The Design of a Feed-in Tariff for Victoria

In the lead up to the recent Victorian State election, the ALP made a commitment to introduce a fair price for grid-connected solar PV electricity via the implementation of a feed-in tariff. The policy release entitled ***Tackling Climate Change – Helping families play their part*** announced that an "effective and efficient feed-in system" would be developed in conjunction with "energy companies and shareholder groups", and that such a feed-in tariff would provide a fair price for renewable energy fed into the grid.

The Alternative Technology Association and the Moreland Energy Foundation welcome this initiative of the Bracks Government and would like to take this opportunity to provide some input into the design of such a scheme in order for it to best achieve the stated goals. In order to provide an incentive for people to install grid-connected solar systems, and thus achieve the goals of the 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.

In announcing the policy, it was recognised that 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.

Applying a solar PV system output figure of 1.185 MWh/year per installed kW, as determined to calculate deemed Renewable Energy Certificates for a solar PV installation in southern Victoria[1], a tariff set at four times the retail rate, or 60 cents per kWh, would generate approximately $17,000 over the 15 years lifetime of the scheme for a typically sized 1.6kW system[2].

Whilst this figure wouldn't cover the purchase and installation cost of such a system (estimated at between $22,000 and $24,000), with the current federal Photovoltaic Rebate Program amount of $8000 for a system of this size, a tariff of 60 c/kWh for 15 years would achieve financial payback on the system within the 15 years of the scheme. We believe that a payback period in the order of 15 years is essential to provide sufficient incentive to drive private investment in solar PV.

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 of payment, fully rewarding the system owner for the benefit of their system to the electricity grid.

[1] Office of the Renewable Energy Regulator (2006) *Calculating Renewable Energy Certificates (RECs) for Small Solar Panel (Photovoltaic) Systems – Fact Sheet*, Australian Government, ORER
[2] 1.6 kW x 1.185 MWh/year/kW x 15 years x $0.60 x 1000 = $17,064

The South Australian Government recently proposed 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.

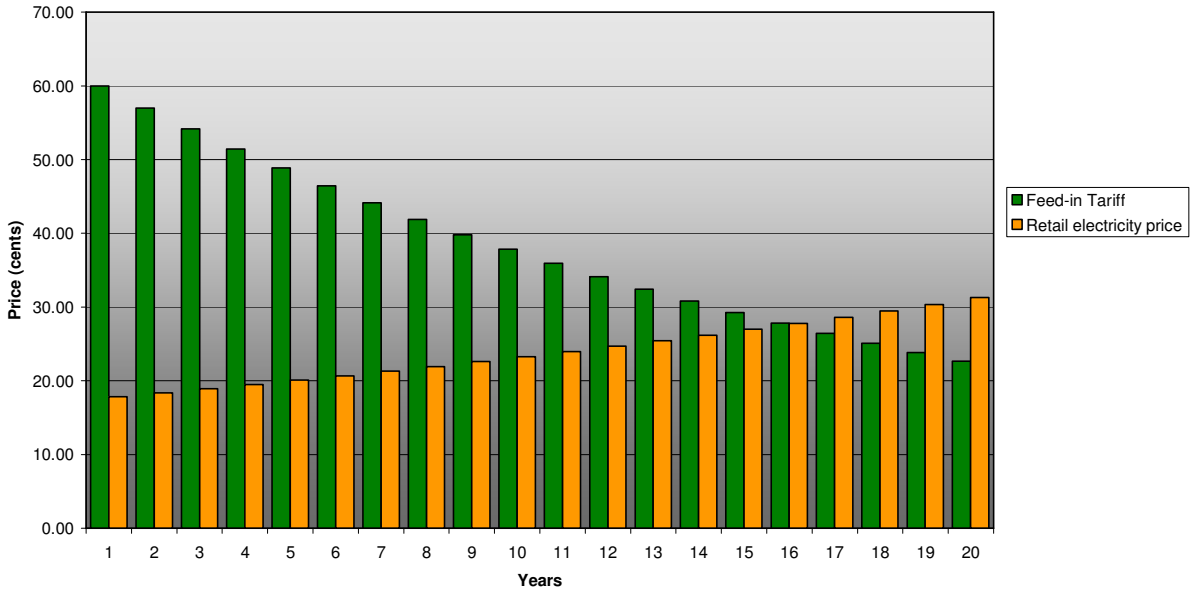
Further, a system of net export metering creates significant uncertainty in the market, both in terms of potential financial return from the feed-in tariffs for the system owner, and in the cost of the system for the government and wider community. The introduction of gross metering allows for far clearer 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 the Victorian Government should adopt a system of gross export metering for any introduced feed-in tariff.

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, we propose 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[3], 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.



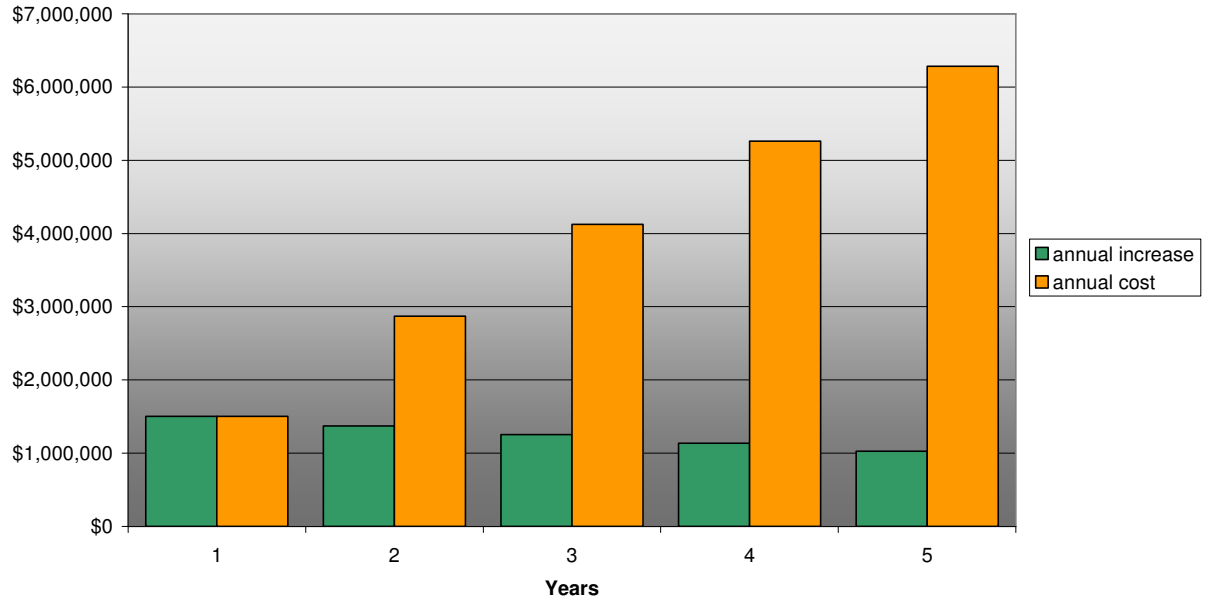
[3] based on the average CPI over the past 15 years

Cost of the Scheme

In the 7 years since the inception of the Photovoltaic Rebate Program (PVRP) Victoria has seen the installation of just over 1.4 MW of grid-connected solar PV. Given that there may have been a small number of systems installed in Victoria 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 installed capacity of around 1.5 MW exists in Victoria. 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[4].

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 2.2 million electricity customers in the state. Indeed, the total cost per annum of this additional capacity would be in the order of $6.3 million[5], or a paltry $3 each per year. Obviously, this figure would be even lower for the typical domestic customer when proportioning the cost on a volume-consumed basis, rather than merely per customer.

Annual cost of additional solar PV capacity (3MW per year for 5 years)



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 for low-income customers, the cost of such a scheme under a gross production metering is clearly readily affordable.

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.

[4] International Energy Agency Photovoltaic Power System Program (2006) *PVPS Annual Report 2006,* IEA PVPS, p. 63
[5] Scheme cost based on a $0.60 feed-in tariff in the first year and degressing at 5% per year, less an assumed retail electricity value of $0.17 c/ kWh in the first year increasing with CPI at 3%, and 3 MW installed each year for 5 years to reach 15 MW.