



**Request for Proposals
South Fork Resources
("RFP" or "2015 SF RFP")**

Issued by

**PSEG Long Island LLC
Through its operating subsidiary,
Long Island Electric Utility Servco LLC
As agent of and acting on behalf of
Long Island Lighting Company d/b/a LIPA**

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1. INTRODUCTION AND BACKGROUND

1.1. Company Overview

The Long Island Lighting Company d/b/a LIPA (“LIPA” or “Company”), a corporation organized and existing under the laws of the State of New York is a wholly owned subsidiary of the Long Island Power Authority, a corporate municipal instrumentality and political subdivision of the State of New York. LIPA, by and through its agent, PSEG Long Island LLC, provides electric service to approximately 1.1 million LIPA customers in its service area, which includes Nassau County, Suffolk County, and the portion of Queens County known as the Rockaways, in the State of New York.

To meet its customers’ electricity requirements, LIPA has secured power supply resources, consisting primarily of various power purchase contracts with third-party generation and transmission developers; and has undertaken a variety of demand-side initiatives to reduce system peak demand (i.e., offered incentive programs to customers to encourage them to adopt energy efficiency measures, install wind and solar electricity-generating systems, and participate in Load Reduction events).

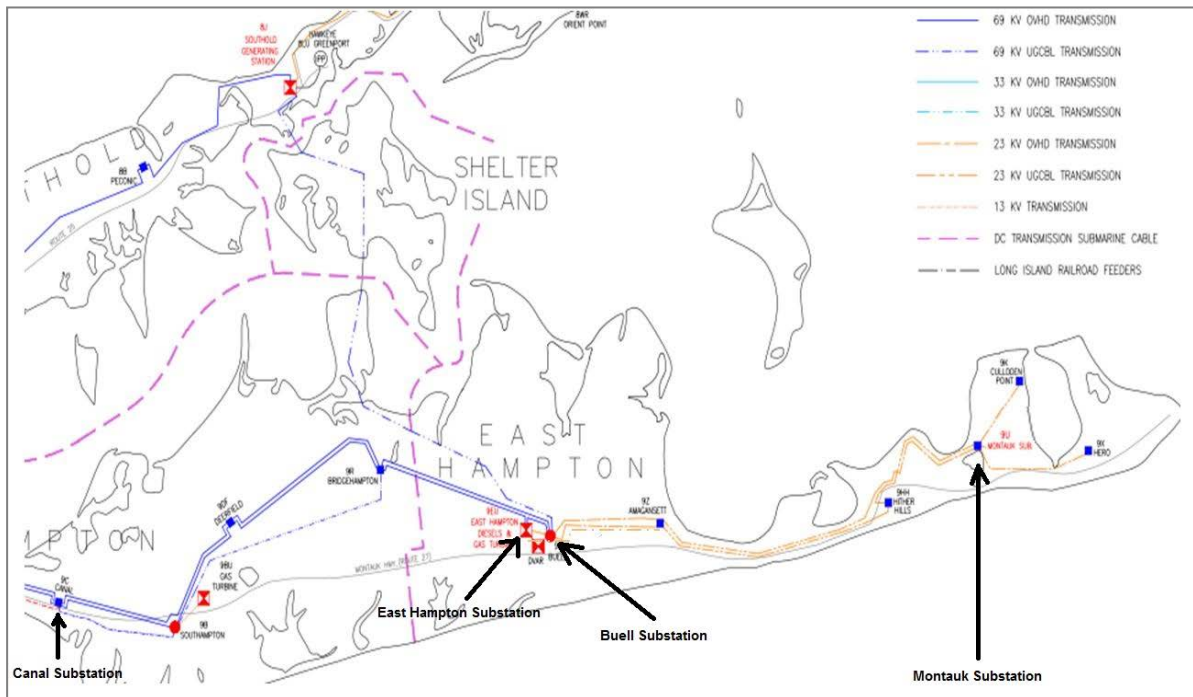
Pursuant to the Amended and Restated Operation Services Agreement (“A&R OSA”) dated December 31st, 2013, as it may be restated, amended, modified, or supplemented from time to time, between LIPA and PSEG Long Island, PSEG Long Island through its operating subsidiary, Long Island Electric Utility Servco (“Servco”), assumed the responsibility as LIPA’s service provider, to operate and manage LIPA’s transmission and distribution system (“T&D System”) and other utility business functions as of January 1st, 2014. On January 1st, 2015, PSEG Long Island assumed responsibility for LIPA’s power supply planning, and its affiliate provides certain services, such as purchasing power and fuel procurement, to LIPA related to these responsibilities. Additional information about LIPA and PSEG Long Island can be found on their respective websites - www.lipower.org and www.psegliny.com.

PSEG Long Island and Servco (collectively referred to as “PSEG Long Island” or “PSEG LI”), as agent of and acting on behalf of LIPA per the A&R OSA, will administer this RFP on behalf of LIPA. In accordance with the A&R OSA and the New York State Public Authorities Law, PSEG Long Island shall enter into agreements for any Load Reduction (see Section A2, Appendix A) resources that are selected, while agreements for any Power Production (see Section B1, Appendix B) resources that are selected shall be entered into with LIPA directly, and shall be subject to approval by the LIPA Board of Trustees, the New York State Attorney General (as to form), and the New York State Office of the State Comptroller.

1.2. Description of Solicitation and Objectives

The portion of the T&D System on the South Fork of Long Island is a peninsular, semi-isolated load pocket with highly constrained transmission capabilities connecting this load pocket with the remainder of the T&D System. For purposes of planning, this load pocket can be subdivided into three subareas. One area comprises the loads served East of the Canal substation; the next subarea comprises all loads served by the substations east of Buell, including the East Hampton, Buell and Amagansett substations; and the third subarea comprises the loads east of Amagansett, that are served by the Culloden Point, Hero, Hither Hills, and Montauk substations. Figure 1-1, below, provides a transmission map of the South Fork.

Figure 1-1: Transmission Map of the South Fork



The peak load on the South Fork is projected to be 314 MW in 2019, and increase at a 2.6% average annual growth rate to 341 MW in 2022. The peak load of the subarea east of Buell is projected to be 41 MW in 2019, and grow to 54 MW in 2030. If this peak load growth were to occur without the addition of local resources (i.e. Load Reduction and/or Power Production) in the load pocket, new transmission lines would need to be built.

As an alternative to adding new transmission lines, this Request For Proposals (“2015 SF RFP”) seeks to acquire sufficient local resources to meet expected peak load requirements until at least 2022 in the South Fork, and 2030 in the east of Buell subarea.

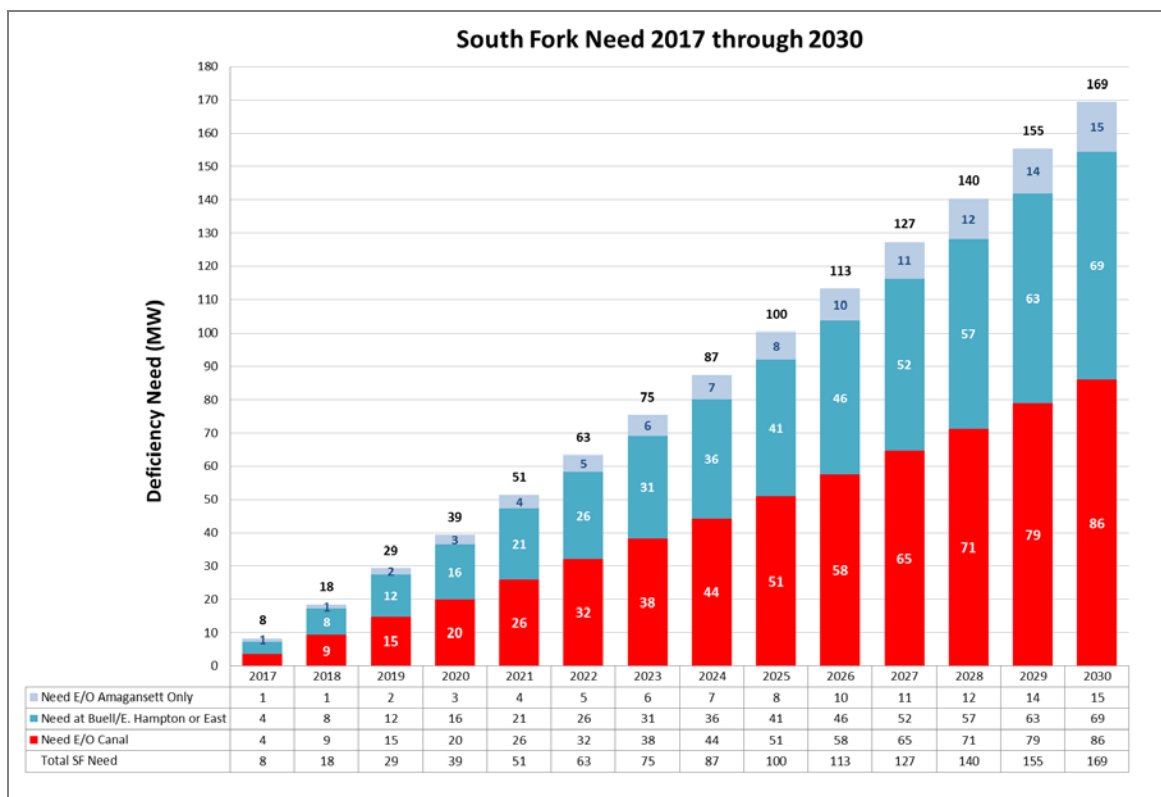
Figure 1-2 illustrates the South Fork power resource (MW) deficiency need for the years 2017 through 2030. The chart highlights the total resource need by year and segments it by the local requirements as needed to address the various constraints on the South Fork. These resource needs are classified generally as follows:

- a) **East of Canal** – This encompasses the load area east of the Canal substation, excluding Canal.
- b) **Buell/E. Hampton or East** – This encompasses the load area east of and including the Buell and East Hampton substations. Defined by Boundary B in Section A6 of Appendix A.
- c) **E/O Amagansett** – The load area east of the Amagansett substation, excluding Amagansett. Defined by Boundary A in Section A6 of Appendix A.

For example, in 2018, a total of 18 MW is needed on the South Fork. Of that, 1 MW is needed east of Amagansett, 8 MW is needed at East Hampton/Buell or any substation east. The remaining 9 MW can be located anywhere east of the Canal substation.

This RFP is based on requirements shown in Figure 1.2, additional value will be attributed to such proposals in the evaluation process with respect to increased avoided costs and/or reduced administrative costs, as applicable. Assessment of avoided costs will be conducted for individual proposals and for portfolios of proposals that are being considered for selection. Portfolio assessment will consider the extent to which avoided costs change for a portfolio as compared to the sum of avoided costs attributed to a series of individual proposals. PSEG Long Island would be willing to accept proposals that only partially meet these requirements if proposals received are not able to meet full requirements in an economical and reliable manner. Proposals will be compared to the least cost transmission solution.

Figure 1-2: South Fork Need (2017-2030)



In April of 2014, the New York State Public Service Commission (“NYS PSC”) instituted a public proceeding regarding Reforming the Energy Vision (“REV”). REV is New York’s comprehensive strategy to develop a cleaner and more reliable, resilient and affordable energy system for all New Yorkers. The objective of REV is to promote more efficient use of energy, deeper penetration of renewable energy resources, and wider deployment of distributed energy resources and storage.

As required by the A&R OSA between LIPA and PSEG Long Island, PSEG Long Island filed a proposed Utility 2.0 plan on July 1st, 2014 (updated on October 6th, 2014) that was consistent with the REV concepts. One component of the Utility 2.0 plan constitutes using certain Load Reduction resources to help defer the need for building new transmission on the east end of the South Fork. Resources acquired through this 2015 SF RFP would be used to meet the objectives set forward in the Utility 2.0 plan.

Accordingly, this 2015 SF RFP has the following four interrelated objectives:

1. Meet the requirements of REV via the PSEG Long Island Utility 2.0 East End Infrastructure Deferral program.
2. Acquire additional local Power Production and/or Load Reduction resources in the South Fork to meet projected load growth and thereby defer the need for new transmission.
3. Support load demand in the South Fork to the degree necessary to avoid overload of existing transmission assets during transmission outages that limit transmission capacity to the South Fork load area.
4. Support system voltage in the South Fork to avoid voltage collapse during a transmission outage.

In addition to the aforementioned objectives, it is also desired to acquire resources that support operation of the South Fork, or subareas, as an isolated power system (i.e., microgrid) in the event of an extreme contingency severing electrical connections between the South Fork load area and the remainder of the T&D System.

There are 3 general classifications of technology options that can be utilized to respond to this RFP:

- 1) Load Reduction - covered by Appendix A with specific target areas described in Appendix A, Section A6;
- 2) Power Production connected to substation - constrained to interconnection at East Hampton or Montauk, as detailed in Appendix B;
- 3) Power Production connected on distribution feeders, detailed in Appendix A

While the technical specifications are, by necessity, separate for each type of resource, this RFP has no preference or bias in its resource selection criteria. It intends to meet the aforementioned objectives through resources with sufficient capacity and technical characteristics such that customers are provided with the best overall value.

1.2.1. Load Reduction Resources

PSEG Long Island will evaluate Offers for Load Reduction products and/or services in which the Respondent offers the ability to reduce power demand on the T&D System. A Load Reduction product and/or service must meet the following criteria:

- a) Load Reduction Availability Days must include all days of the week.
- b) Service Delivery Hours must cover a portion of the eight hour period between 1:00 p.m. and 9:00 p.m. Eastern Standard Time (EST). Additional value will be attributed to proposals in the evaluation process with respect to increased avoided costs and/or reduced administrative costs, as applicable. Assessment of avoided costs will be conducted for individual proposals and for portfolios of proposals that are being considered for selection. Portfolio assessment will consider the extent to which avoided costs change for a portfolio as compared to the sum of avoided costs attributed to a series of individual proposals. PSEG Long Island will accept resources with 2, 4, 6 or 8 hour performance periods. Resources should be dispatchable by PSEG Long Island or have a fixed dispatch time that begin either on the hours of 1 pm, 3pm, 5 pm and 7pm or the Respondent can specify that service is dispatchable at PSEG Long Island's discretion. RFP Evaluation by PSEG and consultants will assemble shorter time period pieces into blocks that meet the system needs. While all Offers for Load Reduction during this period will be considered, additional value will be attributed to such proposals in the evaluation process with respect to increased avoided costs and/or reduced administrative costs, as applicable. Assessment of avoided costs will be conducted for individual proposals and for portfolios of proposals that are being considered for selection. Portfolio assessment will consider the extent to which avoided costs change for a portfolio as compared to the sum of avoided costs attributed to a series of individual proposals.
- c) Operating Months must include May 1st through September 30th.
- d) Product and/or service must be delivered in the subareas specified in Appendix A, Section A6.

While PSEG Long Island maintains the responsibility for aggregating load reductions from disparate sources to meet its load reduction needs, the Respondent may provide this Load Reduction service from a single source or may coordinate multiple sources. Additional value will be attributed to proposals in the evaluation process with respect to increased avoided costs and/or reduced administrative costs, as applicable. Assessment of avoided costs will be conducted for individual proposals and for portfolios of proposals that are being considered for selection. Portfolio assessment will consider the extent to which avoided costs change for a portfolio as compared to the sum of avoided costs attributed to a series of individual proposals. Additional information and requirements relevant to Load Reduction resources are contained in Appendix A.

PSEG LI expects that multiple awards may be made for Load Reduction proposals. PSEG LI further expects that for those Load Reduction proposals in which

the proposed resource cannot identify specific customer participants at the outset but instead are basing the resource on securing some percentage of a specific customer class within the defined area, only one award will be made per technology class per customer segment. This limitation is to prevent the same resource from being counted twice for a single solution. For instance, hypothetically Company A bids 5MW of residential CAC direct load control available for a 4 hour period between 1PM and 5PM that targets a 20% penetration rate of residential CAC customers in the area; Company B also bids 5 MW of residential CAC direct load control available for an 8 hour period from 1Pm to 9PM that targets a 20% penetration rate of residential CAC customers in the area; and Company C bids a 5 MW direct load control targeting small commercial unitary HVAC for an 8 hour period from 1PM to 9PM that targets a 20% penetration of small commercial customers in the area. In this scenario, assuming for convenience that the bids were all equal and cost effective, Company B's and Company C's bids would likely be selected but Company A's would not because (a) it would not be possible for us to determine if the customers targeted to participate in Company A's effort were the same targeted to participate in Company B's; and (b) proposals for relief for the full 8 hour period will be given preference over proposals for less than the full period.

1.2.2. Power Production Resources

PSEG Long Island will evaluate Offers for Power Production products and/or services in which the Respondent offers transmission support at the East Hampton and/or Montauk substations. PSEG Long Island may opt to connect a Montauk resource to a replacement substation in the vicinity of the Montauk Substation. Any incremental cost incurred by the Respondent for such a change in interconnection point may be recovered by the Respondent through a power purchase price adjustment, consistent with Section 2.4.

Specific requirements and specifications applicable to Power Production resources are contained in Appendix B.

1.2.3. Resource Requirements

This RFP is requesting the following resources to meet the needs on the South Fork through 2022, and east of Buell through 2030:

- a) 8 MW of resources in operation by 2017, with at least 1 MW east of Amagansett.
- b) 18 MW of resources (including the 8 MW from 2017) in operation by 2018 with at least 1 MW east of Amagansett.
- c) Resources to be in operation each year from 2019 through 2030 that meet the requirements shown in Figure 1-2 where additional value will be attributed to such proposals in the evaluation process with respect to increased avoided costs and/or reduced administrative costs, as applicable. Assessment of avoided costs will be conducted for individual proposals and for portfolios of proposals that are

being considered for selection. Portfolio assessment will consider the extent to which avoided costs change for a portfolio as compared to the sum of avoided costs attributed to a series of individual proposals.

- d) Only resources greater than or equal to 100 kW (individually or combined) will be considered.

If we are unable to obtain the requested MW amount, then PSEG Long Island may select a reduced portfolio amount. However, depending on the combination of resource proposals received, as much as 169 MW of Load Reduction and/or Power Production resources may be selected. Additionally, there is a preference for in service dates earlier than those previous stated if practical.

The RFP requests Respondents to price their services on a \$/kW-month for capacity and \$/MWh for energy. The first payment would occur at the end of the first month after the winning Respondent installs equipment and demonstrates its capability. For example, if a Respondent installs 1,000 thermostats and can demonstrate that each thermostat will lead to a 1.0 kW coincident peak reduction, LIPA would pay them (1000 x \$x.xx/kW-month) as a reservation fee for that month. If, during and actual curtailment event, the actual kW savings was greater or lower than estimated, an adjustment would be made to the prior payment.

1.3. RFP Schedule & Other Relevant Dates

Responses to this 2015 SF RFP are due no later than November 13, 2015. For further information, please refer to the 2015 SF RFP website that is accessible through PSEG Long Island’s website (www.psegliny.com). Please look in the “About Us” folder under “Proposals”. The below RFP Schedule is based upon expectations as of the release date of this RFP. PSEG Long Island may modify the RFP Schedule at its sole discretion.

Table 1-1: RFP Schedule & Other Relevant Dates

RFP Schedule	
Activity	Date
Release of RFP	June 24, 2015
Pre-bid Conference Webinar	July 14, 2015
Question Submittal Deadline	August 10th, 2015
Proposal Submittal Deadline	November 13th 2015, 3:00 pm EST.
Proposal(s) Selection(s) (planned)	May 6th, 2016
Execution of Contract(s) (planned)	4th Quarter 2016 to 3rd Quarter 2017 ¹

Other Relevant Dates	
Activity	Date
Firm Pricing Required Through	September 30, 2017
Preferred COD Resources (planned)	May 1 st , 2019 ²
<p>¹Execution of contract is dependent upon completion of negotiations; and for resources requiring SEQRA, it is also dependent upon receipt of SEQRA findings.</p> <p>² As indicated in Section 1.2.3, some resources will be required by May 1st of 2017 and May 1st of 2018.</p> <p>All Respondents will be notified, in writing, once the selections are completed.</p>	

2. TERMS AND CONDITIONS

2.1. Commercial Operating Date

The preferred Commercial Operating Date (COD) is May 1st of 2017, May 1st of 2018 or May 1st of 2019.

2.2. Alternative Commercial Operating Dates

2.2.1. Delayed COD

All proposals must offer alternative pricing for the delay of project COD by one year. Selection of COD will be made during proposal selection.

2.2.2. Early COD

If feasible under the RFP schedule described in Section 1.3, Respondents are encouraged to propose an alternative COD earlier than the proposed COD. Selection of COD will be made during proposal selection.

2.3. Form of Agreement

Different Forms of Agreement (“Agreement”) were drafted for specific resources. Preferred Forms of Agreement for different resource types will be made available on PSEG Long Island’s website (www.psegliny.com). Please look in the “About Us” folder, under “Proposals.” This RFP allows Respondents to modify the Agreement to reflect resource specific requirements. Respondents shall provide a “redline” version of the Agreement with any comments, insertions, deletions, or other proposed changes, which must include proposed alternative text, as applicable. Respondent’s “redlines” shall be provided using “Track Changes” in Microsoft Word.

Proposals should be for a term of 5, 10, 15, or 20 years. Due to the need for long-term transmission deferrals additional value will be attributed to such proposals in the evaluation process with respect to increased avoided costs and/or reduced administrative costs, as applicable. Assessment of avoided costs will be conducted for individual proposals and for portfolios of proposals that are being considered for selection. Portfolio assessment will consider the extent to which avoided costs change for a portfolio as compared to the sum of avoided costs attributed to a series of individual proposals.

2.4. Treatment of Transmission Costs

Power Production resource proposals must comply with the NYISO Large Generator Interconnection Procedure, NYISO Small Generator Interconnection Procedure or LIPA’s Small Generator Interconnection Procedures, as applicable. In keeping with LIPA’s policy of non-discriminatory access to its T&D System, Respondents will be responsible for reimbursing LIPA (as Connecting Transmission Owner) for all attachment facilities and system upgrades constructed and owned by LIPA. Respondents may seek to recover such costs through Agreement charges. Any such costs will be considered in the evaluation of the proposals received.

2.5. Firm Pricing Commitment

All proposed contract pricing must be firm and all terms and conditions must be open for acceptance by PSEG Long Island through March 31st, 2017. Pricing must include any and all costs to fully meet the 30% NYS Certified Minority and Women Owned Business Enterprise subcontracting goals and the NYS Certified Service-Disabled Veteran-Owned Business goal of 6%. This requirement for submitting pricing to meet the full goals also applies to firms that are seeking full or partial waivers of the goals. Firm pricing may include fixed prices and prices that are subject to adjustment based on publicly available

indices. Costs that cannot reasonably be forecasted may be subject to “pass-through,” provided they are adequately defined in the contract.

2.6. Separate Pricing for Optional Capabilities

The base offering shall be without the optional capability to operate in the Isolated Mode, if applicable, as described in Appendix B. Respondents electing to offer this optional capability, or any other capability beyond the base requirements of this RFP, shall offer these capabilities as a separately priced option.

2.7. Conditions Precedent for Agreement

For a proposed project that is subject to review under the New York State Environmental Quality Review Act (“SEQRA”), LIPA is prohibited by State Law from executing the Agreement until the SEQRA review is complete.

3. PROPOSAL REQUIREMENTS

3.1. General Requirements

Proposals shall include each of the required elements summarized herein. This applies to each proposal that is submitted by Respondent (i.e., each Proposal shall stand alone in satisfying these requirements).

- a) Proposals that do not include the required information will be deemed non-responsive and will not be evaluated.
- b) Non-responsive proposals include, but are not limited to, those that:
 - i. Are not in conformance with RFP requirements and instructions.
 - ii. Are conditioned on some other act or omission (other than as required by law), whether or not related to this procurement and the resulting contract. Without limiting the generality of the foregoing, by way of example, a proposal that requests extension of an existing contract with the same company is a conditional proposal.
 - iii. Do not include the required Proposal Submittal Fee.
 - iv. Contain any material omission(s).
 - v. Do not meet other submission requirements set forth herein.

Respondents may submit complementary information not explicitly requested within the RFP documents, however, proposals shall remain concise while still providing a complete description of the Respondent's approach, capabilities, key assumptions and pricing for satisfying the required services being solicited in this RFP.

All responses to this RFP shall include details about the ability to meet the resource terms and conditions discussed in Section 2.0, as well as all the Load Reduction and/or Power Production resource specifications listed in Appendices A and B.

As a corporate municipal instrumentality of the State of New York, documents in LIPA's possession are presumptively available to the public under New York's Freedom of Information Law ("FOIL"), Public Officers' Law ("POL") Article 6. Respondents are strongly encouraged to familiarize themselves with the obligations and requirements of FOIL. Consistent with Section 87(2) of the POL, Respondents shall indicate in their proposal, what information, if any, should not be made publicly available by marking such information as confidential. Information marked confidential will be treated as such to the extent consistent with PSEG Long Island's and LIPA's obligations under the Freedom of Information Law ("FOIL"), other applicable law, regulation, or legal process, and will not be disclosed except as required by law, or as necessary for the evaluation of proposals. In the event that LIPA receives a FOIL request for any or all proposals submitted in response to this RFP, LIPA will notify the submitting entity of the FOIL request pursuant to Section 89(5) of the POL.

3.2. Proposal Outline and Content

Proposals submitted to PSEG Long Island in response to this RFP are required to follow the below outline in terms of format. Following the outline are sections, in tabular form, corresponding to the outline that provide additional information and guidance regarding the outline item and required information. Note that not all requirements listed within the proposal outline sections may be applicable to all Load Reduction or Power Production resources. Respondents should exercise their judgment when determining whether or not a requirement is applicable to their proposal and in case of doubt he/she should contact the designed contact persons for this RFP.

Proposal Sections

- 3.2.1 Cover Letter
- 3.2.2 Executive Summary
- 3.2.3 Pricing
- 3.2.4 Resource Overview
- 3.2.5 Development Plans and Schedule
- 3.2.6 Status and Reporting
- 3.2.7 Program Management Capabilities
- 3.2.8 Program Calculation of Impacts
- 3.3.9 Resource Performance
- 3.2.10 Resource Environmental Characteristics
- 3.2.11 Fuel Supply Plan
- 3.2.12 Electrical Equipment
- 3.2.13 Design Studies
- 3.2.14 Factory Tests
- 3.2.15 Commissioning Tests
- 3.2.16 Training
- 3.2.17 Field Services
- 3.2.18 Maintenance and Support
- 3.2.19 Future Upgrades
- 3.2.20 Communication Capabilities
- 3.2.21 Customer Interaction Capabilities
- 3.2.22 Respondent Information and Qualifications
- 3.2.23 Disclosures

- 3.2.24 Agreement Redline
- 3.2.25 Other

3.2.1. Cover Letter

Cover Letter	
Proposal Requirement	Description of Requirement
Signature(s)	Signature(s) by the individual(s) that are duly authorized by the Respondent to make a binding offer to LIPA.
Contact Information	Contact information for Respondent’s primary point of contact, including name, title, address, phone, email, and fax.
Effective Period	Statement clearly indicating the time period during which the Proposal will remain effective. NB: At a minimum, the Proposal must remain effective through September 30 th , 2017.

3.2.2. Executive Summary

Executive Summary	
Proposal Requirement	Description of Requirement
Executive Summary	A brief summary, approximately 2 - 3 pages, of the project’s key features, characteristics, and other distinguishing attributes.

3.2.3. Pricing

Pricing	
<p>Proposed pricing(s) shall include all costs, including license fees and permitting fees, associated with the installation and delivery of the proposed solution. Pricing must also include any and all costs to fully meet the 30% NYS Certified Minority and Women Owned Business Enterprise subcontracting goals and the NYS Certified Service-Disabled Veteran-Owned Business goal of 6%. This requirement of submitting pricing to meet the full goals also applies to firms that are seeking full or partial waivers of the goals.</p>	
Proposal Requirement	Description of Requirement
Pricing	Pricing in \$/kW-month for capacity and in \$/MWh for energy products.
	Pricing for ancillary services, if any.
	Pricing for black start capability, if any.
	Pricings for the previously noted energy related services assuming a five and/or ten year extension in contract period, if any.
	Pricing in \$/kW-month for capacity and in \$/MWh for energy products in relation to the pricing option for a one year delay in COD, as discussed in Section 2.2.1.
	Pricing in \$/kW-month for capacity and in \$/MWh for energy products in relation to the pricing option for early COD, as discussed in Section 2.2.2.
	<p>If proposal requires the use of fuel, include either one of the following pricing mechanisms:</p> <ul style="list-style-type: none"> a) No fuel cost pass-through b) Fixed fuel price for the duration of the contract c) Fuel price formula indexed to a well-known commodity market index <p>NB: Charging energy for electric storage devices will be provided by LIPA.</p>
	<p>In addition to the fuel pricing mechanisms previously described, Respondents may provide an alternate fuel pricing mechanism that substantially reduces the volatility of fuel prices paid by PSEG Long Island.</p> <p>NB: Alternative pricing mechanisms should be described in sufficient detail to allow PSEG Long Island to evaluate and calculate how fuel prices would</p>

	behave in the context of various fuel prices scenarios.
	Cost of Developer Attachment Facilities recovered through the capacity price.
	Explanation of system upgrade cost recovery method (e.g., pass-through, covered in price).
	List and justification of any pass-through costs other than fuel prices.
Pricing Presentation	Summary of the pricing proposal.
	Excel spreadsheet containing all pricing information.
	For Load Reduction resources, provision of a pricing table for each year from 2016 through 2021. NB: PSEG Long Island's desire is that Respondents provide a tiered fee schedule that is adjusted up with the top fee at 100% enrolled demand.
	Line item breakdown and schedule of total costs.

3.2.4. Resource Overview

Resource Overview	
Proposal Requirement	Description of Requirement
Resource Description	Description of each proposed resource solution.
Facility Location	Proposed location of each facility and the proposed route of any line or cable required for interconnection to the proposed Point of Interconnection bus.

Features and Functions	Description of key features and functions of the proposed resource.
Plot Plan & Elevation Drawing	Plot plan and elevation drawings of the facility.
One-Line Diagram	Single-line diagram of each facility's electrical configuration, from the power generation and/or conversion systems, through the facility substation, and the interconnection line or cable to the Point of Interconnection bus.
Block Diagram	Provide a block diagram of the resource.
RFP Data Sheets	Completed RFP Data Sheets. NB: RFP Data Sheets will soon be available in the RFP website.
Data Security	For Load Reduction resources, description of the Respondent's data security and integrity program.

3.2.5. Development Plans and Schedule

Development Plans and Schedule	
Proposal Requirement	Description of Requirement
Development Schedule	Development schedule for the resource solution, including timetable for permitting, environmental review, construction, testing, and commercial operation.
Permitting Plan and Schedule	Permitting plan and schedule, including a list of all environmental, regulatory and other agency/municipal reviews, permits, and approvals.
Community Outreach Plan and Schedule	Community outreach plan and schedule.
Community Benefits	Description of community benefits.
Evidence of Community Support	Evidence of community support. NB: Community support can be in the form of correspondence from local elected officials and community groups.
Equity and Debt Financing Plan & Schedule	Equity and debt financing plan and schedule.
Taxes / PILOT Payments	Information about any Taxes and/or PILOT agreements and plans for negotiation.
Site Control Plan	Information on current site control status and details of plans for obtaining site control.
Site Characteristics	Information about site characteristics, including: <ul style="list-style-type: none"> a) Identification of site zoning b) Information on whether the proposed project is a permitted use under the local zoning code. c) Discussion of any known sensitive environmental features on or adjacent to the site (e.g., wetlands, historic properties, ongoing hazardous materials remediation, residences or other sensitive noise receptors). d) Discussion of storm resistant features and other reliability features.

Operations Plan	Operations plan, including maintenance schedule and outage timeframes.
Fuel Supply Schedule	If a fuel is being used, provision of a fuel supply schedule.
Electrical Interconnection Points	Information about the proposed power production electric interconnection points with the T&D system.
Eastern Area Load Reduction Capacity	For Load Reduction resources, proposed MWs of load reduction to be located east of Boundary A, as described in Section A6, Appendix A.
Western Area Load Reduction Capacity	For Load Reduction resources, proposed MWs of load reduction to be located between Boundary B and Boundary A, as described in Section A6, Appendix A
Developer Attachment Facilities Plan	Plans for any necessary electric transmission facilities from the generation source to such interconnection point, if applicable.

3.2.6. Status and Reporting

Status and Reporting	
Proposal Requirement	Description of Requirement
Status & Reporting	Statement confirming willingness of Respondent to comply with the status and reporting provision listed in the relevant product and/or service Agreement.

3.2.7. Program Management Capabilities

Program Management Capabilities	
Proposal Requirement	Description of Requirement
Program Management	For Load Reduction resources, description of ability to manage the Load Reduction resource being offered.

3.2.8. Status and Reporting

Program Calculation of Impacts	
Proposal Requirement	Description of Requirement
Program Impacts	For Load Reduction resources, description of proposed methodology for the calculation of capacity and energy impacts along with proposed measurement and verification plan.

3.2.9. Resource Performance

Resource Performance	
Proposal Requirement	Description of Requirement
Concept of Operations	Detailed description of the concept of operations to be employed in the solution, specifically addressing the transition from the Standby to the Transmission Support Mode.
Output Limitations	Description of any limitations to real and reactive power capability during undervoltage conditions.
Undervoltage Performance Limitations	Description of any known performance limitations that may occur during undervoltage conditions, where voltage drops below 120 V (on the feeder's primary voltage level; 13.2 kV and/or 4.16 kV).
Auxiliaries Performance	Description of the performance of any supplemental devices, including capacitor banks, STATCOMs, SVCs, or synchronous condensers to provide dynamic reactive capability.
Isolated Mode	Description of Isolated Mode operations, if applicable.
Compliance Validation	Description of the approach and simulation tools that will be used to validate compliance with the specified resource's dynamic performance.
Short-Circuit Current	If power producing devices are used, other than or in addition to synchronous machines, the following short-circuit current characterization

Characterization Part A	shall be provided: Contribution of each resource to balanced and unbalanced transmission faults, both near and remote from the resource location.
Short-Circuit Current Characterization Part B	If power producing devices are used, other than or in addition to synchronous machines, the following short-circuit current characterization shall be provided: Description of the approach that will be taken to define the detailed short-circuit contribution characteristics of the resource, in both phase and sequence component formats.
Load Reduction Performance	For Load Reduction resources, load reduction shall be deliverable under any meteorological conditions existing during program operational hours.

3.2.10. Resource Environmental Characteristics

Resource Environmental Characteristics	
Proposal Requirement	Description of Requirement
Air Pollutant Emissions	Description of the technologies and operational strategies that will be used to control air pollutant emissions, as well as related performance. This shall include: <ul style="list-style-type: none"> a) PM10/2.5, NOx, CO, VOC, and NH3 emissions in ppm and lb/hr during normal operation and start up at 32 F, 59 F and 95 F b) CO2 emissions in lb/MWh at the design heat rate c) Exhaust gas characteristics (e.g., volumetric and mass flow rate, temperature, moisture) d) Heat input in MMBtu/hr HHV
Water Requirements	Information about the water and wastewater requirements, as well as a description of related operational strategies. This shall include: <ul style="list-style-type: none"> a) Water requirements in gallons per minute b) Wastewater discharges in gallons per minute
RFP Data Sheets	Completed RFP Data Sheets. NB: RFP Data Sheets will soon be available in the RFP website.

3.2.11. Fuel Supply Plan

Fuel Supply Plan	
The requirements listed on this table apply to a solution where a fuel is used.	
Proposal Requirement	Description of Requirement
Fuel Supply Plan	Full and complete description of fuel supply plans. Where applicable, the fuel supply plan should include plans for liquid fuel storage for a minimum of 5 days of continuous, full power, operation. It shall also incorporate details regarding liquid fuel procurement, supply, and transportation.

3.2.12. Electrical Equipment

Electrical Equipment	
Proposal Requirement	Description of Requirement
Equipment information	The following subsections (3.2.12.1 - 3.2.12.7) request information relevant to potential key electrical components of a proposed resource.

3.2.12.1. Power Generation Equipment

Power Generation Equipment	
The requirements listed on this table apply to proposed solutions that contain any synchronous generators. NB: These requirements are not applicable to Load Reduction resources, unless connected directly to the distribution system.	
Proposal Requirement	Description of Requirement
Manufacturer of Generation Equipment	Manufacturer name of each generator, prime mover, and excitation system.
Real and	Real (MW) and reactive (MVAR) power ratings of all power generation

Reactive Power Ratings	equipment.
Temporary Reactive Power Capability	Information about any temporary reactive power capability, including the time constraints of such temporary capability.
Prime Mover Description	Description of the prime mover and the fuel it uses.
Generator Electrical Parameters	Information about generator electrical parameters (e.g., direct and quadrature axis impedances and time constants, inertia).
Excitation System Characteristics	Information about excitation system characteristics, including ceiling voltage and time response.

3.2.12.2. Electrical Energy Storage Equipment

<p align="center">Electrical Energy Storage Equipment</p> <p>The requirements listed on this table apply to solutions that contain any electrical energy storage. NB: These requirements are not applicable to Load Reduction resources, unless connected directly to the distribution system.</p>	
Proposal Requirement	Description of Requirement
Manufacturer and Model	Manufacturer name and model of the electrical energy storage medium proposed for each solution.
Energy and Power Capacity	Energy and power capacity of the electrical energy storage system, as well as that of the individual components.
List of Projects	List of projects with electrical energy storage capacity similar to the capacity proposed, in which this manufacturer's equipment has been utilized.
Limitations to Operation	Description of any limitations to the operation of the resource solution posed by the electrical energy storage medium.
Environmental Control Systems	Description of any environmental control systems, including heating or cooling, required for the electrical energy storage medium.
Electrical System Disturbances	Information about the susceptibility of the electrical energy storage system to any electrical system disturbances.
System Degradation	Information about any degradation of energy storage capacity expected as a result of age or utilization, including an explanation of how this degradation will be addressed (e.g., by planned replacement, redundant capacity) in order to maintain the stated net capability.
Potential Environmental Hazards	Description of any environmental hazards presented by the electrical energy storage medium, including an explanation of how these hazards will be mitigated in both facility design and operation.

3.2.12.3. Power Conversion Equipment

Power Conversion Equipment	
<p>The requirements listed on this table apply to resource solutions that contain any electronic power conversion equipment connected directly to the T&D System. This requirement is exclusive of small power converters used for station auxiliaries, excitation supply, power supply to charge batteries for station control, and protection supply; but inclusive of any power converters used to provide reactive power capability. NB: These requirements are not applicable to Load Reduction resources, unless connected directly to the distribution system.</p>	
Proposal Requirement	Description of Requirement
Equipment Description	Description of the power conversion equipment, including the name of manufacturer, model, and ratings.
Power Conversion Topology	Description of the power conversion topology (e.g., two-level voltage source converter, multi-modular voltage source converter, six-pulse thyristor line-commutated converter, etc.).
Voltage Source Converter	If a voltage-source converter is used, information about the effective switching frequency, and whether the switching is synchronous or asynchronous with respect to the grid voltage.
Multiple Converters	If multiple converters are used, information on whether switching is in any way coordinated between the converters.
Auxiliary Equipment	Description of any cooling, control power supply, or other auxiliary systems critical to the power conversion, including an explanation of the susceptibility of these systems to any electrical system disturbances.
Voltage or Frequency Disturbance Ride Through	Information on whether the proposed power conversion equipment has been tested or certified for the ability to ride through voltage or frequency disturbances.
Harmonic Source Characteristics	Information about the harmonic source characteristics of each power conversion equipment for each resource, in terms of magnitude, and whether it is characterized as a harmonic current or voltage source. The characterization should include non-integer harmonics (inter-harmonics), if present.

Harmonic Performance Study	Description of the approach that will be taken in the harmonic performance study.
Harmonics Filters	Information on whether any harmonic filters will be used in the solution. If harmonic filters will be used, also provide information on how detuning conditions will be considered in the harmonic performance analysis.

3.2.12.4. Power Transformers

Power Transformers	
The requirements listed on this table apply to main power transformer connecting each resource to the Points of Interconnection.	
Proposal Requirement	Description of Requirement
Equipment Description	Description of the power transformers, including the name of the manufacturer, MVA rating (i.e., OA/FOA), voltage ratings, winding connection, impedance and HV winding BIL.
On-Load or Off-Load Taps	Information on whether the main power transformer has any on-load or off-load taps. If applicable, provide the tap steps and associated winding.

3.2.12.5. Power Circuit Breaker

Power Circuit Breaker	
Proposal Requirement	Description of Requirement
Equipment Description	Description of the circuit breakers between the main power transformers and the interconnecting lines to the Points of Interconnection. This shall include the name of the manufacturer, type, and ratings.
Remote Tripping	Description of how remote tripping of the facility's HV breaker will be communicated between the substation and the facility.

3.2.12.6. Interconnection Lines

Interconnection Lines	
Proposal Requirement	Description of Requirement
Circuit Details	Information about the circuit lengths and impedance of the proposed interconnection lines from the resource facilities to the Points of Interconnection.
Cable Details	Information about cable type, insulation material, conductor material, core cross-sectional area, and shield configuration.
Overhead Line Details	Information about conductor code, framing, and ground wires.

3.2.12.7. Controls and Protection

Controls and Protection	
Proposal Requirement	Description of Requirement
System Description	Description of the control and protection system, including control inputs, status indications, monitored parameters, and operational feedback available to the T&D system operator. This shall also include an explanation of the protection system for the AC portion of each facility, including the interconnection lines, and indicate all relaying functions.
Equipment Description	Description of the control and protection equipment, including the make and model of the protective relays and of the digital fault recorder to be used for each resource.
Digital Fault Recorder Inputs	Information about inputs that will be monitored via the digital fault recorder.
Events Recording	Information about all events that will be monitored and an explanation of how sequence of events will be recorded.

3.2.13. Design Studies

Design Studies	
Proposal Requirement	Description of Requirement
List of Design Studies	List of all design studies for which results and reports will be provided to PSEG Long Island.
Study Schedule	Schedule of all studies, indicating when data from PSEG Long Island is required and when draft reports will be provided.
Study Description	Description of the approach, model (where applicable), data requirements, scope, and expected results for each study.

3.2.14. Factory Test

Factory Tests	
Proposal Requirement	Description of Requirement
Solution Factory Tests	Description of the scope and extent, and the approximate schedule, of the performance demonstrations for the solution.
Control and Protection System Factory Tests	Description of the scope and extent, and the approximate schedule, of the control and protection system hardware real-time tests.
Power Transformer Factory Tests	Description of the scope and extent, and the approximate schedule, of the power transformer factory tests.
Additional Factory Tests	Description and approximate schedule of any other factory tests having material importance to the security of the T&D System.

3.2.15. Commissioning Test

Commissioning Tests	
Proposal Requirement	Description of Requirement
Commissioning Tests	Description and expected duration of the proposed program for site testing and commissioning.
PSEG Long Island Support	Information about any PSEG Long Island support that will be required for performance of the commissioning tests i.e. PSEG Long Island personnel in the substation during commissioning.

3.2.16. Training

Training	
Proposal Requirement	Description of Requirement
Training	Description of the proposed operator-training program, if any.

3.2.17. Field Services

Field Services	
Proposal Requirement	Description of Requirement
Field Services	Description of field service activities to be performed for equipment installed at sites other than those routinely manned by the Respondent.

3.2.18. Maintenance and Support

Maintenance and Support	
Proposal Requirement	Description of Requirement
Maintenance and Support	Description of planned maintenance and support activities for the resource.

3.2.19. Future Upgrades

Future Upgrades	
Proposal Requirement	Description of Requirement
Future Upgrades	Description of planned activities to replace critical equipment of a resource due to either superior components becoming available or equipment degradation.

3.2.20. Communication Capabilities

Communication Capabilities	
Proposal Requirement	Description of Requirement
Communication Capabilities	Description of communication systems incorporated into the resource for reasons of resource control and/or monitoring. In the case of Load Reduction Resources Respondent’s solutions shall enable cost effective integration between the Respondent’s Demand Response (DR) assets and PSEGLI’s Demand Response Management System (DRMS). PSEGLI recommends that the Respondent’s DR assets provide integration via broadband Internet connected devices that support either a) OpenADR 2.0a or 2.0b protocols or b) web services (e.g. SOAP or REST) to PSEGLI’s Enterprise Service Bus (ESB). OperADR compliant devices that are Internet connected must be able to receive a signal from PSEGLI’s DRMS and execute DR events. Alternatively, Internet connected devices that support SOAP

	<p>or REST web services and integrate to PSEGLI's ESB must be able to receive a signal from PSEGLI's DRMS through the ESB and execute DR events. If the Respondent's DR asset will not be integrated via a broadband Internet connection over OpenADR or via web services, the Respondent shall describe their proposed integration approach.</p> <p>Load Reduction Bidder's solutions shall enable integration between the Bidder's Demand Response (DR) assets and PSEGLI's Demand Response Management System (DRMS). PSEGLI's DRMS system is currently capable of integration with the following systems</p> <ul style="list-style-type: none"> • Broadband Internet connected devices that support OpenADR 2.0a or 2.0b protocols. OpenADR compliant devices that are Internet connected are able to receive a signal from PSEGLI's DRMS and execute DR events. • Broadband internet connected devices that support web services (e.g. SOAP or REST) to PSEGLI's Enterprise Service Bus (ESB). Internet connected devices that support SOAP or REST web services and integrate to PSEGLI's ESB are able to receive a signal from PSEGLI's DRMS through the ESB and execute DR events. <p>If the Bidder's DR asset will not be integrated via a broadband Internet connection over OpenADR or via web services, the Bidder shall describe their proposed integration approach. PSEGLI's assessment of such proposals will include PSEGLI's estimated cost of integrating such proposals into PSEGLI's.</p>
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3.2.21. Customer Interaction Capabilities

Customer Interaction Capabilities	
Proposal Requirement	Description of Requirement
Customer Interaction Capabilities	For Load Reduction resources, description of customer interaction capabilities, such as contacting Load Reduction customers by the aggregator.

3.2.22. Respondent Information and Qualifications

Respondent Information and Qualifications	
Proposal Requirement	Description of Requirement
Respondent Information	The following subsections (3.2.22.1 - 3.2.22.3), request additional information from the Respondent that will assist PSEG LI in its evaluation of the Respondent's proposal.

3.2.22.1. Basic Information & Relevant Experience

Basic Information & Relevant Experience	
Proposal Requirement	Description of Requirement

Company Name & Contact Information	Company name, address and telephone number (and name, address, telephone number, and e-mail address of the contact person for Respondent in connection with its Proposal).
Legal Status & Other	Legal status (e.g., corporation, partnership, limited liability company), date formed, jurisdiction of organization, and identification of any relevant affiliates.
Ownership Status	Ownership status (e.g., privately held or publically traded).
Guarantor Details	If a Guarantor is applicable, provide the same basic information regarding Guarantor as described in the previous three sections of this table.
Consortium Details	If a consortium is applicable, the following requirements apply: <ul style="list-style-type: none"> a) Information of its legal form b) Information on each of its members c) Identification of the member responsible for providing all financial security, executing the Agreement, and providing products and/or services.
Company History & Experience	Company history and experience in the areas of development, financing, construction / implementation, and operation of resource.
NYISO Experience	Information about any knowledge and experience with NYISO requirements.
Technology Experience	Information about similar electric facilities owned and/or operated by Proposer.
List of Completed Projects	List of completed projects having similarity to the proposed project.
Project References	References for the completed projects listed above.
EPC Contractor	If available, details about EPC contractor's experience.
Other Sub-Contractors	If available, details about other contractors' experience.

3.2.22.2. Financial Information

Financial Information	
Proposals must contain evidence of Respondent's and/or any Guarantor's financial condition and capacity to complete and operate the proposed project.	
Proposal Requirement	Description of Requirement
Proposed Financing	Detailed description of the proposed short- and long-term financing arrangements.
Soundness of Financial Arrangements	Evidence that financial arrangements are sufficient to support the project through construction and the Agreement term.
Capital Structure	Description of the proposed capital structure for the project.
Financing Sources	List of all sources of equity and debt financing.
10-Year History of Completed Projects	Schedule showing all major projects developed and financed by the Respondent in the past 10 years.
Issues with Completed Projects	Information about any events of default and/or other credit issues associated with all major projects listed in the "10-Year History of Completed Projects" section above.
Proposed Guarantor(s)	Identification of the proposed Guarantor(s) for the project and documentation of the Guarantor's creditworthiness, including the three most recent audited financial statements of the Guarantor.
Audited Financial Statements of Respondent	Respondent's audited financial statements for its three most recent fiscal years.
Audited Financial Statements of Parent	If the Respondent does not have audited financial statements, provide the audited financial statements for the Respondent's parent.

Non- disclosure of Financial Statements	<p>If the audited financial statements of the Respondent or the Respondent’s parent cannot be provided, provision of:</p> <ul style="list-style-type: none"> a) Statement describing the reasons for non-compliance with this requirement. b) Alternate information to demonstrate Respondent’s financial capacity to complete and operate the proposed project.
References	<p>Four references from prior projects developed by the Respondent that employed financing arrangements similar to the arrangements contemplated by the Proposer for the project.</p>

3.2.22.3. Resumes of Key Team Members

Resumes of Key Team Members	
Proposal Requirement	Description of Requirement
Project Team Information	Resumes detailing the experience of key project team members, including experience with the specific type of resource/project being proposed.

3.2.23. Disclosures

Disclosures	
Proposal Requirement	Description of Requirement
Default Disclosures	Disclosure of any instances in the last five years where Respondent, any of its officers, directors or partners, any of its affiliates, or its proposed guarantor (if any) defaulted or was deemed to be in noncompliance with any obligation related to the sale or purchase of any energy related services or was the subject of a civil proceeding for conversion, theft, fraud, business fraud, misrepresentation, false statements, unfair or deceptive business practices, anti-competitive acts or omissions, or collusive bidding or other procurement- or sale-related irregularities.

Criminality Disclosures	Disclosure of any instances in the last five years where Respondent, any of its officers, directors or partners, any of its affiliates, or its proposed guarantor (if any) was convicted of (i) any felony, or (ii) any crime related to the sale or purchase of any energy related services, theft, fraud, business fraud, misrepresentation, false statements, unfair or deceptive business practices, anti-competitive acts or omissions, or collusive bidding or other procurement- or sale-related irregularities.
Procurement Forms	<p>Signed and completed copies of the following procurement forms:</p> <ul style="list-style-type: none"> a) Contractor Disclosure of Prior Non-Responsibility Determinations b) MacBride Fair Employment Principles c) Contingent Fee Certification d) Non-Collusive Bidding Certification e) New York State Vendor Responsibility Questionnaire/Certification (electronically via https://portal.osc.state.ny.us or http://www.osc.state.ny.us/vendrep/ .) <p>NB: These forms are all available on the RFP website.</p>

3.2.24. Agreement Redline

Agreement Redline	
Proposal Requirement	Description of Requirement
Agreement	<p>“Red-line” mark-up of the Form of Agreement or Contract with any comments, insertions, deletions, or other proposed changes, which must include proposed alternative text, as applicable.</p> <p>Alternatively, if the Proposer accepts the Form Agreement or Contract “as is,” provision of a statement accepting the Agreement or Contract.</p>
	<p>NB: Red-line mark-up should be provided using “Track Changes” in Microsoft Word. Modifications that are not clearly identified using “Track Changes” will not be evaluated.</p>

3.2.25. Other

Other	
Proposal Requirement	Description of Requirement
Glossary & Acronyms	Definition of all terms and abbreviations used in the Proposal that are not commonly accepted industry terminology or abbreviations, and are not defined in this RFP.
NYS Certified Minority and Women Owned Business Enterprise Subcontracting Goals.	<p>a) As per Section 4.10, Respondents shall include their Minority Business Enterprise (MBE) and Woman Business Enterprise (WBE) proposal data, including a utilization plan detailing how the 15% MBE and 15% WBE participation goals will be met.</p> <p>b) Include the names of MBE/WBE firms to be utilized and the scope of work each will be performing.</p> <p>c) Provide a copy of arrangement made with the minority or woman-owned business enterprise (MWBE Form 103).</p> <p>d) Respondents who are certified as a New York State MBE or WBE Business shall provide evidence of their certification. Proposers shall complete LIPA's Diversity Questionnaire, which incorporates MWBE Form 101 and 102.</p> <p>e) For full or partial waiver requests, Respondent must document and certify their good faith efforts to meet or partially meet the MWBE utilization goals. Page two of MWBE Form 104 provides the instructions and steps for firms to document good faith efforts.</p> <p>NB: For more information, Respondents are encouraged to visit the Division of Minority and Women's Business Development's website (Link: http://esd.ny.gov/MWBE.html).</p>
NYS Service-Disabled Veteran-Owned Businesses	<p>a) As per Section 4.11, Respondents shall identify ways that they intend to achieve the New York State Service-Disabled Veteran-Owned Business goal of 6%.</p> <p>b) Proposers who are certified as a New York State Service-Disabled Veteran-Owned Business shall include evidence of their certification.</p> <p>NB: For more information, Respondents are encouraged to visit the New York State Office of General Services' webpage (Link: http://www.ogs.ny.gov/Core/SDVOBA.asp).</p>

4. ADMINISTRATIVE MATTERS

4.1. Interpretation or Correction of RFP Documents

- Any Respondent who discovers ambiguities, inconsistencies, or errors or is in doubt as to the meaning or intent of any part of the RFP Documents shall request an interpretation from PSEG Long Island.
- If a Respondent fails to notify PSEG Long Island of a known error or an error that reasonably should have been known prior to the final filing date for submission, Respondent shall assume the risk, and shall not be entitled to alter its proposal after the submission deadline.
- Any modifications to the RFP Documents will be provided by PSEG Long Island via the RFP website.
- A pre-bid conference webinar will be held on July 14, 2015 from 1:00pm to 3:00pm. Respondents are encouraged to submit written questions or other requests for information through the process described within this RFP.

4.2. Proposal Expenses

- Respondents shall bear any and all costs and expenses required for or in connection with preparation of its Proposal and subsequent actions taken by Respondent up to the execution of the Agreement.

4.3. Proposal Submittal Fee

- Each Proposal must also include the "Proposal Submittal Fee," contained in a certified or bank check made payable to PSEG Long Island. This Fee will be refunded only if a Proposal is returned because it is submitted late. This fee will be based on a scale of \$1.5 per kW of load reduction or power production offered. This applies to all technologies requested in this RFP.
- Proposals without the required Proposal Submittal Fee will be returned to Respondent, and such Proposals will not be considered or evaluated by PSEG Long Island.
- Those Respondents that submitted a Proposal for Block 1 as part of the New Generation, Energy Storage and Demand Response Resources RFP ("2013 GS & DR RFP") will be given a waiver for their first Proposal Submittal Fee.

4.4. Method for Submitting Proposals

- Proposals shall be submitted in the complete name of the party expecting to execute any resulting contract. The Proposal shall be signed by a person who is duly authorized to bind Respondent to a contract.

- All Proposals submitted in response to this RFP must be received by the Proposal Submittal Deadline, as prescribed in the RFP Schedule. Proposals received after this deadline will not be opened and will be disqualified from further evaluation.
- Four (4) bound hard copies of each Proposal and one (1) electronic copy of each Proposal (sent via CD, DVD, or flash drive) shall be submitted to PSEG Long Island at the following address:

Gracia DeSilva
PSEG Long Island
333 Earle Ovington Blvd., Suite 403
Uniondale, New York 11553

- Proposals sent by facsimile or e-mail will not be accepted, and will not be evaluated or considered.
- All material submitted in response to this RFP shall become the sole property of LIPA.

4.5. Communication during RFP Process

Pursuant to State Finance Law sections 139-j and 139-k, this RFP includes and imposes certain restrictions on communications between PSEG Long Island or LIPA and Respondents during the procurement process. A Respondent is restricted from making contact (i.e., an oral, written or electronic communications which a reasonable person would infer as an attempt to influence the award, denial, or amendment of a contract) with any PSEG Long Island or LIPA representative, other than as designated herein, from date of issuance of this RFP through the final award and approval of the resulting Procurement Contract (as that term is defined under State Finance Law) by LIPA and the Office of the State Comptroller (the “Restricted Period”), unless it is a contact that is included among certain statutory exemptions as set forth in State Finance Law sections 139-j(3) (a). LIPA staff and Board of Trustees, and advisors are required to obtain certain information when contacted during the Restricted Period and make a determination of the responsibility of the Respondent pursuant to these two statutes. Certain findings of non-responsibility may result in rejection for contract award, and in the event of two findings within a four-year period, the Respondent is debarred from obtaining governmental Procurement Contracts.

The PSEG Long Island’s Designated Contacts for this RFP are listed in Table 4-1 below:

Table 4-1: RFP Designated Contacts

Contact	Phone Number	E-mail
Edmund Petrocelli, Manager of Power Projects – General RFP related inquiries	(516) 222-3643	Edmund.Petrocelli@PSEG.COM

Steve Cantore ,Manager of Power Asset Management Department – Interconnection related inquiries	(516) 949-8295	Stephen.Cantore@PSEG.COM
Mike LiPetri, Lead Analyst, Planning and Evaluation – Renewables and Load Reduction related inquiries	631-844-3846	Michael.LiPetri@PSEG.COM

The designated contacts will be updated and/or supplemented as needed and all such changes will be posted on the RFP website.

Other than as provided for in this RFP, any contact with LIPA’s Board of Trustees, LIPA staff, PSEG Long Island staff, or advisors regarding this RFP during its pendency may be grounds for disqualification from the RFP process.

Further information about these requirements can be found in the Lobbying Guidelines Regarding Procurements, Rules, Regulations or Ratemaking, which is posted on the RFP website.

4.6. RFP Website

The RFP website, which is available through the PSEG Long Island’s website (www.psegliny.com, go to the About Us folder, under “Proposals”), is a public site, accessible to anyone at any time and does not require a password or login information to view the RFP contents. The RFP website allows Respondents to download documents referenced in the RFP. The RFP website also includes the RFP Schedule, as well as announcements and other related information. Any modifications to the RFP Schedule, the RFP, or supporting documents will be published on the RFP website. The RFP website contains a Questions and Answers (“Q&A”) section.

4.7. Questions about the RFP

Any questions about this RFP should be submitted via email to: DL-PSEGLI-SFRFP@PSEG.COM on or before August 10th, 2015 at 5:00 PM EST.

4.8. Request for T&D System Data

Respondents may request certain transmission system data to assist them in developing their proposals. PSEG Long Island will provide interested Respondents a load flow, contingency list, and a one-line diagram around an electrical bus at a proposed interconnection point. Any requests for T&D System data should be submitted via email

to: DL-PSEGLI-SFRFP@PSEG.COM. Respondents will be required to execute a non-disclosure agreement prior to receiving the requested information.

4.9. Limitations

- Respondents may be requested to clarify the information in their proposals, but they may not alter their proposals or otherwise submit any additional information after the proposal due date.
- While PSEG Long Island, as agent of and acting on behalf of LIPA, has endeavored to supply useful information in this RFP and the associated website, PSEG Long Island and LIPA make no representation or warranty, express or implied, as to the accuracy or completeness of any information contained herein or otherwise provided to any Respondent. Respondents are encouraged to conduct their own investigation and analysis of any and all information contained herein or otherwise provided by PSEG Long Island.

4.10. NYS MWBE Participation/Equal Employment Opportunity

- LIPA and PSEG Long Island are committed to diversity and equal employment opportunities among its contractors. LIPA and PSEG Long Island encourage all firms, including firms that are MWBE certified, to submit proposals in response to this RFP. All certified MWBE firms submitting proposals to this RFP should be registered as such with the NYS Department of Economic Development. Firms that are not certified but have applied for certification shall provide evidence of filing, including filing date.
- For purposes of this solicitation, LIPA and PSEG Long Island hereby establish an overall subcontracting goal of 30% (15% for Minority-Owned Business Enterprises participation and 15% for Women-Owned Business Enterprises participation).
- Respondents shall include their Minority Business Enterprise (MBE) and Woman Business Enterprise (WBE) proposal data, including a utilization plan detailing how the 15% MBE and 15% WBE participation goals will be met (see MWBE Attachment B, "PARTICIPATION BY MINORITY GROUP MEMBERS AND WOMEN WITH RESPECT TO STATE CONTRACTS: REQUIREMENTS AND PROCEDURES") and include the names of MBE/WBE firms to be utilized.
- Respondents shall provide a copy of arrangement made with the minority or woman-owned business enterprise (MWBE Form 103). The New York State Minority & Women Owned Businesses Searchable Database can be found at: <https://ny.newnycontracts.com/FrontEnd/VendorSearchPublic.asp>.
- Respondents who are certified as a New York State MBE or WBE Business shall provide evidence of this certification in their proposal. Respondents are to complete LIPA's Diversity Questionnaire, which incorporates MWBE Forms 101 and 102.
- For full or partial waiver requests, Respondent must document and certify their good faith efforts to meet or partially meet the MWBE utilization goals. Page two of MWBE Form 104 provides the instructions and steps for firms to document good faith efforts.

- If LIPA and PSEG Long Island endorse the certification of the good faith efforts of a full or partial waiver request during the process of evaluating a Proposal, the waiver request will then be submitted to the NYS Executive Chamber requesting their concurrence of the full or partial waiver.
- All forms noted in this RFP section are available on the RFP website. Respondents are encouraged to visit the Division of Minority and Women's Business Development's website (Link: <http://esd.ny.gov/MWBE.html>). Respondents are also encouraged to contact the Division of Minority and Woman Business Development at (518) 292-5250 or (212) 803-2414 to learn more about MWBE subcontracting.

4.11. NYS Service-Disabled Veteran-Owned Businesses

- This RFP has a New York State Service-Disabled Veteran-Owned Business goal of 6%. Proposers shall identify how they intend to achieve the New York State Service-Disabled Veteran-Owned Business goal of 6%.
- Proposers who are certified as a New York State Service-Disabled Veteran-Owned Business shall include evidence of this certification in their proposal.
- For more information regarding New York State Service-Disabled Veteran-Owned Businesses, Respondents are encouraged to visit the New York State Office of General Services webpage at: <http://www.ogs.ny.gov/Core/SDVOBA.asp>.

5. EVALUATION & SELECTION PROCESS

5.1. Evaluation Process

- PSEG Long Island reserves the right to waive non-material deviations in a proposal. Non-material deviations are deviations and/or omissions the waiving of which, at PSEG Long Island's sole discretion, do not disadvantage LIPA or PSEG Long Island, do not provide a competitive advantage to the Respondent and/or will not prejudice other Respondents or potential Respondents.
- Proposals determined to be responsive will be evaluated by a Selection Committee consisting of PSEG Long Island staff (assisted by advisors) that will evaluate such proposals based on the evaluation criteria set forth herein.
- The Selection Committee may request Respondents to clarify proposals for the purpose of assuring PSEG Long Island a full understanding of their response to this RFP. PSEG Long Island may choose to conduct interviews and/or site visits with Respondents to further clarify aspects of their Proposals. If interviews and/or site visits are conducted, PSEG Long Island will notify the affected Respondent(s) of the scheduled date(s).
- Prior to award of any PPA or Service contract, the Selection Committee will conduct a vendor responsibility determination and may require eligible Respondent(s) to answer questions and provide additional information to supplement the information provided in the NYS Vendor Responsibility Questionnaire to assist the Selection Committee in making such a determination. Vendors should file the required Vendor Responsibility Questionnaire online via the New York State VendRep System. To enroll in and use the New York State VendRep System, see the VendRep System Instructions available at http://www.osc.state.ny.us/vendrep/vendor_index.htm or go directly to the VendRep System online at <https://portal.osc.state.ny.us>.

Vendors must provide their New York State Vendor Identification Number when enrolling. To request assignment of a Vendor ID or for VendRep System assistance, contact the Office of the State Comptroller's Help Desk at 866-370-4672 or 518-408-4672 or by email at ITServiceDesk@osc.state.ny.us.

Vendors opting to complete and submit a paper questionnaire can obtain the appropriate questionnaire from the VendRep website <http://www.osc.state.ny.us/vendrep/>

5.2. Right to Reject Proposals

This RFP does not commit LIPA or PSEG Long Island to award a contract, pay any costs associated with the preparation of a proposal, or procure or contract for any project whatsoever. PSEG Long Island reserves the right, in its sole discretion, to accept or reject any or all responses to this RFP, to negotiate with any and all Respondents qualified for being selected for award, or to cancel this RFP in whole or in part and to pursue other resource alternatives, which may include negotiating with entities that were not Respondents.

5.3. Right to Bifurcate Proposal Selection

This RFP does not commit LIPA or PSEG to make a selection or award a contract to all Respondents at the same time. PSEG Long Island may select resources of one type or in one location at a certain date and then select other sources on another date.

5.4. Evaluation Criteria

The Selection Committee will evaluate the Proposals in accordance with the Quantitative Evaluation Criteria and Qualitative Evaluation Criteria outlined in the subsections that follow. The evaluation criteria contain herein serves as guidance for the items that will be considered during the evaluation process. Moreover, not all items listed in these evaluation criteria tables may be applicable to all Load Reduction or Power Production resources.

5.4.1. Quantitative Evaluation Criteria

Table 5-1: Quantitative Evaluation Criteria

Quantitative Evaluation Criteria
a) Agreement charges, including pass through costs and fuel, where applicable
b) Costs for required transmission reinforcements
c) Costs for required distribution reinforcement
d) Savings from T&D System deferrals
e) System impacts including, but not limited to, impact on Transmission Transfer Capability, and NYISO capacity requirements and deliverability
f) Beneficial system impacts from the timing of the demonstrated COD
g) An assessment of the financial impact of the proposed resource on purchases and sales from the capacity and energy markets, including operating reserves
The quantification of system benefits and avoided costs listed in the table will include an assessment of the extent to which a proposal in this RFP contributes to meeting system needs that may be the subject of other contemporaneous RFPs. Nevertheless, Respondents are encouraged to submit proposals in any such RFPs for which they are eligible to participate. The quantification of system benefits and avoided costs listed in the table will include an assessment of the extent to which a proposal in this RFP contributes to meeting system needs that may be the subject of other contemporaneous RFPs. Nevertheless, Respondents are encouraged to submit proposals in any such RFPs for which they are eligible to participate.

5.4.2. Qualitative Evaluation Criteria

Table 5-2: Qualitative Evaluation Criteria

Qualitative Evaluation Criteria
a) Conformance with technical requirements outlined in this document
b) Proposal contains microgrid flexibility option
c) In-Service date flexibility (ability to install earlier if needed)
d) Sizing flexibility (ability to reduce the magnitude of the proposed MW reduction)
e) Feasibility of the fuel supply plan, where applicable
f) Development and schedule risk, as well as risk of maintaining performance through the contract term
g) Site Control
h) Ability to permit project
i) Ability to meet Proposed In-Service Date
j) Exceptions to Agreement, if any
k) Quality of Proposal
i. Financing plan
ii. Financial qualifications
iii. Management experience
iv. Experience with Long Island development
v. History of equipment reliability over claimed lifetime
vi. Reasonableness of Claimed Per-Unit Load Reduction (where applicable)

vii. Expected accuracy of Proposed Measurement & Verification Plan
l) Black Start capability
m) Contractor experience
n) Operating flexibility
o) Integration with T&D System, including ability to meet a COD earlier than planned date
p) Ability for resources to be controllable by PSEG Long Island's Electric System Operator
q) Community impacts
r) Community acceptance
s) Environmental impacts
t) Firm's overall diversity and commitment to equal opportunity programs, including status as a certified MWBE or a firm's demonstrated ability to meet the MWBE subcontracting goals with NYS certified MWBE firms.
u) Firm's demonstrated commitment to certified NYS Service-Disabled Veteran-Owned Businesses or a firm demonstrates that they are certified as a NYS Service-Disabled Veteran-Owned Business.

5.5. Selection Process

- The Selection Committee may conduct the evaluation in phases. The Selection Committee may provide written notice to a proposer if a decision is made to not advance a proposal to the next phase.
- The Selection Committee may designate more than one potential selection (each a "Finalist") and may request each Finalist to submit a Best and Final Offer prior to making its selection decision.
- After the Selection Committee has made its final selection(s), there are two separate tracks for signing an Agreement with PSEG Long Island or LIPA, which is dependent on the resource classification (i.e., Load Reduction or Power Production). These two tracks are described in Sections 5.5.1 and 5.5.2. and are in accordance with the A&R OSA. Please refer to Section A2 in Appendix A for a description of resources that are classified as Load Reduction. Section B1 in Appendix B provides a description of resources that are classified as Power Production.

5.5.1. Load Reduction Resources

- In the case of Load Reduction resources, after the Selection and Executive Committees have made is final selection(s), PSEG Long Island (in consultation with LIPA) and the selected Respondent(s) will negotiate the appropriate contract(s) and no further approval will be required. However, note that finalization of the Agreement will be dependent on the completion of any applicable environmental reviews. All Respondents will be notified, in writing, once the selections are made.

5.5.2. Power Production Resources

- In the case of Power Production resources, the Selection Committee's recommendation will be submitted to the LIPA Board of Trustees for approval. All Respondents will be notified, in writing, once the selections are approved by the LIPA Board of Trustees.
- Following such approval, PSEG Long Island and the selected Respondent(s) will negotiate appropriate contracts, which shall be subject to further approval by the Board of Trustees and completion of applicable environmental reviews. LIPA may disclose to the public the estimated total contract cost of any contract submitted for approval by the Board of Trustees.
- Any such contract(s) that is required to be approved by the NYS Comptroller, shall not be valid, effective or binding until approved by the New York Attorney General and Office of State Comptroller and filed in his office, in accordance with Section 112 of the New York State Finance Law. No payment for services rendered can be made under the contract until such approval is obtained.

5.6. Debriefing of Unsuccessful Respondents

- Upon written request, an unsuccessful Respondent may request a debriefing with PSEG Long Island staff. Debriefings will be scheduled after PSEG Long Island has provided notice of its selection of the successful Respondent(s).
- Discussions during any such debriefing will be limited to an analysis of the evaluation of the Proposal submitted to PSEG Long Island by the Respondent requesting the debriefing. Comparisons between Proposals or evaluations of the other Proposals will not be discussed.
- Debriefings may be conducted in person or by telephone, at PSEG Long Island's discretion.

**APPENDIX A: LOAD REDUCTION SPECIFICATIONS &
OTHER BACKGROUND INFORMATION**

A1. BACKGROUND

Load growth on the South Fork of Long Island has been increasing at a significantly faster pace than the rest of Long Island. The South Fork has a unique load profile, with significant summer, weekend, and holiday activity in the Hamptons and surrounding towns, and corresponding peaks in energy usage.

In contrast to being coincident with the T&D System peak, the South Fork typically reaches its peak electric demand at a different time than the rest of Long Island, and is primarily driven by residential air conditioning load. In fact, the South Fork has peaked six (6) out of the last ten (10) years on a Saturday. Table A1-1, below, lists the aforementioned ten (10) year South Fork peak history.

Table A1-1: Actual South Fork Peak History (2005-2014)

Year	Day	Date	Time
2005	Saturday	8/13/2005	between 2-3 PM
2006	Thursday	8/3/2006	between 4-5 PM
2007	Saturday	8/4/2007	between 5-6 PM
2008	Saturday	7/19/2008	between 2-3 PM
2009	Friday	8/21/2009	between 3-4 PM
2010	Saturday	7/24/2010	between 4-5 PM
2011	Friday	7/22/2011	between 4-5 PM
2012	Saturday	8/4/2012	between 5-6 PM
2013	Saturday	7/6/2013	between 5-6 PM
2014	Thursday	7/3/2014	between 4-5 PM
<p><i>The three peaks highlighted in yellow occurred at hour ending 6 PM, which is one (1) hour later than the T&D System wide peak.</i></p>			

In the South Fork, there is a greater saturation of retail and service businesses and these business types do not experience a post 5 PM drop off in lighting load. Thus, commercial lighting efficiency would be coincident with all ten (10) South Fork peaks shown above.

Residential customer loads in the South Fork are much more weather sensitive than commercial¹. On a peak summer day, up to sixty (60%) percent of the average residential load is directly attributable to air conditioning. Residential accounts use more energy in the South Fork than they do in the T&D System as a whole². Moreover, residential customers normally use more energy on weekends than on weekdays. As shown in Table A1-1, six (6) out of the last ten (10) peaks have occurred on a Saturday. Conversely, the system as a whole never peaks on a Saturday because its corresponding commercial load is much greater on weekdays than on weekends.

The South Fork has Saturday peaks, while the rest of the T&D System has weekday peaks, for the following reasons:

- (i) The South Fork does not have any significant “large” commercial customers that contribute to a weekday peak. Many of the commercial accounts in the South Fork are retail and services accounts, which are open on weekends.
- (ii) Residential accounts, which as previously noted have higher weekend loads, use more energy in the South Fork than they do for the T&D System as a whole³.
- (iii) There is a significant weekend-only population in the South Fork, which is unique to this part of Long Island.

Historic population growth in the South Fork has been significantly smaller than electric load growth. The MW peak has grown by forty-four (44%) percent over the past ten (10) years, while the number of residential accounts has only grown four (4%) percent, and commercial accounts by 12.3%. This implies that the electrical use per customer for existing residential and commercial customers has increased substantially.

Table A1-2, below, shows the 2015-2022 forecasted load growth in the South Fork.

¹ Rate 280 small commercial accounts are also very weather sensitive with 45% of their load on peak day attributable to air conditioning. However, it is difficult to accurately assess the air conditioning load because in many cases the heating and air conditioning energy usage is included as part of a common charge in a tenant-leased property.

² Rate 180 residential accounts in the South Fork use 18% more energy than the Rate 180 system average. Large residential VMRP accounts in the South Fork use 50% more energy than the LIPA system average.

³ Rate 180 residential accounts in the South Fork use 18% more energy than the Rate 180 system average. Large residential VMRP accounts in the South Fork use 50% more energy than the system average.

Table A1-2: South Fork Forecasted Load Growth (2015-2022)

Year	Forecast MW Peak Load
2015	286
2016	292
2017	298
2018	306
2019	314
2020	322
2021	331
2022	341

A1.1. Customer Characteristic⁴

Residential customer load is the primary driver of the electric peak on the South Fork. The number of customers and their contribution to the overall load by classification are displayed in Table A1-3, below.

Table A1-3: South Fork Electric Usage by Customer Classification

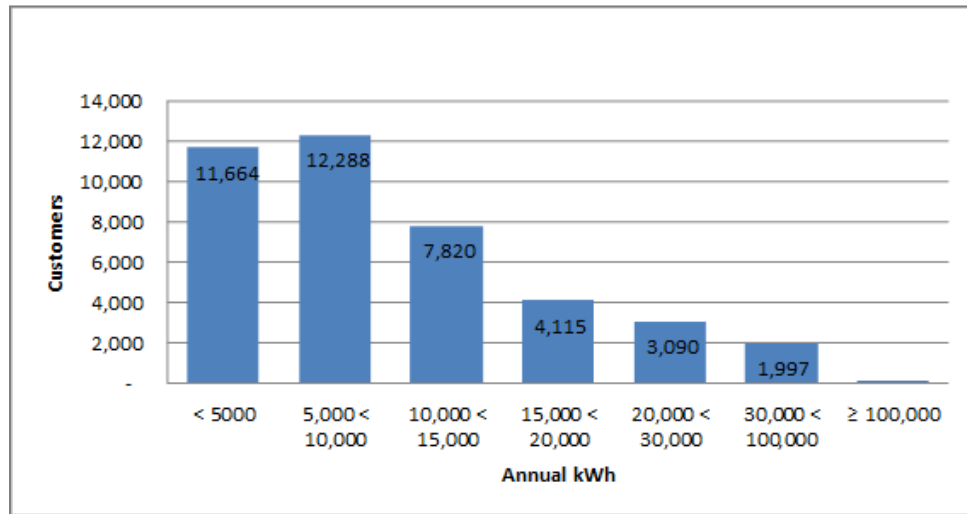
Customer Class	Customers	MW	MWh
Residential - 180	41,538	199	476,346
Small Commercial -280	5,168	8	30,175
Small Commercial -281	2,373	39	117,463
Large Commercial – 285	87	15	61,661
Total	49,166	261	685,646

⁴ Data based on PSEG Long Island July 2013 Load Study.

A1.1.1. Residential Customers

Figure A1-1 shows the distribution of energy usage for the residential customers on the South Fork. The numbers in each column represent the number of customers in their corresponding energy usage range. There are one hundred thirty seven (137) customers with annual usage $\geq 100,000$ kWh. The average annual energy usage for residential customers on the South Fork is approximately 11,500 kWh. This is compared to the island-wide average annual usage of around 9,700 kWh. The average demand per household on the South Fork is approximately 4.8 kW versus 3.2 kW island-wide. Many of the homes on the South Fork are seasonally occupied (summer months), and thus, the overall usage, if they were permanent residents, would be significantly higher. The estimated number of residential customers with central air conditioning is 21,911, and with pool pumps is 18,328.

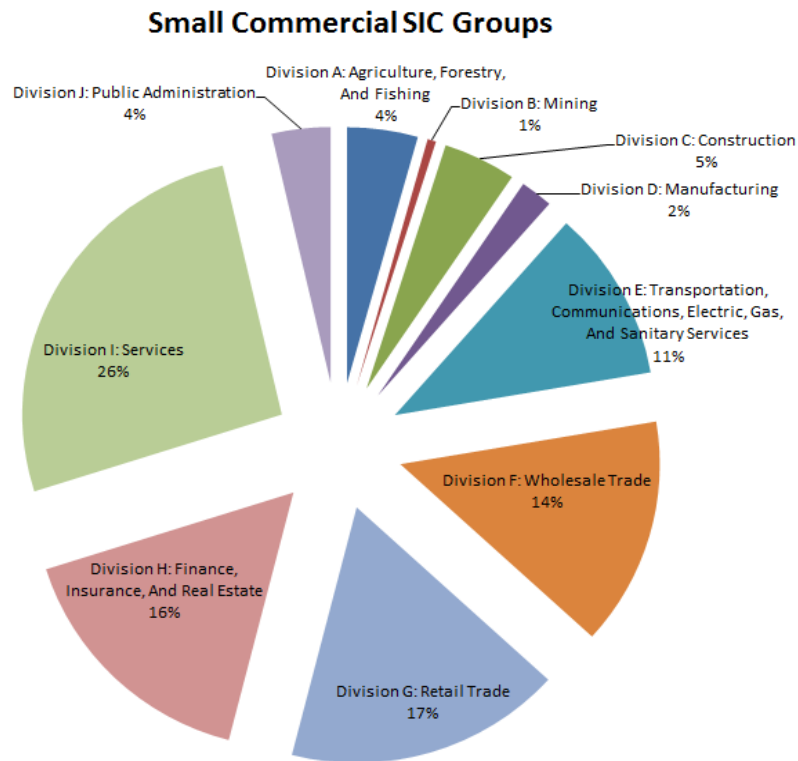
Figure A1-1: South Fork Residential Customers' Energy Usage Distribution



A1.1.2. Small Commercial Customers

The second largest customer base in the South Fork is the small commercial customer (rate codes 280 and 281). Within the overall commercial sector, the small commercial market consumes the most in demand and energy usage. There are approximately seven thousand five hundred (7,500) small commercial accounts on the South Fork, of which 4,841 are estimated to have split system “central” air conditioning equipment. Figure A1-2, below, shows the Standard Industrial Classification Code (“SIC”) code categorization for this customer segment.

Figure A1-2: South Fork Small Commercial SIC Groups

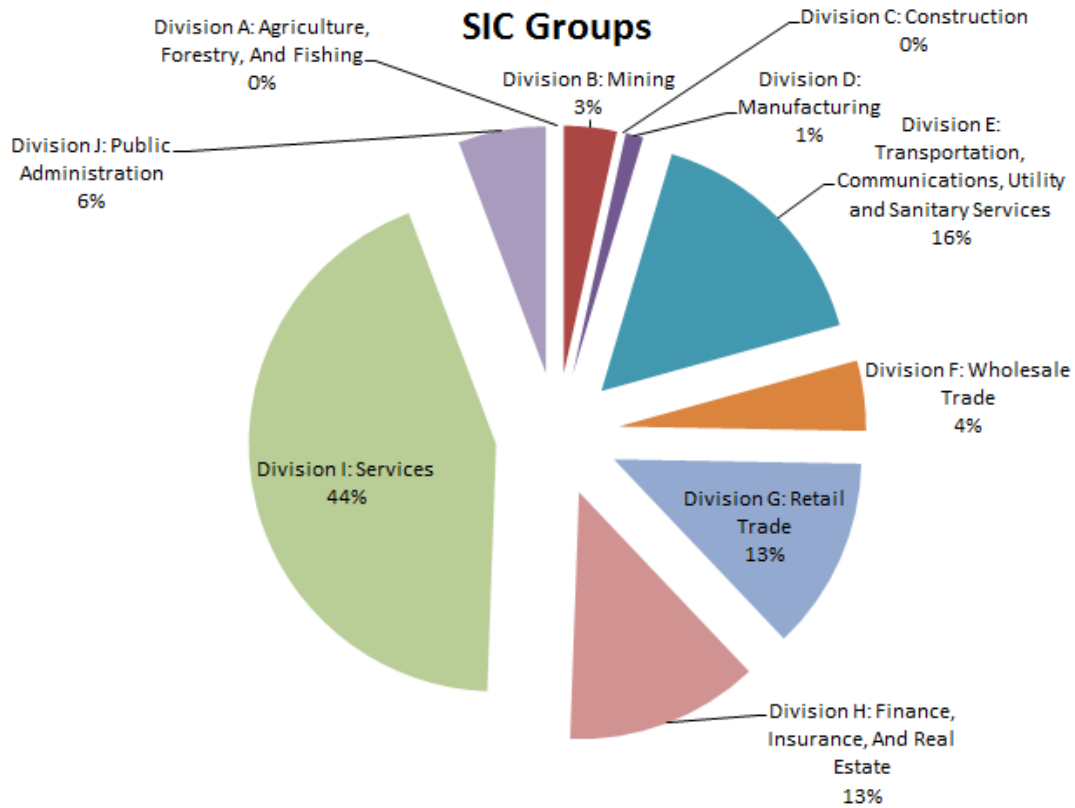


Based on the breakdown of business types, the largest targets for Load Reduction are in the Services and Retail Trade sectors, which are primarily composed of lodging and food stores, respectively. Within the Services sector, is the lodging subdivision, which includes several motels, hotels, and camps. Food stores, restaurants, and small shopping boutiques are the major components of the Retail Trade sector. Of the seven thousand five hundred (7,500) small commercial accounts on the South Fork, there are approximately one thousand seven hundred (1,700) small commercial accounts that are primarily cell tower power packs, boat docks, and pumps. For the remaining five thousand eight hundred (5,800) accounts, this represents about three thousand eight hundred (3,800) customers due to some customers having more than one (1) account.

A1.1.3. Large Commercial

The large commercial customers sector on the South Fork (eighty seven (87) total accounts) is small due to the remote location and lack of commercial and industrial development in the area as a whole. As a result, the demand for energy efficiency is also small, but not insignificant. Figure A1-3, below, show the breakdown of the various SIC groupings for the large commercial segment.

Figure A1-3: South Fork Large Commercial SIC Groups



The Services sector is the largest component of the large commercial customer base with a total of thirty-eight (38) customers, comprised mostly of schools, hospitals, and resorts/hotels. Resorts and hotels should be the largest targets for energy efficiency improvements as many of these buildings are relatively outdated in terms of technology and hold great potential for generating savings. Schools and hospitals should also be considered for Load Reduction due to their high energy usage and occupation throughout the year. The second largest sector within the large commercial customers segment is the Transportation, Communications, Utility and Sanitary Services division, which is comprised mostly of water authority utility buildings.

A2. ELEGIBLE LOAD REDUCTION RESOURCES

Respondents have significant latitude in how they may propose to achieve Load Reduction. Load Reduction resources may be located either behind the meter or connected directly to the distribution system in accordance with LIPA's Small Generator Interconnection Procedures and PSEG-Long Island Smart Grid Small Generator Interconnection Screening Criteria For Operating in Parallel with LIPA's Distribution System, as applicable. Load Reduction resources may include energy efficiency, direct load control, and distributed generation.

Respondents may also choose to emulate or enhance any of the five (5) efficiency and renewable programs that PSEG Long Island is already providing to its South Fork customers. The following provides a listing of the existing PSEG Long Island EE&RE programs:

- a) **Residential Energy Efficiency Products** – the program provides rebates to customers for the purchase of energy efficiency products, such as CFL and LED lighting, Energy Star rated dehumidifiers, and variable speed pool pumps. Rebates are either paid directly to customers or applied at the point of sale through select participating retailers.
- b) **Cool Homes** – rebates are provided for high efficiency central air conditioning systems, including heat pumps, ductless mini-splits and geothermal systems. Participating contractors are also eligible for incentives.
- c) **Commercial Energy Program (“CEP”)** - the commercial energy efficiency program (CEP) is a multi-faceted program that provides energy efficiency rebates and assistance for lighting, HVAC, motors, compressors, and other equipment to businesses that reduce electric demand and save energy. All business customers, schools, not-for-profit entities, and new construction customers are now eligible for energy efficiency rebates based on the efficiency of the proposed measure.
- d) **New York Sun** - a rebate program administered jointly by NYSERDA and PSEG Long Island for both residential and commercial customers that supports the adoption of Photovoltaic (PV) installations on Long Island.
- e) **PSEG Long Island Thermostat Program** - is a direct load control program serving residential and small commercial customers. It controls approximately 30,000 residential and small commercial central air conditioning units in the PSEG Long Island territory. The current program uses a thirteen (13) year old technology that is intended to be replaced beginning in 2016.

A3. ROLES AND RESPONSIBILITIES (AS APPLICABLE)

A3.1. PSEG Long Island Responsibilities

- PSEG Long Island shall be responsible for the overall management of the electric distribution system within its service territory. PSEG Long Island shall provide oversight of the Program.
- PSEG Long Island shall be responsible for managing the contract with the Respondent, who shall be fully responsible for the delivery of the Program. PSEG Long Island shall monitor all program activity, review major decisions, and assess and evaluate the Respondent’s compliance in accordance with performance expectations and requirements.
- All databases developed from Program information shall become the property of LIPA. The Respondent shall be obligated to provide PSEG Long Island with copies of such databases in the format approved by PSEG Long Island. PSEG Long Island may

contract with an independent evaluator to evaluate the Program in accordance with the contract.

- PSEG Long Island may conduct independent QA inspections of Services performed within the Program. The Respondents is expected to provide any required information and/or documentation in a timely manner to facilitate and/or fulfill this inspection function. PSEG Long Island may conduct continuous reviews throughout the Program to monitor performance metrics.
- PSEG Long Island may perform independent measurement, verification and evaluation of reported impacts and savings provided by Respondent(s).
- While not guaranteed, PSEG Long Island anticipates that it will provide a single point interface software platform, which all Respondent(s) will need to integrate their respective communications, data flows, billing determinants, and command/control system utility grid interfaces through the Distributed Energy Resource Platform (the "DER Platform"). PSEG Long Island, in the case of Load Reduction events, shall dispatch the load control event with sixty (60) minutes of notice, when possible. In the case of system disturbances, PSEG Long Island shall dispatch the load control event with 10 minutes of notice.
- PSEG Long Island shall partner with the Respondent(s) in handling escalated customer complaints.
- PSEG Long Island shall have final approval on all Program materials (if applicable). PSEG Long Island shall review all marketing campaigns of the Respondent(s) for adherence to PSEG Long Island standards.
- PSEG Long Island shall provide Respondent with requested utility metering and devices in accordance with its standard tariffs and/or fees and in the course of its general utility practices.
- PSEG Long Island shall pay Respondent for services rendered subject to contractual terms and/or rules and requirements being met.

A3.2. Respondent Responsibilities

- Respondent shall be responsible for the provision of the two-way communication and Load Reduction technology. Respondent's communication technology should be capable of interfacing with and supporting the planned PSEG Long Island DER Platform and should be based upon open ADR protocols.
- Respondent shall be responsible for developing an Implementation Plan governing the Program operations for PSEG Long Island's review, which is to be delivered within ninety (90) days after an executed contract to provide services for the Program. The Respondent shall provide ongoing, day-to-day delivery and implementation of the Program.
- Respondent shall be responsible for tracking participant data necessary to measure load reductions during peak reduction events and to evaluate the Program in a form that can be uploaded to a centralized database and/or event notification system. Respondent

must discuss the expected results and savings of the Program by year, over the contract period, and the recommended market indicators and metrics to be employed to forecast activity levels and results.

- Respondent shall be responsible for supporting the data and informational requirements necessary to perform any independent measurement, verification and/or evaluation by PSEG Long Island.
- Respondent shall be responsible for providing a quality assurance and quality control (QA/QC) plan that describes how it shall ensure the accuracy and reliability of the delivered services. The QA/QC plan shall also describe how it will ensure the Program meets PSEG Long Island's quality standards. Respondent must be prepared to adhere to standards of customer service and QA/QC, which equal or exceed industry norms.
- Respondent shall be responsible to provide a description of important quality assurance issues and standards, including how load reductions will be regularly monitored, and reporting, tracking and report generation expectations will be met.
- Respondent shall be responsible to schedule formal production meetings with PSEG Long Island as often as needed to discuss overall program progress, review marketing and sales activities (if applicable), review savings and budget forecasts, review vendor activity reports and invoices, and identify and resolve program issues and develop action plans.
- Respondent shall be responsible for providing PSEG Long Island with remote access to its entire Program related sales and operations tracking and reporting databases.
- Respondent shall be responsible for identifying key program data, decision points and the process it will use to generate reports that fully capture program activity relative to target milestones and goals.
- Respondent shall discuss its data security and integrity in its proposal.
- Respondent shall be responsible for describing their administrative and technical capabilities to manage all of the administrative and implementation functions associated with delivery, tracking, and reporting on the Program.
- Respondent shall provide a full marketing plan and timeline, including optional contingency mechanisms and levers to boost enrollment as needed.
- Respondent shall coordinate with the utility marketing team to allow review of all marketing campaigns for compliance to PSEG Long Island's standards and requirements.
- Respondent shall perform all activities associated with maintaining a call center operation including, but not limited to, customer recruitment, handling all types of enrollments, installation scheduling, service call processing, complaint handling and tracking, as well as warm transfer between PSEG Long Island's and Respondent's call center.
- Respondent shall perform all necessary and appropriate Commissioning Tests prior to COD to ensure that the Program functions as intended.

A4. PERFORMANCE (AS APPLICABLE)

PSEG Long Island and the Respondent will negotiate the specific performance goals and associated penalties at the time of contract negotiations. Respondents are encouraged to propose specific performance goals and associated penalties for non-performance and failure to meet the performance metrics.

A4.1. Performance Metrics

- PSEG Long Island shall develop a Scorecard that will measure contract performance based on key contract metrics. A quarterly Metric Review Meeting shall be required, at which time the Scorecard shall be reviewed with the Respondent. The responsible PSEG Long Island Program Manager and Procurement Specialist will also be in attendance. Performance metrics shall include the following:
 - a) Safety – Consistent with current PSEG Long Island targets
 - b) Reporting – Timely and accurate
 - c) Invoicing – Timely and accurate
 - d) Customer Satisfaction
 - e) Energy and Demand Savings –Meeting goals

A4.2. Penalties for Callable Resources

- Penalty rates shall be applied to any deficit of contracted capacity relief based upon the difference between the customer's Customer Baseline Load (CBL) assigned to each hour of the event period and its metered use in that hour.
- The CBL shall be calculated using 5 out of 10 days, where a customer's past usage is reviewed within a specified time window (up to 8 hours between the hours of 1:00 – 9:00 pm). Data is collected for 10 days and 5 of those days are used for the calculation. CBL is defined as the high 5 out of 10 days. The last 10 similar days are collected and then the lowest 5 load days of those 10 are dropped. That will leave the highest 5 out of the last 10 similar days for calculations.
- At PSEG Long Island's discretion, Load Reduction tests may be conducted prior to the beginning of the season to verify that the Respondent can meet the contracted load commitment.

A4.3. Penalties for Distributed Generation Resources

- Penalty rates shall be applied to any deficit of contracted capacity relief/delivery based upon metered data for each hour of the event period.

A5. VOLTAGE RIDE-THROUGH CAPABILITY (AS APPLICABLE)

- Any load reduction achieved using photovoltaic (PV) generation or electrical energy storage shall use inverters that have voltage ride-through capabilities compliant with California Public Utility Commission Electric Tariff Rule 21, Section H.1.a.(2) and Table H.1. Inverters shall be tested and certified by Underwriter’s Laboratory for compliance with these requirements.

A6. DESIRED LOCATION OF LOAD REDUCTION RESOURCES

- There is a greater benefit of Load Reduction located in the eastern portion of the South Fork than on the western portion. For the purposes of this RFP, the eastern portion is designated as anything east of Boundary A, defined below. The western portion is designated as anything between Boundary A and Boundary B.
 - a) **Boundary A** is a North – South line running through the intersection of Montauk Highway (Route 27) and Marlin Drive.
 - b) **Boundary B** is the area east of Tuckahoe Road, between Montauk Highway and Sunrise Highway (Route 27), and east of the golf courses located north of the intersection of Tuckahoe Road and Sunrise Highway (Route 27).

Figure A6-1: Boundary A

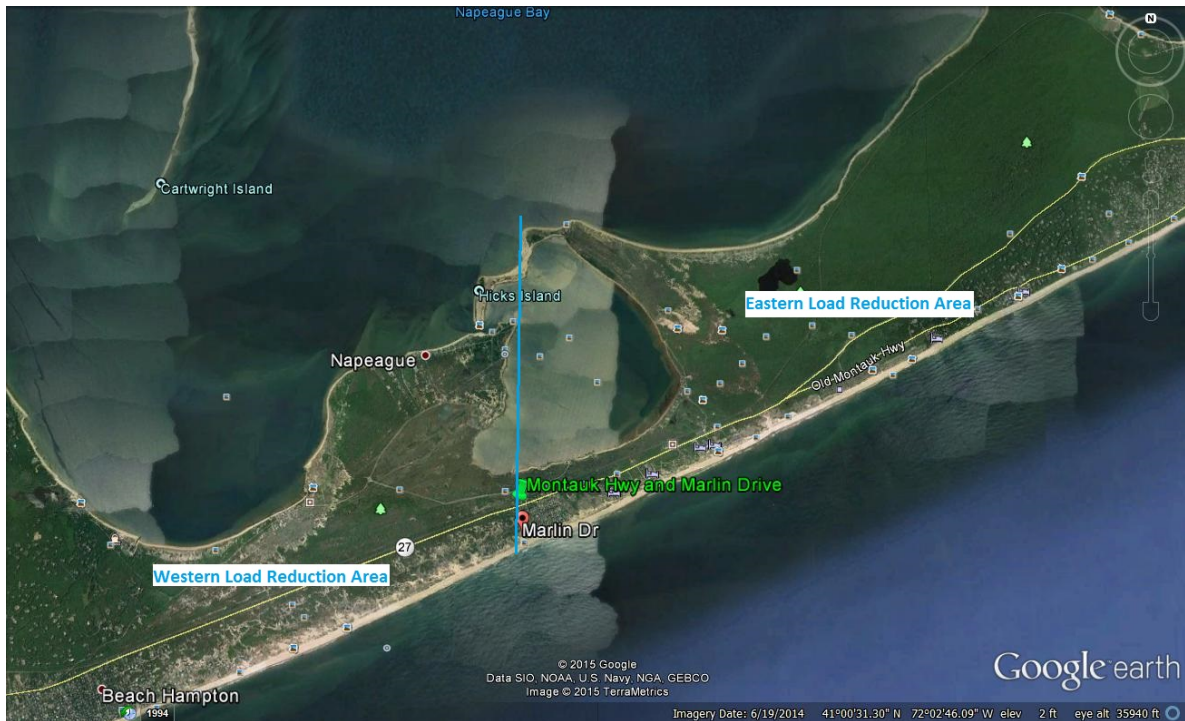
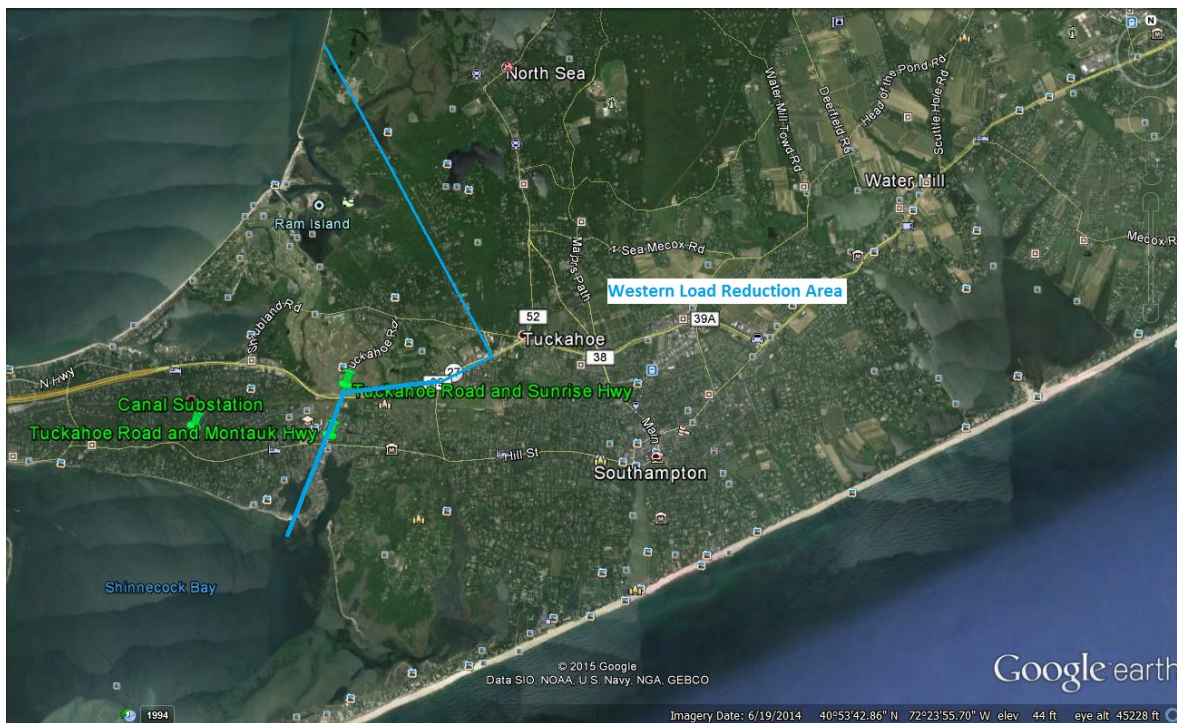


Figure A6-2: Boundary B



APPENDIX B: POWER PRODUCTION SPECIFICATIONS & OTHER

B1. POWER PRODUCTION RESOURCES

This RFP expects that Power Production resources will comprise of one or more of the following:

- a) Conventional generating units, without any other major power-producing component, using a fuel-based prime mover coupled to a synchronous generator. Synchronous generators may be configured to operate as a synchronous condenser when the generator is not dispatched to provide real (active) power.
- b) Generating units, other than as described in Section B1(a), above. (e.g., a resource that produces direct current and is interconnected to the T&D System via an inverter).
- c) Electrical energy storage devices, interconnected to the T&D System via inverters.
- d) Synchronous condensers.

Proposals including additional or alternative technologies will be considered. These will be evaluated against the objectives of the 2015 SF RFP by adaptation of the specifications contained herein to the particular characteristics of the alternative technology proposed.

B2. APPLICABLE RULES AND STANDARDS

B2.1. NYISO and LIPA Interconnection Rules

All proposed facilities must adhere to the NYISO's Large Generator Interconnection Procedures, NYISO's Small Generator Interconnection Procedures, and LIPA's Small Generator Interconnection Procedures, as applicable. Respondents are encouraged to seek information about potential interconnection points in accordance with LIPA's interconnection procedures, which are available on the RFP website. For further information on interconnection requirements, Respondents should contact Steve Cantore of PSEG Long Island's Power Asset Management Department, Phone (516) 949-8295, E-mail: Stephen.Cantore@PSEG.COM.

B2.2. NPCC Standards

All devices (including generators and storage hardware) that produce power must meet the requirements of NPCC Reliability Reference Directory #12, Under-frequency Load Shedding Program Requirements, including Figure 1 (Standards for setting under

frequency trip protection for generators). A copy of this directory is included on the RFP website.

B3. SYSTEM DISPATCH AND BIDDING

Power Production resources will be bid into the NYISO by PSEG Energy Resources and Trade (ER&T). Respondent shall provide all information required to allow PSEG ER&T to bid the plant in and must agree to provide all information required by the NYISO. Respondent shall operate the plant in a manner that complies with NYISO rules and requirements.

B4. LOCATIONAL REQUIREMENTS AND INFORMATION

B4.1. Storm-Resistant Location and Facilities

Power Production resources and interconnection facilities must be designed to withstand 130 mph winds and to elevate equipment to accommodate updated 1-in-500 year flood zones.

B4.2. Site Control

Power Production resources shall be located on sites controlled by Respondent through either fee ownership, land leases, options to lease or purchase, or equivalent demonstration of site control. Respondent shall provide evidence of such site control or its plan to obtain site control in its proposal. All Respondents are responsible for seeking such site control from third parties.

B4.3. Resource Interconnection Point

Power Production resources shall be interconnected to the transmission System at the East Hampton 69 kV bus or at the Montauk 23 kV substation bus (Points of Interconnection).

B4.4. Fuel Supply

Where applicable, proposals shall include all fuel-related delivery and storage infrastructure. Natural gas delivery infrastructure is extremely limited in the East End area, particularly on the South Fork. Respondents must also provide all liquid (e.g., oil) fuel commodity and transportation. For electrical energy storage devices, respondents shall provide all electrical interconnection infrastructure required for power production and charging according to Section B13. Respondents may rely upon LIPA to procure electricity for charging storage devices.

B4.5. Environmental Conditions

The environmental conditions used for design and performance calculations shall be no less severe than the values listed in Table B4-1.

Table B4-1: Assumed Environmental Conditions

Environmental Conditions	
Category	Requirements
Maximum ambient dry-bulb temperature	105 degree-F
Maximum ambient wet-bulb temperature	80 degree-F
Minimum ambient air temperature	20 degree-F
Maximum daily average ambient air temperature	90 degree-F
Minimum daily average ambient air temperature	10 degree-F
Maximum relative humidity	100 %
Minimum relative humidity	10 %
Average annual rain fall	45 inch
Extreme rain fall	3 in/hr
Ice loading conditions	¾ inch
Maximum ground snow depth	24 inch
Maximum frost depth	3 feet
Maximum steady wind velocity (NESC Heavy)	130 mph (165 mph 3 second gusts)
Flood Preparation (Design)	Ability to withstand one (1) in five hundred (500) years Flood Zone concerns
Keraunic level (number of thunderstorm days per year)	30 days/year
Contamination level	SALT LADEN Atmosphere within

	1000 Feet of ocean and seaways (HEAVY per IEEE C57-19-100, Section 9.1.1 Table 1)
Seismic Data	New York State Building Code Z = 0.18 (The Z numerically corresponds to effective peak acceleration in g on rock/stiff soil S1 conditions - shear wave velocities of about 2,500 ft./sec.)

B5. ELECTRICAL SYSTEM CHARACTERISTICS

The following describes the system electrical characteristics at the Points of Interconnection, when the South Fork system is interconnected with the greater T&D System. Conditions when the South Fork system is isolated from the remainder of the T&D System are largely under the control and influence of the Power Production resource and requirements and load characteristics pertinent to optional Isolated Mode operation are provided later in Section B6.3.

B5.1. Existing Short-Circuit Current

The existing short-circuit current capacities at the East Hampton 69 kV and Montauk 23 kV buses (default Points of Interconnection) are provided in Table B5-1. Ultimate short-circuit capacity is the value to be used for substation design short-circuit withstand calculations and switchgear rating. Maximum capacity is the short-circuit level in the present system with all generation on Long Island in service. Minimum short-circuit capacities is the lowest level to be normally encountered, without any lines or transformers out of service. Minimum contingency level is the most severe line outage condition for which the Power Production resources are required to remain in unrestricted operation, while synchronized with the T&D System. When the South Fork system, or any sub-system, is isolated from the remainder of the T&D System, and the Power Production resource is the predominate generation source for the isolated system, the short-circuit current available at the Points of Interconnection, exclusive of the Power Production resource contributions, may be as low as zero.

Table B5-1: Short-Circuit Current Capacities at the Points of Interconnection

	East Hampton		Montauk	
	3-Phase	1-Phase	3-Phase	1-Phase
Ultimate	43 kA		43 kA	

Maximum	8.8 kA	6.7 kA	3.0 kA	2.1 kA
Minimum	5.1 kA	4.9 kA	2.7 kA	1.9 kA
Minimum contingency	1.9 kA	2.0 kA	1.6 kA	1.0 kA

B5.2. Steady-State Electrical Characteristics

The steady-state (continuous) electrical characteristics of the T&D System at the East Hampton 69 kV and Montauk 23 kV buses are specified in Table B5-2. Voltages are specified in per unit and percent of the nominal 69 kV or 23 kV voltage, respectively. Power Production resources shall operate without restriction over these ranges.

Table B5-2: Transmission System Steady-State Characteristics

System Parameters		Values
Continuous ac system voltage range		0.95-1.05 p.u.
Maximum negative-sequence voltage component		2 % of nominal voltage
Maximum zero-sequence voltage component		1 % of nominal voltage
Ambient voltage distortion	2 nd harmonic	1.0%
	3 rd harmonic	0.6%
	4 th harmonic	0.6%
	5 th harmonic	3.5%
	7 th harmonic	2.0%
	6 th , 8 th , 9 th , 10 th 12 th harmonic	0.3%
	11 th , 13 th harmonic	0.5%
	Harmonics n > 13	0.2%
	Total Harmonic Distortion	4.0%
Nominal frequency		60.0 Hz
Normal system frequency range		59.95 – 60.05 Hz

B5.3. Temporary Voltages and Frequencies

System disturbances can cause the voltage and frequency of the T&D System to go outside the steady-state ranges specified in Table B5-2. For the temporary operating conditions specified in Table B5-3, Power Production resources shall be designed to withstand these conditions without damage or loss of availability, and shall remain functional.

Table B5-3: Transmission System Temporary Conditions

System Parameters	Values
Temporary voltage range, up to four hour duration (positive sequence component)	0.90 to 1.10 p.u. of nominal voltage
Short-term voltage range (positive sequence component)	(See Figure B5-1)
Maximum short-term negative sequence	(See Figure B5-2)
Temporary frequency excursions	(See Figure B5-3)
Maximum rate of change for frequency – df/dt	0.25 Hz per second

Figure B5-1: Short-Term Positive Sequence Voltage Range

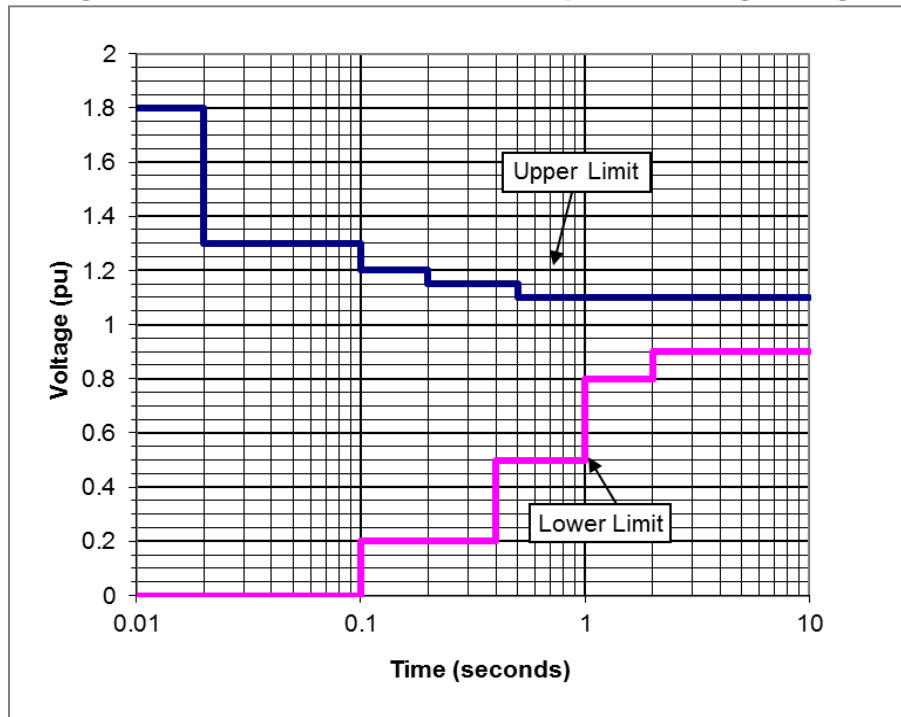


Figure B5-2: Maximum Short-Term Negative Sequence Voltage Component

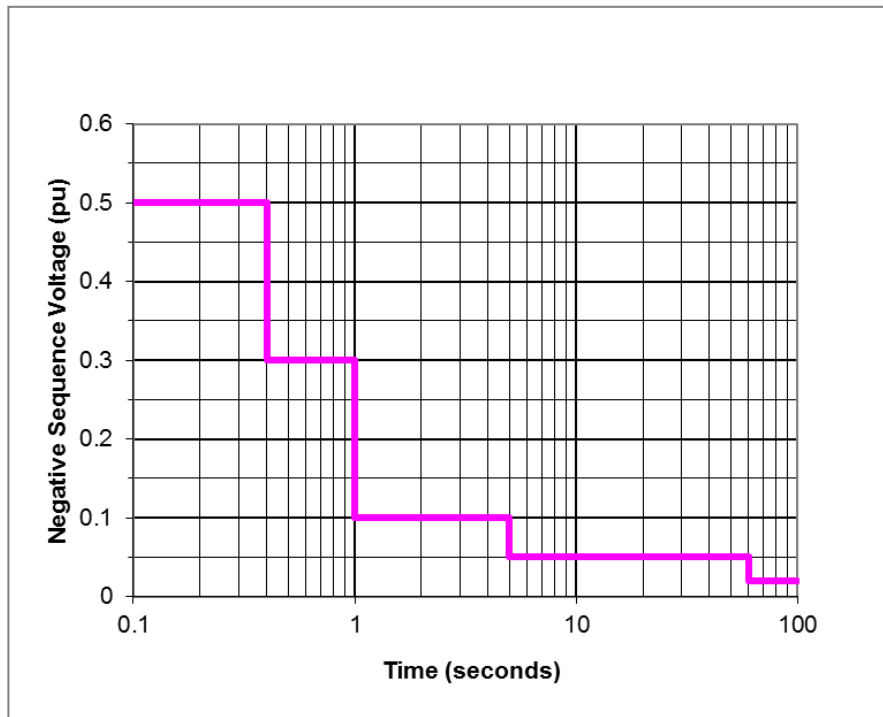
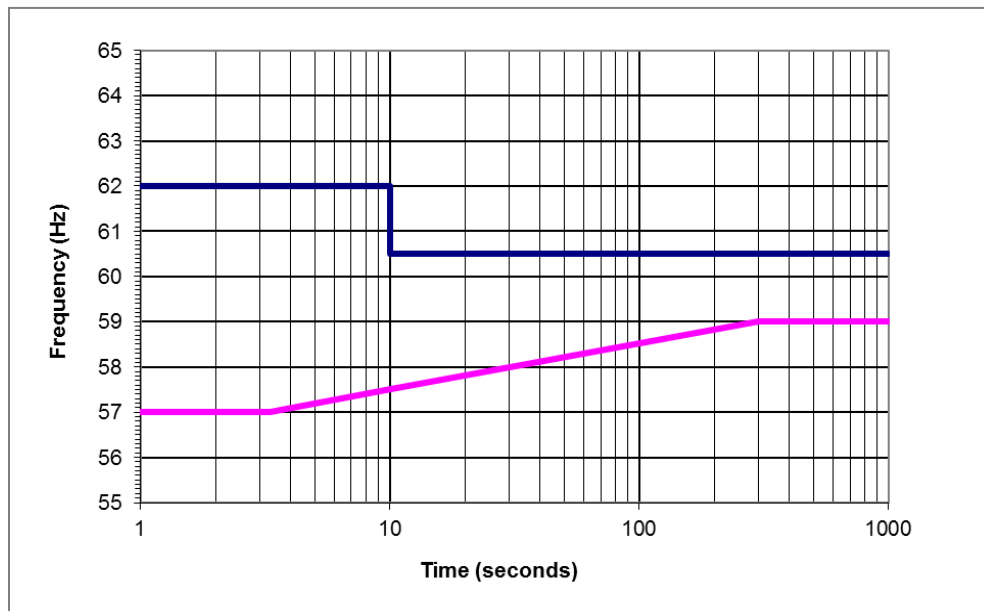


Figure B5-3: Maximum Temporary Frequency Deviation



B5.4. Fault Clearing Times

The fault clearing times for the 69 kV and 23 kV transmission systems in the South Fork area are provided in Table B5-4. The primary clearing time is the sum of the time required for relay reaction to the initial fault condition and the local breaker clearing time. The backup clearing time is the duration of the primary relay breaker failure timer and the backup breaker clearing time.

Table B5-4: South Fork Transmission System Fault Clearing and Reclose Delay Times

Voltage Level	69 kV	23 kV
Primary clearing	7 cycles	7 cycles
Backup clearing	22 cycles	27 cycles
Reclose delay	0.5 to 2.0 seconds	0.5 to 2.0 seconds

B5.5. Existing Transmission-Connected Power Electronic Systems

Certain large power electronic conversion based facilities are connected to the T&D System. Each of these facilities has controls that pose a potential for interaction with the controls of the proposed Power Production resource. Summary descriptions of the facilities in close proximity to the South Fork are provided below.

B5.5.1. D-VAR at East Hampton

A D-VAR, a type of STATCOM supplied by American Superconductor, is located at the East Hampton substation. The D-VAR is interconnected to the 13 kV distribution bus via four 480V-13kV pad-mounted transformers and a breaker. The D-VAR unit has +/- 8MVAR capability in continuous mode and a +/- 24MVAR capability for up to 2 seconds in contingency mode. This device uses a pulse-width modulated voltage-source converter. The present operating mode of the D-VAR device is such that it is idle during normal voltage conditions and only responds to severe voltage deviations to regulate the East Hampton 69 kV bus voltage. The device is programmed with an upper and lower limit defining the nominal 69kV bus voltage band. Currently the upper limit is 1.05 p.u. and the lower limit is 0.949 p.u. If the 69kV bus voltage goes outside of this nominal band, the D-VAR either injects or absorbs VARs to bring the 69kV voltage back within the band. The limits are chosen so as to not require any output from the D-VAR during steady-state conditions. The more severe the voltage variation from the defined band, the greater is the output of the D-VAR (up to the full +/- 24MVAR overload capability). The slope setting is 2%. The response time will depend on a combination of numerous factors such as the actual fault conditions, the voltage sag, system strength, fault duration etc. The overall system speed of response is carefully tuned to properly

respond to the system disturbance (e.g., fault conditions: single phase, phase to phase, and three phase) in a manner that is safe and stable.

B5.5.2. Canal Substation DRSS

A Dynamic Reactive Support System (DRSS) supplied by American Superconductor is in operation connected to the 69kV bus at Canal. The DRSS consists of nine D-VARs (variation of STATCOM) which are connected to the 69kV bus via five 480V-13kV transformers through a 13kV/69 KV 33MVA transformer and a breaker, as well as four 36 MVAR switched shunt capacitor banks connected to the 69kV bus. The DRSS unit has +180/-36 MVAR capability in continuous mode and a +240/-96 MVAR capability for up to two seconds in contingency mode. Current operating plans call for the DRSS device to be only operated in contingency mode to respond to severe system events. The device is programmed with an upper and lower limit defining the nominal 69kV bus voltage band. Currently the upper limit is 1.05 p.u. and the lower limit is 0.90 p.u. If the 69kV bus voltage goes outside of this nominal band, the DRSS either injects or absorbs VARs to bring the 69kV voltage back within the band. The limits are chosen so as to not require any output from the DRSS during steady-state conditions. The more severe the voltage variation from the defined band, the greater is the output of the DRSS (up to the full + 240/-96 MVAR overload capability). The system control allows the D-VAR portion of the DRSS to initially respond to changes in system voltage that bring the Canal 69kV bus voltage outside the nominal band. Capacitors are then switched as needed as commanded by the control system. The slope setting is 2%. The response time will depend on a combination of numerous factors such as the actual fault conditions, the voltage sag, system strength, fault duration etc. The overall system speed of response is carefully tuned to properly respond to the system disturbance (e.g. fault conditions, single phase, phase to phase, and three phase) in a manner that is safe and stable. Response time can be in the order of sub-cycle to cycles.

B6. OPERATING MODES

There are two operating modes (i.e., Standby Mode and Transmission Support Mode) required of Power Production resources and one optional mode (i.e. Isolated Mode) that a Respondent may choose to offer.

B6.1. Standby Mode

In the Standby Mode, Power Production resources shall be connected to the T&D System and shall be able to respond to degradation in transmission capacity to the area by the delivery of power output and voltage support.

The power output of each Power Production resource, while in the Standby Mode, is dependent on the technical capabilities of the Power Production resource to achieve the pre-determined power level within the time constraints specified in this RFP. There are three allowable Standby Mode operating strategies that may be used. Respondents shall indicate in their proposal the Power Production resource operating strategy that will be used while in the Standby Mode.

B6.1.1. Standby Mode Option 1

In Standby Mode Option 1, each Power Production resource shall be dispatched such that the net power flow over the T&D System into the South Fork subarea, to which the Power Production resource is connected, is less than the capacity of the T&D System with the most constraining single- or double-circuit outage contingency (security-constrained dispatch).

PSEG Long Island's evaluation of proposals selecting this option will consider the differential costs of the out-of-merit generation from 2019 until 2030. For purposes of evaluation, the number of hours for which the Standby Mode will be implemented in 2019 is projected to be 688 hours, with Power Production resources at East Hampton producing 18,497 MWh per year. This utilization is expected to increase to 1520 hours and 51,356 MWh per year by 2030. Likewise, Standby Mode for Power Production resources at Montauk is projected to be 124 hours in 2019, producing 344 MWh per year. By 2030, it is expected that Power Production resources at Montauk will be in Standby Mode for 751 hours with an expected annual power production of 4,921 MWh per year.

B6.1.2. Standby Mode Option 2

An alternative operating strategy is for each Power Production resource to operate in the Standby Mode at zero power output with the capability to immediately ramp to a predetermined power output level that eliminates overloads of the T&D System to or within the South Fork load area upon a trigger signal provided to the Power Production resource. Any Power Production resource proposed to operate in this manner in the Standby Mode shall have the capability to ramp to the rated capacity of the Power Production resource in five minutes.

The trigger signal shall be provided by PSEG Long Island. At any time, PSEG Long Island may require the Power Production resource to operate continuously at a security-constrained dispatch level, as in Standby Mode Option 1, such that a trigger signal shall not be required or is unavailable.

B6.1.3. Standby Mode Option 3

In this option, each Power Production resource will operate in the Standby Mode at a non-zero power level less than the security-constrained level described in Standby Mode Option 1, with the capability to immediately ramp output when initiated by a trigger to a predetermined level that eliminates overloads of the T&D System to, or within, the South Fork load area. Proposed Power Production resources using this option shall be capable of ramping output from the standby level to the rated capacity in less than five minutes.

The trigger signal shall be provided by PSEG Long Island. At any time, PSEG Long Island may require Power Production resources to operate continuously at a security-constrained dispatch level, as in Standby Mode Option 1, such that a trigger signal shall not be required or is unavailable.

The differential power production costs described for Standby Mode Option 1 will be considered in the evaluation of proposals electing this hybrid option.

B6.2. Transmission Support Mode

In the Transmission Support Mode, each Power Production resource will deliver power as dispatched by PSEG Long Island and will regulate the voltage at the point of interconnection. In this mode, the Power Production resource remains synchronized to the greater T&D System, although the electrical impedence between the South Fork system and the remainder of the transmission network may be relatively large.

B6.3. Isolated Mode (Optional)

In the optional Isolated Mode of operation, the South Fork power system and the Power Production resource will be separated from, and asynchronous with, the greater T&D System. The Power Production resource will be the predominate generation source in the isolated systems while in this mode, with only small distributed generation potentially connected to the isolated systems in addition to the Power Production resource. Power Production resources are not intended to be operated synchronized together. They will be operated independently to support separate isolated systems. Each Power Production resource will control the frequency of its sub-system in the isolated mode, delivering power as necessary to hold frequency within limits established in this RFP, within the limits of the Power Production resource rated power capacity.

B7. CAPACITY**B7.1. Site Continuous Power Capacity**

Capacity is needed at each of the two Power Production sites. Respondents may provide proposals for one or both Power Production sites. However, proposals for both Power Production resource sites shall provide the flexibility to select one project and not select the other. Each Power Production resource shall have a net power capacity, measured at the Point of Interconnection, within the range specified in Table B7-1. The current analysis indicates that the optimal procurement would secure approximately 63 MW of capacity between the two sites. However, this optimum may change during the evaluation period if load growth is different than projected, current Load Reduction programs under or over perform, Load Reduction proposals in response to this RFP prove to be attractive, or if some of the Feed-In Tariffs projects selected for the South Fork are not built. The following conditions must be met by the Power Production resource proposals:

- a) At Montauk, the minimum capacity at the site shall be 15 MW and the maximum capacity shall be 30 MW.
- b) For the Montauk site operating under Standby Mode Option 1, there shall be at least two independent units. The ratings of the individual units shall be such that no single unit shall exceed 72% of the total Power Production resource site capacity, and the remaining capacity with the largest unit unavailable (n-1

capacity) shall be greater than 7 MW. For reliability, multiple units that are required to meet the total capacity requirements shall be interconnected to the substation bus through separate interconnections, with each unit having its own transformer, switchgear, and interconnection line. The Power Production resource and the interconnection to the substation at Montauk, shall be designed to avoid the potential for common-mode tripping of capacity greater than this specified maximum individual Power Production unit rating.

- c) The energy capability of the Power Production resource at Montauk shall be equal to the rated capacity of the Power Production resource times 40 hours, without recharging of any manner from the power system.
- d) At East Hampton, the minimum capacity at the site shall be 33 MW and the maximum capacity shall be 48 MW.
- e) At East Hampton, there can be one unit or multiple independent units.
- f) The energy capability of the Power Production resource at East Hampton shall be equal to the rated capacity of the Power Production resource times 60 hours, without recharging of any manner from the power system.

Batteries/energy storage are acceptable responses to this RFP. Energy storage may be proposed as a peak shaving device under the load reduction application (Appendix A). For energy storage as a power producing source, it does need to comply with these technical requirements to support the PSEG Long Island system and criteria. Energy storage can also be a viable solution if coupled with another technology or contain a recharging source.

For Power Production resources designed to operate according to Standby Mode Options 2 or 3, as described in Section B6.1, the durations of operation in the Transmission Support Mode, following triggering, may extend as long as 72 hours for the East Hampton Power Production resource, and 120 hours for the Montauk Power Production resource, with energy required over this period as described in (c.) and (f.) above. For Power Production resources using fuel-based generation, the Respondent's fuel storage and fuel delivery logistics plans shall be based on supply of this amount of energy. For Power Production resources using energy storage, the energy amounts shown in Table B7-1 shall be available without any recharging from the T&D System.

These power capacity requirements apply when the voltage and frequency at the Points of Interconnection are within the normal ranges specified in Table B5-2. At voltage levels less than 0.95 p.u. of nominal, each Power Production resource shall be capable of delivering real current (current in phase with the voltage) equal to the real current required to deliver rated power at 0.95 p.u. voltage.

Table B7-1: Power Production Resource Capacities

	E. Hampton	Montauk
Site Power Capacity (MW) = P_{rating}	33 to 48	15 to 30

Unit Size Limits (% of Site Capacity) Applies only to units using operating mode 1	100%	72% providing the remaining capacity with the largest unit unavailable (n-1 capacity) shall be greater than 7 MW
Reactive Power – lagging (MVA _r)	0.31 * P _{rating}	31.5-1.1*P _{rating}
Reactive Power – leading (MVA _r)	0.31 * P _{rating}	0.31. * P _{rating}

B7.2. Reactive Power Capacity

Each Power Production resource shall have a continuous reactive power capacity, variable over the range between the lagging and leading values specified in Table B7-1 at all levels of real power, from zero up to and including the rated power capacity. This reactive power capacity shall be available at all times when in the Standby, Transmission Support, and optional Isolated modes.

For bids covering both Power Production resource locations in a joint proposal and Respondent elects to deviate from the capacities indicated in Table B7-1, according to the provisions of Section B7.1, the reactive capabilities shall be as follows:

- a. The leading reactive power capability of both the Power Production resource at Montauk and at East Hampton shall be 0.31 times the rated real power capacity.
- b. The lagging reactive power capability the Power Production resource at East Hampton shall be 0.31 times the rated real power capacity.
- c. The lagging reactive power capability of the Power Production resource at Montauk $Q_{lagging}$ shall be defined by the following formula:

$$Q_{lagging} = 31.5 - 1.1 \cdot P_{rating}$$

Where P_{rating} is the rated power capacity, in MW, of the Power Production resource at Montauk.

These reactive power capacity requirements apply when the voltage and frequency at the Points of Interconnection are within the normal ranges specified in Table B5-2. At voltage levels less than 0.95 p.u. of nominal, each Power Production resource shall be capable of delivering reactive current (current in quadrature with the voltage) equal to the reactive current required to deliver the specified reactive power capacity at 0.95 p.u. voltage.

Additional reactive power capability, rapidly applied, immediately following faults and other disturbances is beneficial to T&D System voltage recovery. Proposals offering short-term Power Production resource reactive capability greater than the minimum

values specified above, and having the dynamic capability to produce the reactive power rapidly, such as with high-response excitation systems, are preferred.

B8. AVAILABILITY

B8.1. Availability Definitions

The following definitions apply to each Power Production resource individually and independently:

- a) **Total Outage** – A condition where the Power Production resource completely lacks the ability to provide real and reactive power capacity to the T&D System, whether called upon to do so or not.
- b) **Partial Outage** – A condition where the Power Production resource real and reactive power capability is reduced or degraded from the capacities specified in this RFP, whether called upon to do so or not.
- c) **Relative Deration** – Is one minus the lesser of the ratio of available real power divided by the Power Production resource real power (MW) capacity required for the particular Power Production resource by this RFP, and the ratio of available reactive power divided by the Power Production resource reactive power (MVAR) capacity required for the particular Power Production resource by this RFP.
- d) **Declared Outage** – A total or partial outage reported to PSEG Long Island System Operations either prior to, or immediately after a degraded capacity condition occurs. An outage shall only be considered a declared outage if the declaration is provided to PSEG Long Island System Operations prior to any trigger, order, or request for the Power Production resource to operate in the Transmission Support Mode.
- e) **Undeclared Outage** – Any total or partial outage not meeting the definition of a Declared Outage.
- f) **Availability Measurement Period** – The times of day and months of the year for which availability is measured, as specified in this RFP.
- g) **Outage Duration** – The period of time, within the Availability Measurement Period, that a Power Production resource is in a state of outage. Periods of unavailability occurring outside of the Availability Measurement Period hours shall not be included. For Undeclared Outages, the Outage Duration shall be no less than the Minimum Undeclared Outage Duration.
- h) **Minimum Undeclared Outage Duration** – A penalty to availability metrics for inability to respond to a command to operate in the Transmission Support Mode, as an incentive to report availability status to PSEG Long Island System Operations in a timely manner. This is further described in Section B8.4.
- i) **Equivalent Outage Duration** – the product of the Relative Deration multiplied by the Outage Duration, for a Partial Outage. When an outage consists of different levels of Relative Deration, each level will be calculated as separate outages,

with the duration of each outage equal to the period of time that the Power Production resource's capacity is degraded to the particular Relative Deration. When a Partial Outage is also an Undeclared Outage, the Minimum Undeclared Outage Duration shall be applied once to each outage incident. In this case, the Equivalent Outage Duration is the timed-averaged Relative Deration times the Minimum Undeclared Outage Duration.

- j) **Annual Availability** – is the equivalent availability, including both total and partial outages and is defined as follows:

$$\left[1 - \frac{\sum \text{Equivalent Outage Duration hours per year}}{\sum \text{Annual hours in Availability Measurement Period}} \right] \times 100\%$$

B8.2. Availability Warrantee

The Respondent shall warrant at least 95% annual availability for each Power Production resource. The Respondent shall be assessed liquidated damages for failure to achieve the warranted availability. The Respondent and LIPA agree that due to the difficulty in precisely determining the cost to the LIPA for such deficiencies, the amount set forth represents a reasonable amount to compensate the Buyer for costs that will be incurred due to diminished system performance. The following liquidated damages for unavailability in excess of the warranted value will be assessed against the Respondent on an annual basis during the Contract period:

$$\$150,000 \times [\text{Warranted Availability} - \text{Actual Availability}]$$

Any liquidated damages shall be deducted from LIPA's payments to Respondent.

B8.3. Availability Measurement Period

Availability will be measured during the hours from 0900 to 2000 hours Eastern Daylight Savings Time each day in the months of May and September, and all hours of the day in the months of June, July, and August. There are a total of 2879 hours in the Availability Measurement Period of each year.

B8.4. Minimum Undeclared Outage Duration

The Minimum Undeclared Outage Duration for Total Outages and Partial Outages not immediately reported to PSEG Long Island Operations, prior to any trigger, order, or command to provide real or reactive power up to the specified capacity, as needed in the Transmission Support Mode, shall be the lesser of: 500 hours, or the total number of measured hours (as defined in Section B8.3) since the last successful production run.

B9. OPERATING MODE TRANSITIONS

B9.1. Standby to Transmission Support Mode Transition

Each Power Production resource shall be operated in the Standby Mode when directed by PSEG Long Island System Operations, according to the proposed operating strategy options described in Section B6.1. Direction to operate in the Standby Mode will normally be given when the forecasted or actual South Fork power demand exceeds the delivery capability of the T&D System, derated by the most constraining potential transmission outage (single or double-circuit),

B9.1.1. Transition for Standby Mode Option 1

The occurrence of the transmission contingencies requiring support from the Power Production resource will not require an immediate change to Power Production resource dispatched power levels, if operated according to Standby Mode Option 1. For this option, the configuration and output of the Power Production resource do not change for the transition from the Standby to the Transmission Support Mode, and thus the T&D System status will not be specifically communicated to the Power Production resource.

The security-constrained power output dispatch will be periodically updated by PSEG Long Island System Operations.

B9.1.2. Transition for Standby Mode Options 2 and 3

A transition to the Transmission Support Mode will be to a pre-determined power level, established and periodically updated by PSEG Long Island System Operations, where these options are utilized. During continued operation in the Transmission Support Mode, the Power Production resource will be dispatched by PSEG Long Island System Operations.

B9.2. Transition to (Optional) Isolated Mode

The normal transition to the optional Isolated Mode will be from a system outage (blackout) condition. Operation in the Isolated Mode will be as directed by T&D System Operations.

The Power Production resource shall not be required to autonomously detect disconnection of the South Fork system from the remainder of the T&D System (islanding), nor are there any requirements to maintain continuous and stable operation if such islanding should occur when operating in the Standby or Transmission Support Modes.

B9.3. Transition from Isolated to Transmission Support Modes

Transition from the optional Isolated Mode to the Transmission Support Mode requires resynchronization of the Power Production resource and the South Fork area system with the remainder of the T&D System. This resynchronization shall be directed by

PSEG Long Island and will be a manual process. PSEG Long Island will command small increases and decreases to the Power Production resource frequency control references via SCADA.

B9.4. Transition from Transmission Support to Standby Modes

B9.4.1. Resource Operating at Security-Constrained Preload (Standby Mode Option 1)

Power Production resources designed to operate in the Standby Mode at a security-constrained dispatch level, as described in Section B6.1, will continue to operate at the power level as dispatched by PSEG Long Island System Operations. There is no material difference in the Standby and Transmission Support Modes for Power Production resources using this operating strategy.

B9.4.2. Resource Using Fast-Ramping (Standby Mode Options 2 and 3)

Power Production resources designed to operate in the Standby Mode at a power level less than that required to eliminate transmission overload in the event of single- or double-circuit transmission contingencies, as described as Standby Mode Options 2 and 3 in Section B6.1, will ramp the power output to the Standby level at a rate prescribed by Section B6.1, when released from the Transmission Support Mode by PSEG Long Island System Operations.

B10. CONTROL SYSTEM AND OPERATIONS INTERFACE REQUIREMENTS

B10.1. Automatic Voltage Regulator

Each Power Production resource shall have an automatic voltage regulator that controls the reactive power output of the Power Production resource, and is capable of regulating the Point of Interconnection voltage to a reference magnitude with a droop function. The reference magnitude shall be adjustable to include at least the range of 95% to 105% of the nominal voltage, and the droop function adjustable between 2% and 10%. Voltage regulation reference magnitude and droop parameters shall be remotely controllable by dispatch.

The automatic voltage regulator shall be enabled, and the full reactive power capability as specified in Section B7.2 shall be available, when the Power Production resource is in the Standby and Transmission Support Modes. Voltage control while in the optional Isolated Mode is specified in Section B11.2.

B10.2. Frequency Regulation

Each Power Production resource shall have primary frequency response (governor) control capability, adjusting the Power Production resource's real power output in response to deviations in frequency from 60.0 Hz, with a droop function. The frequency droop shall be adjustable from 0% to 10% (percent frequency deviation causing a power reference change equal to the rated power).

During operation in the Transmission Support Mode, and in the Standby Mode if operated at a non-zero power level, the status and parameters of the primary frequency response (governor) controls shall be as specified by PSEG Long Island System Operations.

Frequency regulation in the optional Isolated Mode is specified in Section B11.2.1 of this Appendix.

B10.3. Power Production Resource Stability

B10.3.1. Transient Stability

Each Power Production resource shall maintain stable operation, without loss of synchronism, for any fault in the T&D System cleared normally, or by backup clearing, as specified in Section B5.4. Unsuccessful reclosing into a fault shall be considered normal clearing of initial fault.

B10.3.2. Oscillatory Behavior

The performance of each Power Production resource shall be stable and without poorly damped oscillations in real or reactive power output for any system condition yielding a short-circuit capacity equal or greater than the minimum post-contingency short-circuit capacity listed in Section B5.1 at the Points of Interconnection, when the Power Production resource remains interconnected with the remainder of the transmission system.

The performance of each Power Production resource shall be stable and without poorly damped oscillations in voltage or frequency for operation in the Isolated Mode.

The stability of the Power Production resource shall be independent of any signals communicated from remote locations.

B10.3.3. Interactions with Other Controls

Power Production resources shall not engage in or cause adverse or unstable interactions with other controls, including generator excitation controls, capacitor switching controls, and transformer tap changer controls, or other power electronic systems including other dynamic reactive support devices as described in Section B5-5 of this Appendix.

B10.4. EMS System Interface

B10.4.1. Remote Terminal Unit

Energy Management System interfaces (SCADA RTU) shall be provided by the Respondent, and shall be located at each Power Production resource site and interconnected with the Power Production resource controls to facilitate dispatch of the Power Production resource by the PSEG Long Island System Operator. Detailed RTU hardware requirements are specified in Section B13.4.

B10.4.2. System Operator Inputs

The following control inputs for each Power Production resource shall be available to the T&D System Operator via the SCADA interface:

- a) Initiation and deactivation of the Standby Mode
- b) Contingency power level, to be implemented on transition to the Transmission Support Mode.
- c) AVR voltage reference
- d) AVR voltage droop
- e) Frequency regulation setpoint
- f) Frequency regulation droop setting

B10.4.3. SCADA Monitoring Points

The following system states shall be measured and available for monitoring by the T&D System Operator via the SCADA interface:

- a) Point of Interconnection voltage
- b) Real power output
- c) Reactive power output
- d) Frequency
- e) Operating mode status
- f) Available on-site fuel and/or stored electrical energy

B10.4.4. Operator Human Interface

The human interface for the T&D System Operator will be via the EMS. Separate terminals, display units, or consoles for the Power Production resource will not be used.

B10.5. Transmission Support Mode Trigger

For a Power Production resource using Standby Mode Options 2 or 3, as described in Section B6.1, T&D System Operator will provide a trigger signal indicating degradation of the South Fork T&D System capacity, relative to the actual or predicted South Fork area load, thus triggering a transition of the Power Production resource from the Standby Mode to the Transmission Support Mode. This trigger will be separate from the EMS interface, and shall consist of a dry relay contact.

B11. SPECIAL REQUIREMENTS FOR ISOLATED OPERATION (OPTIONAL)

Operation of a Power Production resource as the predominate generation source in an isolated system (microgrid) requires characteristics and capabilities in the Isolated Mode

that are more rigorous than when operating in synchronism with the T&D System. These requirements only apply if the Respondent elects to offer Isolated Mode capability.

B11.1. Black Start Capability

The Power Production resource shall have the capability to start without any external source of electrical power.

B11.2. Controls for Isolated Operation

B11.2.1. Frequency Control

A frequency regulation function shall be enabled whenever a Power Production resource is operated in the Isolated Mode. The Power Production resource shall maintain frequency of the isolated system between 59.5 Hz and 60.3 Hz at all power levels from zero to the rated capacity of the Power Production resource. Transient frequency deviations shall not exceed these limits for greater than 0.1 seconds in response to abrupt changes in real (MW) load demand of up to 10% of the Power Production resource power capacity, and for reactive (MVAR) load demand of up to 20% of the Power Production resource reactive power capacity.

B11.2.2. Voltage Control

A voltage regulation function shall be enabled whenever a Power Production resource is operated in the Isolated Mode. The Power Production resource shall maintain the positive-sequence component of the Point of Interconnection steady-state bus voltage within the range of 100% to 105% of the nominal voltage. Transient voltage deviations shall not be above 110% of rated voltage, nor below 90% of the nominal voltage for greater than 0.8 seconds, and shall not be above 115% nor below 80% of the nominal voltage for greater than 0.1 seconds in response to abrupt changes in real (MW) load demand of up to 25% of the Power Production resource power capacity, and for abrupt reactive (MVAR) load demand changes of up to 25% of the Power Production resource reactive power capacity.

B11.3. Steady-State and Transient Loading

B11.3.1. Load Imbalance

Load imbalance during operation in the Isolated Mode may result in negative-sequence load current of up to 20% of the Power Production resource rating for an unlimited duration, and 50% of Power Production resource rating for up to two seconds. Each Power Production resource must withstand this current imbalance without deration of the positive-sequence load capacity.

The apparent negative-sequence impedance of the Power Production resource shall not result in Point of Interconnection voltage imbalance, as measured by the negative

sequence component, in excess of 5% of the nominal voltage for current imbalance not exceeding 20% of the Power Production resource rating.

B11.3.2. Harmonic Load Currents

The South Fork system has a mix of residential and small-commercial customer services that have a typical percentage of nonlinear loads that inject harmonic currents. The Power Production resource must absorb these harmonic currents, without deration of the fundamental-frequency real and reactive power capacity. Each Power Production resource, at Points of Interconnection, shall provide effective impedances $Z_{PowerProduction}(n)$ to harmonic load currents at each harmonic order n that are less than the following:

$$Z_{PowerProduction}(n) \leq 0.25 \cdot n \cdot \frac{V_{POI}^2}{S_{PowerProduction}}$$

Where V_{POI} is the nominal phase-to-phase rms voltage, in kV, at the Point of Interconnection (i.e., 69 kV or 23 kV), and $S_{PowerProduction}$ is the MVA rating of the Power Production resource.

B11.3.3. Non-Fundamental Inrush Current

Transformer energization and transformer inrush following fault clearing can generate high-magnitude current distortion. When operating in the Isolated Mode, a Power Production resource shall be capable of withstanding harmonic currents as great as 20% of Power Production resource current rating without tripping, while maintaining harmonic voltage distortion to less than 20% of nominal voltage.

B11.4. Disturbance Performance

B11.4.1. Fault Withstand

Each Power Production resource shall have the capability to withstand balanced and unbalanced faults having Power Production resource current contribution of up to two times the Power Production resource rated current for a duration of up to one second without tripping.

B11.4.2. Short-Circuit Current Capacity

In order to facilitate proper operation of protective relay systems in the South Fork system when operating in the Isolated and Transmission Support modes, the Power Production resource shall be capable of delivering symmetrical short-circuit current to three-phase and single-phase faults at the Point of Interconnection with the magnitudes and durations specified in Table B11-1. Single-phase fault current capacity is inclusive of the contributions of the Power Production resource interconnection transformer. The Power Production resource shall maintain an effective source impedance equal to the nominal line to ground voltage of the POI divided by the short-circuit current specified in Table B11-1, for a duration of 0.2 seconds, for fault conditions where the fault current

delivered by the Power Production resource is less than 200% of the Power Production resource's rated current capacity.

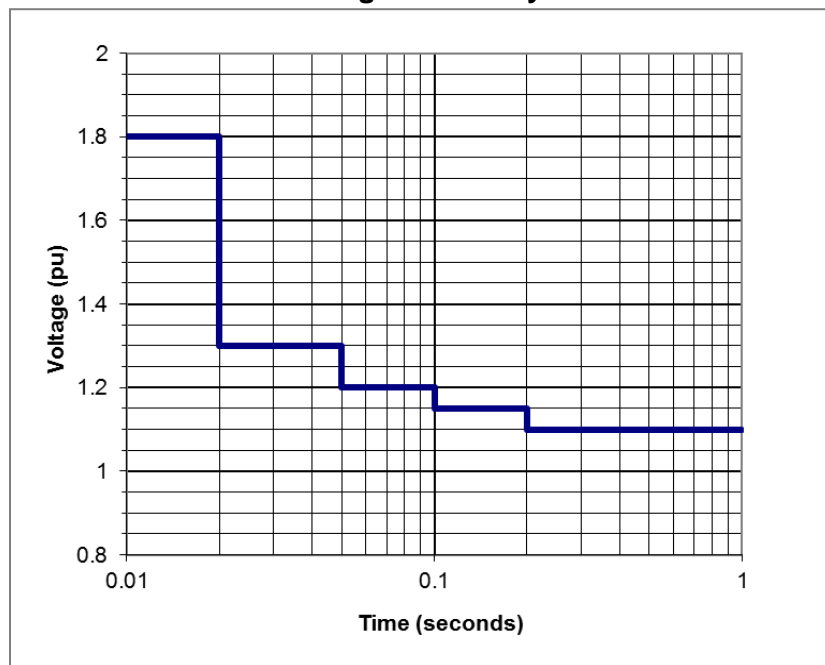
Table B11-1: Minimum Short-Circuit Capacities at Point of Interconnection (Optional Isolated Mode)

	E. Hampton	Montauk
Three-Phase Fault (kA)	6 kA	2.1 kA
Single-Phase Fault (kA)	6 kA	2.1 kA

B11.4.3. Temporary and Transient Overvoltages

The Power Production resource shall not cause transient or temporary overvoltages, inclusive of load rejection overvoltages, at any point on the T&D System that are more severe than the overvoltage envelope defined in Figure B11-1. The temporary voltage envelope for a given bus is defined as the plot of voltage versus time, for which the voltage value at any instant of time is the maximum instantaneous p.u. value of any phase-to-ground or phase-to-phase voltage magnitude (absolute value) during the preceding 16.6666 milliseconds. The crest voltage base for per-unitization of phase-to-ground voltages is 0.816 times the nominal line-to-line rms voltage, and the base for phase-to-phase voltage is 1.41 times the nominal line-to-line rms bus voltage. Overvoltage duration is defined as the total cumulative period of time that the TOV envelope is at or above the given magnitude as a result of a single initiating event.

Figure B11-1: Limits to overvoltage caused by Power Production Resource



B12. HARMONICS AND INTERFERENCE

The requirements specified here for harmonic and interference performance are applicable to all technologies. However, it will be presumed that a Power Production resource solution composed exclusively of synchronous machines will be compliant, and specific studies and testing will not be required. Proposals for Power Production resource solutions using power electronic conversion technology must specifically address this performance, at both the design and testing phases of implementation.

B12.1. Harmonic Performance Metrics

Each Power Production resource shall meet the following current and voltage harmonic performance metrics:

- a) Incremental voltage distortion, above the background voltage distortion level without the Power Production resource in operation, less than:
 - i. 1%, for any individual frequency.
 - ii. 3% for the root-sum-square of all harmonics (THD).
- b) A TIF factor of 35, defined as follows:

$$TIF = \sqrt{\sum_{n=2}^{n=50} \left(\frac{V_n}{V_1} \cdot 300 \cdot n \cdot C_n \right)^2}$$

Where C_n is the C-message weighting factor (Bell System Technical Reference 41009), and n represents the multiple of the fundamental frequency (harmonic order)

- c) Current distortion, exclusive of any currents due to background voltage distortion without the Power Production resource in operation, resulting in an IT product less than 10,000 A. The IT product is defined as:

$$IT = \sqrt{\sum_{n=2}^{n=50} (I_n \cdot 300 \cdot n \cdot C_n)^2}$$

- d) Although the formulae shown for IT and TIF assume that harmonics are integer multiples of the fundamental frequency, the voltage and current distortion specifications above are applicable to all frequency components above 60 Hz and less than or equal to 3 kHz. Interpolation of the weighting factors shall be used for non-integer harmonics.

B12.2. Radio Frequency Interference

The Respondent is responsible for any radio frequency interference radiated from the Power Production resource installations or the connection lines between the Power Production resource and the Points of Interconnection.

A Power Production resource shall not cause radio frequency noise to be radiated from any transmission line or substation that is of greater intensity than 200 uV/m measured at any point greater than 50' beyond the perimeter of any substation, or 50' from the centerline of any transmission line. Measurements of radio interference shall be in accordance with IEEE Standard 430-1986 (R1991), and made by instruments compliant with ANSI Standard C63.2-1996.

B13. DEVELOPER ATTACHMENT FACILITIES (DAF)

B13.1. DAF Interconnection Step-Up Transformer

B13.1.1. Winding Connection

The winding connection of each DAF interconnection transformer shall be such that the Power Production resource appears as an effectively grounded source as defined by IEEE Standard C62.92.1, considering the short-circuit contribution capability and unbalanced fault performance of the Power Production resource.

B13.1.2. Audible Noise

Transformer audible noise level shall be less than the lesser of noise levels established by local codes and ordinances, and 65 dBA.

B13.2. DAF Termination

Termination of each DAF within the substations shall be in accordance with the latest LIPA Interconnection Requirements – Transmission Interconnections, as appropriate to the nature and characteristics of the proposed Power Production resource technology. See <http://www.lipower.org/company/papers/interconnect.html>.

B13.3. Interconnection Circuit Breaker

An adequately-rated circuit breaker shall be installed between the Step-Up transformer(s) and the transmission line that terminates in the substation. PSEG Long Island shall have the ability to remotely trip this circuit breaker.

The interconnection breakers shall be owned, operated, and maintained by the Respondent.

B13.4. Communication Facilities and Interface

For SCADA communication, the LIPA standard is to use a Telvent, Sage 2400 type RTU. The RTUs at each Power Production resource will communicate with the Hicksville control room (via a Respondent-Procured Lease Line) using a Telenetics modem.

For any communication between the developers' control system to the RTUs, DNP 3.0 Serial 9600 N81 protocol shall be used. The data type should be integer not floating.

The Respondent shall provide a SCADA signal list to T&D System Operator.

Respondent will supply the appropriate amount of Digital Input, Digital Output, Status, Analog out, Analog input cards as needed to each RTU.

The RTUs are to be owned and maintained by the Respondent.

B13.5. Auxiliary Power

The primary source of auxiliary power for the Power Production resource shall be from the DAF or the energy produced or stored within the Power Production resource. The Respondent may procure a backup source of auxiliary power from the distribution system.

B14. INTERCONNECTION PROTECTION

B14.1. Protective Relays

Respondent shall provide all relaying necessary to protect the Power Production resource, their transformers, and their connection lines to the substations. Respondent shall ensure protection is properly coordinated with the interconnection facilities.

The Respondent's relays may transfer trip breakers at the interconnection substation, to the extent needed to provide backup protection. Respondent shall provide all necessary interfacing equipment. Protection system design shall ensure that the breakers are not operated outside of their ratings.

The latest requirements of the LIPA Control and Protection Requirements for Independent Power Producers – Transmission Interconnection for relaying and protection, appropriate to the nature and characteristics of the proposed Power Production resource technology, shall be met.

See <http://www.lipower.org/company/papers/interconnect.html>.

The Respondent shall provide reports, including diagrams, to describe the design of the protection systems, and these designs shall be subject to approval prior to design finalization.

If the Power Production resource site is not within a substation and its grounded and bonded area, Line Relaying will be required. Wired differential schemes will be considered with substations. SEL-311L and SEL-321 relays will be required at the substation and Power Production resource site.

Respondent shall be responsible for the installation, configuration, setting, testing, maintenance, and any future replacement of their protection and supervisory communication equipment.

B14.2. Recording and Monitoring Devices

A Digital Fault Recorder (DFR) and Sequence of Events Recorder (SER) shall be installed at each Power Production resource, and maintained in service, by the Respondent. As a minimum, each DFR shall record the following:

- a) Phase voltages at the interconnection voltage level.
- b) Phase currents at the interconnection voltage level.
- c) Real power and reactive power
- d) Operating mode

DFR recording triggers shall include, as a minimum:

- a) Decrease of any phase voltage below 0.9 p.u.
- b) Increase of any phase voltage above 1.10 p.u.
- c) Receipt of the PSEG Long Island-provided trigger to transition from the Standby to Transmission Support Modes, if Standby Mode Options 2 or 3, per Section B6.1, are elected.
- d) Breaker status change.

The event inputs for each SER shall be defined by the Respondent and reviewed by PSEG Long Island.

The DFRs and SERs shall be time stamped with an IRIG satellite clock.

DFR and SER recordings shall be retained by the Respondent for a minimum of sixty (60) days. At any time during this period, PSEG Long Island may request the recordings for a particular event or time period, and the Respondent shall deliver these recordings within seven (7) days of such request.

B15. METERING

The revenue metering requirements for each Power Production resource will be consistent with the latest applicable version of LIPA's Revenue Metering Requirements for Independent Power Producers.

<http://www.lipower.org/company/papers/interconnect.html>).

B16. POWER PRODUCTION RESOURCE MODELS

Power system simulation models, as specified in this section, shall be submitted to PSEG Long Island at least 180 days prior to any interconnection of the Power Production resource to the power system.

B16.1. Synchronous Machine Models

Models of each synchronous generator or synchronous condenser included in the Power Production resource solution shall be provided to PSEG Long Island in a form compatible with the PSS/E positive-sequence dynamic simulation software platform, Version 32.1.1, including excitation controls and governor controls.

B16.2. Power Converter Positive-Sequence Models

If any Power Production resource solution includes any inverters or other power electronic systems interfaced to the power system, a PSS/E model of the entire Power Production resource facility shall be provided to PSEG Long Island, representing the response of all elements including inverter and other power electronic systems. The model shall accurately represent the control characteristics and dynamic behavior of the Power Production resource, in response to balanced voltage and frequency disturbances, to the extent that such can be validly represented in this type of simulation platform (up to 5 Hz bandwidth in the synchronous reference frame). The model shall be validated for accurate representation of disturbances that are within the model's appropriate range of application, using a validated electromagnetic transient model or full-scale testing.

The delivered PSS/E model shall be implemented in Siemens PTI PSS/E dynamic simulation software, Version 32.1.1, and shall be fully documented. The model shall not be proprietary, and must be accessible to other utilities, system operators, asset owners, and other entities associated with the interconnected transmission network.

The PSS/E model shall be updated by the Respondent prior to any change to the Power Production resource controls or control parameters that materially affects the dynamic performance. The Respondent shall ensure compatibility of the provided PSS/E model with the version of PSS/E used by PSEG Long Island, as well as compatibility of the latest PSS/E version released by Siemens PTI. Upgrades and modification of the models to maintain compatibility with these PSS/E versions shall be the responsibility of the Respondent.

B16.3. Power Converter Electromagnetic Transient Models

For a Power Production resource using an inverter or other power electronic converter interfaced to the T&D System, the Respondent shall provide to PSEG Long Island an electromagnetic transients model, implemented in the PSCAD simulation software, Version 4.2 or later, that accurately represents the control characteristics and dynamic behavior of the Power Production resource in response to balanced and unbalanced voltage, phase, and frequency disturbances with up to a 1 kHz bandwidth of simulation validity. This model shall be provided to PSEG Long Island prior to the Power Production resource being placed into commercial operation.

The PSCAD model shall use the same power converter control software algorithms as used in the actual equipment, or a fully validated approximation of these controls that provides modeling fidelity across the specified simulation validity bandwidth.

An averaged power converter model may be substituted for a full switching model, provided the averaged model provides valid representation over the specified bandwidth and represents the interactions across the converter, between the AC and DC sides.

The Respondent must provide documentation establishing the validity of the model, such as comparisons between model results and full-scale test results for a sufficient range of tests.

The PSCAD model may be proprietary, and be bound by reasonable non-disclosure agreements. The model must be made available to LIPA, LIPA's agents and consultants, and any other party as directed by LIPA, provided that the party is not in direct competition with the Respondent or the Respondent's Power Production resource equipment manufacturer.

The PSCAD model may be provided in a compiled, "black box" form such that the details of the model are not disclosed. Information needed to utilize the model, however, must be adequately documented.

The PSCAD model shall be updated by the Respondent prior to any change to the Power Production resource controls or control parameters that materially affects the transient or dynamic performance.

The Respondent shall ensure compatibility of the provided PSCAD model with the version of PSCAD specified by PSEG Long Island. Upgrades and modification of the models to maintain compatibility with new PSCAD versions shall be the responsibility of the Respondent.

B16.4. Short-Circuit Characterization

For Power Production resource designs using any device that can produce a short-circuit contribution to the T&D System, other than a conventional synchronous machine, Respondents shall fully describe the current contributions of the proposed Power Production resource to near and remote faults. The short-circuit current contribution characterization shall include:

- a) Three-phase, single-phase, phase-to-phase, and double-phase to ground fault types.
- b) Characterization of fault current contributions in phase as well as sequence component formats.
- c) Indication of the phase angle of the current contribution relative to the residual voltage value at the Power Production resource terminals during the fault.
- d) Description of non-fundamental-frequency current components.
- e) Dynamic variations in the AC components of current contribution as well as decay of the dc component, if any.
- f) Guidance regarding the appropriate modeling of the Power Production resource in the Aspen One-Liner short circuit analysis program.

B17. DESIGN STUDIES

Respondent shall be responsible to perform the system and design studies necessary to demonstrate conformance of the design to the specification provided in this RFP, and compatibility with the characteristics of the T&D System. The depth and scope of these studies shall depend on the technical characteristics of the Power Production resource solution proposed. Protection coordination studies will be performed for all Power Production resource designs. For Power Production resource designs, including synchronous generators, the system studies shall include transient and dynamic stability analysis.

B17.1. Study Timing

All studies should be completed prior to ordering or construction of any equipment or facilities that may be affected by the results of the studies. Any advanced equipment ordering or facility construction, prior to completion and approval of studies, shall be at the sole risk of the Respondent. In no case shall the Power Production resource be energized or placed into operation prior to the acceptable completion of the specified studies.

B17.2. Study Data

PSEG Long Island shall provide T&D System data to the Respondent within thirty (30) business days of Respondent's data request. As a minimum, PSEG Long Island will provide the Respondent system data in the form of PSS/E load flow and dynamic databases, and an Aspen short-circuit database.

B17.3. Study Review

All design studies are subject to PSEG Long Island for review and comment.

- a) Detailed study scope and study model definitions shall be submitted for PSEG Long Island review prior to commencement of the studies.
- b) Draft study results shall be submitted to PSEG Long Island for review and comment before finalization.
- c) PSEG Long Island shall be provided a minimum of fifteen (15) working days to review each study plan or final study.
- d) Respondent shall make reasonable efforts to incorporate or act on PSEG Long Island's comments.
- e) PSEG Long Island shall be given the opportunity to witness any simulator demonstrations that are relevant to system performance.

B18. SYSTEM VERIFICATION AND TESTING

Respondent shall perform system verification and testing as necessary and prudent to demonstrate proper operation of the Power Production resource in conformance to these specifications. The testing program shall be described by the respondent in their proposal and the scope and content of this program will depend on the technical characteristics of the Power Production resource solution proposed. The testing program shall include field-testing in the T&D System and simulator or other testing as necessary. Field-testing shall not include any staged faults or other severe disturbances of the T&D System.

Respondent shall perform commissioning tests to verify the proper installation, connection, and functional performance of the Power Production resource including all control modes and protection systems.

- a) Detailed commissioning test plans and a preliminary test schedule shall be submitted to PSEG Long Island for review and approval sixty (60) calendar days prior to commencement of any commissioning tests that involve interconnection with the T&D System, exclusion of the provision of auxiliary power.
- b) PSEG Long Island will be promptly informed by the Respondent of any changes to the commissioning tests or schedule.
- c) PSEG Long Island shall be provided documentation of commissioning test results within thirty (30) days of the completion of commissioning.
- d) Any on-line testing will be coordinated through the T&D System Operator.

B19. TRAINING

Respondent will provide training for T&D System Operators that shall cover:

- a) Basic principles of operation
- b) Use of the system operator control interface
- c) Limitations of operation
- d) Contact information

Because T&D System operators work on a shift basis, not all operators requiring the specified training can be available at any one time. Therefore, at least two sessions of the specified training shall be provided.
