



Utility 2.0 Long Range Plan 2017 Annual Update

Prepared for Long Island Power Authority

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Executive Summary

This document provides PSEG Long Island's 2017 annual update to the Utility 2.0 Plan ("Utility 2.0 Plan" or "Plan") related programs.

PSEG Long Island prepared its first Utility 2.0 Plan in July 2014, which set forth plans for integrating Distributed Energy Resources ("DER") in the Long Island Power Authority ("LIPA") electric grid and identified load management projects and tools to defer infrastructure projects. Since the original filing, PSEG Long Island has continued working with LIPA and the New York State Department of Public Service ("DPS") concerning the implementation of New York's Reforming the Energy Vision ("REV") on Long Island. Incorporating these collaborative discussions and recommendations, PSEG Long Island has provided updates of the Utility 2.0 Plans annually. During this time, PSEG Long Island expanded its efforts to identify projects that are consistent with and complementary to the goals of REV, including through increasing energy efficiency, promoting the use of DER, identifying opportunities to defer traditional capital investments, and seeking to improve overall system efficiency. Some of the noteworthy projects are:

- A new Dynamic Load Management ("DLM") tariff was offered.
- A Home Energy Management Program was developed for improving customer satisfaction.
- Alternative energy solutions were developed and awarded for South Fork load area(s): energy storage, wind power and load management.
- An Advanced Metering Infrastructure ("AMI") communication network was installed to support deployment of smart meters with focus on large customers.
- Analysis was done to determine the feasibility of offering on-bill financing.

In its 2017 Utility 2.0 Plan, PSEG Long Island continues to recognize and endeavor to adapt to the transformative changes taking place in our industry. This Plan showcases PSEG Long Island's long-term strategic vision and efforts in support of the policy goals of REV through integrating distributed resources into long-term system and capital planning, empowering customers with energy choices, enhancing system efficiency, and supporting a sustainable market for clean energy developments. The major initiatives for this program are: Rate Modernization and institution of a rate engine to support it, and recognition of AMI as the critical infrastructure to implement the vision.

The 2017 Plan consists of the following:

- Section 1 provides an overview and outlines the budget requests for 2018-2022.
- Section 2 provides details of PSEG Long Island's strategic vision and its Utility 2.0 strategy and Roadmap, focused on AMI and customer experience.
- Section 3 provides the status of select existing projects and initiatives undertaken during 2017 and the previous years for which no additional funding is required.
- Section 4 provides individual project plans for eight (8) projects. These projects, including a full-scale smart meter deployment, an innovate Super Saver program in North Bellmore, and Rate Modernization, are being proposed in support of PSEG Long Island's Utility 2.0 vision to achieve REV's, PSEG Long Island's, and LIPA's policy goals and vision.
- Section 5 is the approval request.

Section 1 – Utility 2.0 Plan Budgets

In accordance with Public Authorities Law Section 1020 - f(ee) and the Amended and Restated Operations Services Agreement (“OSA”) dated December 31, 2013, PSEG Long Island submitted a Utility 2.0 Long Range Plan on July 1, 2014 for consideration by LIPA and DPS. This inaugural Plan provided a foundation for further modernizing PSEG Long Island’s service territory, saving energy, and improving the environment.

As required by the OSA and the Public Authorities Law, PSEG Long Island is required to update the Utility 2.0 Plan annually. Following this requirement, PSEG Long Island updates and refines its Utility 2.0 Plan approach based on recent experience, following the developing state and regulatory policies, input from a broad set of stakeholders, and ongoing development of new technologies. In accordance with this requirement, PSEG Long Island filed annual Plan updates in 2014, 2015, and 2016.

This 2017 Plan includes a comprehensive vision embodied in the proposed implementation of critical projects such as Smart Meter Deployment, Rate Modernization, and the Super Saver demonstration project. It also provides progress updates on projects identified previously such as South Fork, Dynamic Load Management (“DLM”), Home Energy Management (“HEM”), and Electric Vehicles (“EV”).

In this 2017 Plan, PSEG Long Island has identified eight (8) projects which require incremental funding approval from LIPA. These projects are:

- Smart Meter Full Deployment
- Rate Modernization and Rate Engine (billing software)
- Smart Grid Interconnection Portal
- Super Saver Demonstration Project
- Transportable Storage
- Long Island Solar Photovoltaic (“PV”) System Output Study
- On-Bill Financing
- Electrical Vehicles

1.1. Budget Requests for 2018-2022

The following tables provide the overall budget requirement for the next five years to support the identified projects. This budget request is incremental to the proposed 2018 Capital and O&M budgets.

The amounts shown are in thousands (\$1,000s).

Overall Budget Requirement

Budgets	2018	2019	2020	2021	2022	Total
Capital **	\$21,880	\$67,558	\$60,400	\$61,100	\$61,700	\$272,638
O&M Expenses **	\$7,162	\$7,853	\$5,148	\$5,207	\$5,500	\$30,870
Fuel + Purchase Power	\$42	\$85	\$85	\$85	\$85	\$382

**The Smart Meter Full Deployment Project costs have been estimated with a high degree of confidence and major cost components have little risk due to contractual pricing. However, project costs will be updated in the 2019 Utility 2.0 Filing, incorporating the experience from the North Bellmore Super Saver smart meter saturation deployment. Similarly, Rate Modernization costs after 2018 are estimates only and will be updated based upon 2018 work with the consultants and technology providers in the 2019 Utility 2.0 Filing.

The capital budget request for each of the identified projects, which require capital funding, is as follows:

Capital Budget Request

	2018	2019	2020	2021	2022	Total
Smart Meters **	\$10,300	\$59,300	\$59,400	\$60,100	\$60,700	\$249,800
Rate Modernization/Engine **	\$4,250	\$5,100	\$1,000	\$1,000	\$1,000	\$12,350
SGIP	\$4,330					\$4,330
Super Saver Program	\$2,500					\$2,500
Transportable storage	\$400	\$3,158				\$3,558
PV						\$0
On-Bill Financing	\$100					\$100
EV Infrastructure						\$0
Annual Total	\$21,880	\$67,558	\$60,400	\$61,100	\$61,700	\$272,638

** See comments below the overall budget request table.

The O&M budget request for each of the identified projects is as follows:

O&M Budget Request

	2018	2019	2020	2021	2022	Total
Smart Meters **	\$300	\$1,700	\$2,200	\$2,600	\$3,100	\$9,900
Rate Modernization/Engine **	\$1,867	\$3,550	\$1,220	\$1,130	\$1,248	\$9,015
SGIP	\$3,170	\$1,100	\$1,100	\$1,100	\$1,100	\$7,570
Super Saver Program	\$1,000	\$750	\$500	\$250		\$2,500
Transportable storage		\$53	\$53	\$52	\$52	\$210
PV	\$150					\$150
On-Bill Financing	\$500	\$500				\$1,000
EV Infrastructure	\$175	\$200	\$75	\$75		\$525
Annual Total	\$7,162	\$7,853	\$5,148	\$5,207	\$5,500	\$30,870

** See comments below the overall budget request table.

1.2. Rate Impact Estimates and Proposed Method of Recovery

The following tables provide the estimated rate impact (capital and O&M budgets) for each of the projects included in this Utility 2.0 Plan:

*Rate Impact as a percentage of the typical residential bill: ****

	2018	2019	2020	2021	2022
Rate Modernize/ Engine	0.105%	0.130%	0.027%	0.027%	0.027%
SGIP	0.112%	0.003%	0.003%	0.003%	0.003%
Supersaver Program	0.061%	0.002%	0.002%	0.001%	0.000%
Transportable storage	0.008%	0.075%	0.000%	0.000%	0.000%
PV	0.000%	0.000%	0.000%	0.000%	0.000%
On-Bill Financing	0.004%	0.002%	0.000%	0.000%	0.000%
EV Infrastructure	0.001%	0.001%	0.000%	0.000%	0.000%
Annual Total	0.292%	0.213%	0.032%	0.031%	0.030%

*Rate Impact in dollars per month for a typical residential customer bill, with an average of \$150 monthly bill: ****

	2018	2019	2020	2021	2022
Rate Modernize/ Engine	\$0.16	\$0.20	\$0.04	\$0.04	\$0.04
SGIP	\$0.17	\$0.00	\$0.00	\$0.00	\$0.00
Supersaver Program	\$0.09	\$0.00	\$0.00	\$0.00	\$0.00
Transportable storage	\$0.01	\$0.11	\$0.00	\$0.00	\$0.00
PV	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
On-Bill Financing	\$0.01	\$0.00	\$0.00	\$0.00	\$0.00
EV Infrastructure	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Annual Total	\$0.44	\$0.32	\$0.05	\$0.05	\$0.05

PSEG Long Island's proposed method of recovery is collection through the DER Rider.

***The Capital and O&M cost impact for Smart Meter Full Deployment is furnished separately in Appendix 1

Section 2 – PSEG Long Island Vision and Roadmap

PSEG Long Island’s strategic vision is to be an innovative, forward-looking customer-centric utility that provides clean and reliable energy, develops options for new energy products and services, and empowers customers to make informed energy decisions. We are committed to providing excellent service and valuable information to all of our customers, in ways that empower them in making energy-related decisions. Our customers expect PSEG Long Island to develop new solutions and processes that will achieve the vision.

PSEG Long Island is proposing programs and services that align with REV, providing customers access to their personalized detailed energy information, enabling them to make informed energy decisions while contributing to enhanced reliability and animating markets. Our consumers are just now starting to adopt electric vehicles, home automation systems, distributed generation and storage. PSEG Long Island believes in the promise of expanded services, increased customer satisfaction and greater bi-directional, dynamic and economic use of the electric grid. We believe that now is the time to lay the groundwork to allow for the seamless and structured integration of these customer-driven solutions.

PSEG Long Island has already started making the infrastructure investments necessary to realize this vision. In this filing, we set forth a comprehensive approach that continues to put our customers at the center of our business. With the investments recommended herein, our customers will be in the position to participate in the opportunities that DER, new energy service providers, modernized pricing options, and new technologies can offer.

The recently released Integrated Resource Plan indicates that the need for new baseload power plants appears to have diminished as sales remain flat and sales per customer have declined. Furthermore, the State’s goal of achieving 50% of electricity from renewable sources by 2030 provides support for greater integration of renewable resources onto the grid. Our expectation is that most new energy resources on Long Island will be in the form of energy efficiency, renewables, demand response, and energy storage. Additionally, as automation expands to our residential and commercial customers, the opportunity exists to utilize the distribution system more efficiently. Similarly, strategic electrification such as heat pumps and electric vehicles can help to improve the environment and improve system efficiency if we have the infrastructure, pricing and capability in place to help guide customer choices before such technologies become a significant portion of load.

As a company, we are committed to actively listening to our customers’ needs, providing customized options, and improving processes to make it easy to do business with us. We are establishing a new partnership with customers to provide reliable service and timely information – one in which we become a trusted resource and energy management advisor.

2.1. Objectives

Focused on our customers and in support of NY REV, PSEG Long Island’s objectives of Utility 2.0 are as follows:

- Motivate and inspire our customers to increase their understanding of all aspects of their energy needs and take active control of their energy usage.

- Empower customers to make choices regarding their use and cost of energy.
- Enhance opportunities for market innovation and market animation.
- Build and maintain an intelligent grid focused on improving reliability, quality and security of the electric system.
- Enhance and operate conventional and non-conventional grid assets based upon most up-to-date data and decision-making tools.

PSEG Long Island is dedicated to moving forward strongly in executing the vision. Over the past few years, PSEG Long Island, building upon LIPA's studies and implementation, has taken important steps to establish key foundational projects and systems which will be further expanded and enhanced in the next few years as part of our planned roadmap.

2.2. The Foundation

PSEG Long Island believes that customers' consumption of electricity is driven by the value of the product or service using that electricity, often without a clear and deliberate understanding on the part of the customer as to how much or when such electricity is being used. Offers of incentives to customers to change their consumption patterns to minimize grid impacts (and costs) have been met with mixed results, as consumption is often routine without near-real-time feedback. However, we believe with the gradual uptake of new technologies presently being introduced into the marketplace, it will be feasible that customers will be able to receive feedback on how much energy they are using in near-real time, decide how much energy they want to use and at what time of day they want to use it, while being informed about the cost impacts of their choices. PSEG Long Island, consistent with relevant REV goals, will establish projects and programs to offer increased opportunities to market participants – technology vendors, innovators and customers – which will increase efficiency of the electric system and reduce the costs to customers.

To enable more customer choices and market participation, PSEG Long Island will continue innovating the electric distribution system using state-of-the-art grid sensors and controls. This effort encompasses both Smart Meter Deployment and Rate Modernization to enable PSEG Long Island to offer tools and capabilities for employees and customers to improve system efficiency and customer satisfaction. These efforts include customer empowerment, improved reliability and quality of the electric system, and ensuring security of company and customer data. PSEG Long Island, with its home energy management tools, will offer customers the ability to better monitor and control near-real-time usage in the near future.

2.2.1. Modernizing the Customer Experience

PSEG Long Island is implementing a comprehensive approach that puts our customers first. We are committed to enhancing electric reliability and storm response by investing in the foundational infrastructure to provide innovative ways for our customers to interact and engage with our services. We are expanding and enhancing communication to be more personalized and relevant. Providing real-time, transparent information to our customers empowers them to have better monitoring and control of the timing and quantity of usage.

PSEG Long Island is committed to providing excellent service and valuable information to all of our customers. We are expanding the variety of communication channels to meet our customers' preferences as well as modernizing our technology. In an increasingly digital world, we know that

our customers appreciate convenience. PSEG Long Island continues to develop new technological solutions to help make things work for our customers.

Through a comprehensive Home Energy Management Program launching in September 2017, PSEG Long Island will be able to better motivate and inspire our customers to increase their understanding of virtually all aspects of their energy needs and take active control of their energy usage.

PSEG Long Island will continue to further enhance these measures over the next few years.

2.2.2. Smart Meter Full Deployment – the Foundational Requirement

The full deployment of smart meters is integral to all components of the Utility 2.0 efforts establishing the foundation for innovation and change. Smart Meter Full Deployment is required to enable customers to make more informed energy choices, develop new energy products and services, and protect the environment.

Since 2010, the LIPA system has had several pilots and selective smart meter deployments to help gain experience with smart meter technologies, to understand customer impacts, and to develop the necessary integration to support remote meter reading and billing. In 2016, as a result of the successes with smart meter deployments to date, PSEG Long Island expanded the AMI communications network to cover the entire service territory.

To date, PSEG Long Island has already installed over 40,000 smart meters which now measure over 30% of system energy, focused on our largest commercial customer accounts. We have gained experience in customer engagement regarding smart meters, implemented a functional Meter Data Management System (“MDMS”) and AMI web portal, and completed systems and processes to support billing of all current rates, including current Time of Use (“TOU”) and totalized accounts. In addition, we have developed and implemented a labor strategy to support full-scale deployment of smart meters which includes cross-training employees to support the AMI and smart meter programs.

PSEG Long Island’s Metering Strategy is shown in Figure 1 below.

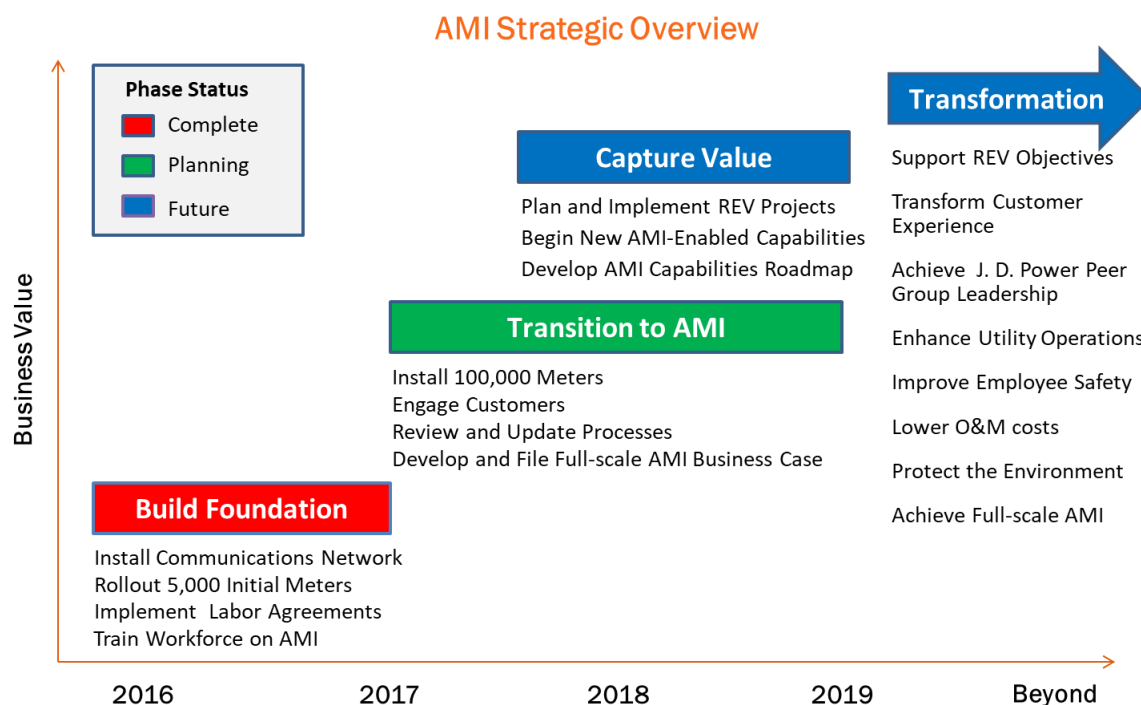


Figure 1. PSEG Long Island Metering Strategy

2.2.3 Rate Modernization

PSEG Long Island is seeking to design innovative rates more consistent with New York State’s REV to provide additional value and real benefits by saving customers’ money and reducing impacts to the system. The implementation of AMI and a new MDMS, smart meter deployment, and a rate calculation engine are essential foundational requirements to provide hourly load profile data and offer customers new electric rate choices that better meet their needs.

PSEG Long Island requires the selection, purchase, and integration of a new rates engine with the new MDMS and current billing systems to enable a suite of diverse rate options to be available at scale for both residential and commercial customers. A new customer-facing tool will be sought to provide customers a view of the various rate options, compare pricing, and allow customers to select the rate they believe best suits their lifestyle and energy management needs. Customers will be able to receive more granular energy information and suggestions on how to shift load and save money. These rate options, and the ability to understand the impacts of their choices, are important steps in realizing the vision of Utility 2.0.

2.3. PSEG Long Island Execution Strategy and Roadmap

Figure 2 depicts PSEG Long Island’s Roadmap to achieve this vision. It has three interrelated steps:

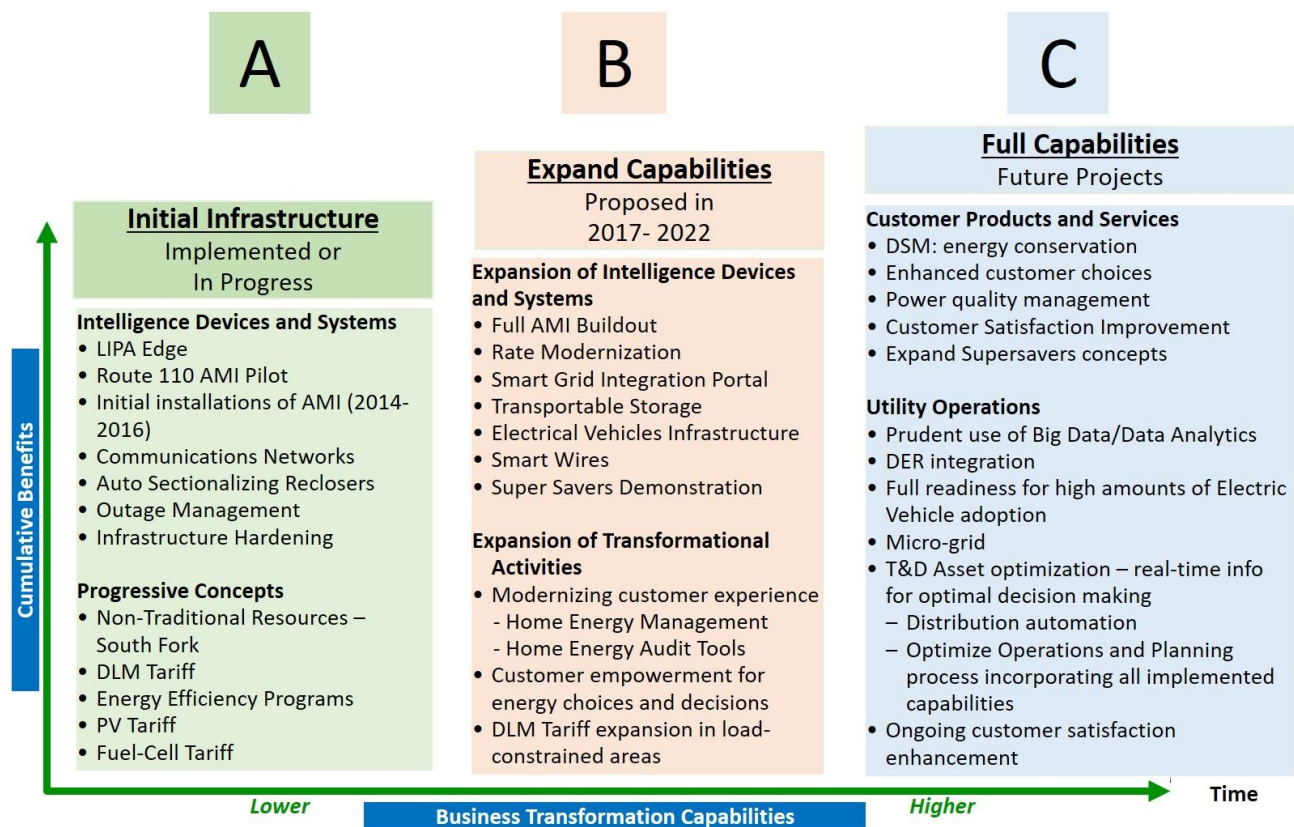


Figure 2. PSEG Long Island Roadmap

Initial Infrastructure projects and progressive concepts (Column A in Figure 2)

These projects and/or concepts are either already implemented or are in advanced stages of implementation. Over the past several years, PSEG Long Island has begun to build smart grid foundation with projects such as communication networks, smart meter pilots, auto-sectionalizing reclosers to improve CAIDI and SAIDI and non-traditional resource implementation (wind, energy storage). This has allowed PSEG Long Island to review and analyze the state of industry and assess cost-beneficial projects to improve customer satisfaction and reduce peak loads. With the experience gained from these projects, PSEG Long Island will further expand select projects to leverage the lessons learned and achieve its vision and objectives.

Expand capabilities – infrastructure and transformational activities (Column B in Figure 2)

In this 2017 Utility 2.0 Annual Update Plan, we have proposed projects that we believe are necessary to be able to offer the new programs, services and associated billing and payment capabilities to support a modernized customer experience. Projects proposed in this plan, such as Rate Modernization, will look to offer customers energy choices regarding how the timing and usage of energy could impact their rates, while the Smart Grid Integration Portal will expedite the interconnection process of DER and enhance customers' experience. Electric Vehicle Infrastructure initiative will assist PSEG Long Island in expediting early adoption of electric vehicles and provide critical experience with the charging infrastructure. Super Saver pilot program will offer a cohesive and uniquely targeted outreach effort to North Bellmore customers for early adoption of home energy management tools. PSEG Long Island will evaluate how incentives and tariffs impact customers' behavior with the goal to reduce peak loads and defer conventional wired

infrastructure projects for this project. Projects such as this could lead to the eventual customization of energy efficiency offerings targeted for optimized results. The plan also includes the installation of transportable energy storage capable to support transmission and distribution (“T&D”) infrastructure deferral and mitigate local power quality issues.

The identified projects in this Plan are for the 2018-2022 time period and will be continually reviewed and reported to LIPA annually.

Full Capabilities (Column C in Figure 2)

PSEG Long Island will continue to expand capabilities to improve customer satisfaction and operational benefits and optimize the business processes. We continually review and monitor efforts undertaken by other New York utilities as well as leading utilities across the United States to determine ideal opportunities and projects that will expedite the implementation of PSEG Long Island’s vision for the Utility of Future.

In the future, we envision: (1) Full TOU rate plans capable of supporting beneficial electrification, and new unique pricing options; (2) customized and targeted energy efficiency offerings based upon Value of Distributed Energy Resources (“VDER”); (3) broadened customer sited generation; (4) development of new energy service company customer offerings (storage offerings for demand customers), and (5) offerings to support signal responsive automation at residential and commercial customers.

2.4. Rationale and Roadmap for Critical Programs and Initiatives

While this Plan sets forth several new customer-focused offerings, without the fundamental capability to fully deploy smart meters, process and utilize the data received from them, and integrate the information into other PSEG Long Island systems, the remainder of the projects will not be able move from demonstrations to system-wide deployment. PSEG Long Island recognizes (a) Smart Meter Full Deployment and (b) Rate Modernization as the two most critical and foundational programs in its 2017 Utility 2.0 Annual Plan.

PSEG Long Island will provide annual updates of its Utility 2.0 plan to LIPA to apprise LIPA of the progress made and results achieved.

Section 3 – Updates on the Projects Identified and Previously Approved

PSEG Long Island continued working on its Utility 2.0 programs in 2017, building upon the foundation laid out in previous years. It continued its strong coordination and ongoing communications with LIPA and the DPS in its Utility 2.0 and NY REV Implementation efforts, and focused on meeting state energy plan goals.

This section provides an update on:

- Projects identified in our 2016 Utility 2.0 Plan for which significant progress was made in 2017.
- Several new initiatives that were undertaken in 2017, or planned to be undertaken in 2018 for which we do not seek budget approvals in this Plan filing.

3.1. South Fork Project Update

The South Fork request for proposals, issued in 2015 and based on REV Non-Wires Alternative approach, focused on deploying cost-effective resources to help defer the need for building new transmission infrastructure on the South Fork. The RFP was intended to enable PSEG Long Island to acquire a minimum of 63 Megawatts (“MW”) of local resources to defer the need for new transmission infrastructure until at least 2022 on the South Fork and until 2030 east of Amagansett. Sufficient reduction and/or power production resources connected to substations or distribution feeders would help defer ten transmission projects.

Proposals included: power generation, battery storage, direct load control, wind energy, and thermal storage.

After a thorough evaluation process, a portfolio of three proposals was selected.

The selected portfolio includes offshore wind generation, battery storage technology, and demand management/direct load control.

3.1.1. South Fork Offshore Wind Energy Project

Deepwater Wind LLC was selected to provide 90 MW of renewable energy generation to be interconnected on the South Fork of Long Island.

This project was selected for a number of reasons:

- Fifteen wind turbines will generate 90 MW of clean renewable power.
- Renewable energy supported by our customers helps to meet the NYS Clean Energy Standard.
- Allows Localized renewable energy injection to where the power is needed.
- Transmission upgrades ensure year-round power supply.
- LIPA has secured a 20-year Purchase Power Agreement with Deepwater Wind LLC for 90 MW with commercial operation of the project by December 31, 2022.

PSEG Long Island will continue to work with Deepwater to develop Engineering and Procurement Agreement(s) and Interconnection Agreements and coordinate injecting this intermittent resource into the 69 kV system on the South Fork.

3.1.2. East Hampton and Montauk Energy Storage Projects

East Hampton Energy Storage Center, LLC (5 MW)

East Hampton ESC will develop, own and operate a lithium ion battery storage facility located at the existing National Grid-owned power generation site west of Cove Hollow Road in the Town of East Hampton. The project would be rated at 5 MW, connected via a dedicated feeder into the East Hampton Substation, and be operational by May 1, 2018.

Montauk Energy Storage Center, LLC (5 MW)

Montauk ESC will develop, own and operate a lithium ion battery storage facility located in Montauk on Second House Road. The project would be rated at 5 MW and would initially be connected to the Montauk Substation until the Navy Road Substation is completed. This project will be operational by May 1, 2018.

LIPA has secured a 20-year purchase power agreement for the storage and generation capacity of each of these projects.

3.1.3. Direct Load Management/Control Program

The third component of the South Fork portfolio is a Direct Load Management/Control program that will provide 8.2 MW of load reduction by May 1, 2019.

PSEG Long Island has an Energy Services Agreement contract with Applied Energy Group (“AEG”). AEG will provide 8.2 MW of direct load control and energy efficiency measures on the South Fork of Long Island, East of the Shinnecock Canal. The direct load control initiative consists of Wi-Fi central air conditioning thermostat control, room air conditioning control, residential pool pump control, and small business HVAC control. In addition, AEG will include various residential and business energy efficiency measures in their load reduction effort to further reduce electric load on the South Fork.

3.2. Dynamic Load Management (“DLM”) Tariff

LIPA introduced DLM programs to the electric tariff, effective April 1, 2016. This DLM is designed consistent with those of the state’s investor owned utilities and in alignment with NY REV. The tariff provides price signals to encourage innovative market-based solutions to support T&D infrastructure needs and load relief. The DLM Program, which consists of three defined programs summarized below, will be typically in place during higher electric use months, May 1 – September 30, also known as the “capability period.”

Direct Load Control Program (“DLCP”)

The Direct Load Control Program pays customers \$85 toward the purchase and installation of “smart” thermostats – capable of producing a 1-kW or greater load reduction – that allows PSEG Long Island to curtail usage of central air conditioning systems and possibly other equipment in a home or small business during declared “Curtailment” or “Test” Events. Participating customers receive an additional \$25 payment for each subsequent year (up to at least four) that they remain in the Program *and* allow their facility’s load to be curtailed for at least 50% of the full curtailment event(s). Customers must utilize a PSEG Long Island-approved thermostat provider, install the device in home or business, and be linked to PSEG Long Island through an Internet connection that the customer identifies at the time of enrolling in the Program.

There are approximately 29,000 legacy Edge thermostats which also provide summer load relief. Most of these thermostats are well beyond their design life. In future years, we anticipate the migration of some of the Edge Direct Load Control participants to the new DLM tariff program.

Commercial System Relief Program (“CSRP”)

Participants in the Commercial System Relief Program are required to provide a load reduction of at least 50 kW for a specific four-hour period (selected by the participant and agreed to by PSEG Long Island) during weekdays, when PSEG Long Island declares a load-curtailement Planned Event and provides at least 21 hours advance notice. Participation is optional if a) less than 21 hours advance notice is provided, b) a load reduction duration beyond four hours or during a different time period or during a month outside the Capability Period is requested.

Participants may be either a customer or an “aggregator” who recruits a group of customers whose aggregate load reduction capability satisfies the 50 kW requirement. The load curtailment capability can be provided by any reliable means, including using an engine-generator or battery that operates during the curtailment event to satisfy all or a portion of the site’s power requirements. Other dispatchable load-curtailement options include turning off lights or equipment, slowing motors that are driving pumps or fans, and adjusting thermostat settings. Non-dispatchable measures are also acceptable, such as installing energy efficiency measures that reduce a facility’s power demand during all hours of the Capability Period. The idea of the CSRP is to allow a variety of approaches to be used, because the applicability and cost of each option will vary depending on the physical and operational characteristics of the specific facilities that participate.

Curtailement Events are called when the day-ahead forecasted total load on PSEG Long Island’s grid reaches 92% of the forecasted summer system-wide peak load, and during other power-supply emergencies identified by the NYISO or by PSEG Long Island.

The CSRP offers several features to both individual customers and aggregators of customers in the program. The program scope consists of:

- Monthly Reservation Payments per kW for commitments to reduce load on 21 hours’ notice. The current reservation payment is \$5/kW per month for five summer months.
- Performance Payments for each kWh of energy curtailed during a called event, lasting up to four hours. The current performance payment is \$0.25 per kWh reduced during a curtailment event.
- Bonus payments for each kWh of energy curtailed beyond the four-hour limit of the performance payment.

PSEG Long Island installs an interval meter with communications capability at each participating customer’s facility, and will use this meter data to determine the kW of load relief delivered, and kWh of energy savings for which performance payment will be made.

Distribution Load Relief Program (“DLRP”)

The Distribution Load Relief Program is targeted to Designated Load Areas (“DLA”) or “load pockets” on the electric system that are identified from time to time when the load forecast for a DLA indicates that a potential overload condition is likely to occur in the future. Implementation of the DLRP is more cost-effective than the expensive investments that would be required to

upgrade the distribution system serving the DLA. As part of the Super Saver Project (see Section 4.4), PSEG Long Island will designate North Bellmore as its 1st DLA. In the future, DLA will be identified, when necessary, by PSEG Long Island and posted to the PSEG Long Island website.

The DLRP offers:

- Monthly Reservation Payments per kW for commitments to reduce load on two (2) hours' notice
- Performance Payments for each kWh of energy curtailed during a called event lasting up to four hours
- Bonus Payments for each kWh of energy curtailed beyond the four-hour limit of the performance payment.

Payment amounts will be specific for each Designated Load Area, and shown in the website posting mentioned above.

All other features of the DLRP (minimum curtailment of 50kW, means for accomplishing load relief, use of interval meters to determine kW of actual relies and kWh of savings, etc.) are the same as is described above for the CSRP.

3.2.1. DLM Implementation through August 2017

PSEG Long Island has activated each of these DLM tariff programs in 2016 and 2017 as customers have signed up. The following table provides the current enrollment and MW reductions.

Current DLM Enrollment and MW Reductions

Program	Customers/Devices	MW Available	2017 Curtailment Events
Direct Load Control	7,100	7.1	4
CSRP	39*	14	2
DLRP	39*	14	2

*Customers currently enrolled in the CSRP and DLRP programs are duplicative, having enrolled in both programs.

3.3. Yaphank Load Reduction Project Status

The Yaphank Load Reduction Project was proposed in the 2016 Utility 2.0 Plan Update as it was projected that the area, which consists of five substations, would be in need of an additional 10 MW by the year 2020, 15.3 MW by year 2027 and 38 MW by year 2026.

An RFP for Yaphank load area was prepared for load relief resources both in front of the meter and behind the meter. Concurrently, a Fuel Cell Tariff, Commercial Rooftop and Parking Facility Solar Tariff, and a 2015 Renewable RFP were offered. The resources needed to address the load pocket have been authorized through the Fuel Cell Tariff in three contracts for fuel cells in the Yaphank area, thereby eliminating the load reduction need.

Due to the recent changes in the load forecasts and anticipated availability of Fuel Cell resources, PSEG Long Island will defer the issuance of the RFP until such requirement arises in the future

3.4. Smart Wires – Whiteside Project Summary

PSEG Long Island’s planning process constantly reviews possibilities to cost-effectively defer traditional capital investments, such as the replacement or expansion of transmission infrastructure. These innovative approaches help defer traditional capital investments consistent with and complementary to the goals of REV.

Smart Wires develops and manufactures modular power flow control solutions that can push or pull power away from overloaded transmission lines and onto under-utilized corridors on the transmission grid. PSEG Long Island evaluated Smart Wires PowerLine Guardian technology as an alternative to a traditional reconductoring solution. The Lake Success to Stewart Manor 69 kV path will experience thermal overloads under contingency conditions. The Smart Wires PowerLine Guardian devices function as a “dynamic series reactor,” dynamically injecting magnetizing reactance to increase the 69kV circuit reactance, which will push power flow to alternate lines with spare capacity.

This innovative technology will mitigate thermal constraints on the Lake Success – Whiteside 69kV overhead circuit path, providing an opportunity to defer or avoid the traditional alternative of circuit reconductoring and associated pole replacements. The project is presently contemplated for completion in 2018.

The Smart Wires PowerLine Guardian solutions represent a quickly deployable, scalable and reusable alternative to traditional planning tools. The technology also provides a customer-friendly solution to avoid construction in sensitive areas, demonstrating a commitment to customers. Given the uncertain nature of future network needs, Smart Wires’ devices are a robust investment capable of mitigating near-term constraints while providing long-term flexibility.

3.5. Electric Vehicle Consulting Study

PSEG Long Island is working on developing an EV strategy to accelerate the adoption of electric vehicles. The EV market is still in its early stages of adoption in Long Island, and significant collective and collaborative efforts, among State and local governments and EV suppliers, will be needed to incubate, expand, and accelerate the EV market transition. From PSEG Long Island’s perspective, the conditions for improved EV adoption are particularly fertile on Long Island, where consumer demographics are strong, electricity generation sources are relatively clean, and state policies support an overall goal to reduce greenhouse gas emissions.

PSEG Long Island has initiated a study of the current market to identify key areas for future investment, characterize EV opportunities, quantify potential benefits, and assess market and distribution system impacts. It is expected that the study, to be completed by the end of 2017, will provide the foundational information for subsequent policy, program, and advocacy planning.

PSEG has contracted with Gabel and Associates, a recognized industry authority that is experienced in assisting public and private-sector clients in accelerating the growth of the EV market, to undertake this study for PSEG Long Island.

The scope of work includes baseline modeling for electric vehicles, associated charging equipment and current market technology.

The focus of the study and deliverables are:

- **Market Characterization:** Investigate and provide baseline information about the existing EV market in the LIPA territory, including information about EV penetration, technical vehicle specifications updated to reflect changing market conditions, and key modeling factors related to travel patterns, charging behaviors, and both energy and emission factors. A baseline “do nothing” (no EV) scenario will be defined, along with three (low, medium, and high) adoption trajectories that are specific to LIPA market conditions. Both “natural” and “managed” load profiles will be considered, allowing consideration of the relative impacts of different charging management strategies.
- **Impact and Benefit Quantification:** Based on the baseline information, Gabel will develop and use models to estimate economic, environmental, and where feasible, other impacts for the EV adoption cases under consideration. In addition, Gabel will identify potential grid impacts for the EV adoption cases, based on a survey level review of LIPA distribution system architecture.
- **Utility Impact and Opportunity Assessment:** Gabel will outline potential impacts on the utility, and identify strategic opportunities for PSEG Long Island engagement in EV market development. Particular emphasis will be placed on market development programs where PSEG Long Island is uniquely able to provide value and benefit, and solutions that ensure that EV grid loading happens in an optimal way. Examples of programs and policies pursued in other states will be used as examples where relevant.
- **Benefit-Cost Analysis:** Based on the results of the previous tasks, we will provide a high-level quantification of the benefits and cost for key market development initiatives that can be undertaken by PSEG Long Island directly.

Nissan Bulk Purchase Offering 2017

Nissan approached PSEG Long Island in 3Q 2017 about offering a bulk discount of \$10,000 to all its employees and customers for the purchase of a new 100% electric 2017 Nissan Leaf vehicle. The offering leverages the current New York State vehicle rebate of \$1,700 and the Federal ITC of up to \$7,500. The offering brings the cost of a midrange vehicle of \$32,000 down to \$13,500 for qualifying individuals. PSEG Long Island launched the offering in late August 2017. Pending the outcome and success of the initial offering, Nissan may be able to extend or consider an additional offering for employees and customers.

3.6. Home Energy Management (“HEM”) Program – Tendril

Last year PSEG Long Island proposed and issued an RFP for an HEM program. This year our contractor, Tendril, has been selected and project activities have begun.

The HEM Program is a behavioral program intended to motivate and inspire approximately 300,000 Long Island customers to increase their understanding of their energy needs and take active control of their energy usage.

HEM Program Objectives

- Creation of a positive customer experience.
- Being a trusted expert partner in controlling energy costs.
- Annualized average energy savings goal of 1.5% for each program participant.

- Actionable behavior recommendations.
- Suggestions for energy efficient product purchases.
- Help for customers reducing their electric bills.
- Support of New York State REV.
- Implementation of a unique innovative business approach that supports the reduction of greenhouse gasses.

HEM will include:

- A series of individualized multi-channel communication engagements including information, disaggregation, and interpretation of billing and energy usage, understanding of energy conservation and energy efficiency solutions, availability of utility programs, and other ways to empower customers to manage their energy usage and save money.
- Multiple channels for customer engagement including but not limited to print, direct mail, and electronic (e.g., email, social media, app-based, and/or web-based) channels needed to effectively reach and engage the variety of target audiences.
- Home energy reports pushed to customers, either in whole or in parts, through multiple communications with customer.
- Behavior-based strategies to motivate and inspire customers to increase their understanding of all aspects of their electric service and take active control of their energy usage.
- Web-based portal for ongoing customer engagement.
- Use of multiple behavior-based strategies tailored to each target customer segment.
- Online Home Energy Assessment “audit” capability available on demand by all customers capable of being operated through a customer’s My Account or public website as well as through this program’s specific customer engagement portal or digital application.

Section 4 – PSEG Long Island Projects Requiring LIPA Budget Approval

The following are projects for which there are incremental fund requests to PSEG Long Island's base Capital and Operating Budgets.

4.1. Smart Meter Full Deployment Plan

Objectives

PSEG Long Island wants to inspire its customers to increase their understanding of their energy needs and take control of their energy usage. PSEG Long Island's vision is aligned with New York State's comprehensive energy strategy, Reforming the Energy Vision ("REV"). Consistent with REV, full deployment of smart meters will allow customers to be more informed about energy usage and make energy choices. Full deployment of smart meters will also allow PSEG Long Island to enable the development of new energy products and services, and better protect the environment. The proposed Smart Meter Full Deployment Project provides the foundation for such innovation and change.

In the 3-Year Rate Plan filed in 2015, the NY DPS recommended a subsequent AMI filing through Utility 2.0. This document presents the business plan and filing for the Smart Meter Full Deployment Project based on the recommendation.

Scope of Work

- Deploy smart meters for large commercial and market participant customers including: TOU, PV net, Recharge New York, and Retail Choice by year-end 2018.
- Deploy smart meters system-wide by year-end 2022.
- Upgrade existing MDMS and AMI web portal to enhance the customer experience and expand functionality by year-end 2018.
- Expand customer education and outreach as well as direct customer communications.
- Develop a roadmap for achieving the future benefits enabled by AMI.

Savings in labor and associated costs from meter reading and other customer service functions more than pays for the costs of the project financially. In addition, the full deployment of smart meters will:

- Modernize the customer experience
- Provide a foundation for future REV initiatives
- Enable short- and long-term operational improvement opportunities for PSEG Long Island

In addition to alignment with REV, the smart meter deployment supports both PSEG Long Island's and LIPA's missions and the PSEG Long Island's comprehensive Utility 2.0 strategy.

Current Status

PSEG Long Island has proven success with AMI, having completed the implementation of an AMI communication network for its entire service territory, commissioned the AMI data collection software and MDMS, launched an AMI web portal, and installed well over 40,000 smart meters across all rate classes. PSEG Long Island's AMI experience reduces business and technology risks and ensures the success of the Smart Meter Full Deployment Project.

Smart Meter Full Deployment Plan Budgets

Year	2018	2019	2020	2021	2022	2018-2022 Total
Capital**	\$10,300	\$59,300	\$59,400	\$60,100	\$60,700	\$249,800
O&M**	\$300	\$1,700	\$2,200	\$2,600	\$3,100	\$9,900

In addition to the budget request shown for 2018-2022, PSEG Long Island has estimated additional O&M costs of \$31.5M for 2023-2037 time period. The details are furnished in Appendix 1.

The project will generate total O&M savings of \$473.3 million over 20 years. The project produces savings from meter reading labor, \$276.8 million or 59%; service order labor, \$89.3 million or 19%; meter salvage and fleet, \$58.1 million or 12%; management labor, \$33.8 million or 7%; and billing and call center labor, \$15.3 million or 3%.

**The Smart Meter Full Deployment Project costs have been estimated with a high degree of confidence and major cost components have little risk due to contractual pricing. However, project costs will be updated in the 2019 Utility 2.0 Filing, incorporating the experience from the Bellmore Super Saver smart meter saturation deployment.

4.2. Rate Modernization

Objectives: Roadmap to Rate Modernization

PSEG Long Island is seeking to design innovative rates more consistent with NY REV that provide real value and benefits by saving customers money while reducing impacts to the system. Customers prefer options to choose among a suite of rate plans that best meet their lifestyle needs.

The implementation of AMI and a new MDMS, full-scale smart meter deployment, and a rate calculation engine are essential foundational requirements to provide hourly load profile data and offer customers new electric rate choices.

Scope of Work

PSEG Long Island is planning to research, develop, and integrate into our systems new rate options and a suite of creative new rate plan bundles that provide easy-to-understand, diverse choices that meet our customers' energy management needs.

To enable this suite of rate options to be available at scale for both residential and commercial customers PSEG Long Island also requires the selection, purchase, and integration of a new rates engine along with the new MDMS (see Smart Metering Full Deployment Plan Section 4.1) and current billing systems.

Additionally, a new customer-facing online tool will be sought to provide customers a view of the various rate options, compare pricing, and allow the customer to select the rate they believe best suites their lifestyle and energy management needs. Customers will be able to receive more granular, near real-time energy information and suggestions on how to shift load and ultimately save money. These rate options, and the ability to understand the impacts of their choices, are important steps in realizing the vision of Utility 2.0.

These initial phases of the project will be completed in 2018 and 2019. Starting in 2020 residential customers with a smart meter will be offered new rate options. As an interim step, prior to the rollout of these new rate plans, PSEG Long Island is proposing to modify current TOU rates M188 and M288 to make them more efficient by updating the peak to off-peak ratios.

Current Status: Background

The new rates engine will allow for efficiency improvement to coding and result in a dynamic approach for complex coding modifications in Customer Account System ("CAS") to manage changes in customer rates. The new rates engine solution will allow PSEG Long Island business and Information Technology departments to work together in setting up initial rate structures and will give PSEG Long Island business management the flexibility and ease of designing more creative, customer-centric electric rates. Changes or additions to rates will be managed more quickly, giving PSEG Long Island the capability to respond to customers in a timely fashion.

Existing TOU Rates for Customers

Currently, there are multiple TOU rates for both residential and commercial customers. The TOU rate design presents delivery rates for peak and off-peak times. Power rates are set for the total kWh usage in a month and do not vary by time period. Residential and small non-demand commercial customers have options presented in *Table 1*. The M188 and M288 rates are for a limited AMI pilot, for which only a handful of customers are still participating. Current TOU rates

provide a very limited benefit to customers. The TOU rate adjusts customer delivery charges only, as opposed to modern TOU rates which adjust both customer delivery and power supply charges. Current TOU rates are based on-peak-to-off-peak-ratios that are out of date and did not factor in the increasing central air conditioning load. Other issues with the current TOU rate offering include unusually long peak periods of more than 10 hours. Long peak periods make it difficult for customers to change their behavior to shift load to the off-peak period. In the interim, as part of the of the Super Saver Pilot program, PSEG Long Island is proposing to modify rates M188 and M288 to make them more efficient by modernizing the peak to off-peak ratios.

The Various TOU Rates for Residential and Small Commercial Customers

Rate Class	Target Customer Group	TOU Periods (All Year)	
		On Peak	Off Peak
181, 182, 184, 188	Residential, Voluntary	10AM-8PM Weekdays	All remaining hours
M188	Residential, AMI	2PM-7PM Weekdays	All remaining hours
288	Commercial, Small, Voluntary	10AM-8PM Weekdays	All remaining hours
M288	Commercial, Small, AMI	2PM-7PM Weekdays	All remaining hours

Next Steps: Plan of Action

By the end of 2017, PSEG Long Island will issue an RFP for a system integrator to assist with identification of the new platform, design, build and implement the new rates engine and behavior-based rates. In early 2018, we will begin the Plan & Analysis phase (Phase 0) of the project. A second deliverable for Phase 0 includes determining the phased approach with final cost estimates needed to implement the new solution. In addition to the new rates engine software, we will be developing customer-facing tools to model rate options that will enable customers to compare different rates and potential savings so they can make informed decisions.

Rate options to be researched and potentially developed include enhanced TOU, anytime convenience rate (like our current rate 180), green energy rate, PV commercial net metering real-time rate (VDER), and standby rates so that customers will have choices regarding the pricing and service levels that meet their needs. The rate engine will be designed to permit solar financing using a two-meter approach, with one meter exclusively measuring the output of the solar inverter.

Guiding Principles

We will adhere to the following guiding principles:

- Provide choice. Create customer-centric options for obtaining and using energy.
- Engage with solutions. Control and manage bills and energy usage.
- Practice fairness. Provide options that reflect the unique needs of diverse segments of the population.
- Remain easy to understand. Provide simple, easy-to-understand and easy-to-adopt rate options.

4.2.1. Rate Design Vision Post AMI & Smart Meter Rollout

PSEG Long Island is proposing to build upon the full deployment of smart meters by offering customers rate choices that are not currently available to those with conventional meters. PSEG Long Island will research, design, and evaluate rates for customers who are willing to manage when they use power or who have special needs or interests (e.g., EV rates, green rates).

The Smart Metering Full Deployment Program (Section 4.1) along with a new rates engine will provide the needed technology to support new TOU rates and other rate options that will conform to the REV Track II proceeding. These projects will support new rate options enabling the adjustment of both a customer's power supply and delivery rates, to provide even greater savings. Smart meter data is required to support rates that use multiple time periods (e.g., peak rate period less than 4 hours to promote load shifting) and will provide customers with more granular energy information and suggestions on how they can shift their electric load to save money. Proposed rate changes would be focused primarily on residential customers.

Enhanced TOU Rates

Research and development of new rate offerings for residential customers will take into account the following considerations:

- TOU rate design should consider how the daily and seasonal Locational Marginal Price ("LMP") patterns change by month and by hour.
- Weekends during the year have similar patterns to weekdays, but have lower average costs.
- Number of Hours On-Peak: Can customers practically shift load off-peak during the entire span of the peak period? This is known as the principle of practicality.
- TOU rates will be designed to encourage specific energy management behaviors (e.g. the purchase of electric vehicles by introducing a TOU rate that provides lower overnight rate for vehicle charging).

To determine the price of energy under seasonal or TOU rates during the year, it is necessary to know the cost differential between seasons and diurnal periods. If cost differences are small, then the incentive to shift electricity consumption patterns will not be sufficient enough to warrant the use of seasonal or TOU rates for some or all classes of customers. There are systems resources that operate to minimize cost differentials, therefore depending on TOU rate design implementation, there may be dampened participation or a built-in cross-subsidy to non-TOU customers. Having full system smart meter data will help inform TOU rate design parameters to strike a balance between these two opposing forces. Additional more creative incentivizing structures for TOU participation will also be researched and tested.

Figure 3 displays a likely TOU rate structure for residential customers.

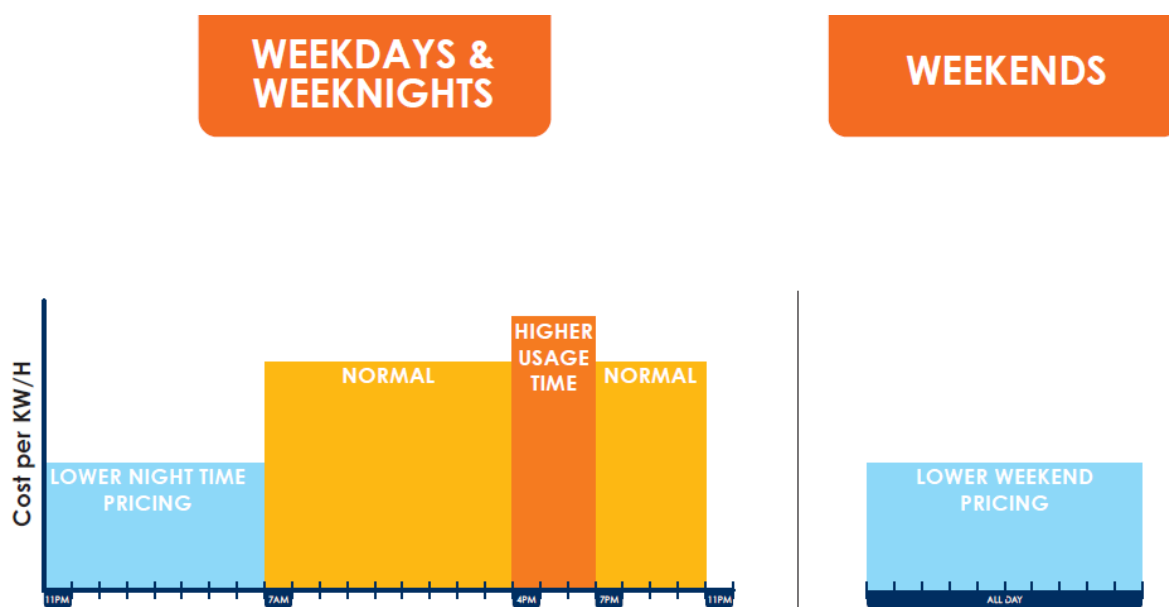


Figure 3. Likely TOU Rate Structure for Residential Customers

Enhanced Green Rates

Some segments of our customers are focused on doing their share to promote a clean environment and support a sustainable independent energy future. Provided a program that aligns with their values, these customers are willing to pay an incremental amount to invest in clean and renewable energy options. J.D. Power data has shown variations of this type of rate option to be the number one most satisfying alternative rate choice. Additional green rate options will be researched and deployed along with the enhanced TOU rates.

Easy to Understand - Rate Package Bundles

Not only are customers interested in new, flexible rates, they are also interested in options that are simple and easy to adopt that meet their energy management goals. To that end, research and evaluation will also consider rate package bundles. An example of a bundled package could be for the cost conscious consumer. This easy to select bundle might include items such as a TOU rate, billing alerts, paperless billing, HEM reports, and other programs that reduce costs to the customers all in one easy step. Other bundled options to be researched and developed include options to support the expansion of low income customer programs as well as anytime convenience options.

4.2.2. Customer Research & Engagement Plan

Local “Voice of the Customer” research has highlighted that Long Islanders understand that it costs more to live on Long Island. They perceive the value of living on Long Island and understand that value does not necessarily have to be associated with low price. Value can come from information, choice, expanding clean energy, improving reliability and more personalized customer service. In general, customers do not want to be told they must behave in a particular way with respect to their energy usage. They want to use energy when they want to use it. Customers have indicated it would take a substantial savings (20% or more off their bills) for customers to change usage

patterns significantly. That said, customers highly value having choice and options so they can determine what they want to do and when.

As seen in lessons learned from numerous utilities throughout the country, success or failure of alternate rate plans is fully dependent on the rigor of customer research, segmentation analytics, message development research and testing of customer communication and public education campaigns. This process ensures that rates and associated options are designed in a customer-centric way that will work for the intended audience. Rollout and engagement communications need to be tailored to each product and their intended segment and connect with customers with a message that resonates and results in action.

Best practices and lessons learned will be reviewed throughout the industry. PSEG Long Island can access this information through a variety of groups including the Smart Grid Consortium, J.D. Power, E-Source, Chartwell, and other electric utility networks. Quantitative and qualitative research and vetting of rate design options will be conducted. Several focus groups have already been held to begin to understand which options resonate and meet the needs of our Long Island customers. Additional focus groups, online community panel discussions, and other surveys will be utilized in the development and engagement process.

PSEG Long Island will explore using a variety of statistical analytic techniques to identify customers with the highest propensity to participate in each rate option. This modeling will attempt to find the best fit rate package for our customers and the best outreach for each group accordingly with key drivers unique to that group. Identifying each segment that is likely to participate in an alternative rate plan and designing the plan and associated education and engagement around the needs and desires of that segment is the best practice for successful adoption. While there may be customer wide communications, others should be crafted for those most likely to engage.

The rates and rate packages highlighted in this proposal are initial plans and high-level qualitatively tested concepts. Additional research (both qualitative and quantitative at scale), development of detailed rate structures and packages, and customer testing will determine the final suite of options and associated components.

Research will also include the testing of the design, application and value of a rate engine calculator which will provide customers pricing information; the ability to compare rate options based on their individual lifestyles and the confidence to make fact based decision in rate participation.

Specific and targeted customer communication, public education, and awareness materials will be developed to support this initiative and deployed in a variety of communication channels including bill inserts, email and bill messaging, social media, in-person events, brochures, email, direct mail and print messaging. PSEG Long Island's website will be updated to promote new rate options and further educate customers on benefits and risks of each.

Budgets for Rate Modernization (\$ in thousands)

(\$ in thousands)	2018	2019	2020	2021	2022	Total
Capital Costs **	\$4,250	\$5,100	\$1,000	\$1,000	\$1,000	\$12,350
O&M Expenses **	\$1,867	\$3,550	\$1,220	\$1,130	\$1,248	\$9,015

** The 2018 budget noted above is a high-level estimate based on a rough order of magnitude. Due to the complexity of this project, detailed planning and analysis will be conducted during Phase Zero to determine a more accurate estimate of the implementation cost and schedule. Also based on proposed solution, there might be some shifting between capital and operating expenses. Once Phase Zero is completed, we will provide an update on the estimated budget and, if necessary, will update the numbers in next year's Utility 2.0 filing.

Incremental Expenses

This project will incur an incremental Capital cost of \$12.35 million and O&M cost of \$9.015 million over the five-year plan to implement the Rate Modernization project. Major components include \$20.45 million for the new rates engine, \$0.60 million for customer communications and outreach, and \$0.32 million for rates research (development and messaging).

The two following figures provide (a) high-level breakdown of Project costs by year and (b) breakdown of the costs for Rate Engine and rate research activities.

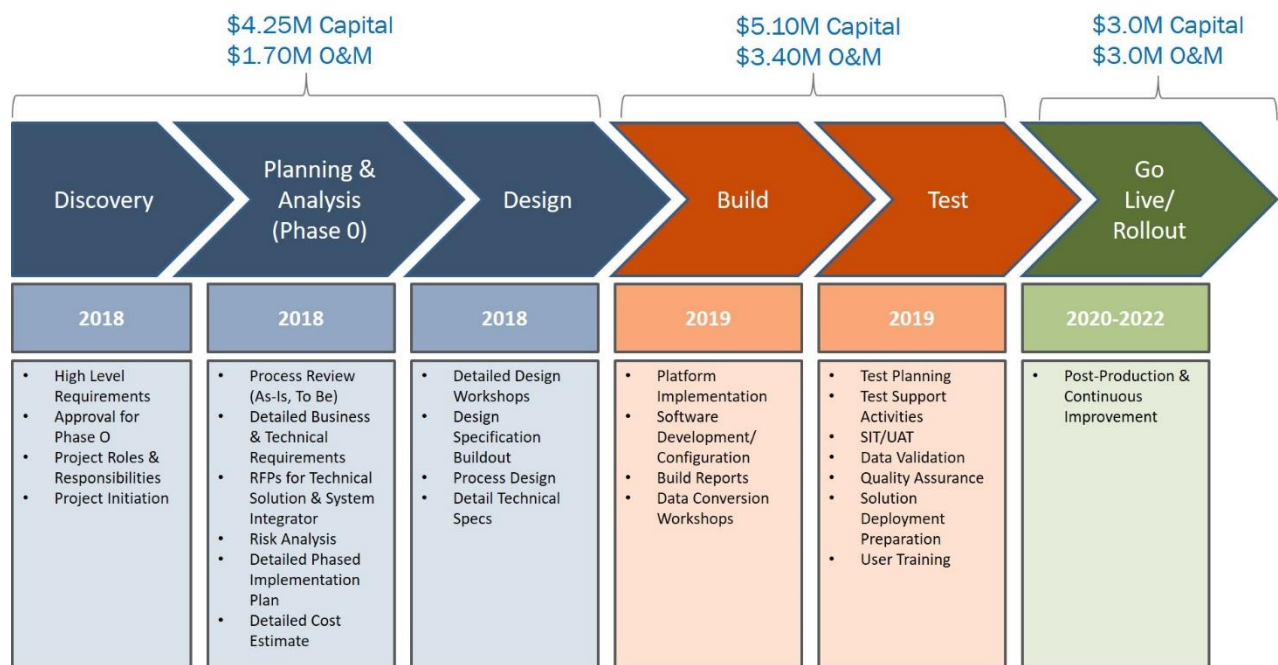


Figure 4. Project costs by year

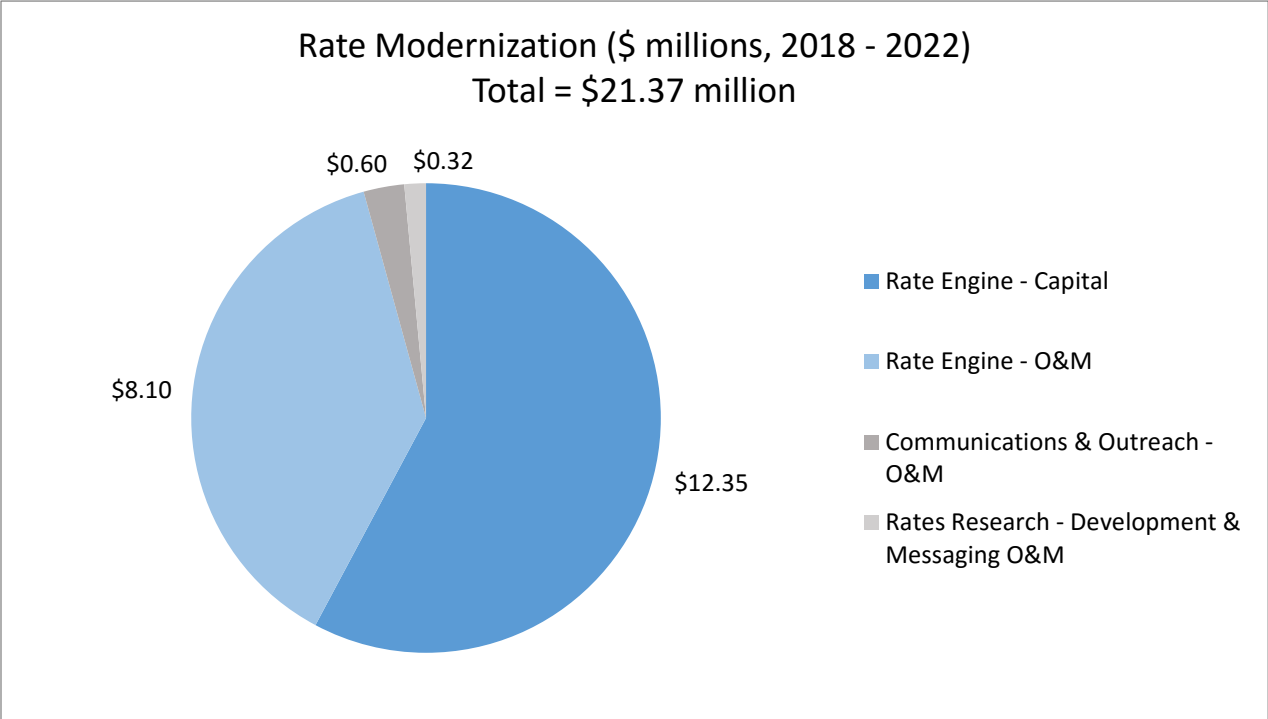


Figure 5. Rate Engine and rate research costs

4.3. Smart Grid Interconnection Portal (“SGIP”)

Objectives

PSEG Long Island’s current process for the submission and evaluation of interconnection is not integrated and offers the opportunity for technological improvements. As a result, we are implementing an interconnection Online Portal to facilitated interconnections.

SGIP project is a multi-year project. This project began in 2016 and will conclude in 2018.

Scope of Work

- Streamline the SGIP application process to ensure the timely and efficient processing of the related applications, documents, and payments as well as the completion of interconnection feasibility studies.
- The Interconnection Online Portal (IOP) and associated integrated processes will accelerate application processing and provide greater transparency and efficiency around the interconnection process.
- The IOP will allow for online application submittal, automated application management and automated application screening for applications $\leq 50\text{kW}$.
- Integration of the IOP with other processes such as net metering, bill processing, and equipment changes, will facilitate automated analysis, improved interconnection planning, and enhanced customer communication. This work will involve the following Application Features:
 1. **Online Portal** - Provides customers the ability to submit all SGIP request types online.
 2. **Workflow/Case Management Module** – Provides the Power Asset Management group with the ability to track, automate and streamline SGIP application processing and communicate near real-time status updates to customers online.
 3. **Technical Analysis Module** – Enables automatic calculations of voltage and feeder analysis in support of SGIP application processing.
 4. **Hosting Capacity Module** - Will provide customers and project developers the ability to investigate the viability of potential DG projects with little or no utility intervention and may provide the ability to initiate an online interconnection application.
 5. **Document Management Module** – Provides PSEG-LI customers and staff with the ability to upload, download and manage SGIP workflow documents as well as set document retention policies.
 6. **Reporting Module** –Generates standard and customized end-to-end SGIP workflow reports defined by roles and organized into a dashboard.

The project will have the following phases:

1. Phase 1 – Capital Project (Implemented 1/23/2017)

- Web-based portal
- Ability for an interconnection applicant to submit their application online and get confirmation status

2. Phase 2 – Capital Project

- Web-based portal enhancements
- Integration to vendor hosted back-end system

3. Phase 3 – O&M Project Vendor-hosted system providing back-end functionality to enable PSEG PAM team:

- Ability to evaluate proposed Distribution Generation against system requirements and conditions such as load flow, harmonics and voltage analysis.
- Provide analysis of application and feedback to customer regarding technical viability and a determination whether the proposed project has major cost implications.
- Enable project workload such as transformer replacements and net meter installations to automatically flow thru work management (SAP) queue to construction departments.

SGIP Project Budget (\$ in thousands)

	2018	2019	2020	2021	2022	Total
Capital	\$ 4,330					\$4,330
Incremental O&M Expenses **	\$3,170	\$1,100	\$1,100	\$1,100	\$1,100	\$7,570

The requested project budgets are the net costs after accounting for the revenues anticipated for the application fees for greater than 50 kW applications.

The capital funding will be for the following key items:

- Online Portal enhancements:
 - Online submissions of new construction customers applications
 - Online payments processing for SGIP application fees
 - Ability for customers to submit documentation online
 - Enhanced functionality to include project completion process
 - Provision to customer of near-real-time online application status
 - Enabled submission of all system types
- Online portal integration with vendor platform
- Implementation of CYME gateway to capture updated substation models and build interface to vendor
- SAP Integration

The O&M funding will be for the following items:

- Vendor fees to set up, configure and enable the hosted solution for application processing and ongoing maintenance
- SGIP application processing which will include workflow processing, document management, technical analysis and hosting capacity
- Development of a dashboard and reporting system

The project benefits are:

- Reduce resource cost
- Improve customer service and streamline application process
- Guide customers through the submission of SGIP applications and other supporting services
- Automate application validation and processing and accelerate turn-around time
- Monitor application progress and keep customers informed from beginning to end
- Automate management and regulatory reporting
- Determine DG penetration thresholds, feeder analysis, and limits on feeders and across systems
- Provide hosting capacity functionality

4.4. Super Saver North Bellmore Substation – Demonstration Project

PSEG Long Island is proposing a unique demand reduction program for customers served by a North Bellmore Substation, which is a load pocket that is expected to require investment to meet growing local energy needs. This innovative program will utilize a focused outreach to the North Bellmore community residents provided through Tendril (our Home Energy Manager provider) and, in addition to behavioral and challenge communications, will promote multiple tools and technologies such as customer analytics, DLM, smart thermostats, smart meters, and energy audits, which will deliver targeted load reduction and enhanced customer empowerment. Additionally, PSEG Long Island may provide a modified DLRP payment incentive to large commercial and industrial customers in the North Bellmore load area.

Objectives

- Enhance customer knowledge by providing them with the tools that will support effective management of their energy bill.
- Empower customers with additional energy management choices leading to enhanced market animation and improvement in system-wide efficiency.
- Defer conventional T&D related capital expenditures by deploying demand reduction techniques and customer engagement.

Scope of Work

PSEG Long Island selected the North Bellmore Substation, based upon specific criteria such as (a) projected load growth and need for new capital investment, (b) infrastructure readiness for AMI, (c) concentration of residential customers and their loads, (d) concentration of commercial and industrial customers and their loads, and (e) feeder profiles that may offer highest load reduction potentials.

PSEG Long Island selected four (4) feeders connected to the North Bellmore Substation for this demonstration project. The total number of customers connected to these four feeders is 10,034.

Our target schedule for this program is:

- Customer assessments and analytics – 1Q 2018
- Smart Meter implementation start – 1Q 2018
- Complete Smart Meter installations – 2Q 2018
- Home Energy Audits – begin 2Q 2018
- Offered smart plugs and smart strips – begin in 2018
- Customer sign-ups for DLM participation – begin in late 1Q 2018
- Implementation of orchestrated energy management – May 2018
- M&V and program reporting – starting March 2018

Appendix 1 – Innovative Load Reduction Super Saver Program details documentation of the proposed Program.

Super Saver Program Budgets (\$ in thousands)

	2018	2019	2020	2021	2022	Total
Capital	\$2,500**					\$2,500**
O&M Expenses	\$1,000	\$750	\$500	\$250		\$2,500
Fuel + Purchase Power	\$42	\$85	\$85	\$85	\$85	\$382

**Includes \$2.5M for Smart Meters. The overall cost for full scale deployment of smart meters will decline by \$2.5M in later years if funding is approved here.

Supporting documentation for the above budgets is available in Appendix 2 – Innovative Load Reduction Super Saver Program.

4.5. Transportable Storage Demonstration Project

PSEG Long Island proposes a Transportable Storage demonstration project (the “Project”) in 2019. The mobility of Transportable Storage will enable it to be deployed for multiple PSEG Long Island needs over its lifetime, further increasing utilization and benefits.

Objectives

The Project will include a 500 kW, 2 MWh energy storage portable battery which can be installed at strategic location(s) in order to support multiple needs such as load support, power quality, reliability, resiliency, demand reduction, and system upgrade deferral. The Project may create new replicable business models that enable PSEG Long Island to successfully and profitably build and operate Transportable Storage systems in other areas of its territory

Multiple quantitative and qualitative benefits are associated with transportable storage. It offers several benefits, which are unique to Transportable storage. The anticipated benefits for this transportable storage are:

- Transportable storage is a flexible asset that can be repurposed throughout the grid, participating in the most valuable services, on “as required” basis.
- Enhances the utility’s ability to better manage capacity constraints on its distribution system.
- Mobility of batteries allows assets to serve multiple short-term needs over the life of the batteries.
- Allows for “optimal customer location for highest benefit” analysis and implementation (PSEG Long Island can review most beneficial locations in advance of summer peak seasons).
- Defers T&D capital projects.
- Provides information to more confidently anticipate market income streams to cover project investment costs.

It is intended that the mobility of storage assets will enable PSEG Long Island to manage multiple short-term problems over the course of the storage batteries’ operating lives. The initial installation can support immediate needs at Long Beach Substation area.

This Project has the potential to animate markets via third-party developers to develop mobile storage solutions and offer “storage as a service” to utilities and customers.

Scope of Work

- In 2018, perform circuit analyses to determine best location(s) as initial application. This will include distribution system upgrade projects, load growth projections and short circuit analysis.
- Procure a 500kW, 2 MWh transportable energy storage for installation in 2019.

Assuming Project Approval by January 1, 2018, the Project's milestone schedule is as follows.

Project Milestone Schedule

Date	Milestone
January 2018	Project Approval
January 2018	Circuit Analyses Begins with a third party
September 2018	Circuit Analysis complete (with simulation model results)
October 2018	Community comments solicited
October 2018	Battery Purchase Order Issued
March 2019	Electrical Interconnection Work Complete
April 2019	Batteries Delivered
May 2019	Performance Testing
May 2019	Commercial Operation Date

PSEG Long Island will review the suitability and specific applications in early 2018 and decide specific locations and application. Once the engineering and application specifics are developed, formal RFP process will be used to procure the equipment and associated services

The total initial costs of the projects are anticipated as follows.

Anticipated Initial Project Costs

Cost Categories	Costs
Initial Investment Cost of Transportable Storage System	\$2,170,000
10-Year Warranty	\$246,000
10-Year Ops & Maintenance Package	\$280,000
Technical, Economic Analysis, Logistics Support and Interconnections	\$772,000
Communication Software and Customer Analysis/Acquisition	\$300,000
Total Costs	\$3,768,000

Transportable Storage Program 2018-2022 Budgets (\$ in thousands)

(\$ in thousands)	2018	2019	2020	2021	2022	Total
Capital	\$400	\$3,158				\$3,558
O&M Expenses		\$53	\$53	\$52	\$52	\$210

Appendix 3 provides a detailed REV Demonstration Project description.

Cost-Benefit Analysis

Costs:

The total initial cost to design, build, and implement the Project is approximately \$3.8 million. The total costs that will be incurred by PSEG Long Island during the demonstration period include the design and construction of the energy storage system, interconnection, installation, transportation costs, and development and implementation of the Project. Investment timing details remain to be determined but design phase activities will begin immediately upon LIPA approval.

Benefits:

PSEG Long Island anticipates the following benefit stream, which will be further validated during the demonstration project:

- **T&D Deferral:** An estimated \$100,000 per year T&D deferral cost savings are anticipated for deferring the planned T&D upgrade project at Long Beach. While the Long Beach needs are anticipated for a few years, the transportable storage can be moved to another substation/feeder locations requiring intermediate time (one to two years) support. We anticipate benefits of \$100,000 annually over the life of the battery assets.
- **NY ISO Market Participation:** As the NY ISO market is opening up for wholesale (avoided capacity) and ancillary services, transportable storage will allow PSEG Long Island to participate in that market. We anticipate \$70,000 benefits in Year 1 which will go up to \$120,000 in Year 10.

Additionally, non-quantifiable benefits in support of this project are:

1. Transportable storage will allow T&D to support faster-than-forecasted demographic changes and demographic behavior requiring immediate load support – by ensuring the required MW load increase at the feeder or at the substation can be provided at short notice.
2. PSEG Long Island may also be able to deploy the transportable storage where power quality improvement would be most beneficial and/or required.

4.6. Long Island Solar PV System Output Study

After more than a decade of the very successful promotion of rooftop solar installations on Long Island through programs such as Solar Pioneer, Solar Entrepreneur, and the NY-Sun Initiative, Long Island has the highest penetration of rooftop solar systems of any region in New York. There are now over 40,000 residential and commercial PSEG Long Island customers with PV systems and the rate of installations remains high. With the state-wide commitment to aggressive renewable energy targets of 50% renewable energy by 2030, along with falling costs of solar PV systems, rooftop solar PV systems hold the promise of not only maintaining current levels of installation but actually increasing in the future. As the prevalence of rooftop photovoltaics continues to grow, the ability to predict the output from such distributed, intermittent, behind-the-meter generation will become essential for planning load and system requirements, maintaining system reliability, designing new rates such as VDER and assessing progress on clean energy goals..

While the rated generating capacity of the rooftop solar PV systems currently on Long Island is approximately 300 MW, the actual output and annual energy generation these systems provide is unknown. Similarly, the hourly load profiles of these systems are inadequately understood. Over this time period, the technology types, ownership models, and incentive program rules have varied significantly. Depending on a variety of site-specific factors (e.g., panel and inverter type, panel orientation and inclination, shading, temperature, system age), the actual system output can vary considerably from the manufacturer's rated power output. Utility electric meters provide the "net load," or customer electric usage minus the actual solar PV output.

Objectives

This analytical effort will support PSEG Long Island in better understanding solar production on the grid at critical times and support future resource adequacy investment decisions. More specifically, the objectives are to:

- Develop actual and typical hourly output profiles for the 40,000 solar PV systems on Long Island
- Provide actual annual kWh output for solar PV systems in relation to:
 - Installed DC rated capacity (i.e., number and size of panels)
 - Ownership type (i.e., customer owned, third-party owned)
 - Panel manufacturer
 - Inverter type
 - System installer
 - System age

Scope of Work

This study involves the collection and analysis of actual metered output for as many of the 40,000-plus residential and commercial solar PV systems on Long Island as possible. Ideally, these data will include at least one year of output data and will be composed of the shortest time intervals available. Access to generation data for distributed generation customers poses challenges to any research study, as this data is owned and maintained by customers and third-party vendors (solar inverter manufacturers or panel vendors), and not PSEG Long Island. The key to solving this issue is to gain customer participation and secure access to their system inverter data (particularly in cases where this is not required as part of program participation). Obtaining system output data

will require the permission and cooperation of both the PSEG Long Island customers and the system vendors collecting and maintaining system output data. Key steps required to obtain and analyze the necessary data are described below.

- Initial analysis of PSEG Long Island solar PV system data to characterize systems (e.g., manufacturers, vendors, and other system characteristics) and identify top vendors.
- Telephone and in-person meetings with Long Island PV vendors to identify processes for accessing customer data.
- Mailings and/or email to each Long Island customer with rooftop solar to obtain permission to access data. We may set up a webpage (or ask each vendor to do so) where customers can learn more about the study and authorize use of their system data.
- We anticipate two scenarios to access the system output data. The preferred approach is to obtain data compiled by the vendors for those customers who have given their permission to share their system output data with PSEG Long Island. Another approach is to have the customer provide us with their unique solar API key¹ that we will use to download customer-specific historical data from each vendor's API. In cases where customers cannot or will not provide PSEG Long Island with access to their unique API key, we will have customers download their own inverter data and provide us with these data. A combination of these two approaches may be necessary.
- Develop sampling plan and sample, if necessary. Depending upon data availability and the level of effort needed to collect the data, it may be necessary to analyze a sample of systems that is representative of the population in terms of system manufacturer, age, vendor, type of ownership, etc.
- Compile PV system data. The details of this task will depend on the realities of data availability. Through discussions with the Long Island vendors, we will learn more about the effort required to obtain customer data.
- Clean and analyze PV system output data.
- Determine distribution of gross solar generation, gross customer load, and net customer load.

The analysis will support an assessment of the types of systems that generate the most and least energy, as well as whether those systems achieve their anticipated potential by key characteristics (e.g., calculation of an efficiency ratio of solar insolation over performance). The analysis will also identify emerging trends and relationships relevant to system and customer characteristics. Recent net energy metering evaluations have suggested that key solar system features could be driving lower or higher realization rates in terms of solar system performance – including overestimating inverter losses, especially by inverter type, as well as overly conservative treatment of shading in production estimates. Our analysis will seek to understand what may be driving performance, and how much it differs from anticipated performance which will provide customers considering future photovoltaic installations valuable insight as they plan for incorporating rooftop photovoltaics as a part of their distributed energy resource mix.

¹ An API Key is a multi-character string that uniquely identifies the customer and provides access to a solar vendor services and their solar generation data from the inverter.

Current Status

We will request the existing solar PV system data from PSEG Long Island (both participating and non-participating) customers. We will characterize the existing systems in terms of vintage, size, orientation, and shading, and identify top vendors to contact regarding system generation data.

Next Steps

We will request the existing solar PV system data from PSEG Long Island (both participating and non-participating) customers. We will characterize the existing systems in terms of vintage, size, orientation, and shading, and identify top vendors to contact regarding system generation data.

2018 Budget (\$ in thousands)

(\$ in thousands)	2018 Incremental Request
Capital	None requested
O&M Expenses	\$150

4.7. On-Bill Financing

As part of a potential REV Demonstration Project, PSEG Long Island proposed to design and implement a new Energy Loan Program to provide private-sector loans for eligible residential customers to purchase solar PV systems and other efficient equipment. Customers would remit loan payments utilizing PSEG Long Island's On-Bill Recovery ("OBR") mechanism.

Currently all PSEG Long Island residential customers have access to financing through Green Jobs Green New York ("GJGNY"). Effective September 1, 2016, NYSERDA increased the GJGNY PV loan program interest rate to 7.99% for residential customers earning more than 120% of the area median income. Subsidized GJGNY rates as low as 3.49% remain available for low- to moderate-income residential customers. PSEG Long Island's goal is to provide a cost-effective alternative loan product with interest rates less than the unsubsidized GJGNY PV loan rate.

Objectives

- Customers will benefit from access to cost-effective loans with payments that will be structured not to exceed the estimated energy cost savings from the PV system.
- The burden of the utility's annual program funding will shift from all ratepayers to only the participants in the loan program.
- This approach will open up capital markets and promote the long-term growth of the solar industry on Long Island.

Scope of Work

On August 1, 2016, PSEG Long Island responded to NY Green Bank's Open Solicitation for Clean Energy Financing Arrangements and submitted a proposal to implement a new Energy Loan Program. In the proposal, PSEG Long Island outlined an On-Bill financing pilot program consisting of 1,250 projects or 12 months, whichever comes first. Using an average system size of 10,000 Watts with 11,100 kWh savings per year, the proposed portfolio includes approximately \$22 million in loans with 15 year fixed payment terms for the pilot.

PSEG Long Island requested that NY Green Bank provide both senior debt and subordinated capital for the Energy Loan Program. PSEG Long Island is in discussions with the NY Green Bank regarding program development and customer and project underwriting criteria. When the Energy Loan Program portfolio reaches critical mass, NY Green Bank will work to structure third-party securitization via asset backed securities. Ultimately, the goal is to attract private capital and create a sustainable PSEG Long Island Energy Loan Program.

Current Status

Program development work continues, and various mechanisms have been evaluated in an effort to develop the optimal structure to meet the needs of a residential solar customer, LIPA, NY Green Bank (NYGB), and private-sector lenders. LIPA has been engaged in these discussions, and during the course of discussions proposed the use of a Two Meter Approach which would utilize the monetized PV production generated by the customer to repay the loan. This Two Meter Approach would build on existing AMI net meter rollouts as part of other Utility 2.0 efforts.

In the Two Meter Approach, customers with an energy loan would be equipped with both an AMI net meter and an AMI inverter meter. Every month, the customer would be billed for their total usage, which would be the sum of the kWh on both AMI meters. On the same bill, the customer

would receive a credit for their solar generation, which would be applied to the non-utility (loan) charge first. The monetized credits would flow directly from LIPA to the lender.

Significant modifications to the CAS and Electronic Billing Option (EBO) IT systems would be necessary to support the Two Meter Approach. The Rate Modernization and rate engine software project will be designed to accommodate billing using the Two Meter Approach effective January 1, 2020.

In order to launch an On-Bill Energy Loan program in 2018, staff is proposing to implement a One Meter Approach as an interim step utilizing existing CAS and EBO systems. The proposed One Meter Approach program was developed to follow many of NYSERDA's Green Jobs Green NY (GJGNY) On-Bill Recovery Loan Program policies and procedures. One departure from GJGNY that was stipulated by NYGB was that allocation of customer partial payments would be made on a pari passu basis (at the same rate or on an equal footing). This was a mechanism that NYGB felt would be essential to attract third-party lenders at low rates. Pari passu would also subject the borrower to termination of electric service for failure to pay the loan.

PSEG Long Island is conducting feasibility assessments of the One Meter and Two Meter Approaches to better define the impacts on energy efficiency and renewable energy, revenue operations, finance, meter services, planning resources and engineering, information technology, and legal issues. PSEG Long Island will continue to work through structuring the project with the aim of providing an innovative means to further promote the residential solar PV market while ultimately utilizing third-party financial support.

On-Bill Financing Budgets (\$ in thousands)

(\$ in thousands)	2018	2019
Capital	\$100	\$0
O&M Expenses	\$500	\$500

Assuming an expeditious passage of the legislation to support the One Meter program, the budget would be used for the rollout of the Energy Loan Program beginning in 2018. The capital expenses would be utilized to pay for the user acceptance testing that is necessary to determine the IT enhancement for the One Meter program to remain compatible with our billing and collections systems.

The O&M expenses relate to outside services costs necessary for the launch of the loan program. The O&M expenses would primarily be for loan origination, loan services, and development of a web portal for credit approval, as well as legal fees.

Some of these O&M costs would be annual flat fees while others are expected to be scalable based on the number of applications to the program. The costs would likely be recaptured from the participants through an application fee (to recoup upfront expenses) and then through an adder to the interest rate for ongoing O&M fees, depending on the volume of loan activity.

4.8. Electric Vehicles Program

Objective

PSEG Long Island has chartered a team to develop an internal strategy for enhancing the penetration of electrical vehicles and aligning it with NY REV Objectives of reducing GHG emissions, customer empowerment, and market-animation and load factor improvement. Gaining first-hand information on the potential areas where chargers will first be deployed and the charging profiles that are likely to be occurring at such locations will provide keen insight as to the veracity of assumptions used in the development of our internal strategy while also promoting the adoption of the greater EV penetration by providing for assistance in the installation of Smart EV chargers by our major account customers.

Scope of Work

The internal strategy will focus on:

- Continuing to developing educational and marketing material on PSEG Long Island website.
- Installation of workplace charging systems at major account customer facilities with the goal of 50 new charging stations installed by end of 2018.

Current Status

Electric Vehicle technology and information is now readily available to all customers on the PSEG Long Island website at <https://www.psegliny.com/page.cfm/EV>. The website includes a wide range of information about Plug-in Electrical Vehicle technology; Electric Vehicle Charging Equipment (EVSE), charging station locations throughout Long Island along with many other benefits now available to EV owners.

PSEG Long Island anticipates launching a Commercial Workplace Charging program in the fourth quarter 2017. The program offering will consist of a rebate of 80% of the cost of the invoiced value of the charging equipment not to exceed \$4,000 max per port up to 10 ports per customer for a three year term. The rebate will be paid out in three parts starting with 60% rebate payment once the equipment is purchased, installed and operational. The balance of the rebate will be a performance payment of 10% increments for Year 2 and Year 3 for the annual charging usage data. The equipment will be selected from a list of UL approved Level 2 Commercial Chargers only. The customer will have six months to install the chargers once the application is approved. The customer will need to provide the Utility with access to the data via a web portal and/or API site for data collection. The customer will receive the performance payment in Year 2 and Year 3 upon receipt of the granular annual usage data for our analysis and program monitoring for each Workplace Charging location. The data collected will provide insight to the local behavioral usage of EV Workplace charging for use toward developing more effective program.

Fleet Vehicles

PSEG Long Island's Transportation department has requested \$750,000 added to its 2018 capital budget for the purchase of 20 Electric plug-in light duty passenger vehicles and associated charging stations. The purchase will be contingent upon review and approval of the Utility Review Board (URB). The vehicles will be utilized as company pool vehicles and will be located at various division offices throughout the PSEG Long Island's territory. The vehicles are intended to be wrapped and branded in a theme supporting electric vehicle adoption throughout the PSEG Long Island territory.

The vehicle wrapping will provide a highly visible opportunity to promote the awareness and adoption of Electric Vehicle technology and PSEG Long Island’s support of electrical vehicles. The pool vehicles will provide firsthand experience and working knowledge to PSEG Long Island Fleet Management and PSEG Long Island employees. The combination of both first-hand experience and data collection is essential and key toward building awareness in support of Electric Vehicle adoption on Long Island for employees and customers.

Next Steps

- Continue to update and enhance website
- Launch the Commercial Workplace Charging rebate program

Electric Vehicles Program 2018-2022 Budgets (\$ in thousands)

(\$in thousands)	2018	2019	2020	2021	2022	Total
Capital						
O&M Expenses	\$175	\$200	\$75	\$75		\$525

Section 5 – Conclusions and Approval Request

In this 2017 Utility 2.0 Plan Update, PSEG Long Island recognizes the transformative changes taking place in our industry. This Plan showcases PSEG Long Island’s strategic vision as well as its efforts to support the policy goals of REV through integrating distributed resources into the system and capital planning, empowering customers with energy choices, enhancing system efficiency, and supporting a sustainable market for clean energy developments.

This Plan provides details for eight (8) proposed projects to support PSEG Long Island’s Utility 2.0 vision. These projects are critical foundations to realizing PSEG Long Island’s vision and providing capabilities to improve overall customer satisfaction and system efficiency. The projects are:

- **Smart Meter Full Deployment** – This is the foundational infrastructure to realizing PSEG Long Island’s vision of modernizing the customer experience, enhancing data analytics, and achieving REV. The full deployment plan will be available in the next few weeks.
- **Rate Modernization and Rate Engine** – This will empower customers to make their energy decisions and allow PSEG Long Island to accurately bill the customers based upon their uniqueness of energy usage and timing.
- **Smart Grid Interconnection Portal** – This will enhance the customer experience and expedite the DER interconnections process.
- **Super Saver Demonstration Program for North Bellmore** – this will allow PSEG Long Island to demonstrate how a series of efficiency and demand management actions can help alleviate circuit overloads.
- **Transportable Storage Demonstration Project** – This will allow implementing shorter duration storage in support of specific T&D needs and offer critical learning to PSEG Long Island engineering and operations.
- **Long Island Solar PV Output Study** – This analytical effort will enhance understanding of solar PV’s impact on the grid at critical times and support future resource adequacy investment decisions.
- **On-Bill Financing** – This will allow providing innovative means to further promote residential solar PV and other efficient technologies.
- **Electrical Vehicle Program** – This will allow continuation of educational and marketing material development, purchasing plug-in vehicles, and investing in workplace charging systems for EV market animation and load factor improvement.

Our budget request for 2018-2022 for executing the identified projects is summarized below. The amounts shown are in thousands (\$1,000s). This budget request is incremental to the proposed 2018 Capital and O&M budgets.

2018-2022 Budget Request (\$ in thousands)

Budgets	2018	2019	2020	2021	2022	Total
Capital **	\$21,880	\$67,558	\$60,400	\$61,100	\$61,700	\$272,638
O&M Expenses **	\$7,162	\$7,853	\$5,148	\$5,207	\$5,500	\$30,870
Fuel + Purchase Power	\$42	\$85	\$85	\$85	\$85	\$382

**The Smart Meter Full Deployment Project costs have been estimated with a high degree of confidence and major cost components have little risk due to contractual pricing. However, project costs will be updated in the 2019 Utility 2.0 Filing, incorporating the experience from the Bellmore Super Saver smart meter saturation deployment. Similarly, Rate Modernization costs after 2018 are estimates only and will be updated based upon 2018 work with the consultants and technology providers in the 2019 Utility 2.0 Filing.

Appendix 1 – Smart Metering Full Deployment Plan

(See attached PDF)

Appendix 2 – Innovative Load Reduction Super Saver Program

(See attached PDF)

Appendix 3 – REV Demonstration Project – Mobile Battery Storage

(See attached PDF)