



Great Southern Solar Solar Power Proposal PV-1071

for

Denmark Shire South Coast Highway Denmark

Date: 22 December 2011
Rev: 0
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Great Southern Solar is pleased to offer the following Solar Power Solution in response to interest from the Denmark Shire.

1 Project Description

The proposed project is to design and install a 26.2 kW SunPower solar power system on the roof of the Shire building in Denmark.

The system will consist of 110 SunPower 238 watt photovoltaic (PV) modules installed on Suntop III aluminium framing, five Kaco 6002 power inverters, electrical protection and ancillaries.

The PV modules (solar panels) will be installed in the roof surface shown below with marshalling cubicles and inverters wall-mounted at the rear of the building in the plant area as close to the main switchboard as practicable.



The solar panels will be mounted on frames on the Shire building's north facing roof, where they will get maximum sun exposure and production.

All electrical work necessary to install and commission the system has been included in this offer. The work will take one week. There will be only a short power outage to connect the system to the grid, and this will be timed to minimise disruption to Shire staff.

In addition to the system itself, the following elements will be delivered through this project:

1. Project Management plan
2. Electrical design schematics



3. Commissioning plan
4. System Handover certificate
5. As-built drawings based on client supplied original drawings
6. Warranty documentation
7. System operation and maintenance manual
8. System familiarisation and staff training

The table below contains a list of the components to be used in the project, their country of origin and the warranties that will be offered on the relevant components.

Component	Description	Country of Origin	Warranty
PV Power Modules	SunPower SPR-238	Philippines	10 years (product). 90% - 12 years; and 80% - 25 years (performance)
Inverters	Kaco Powador 6002	Germany	7 Years
Module Framing system	Conergy Suntop III framing	Germany	10 years
Solar DC Cabling	LappKabel Olflex Solar XLS 4mm	Germany	1 year
Circuit Breakers	Kraus and Naimer	New Zealand	1 year

We have designed the system in accordance with the Clean Energy Council design rules, and the estimates of energy production have been determined in accordance with the Clean Energy Council criteria. The system design summary is shown in Appendix A.

2 Project Benefits

2.1 Excellent Return on Investment

The project offers reduced power consumption and access to more financially attractive power tariffs, and allows the Shire to avoid the Natural Power Premium. These benefits are described in more detail in Sections 2.2 to 2.4, respectively.

We estimate that the combination of these benefits translates into a return on investment of approximately 16% over ten years.

This return is achieved within the manufacturer's warranty period for the solar panels.

Our calculations are based on assumed patterns of consumption, financing costs and stated electricity price rises, and will vary based on actual outcomes. The projected price rises do not include the impact of the carbon tax as the magnitude of the consequential power price rise is currently uncertain but is expected to raise electricity prices by an additional 13% and 16% in



Western Australia (source: <http://www.energetics.com.au/newsroom/energynewsletter/carbon-price-announcement>).

2.2 Reduced Power Consumption

We understand from information provided during the site assessment, that the average daily consumption by the Shire is 216 units/day, with the heaviest consumption on weekdays. We have back calculated that the weekday consumption is 264 units and the weekend daily consumption is 96 units using the information from Greensense view. The solar power system described above is expected to generate 117 units/day averaged throughout the year, with a annual maximum of around 180 units in summer and a maximum system output of 26.2 kW at any one moment.

Solar generation is a natural fit for an office building where the heaviest consumption occurs during working hours when the solar generation occurs.

We expect that the Shire will usually consume all of the power produced by the system on weekdays: it will work to supplement the Shire's power consumption, and significantly reduce current power bills. If the power consumption by the Shire is less than the output from the solar power system, the excess production from the system will seamlessly feed power back into the grid.

Overall, the system is expected to reduce power consumption by an average of 117 units/day on weekdays and 32 units/day on weekends and public holidays.

2.3 Optimised Power Tariffs

The Shire building continues to draw significant power overnight. Installing the solar power system makes switching to time of use tariff (R3) attractive because the system will take care of around half power consumption during the day (when the R3 price is higher), and the Shire would take advantage of cheaper off-peak power overnight. These changes more than offset the higher peak price for power consumed during the day from the Grid. Overall, this would have a net reduction of power bills by around \$1,400/year.

Additional annual saving of more than \$3000 can be achieved if the Shire is able to meet the requirements of an R1 tariff (demonstrating that consumption is below 137 units/day on average), noting that this is also a time-of-use tariff, but with lower unit rates than the R3 tariff. These savings have not been factored into the return on investment calculations presented in Section 2.1 because they depend on Synergy's approval for the lower tariff.

2.4 Avoided Natural Power Premium

The Shire currently pays a natural power premium of 5.54c/kWh on 25% of the power it consumes from the grid. This means that, with its current solar power system, over 30% of its power is coming from renewable sources.

This proposal will mean that over 50% of the Shire's power will be from renewable sources without the premium, so the Shire could cease paying the Natural Power Premium. This would add to its overall power savings.



2.5 Enhanced Corporate Image

The Shire office building is highly visible to highway traffic on South Coast Highway, and to visitors to the Shire building. The SunPower panels that are offered as part of this proposal will make an attractive statement in their own right. Combined with the existing panels, the system will also send a strong, positive message about the Shire's commitment to sustainability. The selected panel (SunPower SPR-238) is visually identical to the existing panels, so a seamless transition between the two panels is presented to observers.

3 Project Options

In addition to the solar power system itself, the Shire can choose to retain and trade its own Small Technology Certificates (STCs), and may wish to integrate power output information into its existing Greensense display in its customer service area as a demonstration for visitors and staff. These two options are itemised separately in the project price in Section 9.

4 Technology Partners

4.1 Photovoltaic Modules

The generation technology proposed for this project is supplied by SunPower Corporation. SunPower has been making solar power modules for 25 years and solar power module manufacturing represents 100% of its business. The SunPower brand is synonymous with quality and excellence in design, and the company has been an innovative leader in PV technology for over a quarter of a century.

The SPR-238 panel is the latest design of SunPower's premium panel. It is renowned for superior performance and reliability thanks to SunPower's extensive knowledge and testing experience, which has produced a finely honed balance between cost and performance to deliver a module which maximises return on investment for the customer. The patented SunPower[®] Maxeon[™] cell technology sets the standard for solar performance and reliability, enabling up to 50% more power than conventional solar panels and up to a three times more reliable performance. Maxeon solar cells hold the world efficiency record of 22.4%.

The specifications of the PV Module are shown in Appendix B.

4.2 Inverter

The Kaco Powador 6002 is a state-of-the-art, transformer inverter rated at 6.0 kW DC power and 4.6 kW AC. The specifications of the inverter are shown in Appendix B. The inverter has on-board performance communication which will facilitate the integration with the Greensense dashboard view (or equivalent) so that the system can support the Shire's positive image for visitors and staff, as well as providing power to the offices.



4.3 Great Southern Solar

Great Southern Solar has been selected as the premium SunPower regional partner for the Great Southern and the exclusive Great Southern Gold dealer for Selectronic (the Australian agent for Kaco inverters) because of our strong customer commitment, strong technical background and our professional attitude. Accordingly we have excellent access to product support and are able to offer premium pricing to enable good return on investment for our customers.

At Great Southern Solar we take time to understand your needs as our customer, so that we can ensure that the system you invest in will best meet your particular needs.

5 Design and Installation Standards

All installation work will comply with the following standards:

- AS 4777.1-2005 Grid connection of energy systems via inverters - Installation requirements
- AS 4777.2-2005 Grid connection of energy systems via inverters - Inverter requirements
- AS 4777.3-2005 Grid connection of energy systems via inverters - Grid protection requirements
- AS NZS 5033-2005 Installation of photovoltaic (PV) arrays
- AS NZS 5033- 2009 Installation of photovoltaic (PV) arrays - Amendment 1
- AS NZS 3000-2007 Australian New Zealand Wiring Rules

6 Approvals

As part of this proposed project, a number of approvals are required.

Great Southern Solar will apply for the Western Power SSRES approval (connecting the power system to the grid). This approval must be received before proceeding with the installation, so this proposal is subject to that approval.

Great Southern Solar will provide information that may be required by your planners and building approvals staff, should planning and/or building approvals be required for the new solar power system.

7 Personnel Accreditation

The following Great Southern Solar personnel will be involved in the project:

Client Contact:	Don Anderson (Project Manager AQF Level 5, B.Eng(Mech))
System Designer:	Andrew Greeuw (BCSE Accreditation A7101611)
Electrical Contractor:	Kevin Cloud (CEC Accreditation A2188279, EC)
Lead Installer:	Matt Egan (Mechanic, working safely at heights, forklift licence)



8 Great Southern Solar

Great Southern Solar has successfully completed over 250 solar power installations throughout the Great Southern with a total installed capacity of over 600 kW. Great Southern Solar has assembled a reliable and competent team able to deliver in accordance with your needs. The following examples are some of those most relevant to this project:

Client	System size & spec	Address	Phone
Denmark Co-op	14.6 kW roof mount system (in progress)	South Coast Hwy, Denmark	9848 1200
Heather Williams	5.0 kW roof mount system	8 Short St, Denmark	9848 3581
GSIT Albany	4.1 kW roof mount system	Anson Rd, Albany	9831 1066

9 Project Price

The 'system only' price for the system as described in Section 1 of this proposal, is shown in the following table. This 'system only' price assumes that Great Southern Solar will retain the Small Technology Certificates (STCs) for the project.

The Denmark Shire may wish to retain and trade its own STCs, to maximise the rebate value for the Shire by selling into the Clearing House at a premium price. The additional price for this is shown as Option 1.

The Kaco Powerdor Inverter can easily be integrated into the existing Greensense display for the Shire's visitors and staff, and this is shown as Option 2.

Option	Description	Price (incl GST)
System only	Solar power system, fully installed	\$96,751
1	Retain ownership of STCs	+ \$13,485
2	Greensense integration	+ \$850

A detailed price break-down for the solar power system is given in Appendix C, along with our terms and conditions of sale.

We would be pleased to discuss options with you further, and to answer any other questions you may have.

We have included an acceptance sheet for you, should you wish to proceed.



Acceptance Sheet

Thank you for your interest in purchasing a solar power system with Great Southern Solar ('the Supplier'). Filling out your details in this form will help us make sure we have your details correct, so that we can give you the best possible service.

Customer Business Name:

Trading Name (if applicable):

ABN:

Postal Address:

Installation Address:

Contact phone number:

Contact mobile number:

Fax number:

E-mail address:

The Customer and the signatories appearing below acknowledge that they have read and understood the Supplier's terms and conditions and agree to be bound accordingly; and accept the quote provided by the Supplier as set out in the proposal, as follows:

- | | | |
|-----------------------------------|-----|--------------------------|
| System only | Yes | <input type="checkbox"/> |
| Option 1 (retain STCs) | Yes | <input type="checkbox"/> |
| Option 2 (Greensense integration) | Yes | <input type="checkbox"/> |

Signed by the Customer or if a company by its directors:

Name	Signature	Date
Signatory 1		
Signatory 2		

We will contact you shortly to arrange a suitable time to install your system.



Appendix A – System Design Summary



Appendix B – Equipment Specifications



Appendix C – Price Breakdown and Contract Terms

DESIGN SUMMARY

Great Southern Solar

P.O. Box 838
DENMARK WA 6333

System Designer **Andrew Greeuw**
BCSE Accreditation **A7101611**

System Design for ... **Denmark Shire**
South Coast Highway
Denmark WA 6333

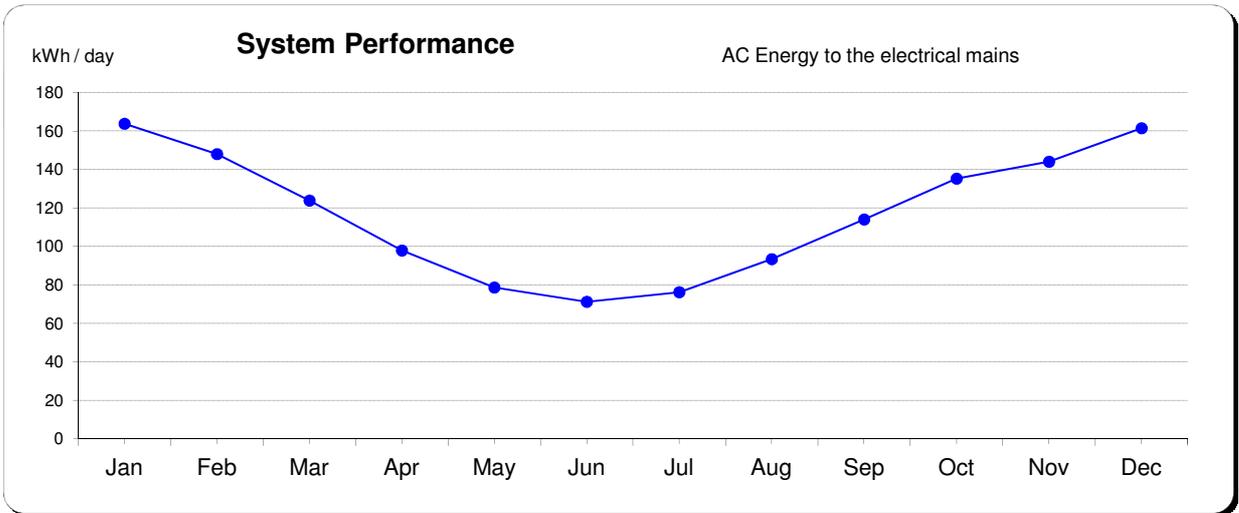
Solar Array **110** **238** WATT modules for a TOTAL of **26,180** WATTS
Array orientation ... true NORTH at a Tilt angle of 25°

Sunpower
SPR-238E-WHT-D

Inverter 5x KACO
Powerdor 6002

System Energy production estimates ...

Annual AVERAGE ...	117.8	kWh/day
MAX January	163.9	kWh/day
MIN June	71.3	kWh/day
TOTAL Energy production ...	43,015	kWh/year



System Notes ...

*Long term solar radiation data for ALBANY has been used for this design.
This power system has been designed in accordance with CEC GC Design guidelines*

*---
Directly applicable Australian Standards and guidelines are -
AS/NZS 3000 Australian and New Zealand Wiring Rules
AS 4777 Grid connection of energy systems via inverters. Part 1: Installation requirements
AS/NZS 5033 Installation of photovoltaic (PV) arrays
CEC GC Design and Install guidelines*

signed

Andrew Greeuw

21 Dec, 2011

*The Clean Energy Council is the association representing the Australian Renewable Energy Industry. All accreditees are bound by a code of ethics and are required to design and install power systems in accordance with all relevant Australian Standards and applicable Industry guidelines.
For more information refer to the CEC web-site at www.cleanenergycouncil.org.au
The CEC National Office can be contacted on (03) 9929 4100*

**Denmark Shire
Net Present Value —
14/12/2011**

SunPower SPR-238

Operational Costs	Value
Cost of equipment	\$86,729
Fixed costs	\$500
Vehicle insurance	\$0
Driver pay	\$0
Miscellaneous	\$0
Maintenance	Variable
Depreciation	N/A
New sales	0
Profit per sale	\$0
Courier delivery charge	\$0
Number of deliveries	0
Sale of equipment	\$0
WACC	9%
Customer Tariff	R3 peak

	Current	With PV
Average Daily consumption	216.00 kWh/day	92.71
Average weekend consumption @ 4kW	96.00 kWh/day	32
Average weekday consumption	264.00 kWh/day	117
Average weekday daytime load is	20.80 kW	
Average weekday night load is	4.00 kW	5.55

Gray cells will be calculated for you and do not require any entry.

Denmark Shire CONFIDENTIAL

Term in years	Expenses			Income					Cash flow	Cumulative cash flow
	Fixed costs	Other costs	Total	Money saved by project	Renewable premium	onpeak costs	Tariff change	Total		
0	\$86,729		\$86,729						(\$86,729)	(\$86,729)
1		\$0	0	\$ 11,602	\$ 1,870	480.29	2768.69	15,760	\$15,760	(\$70,969)
2		\$0	0	\$ 11,741	\$ 2,019	494.22	2848.98	16,115	\$16,115	(\$54,854)
3		\$0	0	\$ 12,399	\$ 2,181	500.15	2883.17	16,963	\$16,963	(\$37,891)
4		\$0	0	\$ 13,391	\$ 2,355	528.16	3044.63	18,262	\$18,262	(\$19,629)
5	500	\$0	500	\$ 14,462	\$ 2,544	570.41	3288.20	19,723	\$19,223	(\$405)
6		\$0	0	\$ 15,619	\$ 2,747	616.04	3551.25	21,301	\$21,301	\$20,896
7		\$0	0	\$ 16,868	\$ 2,967	665.33	3835.35	23,005	\$23,005	\$43,901
8		\$0	0	\$ 18,218	\$ 3,204	684.62	3946.58	24,684	\$24,684	\$68,585
9		\$0	0	\$ 19,675	\$ 3,461	739.39	4262.31	26,659	\$26,659	\$95,244
10	500	\$0	500	\$ 21,249	\$ 3,737	798.54	4603.29	28,792	\$28,292	\$123,536
									\$123,536	
									NPV (10) = \$41,722	
									IRR= 17.8%	



QUOTATION NO. PV-1071

To:
Dale Stewart
Denmark Shire
Denmark WA 6333

Date: 22/12/2011

ABN 6515 1357 078
PO Box 838
or Lot 983 Industrial Road
Denmark WA 6333
Ph: (08) 9848 1369
Fax: (08) 9848 1217
Sales@GreatSouthernSolar.com.au

Installation Address:
South Coast Hwy
Denmark WA 6333

Dear Dale

We have pleasure in submitting our quotation for work as detailed below.

	Amount EXC GST	Amount INC GST
Supply and install a 26.2kW SunPower Solar Power System as described in proposal PV-1071 Rev 0		
Solar Panels - SunPower SPR-238	\$69,949.69	
Inverter - Kaco Powador 6002	\$15,187.50	
Materials	\$ 8,066.78	
Installation	\$ 7,010.58	
GST		\$ 10,021.45
Total System Cost		\$ 110,236.00
Less Solar Credits - 465 RECs @ \$ 29 /REC	\$13,485.00	
Price for the customer		\$ 96,751.00
Terms and conditions of sale are attached		

All work is performed by our experienced and competent staff and backed by our customer service guarantees - see clause 6 of our terms and conditions

This quotation is valid for 30 days.

Payment terms are 20% upon acceptance of order and the balance on practical completion.

Payment can be made EFT - Bank details: BSB:036161 A/C: 137010 Ref: PV-1071

Please give us a call if you have any questions regarding this offer - 9848 1369

Kind regards

Don Anderson
Manager

