Government of South Australia
Department of the Premier and Cabinet

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Committee Secretary
Senate Standing Committee on Environment,
Communications and the Arts
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600
Australia

cc: Senator Anne McEwen, Committee Chair

Dear Secretary,

Re: **Senate Standing Committee on Environment, Communications and the Arts: Inquiry into the Renewable Energy (Electricity) Amendment (Feed-in-Tariff) Bill 2008**

The South Australian Parliament passed Australia's first feed-in legislation on February 14th, 2008. The scheme commenced operation on July 1st, 2008.

South Australians have taken advantage of the Commonwealth's Photovoltaic rebate Program (PVRP, now known as the Solar Homes and Communities Plan) more than any other jurisdiction – with over 35% of the Grid Connect PV market in terms of both system numbers and installed capacity (as at the end of April 2008).

The Bill that is the subject of your Inquiry requires that the tariff be paid *"... on all of the electricity that they produce (not just the component which is exported to the grid)..."*. The purpose of this correspondence is to clear up some misconceptions about the merit of a 'net metering' approach to feed-in schemes.

The Draft Report of the Garnaut Review at section 17.2.2 page 437 typifies the perceptions of the merit of 'net metered' schemes.

> *17.2.2 What should the value of a feed-in tariff be?*
>
> *There are two main ways by which feed-in tariffs can be paid-gross metering and net metering. Gross metering pays the embedded generator for all electricity it generates, while net metering pays for just the energy exported to the grid (gross generation minus local energy consumed).[8] Feed-in tariffs in Spain and Germany, for example, are calculated on a gross-metering basis. In Australia, most feed-in tariff commitments have been based on the net quantity of energy exported to the grid.*
>
> *For small embedded generation systems installed by households or firms that are consuming electricity throughout the day, it is likely that no exports to the grid will be possible. However, the benefits of embedded generation (lower transmission losses, deferred costs for network augmentation, and displacement of high-cost generation during peak periods) are present for every unit of electricity produced, not just the amount exported. A feed-in tariff based on gross metering is thus a more accurate means of pricing these benefits.[9]*
>
> *[8] The selection of the type of tariff will depend on the technological capabilities of the meters installed.*
>
> *[9] Some argue that a gross-metered feed-in tariff is undesirable because, from a sustainability perspective, it does not encourage embedded generators to consume less electricity, whereas under a net-metered scheme profits can only be made by exporting more to the grid. This reasoning is erroneous because the incentives to consume should come through the retail tariff paid for electricity, not through the feed-in tariff system.*

The statement in relation to the net quantity of electricity exported to the grid that *"it is likely that no exports to the grid will be possible"* is incorrect.

It is a common misconception that the meters record on a daily 'net' or even a monthly, quarterly or annual 'net' of production vs. consumption. In fact, the metering employed in South Australia, and presumably elsewhere, samples energy flows at least once every electrical cycle (ie 1/50th of a second). These flows consist of power exported to the grid and power imported from the grid. The meter separately identifies each. Therefore, the only way that a household could fail to export electricity from the PV would be for that household to have consumed all of the power generated every 1/50th of a second. This is inconceivable.

The South Australian scheme is based on a 'net metering' approach primarily because this is the configuration that existing metering arrangements give.

The need to avoid unnecessary implementation costs in the form of additional or replacement meters and data systems was an important consideration in the design of South Australia's feed-in scheme. As part of the policy development process, actual data from hundreds of existing installed systems was analysed. This data showed that close to 50% of all electricity generated by these small PV systems was being exported to the grid. And since the scheme is based on existing metering arrangements, this analysis will be valid for the scheme in operation.

The calculations performed in the development of the scheme have been repeated with actual, metered billing data up to the end of April 2008 with the 50% assessment being confirmed. Attachment A to this letter outlines the analysis performed and the results obtained. As far as I am aware, this is the only analysis performed in Australia on actual metering data.

To reiterate, the attached analysis is based on 12 months of actual data from over 1500 installations connected, metered and billed exactly as they are under the scheme.

Given this and the cost of changing the metering arrangements of all existing installations (over 3000 grid connected installation as at the end of April 2008) to achieve a 'gross metering' model, it was clear that a 'net metering' approach delivers a substantial benefit without incurring significant implementation costs from gross metering. Further, in the context of South Australia having the 'peakiest' electricity demand in the NEM, this arrangement provides a clear incentive to PV owners to change behavior in order to manage their electricity consumption and maximize the benefit received.

I am more than happy to make one of my staff, the data and analysis available to the committee at any time. I can be contacted at oloughlin.tim@dpc.sa.gov.au or on (08) 8207 2323.

Yours sincerely

TIM O'LOUGHLIN
Deputy Chief Executive
Sustainability and Workforce management
Department of Premier and Cabinet
Government of South Australia

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Attachment A

Calculation of Level of PV Export for South Australia

Summary:

Billing period analysed:	1 May 2007 to 31 April 2008
Scope:	Installations with bi-directional metering exporting for the whole year (ie minimum 4 readings)
No of systems:	1544
Total quantity exported:	1,963,750 kWh
Average System Size	1578 Watts (to end April 2007)
Median Export Quantity:	1080 kWh for the 12 months
ORER Zone 3:	1382kWh/kW
Average System gross production:	2180 kWh
Estimated average %:	49.5%

Availability of Data

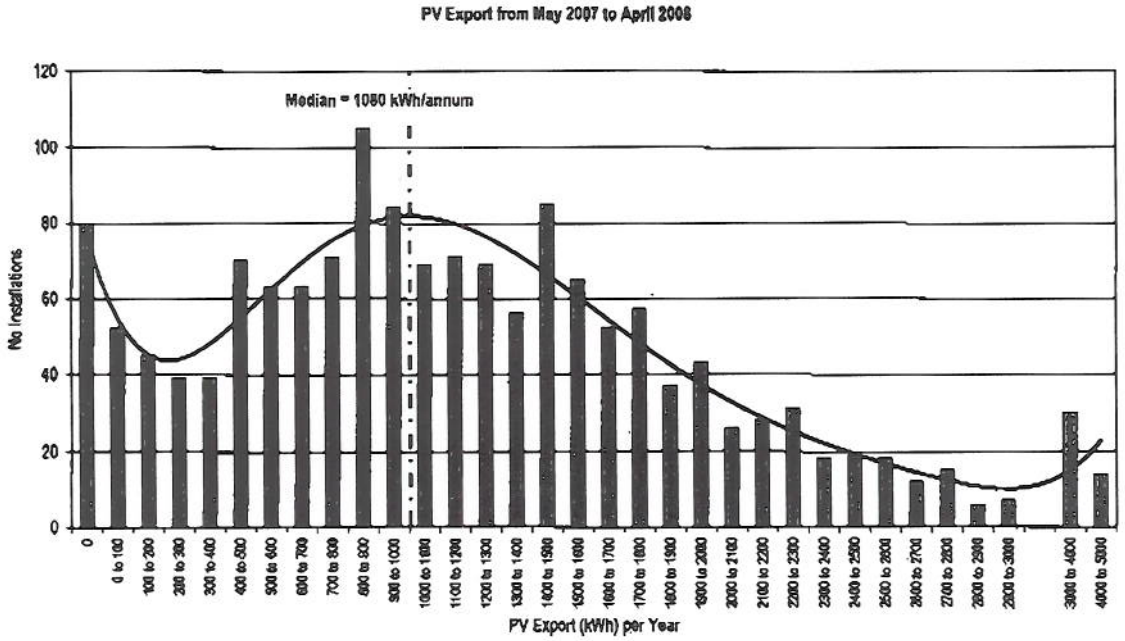
To estimate the level of export that would be expected for a typical PV system in the state, real meter data was obtained from ETSA Utilities for all customers using an import/export meter for their PV installation. The data obtained was for meter readings between 1/5/2007 to 30/4/2008, covering 2597 PV customers.

Any new installations in the period covered were identified by having 3 or less meter readings over the 12 month period. The data for these new installations was disregarded, as they were not operational for the entire year, resulting in a data set of 1544 installations.

Total quantity of electricity exported by these 1544 installations was measured as 1,963,750 kWh.

Distribution of Export

The export of electricity from a PV customer is dependent on a variety of factors including system size, orientation and the amount and pattern of electricity usage within the house. For the export data analysed, the median export was 1080kWh per year.



Calculation of Median Export in South Australia

The gross output of PV installations is not metered and ETSA Utilities is unable to report on the size of individual installations. In order to estimate the level of net export for a typical installation in South Australia, the median net export for the state was divided by the expected gross PV output for the average size PV installation.

$$Median\_Net\_Export(\%) = \frac{Median\_Net\_Export}{(Median\_SA\_System\_Size)x(Zone\_Rating)}$$

Where:

- *Median_SA_System_Size* is the median system size in South Australia. This was calculated from the *Photovoltaic Rebate Program (PVRP)* register from existence to April 2007 and is equal to **1.58kW**.

- *Zone_Rating* Adelaide is in climate zone 3, and therefore has a zone rating of **1382kWh/kW** per year, as published by the Office of Renewable Energy Regulator (ORER)[1]

The Median-sized system of 1.58kW can be expected to generate (gross production) 2180 kWh for the year.

The median net export of 1080 kWh results in an export level of 49.5% for the median PV installation in South Australia and assumes:

- Each PV system orientation is optimal, and unshaded by local structures
- There is no degradation in any of the PV systems output

In practice these assumptions are unlikely to be met in full. This results in a small overestimate of the gross PV output for the year, which in turn makes the 49.5% figure conservative. For this reason it is reasonable to conclude that net export to be regarded as "around 50%"

[1] http://www.orer.gov.au/publications/pubs/photovoltaic1207.pdf