The Design of a Feed-in Tariff for Australia

In order to provide an incentive for people to install grid-connected solar systems, and thus achieve the goals of a feed-in tariff scheme, there are three key elements of a feed-in mechanism which need to be considered: the level of the tariff; the means of metering; and the duration of the scheme. It is the combination of these three elements which determine the success or otherwise of a feed-in mechanism.

Grid-connected solar PV has numerous benefits, including reducing greenhouse gas emissions, limiting the growth in peak demand and avoiding the need for expensive network infrastructure augmentation. A fair price for the feed-in of electricity is one in which the homeowner receives not only full reward for the value of the electricity at the retail rate at the time of production, but also recognises these and other numerous benefits of solar PV. As such we strongly believe that an effective scheme would involve a feed-in tariff:

- ⇒ **mandated at 60 cents per kWh;**
- ⇒ **offered for 15 years; and**
- ⇒ **paid on the entire output of a system via gross production metering**
- ⇒ **5% degression rate**

Tariff Level and Scheme Length

In the accompanying document, *The Case for a Feed-In Tariff for Solar Micro-Generation,* we outline the numerous benefits achieved from the installation of grid-connected solar PV. These benefits are many and varied, with the environmental, network and economic case alone warranting a feed-in tariff incentive to stimulate the growth of this technology. When considering the additional industry development and employment creation benefits, there is a strong case for development of the solar PV industry.

The key element in driving investment in solar PV via a feed-in tariff is in creating a guaranteed return on investment and reducing payback times down to a reasonable level. We believe that a payback period between 10 and 15 years is essential to provide sufficient incentive to drive private investment in solar PV.

For this to be achieved, a feed-in tariff rate needs to be set at around 60c / kWh and be guaranteed for a minimum of 15 years. With the federal government's Photovoltaic Rebate Programme (PVRP) capped at $8000 for a 1kW system, a feed-in tariff of 60c will bring paybacks down to this level – around 15 years in the south of the country, and closer to 10 in the sunnier north. However, it is essential that this is paid on the total generation of the solar PV system.

Metering

It is essential that any feed-in scheme implements a system of gross production metering, whereby a homeowner is credited for the full production of their system. Gross production metering – typically involving a separate meter to measure the entire generation from the PV system – results in the fairest and most accurate calculation and payment, fully rewarding the system owner for the benefit of their system to the electricity grid.

The South Australian Government recently announced a system of net export metering which would reward homeowners for the electricity exported to the grid *minus what is consumed in the home at the time of production*. This system of 'net export metering' significantly discriminates against certain classes of consumers, as well as making calculation of the cost of the scheme extremely difficult, as outlined below. In addition, such a system would put us at odds with the majority of feed-in mechanisms internationally, with almost all based on gross production metering.

A net export metering regime for feed-in tariffs discriminates against both owners of smaller grid-connected systems and those who are more likely to consume electricity during the day, such as senior citizens or stay-at-home parents. In cases such as these, where instantaneous system production rarely exceeds household consumption, system owners rarely exporting electricity to the grid would not be able to receive the benefit for premium feed-in rates offered, and thus would gain very little financial return on their investment.

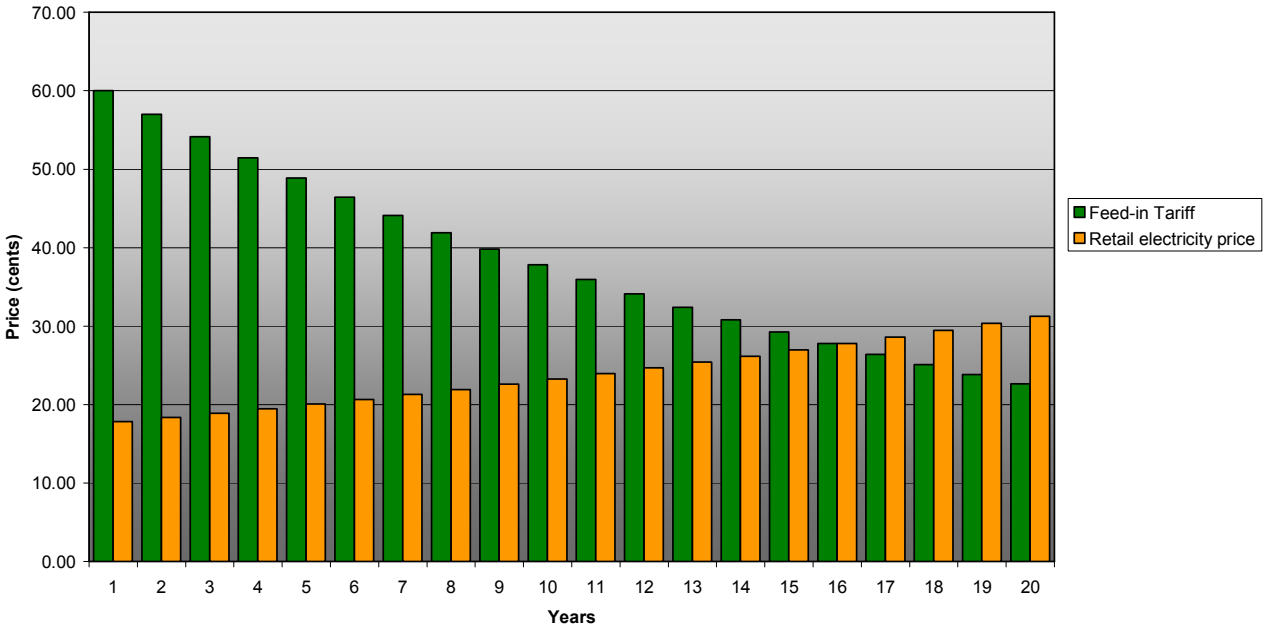
Further, a system of net export metering creates significant uncertainty in the market, both in terms of potential financial return from the feed-in tariffs for the system owner, and in the cost of the system for the government and wider community. The introduction of gross metering allows for far clearer estimates of ongoing costs and benefits of the tariffs due to the relative predictability of gross electricity production for a given sized installation over a given time frame.

Whilst it is possible to achieve the same level of incentive for some classes of individuals (those with larger systems and / or those not at home during the day) to invest in a solar PV system using net export metering, it would require significantly higher tariffs, longer implementation times, or both. For all of the above reasons, we strongly believe that any feed-in tariff scheme in Australia should be based on a system of gross generation metering.

Degression Rate

In order to take into account the economies of scale and technological advances which will lead to a reduction in the installed costs of PV systems over time, ATA proposes the inclusion of a 5% degression rate of the feed-in tariff. Thus, the initial tariff of 60 c/kWh in the first year would fall to 57 c/kWh in the second, 54.2 c/kWh in the third year, and so on. With increasing retail rates for electricity and falling costs for solar PV over time, the up-front costs towards the end of the 15 years a degression of 5% would result

As shown below, an average increase in electricity retail prices of 3% per annum over the next 15 years[1], and assuming a $20 / tonne carbon price, a degression of 5% would see parity reached at the end of the 15 years of the scheme.



Cost of the Scheme

In the 7 years since the inception of the Photovoltaic Rebate Program (PVRP) Australia has seen the installation of under 10MW of grid-connected solar PV. Given that there would have been a small number of systems installed across the country before the introduction of the PVRP, as well as a handful of installations since 2000 not subject to the PVRP, it could be assumed that a total grid-connected capacity of just over 10MW exists in Australia. By means of comparison, under what is widely considered a worlds-best-practice feed-in tariff model, Germany has a total installed capacity nearing 2,600MW, with up to 750 MW installed in each of the past two years alone[2].

[1] based on the average CPI over the past 15 years
[2] International Energy Agency Photovoltaic Power System Program (2006) *PVPS Annual Report 2006,* IEA PVPS, p. 63

Even with the modest target of a 10-fold increase in capacity over the next five years, the cost of this additional 15 MW is relatively minor when spread proportionally across the millions of electricity customers across the country. This cost is even lower for the typical domestic customer when proportioning the cost on a volume-consumed basis, rather than merely per customer.

These costs are further reduced, when considering the direct financial flow-on to residential customers from reduced network augmentation costs and associated network charges (presently approximately 50% of retail electricity charges) and lower peak wholesale pool prices. With appropriate concessions to protect low-income and disadvantaged customers, the cost of such a scheme under a gross production metering is clearly readily affordable.

Indeed, a recent progress report by the German Government on their feed-in tariff scheme shows that there was actually a net financial benefit from the feed-in tariff scheme introduced there, with the savings from reduced wholesale electricity and fuel imports costs, as well as the avoided damage resulting from climate change, outweighing the cost of the feed-in tariff by a factor of approximately two-to-one[3].

The additional economy-wide benefits of improved supply reliability, enhanced energy security through diversification, reduced greenhouse gas emissions, and industry development resulting in additional employment opportunities, along with the subsequent and ongoing reduction in costs of solar PV technology resulting from economies of scale, make the case for an enhanced feed-in tariff based on gross production metering a very compelling one.

[3] Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) *Renewable Energy Sources Act Progress Report 2007*, BMU, Germany, 2007