

PSE&G Solar 4 All Program Solicitation

Photovoltaic Generating Stations on Third Party Host Sites

Additional Requirements, Instructions and Information

1. Project Definitions

“AC” shall mean Alternating Current

“CEC” shall mean California Energy Commission

“DC” shall mean Direct Current

“kW” shall mean a measure of instantaneous power as measured in kilowatts

“kWh” shall mean kilowatt-hours

“NEC” shall mean the National Electrical Code

“Planning Period” shall mean the PJM Planning Period defined as the annual period each year spanning June 1st through May 31st.

“PSE&G” shall mean Public Service Electric and Company or an affiliate thereof.

“PV Solar Systems” shall mean all equipment and components of the PV Solar System up to and including the Photovoltaic panels, DC wiring, DC conduits and raceways, DC Distribution Panel, Inverters, AC wiring, AC conduits and raceways 120/208 volt AC panels and/or necessary switchgear to interconnect to the utility distribution system.

“Site” means the parcel of real property on which the Facility will be constructed and located, including any easements, rights of way, surface use agreements and other interests or rights in real estate reasonably necessary for the construction, operation and maintenance of the Facility.

“STC” shall mean Standard Test Conditions: 1,000w/m² insolation, cell temperature of 25°C; solar spectral irradiance per ASTM E892 (Air Mass = 1.5)

“Proposer” shall mean the responder to this solicitation specification.

2. Interconnection to PSE&G Electric Distribution System

All installations shall be in compliance with any of the interconnection and equipment requirements contained herein and with the following requirements either attached or as referenced.

a. Plant Engineering Policies and Procedure (PEPP) manual (*this Manual can be accessed from the following WEB Site* http://psmanuals/web_pages/pepp.html)

1. Section 3 Underground Services (as applicable)
2. Section 5 Customer Equipment Requirements – Primary Service
3. Section 9 Non-Utility Generation (as applicable)

b. Information and Requirements for Electric Service (The Green Book)

Chapters 1 through 8 (As applicable) This can be accessed at http://www.pseg.com/customer/business/new_service/pdf/RequirementsElecSvc2005.pdf)

- c. PSE&G Interconnection Requirements for Small Scale Distributed Generation Equipment



efb_PSEG_Intercon_Std.pdf

- d. Systems connected to 13KV Distribution shall not exceed 5 MVA output balanced 3 phase 4 wire grounded Wye.
- e. Systems connected to 4KV Distribution shall not exceed 3 MVA output balanced 3 phase 4 wire grounded Wye.
- f. Systems connected to 26KV Sub transmission shall not exceed 20 MVA output balanced 3 phase 3 wire ungrounded Delta

3. General Engineering and Consulting Services

- a. Designs shall be such as to minimize the use of poured concrete foundations.
- b. Proposer shall arrange for all permitting and shall identify all applicable permits required for installation and operation of Solar Systems
- c. Final Proposer design package shall be stamped by a NJ Licensed Professional Engineer.
- d. Proposer shall furnish two (2) final "as-built" engineering design packages to PSE&G for record set purposes.
- e. Proposer shall support PSE&G with necessary design information needed for utility interconnection, and other information as needed.

4. Technical Services

- a. Field technical support during PV Solar System construction: one (1) full-time field engineer until final acceptance.
- b. Project turnover to PSE&G, including PSE&G training consisting of an eight (8) hour session for review of PV Solar System O&M procedures, and delivery of plant O&M documentation (if PSE&G does not exercise O&M option).

5. Engineering Design Package

Proposer shall develop a comprehensive Engineering Design Package. The package shall be submitted for local code compliance review and the format shall be acceptable to PSE&G. All drawings shall be created in Bentley MicroStation format version 08.05.02.27 (preferred) or AutoCAD format, revision 2004 or newer (if MicroStation can not be provided). PSE&G shall supply the blank drawing template. The Engineering Package shall include the following minimum items:

Solar-4-All – Segment 1B Solicitation – Additional Requirements, Instructions and Information

- a. Cover sheet
- b. Site plan
- c. Symbols, abbreviations and notes
- d. Structural plans, details and elevations
- e. General array layout
- f. Installation Details for the PV Solar System including mounting method and location of transformers, inverters and other equipment
- g. Electrical Single-Line Diagrams
- h. Series and Parallel String Wiring Diagrams
- i. Inverter installation plans and details
- j. Electrical details
- k. Grounding plans and details
- l. Equipment Cutsheets
- m. Footing / foundation / equipment support details.

6. Supporting Calculations

- a. Proposer shall provide structural calculations and details for Module Support Structure (racking), including detailed derivation of design load for wind and seismic loads
- b. DC and AC cabling and conduit sizing calculations
- c. Grounding system sizing calculations

7. Design Criteria

The PV Plant shall conform to all applicable building codes and standards including but not limited to allowable point and overall loads, and governing wind, snow and combined design load requirements. The following table provides additional design details:

Materials Specifications	Steel Design: IBC 2006 Chapter 22, Reference AISC 360 Aluminum Design: IBC 2006 Chapter 20, Reference Aluminum Design Manual
Environmental Conditions	The PV Plant shall be designed for outdoor exposure to weather and UV irradiation for a minimum of 20 years, in a temperature range of -40 °F (-40 °C) to 200 °F (93 °C). The site location shall not be classified as a corrosive or hazardous environment.
Design Wind Loads	As required by site Exposure Category, defined in ASCE/SEI 7-05 Chapter 6
Design Snow Loads	To be determined by Proposer's engineering evaluation and referencing applicable code.
Seismic and Stress Loads	The support system shall resist a maximum load combination (positive or negative) of 25 psf, based on Allowable Stress Design and also meet the design requirements of Seismic Site Class E, as defined in ASCE 7-05, Chapters 11,12,15.

7.1. Additional Design Criteria

- a. PV Solar Systems shall have a minimum design life of 20 years.
- b. PV Solar Systems shall be designed for fully automatic, unmanned operation and shall include appropriate communications for monitoring system output.
- c. PV Solar System shall be designed and manufactured for high reliability and maintainability.
- d. PV Solar System electrical design will be NEC compliant and 2007 NESC – National Electric Safety Code compliant.

8. Codes, Permitting, Regulations and Standards

Proposer shall design the PV Solar System in accordance with all applicable federal, state, and local laws, codes regulations, and standards. The codes and standards utilized shall be the latest editions in effect at the project start date.

Where these codes do not govern specific features of the equipment or system, Industry standards, Original Equipment Manufacturer (OEM) specifications shall be applied. Where local codes or ordinances will have an impact on the design, PSE&G and Proposer shall jointly address these with the local authorities having jurisdiction.

Applicable Codes and Standards

- Uniform Construction Code
- 2005 NEC
- 2005 National Electrical Testing Association
- Occupational Safety and Health Act (OSHA)
- UL – Underwriters Laboratory
- IEC – International Electrotechnical Commission
- 2007 NESC National Electrical Safety Code

9. PV Solar Systems Equipment

Proposer shall provide the following equipment along with specifications to be used for each Program Segment. Specifications shall include but not be limited to equipment manufacturer, model number, quantity and footprint of the equipment, warranty information (inverters, transformers and switchgear) and cost of each item. Specific equipment is listed below per Segment. Please include and list any additional equipment required for your design not listed in this section.

Proposer shall provide all required PV Solar System Equipment to meet the following general equipment requirements and requirements for PV modules, module support structure, DC wiring harnesses, DC fused combiner boxes, disconnect switches, inverters, and inverter isolation transformers.

9.1. General Equipment Requirements

- a. Hardware must be selected based upon a minimum 20-year system design life.
- b. Exposed metallic components shall be corrosion resistant, stainless steel, hot dipped galvanized steel or aluminum.
- c. Electrical components shall be designed for 600 volts AC Class or greater.
- d. All electrical equipment shall be rated for at least 125% of the current necessary for the application.
- e. All non-metallic exposed materials shall be sunlight and UV resistant.
- f. All materials shall be designed to withstand the temperatures to which they are exposed.
- g. The design for ground mounted equipment shall minimize the use of poured concrete foundations and footings.

9.2. PV Module Requirements

- a. Panel manufacturers and panel technology shall be subject to PSE&G approval, such approval not to be unreasonably withheld.
- b. Shall be Listed or Recognized to UL 1703.
- c. Shall be certified for reliability and safety according to IEC 61215 or IEC 61646 and Safety Class II (SK II).

- d. Shall be manufacturing certified to ISO9001:2000 quality and ISO14001:2004 environmental standards.
- e. Shall provide a power output warranty of at least 90% of the nominal output power rating ($P_{mpp} \pm 5\%$) during the first ten (10) years and 80% during second ten (10) years, subject to the warranty terms and conditions.
- f. Manufacturer shall provide pre-wired modules with quick-connect type connectors.
- g. Power Tolerance of each module shall be within $\pm 5\%$ of the rated power at STC.
- h. Open Circuit Voltage (V_{oc}) shall be within 10% of data sheet at STC.
- i. Modules shall be rated for a minimum of 600 volt system voltage.

9.3. Modules Support Structure Requirements

- a. Structural support system (racking) shall be approved by PV module EPC Contractor for use with PV modules.
- b. For ground-mounted units, support structure shall include footings appropriate for the support structure (transformers, inverters etc).
- c. PV Solar System shall not adversely affect roof access for inspection and repair.
- d. The entire system shall not weigh more than the residual load-bearing capacity (as determined by structural analysis sealed by a NJ licensed professional engineer) over the array area.
- e. The array shall be mounted in such a way that the normal drainage of a roof is not affected.
- f. Walking space shall be provided through the PV array to facilitate installation, inspection and maintenance access to modules and other existing roof equipment, such as roof-top HVAC units, etc. The PV array shall also include free access around the roof perimeter.
- g. For roof-mounted systems module support should minimize or eliminate penetration of the roof.
- h. For roof mounted units structural support system shall be isolated from the building roof using approved roof liners (or equal), Supplier to design in combination with building PSE&G (assumed to be single-ply built-up roofing).
- i. For building mounted systems, the module support system shall be placed on a low-rise building only, as defined as ASCE 7-05, Chapter 6, Section 6.2, with a roof slope no greater than 5%.
- j. Mounting hardware shall be corrosion resistant for a minimum of 30 years and shall be suitable for outdoor exposure to weather and UV irradiation for a minimum of 30 years, in a temperature range of -40 degrees F to 200 degrees F.

- k. Proposer shall assign all mounting system and hardware warranties to PSE&G; mounting system and hardware shall be warranted by original manufacturer to be free from defects in material and workmanship for a period of one (1) year.
- l. Mounting system shall promote ambient air circulation beneath and above modules.
- m. Components shall be manufactured from corrosion resistant materials.
- n. The module support system shall maintain its structural integrity for at least 30 years.
- o. The support system shall be electrically grounded in compliance with the NEC and the PV modules shall be electrically interconnected and Grounded in compliance with the NEC and UL 1703.
- p. The support system electrical devices shall be constructed to UL and NEC requirements and listed as required by PSE&G.

9.4. Inverter Requirements

- a. EPC Contractor shall supply all DC to AC inverter(s).
- b. Inverters shall be CEC listed.
- c. Inverter peak efficiency (including inverter isolation transformer) shall be greater than 95% according to CEC rating.
- d. Inverter shall meet all applicable UL and IEEE Standards, NEC codes, and current applicable ANSI and FCC standards.
- e. Inverter's Total Harmonic Distortion (THD) shall be less than 5%.
- f. Inverter shall include over-voltage and under-voltage and frequency protection in compliance with UL1741.
- g. Inverter shall have anti-islanding protection to prevent back-feeding inverter-generated power to the grid in the event of a utility outage.
- h. Inverter shall have AC and DC surge protection.
- i. Inverter's environmental ratings shall meet or exceed: -20 to +45°C (-4 to 122°F), Humidity: 15% - 95%, non-condensing, 6,500 ft elevation, Seismic Site Class D (per IBC 2006). Note: If the inverter and all associated equipment are not rated for NEMA 4 Weather Proof, all inverters and associated equipment shall be housed in NEMA 4 enclosures.
- j. EPC Contractor shall assign Inverter manufacturer's warranty to Owner; minimum warranty term shall be five (5) years.

9.5. Metering & Communications Equipment Requirements

Metering Equipment

1. Hoffman-style box must be provided to accommodate metering. The Hoffman style box must include a heater, 120 volt AC receptacle (source of this station power may be flexible) and space for (2) meter sockets, SCADA Remote

- Terminal Unit device and other metering accessories. Estimate box dimension 54" x 42" x 16".
2. Hoffman-style box will need at least two communications lines. (1) An appropriate line for real time metering, (1) Basic Telephone Service (POTS) line for revenue metering, and possibly (1) POTS for a telephone handset to be used by PSE&G traveling operators. (This is typically required if there is not another telephone available to Operations within 100' of the equipment).
 3. PSE&G will arrange for phone service to come to a demark location, the contractor will need to bring the phone signal from the demark to the metering location.
 4. PSE&G will provide metering material for the contractor to mount at the site:
 - o Instrument transformers
 - o Meter enclosures
 - o SCADA RTU equipment
 - o Secondary wiring for instrument transformers
 5. The contractor will mount enclosures with appropriate conduit connections as specified by the PSE&G meter department. PSE&G will make secondary connections at Instrument Transformers, Meters, and RTU equipment.
 6. Meter Panel location must be within 80 feet (IT secondary wire run) of 26 kV metal enclosed ITs, and within 100 feet of 13 kV instrument transformers.
 7. One line drawing, Conduit plans, and Metal enclosed switchgear drawings must be approved by PSE&G meter department before metering installation work begins.

Communications and Diagnostic Equipment:

1. Communications to provide the status of the energy output and other full system status information. The communications should be capable of remote reporting to multiple locations.
2. Communications hardware on site.
3. Provision to know when a panel / inverter or sub-loop is non-operational

10. System Performance

EPC Contractor shall provide PV Solar system's electric production estimate.

EPC Contractor shall provide an estimate of PV output. Since the exact location of the solar generating facilities is not known at this time, calculations shall be made for the following configurations:

Both fixed and tracked systems will be considered subject to the evaluation criteria.

11. Terms of Solicitation

The following are PSE&G's standard terms and conditions pertaining to acceptance of proposals. By submitting a response to this Solicitation, the EPC Contractor is accepting these terms:

- a. All proposals become the property of PSE&G and will not be returned.
- b. PSE&G will not incur any expense in the development of your proposal.

- c. Proposals will remain valid for a minimum period of three (3) calendar months following the closing date of the Solicitation. Proposals, once submitted, cannot be withdrawn for the term of the validity period except with the written consent of PSE&G.
- d. This Solicitation is issued to elicit responses to PSE&G's requirements. It is therefore not an offer. No contract or other binding obligation on PSE&G will be implied unless and until an Agreement has been executed on the terms and conditions acceptable to PSE&G.
- e. PSE&G reserves the right to reject any or all proposals submitted in response to this Solicitation.
- f. PSE&G may request additional detailed technical, commercial and/or financial specifications during the Solicitation process period. Such requests must be answered in writing and within the terms stated in the request. The terms and conditions of such request, as well as the terms and conditions included in the corresponding answer may, at PSE&G's option, be included in any agreement executed thereafter.
- g. This Solicitation creates no obligation whatsoever on PSE&G's part, and we may amend, recall, or revise the Solicitation at any time. All proposals submitted in response to this Solicitation shall become PSE&G's property. We are free to accept or reject, in whole or in part, any and all proposals in the exercise of our sole judgment and discretion. Any contractual or other commitment by PSE&G is contingent upon the execution of a formal written contract or the issuance of a PSE&G purchase order. Under no circumstances shall PSE&G be billed, charged, or make payment for any goods or services whatsoever unless and until either: (1) an authorized representative of PSE&G signs a formal written contract; or, (2) PSE&G issues a purchase order to the successful.
- h. Each Proposer, by submitting a Proposal, agrees that any cost incurred by the Proposer in responding to this request, or in support of activities associated with this request, is to be borne by the and may not be billed to PSE&G. PSE&G shall incur no obligations or liability whatsoever to anyone by reason of the issuance of this Solicitation or by the actions of anyone relative thereto.
- i. EPC Contractor's acknowledgement that PSE&G intends to use the information in the Proposal to support its filing to the New Jersey Board of Public Utilities, and that PSE&G in defending its filing may be compelled by the Board and other interveners in the proceeding to divulge the source of information on which its program assumptions were developed.

12. No Obligation

This Solicitation creates no obligation whatsoever on PSE&G's part, and we may amend, recall, or revise the Solicitation at any time. All proposals submitted in response to this Solicitation shall become PSE&G's property. We are free to accept or reject, in whole or in part, any and all proposals in the exercise of our sole judgment and discretion. Any contractual or other commitment by PSE&G is contingent upon the execution of a formal written contract or the issuance of a PSE&G purchase order. Under no circumstances shall PSE&G be billed, charged, or make payment for any goods or services whatsoever unless and until either: (1) an authorized representative of PSE&G signs a formal written contract; or, (2) PSE&G issues a purchase order to the successful.

Each Proposer, by submitting a Proposal, agrees that any cost incurred by the in responding to this request, or in support of activities associated with this request, is to be borne by the and may not be billed to PSE&G. PSE&G shall incur no obligations or liability

whatsoever to anyone by reason of the issuance of this Solicitation or by the actions of anyone relative thereto.

13. Confidentiality

PSE&G expects all materials it provides to EPC Contractor, including this Solicitation, to be treated as proprietary and confidential, whether or not labeled as such.

14. Exclusion of New Jersey Taxes

Do not include in your proposal any New Jersey Sales or Use Tax, which you may be required to collect. PSE&G has a direct payment permit to make payment directly to the state sales tax bureau.

If the materials being furnished or installed on this project are classified as exempt from New Jersey Sales and Use Tax, PSE&G will issue separate instructions for handling the sales tax associated with the project.

15. Notice of Award

Please do not contact PSE&G to discuss the status of the proposal award, projected award time frames or reasons for non-selection. PSE&G will notify prospective EPC Contractors if additional information is required. Letter will notify all unsuccessful EPC Contractors as soon as possible. PSE&G will not inform the unsuccessful as to why they were not awarded the proposal. PSE&G is under no obligation to provide any reasons why a EPC Contractor was or was not successful.

16. Compliance with Laws, Fair Bidding, Drug and Alcohol Policies

EPC Contractor certifies that it complies with all state and federal antitrust laws that pertain to competitive bidding practices. In addition, EPC Contractor certifies all goods and services described and/or offered in its Proposal shall have been produced, sold, delivered, and furnished in strict compliance with all applicable laws and regulations. Upon request by PSE&G, EPC Contractor shall execute and deliver such documents as may be required to effect or to evidence compliance.

EPC Contractor absolutely prohibits any discussion, consultation, or communication by its employees, agents, or representatives with any of its competitors relating to prices, terms or conditions of sale. EPC Contractor further certifies that no employee, agent, or representative of the EPC Contractor's Company has entered or will enter into any understanding, agreement, plan, or scheme pertaining to this proposal, whether express or implied, formal or informal, oral or written, with any competitor with respect to prices, terms and conditions of sale, output, production, distribution, territories, or customers.

EPC Contractor certifies to PSE&G, its affiliates, divisions, subsidiaries, successors and assigns PSE&G, that its proposal is made in good faith and not pursuant to any understanding, agreement, plan, or scheme with any firm or person to either: a) submit an intentionally high, low, or otherwise noncompetitive proposal for the purpose of giving a false appearance of competitive, or b) allocate territories or customers among contractors or EPC Contractors. Contractor also certifies that the proposal practice(s) quoted have been arrived at independently, without discussion, consultation, communication, disclosure, understanding, or agreement, for the purpose of restricting

competition with any other contractor, EPC Contractor, or competitor for this work. No attempt has been made or will be made to solicit, cause or induce any firm or person to refrain from submitting a proposal on this work, or to submit a higher, lower, noncompetitive, or other form of complementary proposal intended to give false appearance of competition.

EPC Contractor certifies that it has not offered or entered into a subcontract, or agreement regarding the purchase of materials or services from any firm or person, or offered, promised, or paid cash, or anything of value to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from proposing or to submit a complementary proposal on this work. The EPC Contractor has not accepted or been promised any subcontractor or agreement regarding the sale of materials or services to any firm or person, whether in connection with this or any other project, in consideration for an agreement or promise by any firm or person to refrain from proposing or to submit a complementary proposal on this work.

The PSE&G name and logo signify the well-known brand image of PSE&G and therefore are invaluable assets. To properly protect this brand image, you may use the PSE&G trade name in your response to this Solicitation , but **DO NOT** use the PSE&G name with the logo, or the logo alone, anywhere in your Proposal.

17. PSE&G's Commitment to Proposer Diversity

PSE&G recognizes the importance of Proposer diversity and is committed to ensuring that it is an integral part of our strategic sourcing and procurement processes. To this end, PSE&G maintains strong and active relationships with a diverse and highly qualified group of Proposers. Proposer Diversity not only helps our company meet important business needs, but promotes job creation and stimulates the local economy.

Proposer Diversity has created many win-wins for our company and the communities we serve. During the past decade, PSE&G has done more than \$1 billion dollars of business with diverse EPC Contractors. We are determined to build on this record and do even more.

Proposer Diversity is just good business. The success of PSE&G is driven by an array of factors but most fundamentally includes our ability to provide safe, reliable, low-cost service, and anticipate the opportunities which lie ahead in energy, the environment and other areas critical to our business. We recognize that small and diverse businesses help provide ideas and perspectives reflective of the diverse marketplace which we serve. In short, it is often the small Proposer that can help us better see the big picture.

Our Proposer Diversity Process was not developed as an isolated initiative. Rather, it is interwoven in our hiring, promoting, leadership development and business practice. As a result, we have already reaped the benefits of the innovation of diverse Proposers, as have our customers, shareholders and other key constituents.

Proposer Diversity is an important area for reinforcing our leadership, not only in the industry but in the wider community. It is integral to our efforts to achieve even greater business success while providing benefits to society.

18. PSE&G's Standards of Integrity Summary

Public Service Enterprise Group Incorporated ("PSE&G") adopted the Standards of Integrity ("Standards") in 1991 as the embodiment of its commitment to conduct operations consistent with the highest standards of legal and ethical conduct. The Standards provide basic guidelines and expectations for behavior that apply to all directors, associates, and consultants. They apply to all of our relationships and activities with fellow associates, the public, customers, consultants, competitors, government agencies and officials, the media and all others who may associate our words and actions with PSE&G.

A copy of PSEG's Standards of Integrity can be found on our website <http://www.PSEG.com/>