

BULK POWER ENERGY STORAGE PROCUREMENT OF SCHEDULING AND DISPATCH RIGHTS – REQUEST FOR PROPOSAL

National Grid

September 30, 2019

APPENDIX C3 – TECHNICAL INFORMATION

All Projects must meet NYISO requirements as defined in relevant NYISO tariffs¹ and National Grid’s Electricity Tariff – PSC No. 220 and applicable Electric Service Bulletins.²

Please provide the following Project information in the order requested. Indicate if a question is not applicable but do not leave responses blank. Please specify which of the four (4) identified locations the proposed energy storage project (“Project”) will be in sited and ensure that the proposed Project meets all location-specific system requirements (see Appendix E – Location and Use Cases). Please answer every question below for each Project the Bidder is proposing to site (if more than one).

PROJECT DESIGN

1. Provide a description and equipment specifications of the proposed Project, including storage modules, power converter, meters, communications equipment and protocols, disconnect devices, point of interconnection voltage, and any other related facilities necessary to interconnect the proposed Project to the National Grid distribution system.
2. Please provide information relating to the availability of, and Bidder’s access to, the equipment and components proposed / to be utilized for construction and operation of the Project, including procurement lead times.
3. Provide a list of the manufacturers of the storage system and major individual balance of plant equipment.³
4. Describe equipment standards and certifications for compliance, *i.e.*, International Electrical Code (“IEC”), National Electric Code (“NEC”), Institute of Electrical and Electronics Engineers (“IEEE”) etc. Also see safety-related standards in the Safety section below.
5. Specify how the Project’s design will meet new equipment and certification requirements of all relevant national, New York State, and local codes and standards, and any additional requirements of the local authority having jurisdiction (“AHJ”).
6. All components of each proposed Project including charge controllers, wiring, and metering equipment must be new equipment and certified as meeting the requirements of all relevant national, New York State, and local codes and standards, and any additional requirements of the local AHJ.
7. Physical size and footprint including preliminary site layout plan.

¹ Available at <https://www.nyiso.com/regulatory-viewer>

² Available at <https://www.nationalgridus.com/ProNet/Technical-Resources/Electric-Specifications>

³ Please note that Bidder Offers that include Huawei and/or ZTE technology or products will not be considered.

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8. Accurate and validated (preferably independently verified) performance characteristics of the proposed Project.
9. Describe how the energy storage system and components will comply with all manufacturers' installation requirements, applicable laws, regulations, codes, licensing, and permit requirements. This includes, but is not limited to, the New York State Environmental Quality Review Act ("SEQRA"); any applicable provisions of the New York State Environmental Conservation Law ("ECL") and New York State Department of Environmental Conservation ("NYSDEC") regulations pertaining to disposal; Article 10, if applicable; the International Building Code Series as amended by the New York State Uniform Code Supplement; the National Electrical Code® ("NEC"); Interconnection Standards; and all applicable State, city, town, or local ordinances or permit requirements, and any additional requirements of the local AHJ. It is the Winning Bidder's responsibility to ensure compliance with all such laws.

OPERATIONAL PARAMETERS

1. The energy storage equipment must consist of commercial products carrying a manufacturer warranty. The warranty must cover the entire energy storage system, including ancillary equipment and power electronics.
2. The Bidder's Offer must list any operational restrictions for each item listed in the Operating Information in the Appendix B - Offer Form as applicable and describe how they relate to warranty conditions.
3. Bidder Offer must describe how to comply with the testing and verification as described in Exhibit M of the Appendix D1 - ESSA.
4. Describe what capabilities will be in place for remote monitoring and control (e.g., equipment, communication means, and protocols used).
5. Describe what change management controls and procedures will be used to coordinate between National Grid and the Project owner regarding any changes to the Project.
6. Submit control schemes, electrical configurations, and description of any integrated control schemes in sufficient detail for National Grid to review and confirm acceptance of Bidder's Offer.
7. Will dispatchable capacity vary seasonally? If so, provide an example calculation of the net power to the grid downstream of system and step-up transformer losses for both a typical winter and summer day.
8. Provide the active and reactive power capability curve of the Project.
9. Provide a description of the communications and control architecture along with any diagrams as applicable for the Project.
10. Describe and estimate what the ancillary loads are expected during operation including losses.
11. Specify how the Project's ancillary load will be supplied during a power outage to the Project interconnection (i.e., ability to self-supply or requires a separate service).

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12. Describe the available and expected states of the power conversion systems, and the applicable steps and timing (warmup, synch, voltage ramp, etc. as applicable) for transition from such states to a normal distribution-connected mode supplying active or reactive power services.
13. Measurement and verification (“M&V”) capabilities.
14. Ability of the Project to directly integrate with National Grid’s EMS/ADMS systems.
15. Bidder shall provide a supply list of alarms, definitions of each, severity level, response, and correction.

MAINTENANCE PRACTICES

1. Provide a copy of all original equipment manufacturer warranties, suggested maintenance schedules, and spec sheets.
2. Provide a description of the expected Operating Life of the Project including any inverter equipment and the long-term replacement or shuffle (*e.g.*, augmentation) plan.
3. Provide a description of how the Bidder will maintain the MW and MWh ratings of the Project during the Term of the ESSA.
4. Provide any information regarding planned or forced outage rates based on manufacturer’s recommendation and experience.
5. Provide a description of how the Bidder will provide operational and/or maintenance onsite and remote support in real time (*e.g.*, via an operating center with 24x7x365 support).

SAFETY

1. Provide the following documentation for the Bidder and associated contractors for the previous three (3) years (*i.e.*, 2016-2018):
 - a. Occupational Safety and Health Administration (“OSHA”) 300 Form;
 - b. Signed copies of the OSHA 300A Form; and
 - c. Experience Modification Rate, preferably via a letter from the Bidder’s insurance company.
2. Provide the following information for the Project:
 - a. Health and Safety Plan; and
 - b. Site-specific Health and Safety Plan.
3. Provide an outreach plan to educate and inform the local AHJ and emergency services including local fire departments.
4. Additional safety requirements shall include, but not be limited to the following at the cost of the Bidder:
 - a. Compliance with National Grid safety standards per Appendix I.
 - b. Compliance with the following standards and certified by a Nationally Recognized Testing Laboratory (“NRTL”), at a minimum: UL 9540, UL 9540-A (provide a specific action plan of both automated and manual measures to mitigate a thermal runaway event), National

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Fire Protection Association (“NFPA”) 855, National Grid’s ESB No. 756, UL 1973 (Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail Applications), UL 1642 (Standard for Lithium Batteries), UL 1741 or UL 62109 (inverters and power converters), IFC 2021 NY Department of State, Division of Building Standards & Codes – 2019 Energy Storage System Supplement. These listings must be received before the Project enters commercial operation. In all cases Projects must satisfy the requirements of the local AHJ. A field evaluation may also be conducted by a NRTL to the applicable product safety standard(s).

- c. Installation of fire suppression systems, which shall remain operational at all times and be tested regularly; and c) connection of fire alarms to National Grid.