Eastern Alliance for Greenhouse Action

User Guidelines -

Procurement Documentation
Solar PV Supply and Installation

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1. Introduction

Procurement documentation for the Supply and Installation of Solar PV Systems has been prepared on behalf of the Eastern Alliance for Greenhouse Action (EAGA). This document sets out guidelines for the use of that Procurement documentation including recommended prerequisites for tendering and outlining cost, benefit and risk implications associated with incorporating optional elements referenced in the Procurement documentation

The Procurement documentation is not intended to address solar storage requirements given the poor financial returns for solar storage systems based on financial analysis undertaken on solar storage on behalf of EAGA.

2. Using the Documentation

The procurement documentation is designed to be used in conjunction with Councils' standard Conditions of Tender. Commercial elements are usually reflected in Councils' standard Conditions of Tender but the specific items that may be added in the case of Solar PV Installations are included in these User Guidelines at Appendix A.

The procurement documentation is designed to be used in the following manner:

- Clauses denoted as optional (and which are discussed further in these guidelines) are designed to be either specifically removed or optionally specifically reformatted and included
- Clauses incorporating "……." elements (and which are discussed further in these guidelines) are designed for Council to complete the values relevant to their specific requirements

3. Prerequisites

The Procurement documentation assumes the following items have been undertaken by Council and as such these have not been included in the Procurement documentation:

3.1 Roof Structural Assessment

The Procurement documentation assumes that Council has already undertaken some form of structural assessment to ensure that the roof is suitable for the installation of a solar from a load bearing perspective.

Some organisations will require that the solar installer arranges an independent roof structural assessment as part of the tender. Problems may arise contractually if the successful tenderer arranges the assessment and the roof is not deemed suitable for solar.

If Council wishes to have the solar installer to obtain the structural certification, then the following clauses could be inserted into the Procurement Documentation:

Structural Certification

The successful tendered is responsible for providing certification from a professional structural engineer on the structural suitability of the sites for the for the proposed solar PV installations.

The site-specific structural certification should include:

- *Confirmation of the structural suitability of the existing buildings for the proposed PV system framing and panels based on both additional dead and wind loads; and*
- *Maximum short-term dead loads possible during construction and recommended locations for such dead loads.*

3.2 Heritage Considerations

The Procurement Documentation assumes that Council has carried out an assessment of any heritage constraints on the installation of solar and notes any restrictions, such as location of panels, in the tender documentation separately.

3.3 Meter data

Whilst initial evaluations may have been conducted on the appropriate sizing for solar PV arrays at various sites a more optimal design at that size may be able to be undertaken by the solar designers if they have meter data provided. For example, a 5kW array on a roof with east and west orientations may have the allocation of panels between east and west orientations best optimised by detailed consideration of load patterns throughout the day.

As a result, it is recommended that recent half hour interval meter data should be provided as part of the tender documentation although it is not essential.

4. Specific Tender Clauses

Clause 4.5 Racking

The optional clause below has been included. At least one Council has the requirement for mechanical seals only. The requirements in the document have been written to indicate that a 25 year life of seals is required which should cover this element but if not, this clause can be added

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

Clause 4.6 System Monitoring

An optional clause relating the provision of system monitoring is included in the documentation.

In their simplest for, system monitoring solutions may only involve sending alarms in the event of system equipment failures such as inverter failures and this has been included as mandatory

More comprehensive system monitoring systems provide real time and historical data with charting tools provided for client software applications. These solutions allow detailed analysis of solar performance and identify issues such as equipment failures and potentially the need for cleaning.

Certain Councils may have a requirement for provide a specific monitoring system which may be in the form of either inverter specific equipment (e.g. Fronius Smart Meter) or inverter independent equipment (e.g. Solar Analytics). Such requirements may be put in place if there is a requirement to ensure consistency in software used for reporting solar performance. Inverter independent solutions allow consistent reporting across sites which may have disparate inverter systems.

Regardless, useful solar monitoring systems will require some form of data connection and Councils will normally not wish for them to be connected to existing internet connections for security and other reasons. The cost of a data connection for these systems can be up to $200 per annum which is high in comparison to savings from small solar systems (<5kW).

One of the additional advantages of solar monitoring is the ability to detect a reduction in output that may indicate that cleaning is required.

Clause 4.7 Ancillary Equipment and Cabling

The optional clause below has been included. It will add cost to the installation and is a requirement that exceeds that of the relevant Australian Standard but is a requirement of at least on Council

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.

Clause 6 Safety

The optional clause below has been included. It is a requirement for the installation of permanent anchor points for on existing sites. Some Council's require permanent anchor points to be installed to facilitate ongoing maintenance and this can have very significant cost ramifications for solar projects, even medium to large sized installations, and may make the projects unviable.

Many organisations only require temporary anchor points to be installed.

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

Clause 7 Maintenance

This entire clause is optional as currently written

Councils may want to carry out maintenance as part of their existing building maintenance arrangements or provide for specific maintenance services to be carried out in the tender.

Maintenance usually falls into 2 broad categories:

- Cleaning of solar panels
- Electrical

The optional maintenance clause provides for both categories and can be included as required.

5. Other Information

There are parts of the documentation that require users to enter values as follows:

Clause 4.2 installation Guidelines

The following clauses have been included in this section and require completion of certain information:

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.

The above criteria may be specified at a site level if Council believes different sites will have different criteria.

Minimum panel tilt is sometimes specified, and some Council's use a value of 10%. If specified, and the site has a flat roof then tilt framing will need to be installed which will add a cost. Tilt has the benefit of additional solar output for the same panel capacity and also assists in self-cleaning of panels.

Minimum setbacks from roof edges are specified by some Councils. If the setback is too far then will significantly reduce the available roof area for solar panels. The main reason for having panels set back from the roof edges (apart from potential safety concerns) is to reduce the ability for wind to get under the panels and reduces the wind loading on the roof. The distance can be included as necessary.

Clause 4.7 Ancillary Equipment and Cabling

Whilst design guidelines address this issue Council's sometimes specify more onerous conditions as per the clause below. A 1% maximum voltage drop is specified by one Council while others may specify different % or not incorporate the clause. 1% is the CEC guideline maximum level.

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

Clause 5.3 Defects Liability Period

Most contracts will include a clause similar to the following:

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

The defects liability period is often set at 12 months but periods of up to 5 years have been specified. This requirement increases the cost of the installation and can be set out separately in Council's conditions of tender if required.

Appendix A – Additional Commercial Elements

This procurement documentation is designed to be used in conjunction with Councils' standard Conditions of Tender which usually incorporates commercial elements associated with the Tender including pricing components.

The response template included with this documentation includes 2 specific items related to pricing in the form of:

- Power Purchase Agreement (PPA) Pricing
- Leasing/Rental Pricing

Councils may wish to incorporate wording in their Commercial Clauses that reflect these 2 alternative "buy options" to outright purchase of the solar installations. Specifically Councils may wish to consider the inclusion of more specific terms in their Commercial Clauses to accommodate the "buy options" as follows.

> *Council is seeking 3 forms of pricing response from Tenderers foe each site. Pricing shall be included on the basis of:*
>
> A. *Council paying for the solar PV installation through a lump sum payment or a series of progress payments*
>
> B. *Council entering into a Power Purchase Agreement to purchase the output from the solar installation at a unit rate for the electricity produced for a fixed term. Under such conditions, the Tenderer will be required to provide a meter to measure the electricity output. Under such an arrangement the Tenderer shall be responsible for maintaining the solar PV installation for the duration of the fixed term. Tenderers shall provide Council with the option to purchase the Solar PV installation at the completion of the Fixed Term or to extend the PPA term.*
>
> C. *Council entering into a fixed term leasing or rental agreement with monthly lease/rental payments to be made for the duration of the fixed term. Tenderers shall provide Council with the option to purchase the Solar PV installation at the completion of the Fixed Term or to extend the lease/rental term.*

A fixed term of 10 years is recommended for each of these "buy options" as this is usually the warranty period for inverters and aligning the term with warranty provisions is a sound approach.