="list-style-type: none"> • Company Engagements initiated. <p><u>Milestone 5 (2018)</u></p> <ul style="list-style-type: none"> • Office Hours and Expert Presentations initiated. <p><u>Milestone 6 (each year starting in 2018)</u></p> <ul style="list-style-type: none"> • Practice Pitch, SWAT Team, and Other Engagements initiated. <p><u>Investor, Corporate, and Customer Engagement</u></p> <p><u>Milestone 1 (2018)</u></p> <ul style="list-style-type: none"> • Competitive solicitations launched. <p><u>Milestone 2 (2018)</u></p> <ul style="list-style-type: none"> • Awards from solicitations contracted. <p><u>76West</u></p> <p><u>Milestone 1 (2018)</u></p> <ul style="list-style-type: none"> • Awardees from third round⁵ selected. <p><u>Milestone 2 (2019)</u></p> <ul style="list-style-type: none"> • Awards from third round contracted. <p><u>Milestone 3 (2019)</u></p> <ul style="list-style-type: none"> • Awardees from fourth round selected. <p><u>Milestone 4 (2020)</u></p> <ul style="list-style-type: none"> • Awards from fourth round contracted. <p><u>Innovation Advisors</u></p> <p><u>Milestone 1 (2019)</u></p> <ul style="list-style-type: none"> • Competitive solicitation launched. <p><u>Milestone 2 (2019)</u></p> <ul style="list-style-type: none"> • Awards from solicitation contracted. <p><u>Milestone 3 (2020)</u></p> <ul style="list-style-type: none"> • Competitive solicitation launched. <p><u>Milestone 4 (2020)</u></p> <ul style="list-style-type: none"> • Awards from solicitation contracted. <p><u>Milestone 5 (2021)</u></p> <ul style="list-style-type: none"> • Competitive solicitation launched. <p><u>Milestone 6 (2021)</u></p> <ul style="list-style-type: none"> • Awards from solicitation contracted. <p><u>Milestone 7 (2022)</u></p> <ul style="list-style-type: none"> • Competitive solicitation launched.
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⁵ Rounds 1 and 2 for 76West were funded through RGGI.

	<p><u>Milestone 8 (2022)</u></p> <ul style="list-style-type: none"> • Awards from solicitation contracted.
Goals Prior to Exit	<ul style="list-style-type: none"> • The potential impact of this initiative includes: <ul style="list-style-type: none"> ○ Accelerating the time to market for early-stage companies and enable them to raise investment, secure partnerships, and sell products and services in the State. ○ Achieving key incubator client company and graduate milestones, including: <ul style="list-style-type: none"> ▪ Closing major financing rounds (Seed, Series A, Series B, Series C, etc.) ▪ Entering into development/partnership agreements with corporate/strategic partners ▪ Reaching significant sales milestones ▪ Achieving liquidity events (mergers and acquisitions, initial public offerings, etc.) ○ Maintaining NYSERDA's historical investment leverage ratio for the incubator program – \$7 of private and follow-on capital mobilized for every \$1 NYSERDA invests. • NYSERDA will continue to evaluate the effectiveness of its approach towards cleantech startup growth and will adjust its strategies accordingly based on the needs of customers and partners in the market. As the cleantech incubators have evolved and gained traction, NYSERDA has shifted the focus of milestones from those for operations and programming to primarily client-driven milestones. • Establishment of a level of cleantech startup and business incubation activity in the Southern Tier approaching the levels found in other major regions of the state. • Move cleantech entrepreneurs and early-stage companies from ideation through the point of traction and scale. • Leverage target market actors (investors, corporate and strategic partners, and customers) to increase awareness of partnership opportunities and New York State's cleantech innovation ecosystem, which is driven by NYSERDA's Innovation Program Partners and other market partners to provide access to capital, executive expertise, strategic relationships, and business support for cleantech entrepreneurs and early-stage companies. • In the ideal scenario, the end state of the market that would enable NYSERDA to exit this initiative is one where early-stage cleantech companies in New York State are able to attract follow-on capital and secure partnerships and development agreements without any support from these activities. It is highly unlikely that this end state would be achieved in the next four years. As a result, the need for the assets and resources that make up this initiative is not envisioned to go away after the end of proposed funding for this initiative in 2021. NYSERDA intends to continue to support the activities at a level that is commensurate with the market need for these activities beyond 2021.

10.1.5 Relationship to Utility/REV

Utility Role/ Coordination Points	<ul style="list-style-type: none"> • The implementation of REV over the coming years will provide new market and business opportunities for entrepreneurs and early-stage companies developing innovative clean energy technologies and solutions. • NYSERDA will continue to promote active and ongoing coordination between its Innovation Program Partners and the utilities that operate in their respective markets. It will achieve this by creating new opportunities for
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	<p>entrepreneurs and early-stage companies to meet and network with utilities through existing and future program offerings and events.</p> <ul style="list-style-type: none"> • Several utilities based in New York State have already participated in previous events, competitions, workshops, etc. to engage with early-stage cleantech companies. NYSERDA will provide even more opportunities for utilities to connect with companies through this set of activities. • Utilities could serve as pilot and demonstration partners for companies in order to accelerate their time to market. NYSERDA will look to engage utilities as appropriate to help establish these connections with relevant companies that meet their requirements. • This initiative will leverage the investments being made to modernize the utility business model through the work of entrepreneurs and early-stage companies that are developing innovative products and solutions for the market.
Utility Interventions in Target Market	<ul style="list-style-type: none"> • The New York utilities do not have any similar offering to this market.

10.1.6 Budgets & Expenditures

An annual commitment budget for all activities included in this chapter is shown in Table 1. The annual expenditure projection is included in Table 2. 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.

Table 1: Annual Innovation & Research Budget Allocation – Commitment Basis

Commitment Budget	2016	2017	2018	2019	2020	2021	2022	Total
Business Support	\$6,000,000	\$6,500,000	\$10,950,000	\$13,950,000	\$8,650,000	\$7,650,000	\$4,500,000	\$58,200,000
Total	\$6,000,000	\$6,500,000	\$10,950,000	\$13,950,000	\$8,650,000	\$7,650,000	\$4,500,000	\$58,200,000

Table 2: Annual Expenditures Projection

Expenditures	2016	2017	2018	2019	2020	2021	2022	2023	Total
Total	0%	3%	14%	27%	21%	20%	12%	3%	100%

10.1.7 Progress and Performance Metrics

Table 3 provides program Activity/Output indicators representing measurable, quantifiable direct results of activities undertaken in the initiative. Outputs are a key way of regularly tracking progress, especially in the early stages of an initiative, before broader market changes are measurable. Outcome indicators can encompass near-term through longer-term changes in market conditions expected to result from the activities/outputs of an intervention. Outcome indicators will have a baseline value and progress will be measured periodically through Market Evaluation.

Table 3. Initiative Specific Metrics⁶

Indicators⁷		Baseline (Before/ Current)⁸	2019 (Cumulative)	2022 (Cumulative)
Activity/Outputs	Incubators – Companies Engaged	0	119	146
	Incubators – Companies Graduated (Graduates)	0	12	21
	Geographic Coverage – Companies Engaged	0	24	24
	POCCs – Teams Engaged	0	15	75
	POCCs – Businesses Formed	0	10	40
	EIR – Companies Engaged	0	520	1,420
	ICC Engagement – Companies Engaged	0	141	496
	76West – Companies Engaged	12	24	24
	Innovation Advisors – Advisors Deployed	3	7	19
Outcomes	Products Commercialized	66	93	193
	Investor Agreements Executed	0	5	25
	Corporate and Strategic Partnerships Formed	0	3	18
	Customer Agreements Executed	0	1	10

In addition to the above outcomes, NYSERDA will also assess the following broad outcomes:

- Continued investment in the incubator program will maintain the historical investment leverage levels of incubator client companies and graduates.
- Highly targeted and timely infusions of capital through the ignition grants program will better position incubator client companies to attract follow-on capital from investors and/or secure commercialization support from development partners.
- High-performing cleantech incubators and POCCs will be able to attract funding from other sponsors to help sustain their operations and programs while retaining a focus on NYSERDA’s clean energy goals.
- Revenue generated in New York State.
- Exits or liquidity events (mergers and acquisitions, outright sale, initial public offering, private placement, etc.) realized by participant companies.

⁶ There may be some overlap in the Activity/Outputs and/or Outcomes that are achieved and reported through this set of initiatives. For example, a company that is a client of an Incubator may also receive support from the Entrepreneurs-In-Residence program or one of the Investor, Corporate, and Customer Engagement activities.

⁷ A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.

⁸ Revised baseline values are based on preliminary research and will be updated upon completion of a market evaluation study still underway. Once finalized, this study will be available publicly on NYSERDA’s website and in the DPS Document and Matter Management system.

Benefits shown in Table 4 and Table 5 are direct, near-term benefits associated with this initiative's projects. These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation. Private Investment refers to private and follow-on capital raised by incubator client companies and graduates as well as the program funding leveraged by the incubators through sponsors other than NYSERDA. As such, there will be lag from the time funds are committed for Incubators and Ignition Grants to realizing the leverage (estimated as ~3 years); this lag is not shown in table 4 due to impacts being expressed on a commitment-year basis.

Table 4. Direct Impacts

Primary Metrics ⁹		2016	2017	2018	2019	2020	2021	2022	Total
Energy Efficiency	MWh Annual	-	-	-	-	-	-	-	-
	MWh Lifetime	-	-	-	-	-	-	-	-
	MMBtu Annual	-	-	-	-	-	-	-	-
	MMBtu Lifetime	-	-	-	-	-	-	-	-
	MW	-	-	-	-	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-	-	-	-	-
	MWh Lifetime	-	-	-	-	-	-	-	-
	MW	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Lifetime		-	-	-	-	-	-	-	-
Customer Bill Savings Annual (\$ million)		-	-	-	-	-	-	-	-
Customer Bill Savings Lifetime (\$ million)		-	-	-	-	-	-	-	-
Private Investment (\$ million) ¹⁰		\$90.0	\$90.0	\$58.8	\$63.9	\$34.0	\$32.0	\$18.5	\$387.2

Table 5. Annual Projected Initiative Participation

	2016	2017	2018	2019	2020	2021	2022	Total
Participants ¹¹	32	92	592	749	869	925	1,076	4,335

10.1.8 Fuel Neutrality

Fuel Neutrality	<ul style="list-style-type: none"> • Early-stage cleantech companies are generally involved in developing new business models to bring innovative technologies and solutions to market that
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⁹ Impacts are expressed on a commitment-year basis and are incremental additions in each year. Benefits are rounded to three significant figures. Totals may not sum due to rounding.

¹⁰ In this instance, Private Investment could include, but is not limited to, private capital raised by participant companies, private capital secured for financing clean energy projects by participant companies, and revenue generated by participant companies.

¹¹ Participants include those directly utilizing one or more initiative(s): entrepreneurs, early-stage companies, NYSERDA innovation program partners, venture development organization partners, service providers, mentors, investors, corporate/strategic partners, and/or customers/end-users. There may be some overlap in the Participants that are engaged and reported through this set of initiatives.

	<p>will help achieve New York State’s greenhouse gas emission, renewable energy, and energy efficiency goals.</p> <ul style="list-style-type: none"> • The innovative technologies and startup companies that will advance through this initiative will provide a range of benefits for New York ratepayers to advance REV objectives, potentially including higher efficiency end-use devices, energy management systems, new grid technology solutions, better performing renewable energy systems, and a range of improved DER options. • There could also be instances where the primary target market for a technology or solution being offered by a client company or graduate is as an alternative fuel.
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10.1.9 Performance Monitoring and Evaluation Plans

<p>Performance Monitoring & Evaluation Plan</p>	<p><u>Test-Measure-Adjust Strategy</u></p> <ul style="list-style-type: none"> • NYSERDA will collect and analyze established innovation metrics for participant entrepreneurs and companies, including private capital raised, non-NYSERDA grants awarded, products commercialized, revenue generated, jobs created/retained, investor agreements executed, corporate or strategic partnerships formed, customer agreements executed, and program funding leveraged from other sponsors by NYSERDA Innovation Program Partners. These metrics will be regularly collected for each company that participates in the various programs to assess progress toward the overall outcomes and goals of the initiative. <p><u>Market Evaluation</u></p> <ul style="list-style-type: none"> • Market Evaluation will draw on the logic model and will include baseline and longitudinal measurement of key indicators of programmatic and broader market success. • Baseline measurements of key market indicators will occur soon following initiative launch and will provide additional insights that will allow NYSERDA to adjust strategies. Measurements include, but are not limited to, engagement with entrepreneurs, early-stage companies, mentors, investors, corporate and strategic partners, and customers. • Regular (e.g., annual or biennial) updates to key performance indicators and measurement of market change, including but not limited to, product commercialization and revenue generated by new commercial products and products that have previously been commercialized. • Sources of data include intervention data, public and commercially available data, and primary data collection through surveys of key market actors.
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10.2 Manufacturing Corps (M-Corps)

10.2.1 Overview

<p>Present Situation</p>	<ul style="list-style-type: none"> • Cleantech¹² startups frequently don't understand issues of product manufacturability or how to approach manufacturing with a business-like perspective. They often do not know how or where products will be manufactured, or if their product can be manufactured profitably or at scale. This lack of expertise hampers their progress to market and their ability to secure private investment and corporate partners. • Cleantech startup companies often experience a cash flow squeeze when undertaking manufacturing. They struggle to raise cash from the private sector as well as grants or loan backing from the public sector because they have not yet sold their product. At the same time, the cleantech startup company has major capital demands to manufacture their product. These challenges converge to create a cash and resource shortfall that is difficult or impossible for many cleantech startup companies to overcome. • Manufacturers are hesitant to work with startup companies because startups are not yet effective partners – lacking broad manufacturing plans, as well as specific critical deliverables like technical drawings of a product Designed for Manufacturing (DFM) at scale.¹³ Manufacturers are reluctant to spend time training cleantech startup companies because it is costly and has uncertain returns.
<p>Intervention Strategy</p>	<ul style="list-style-type: none"> • NYSERDA has identified a series of solutions to the manufacturing challenges that face startups. NYSERDA will pilot a suite of interventions targeting, but not limited to, companies involved with NYSERDA Proof-of-Concept Centers, incubators and Technology and Business Innovation product development activities. The program will first be rolled out on a small scale and then the most promising interventions on a larger scale. • To implement this strategy, NYSERDA will competitively select two or more entities to run the pilot program, while also allowing the selected entities to test out additional interventions that they believe could be promising for their region. Based on the learnings from the pilot, NYSERDA will issue another competitive solicitation to select one or more entities to implement the most promising interventions on a larger scale. • This strategy represents NYSERDA's first attempt at addressing what has been observed as a significant and pressing market need for both cleantech startup companies and established contract manufacturers. As such, the strategy and associated activities will be phased in over time with an initial 12-18-month pilot deployment. Upon analysis of program impact and after making necessary adjustments, a broader statewide rollout will occur. NYSERDA's investment in the M-Corps Initiative will cover both the pilot period and the statewide rollout over a combined period of approximately four years. • NYSERDA intends this to be a short-term initiative where, after NYSERDA's initial involvement, market actors including investors, manufacturing partners, and venture development organizations will organically implement the most successful interventions that make a proven impact on cleantech startups' ability to scale. The interventions are designed to incentivize these market actors to continue forward after the close of the NYSERDA program period.

¹² Here, cleantech refers to energy-related technologies that generate commercial benefits to customers while addressing environmental concerns, such as global climate change, sustainability, and energy security.

¹³ DFM is defined by the adjustments to early product design that ensure large scale manufacturing will be economical. As an example, a product that was machined for prototype units may need to be injection molded for manufacturing thousands of units. The design of the injection mold tooling and redesign of the product for that manufacturing process fall under DFM.

	<ul style="list-style-type: none"> For a visual representation of this strategy, please reference the flow chart entitled “Logic Model: Manufacturing Corps Initiative” which can be found in Appendix A.
Goals	<ul style="list-style-type: none"> Accelerate the time-to-market¹⁴ for cleantech startup companies by removing barriers for cleantech startup companies to work with New York State (NYS) manufacturers. Better prepare startup companies for working with manufacturers by addressing both product DFM and the ability of startups to pay for manufacturing costs. This technical and financial de-risking is key to the desirability of startup companies as customers for manufacturers. Evidence of success may include signed contracts between startups and manufacturers to produce cleantech hardware products. These same activities also address a startup company’s investor readiness. Improve the profitability of NYS cleantech companies through reduction in Cost of Goods Sold (COGS) by reducing supply chain and manufacturing costs. Increase seed and follow-on capital investments in cleantech startup companies who have strong manufacturing strategies for their product(s). Improve manufacturers’ ability to unlock new customer opportunities by working with startups and thereby increasing revenue.
State Energy Plan/Clean Energy Standard Link	<ul style="list-style-type: none"> A focus of the State Energy Plan is to remove market barriers and bridge market gaps to enable a dynamic clean energy economy operating at a scale to create jobs and drive local economic growth, while protecting our environment by reducing greenhouse gas (GHG) emissions and other pollutants. As articulated in the State Energy Plan, NYSERDA assists cleantech startup and early stage businesses bringing innovative clean energy technologies to the customer through strategic investments in statewide, multi-use assets that provide business incubation, manufacturing support, mentorship, and access to private sector investors and potential development and commercialization partners. The M-Corps Initiative is a component of the portfolio of NYSERDA innovation investments. NYSERDA investments will result in the deployment of the next generation of clean energy products and solutions that advance REV principles and address the state’s key environmental, energy, and economic challenges.

10.2.2 Target Market Characterization

Target Market Segment(s)	<ul style="list-style-type: none"> This initiative will target cleantech hardware startup companies in NYS and manufacturing entities working with cleantech startup companies in NYS. The initiative is sector/technology agnostic for all areas of the clean energy and clean technology space.
Market Participants	<p>Market participants include:</p> <ul style="list-style-type: none"> Entrepreneurs Cleantech startup companies Investors, including but not limited to: <ul style="list-style-type: none"> Angel investors Venture capital funds Impact investors Family offices (a private firm that manages investments and trusts for one or more families.) Foundations Government agencies Corporate/strategic investors Venture Development Organizations, including but not limited to: <ul style="list-style-type: none"> NYSERDA Cleantech Incubators

¹⁴ A review of NYSERDA investments in product development projects for cleantech companies between 2009 and 2015 indicates the average time-to-market is 7 years. This cycle time only applies to hardware products not software.

	<ul style="list-style-type: none"> ○ NYSERDA Proof-of-Concept Centers ○ Empire State Development's New York State Innovation Hot Spots and Certified Business Incubators ○ Empire State Development's (ESD) Regional Technology Development Centers ○ ESD's Centers for Advanced Technology ○ Universities ● Manufacturing Partners, including but not limited to: <ul style="list-style-type: none"> ○ Contract manufacturers ○ Original Equipment Manufacturers ○ Strategic corporate partners ○ DFM experts ○ Plant design and LEAN Six Sigma experts ○ Federally-funded Manufacturing Extension Partnerships ○ Early prototyping spaces ○ Manufacturing process prototyping experts ○ Testing, certification and regulatory experts ○ Industrial project management experts ○ Quality assurance experts ○ Component sourcing and supply chain experts ○ Packaging and industrial design experts ○ Manufacturing project management experts
Market Readiness	<ul style="list-style-type: none"> ● New York's clean energy market is steadily growing, especially given REV and the aggressive energy and emissions goals that have been established. Cleantech startup companies have an important role to play in the achievement of NYS' clean energy goals. ● NYSERDA's engagements with market actors indicate a strong need for manufacturing interventions. Manufacturing partners are particularly interested in business development opportunities with startups that NYSERDA and the greater investment community have identified as ready for manufacturing. ● Investors have expressed a desire for trusted manufacturers to partner with them on investment opportunity panels. Investors also seek manufacturing assistance for their startup portfolio companies (e.g. vendors and mentors). ● Dozens of manufacturers who participated in NYSERDA's customer discovery reported an interest in working with startup companies to grow their businesses but reported a lack of knowledge of how to access the market opportunity. Adding startup companies to the manufacturers' customer base is a client diversification tool. ● Throughout the customer discovery process, NYSERDA has fielded many requests from startups for manufacturing and scaling assistance. The need is particularly timely now as a number of NYSERDA's portfolio companies are trying to scale up. ● During customer discovery, all six NYSERDA-funded incubators, the eleven federally-funded Manufacturing Extension Partnership sites in NYS, and many other venture development organizations expressed an urgency for the interventions outlined in NYSERDA's M-Corps Initiative based on their collective experience bringing new hardware products to market.
Customer Value	<ul style="list-style-type: none"> ● The NYSERDA M-Corps Initiative will contribute to the manufacture and commercialization of cleantech products as well as the mobilization of capital in a way that would most likely not occur in the absence of this program. ● For a startup company targeting the cleantech sector who needs to deliver a complex hardware product to the market, NYSERDA's M-Corps Initiative provides a clear manufacturing strategy that lends legitimacy with potential manufacturers and potential investors for market-validated products. ● For a private capital investor who needs quality deal flow that leads to profits, NYSERDA's M-Corps Initiative provides a technically and financially de-risked

	<p>investment in a startup company who has a clear manufacturing strategy for their market-validated product(s).</p> <ul style="list-style-type: none"> • For a strategic corporate investment partner who needs innovative, disruptive, and efficient cleantech solutions to complement existing product lines or add new capability, unlocking new market channels, NYSERDA's M-Corps Initiative provides a deal flow of hardware-focused startup companies who are actively seeking investment partners including strategic corporate partners. • For a contract manufacturer who needs opportunities for growth, NYSERDA's M-Corps Initiative provides incremental revenue and higher profit margin potential, access to new customers who are well-prepared for manufacturing, partners as well as customer diversification. • For a venture development organization who needs business results for their client companies, NYSERDA's M-Corps Initiative provides real world expert manufacturing mentorship and training that allow venture development organizations to help startups develop a strong manufacturing strategy and raise capital.
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10.2.3 Stakeholder/Market Engagement

<p>Stakeholder/Market Engagement and Customer Discovery</p>	<ul style="list-style-type: none"> • NYSERDA has conducted extensive, ongoing customer discovery and market engagement work including more than 100 interviews of market actors including startup companies at all stages, private investors, strategic corporate partners, manufacturing partners, potential venture development organizations, U.S. Department of Energy's Advanced Manufacturing Office, and other similar manufacturing programs across the United States. • NYSERDA's M-Corps Initiative has been designed to leverage best practice and lessons learned through customer discovery from startup companies who have successfully scaled, other manufacturing initiatives across the country, past NYSERDA programs, ESD programs past and present, and the collective expertise of NYSERDA's partners and contractors. • NYSERDA will engage with market actors and stakeholders throughout the M-Corps Initiative. NYSERDA recognizes that ongoing customer discovery is needed to ensure the program adjusts to meet the dynamic needs of the marketplace.
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10.2.4 Theory of Change

<p>Technology Opportunities and Barriers Addressed</p>	<ul style="list-style-type: none"> • Entrepreneurs and startup companies often lack the manufacturing expertise necessary to successfully bring clean energy technologies to market. The problem is even more prevalent for cleantech startup companies developing advanced hardware technologies. • Many cleantech startup companies in New York State do not know how to find manufacturers for their product(s). This creates an opportunity for NYS' manufacturing and venture development organizations, through this initiative, to build networks and increase the potential for productive, meaningful interactions between startup companies and manufacturing partners • Once startup companies and manufacturers find each other, they do not know the best practices for working with each other. Manufacturers often give up on startup company business opportunities because they do not want to train startup companies on manufacturing strategy or tactical decision making. • Startup companies do not have the requisite cash flow to undertake production runs. Manufacturers find working with startup companies challenging because funding production is challenging for startup companies.
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	<ul style="list-style-type: none"> • When a startup company does not have a manufacturing strategy, private investment is more difficult to obtain. This creates an opportunity for NYSERDA to mobilize private capital through this initiative by helping startup companies develop a manufacturing strategy and engage potential manufacturing partners.
Testable Hypotheses	<ul style="list-style-type: none"> • If NYSERDA’s M-Corps Initiative helps cleantech startup companies develop a manufacturing strategy, then manufacturers will be more willing to work with startups. • If NYSERDA’s M-Corps Initiative lowers the risk of production costs for cleantech startup companies by providing cash flow and technical assistance, then manufacturers will more readily work with startup companies. • If NYSERDA’s M-Corps Initiative helps a cleantech startup company develop a manufacturing strategy, then the cleantech startup company will be in a better position to attract capital from private investors, and secure agreements with strategic corporate partners. • If NYSERDA’s M-Corps Initiative helps a cleantech startup company prioritize its hardware manufacturing challenges, investors will be more likely to fund the startup company to overcome those high priority challenges.
Activities (Resources)	<ul style="list-style-type: none"> • NYSERDA will collect additional data to further develop market insights to better understand the barriers between startup companies and manufacturers, to identify manufacturers interested in working with startups as initial M-Corps participants. This activity will collect necessary baseline information against which to measure progress. The results will be used for program design, and targeted marketing and communications. This may include but shall not be limited to the completion of a survey of startups and manufacturing partners. • NYSERDA will identify and embed manufacturing experts in cleantech startup companies for limited engagements. These experts will help the cleantech startup build a roadmap for manufacturing and commercialization during a contract period, providing valuable insight and potential pivot opportunities to both the cleantech startup and the NYSERDA team overseeing each cleantech startup. • NYSERDA will partner with respected industry partners to develop manufacturing curriculum and training content for cleantech entrepreneurs. • NYSERDA may partner with other government agencies (ESD, New York City Economic Development Corporation, Industrial Development Agencies, etc.) to make scalable manufacturing spaces available to cleantech startup companies. An assessment of cleantech startup companies who are ready to manufacture and seek scaling assistance will determine future activities. • NYSERDA will create and implement a communications strategy for the M-Corps Initiative that could include print, social media, videos, white papers, and/or events. • NYSERDA will issue a competitive solicitation in a pilot of the activities below to engage one or more entities. Proposers will be asked to specify the geographic region in which they will pilot these activities. By building a pilot program before a statewide rollout of the initiative, NYSERDA will be well-positioned to capture best practices and pivot opportunities on a smaller scale then leverage them for maximum impact. The solicitation will include offerings that: <ul style="list-style-type: none"> ○ Build knowledge of product manufacturability among entrepreneurs (i.e., DFM workshops, manufacturing expert office hours, networking sessions, etc.). ○ Match cleantech startup companies with relevant manufacturers (i.e., build a database of interested parties, arrange tours of manufacturer locations, etc.). ○ Mentor cleantech startup companies in manufacturing strategy and work product development (i.e., temporarily embed manufacturing expertise in cleantech startup companies, engage testing and certification bodies to mentor startup companies on material and component choices, etc.).

	<ul style="list-style-type: none"> ○ Improve access to manufacturing resources (i.e., early prototyping facilities, multi-use facilities, specialty equipment, etc.). ○ Production Cost De-Risking Program that reduces the burden of production costs and improves cash flow for cleantech startup companies as well as manufacturers (i.e., NYSERDA payment guarantees for upfront manufacturing costs, NYSERDA-facilitated improved payment terms, etc.). ○ Engage manufacturers to work with startups more successfully (i.e., assist with market-validation and purchase order due diligence, train on the best practices of working with startup companies, etc.). • NYSERDA will review the M-Corps pilot program on an ongoing basis for effectiveness and subsequently adjust it as needed. NYSERDA and the contractor will collect data on successes and barriers for market actors, adding, removing, or changing interventions as needed. • NYSERDA will issue a competitive solicitation to enlist entities in a statewide implementation of the interventions proven successful during the pilot program. These interventions may include those outlined above, as well as interventions that evolve through the pilot.
Key Milestones	<p><u>Milestone 1 (2017)</u></p> <ul style="list-style-type: none"> • Competitive solicitation launched for pilot sites. <p><u>Milestone 2 (2018)</u></p> <ul style="list-style-type: none"> • Awards from pilot site solicitation are contracted. Pilot program launched. <p><u>Milestone 3 (2020)</u></p> <ul style="list-style-type: none"> • Pilot program ends. Metrics reviewed based on pilot program performance and adjustments identified to implement in statewide solicitation. <p><u>Milestone 4 (2021)</u></p> <ul style="list-style-type: none"> • Statewide competitive solicitation based on pilot program launched. <p><u>Milestone 5 (2021)</u></p> <ul style="list-style-type: none"> • Awards from statewide solicitation are contracted. Statewide program launched. <p><u>Milestone 6 (2023)</u></p> <ul style="list-style-type: none"> • NYSERDA investment in statewide program ends. Metrics reviewed based on statewide program performance.
Goals Prior to Exit¹⁵	<ul style="list-style-type: none"> • Venture development organizations organically assist hardware startup companies with minimal NYSERDA intervention as they work to design their products for scale manufacturing. • Startup companies can solicit at least three competitive quotations with manufacturing partners who are willing to extend reasonable payment terms to the startup. This allows startups to finance production costs without dilutive equity investment and control COGS with competitive bidding practices. • Venture development organizations, manufacturers, and investors network with each other and collaboratively accelerate the most promising startup companies to market. • Investors and manufacturers work together to educate entrepreneurs on manufacturing readiness.

¹⁵ NYSERDA recognizes that this ideal end state may take more or less time than this Investment Plan outlines given the lack of historical information. NYSERDA therefore will review key outcomes and metrics throughout the program to determine future activities (continue, pivot, or end).

10.2.5 Relationship to Utility/REV

Utility Role/Coordination Points	<ul style="list-style-type: none"> • The implementation of REV over the coming years will provide new market and business opportunities through utilities and others for startup companies developing emerging clean energy technologies. • Bringing more cleantech products to market through NYSERDA's M-Corps Initiative drives technological efficiencies within the state that REV relies upon.
Utility Interventions in Target Market	<ul style="list-style-type: none"> • The New York utilities do not have any similar offering to this market.

10.2.6 Budgets & Expenditures

An annual commitment budget for all activities included in this chapter is shown in Table 6. The annual expenditure projection is included in Table 7. 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.

Table 6: Annual Innovation & Research Budget Allocation – Commitment Basis

Commitment Budget¹⁶	2018	2019	2020	Total
Business Support	\$4,000,000	\$3,000,000	\$5,000,000	\$12,000,000
Total	\$4,000,000	\$3,000,000	\$5,000,000	\$12,000,000

Table 7: Annual Expenditures Projection

Expenditures	2018	2019	2020	2021	2022	Total
Total	20%	20%	27%	27%	6%	100%

10.2.7 Progress and Performance Metrics

Table 8 provides program Activity/Output indicators representing measurable, quantifiable direct results of activities undertaken in the Initiative. Outputs are a key way of regularly tracking progress, especially in the early stages of an initiative, before broader market changes are measurable. Outcome indicators can encompass near-term through longer-term changes in market conditions expected to result from the activities/outputs of an intervention. Outcome indicators will have a baseline value and progress will be measured periodically through Market Evaluation.

¹⁶ The 2018 and 2020 Commitment Budget reflects the ramp up required for the pilot program and the statewide program, respectively. The 2019 budget reflects a period of pilot program wind down and evaluation in preparation for the statewide program launch.

Table 8. Initiative Specific Metrics¹⁷

Indicators ¹⁸		Baseline (Before/Current) ¹⁹	2021 (Cumulative)	2023 (Cumulative)
Activities / Outputs	Manufacturing strategies developed for cleantech products	0	24	66
	Manufacturing agreements signed between startups & manufacturers	0	24	66
Outcomes	Cleantech products manufactured total ²⁰	0	24	66
	Agreements to invest in cleantech startup companies signed ²¹	0	0	14

In addition to the above outcomes, NYSERDA will also assess the following broad outcomes for companies engaged in the M-Corps Initiative:

- Cleantech products manufactured in NYS.
- Revenue generated by cleantech companies producing cleantech products.

Benefits shown in Table 9 and Table 10 are direct, near-term benefits associated with this initiative’s projects. These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation. Private Investment refers to private and follow-on capital raised by engaged cleantech startup companies as well as the program funding leveraged by the market actors through sponsors other than NYSERDA. As such, there will be lag from the time funds are committed to the Initiative to realizing the leverage (estimated as 3-5 years); this lag is not shown in table 9 due to impacts being expressed on a commitment-year basis. Due to the nature of the activities, estimating energy impacts at this stage is difficult because the specific technologies that will be supported are not known. However, energy savings for projects supported by this initiative will be tracked and reported.

Table 9. Direct Impacts

Primary Metrics ²²	2018	2019	2020	Total
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¹⁷ An engaged market actor is one who is accessing a specific M-Corps Initiative intervention. All activities, outputs, and outcome metrics outlined in this initiative are stated and will be measured using engaged actors.

¹⁸ A 0 (zero) denotes that the actual value is currently believed to be zero for engaged market actors.

¹⁹ Revised baseline values are based on preliminary research and will be updated upon completion of a market evaluation study still underway. Once finalized, this study will be available publicly on NYSERDA’s website and in the DPS Document and Matter Management system.

²⁰ NYSERDA recognizes that not all cleantech products will be manufactured in NYS. For those engaged in the M-Corps Initiative, NYSERDA will track both the total number of cleantech products manufactured and the subset of those that are manufactured in NYS.

²¹ In this instance, “Number of agreements to invest in cleantech startup companies signed” refers to the number of agreements between engaged cleantech startup companies and private capital investors and/or strategic corporate partnerships. The value of these agreements depends on the exact mix of cleantech startup companies and cleantech products. This assumes a 3-5-year lag from the time agreements are committed toward realizing the target.

²² Impacts are expressed on a commitment-year basis and are incremental additions in each year. Benefits are rounded to three significant figures. Totals may not sum due to rounding.

Energy Efficiency	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MMBtu Annual	-	-	-	-
	MMBtu Lifetime	-	-	-	-
	MW	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-
	MWh Lifetime	-	-	-	-
	MW	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		-	-	-	-
CO2e Emission Reduction (metric tons) Lifetime		-	-	-	-
Customer Bill Savings Annual (\$ million)		-	-	-	-
Customer Bill Savings Lifetime (\$ million)		-	-	-	-
Private Investment (\$ million) ²³		\$20.0	\$15.0	\$25.0	\$60.0

Table 10. Annual Projected Initiative Participation

	2018	2019	2020	Total
Participants ²⁴	100	150	200	450

10.2.8 Fuel Neutrality

Fuel Neutrality	<ul style="list-style-type: none"> The M-Corps Initiative is intended to accelerate the commercial introduction of the new products supported across the Innovation & Research portfolio. As this initiative is a companion to other Innovation & Research programs, the assessment of and justification for fuel neutrality is provided as a component of those other programs. Individually, each of the products supported by this initiative will deliver energy and environmental benefits to NYS and advance REV objectives. The additional support offered through this initiative will increase the likelihood that commercially viable products will be manufactured and that the energy and environmental benefits will be realized.
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²³ Private investment for Table 9 is inclusive of public, private, and corporate sources of funding and investment. See Table 8 for specific metrics for the program. This assumes a 3-5-year lag from the time agreements are committed toward realizing the target investment leverage goal.

²⁴ Participants include those directly utilizing M-Corps programs: manufacturing partners, entrepreneurs (and venture development organizations that support entrepreneurs). Metrics are on a commitment basis and represent lag time outlined.

10.2.9 Performance Monitoring and Evaluation Plans

<p>Performance Monitoring & Evaluation Plan</p>	<p>Test-Measure-Adjust Strategy</p> <ul style="list-style-type: none"> • NYSERDA will collect and analyze established innovation metrics for engaged cleantech startup companies including number of cleantech products manufactured, revenue generated by engaged startups and manufacturing partners, and time-to-market as well as new metrics including the number of contracts signed between cleantech startup companies and manufacturers. These metrics will be collected for each cleantech company participating in the initiative to assess progress toward the overall outcomes/goals of the initiative. • The pilot program interventions will be evaluated and adjusted according to quantitative results and qualitative feedback gathered during and at the close of the pilot period. Throughout the full length of the M-Corps Initiative including during/after the pilot period and during the statewide rollout, interventions will continue, pivot, or end based on those findings. <p>Market Evaluation</p> <ul style="list-style-type: none"> • Market Evaluation will draw on the logic model and will include baseline and longitudinal measurement of key performance indicators of programmatic and broader market success. • Baseline measurements of key market indicators will occur following initiative approval and will provide additional insights that will allow NYSERDA to adjust the strategy. They may include but are not limited to: time-to-market for cleantech products, manufacturing strategies developed for cleantech products, and private investment leverage. • Regular (e.g., annual) updates to key performance indicators and measurement of market change, include but are not limited to number of commercial cleantech products introduced, revenue generated, and time-to-market. • Sources of data include intervention data, public and commercially available data, and primary data collection through surveys of key market actors.
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10.3 Novel Business Models and Offerings

10.3.1 Overview

<p>Present Situation</p>	<ul style="list-style-type: none"> • Reforming the Energy Vision (REV) envisions a future for New York State’s energy system that involves new and changing relationships between utilities and electricity market participants, including in related energy markets, such as transportation and natural gas. This will likely require and inspire new business models, services and products.²⁵ • Conventional business models – in which a provider of a fully-developed energy efficiency, renewable energy, or distributed energy resource product sells capital equipment to a customer who reaps the benefit of savings or revenue streams over time – have frequently met with market resistance. • While many investments in established, commercially available clean energy products will provide a positive return on investment, they are often not made because of high first costs to individuals and businesses, along with uncertainty in recouping the resulting financial returns. Therefore, much value that could result from such investments remains to be unlocked. • Novel business models that reallocate costs, risks, ownership, and returns relative to conventional models have produced offerings that have been more attractive to their customers than conventional business models employing the same established, demonstrated technology. • However, companies pursuing new business models face high development costs, while early volumes of customer demand are low. This results in an inability to raise necessary capital, even for business models that can ultimately be commercially sound.
<p>Intervention Strategy</p>	<ul style="list-style-type: none"> • The Novel Business Models and Offerings (NBMO) initiative will support promising companies in making business model investments to accelerate the deployment of these models. NYSERDA will provide these companies selected through a competitive solicitation with financial resources to: <ul style="list-style-type: none"> ○ Assist with validation of new business models and offerings ○ Assist with the implementation and scaling of new business models and offerings • The funds may be used for the development and refinement of legal documents, development of tools for marketing and customer engagement, business development personnel, raising project capital, and other activities that enable the company to scale the deployment of the business model more rapidly. The funding is not for product or technology development and the initiative will take no technology risk. • The new business models will advance clean energy in various markets, including but not limited to: <ul style="list-style-type: none"> ○ Commercial/Industrial buildings ○ Multifamily buildings ○ Residential buildings ○ Distributed generation ○ Smart grid ○ Energy storage ○ Transportation

²⁵ Here we use the term “business model” to mean the way in which a company creates value, delivers it to customers and captures some of it for itself. It encompasses a company’s key activities and resources, its cost structure, its offerings to customers and the nature of its revenue streams.

	<ul style="list-style-type: none"> ○ Transactive energy²⁶ • The NBMO initiative is adjacent to strategies under REV Connect, the Market Characterization and Design Chapter (MCDC) novel solutions and concepts support, and Cleantech Startup Growth (CTSG), however the NBMO initiative differs in key ways. In contrast to REV Connect, NBMO is to develop solutions for the whole market, not just a single project or opportunity. In contrast to MCDC, NBMO is to enable scaling of a single commercial solution. In contrast to CTSG, NBMO financially supports specific investments at specific companies, rather than general broadly available support functions. NYSERDA will coordinate its efforts across the offerings to ensure that duplication is avoided. • For a visual representation of this strategy, please reference the flow chart entitled “Logic Model: Novel Business Models and Offerings,” which can be found in Appendix A.
Goals	<ul style="list-style-type: none"> • Support and scale up business models that facilitate greater customer uptake of clean energy solutions.
State Energy Plan/Clean Energy Standard Link	<ul style="list-style-type: none"> • This initiative seeks to develop scalable business models that will support the 2015 New York State Energy Plan goals of reducing greenhouse gas emissions by 40%, increasing renewable electricity options to enable the generation of 50% of electricity from renewable sources, and decreasing energy consumption through a 600 trillion BTU increase in statewide energy efficiency. In addition, the initiative seeks to advance the REV goal of enabling greater deployment of DER. • More specifically, the Energy Plan calls for supporting the development of next-generation clean energy technology solutions and innovative business models. This initiative will assist in validating and scaling new business models that will facilitate increased deployment of clean energy technologies and solutions.

10.3.2 Target Market Characterization

Target Market Segment(s)	The target market segments are early-stage and startup businesses that develop and operationalize new business models, existing clean energy businesses that seek to evolve their business model to improve customer uptake and capitalize on REV market opportunities, and service providers that offer novel services that facilitate clean energy deployment.
Market Participants	<p>Market participants include:</p> <ul style="list-style-type: none"> • End use customers. • Entrepreneurs seeking to enter the clean energy space. • Existing clean energy service providers seeking to evolve their business model through new offerings or services such as HVAC firms, lighting companies, demand response companies, building systems companies, and on-site energy solutions providers. • Non-clean energy firms offering related services to end use customers such as security providers, internet providers or property management firms. • Firms offering new services to clean energy companies that can reduce their costs and enhance their customer acquisition, such as brokers, insurers, information providers, or financial service companies. • New integrated solutions providers and aggregators seeking to capitalize on REV opportunities.

²⁶ According to The GridWise Architecture Council formed by the US Department of Energy, “transactive energy” means, “a system of economic and control mechanisms that allows the dynamic balance of supply and demand across the entire electrical infrastructure using value as a key operational parameter.”

	<ul style="list-style-type: none"> • Business incubators. • Utilities and their REV partners.
Market Readiness	<ul style="list-style-type: none"> • NYSERDA and others who work regularly with clean energy companies, for example the directors of NYSERDA's incubators, routinely see companies with new business models thwarted by an inability to raise capital to scale, even for models that are commercially sound. Even employing proven technology, they face high costs of development and low rates of early customer acceptance because of the novelty of the offering. • Companies pursuing business model innovation regularly respond to NYSERDA research and development solicitations for funding. The preliminary REV Connect test pipeline shows that eight companies offered novel partnership structures with utilities²⁷ that could be candidates for a NBMO program. NY Prize, NYSERDA's upcoming soft cost challenge and similar initiative are also expected to reveal companies that face challenges addressed by the NBMO initiative.
Customer Value	<ul style="list-style-type: none"> • Businesses pursuing innovative approaches will benefit from increased information on the solutions valued by potential customers and partners, as well as support for building their business and its offering. • Novel offerings will make it easier for end-use customers to implement clean energy solutions, and subsequently reduce their energy costs. • Some new business models will also offer additional sources of related value to the customer (e.g., home security) as well as opportunities to participate in new areas of energy markets, for example through aggregation projects. • New business models, particularly those that deal with first cost barriers and risk management, can extend the reach of clean energy products and services to new customer segments and groups. • New business models that harness the power of information and data, develop new processes, or optimize resources offer the potential to drive down soft costs which in turn can make clean energy more affordable for end use customers. In addition, energy information and data could potentially be monetized in other industries.

10.3.3 Stakeholder/Market Engagement

Stakeholder/Market Engagement	<ul style="list-style-type: none"> • NYSERDA has met with early-stage and startup businesses, existing companies, utilities, and incubator directors, to gather feedback on this initiative. • Stakeholders interviewed indicate that new business models have high potential value and climate impact, and a program to foster their development and implementation could accelerate deployment. • Funding to support legal expenses, business development expenses, marketing, and capital raising were highlighted as needs to accelerate scaling. • In addition to assistance with addressing costs associated with launching a new business model (e.g. legal fees, marketing, customer acquisition), some stakeholders indicated that tools and advice on understanding the value proposition to customers was critical. • Stakeholders also indicated that speed and flexibility are key. Companies need to be able to move quickly to be competitive, and any NYSERDA initiative needs to be designed with that in mind.
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²⁷ Examples of novel partnerships with utilities include new shared savings agreements for efficiency retrofits between small and medium sized companies and utilities, and partnerships between utilities and electric vehicle charging companies that allow the charging infrastructure to be leveraged for grid benefits.

	<ul style="list-style-type: none"> • Market engagement will continue via program marketing. In addition, companies proposing new business model activity to other NYSERDA programs will be identified through internal NYSERDA coordination and targeted via outreach efforts.
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10.3.4 Theory of Change

Market Barriers Addressed	<ul style="list-style-type: none"> • Market-specific barriers: <ul style="list-style-type: none"> ○ High Customer Acquisition Costs. Cost of customer acquisition is high for many clean energy solutions. New business models can aim to standardize customer approaches, bundle energy with other services, or use new techniques to target high-potential customers. ○ High Upfront Costs. Clean energy solutions frequently require a large upfront investment. New business models can make use of innovative financing structures to reduce initial costs. ○ Low Customer Priority. Energy is not always a top-of-mind customer issue. New business models that combine multiple customer value streams, such as energy efficiency paired with security features, to make the sale may have improved success over energy-only products. ○ Perceived Risks. Customers perceive long term risks with implementing new technologies. New business models can reallocate risks and rewards to insurers and investors and provide customer guarantees. Customers also perceive risks about recouping their investments should their situation (e.g., location) change. New models can facilitate transactions to transfer benefits to new holders. • Company-specific barriers: <ul style="list-style-type: none"> ○ Companies advancing new business models face a lack of capital to fully develop and scale. New business models require trial and error, which can be costly. They need to be strongly promoted to scale, which requires capital. NBMO funding directly fills this additional need for capital. ○ Unproven returns of new business models keep the cost of project capital high. NBMO funding to scale innovative business models helps to demonstrate investor returns, which can attract new capital sources and bring the cost of capital down.
Testable Hypotheses	<ul style="list-style-type: none"> • If entities advancing innovative business models receive stage-appropriate support, then they will be able to accelerate the acquisition of customers and the deployment of clean energy products and technologies.
Activities	<ul style="list-style-type: none"> • NYSERDA's will issue a competitive solicitation to award funding to scale and validate novel business models and offerings. The level of funding provided will differ for companies with a well-defined and validated business model, and for companies with a well-articulated business model that is plausible but has not yet been tested against the needs of market participants and real-world costs and barriers. <ul style="list-style-type: none"> ○ For validated business models, as evidenced by real transactions, NYSERDA will provide direct funding to enable the company to begin execution and scale. Funding would be available for legal, marketing, insurance, customer acquisition, and other expenses, but not for buying down the capital cost of any installed equipment and technology. ○ For not yet validated models that still require market testing NYSERDA may provide a lower level of direct funding enable the company to fill in knowledge gaps and validate the model with robust customer and stakeholder engagement.

	<ul style="list-style-type: none"> • NYSERDA will solicit proposals from companies with novel business models and offerings. These will be evaluated competitively with multiple opportunities per year.²⁸ Proposals will be evaluated using the following criteria: <ul style="list-style-type: none"> ○ Soundness of the novel business model based on a thorough description and as evidenced by real transactions. ○ Absence of technology risk ○ The economic return on the deployed clean energy enabled by the new business model or offering, including the sustainability of the company while delivering value to customers and financial backers ○ The scalability of the new business model and its market potential ○ Low levels of company risk, as evidenced by prior investment, financial strength, or demonstrated quality of the management team. ○ Market relevance of funding milestones. • Following awards, NYSERDA will employ project management practices to further limit the risks of market acceptance and mitigate execution risk as much as possible. Companies that cannot demonstrate transactions will not be eligible for the highest funding level, and NYSERDA will use Innovation Advisors, - experienced entrepreneurs and investors under contract to NYSERDA - in support of project selection and management. Progress will be monitored with a focus on ensuring achievement of well-defined and commercialization-critical milestones. • NYSERDA will coordinate with utilities in cases where the company’s business model intersects with evolving utility business models to ensure there is no duplication and to share lessons learned.
<p>Key Milestones</p>	<p><u>Milestone 1 (2018)</u></p> <ul style="list-style-type: none"> • Release solicitation for New Business Models and Offerings proposals for both scaling and validation support. <p><u>Milestone 2 (2018)</u></p> <ul style="list-style-type: none"> • Contract with first-round NBMO awardees. <p><u>Milestone 3 (2018)</u></p> <ul style="list-style-type: none"> • Contract with second-round NBMO awardees. <p><u>Milestone 4 (2019)</u></p> <ul style="list-style-type: none"> • Conduct preliminary program process assessment, examining the distribution of proposers, scope of proposed impact, and marketing and selection processes through first two rounds, and revise the solicitation as necessary. <p><u>Milestone 5 (2020)</u></p> <ul style="list-style-type: none"> • Re-release solicitation if necessary for the third round. <p><u>Milestone 6 (2020)</u></p> <ul style="list-style-type: none"> • Contract with third-round NBMO awardees. <p><u>Milestone 7 (2020)</u></p> <ul style="list-style-type: none"> • Perform program assessment to determine continuation. <p><u>Milestone 8 (2020)</u></p> <ul style="list-style-type: none"> • Contract with fourth-round NBMO awardees, if the program is continued.

²⁸ The initiative will start with two funding opportunities a year.

Goals Prior to Exit	<p>NYSERDA will exit or cease funding specific areas of business model innovation and shift focus once sustainability of such business models is confirmed, as indicated by:</p> <ul style="list-style-type: none"> • New equity investments in NBMO awardees • Multiple REV-enabling business models being pursued by non-utility companies <p>In addition, if the mid-term program assessment indicates that too few business models have demonstrated success and scaling, the program may be terminated.</p>
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10.3.5 Relationship to Utility/REV

Utility Role/Coordination Points	<ul style="list-style-type: none"> • Proposers applying to this program may also be seeking a utility partner within a REV demo framework. In these cases, NYSERDA will coordinate with utility and DPS staff to ensure alignment on project goals, outcomes, and the most optimal use of available resources. • This offering could help companies with innovative business models validate their value proposition and thereby position the company for more effective utility engagement
Utility Interventions in Target Market	<ul style="list-style-type: none"> • REV Demos could be used to deploy and test new business models • REV Connect could highlight partnerships with utilities that may require further development before utilities can sign on.

10.3.6 Budgets & Expenditures

An annual commitment budget for all activities included in this chapter is shown in Table 11. The annual expenditure projection is included in Table 12. 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.

Table 11. Annual Innovation & Research Budget Allocation – Commitment Basis

Budget	2018	2019	2020	2021	Total
Business Support	\$3,150,000	\$3,500,000	\$4,550,000	\$4,900,000	\$16,100,000
Total	\$3,150,000	\$3,500,000	\$4,550,000	\$4,900,000	\$16,100,000

Table 12. Annual Expenditures Projection

Expenditures	2018	2019	2020	2021	2022	Total
Total	7%	20%	24%	29%	20%	100%

10.3.7 Progress and Performance Metrics

Table 13 provides program Activity/Output indicators representing measurable, quantifiable direct results of activities undertaken in the initiative. Outputs are a key way of regularly tracking progress, especially in the early stages of an initiative, before broader market changes are

measurable. Outcome indicators can encompass near-term through longer-term changes in market conditions expected to result from the activities/outputs of an intervention. Outcome indicators will have a baseline value and progress will be measured periodically through Market Evaluation.

Table 13. Initiative Specific Metrics

Indicators²⁹		Baseline (Before/Current)	2019 (Cumulative)	2022 (Cumulative)
Activity/ Outputs	Number of companies supported	0	16	33
	Number of validation and scaling projects initiated	0	19	46
	Number of validation and scaling projects completed	0	14	46
Outcomes	Number of supported companies raising additional capital	0	0	11
	Number of new business models successfully scaled by supported companies	0	4	8
	Number of new business relationships formed with utilities by supported companies	0	2	6

In addition to the above outcomes, NYSERDA will also assess the following broad outcomes:

- Declining cost of capital for clean energy equipment deployed via new business models.
- Demonstrated returns on capital provided by financial institutions to new business models.

Benefits shown in Table 14 and Table 15 are direct, near term benefits associated with this initiative’s projects. These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation. Due to the nature of the activities, estimating energy savings impacts at this stage is difficult because the specific businesses and technologies that will be supported are not known. However, energy savings for projects supported by this initiative will be tracked and reported.

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

Table 14. Direct Impacts

Primary Metrics		2018	2019	2020	2021	TOTAL
Energy Efficiency	MWh Annual	-	-	-	-	-
	MWh Lifetime	-	-	-	-	-
	MMBTu Annual	-	-	-	-	-
	MMBTU Lifetime	-	-	-	-	-
	MW	-	-	-	-	-
Renewable Energy	MWh Annual	-	-	-	-	-
	MWh Lifetime	-	-	-	-	-
	MW	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual		-	-	-	-	-
CO2e Emission Reduction (metric tons) Lifetime		-	-	-	-	-
Customer Bill Savings Annual (\$ million)		\$-	\$-	\$-	\$-	\$-
Customer Bill Savings Lifetime (\$ million)		\$-	\$-	\$-	\$-	\$-
Private Investment (\$ million)		\$32.9	\$36.6	\$47.6	\$51.3	\$168.4

Table 15. Annual Projected Initiative Participation

	2018	2019	2020	2021	Total
Participants ³⁰	9	6	9	9	33

10.3.8 Fuel Neutrality

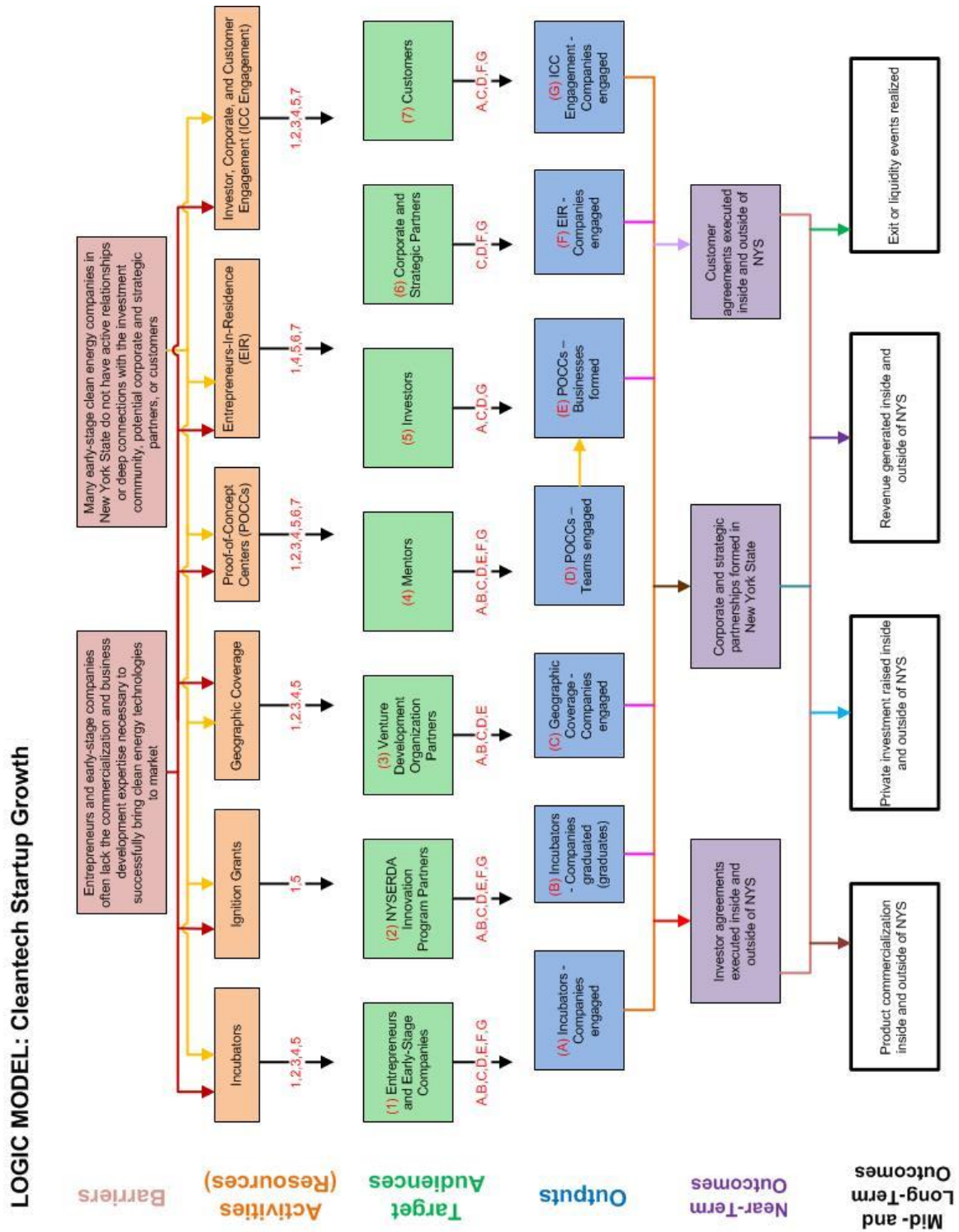
Fuel Neutrality	<ul style="list-style-type: none"> • Awardees under this program are generally involved in developing new business models to bring innovative technologies and solutions to market that will help achieve New York State’s greenhouse gas emission, renewable energy, and energy efficiency goals. • The innovative business models and startup companies that will scale through this program will provide a range of benefits for New York ratepayers to advance REV objectives, potentially accelerating the deployment of energy efficiency investments, a range of improved DER options, new transactions with electric and gas utilities, energy management, and other services.
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³⁰ Participants are clean energy companies awarded funding under this program area. Note that some companies may receive funding both for validation and for scaling; they are counted once. In addition, some companies may receive funding under this program and also receive research and development funding, as well as support under CTSG. The amount of overlap is unknown at this time but will be monitored to avoid double-counting of benefits.

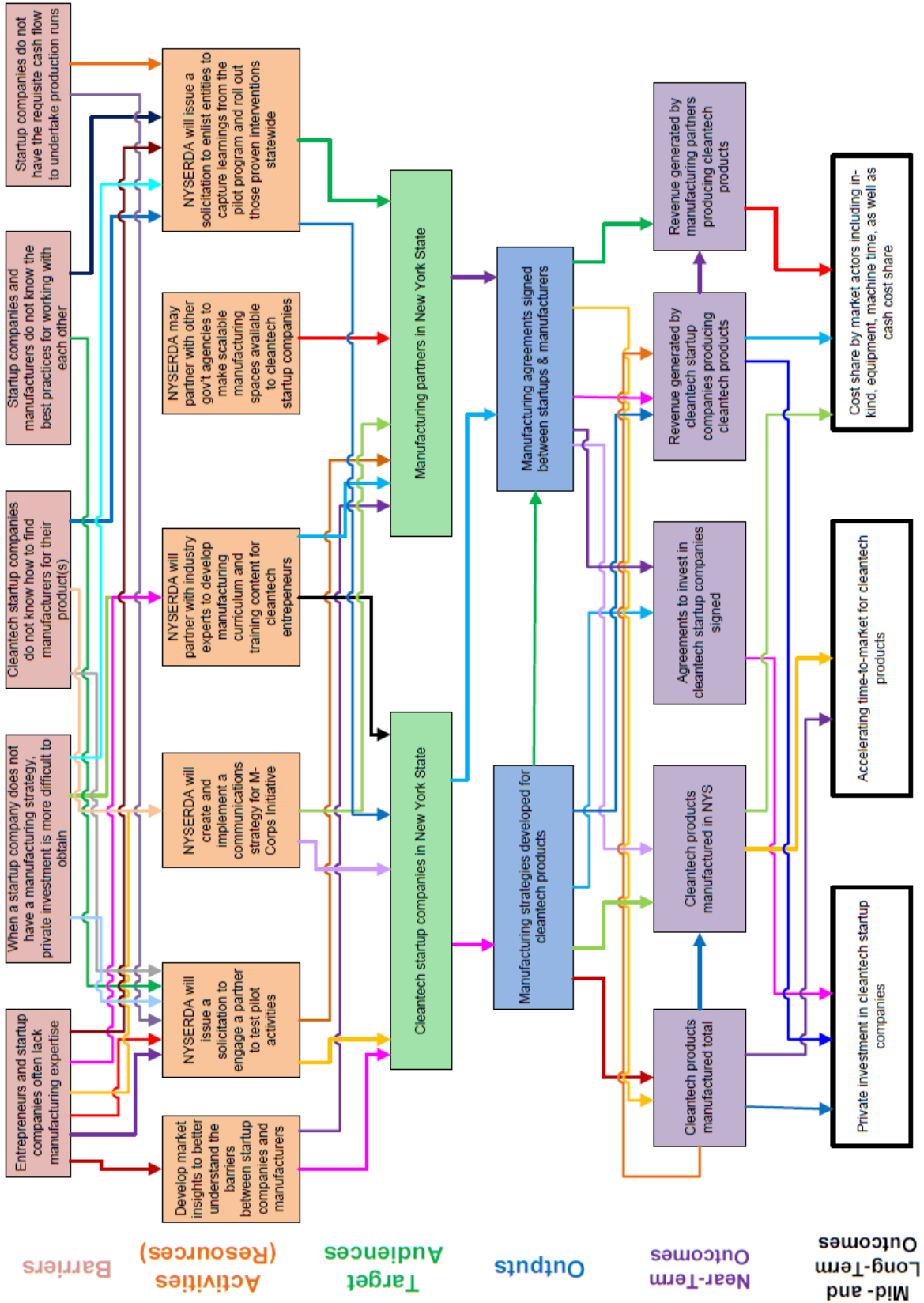
10.3.9 Performance Monitoring and Evaluation Plans

Performance Monitoring & Evaluation Plan	<p>NYSERDA's approach to monitoring and assessing the effectiveness of the initiative and overall market development is described below.</p> <p><u>Test-Measure-Adjust Strategy</u></p> <ul style="list-style-type: none">• Collect, analyze and report on progress of the initiative by monitoring the activities including number of projects initiated and completed by type, the level of private investment attracted, and other key output metrics on a regular basis (i.e., quarterly, bi-annually).• For any new business models launched under the program, on an annual basis, NYSERDA staff and supported companies will track customer uptake.• Following the first two rounds, during the first year, NYSERDA will assess program process, examining the distribution of proposers, size and scope of proposed impact, and marketing and selection processes through first two rounds. This assessment may lead to new tactics for promoting the program particularly to strategic sectors.• Following the award of projects from the first three rounds, estimated to occur in the third year, program success in accomplishing the deployment and growth of new business models will be assessed. At this point, the program solicitation could be terminated if too few business models have demonstrated success or if they fail to demonstrate sufficient scale. <p><u>Market Evaluation</u></p> <ul style="list-style-type: none">• Market Evaluation is not planned for this initiative, beyond aspects addressed in the Test-Measure-Adjust Strategy. <p><u>Impact Evaluation/Field Verification</u></p> <ul style="list-style-type: none">• Impact evaluation and field verification is not planned for this initiative as there are no energy impacts claimed.
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Appendix A – Logic Models



LOGIC MODEL: Manufacturing Corps (M-Corps) Initiative



LOGIC MODEL: Novel Business Models and Offerings

