Eastern Alliance for Greenhouse Action

Procurement Documentation

Request for Tender Template –

Solar Supply and Installation Specifications

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1. Introduction

Council is seeking tender offers from suitably qualified providers for the supply and installation of Solar Photovoltaic (PV) systems at a number of sites as set out in Appendix A (Sites) of the tender documentation.

2. General Requirements

2.1 Solar PV System

For each site Council is seeking the design, supply, delivery, installation, testing, commissioning and documentation of Solar PV systems in accordance with the requirements of this tender, the Standards and guidelines referenced in this document and any other standards or requirements of relevant authorities identified in this document.

Optional maintenance services may be required to be provided at the discretion of Council.

More specifically Council requires:

- Design of the solar PV system in accordance with Clean Energy Council guidelines and appropriate Australian standards including solar PV modules, inverters, solar framing and mounting systems, switchgear, cabling and cabling protection
- Supply and installation of roof safety hardware as required for lifting materials and working at heights for construction
- Supply and installation of solar PV modules, inverters, solar framing and mounting systems, switchgear, cabling and cabling protection
- Electrical connection of Solar PV installation to the local electricity distribution network service provider's network in accordance with the network service provider requirements having previously made a grid connection application to the network service provider. This includes the provision of appropriate protection and control systems as required by the network services provider
- Provision and installation of metering as required by Council's electricity retailer
- Testing and commissioning of the complete solar PV and associated electrical installation including provision of testing and commissioning documentation. In addition, a Certificate of Electrical Safety shall be provided. Council may at its discretion arrange for an independent solar and electrical installation inspection and the successful tenderer will be required to make good any defects identified as part of any independent inspection.
- As installed drawings of the Solar PV installation and associated electrical installation
- An operations and maintenance manual including detailed procedures for emergency shutdown

- Provision of warranties that as a minimum meet the specific warranty provisions within this document

2.2 Ancillary Activities

In providing the goods and services as set out in section 2.1, Council requires that the successful tenderer shall:

- Install any additional permanent safe access infrastructure to ensure safe installation of the system as specified in this document by Council Approved Installers;
- Identify any switchboard upgrades or reconfiguration as required for the installation of the proposed PV system for installation by Council Approved Electrical Contractors;
- Carry out patching, painting and making good all building works after installation of the Solar PV system and associated electrical system to Council Standards;
- Arrange and provide all necessary documentation for the creation and transfer of Small-scale Technology Certificates (STCs) for systems with capacity of <100kW;
- Provide all necessary information and documentation in order to assist Council in an application to register an accredited power station able to create Large Generation Certificates (LGCs) for systems with a capacity of 100kW or greater.

3. Tenderer Requirements

Tenderers are required to meet the criteria set out below:

3.1 Conflict of Interest

Tenderers are required to declare any conflict of interests in responding to this tender or carrying out work at any site incorporated in this tender.

3.2 Accreditation

Tenderers are required to submit documentation that supports accreditation in any of the areas set out under this section 3.1.

3.2.1 Electrical

All electrical work is required to be undertaken under a registered electrical contractor and by licensed electricians with solar accreditation.

3.2.2 Solar Accreditation

All tenderers are required to provide certification that verifies that Clean Energy Council (CEC) installers and designers shall be performing all work associated with the design and installation of the Solar PV systems. This must include any subcontractors who must be specifically referenced in the tender documentation and for whom relevant accreditation documentation must be provided.

3.2.3 Occupational Health and Safety

All tenderers are required to have comprehensively documented Solar PV installation specific Occupational Health and Safety procedures

Successful tenderer(s) will be required to undertaken Council online induction and accreditation.

Council may give preference to tenderers that have a Safety Management System that have been independently certified to be compliant with AS4801.

3.2.4 Quality Management

Council may give preference to tenderers that have a Quality Management System that have been independently certified to be compliant with ISO9001.

3.2.5 Environmental Management

Council may give preference to tenderers that have an Environmental Management System that have been independently certified to be compliant with ISO14001.

3.3 Experience

Tenderers are required to have a minimum of 5 years' experience in the design and installation of commercial gird connected solar systems

3.3.1 Reference Sites

Tenderers are required to provide details of a minimum of five grid-connected solar PV reference sites with a contact for each site.

4. Technical Requirements

The following requirements apply to the PV Solar Design and Installation.

4.1 Design

The solar PV design must comply with all the recommendations provided in the most current Clean Energy Council 'Grid Connected Solar PV systems – Design Guidelines for accredited installer'.

The design must be conducted by a solar PV designer with full accreditation from the CEC. All appropriate documentation must be provided to the client prior to installation and at practical completion.

Electrical design of the system must be completed and signed off by an accredited solar PV designer accredited with the CEC. All appropriate design documentation shall be submitted to Council for approval prior to any works being undertaken

4.2 Installation

The installation must comply with all recommendations provided for within the Clean Energy Council installation guidelines.

Panels shall be installed with a minimum tilt of …….. degrees. Panels should be installed with minimum setback of …… mm from roof edges and should not prevent use of existing roof anchors or access points.

For string inverters, the following installation requirements apply:

- Inverters must be located where they can receive adequate ventilation so as to not compromise inverter efficiency
- Inverters are to be located so that they are not exposed to undue weather, and not be in a location which has direct sun light between 9am and 3pm at the equinox and if so adequate shade screens are to be installs.
- Inverters are required to be waterproof
- Inverters are to be readily accessible to maintenance staff via a safe access point(s);
- Inverters must be protected by a vandal resistant steel cage/ventilated box or similar where the inverter is accessible to the public
- Access to the inverters is to be restricted as per Standards where the system maximum voltage exceeds 600V

4.3 Panels

Solar Panels are required to be on the register of CEC approved modules.

They are required to be from a Tier 1 manufacturer.

4.3.1 Panel Warranties

Panels tendered must have a performance warranties of at least 80% at 25 years.

Panels must have a manufacturing/product warranty period of at least 10 years with preference given to panels with longer warranties.

Preference will be given to warranties that are underwritten by third party insurance companies.

Details of panel warranties and warranty support are required to be submitted as part of the tender responses.

4.4 Inverters

Inverters tendered must:

- Conform to AS4777.2
- Be on the CEC approved inverter list
- Be approved by the local electricity distribution network provider

Single phase inverters shall only be utilised for ratings up to 5kW.

Three phase inverters must have the load balanced across all three phases. Successful tenderers shall carry out a load analysis across three phase sites to ensure site loads are balanced across phases.

Inverters must have a peak efficiency of at least 96%. Preference will be given to inverters with higher efficiencies.

4.4.1 Inverter warranties

Inverters are required to have a minimum warranty of 10 years.

Preference will be given to warranties that are underwritten by third party insurance companies.

4.5 Racking

Racking must comply with AS1170.2.

Racking should be of high quality and meet all relevant Australian Standards and should preferably be of Australian manufacture.

Racking and panel connectors shall be vandal proof.

Racking is to be installed as per the manufacturer's instructions.

Tenderers are to supply details of the roof attachment method and tenderers are to provide details of how the proposed installation and attachment method are suited to the roof at each site.

Non-penetrative fittings are to be used for the Klip-Loc or similar roofing materials. Non-penetrative frame fixing must comply with appropriate pull-out tests as specified by the CEC.

Where penetrative methods are used, weatherproofing of the fixing method must be maintained and ensured for the design life of the installation i.e. 25 years.

The successful tenderer shall ensure that all penetrations through fire walls are filled with fire stop compound on completion of installation to ensure compliance with building regulations.

Optional Clause – Any roof penetrations are to be mechanically sealed.

The racking is to be weatherproof and corrosion resistant. The lifetime of the mounting structure must exceed the lifetime of the PV arrays.

All dissimilar metals must be mechanically separated to prevent galvanic corrosion.

4.5.1 Racking System Warranty

Racking systems are required to have a minimum warranty of 10 years.

4.6 System Monitoring

Tenderers are required to provide solar monitoring that enables Council to be alerted in the event of a failure of major equipment such as inverters.

The tenderer shall be responsible for providing communication links suitable for providing such alerts.

Optional Clause: Tenderers are required to supply a System Monitoring solution that allows Council to remotely observe current system performance and download data to a system with tenderer provided software that allows Council to analyse historical solar performance information to a granularity of at least one hour granularity. The software shall be capable of being configured to provide alerts in the event of low output under specific solar conditions/

4.7 Ancillary Equipment and Cabling

All electrical equipment associated with the installation including but not limited to switches, breakers, cabling and other ancillaries are required to meet all relevant Australian Standards.

All electrical equipment including cabling shall be installed in accordance with AS3000 and also conform to:

- AS5033
- AS2053 (Main generator cabling)
- CEC installation guidelines regarding sealing of conduits and enclosures.

DC cabling should be of sufficient gauge to prevent voltage drop exceeding ……% at nominal output between the panels and their corresponding inverter.

DC isolators are to be installed in accordance with AS/NZS3000.

Optional Clause: DC Isolators should be installed in an accessible location and must be mounted on a fire proof material i.e. brick or 12 mm cement sheet. Floor surface below breakers should be of low flammability.

Cable should be located and or shielded so as to minimise the risk of arc related fire spreading to the building.

All cabling shall be run concealed where possible and all AC submains cables shall be run on cable tray or cable ladder or similar.

4.8 Earthing

All electrical systems installed shall include an earthing system which is compliant with all aspects of AS/NZS 3000 and AS/NZS 5033.

5. Documentation

5.1 Prior to Commencement

The successful tenderer is required to submit proposed indicative location drawings for key equipment including panels and inverters for Council approval prior to commencing any work on any site.

5.2 Applications

The successful tenderer is required to submit the relevant documentation in order to gain appropriate approvals to enable:

- The installation to be pre-approved by the local electricity distribution network service provider and connected to the network
- Compliant Metering to be installed
- STCs to be created for each site, those STCs to be transferred to the successful tenderer on completion of the compliant solar PV installation with the value of those STCs credited to Council against the cost of the solar PV installation

- Registration of the system as an accredited power station where the installation size is 100kW or greater

5.3 Installation

The successful tenderer is required to provide the following documentation on completion of the solar PV installation:

- System documentation including but not limited to layout, wiring diagrams, shutdown procedure and recommended maintenance.
- Three (3) copies of Operator and User Manual as specified in AS/NZS 5033 and the CEC installation guidelines
- Full details of warranties and warranty claim procedures
- Copies of testing and commissioning documents

5.4 Defects Liability Period

All workmanship and installation shall be guaranteed for a minimum period of ……. years from the date of Practical Completion.

The cost of all labour and materials expended in complying with the above shall be borne by the successful tenderer.

Council may conduct or arrange to be conducted an independent post implementation check. Any defects arising out of that check process shall be resolved by the successful tenderer.

5.5 Standards

All work carried out under this tender shall comply with the following standards and guidelines:

- CEC Clean Energy Council- Grid Connected Solar PV systems – install and supervise guidelines for accredited installations
- CEC Clean Energy Council- No Battery Storage Grid Connected Solar PV systems – Design guidelines for accredited installers
- AS/NZS 5033 Installation of photovoltaic arrays
- AS 4777.1 Grid connection of energy system via inverters Part 1: Installation requirements
- AS 4777.2 Grid connection of energy system via inverters Part 2: Inverter requirements
- AS 4777.3 Grid connection of energy system via inverters Part 3: Grid protection requirements
- AS/NZS 3000 Wiring Rules
- AS/NZS 1768 Lightning Protection
- AS/NZS 2053 Conduits and Fittings for Electrical Installation

- AS/NZS 3008 Selection of cabling
- AS/NZS 1170.2 Structural design actions – Wind actions
- AS/NZS 3439.1 Low voltage switch gear and control gear
- AS/NZS 3017 Electrical installations – Testing guidelines
- ESAA Electricity Supply Association of Australia – Guidelines for grid connection of energy systems via inverters
- SIR - Victorian electricity distributors services & installation rules
- Energy Safe Victoria Installation of grid connected PV systems, July 2011
- BCA - Building Code of Australia
- Local electricity distribution network service provider Solar PV systems technical guidelines

6. Safety

The successful tenderer is required to design, supply and install safety hardware and fall arrest systems to ensure safe access to the proposed Solar PV installation area. The proposed safety hardware and fall arrest systems shall comply with the appropriate Australian Standards and regarding their proposed solar system design.

Optional Clause: The successful tenderer is required to design, supply and install permanent safe roof access hardware and fall protection in accordance with AS1657 & AS1891, to allow safe on-going operation and maintenance of the installed solar PV system

Where existing safe roof hardware is in existence Council has a strong preference for the solar design and installation to allow the ongoing safe usage of the existing equipment. Where existing roof safety hardware is removed, not accessible due to the solar installation, or restricts the current intended purpose of the hardware following solar installation the successful tenderer is required to design and supply replacement safe roof hardware to ensure safe roof access is maintained and the original purpose of the safe roof hardware is achieved.

6.1 Safety standards

Any safety equipment installed at the site must comply with the following standards as applicable:

- AS1657 Fixed Platforms, Walkways and Ladders: design, construction and installation
- AS5532 Manufacturing requirements for single point anchor devices for working at height
- AS1170.2.2:2011 Structural designs Part 2- Wind actions
- AS1499-1998 Steel Structures
- AS1891.1 1995 Industrial safety belts and harnesses
- Australian Standard AS 1891.1 - Safety belts and Harnesses
- Australian Standard AS 1891.2 - Horizontal life line and rail systems
- Australian Standard AS 1891 - Horizontal life line and rail systems - Prescribed configurations (Supplement 1)

- Australian Standard AS 1891.3 - Fall arrest devices
- Australian Standard AS/NZ 4488 - Parts 1 & 2 - Industrial Rope Access
- Australian Standard AS 1891.4 - Selection, use and maintenance AS480 Health and Safety Compliance

7. (Optional Clause) Maintenance Services

Ongoing maintenance by the successful tenderer is required for a period of ……. years shall be included in the tender response. This shall include as a minimum:

Biannual inspection and maintenance of the system for the maintenance period to be carried out by a CEC accredited electrician including:

- *Cleaning*
  - *Inspection of the Solar PV array to check if modules need cleaning and clean if required*
- *Inspection of the solar PV array to check:*
  - *Adequacy of the panel connections and mounting structure*
  - *Mechanical condition of the array cabling*
  - *Electrical condition of the array cabling*
  - *Record array output voltage*
  - *Record array output current*
- *Inspection of the inverter to check*
  - *Cleanliness*
  - *Adequate connections of cables to the inverter*
  - *Adequate functioning of the inverter*
- *Inspection of the balance of system, to check*
  - *Switches/circuit breakers are operating correctly*
  - *Cables/conduits mechanically okay*
  - *Electrical connections okay*
- *Testing of all installed anchor points*