

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

Clean Energy Fund Investment Plan: Industrial Chapter

Portfolio: Market Development

Submitted by:

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

Revised May 7, 2021

Clean Energy Fund Investment Plan: Industrial Chapter		
Revision Date	Description of Changes	Revision on Page(s)
April 29, 2016	Original Issue	Original Issue
December 30, 2016	Revised Table 3 to correct an error in the Direct Cumulative Annual Energy Savings for participants and revised Table 5 to correct an error in the Total CO2e Emissions Reductions (metric tons) Annual.	Multiple
June 23, 2017	Increased funding to support an additional Strategic Energy Management pilot cohort, include a broader pool of industrial facilities, and add an Energy Management Information System (EMIS) offering, with a corresponding increase in benefits. Removed outputs from Table 3 that were duplicative to energy savings information in Table 4. Tables 1-6 have been updated to reflect these revisions, 2016 actual values, and a shift in budget and benefit timing.	Multiple
November 1, 2017	Updated the baseline values in Table 3 to reflect latest data available. In addition, updated 2019 values to show cumulative targets rather than incremental targets as previously filed.	14
April 19, 2019	As part of the Annual Investment Plan & Performance Report (IPPR) process, NYSERDA has updated budget and benefit values to align with actuals for past years and adjusted budget and benefit forecasts for future years, as appropriate, based on experience to date. Budget and benefit tables have been moved to Appendix B of this chapter and output/outcome tables have been moved to Appendix C of this chapter. Updated rounding convention has been applied to budget and benefit tables.	Multiple
November 4, 2019	Updated to expand eligibility for the Strategic Energy Management Component to the commercial sector and to add additional funding for additional cohorts, with a corresponding increase in benefits. Updated initiative name to Energy Management Practice.	Multiple
November 5, 2019	Updated initiative name to Energy Management Practice in Appendices.	Multiple
December 11, 2019	Revised outputs and outcomes in Appendix C-1.	Appendix C-1
June 1, 2020	As part of the Annual Investment Plan & Performance Report (IPPR) process, NYSERDA has updated budget and benefit values to align with actuals for past years and adjusted budget and benefit forecasts for future years, as appropriate, based on experience to date. Removed Industrial RTEM component and added to Energy Management Technology initiative.	Multiple within the plan. Appendix A, B, & C

<p>May 7, 2021</p>	<p>As part of the Annual Investment Plan & Performance Report (IPPR) process, NYSERDA has updated budget and benefit values to align with actuals for past years and adjusted budget and benefit forecasts for future years, as appropriate, based on experience to date.</p> <p>The chapter has been updated to provide a bridge between committed and acquired planning. Committed budget and benefits summaries have been added to plan text, while Appendix B has been updated to reflect expenditure & acquired benefits plans.</p> <p>Appendix C was modified to remove a few indicators errantly listed in this table during the last filing.</p>	<p>Appendix B</p> <p>11, Appendix B</p> <p>Appendix C</p>
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Industrial

NYSERDA aims to address energy efficiency opportunities in the industrial sector that focus on process efficiency improvements. Acceleration of activity in the Industrial sector requires decision-makers to be able to more easily determine their options and have confidence in their investment decisions. Initiatives will aim to overcome barriers impeding progress including: risk aversion by facility managers and decision makers that energy efficiency could disrupt industrial processes, lack of in-house expertise in energy management, lack of trust in the energy efficiency technology to deliver the intended benefits for the company, and a lack of attractive service offerings to say “yes” to as suppliers often lack scale and a ready market for which to develop more compelling offerings and cost and finance sensitivity.

The first initiative described in this Chapter is Energy Management Practice, which aims to integrate the adoption of energy efficiency and clean energy into companies’ core business processes. Programming and resources provided will focus on identifying areas for improvement, driving managerial and corporate behavioral changes with respect to energy, developing the mechanisms to track energy optimization efforts versus other business investment opportunities, and allowing companies to become accustomed to energy management with minimal risk.

The initiative was previously modified in 2017. Those modifications included, moving the anticipated budget and benefit commitments for both the On-Site Energy Manager and Strategic Energy Management components out one year to reflect a later than anticipated program launch, adding \$1 million of funding to the Strategic Energy Management component to support an additional pilot cohort (with a corresponding increase in benefits), and updating the lifetime benefits to reflect a ten year measure life, to correct an error in the previously filed version. The 2017 modification also added an Energy Management Information System (EMIS) offering.

2019 modifications include the addition of \$18 million of funding to the Strategic Energy Management component to support additional industrial cohorts and expand into other market segments (with a corresponding increase in benefits).

1.1 Energy Management Practices

1.1.1 Overview

Present Situation	<ul style="list-style-type: none">• Industrial energy use represents 7.4%¹ of total energy use (across all sectors) in the state and 4% of electric economic energy efficiency potential, 11% of natural gas economic energy efficiency potential, and 2% of petroleum fuels economic energy efficiency potential.• Energy is one of the largest operational costs for industrial and manufacturing facilities, sometimes exceeded only by raw material and labor costs. Investing in process and energy efficiency projects can help lower those energy costs, and
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¹ NYSERDA Patterns & Trends 2013 report (published Oct 2015).

	<p>improve a company’s bottom line and overall competitiveness. Addressing the industrial sector’s energy management requires a range of solutions designed to help manufacturers of various levels of sophistication improve their energy efficiency.</p> <ul style="list-style-type: none"> • While a full-time On-site Energy Manager would afford a manufacturer with the dedicated focus and expertise to pursue and implement energy efficiency projects, many industrial organizations lack awareness of the costs and benefits of dedicating a fulltime energy manager staff member relative to other business investment opportunities. • Strategic Energy Management (SEM) – a disciplined approach to reducing energy intensity over time, characterized by demonstrated customer commitment, planning and implementation, and systematic measurement – provides the opportunity to achieve systematic energy savings. Yet currently in New York there are limited resources, both internal to industrial facilities and in the external market, that can support this approach, despite the growing interest in pursuing it. • The number of SEM programs offered by program administrators across the United States and Canada grew rapidly from seven in 2011 to twenty-one in 2014, demonstrating interest by the industrial sector. Currently, there are three strategic energy management programs in the Northeast region. Discussions with market actors have indicated that New York State’s involvement in offering SEM could push adoption of this strategy in the state and expand the market in the region for service providers. • SEM program success can be enhanced through the installation of an Energy Management Information System (EMIS) which can store, analyze, and display energy consumption data collected from sensors, equipment feeds, and meters.
<p>Intervention Strategy</p>	<ul style="list-style-type: none"> • This Energy Management Practice initiative will look to address the interest in On-site Energy Managers and the availability of Strategic Energy Management resources. Sponsoring On-site Energy Managers who support project identification, implementation, and clearly demonstrate the value proposition of process and energy efficiency projects, and implementing SEM which promotes operational, organizational and behavioral changes resulting in energy efficiency gains on a continuing basis, would allow companies to better manage their energy. • The On-site Energy Manager component of this initiative will also promote the development of a pool of experts needed to support SEM and achieve continuous energy efficiency. Having On-site Energy Manager resources, whether contracted or permanent staff, will be critical to the broader adoption of SEM. • Through this initiative, NYSERDA intends to prove the business case for integrating energy efficiency as a core business practice and applying the principles of continuous improvement to energy management, fostering substantial, long-term savings. • Industrial customers may opt to accomplish this with the support of a dedicated On-site Energy Manager or through a structured series of ‘learn by doing’ Strategic Energy Management training • Over the next few years, NYSERDA will conduct multiple projects to guide customers through the process of establishing and implementing an SEM system or to match facilities with a cost-shared On-site Energy Manager to prove the business case for this dedicated resource. • The data from these projects will be disseminated to the market along with training and developed tools to support integration of Energy Management Practice. <p>For a visual representation of this strategy, please reference the flow charts entitled “Logic Model: On-site Energy Manager” and “Logic Model: Strategic Energy Management,” which can be found in Appendix A.</p>

Goals	<ul style="list-style-type: none"> • The value of an On-site Energy Manager role in industrial facilities will become standardized, fostering the emergence of an on-site energy manager provider market which will gain traction and become self-sustaining. • Build the market demand for SEM through cohorts and follow up information illustrating the value of SEM. • Provide training to and develop partnerships with consulting firms and other relevant market actors to grow the market supply of SEM trainers. •
State Energy Plan/Clean Energy Standard Link	This strategy contributes to NYS Energy Plan goals for energy efficiency and emission reductions through program participants implementing energy efficiency and productivity projects as well as behavioral and operational changes.

1.1.2 Target Market Characterization

Target Market Segment(s)	<ul style="list-style-type: none"> • In New York there are approximately 820 large and 1910 medium industrial facilities. • Large industrial firms’ annual energy expenditures exceed \$1M, medium industrial customers’ annual energy expenditures between \$500,000 to \$1M, small industrial customers’ annual energy expenditures \$500,000 and below. • The target market is industrial facilities in NYS with high energy intensity (i.e., high energy associated with a process relative to the output of the process) and high energy costs relative to other business costs. • Likely participants are industrial sites whose organization and management are poised to support a structured, long-term management plan to influence operational, organizational, and behavioral changes resulting in continual improvements in energy performance. • Commercial entities are also eligible to participate in the Strategic Energy Management initiative. As more sectors and subsectors adopt and share the benefits of SEM, NYSERDA expects interest from non-industrial customers to increase, and will adjust activities to meet demand. • SEM delivery platforms, tools, and materials tools will be explored for customers in the market outside the eligibility parameters for existing cohorts.
Market Participants	<ul style="list-style-type: none"> • Critical Staff: facility and process engineers, production and plant managers, operations and maintenance managers, energy managers, and C-suite executives • Multiple decision-makers: facility, production, managerial, On-site Energy Managers • Energy-focused Process consultants • Utility Companies • Manufacturing and Sector Association Groups
Market Readiness	<p><u>On-Site Energy Manager</u></p> <ul style="list-style-type: none"> • Early adopters include the largest manufacturers in New York which often have dedicated energy managers, or manufacturers which are provided similar resources through corporate energy teams. Other companies may have employees who address energy or sustainability as part of a larger role. • Service providers are ready and willing to provide on-site services and have capabilities that can be leveraged. <p><u>Strategic Energy Management</u></p> <ul style="list-style-type: none"> • National market leaders and large corporations with aggressive energy goals have begun to implement SEM in various forms, including EPA’s Energy Star for Energy Management, ISO 50001, and DOE’s Superior Energy Performance.

	<ul style="list-style-type: none"> • Interest for further growth of SEM is evidenced by the 2015 American Council for an Energy-Efficient Economy (ACEEE) Summer Study on Energy Efficiency in Industry conference where over 200 papers focusing on SEM topics were submitted, and an entire track was devoted to SEM. • SEM is scalable and applicable to a broad range of facilities regardless of size or industry because it is a management system and is not limited to any piece of equipment or process. • Information obtained from SEM working groups and the Consortium for Energy Efficiency's 2014 SEM Program Case Studies Report indicate that service providers assist in the delivery of SEM programs across the United States and Canada. These companies have gained experience leading and managing strategic energy management programs and are able to provide support to this strategy in New York. Voice of Customer discussions also indicate that once the state of New York provides an SEM offering to the marketplace, it will develop and bolster the service provider network for strategic energy management on the east coast. • There are existing tools in the market that can assist and guide this strategy that include: <ul style="list-style-type: none"> ○ DOE eGuide ○ DOE Energy Management Guidelines ○ The US EPA's ENERGY STAR Guidelines for Energy ○ EPA: Small and Medium Sized Manufacturer Energy Guide ○ DOE - 50001 Ready Navigator ○ Energy Star Portfolio Manager ○ EPA's Energy Use Assessment Tool ○ CEE: SEM Minimum Elements guide •
<p>Customer Value</p>	<p>Industrial facilities operate in a highly competitive environment with tight margins. Particularly in energy-intensive industrial sectors, effective management of energy expenditures is crucial to remaining profitable and competitive.</p> <p>Projected benefits to the customer of a dedicated On-site Energy Manager resource include:</p> <ul style="list-style-type: none"> • Estimated annual cost of fully burdened, full time On-site Energy Manager to hire permanently or contract is approximately \$250,000 • Under this risk reduction pilot NYSERDA would provide a cost share of up to 75% of an energy manager's cost up to \$187,500, for a net \$62,500 cost to customer based upon the estimated annual cost of \$250,000. • Pilot annual energy savings range minimally from \$80,000 to \$210,000 for medium and large sites, respectively, based upon average EEPS2 Industrial and Process Efficiency electric and natural gas project savings. This yields payback of less than 2 years without NYSERDA pilot cost-share and less than 1 year with NYSERDA pilot cost-share. Lifetime savings are \$1,200,000 to \$3,150,000, medium and large respectively. • Other non-energy benefits from production improvements (scrap reduction, process time improvements, sustainability measures like water savings, etc.) may be substantial for industrial facilities and further improve the cost justification/value proposition of these initiatives. <p>Projected benefits to the customer of implementing a Strategic Energy Management system include:</p> <ul style="list-style-type: none"> • Participants, on average, will reduce their overall electric energy consumption by 4 percent during the first year of SEM implementation.

	<ul style="list-style-type: none"> • Estimated cost of an individual facility hiring a consultant to provide training, guidance, and support for SEM is approximately \$55,000 per year. Assumed costs for one year of SEM guidance and project implementation, without NYSERDA's involvement is estimated to be \$485,000 (\$55,000 consultant cost plus an estimated \$430,000 to implement energy-related capital and operational & maintenance projects). Based on a 4% energy reduction, the average large customer would realize roughly \$100,000 in energy savings, resulting in a simple payback of 4.9 years. Facilities participating in NYSERDA's SEM cohorts, where NYSERDA provides the consultant, would have a simple payback of 4.3 years. • Other benefits resulting from production improvements (scrap reduction, process time improvements, etc.) improve cost justification • Additional benefits include peer to peer exchange of best practices, and building and sustaining a discipline of energy efficiency within organizations •
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1.1.3 Stakeholder/Market Engagement

Stakeholder/Market Engagement	<ul style="list-style-type: none"> • NYSERDA's strategic assessment work confirmed both On-site Energy Manager and Strategic Energy Management as intervention opportunities. The effort found that to have the maximum impact, decision makers need to be educated on the value of energy management as part of their core mission; energy management is as fundamental as any other aspect of cost and operations management. It also suggested that NYSERDA could subsidize a temporary energy-manager-for-hire program for customers that lack sufficient internal resources (time or expertise) to support the identification and implementation of potential efficiency or process improvement projects and to help develop long-term energy plans for the facility. • American Council for an Energy Efficient Economy (ACEEE) 2013 white paper entitled, <i>Onsite Energy Manager Pilot Programs: A Survey of Practices and Lessons Learned</i>, informed this strategy. • Voice of customer from Stakeholder meetings, Best Practice Forums, and one-on-one meetings with customers, vendors and stakeholder organizations informed this strategy. • NYSERDA hosted a Best Practice event focusing on SEM concepts called Industrial Continuous Energy Management Conference on 11/12/15. A total of 43 external individuals, representing 30 different organizations, attended this event • NYSERDA continues to work with stakeholder organizations and the market to promote and inform these strategies. NYSERDA participates in the Consortium for Energy Efficiency's SEM Committee and the Northeast Regional Energy Management Practice Discussion Group. These groups contain regional and national program administrators, government agencies, utility companies, and trade associations. Discussions within these groups include program design, new ideas, emerging technologies and trends, establishing common SEM definitions and components, and sharing lessons learned. These forums allow NYSERDA to integrate learnings from other market actors into this strategy and subsequent market transfer.
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1.1.4 Theory of Change

Market Barriers Addressed	<u>On Site Energy Manager</u> <ul style="list-style-type: none"> • Lack of awareness of the benefits of an On-site Energy Manager
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	<ul style="list-style-type: none"> • Limited access to internal capital and resources necessary to fund a dedicated On-site Energy Manager position • Facilities lack manpower or technical expertise to address energy efficiency projects or the energy aspect of process improvement projects • Lack of educated on-site resources with expertise in energy efficiency as it relates to process efficiency • Risk aversion related to facility down time • Limited number of qualified service providers • Staffing and operating cost constraints • Limited understanding of the energy embedded in the manufacturing process <p><u>Strategic Energy Management</u></p> <ul style="list-style-type: none"> • Lack of standardization in SEM • Difficulty in obtaining executive support due to lack of awareness of SEM benefits • Lack of expertise within facilities • Staffing and operating cost constraints • Limited understanding of the energy embedded in the manufacturing process • Limited number of SEM qualified service providers •
<p>Testable Hypotheses</p>	<p><u>On-Site Energy Manager</u> If a dedicated, on-site resource/expert, focused on process efficiency and energy optimization, is put into place at a facility through NYSERDA’s support, then:</p> <ul style="list-style-type: none"> • Cost savings (because of process and energy efficiency initiatives) will justify the long-term funding of this function within the organization. • An On-site Energy Manager can influence corporate behavior to continually identify and implement process efficiency and energy optimization measures that are attractive investments to industrial facilities. • Adoption of an energy management discipline is accelerated by transferring knowledge and increasing confidence that energy improvements will not disrupt process and are aligned with the organization’s core mission. <p><u>Strategic Energy Management</u></p> <ul style="list-style-type: none"> • Customers that implement SEM frameworks can build strong energy management disciplines and sustain significant energy reductions over the long term. If an energy champion can influence corporate behavior through the transfer of knowledge to the energy team, then facilities will be able to continually identify and implement process efficiency and energy optimization measures that are attractive investments for their facility. • If data, case studies, and testimonials from pilot cohorts are developed and disseminated through Best Practice Workshops and other outlets, and more consulting firms offer strategic energy management and energy manager services, then companies will trust and adopt strategic energy management. • If facilities adopt a strategic energy management system, then they will be able to comprehensively and systematically improve their energy performance and achieve greater savings than through an ad hoc project approach. •
<p>Activities</p>	<p><u>On-Site Energy Manager pilots:</u></p> <ul style="list-style-type: none"> • Conduct outreach to educate industrials on the value of On-site Energy Manager and promote program participation • Conduct energy assessments of existing conditions, determine baseline and performance score card • Establish an energy team: includes staff from various business units

	<ul style="list-style-type: none"> • Energy accounting and analysis: Develop performance metrics for energy and productivity initiatives • Integrate energy conservation and productivity initiatives into company business model • Review progress reports on energy and productivity projects • Develop case studies and value propositions for replication through Best Practice Workshops and other outlets • Develop a road map for decision makers and facility staff for on-boarding the role • Creation of a list of qualified energy-focused process consultants from which on-site energy management expertise can be sought or matched with facilities <p><u>Strategic Energy Management pilots:</u></p> <ul style="list-style-type: none"> • Conduct outreach to educate on the value of SEM and promote program participation • Organize cohort training sessions and develop materials • Organize cohort network to promote peer or peer exchange • Lead facilities through SEM training and implementation of SEM activities • Review deliverables from SEM key milestone activities to ensure SEM adoption and energy savings • Review progress reports on energy and productivity projects • Develop case studies and value propositions for replication through Best Practice Workshops and other outlets • Develop and disseminate templates and resources for SEM • Establish and coordinate qualified consultant pool with participants • Develop alternative self-serve web-based SEM training program •
<p>Key Milestones</p>	<p><u>On-Site Energy Manager pilots:</u></p> <p><u>Milestone 1 (2016 - 2018) - Complete</u></p> <ul style="list-style-type: none"> • List of qualified energy-focused process consultants from which On-site Energy Management expertise can be sought and/or matched with industrial facilities • C-suite executive buy-in and engagement which provides momentum for energy planning and management activities at industrial sites <p><u>Milestone 2 (2016 - 2018) - Complete</u></p> <ul style="list-style-type: none"> • Industrial end user commitment to energy goal creation and realization is key to successful On-site Energy Manager engagements • Robust tracking and reporting of energy and non-energy benefits of the On-site Energy manager role <p><u>Milestone 3 (2018) - Complete</u></p> <ul style="list-style-type: none"> • Long-term energy resource(s) dedicated to energy management, without NYSERDA support (e.g., manufacturer hires energy manager function in-house; continues contracting with On-Site Energy Manager consultant; or contracts with a new consultant) • Transition of knowledge and tools from pilot On-site Energy Managers to long-term energy resource <p><u>Milestone 4 (2019 – 2022) - Complete</u></p> <ul style="list-style-type: none"> • A credible business case that proves the benefits of on-site energy management in industrial facilities <ul style="list-style-type: none"> ○ Large sites will save at least 1,200 MWh and 15,000 MMBtu annually ○ Medium sites will save at least 500 MWh and 5,000 MMBtu annually

- Business case content for consultant marketing plans which address this need in the industrial market
- Successful dissemination of training, road maps, case studies, and vetted consultant lists creates both supply for On-site Energy Manager by qualified technical consultants and demand for the role at industrial sites

Strategic Energy Management pilots:

Milestone 1 (2016 and 2017) - Complete

- Facilities understand how energy intensity is embedded in their process and have integrated energy management into their organizational discipline.
 - Facilities possess knowledge of SEM (have an energy map, identified goals and metrics, and have developed a project register identifying projects and an action plan for project implementation) and have a system for monitoring, tracking, and making decisions based on their energy use.

Milestone 2 (2017 and beyond) - Complete

- Facility executives value and adopt SEM due to organizational change and systematic energy management that enables them to identify attractive investments for their facility.
 - Continuation of energy champion and team beyond the cohort (for participating facilities)
 - Executive support to implement energy-related projects.

Milestone 3 (2018 and beyond) - Complete

- Industrial facilities seek out developed information and standardized tools as well as contractor support to implement and adopt SEM.
 - Tracked inquiries and dissemination of case studies, training, SEM resources, and vetted consultant list.

Milestone 4 (2018 and beyond) - Complete

- SEM replaces the ad-hoc energy project approach resulting in deeper and continuous energy savings and energy decision-making at industrial facilities
 - Critical staff can express how the energy measures they've implemented have affected their bottom line.
 - Facilities realize 1-2% reductions in their energy consumption annually
 - For large industrial facilities, this equates to approximately 150-300 MWh, 1,100-2,500 MMBtu Natural Gas, 75-160 MMBtu Oil, and \$100,000 in energy savings per participant in the first year

Milestone 5 (2020)

- Release RFP for commercial SEM Energy Coach.

Milestone 6 (2020)

- Release RFP for Energy Coach for additional industrial cohorts.

Milestone 7 (2020) - Complete

- Launch self-serve, web-based SEM training as an alternative option to the cohort-based offering.

Milestone 8 (2021)

- Release PON for commercial SEM cohorts.

Milestone 9 (2021)

	<ul style="list-style-type: none"> Complete the market dissemination plan inclusive of stakeholders, vendors, and end-use customers to increase the awareness and adoption of SEM.
Goals Prior to Exit	<ul style="list-style-type: none"> Cost savings (energy combined with other benefits) because of On-site Energy Manager activities are greater than the cost of on-site manager or services, thereby justifying the hiring or contracting of an energy manager. Each year, an additional 10-15 new on-site energy managers or services begin in industrial facilities, without direct NYSERDA support, resulting in an increase of 0.5% market penetration of large and medium industrial facilities each year. 90% of participants in the SEM pilot have demonstrated adoption of the training and activities resulting in cost and energy savings from capital improvement projects, operations and maintenance measures, behavioral changes, and employee engagement. Each year an additional 5-10 new facilities undergo SEM as a result of the information and tools disseminated into the marketplace. Resources to support On-site Energy Manager and SEM, including case studies, trainings, a consultant list, and supporting documents which will be updated and maintained as needed, are fit for use and available to the public. Replication tools are fit for use and available to the market through Best Practice Workshops and other outlets.

1.1.5 Relationship to Utility/REV

Utility Role/Coordination Points	<ul style="list-style-type: none"> As customers establish a better understanding of how energy is an integral component of their manufacturing process through efforts such as dedicating an On-site Energy Manager resource and/or incorporating SEM activities at their facility, they can improve the ability to control a facilities energy usage. Through new innovative rates in REV, facilities may be able to embark on greater energy efficiency and process improvements, establish plans for demand response activities to reduce peak without effecting production, and expand to implement distributed energy generation. Utilities have established relationships with key accounts who may serve to be ideal candidates for pilot participation. NYSERDA has and will continue to collaborate with utilities on initiatives and how to maximize information exchange. By sharing pilot case studies, tools available and results On-site Energy Manager and SEM with utilities, utilities can be an avenue to help disseminate information leading their customers to achieve deeper energy savings and control costs.
Utility Interventions in Target Market	<ul style="list-style-type: none"> NYSERDA will coordinate with utilities as customers may take advantage of investor owned utility prescriptive or custom incentive programs for energy efficiency improvements.

1.1.6 Budgets

The commitment budget for all activities included in this investment plan is as follows:

Funding Commitments

		----- Commitments Plan -----						
Budget	Plan Total	Previously Committed	2020	2021	2022	2023	2024	2025
Incentives and Services	15,650,021	5,838,548	2,581,723	2,597,995	1,932,939	1,232,939	732,939	732,939
Implementation	7,235,883	1,538,006	172,830	1,199,494	1,340,000	1,150,000	935,553	900,000
Research and Technology Studies	-	-	-	-	-	-	-	-
Tools, Training and Replication	5,990,875	725,641	300,182	1,165,904	2,273,273	725,874	400,000	400,000
Business Support	-	-	-	-	-	-	-	-
Total	28,876,778	8,102,195	3,054,735	4,963,393	5,546,211	3,108,813	2,068,492	2,032,939

An annual expenditure budget for all activities included in this investment plan is shown in Appendix B alongside expected acquired benefits. Budgets 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 Appendix B is intended for informational purposes only.

1.1.7 Progress and Performance Metrics

The anticipated commitment benefits totals for the initiative with respect to CEF Order target metrics is as follows:

Benefit Commitments

Direct Benefit (2016-2025)	Plan Total
Energy Efficiency MWh Annual	350,691
Energy Efficiency MMBtu Annual	2,181,384
Renewable Energy MWh Annual	-
CO2e Emission Reduction (metric tons) Lifetime	3,394,955
Participant Bill Savings Lifetime	567,257,706
Leveraged Funds	177,107,920

Indirect Benefit (2016-2030)	Plan Total
Energy Efficiency MWh Annual	408,906
Energy Efficiency MMBtu Annual	3,138,925
Renewable Energy MWh Annual	-
CO2e Emission Reduction (metric tons) Lifetime	4,904,911

Benefits summarized in Appendix B represent the plan for acquiring impacts through completed projects or activities.

Benefits listed as direct, are near term benefits directly associated with this initiative’s projects. These benefits will be quantified and reported on a quarterly basis and will be validated through later evaluation.

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

Appendix C 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.

1.1.8 Fuel Neutrality

Fuel Neutrality	<ul style="list-style-type: none"> • NYSERDA intends to offer On-site Energy Manager and SEM components of an Energy Management Practice initiative in a fuel neutral manner to encourage more efficient use of all fuel types. This will help develop the market at the scale needed to achieve New York State’s clean energy goals. • Offering Energy Management Practice initiatives on a fuel neutral basis will allow NYSERDA to achieve savings at a cost of \$91 per annual ton of carbon, compared to a cost of \$206 per annual ton of carbon in an electric only scenario.
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1.1.9 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>Routine reporting on energy savings to date, project lists developed, and progress against identified annual energy savings goals will be collected and reviewed. Redirecting (as needed) will ensure continued progress against goals.</p> <p><u>Test-Measure-Adjust Strategy – On-site Energy Manager</u></p> <ul style="list-style-type: none"> • Year 1: Monitor market demand for On-Site Energy Managers at industrial and manufacturing facilities. Review and analyze early energy assessments and performance scorecard of pilot participants. Assess requirements for pilot participants. Receive input from pilot participants- both end-user and on-site energy managers, Consortium for Energy Efficiency’s Industrial SEM Committee and the Northeast Regional Continuous Energy Improvement Discussion Group, and other stakeholders. Review energy and productivity reports, continue to monitor market demand for services. • Year 2: Repeat Year 1 actions. • Year 3: Repeat Year 1 actions. Assess market uptake of standardized documentation, effectiveness of training materials. <p><u>Test-Measure-Adjust Strategy – Strategic Energy Management</u></p> <ul style="list-style-type: none"> • Year 1: Assess requirements for cohort participants. Receive input from cohort participants, Consortium for Energy Efficiency’s SEM Committee and the Northeast Regional Continuous Energy Improvement Discussion Group, and other stakeholders. Analyze data from cohort participants to understand performance and market capabilities. • Year 2: Repeat Year 1 actions. • Year 3: Repeat Year 1 actions. Assess market uptake of standardized documentation and training effectiveness. Assess the need to continue SEM pilots. <p><u>Market Evaluation</u></p>
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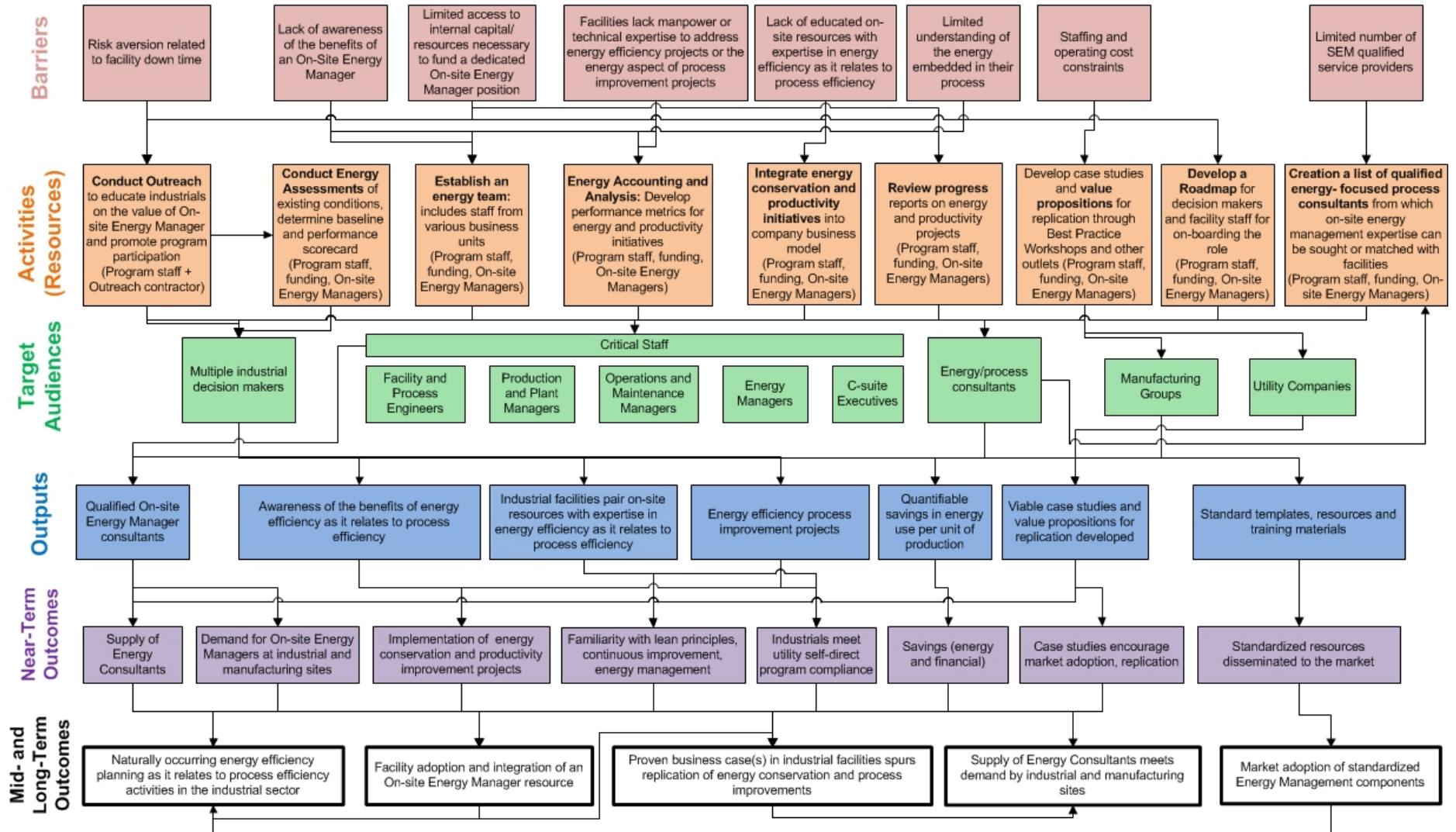
	<ul style="list-style-type: none"> • Market Evaluation will be done in a coordinated manner for On-site Energy Manager and Strategic Energy Management. Because the market actors overlap across strategies and the evaluation of SEM and OSEM are underway, to reduce survey fatigue, the evaluation of EMIS will be included in the future assessment activities of SEM and OSEM. Market Evaluation will be aligned with the logic model(s) and will include baseline and longitudinal measurement of key indicators of programmatic and broader market success. • Baseline measurements of key performance indicators will occur soon following initiative approval and will address indicators including: <ul style="list-style-type: none"> ○ For On-site Energy Manager current market penetration of On-site Energy Managers, current state of service provider knowledge and experience in providing these services, etc. ○ For Strategic Energy Management, the current market penetration of SEM, current state of facility knowledge and experience in SEM practices, etc. • Regular (e.g., annual or biennial) measurement of market change will occur once the program is underway and will provide follow up measurement to these baseline indicators as well as assess level of replication of strategic energy management practices and on-site energy managers into non-pilot facilities, the models for replication, and the associated benefits. • Sources of data for market evaluation include intervention data, public and commercially available data, and primary data collection through surveys of key market actors. <p><u>Impact Evaluation/Field Verification</u></p> <ul style="list-style-type: none"> • Impact Evaluation/Field Verification will also be coordinated for the two components of this overall Energy Management Practice strategy. • As projects mature and measures are installed or process improvements implemented, measurement and verification will be conducted at the pilot facilities to verify energy savings. This verification will be conducted according to the International Performance Measurement & Verification Protocol (IPMVP) method(s) most appropriate given the improvements made. • Depending on the extent of replication identified in Market Evaluation, impact evaluation will quantify the level of benefits, including energy savings. • Data from Field Verification/Impact Evaluation can be used to help lend confidence in the market, especially among other end users.
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Verified Gross Savings Specification Tables

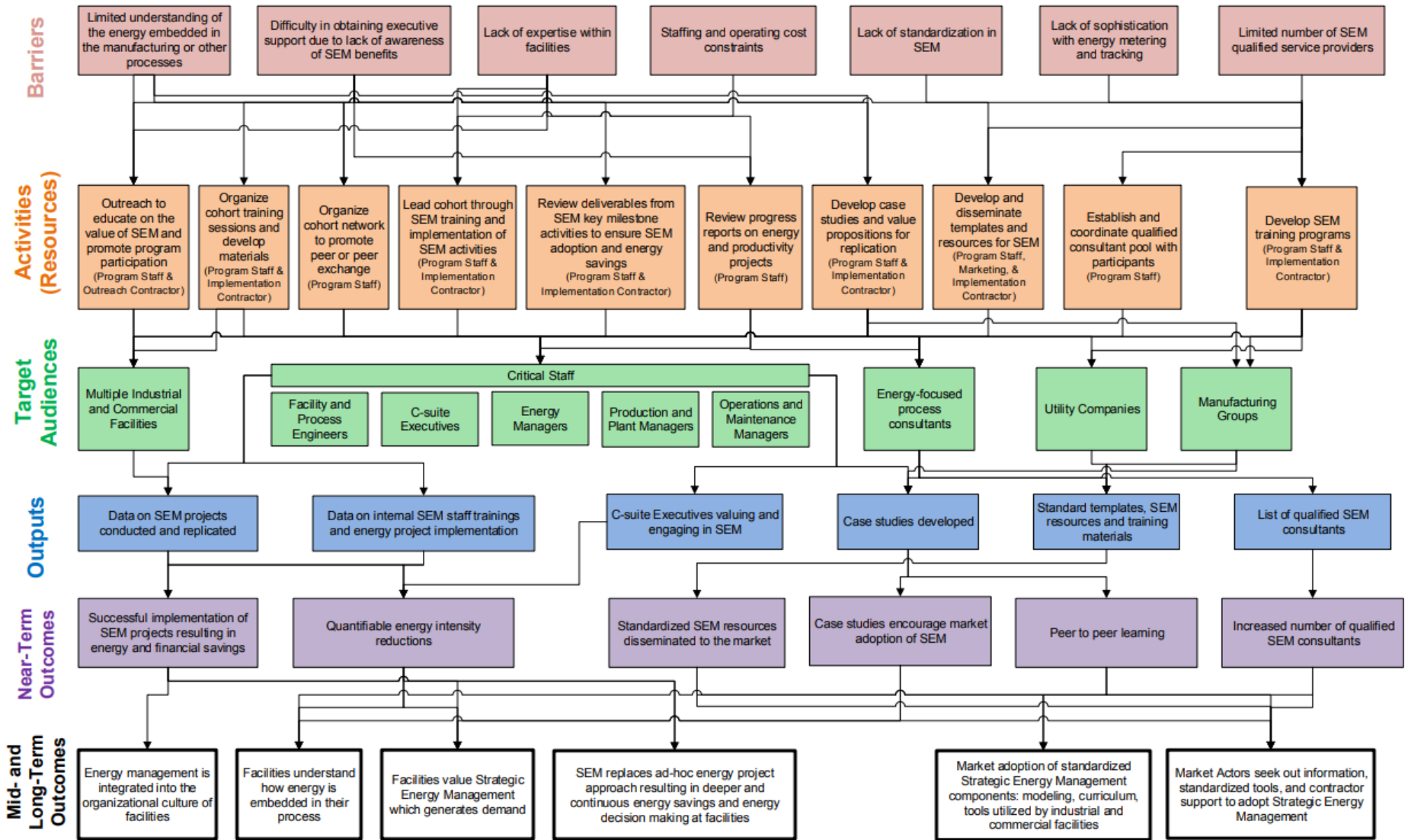
Verified Gross Savings Specification Template	
Date of ETIP/SEEP/CEF filing: (see cover page)	
Program Name	Industrial Energy Management Practices: On-Site Energy Manager (OSEM), Strategic Energy Management (SEM), Energy Management Information System (EMIS)
Program Description	Energy Management Practices aims to integrate the adoption of energy efficiency and clean energy into companies' core business processes. Programming and resources provided will focus on identifying areas for improvement, driving managerial and corporate behavioral changes with respect to energy, developing the mechanisms to track energy optimization efforts versus other business investment opportunities, and allowing companies to become accustomed to energy management with minimal risk.
Gross Savings Methodology	<ul style="list-style-type: none"> • OSEM – Acquired savings are reported as measures are installed. There is no additional program M&V to determine energy savings RR. • SEM and EMIS – Acquired savings are reported as systems are installed and verified. Testing is done by the program to determine system accuracy. There is no additional program M&V to determine energy savings RR.
Realization Rate (RR)	No RR has been determined for this program within the preceding five-year time frame
Planned VGS Approach	Beginning in 2020, Industrial Energy Management Practices (OSEM, SEM, EMIS) will undergo Gross Savings Analysis for program period 2018-2020. Details related to the Gross Savings Analysis methodology will be submitted in an EM&V Plan in Q3 2020. The estimated completion of the Gross Savings Analysis Report is Q4 2021. An independent evaluator will perform the Gross Savings Analysis. Where possible, NYSERDA will also employ an incremental impact evaluation approach whereby data is analyzed on a frequent, periodic basis and findings shared to offer more real-time feedback on program performance.
Exemption from EAM Status	N/A

Appendix A – Logic Model

LOGIC MODEL: On-site Energy Manager



LOGIC MODEL: Strategic Energy Management (rev. 03/11/19)



Appendix B | Initiative Budget and Benefits Summary

Energy Management Practices

		Benefits Acquisition Plan														
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Direct Benefit	Plan Total															
Energy Efficiency MWh Annual	350,691	-	-	13,352	63,407	39,006	45,093	37,191	36,881	36,033	11,416	13,563	13,563	13,563	13,563	14,063
Energy Efficiency MWh Lifetime	3,934,385	-	-	200,280	661,990	547,355	542,205	416,306	396,205	369,430	117,490	135,625	135,625	135,625	135,625	140,625
Energy Efficiency MMBtu Annual	2,181,384	-	-	43,440	510,059	255,565	174,649	149,390	155,390	163,140	104,750	125,000	125,000	125,000	125,000	125,000
Energy Efficiency MMBtu Lifetime	25,708,977	-	-	651,600	6,689,540	3,639,280	2,229,357	1,768,900	1,708,900	1,700,150	1,071,250	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Renewable Energy MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual	296,665	-	-	8,989	58,839	34,002	32,338	26,952	27,137	27,153	11,649	13,871	13,871	13,871	13,871	14,121
CO2e Emission Reduction (metric tons) Lifetime	3,394,955	-	-	134,842	686,825	480,141	396,415	307,325	293,867	279,975	119,506	138,711	138,711	138,711	138,711	141,213
Participant Bill Savings Annual	50,440,278	-	-	1,285,198	8,039,268	5,461,480	6,327,944	5,448,184	5,473,435	5,468,505	1,854,515	2,207,950	2,207,950	2,207,950	2,207,950	2,249,950
Participant Bill Savings Lifetime	567,257,706	-	-	19,277,971	91,006,342	77,092,180	75,074,840	60,562,583	58,361,140	56,037,231	19,027,919	22,079,500	22,079,500	22,079,500	22,079,500	22,499,500
Leveraged Funds	177,107,920	-	-	2,525,045	31,427,886	7,879,370	15,941,760	18,438,845	17,326,574	16,365,840	10,327,600	12,500,000	12,500,000	12,500,000	12,500,000	6,875,000
Indirect Benefit	Plan Total															
Energy Efficiency MWh Annual	408,906	-	-	-	-	27,081	15,000	15,000	15,000	15,000	45,202	15,000	15,000	15,000	15,000	216,623
Energy Efficiency MMBtu Annual	3,138,925	-	-	-	-	280,788	187,500	187,500	187,500	187,500	514,006	187,500	187,500	187,500	187,500	844,131
Renewable Energy MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Renewable Energy MW Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2e Emission Reduction (metric tons) Annual	381,692	-	-	-	-	29,465	18,133	18,133	18,133	18,133	51,752	18,133	18,133	18,133	18,133	155,410
CO2e Emission Reduction (metric tons) Lifetime	4,904,911	-	-	-	-	385,320	271,997	271,997	271,997	271,997	608,182	271,997	271,997	271,997	271,997	1,735,432
Energy Usage	Plan Total															
Direct Energy Usage MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MMBtu Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Direct Energy Usage MMBtu Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MWh Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MWh Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MMBtu Annual	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect Energy Usage MMBtu Lifetime	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Participants	Plan Total															
Participants	280	-	-	5	32	5	22	26	20	25	20	25	25	25	25	25
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	280	-	-	5	32	5	22	26	20	25	20	25	25	25	25	25
Budget	Plan Total															
Incentives and Services	15,650,021	-	761,043	1,454,087	1,426,981	1,784,081	2,100,348	2,267,280	1,486,285	1,101,760	886,400	700,000	700,000	700,000	281,756	-
Implementation	7,235,883	-	357,111	355,474	419,319	359,547	774,181	788,000	750,000	749,000	747,698	550,000	435,553	350,000	300,000	300,000
Research and Technology Studies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tools, Training and Replication	5,990,875	-	40,344	82,040	285,876	300,239	510,380	638,896	761,033	761,033	761,033	750,000	500,000	300,000	200,000	100,000
Business Support	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	28,876,778	-	1,158,498	1,891,601	2,132,176	2,443,867	3,384,909	3,694,176	2,997,318	2,611,793	2,395,131	2,000,000	1,635,553	1,350,000	781,756	400,000

Table Notes:
 * With the May 2021 IPPR filing of all investment plans, each Appendix B table that accompanies an investment plan was transitioned from yearly commitment-based budget and benefit plans to plans that forecast expenditures and acquired benefits.

Appendix C | Initiative Outputs and Outcomes Summary

Energy Management Practices

	Indicators	Baseline	2020 Target	2025 Target
		(Before/Current)	(cumulative)	(cumulative)
Outputs	Number of energy management plans with energy reduction target developed	0	30	30
	Number of energy efficiency projects identified and completed during pilot engagement (likely starts with low/no cost and Operations & Maintenance type measures)	0	30	30
	Number of case studies, testimonials developed, webinars or knowledge transfer sessions conducted	0	30	30
	Number of qualified SEM providers	0	5	5
	Number of C-suite executives who engage in SEM	0	27	110
	Number of facilities providing internal SEM staff trainings	0	27	110
	Number of facilities evaluating projects using an SEM energy intensity metric	0	27	110
	Number of requests for standardized SEM resources	0	9	85
Outcomes	Number of energy managers hired/retained within pilot facilities	0	20	20
	Market penetration of on-site Energy Managers: % of the addressable market participating in this strategy; nonparticipant industrial sites hiring an OsEM	15%	16.5%	16.5%
	Number of projects implemented involving more complex CapEx and process improvements as a result of this strategy	0	40	40
	Number of industrial plants (beyond pilot participants) adopting on-site Energy Manager role	110	30-45 (10 – 15 per yr.)	30-45 (10 – 15 per yr.)
	Number of energy teams maintained beyond the cohort (indicating executive support for SEM)	0	27	110
	Number of facilities that have adopted a system for monitoring, tracking, and making decisions based on their energy use to assist with their SEM activities as a result of this strategy	1,886 facilities	1,913	1,996
	Number of industrial facilities (beyond pilot participants) that have adopted SEM	0	11	30

Table notes

- a. A 0 (zero) denotes that the actual value is currently believed to be zero for baseline/market metrics.
- b. Revised baseline metrics reflect the recently-completed Continuous Energy Improvement market baseline evaluation. This study will be available publicly on NYSERDA's website and in the DPS Document and Matter Management system in the near future.
- c. Baseline values for post-pilot performance will be measured after the first round of pilot offerings are complete.
- d. A total of 1,886 facilities, representing 27% of the addressable market, reported having adopted SEM, indicating there is still a large market potential to capture for SEM. The additional 27 facilities adopting a system for monitoring reflect the direct results of the initiative, and does not include anticipated indirect impacts.
- e. Baseline values for post-pilot performance will be measured after the first round of pilot offerings are complete.