



Renewable and Distributed Generation Working Group
Secretariat Ministerial Council on Energy
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The growing demand for energy globally and in Australia presents many challenges but also many opportunities for emerging and commercial technologies such as solar photovoltaic (PV).

At BP Solar, Sydney Olympic Park, we are optimistic about the contribution of solar PV to the energy mix in Australia and are pleased to provide BP Solar's response to the "Impediments to the Uptake of Renewable and Distributed Energy" discussion paper.

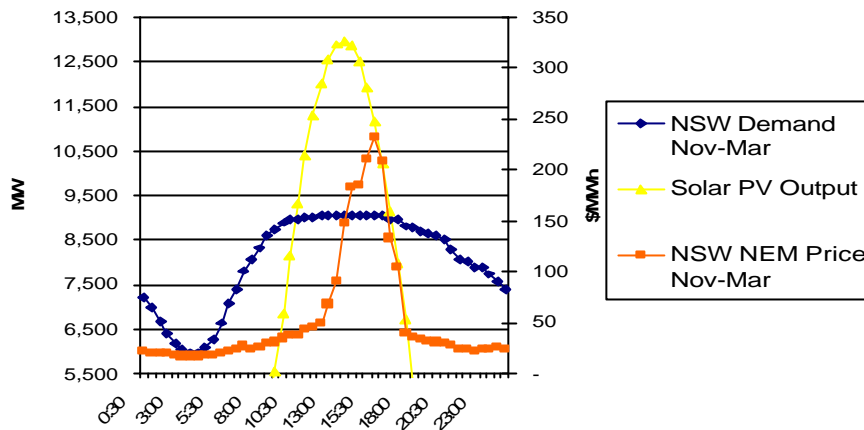
Background

BP Solar has been manufacturing in Australia for 30 years and has during this time increased its capacity and capability to do so significantly. Last year, at a cost of \$8M, the facility's production capacity increased by 25% to 50MW. We now employ over 250 people and export over \$100M worth of product to other markets in the region. We are enormously proud of these achievements but we are also quietly confident we can do more and remain optimistic more will be done.

Why solar PV?

Solar PV is the only carbon free distributed generation technology that can be installed in the built environment without moving parts.

From a policy makers point of view the compelling case for solar PV is based on the correlation between the technologies output and the demand for electricity. Put simply it is a response mechanism to peak demand. Australians increasing desire to have air-conditioners is fuelling growth in the peakiness of energy demand. This new and emerging challenge will need to be managed with new solutions and approaches. Coal fired power stations have proven their ability to meet base load needs at scale but the solutions to peak demand will reside with those technologies which have the ability to generate power when and where it is needed.



The case for Solar PV is also linked with its status as a renewable, clean and environmentally benign technology. Being emission free, Solar PV can be used to mitigate against the risk that externalities will be factored into energy generation costs. Planning for such an environment is likely to become a reality.

Further, the competitive position Australia enjoys of having a world leading technology based facility in Sydney, gives ground to leverage off this asset and build a sustainable Australian industry which supports and creates thousands of skilled jobs, attracting private capital and more than doubling its economic contribution to Australia.

But before these benefits can be realised the focus remains on removing the impediments that exist today.

Challenge

Today there exist impediments to the uptake of distributed generation technologies like solar PV. The primary hurdle is the capital outlay and the fact that today's investor is not rewarded for producing clean electricity when it is needed most, on hot sunny days when air conditioners are pumping.

If system costs can be reduced and cost reflective pricing mechanisms introduced, the opportunity exists to capitalise on a sympathetic public and the technologies broader wide scale appeal.

Continued advances in reducing costs and in improving the efficiency of the cells are helping bridge the economic hurdle and move us closer to achieving grid parity. Moving the technology down the cost learning curve so that it can compete with the cost of producing conventional coal fired power is likely to occur within the next decade. There are many ways of achieving this but one of the most significant factors which will influence the timing is scaling up or growing volume.

Solutions

With the right signals, markets respond and as has been evidenced in other regions, they can serve to accelerate uptake and also stimulate industry investment and deliver economic dividends. BP Solar is committed to the development of the solar PV industry in Australia using market transition policies.

Feed In Tariffs have proven to be instrumental in growing solar PV and other renewables in many markets around the world. To date some 37 countries, states and provinces have now enacted such laws. Such is its popularity that it is now not only the dominant support

mechanism for renewable energy deployment globally but it also fast becoming the industry standard.

Feed In Tariff or Solar Premium defined

The *Solar Premium* is a premium tariff paid to consumers with solar photovoltaic (PV) systems. The tariff is set at a higher level than current electricity tariffs and is paid on each unit of electricity generated by the consumers' solar PV system. The premium falls every year and is funded through a small levy on retail electricity bills.

Example

The German FIT was introduced only 5 years ago, but has been responsible for rapidly propelling industry development in Germany and delivering to the Government many benefits beyond those anticipated.

Germany's FIT:

- Provides investment certainty for a period of 20years
- Provide preferential tariffs for electricity generated from renewables (including solar PV, wind)
- The preferential tariffs decline by 5% per year to encourage industry development

Key Facts about German FIT:

- More people are now employed in the solar industry (25,000) than the black coal industry
- 830MW of solar PV was installed in Germany last year (2005), an increase of 50% from 2004 due to FIT (Renewable Energy Law)
- Since the law was introduced Germany's annual greenhouse gas emissions have reduced by 23 million tonnes

Our modelling would suggest that if a FIT were adopted in NSW it would:

1. Deliver more 1,500MW of clean solar peaking capacity by 2020 (a quarter of new peaking capacity required)
2. Provide significant economic benefits by matching typical summer demand with a systems output. Capturing this benefit and rewarding an investor at rates equivalent to NEM prices would avoid network upgrades, ensure peak electricity generation, generate tax receipts from industry revenue in excess of \$260M etc.
3. The cost to implement would be significantly less than benefits – it would increase electricity costs by less than 1% or the equivalent of a cup of coffee per year for a typical customer.
4. Provides improved energy security and price stability by promoting a diverse energy portfolio
5. Would reduce the environmental footprint by 2 million tonnes of CO2 per annum by 2020 (excludes air quality benefits).
6. Would deliver an unsupported solar industry in 2020 – by decreasing preferential tariffs each year (in the order of 5%), industry is encouraged to realise potential cost reductions
7. Would attract private investment and correct the financial barrier that exists today.

The mechanics in detail

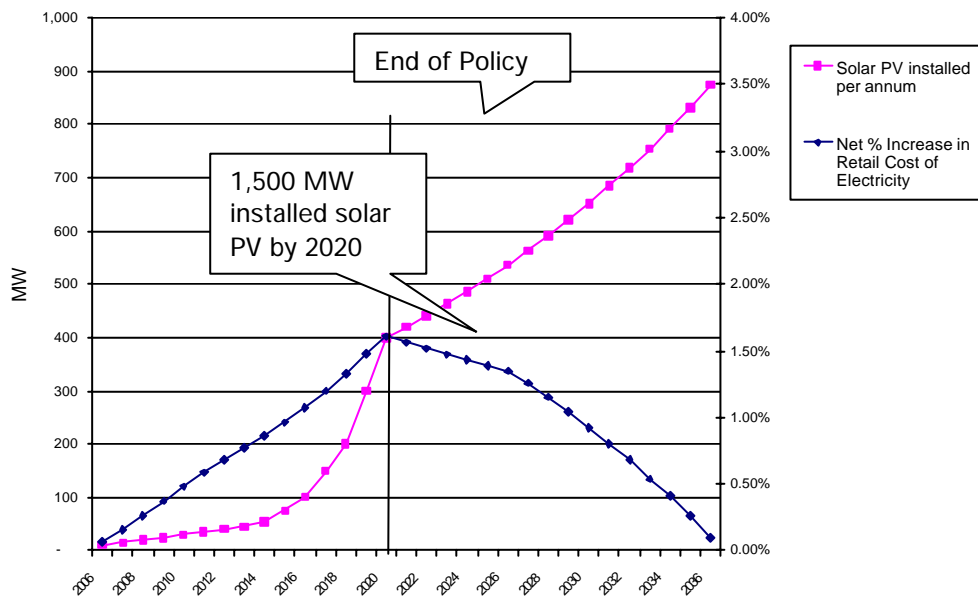
The following calculation is based on a *Solar Premium* of 45¢ per kWh above the retail rate for grid-connected PV generation, declining to only 7¢ per kWh by 2020. This is to say that the purchaser of a solar PV system in year one of the policy will be guaranteed a feed-in tariff of 55¢ per kWh, maintained in real terms and paid for a full 20 years. In combination with the current federal tax support, the premium need only begin at 30¢ per kWh.

The premium recognises the higher value of solar PV generation over conventional generation, and as such is funded by a small levy spread across all beneficiaries (i.e. electricity consumers - with the exception of those energy intensive industries for whom the levy would prove significant) with no government funding.

The guaranteed tariff is then set to fall by 5% per annum, to ensure the cost reductions that result from scaling up the industry are passed on to consumers. By 2020 the premium falls to less than 7¢ per kWh. That is to say that a purchaser of a solar PV system in year 15 (the final year of the *Solar Premium* policy) will receive a 27¢ (20¢ retail + 7¢ premium) per kWh tariff fixed in real terms for its payment over 20 years.

With such a market-driven policy in place, private capital can provide the investment to ensure the 1,500MW forecast above are delivered in a manageable but substantial expansion of the solar industry. The PV take-up rates are based on those experienced in Germany and Spain on the introduction of equivalent feed-in tariff returns.

The collection mechanism exists today in NSW with the Energy Savings Fund which need only be expanded and extended to 15 years. The resulting cost on consumers' electricity bills (cost of *Solar Premium* less value of electricity) is charted below, alongside the increase annual solar PV installation.

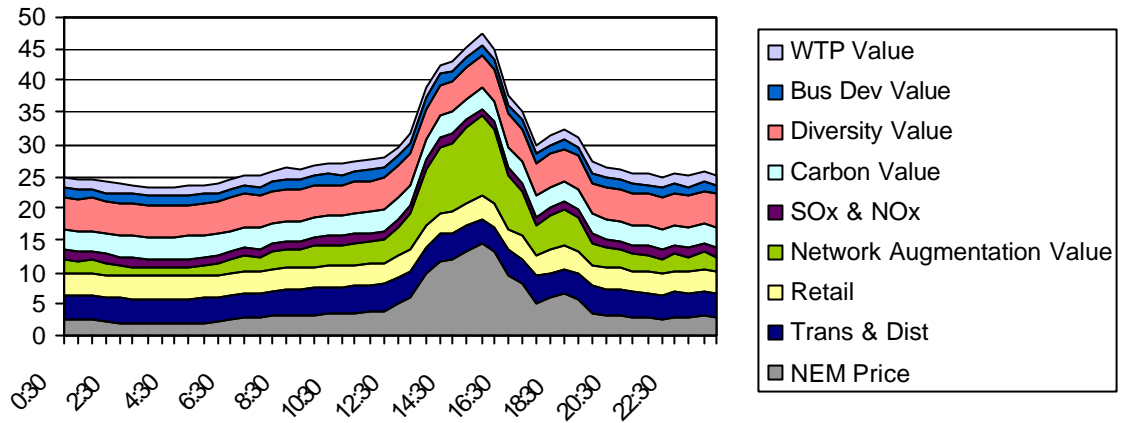


Impact on Retail Electricity Cost versus Increased Annual Solar PV Installation

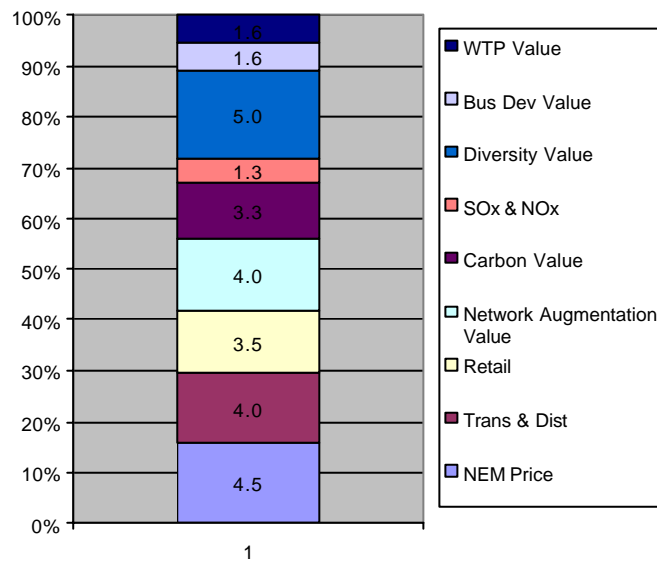
With rising retail electricity costs - assumed to increase at 4% per annum (i.e. conservatively below near-term electricity inflation) - and falling solar PV costs, parity will be reached by 2020. No new support is required after 2020. The cost to the consumer will average 0.9%, peaking at 1.6% before rapidly falling to zero (as shown above). This excludes the other values that result from the *Solar Premium* which generate positive net present value for the economy.

This economic justification for the policy can be illustrated by showing the component values of the solar electricity and how these compare to the tariff - these values are not currently

captured in the marketplace, they are nonetheless suffered by the economy and the taxpaying consumer. The two illustrations below show the time of day values of solar electricity and its constituent parts. Both charts include certain values where assumptions are required ahead of more accurate results due from studies in place today.

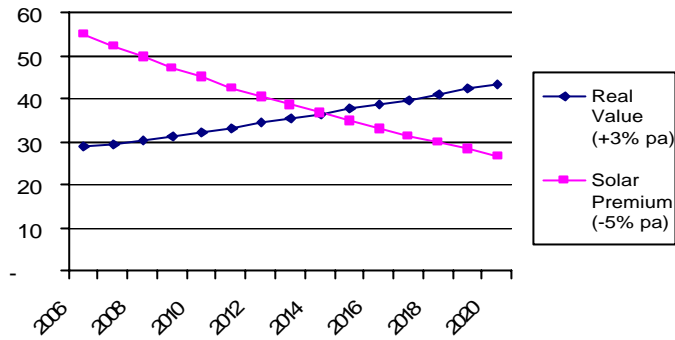


Time of Day Composition of Total Value of Solar Generation



Percentage Composition of Total Value of Solar Generation

The total average estimated value of 29c/kWh will continue to rise over time. The gap with a decreasing *Solar Premium* therefore falls rapidly, such that the policy starts creating increasing value from 2014 onwards. The early year's costs therefore represent necessary industry development, required to achieve a long-term solution. Overall the policy brings positive net present value to the states which introduce it.



Cost of Solar Premium versus Value of Solar Electricity Generated

Whilst the above model is based on NSW, there are no reasons why other state governments could not introduce a Solar Premium or adopt a Feed In Tariff model.

BP Solar would certainly commend and encourage each of the state Governments to consider its appropriateness as they tackle energy issues and to this end we would be happy to work with each of them to discuss the options and implications for their state in greater detail.

Smart Meters

BP Solar supports an aggressive timetable for the roll out smart meters to the Australian market, smart meter technology that has import and export capability in addition to being able to display prices. Rolling out meters that do not have such functionalities would limit the extent to which such technology would serve the purpose of being a demand management tool, helping the consumer understand how they can minimise their electricity bill and electricity requirements by changing their patterns of usage of electricity.

In addition, rolling out meters with import and export functionality and pricing display, allows a solar PV owner to maximise the return on their investment. This will be of great significance in encouraging greater market uptake when cost reflective pricing or differential pricing structures are introduced.

Conclusion

BP Solar is encouraged by the endeavours of the Ministerial Council of Energy to review the impediments to renewable and distributed energy technologies and are keen to see greater focus on the adoption of policies that stimulate private investment by recognising the contribution and value solar PV technology uniquely offers over and above other generation technologies.

BP Solar looks forward to working with Government and other stakeholders to progress the removal of the impediments to uptake of solar. We would be happy to answer any questions you may have in regards to the above. Please contact Andrea Gaffney for further information on 02 8762 5823.

Kind regards

BP SOLAR AUSTRALIA PTY LTD



Mark Twidell
Regional Director Australasia

