Australian PV Association

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APVA Response to the Queensland Competition Authority's Issues Paper on 'Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland', *Aug 2012*

Sept 2012

QCA's Issues Paper on 'Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland',[1] has made some useful contributions to the debate around the value of PV electricity. However, the paper highlights several critical issues pertinent to the debate in Queensland and nationally:

- Prevailing electricity tariffs are often not cost reflective, so that it is difficult if not impossible to calculate the real benefits being provided by PV and other distributed energy solutions
- It would be discriminatory under the NEM rules to treat PV customers differently from those who have the same electricity load, but achieved through energy efficiency or other means
- State and national electricity regulators are focussing on ways to stop PV uptake from impacting their existing market arrangements, rather than acknowledging the disruptive nature of current developments and the urgent need for new market structures to be implemented
- Regulators are focussing on maintaining the income and profits of incumbent distributors and retails, rather than on assessing ways and means to achieve the best long term outcomes for the Australian public.

The APVA remains of the view that tariffs for exported PV electricity should have a mandated minimum value and that, in the absence of premium feed-in tariffs, net metering arrangements would provide the most straightforward means of reflecting current PV value to retailers. The value to the customer of power used on site should be the value of the electricity displaced, as it would be if energy efficiency or demand management were used instead of PV. These arrangements should apply to both residential and commercial customers, across all tariff types and be available until such time as electricity tariffs are cost reflective and suitable changes are made to provide an active market for distributed energy services in or alongside the NEM.

Also, PV should not be treated as a special case; rather, in line with the NEM objectives of technology and participant neutrality, distributed energy regulations should apply to all participating technologies. Hence, end-use customers should be free to use energy efficiency, distributed generation and demand management options to reduce their electricity bills.

[1] 'Issues Paper - Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland', Queensland Competition Authority, Qld Government, August 2012.

QCA findings

APVA commends the QCA on the following points:

- *Recognising that retailers benefit from more than just the wholesale market value of the electricity produced by PV systems.*
- *Recognising that the simplest and most accurate way to value PV exports to retailers in the current regulatory environment is simply the retail tariff minus any costs associated with buying and selling that electricity.*
- *Confirming that reductions in loss factors and the merit order effect provide financial benefits to retailers that are currently not recognised.*
- *Recognising that it may be appropriate to provide different financial incentives to PV that provides support to the distribution network in particular areas.*

However, of overriding concern to the APVA is the failure of the report to acknowledge the changing environment in which retailers will need to operate as the uptake of distributed energy technologies – distributed generation (DG), demand side management (DSM) and energy efficiency (EE) - increases. The APVA is of the view that the current regulations do not adequately cater for the significant changes now under way in the distributed energy market generally and that these cannot be separated from responses to PV in particular.

As electricity costs increase, deployment of Solar Water Heating systems and Energy Efficiency is going to increase regardless of PV, which will further decrease customer electricity use. In addition, at least in areas where cost reflective pricing is desired, the rollout of time of use meters will increase interest in demand management. New regulatory arrangements should be put into place as soon as possible to cater for this new market in distributed energy services. Such a market would facilitate new business models for both networks operators and retailers, providing appropriate incentives for grid support functions, distributed generation and demand reduction. Attempting to maintain the current market structures will reduce incentives for change to lower cost energy service delivery and lock in last century's now inefficient technology and institutional structure for longer than need be.

New market structures should encompass incentives for the grid services that PV inverters can provide, including reactive power and voltage support, whilst also creating opportunities for associated storage and load control. Importantly, measures that support Distributed Energy are also likely to support vehicle-to-home (V2H) and vehicle-to-grid (V2G) from electrical vehicles, which, if properly managed, could significantly reduce residential evening peaks – and vice versa, if appropriate regulatory arrangements are not in place. Customers would need to actively participate in these new business models and markets, marking a significant change from the past customer role as a passive recipient paying for a service to someone that actively manages their load with some combination of DG, EE and DSM, or purchases this service from a new type of energy service provider.

Responses to Questions in Issues Paper

Issues Paper Section 3.1

(a) How should the term fair and reasonable be interpreted? Should it be interpreted as a subsidy-free value that reflects the benefits to retailers of electricity generated from small-scale PV generators? If not, how should it be interpreted and why?

(b) Should the Authority include the benefits associated with PV exports to other parties (all customers and distribution entities) in setting the fair and reasonable value? Why?

(c) Are there any other issues that the Authority should consider in interpreting the term fair and reasonable value?

APVA Response:

The term fair and reasonable should be interpreted as a subsidy-free value that reflects the benefits to the electricity system of electricity generated from small-scale PV generators. However, the paper acknowledges that regulated tariffs in Qld are not necessarily cost reflective and, in the Ergon area in particular, are significantly cross-subsidised. With little or no transparency in electricity tariff calculations, it is not possible to ascertain what a fair and reasonable price for PV electricity should be and hence additional steps are required to ensure that all the PV benefits do flow on to relevant stakeholders.

Suppression of wholesale electricity prices

As acknowledged in the IPART Report "Solar feed-in tariffs: Setting a fair and reasonable value for electricity generated by small-scale solar PV units in NSW Energy — Draft Report",[2] the suppression of wholesale electricity prices by PV is a benefit captured by retailers. This should therefore be included in the fair and reasonable value captured by retailers.

Although it may be difficult to accurately quantify such benefits, it is not particularly difficult to *estimate* them. This has been done most recently by ROAM Consulting for the Australian Solar Institute.[3] They found that 5GW of PV across the NEM (there is currently about 1.4GW of PV in the NEM), representing approximately 10% of peak demand, would reduce wholesale electricity prices by 10-25% - with lower penetrations of PV having a disproportionately higher impact as higher cost generation is displaced.

Although ROAM Consulting did not covert this impact on wholesale prices into a per kWh for PV, this has been done in a similar study by the Melbourne Energy Institute. Using actual price dispatch stacks from the NEM in 2010 they estimated the impact of the PV that was installed during 2010. They assumed the ORER levels of generation throughout the NEM and found the total value to be about $34 million, which when divided by the total PV generation, equated to just over 10c/kWh. While the authors acknowledge their approach is not perfect (for example their model assumes static bidding and so does not allow for possible changes in participant bidding behaviour in response to PV), the size of the benefit makes it worthy of further investigation.

It should be noted that the BMU (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety) in Germany formally reports on the value of the merit order effect every year, in part based on work they commission, when they evaluate the uptake of renewable generation and the

[2] "Solar feed-in tariffs: Setting a fair and reasonable value for electricity generated by small-scale solar PV units in NSW Energy — Draft Report", Independent Pricing and Regulatory Tribunal, NSW Government, November 2011.

[3] ROAM (2012) Solar Generation Australian Market Modelling, Report (ASI00003) funded jointly by ROAM Consulting and the Australian Solar Institute.

effectiveness of associated policies. They estimated that the MOE induced by all renewable generation in 2009 (no figures are yet available for 2010) reduced the costs of wholesale electricity by about 3.1 billion euros.[4] When divided by total renewable generation, this equated to about 4 eurocents/kWh.[5]

If this benefit to retailers is ignored, the QCA will in fact be recommending that the fair and reasonable value should include a subsidy, from the owners of PV systems to retailers and presumably to all customers, if/when retailers do pass the savings on. While this may be considered an indirect benefit or externality, this is the very reason that government regulation is required to capture and allocate them fairly.

As indicated in the introduction to this submission, the APVA does not believe that specific rules should be set for PV, rather that new regulations should be developed which cover all distributed energy. For instance, all distributed generation, as well as any activities that reduce electricity use, such as the variety of energy efficiency measures and solar water heaters, provide similar indirect benefits to those described above for PV. The latter are currently rewarded with a value equal to the prevailing retail tariff.

Provision of network support

The Issues Paper seems to be taking a rather one-sided approach to PV providing network support.

Page 8 of the Issues Paper states:

"Regardless of the potential benefits or costs of PV exports to distributors, the Authority questions whether such impacts should be included in a fair and reasonable value for feed-in tariff, given that any such impacts should be reflected in network charges approved by the AER, which retailers can be expected to pass through to customers."

So to paraphrase, because a financial benefit is passed through to all customers, it should not be considered as a value provided by PV systems.

However page 4 of the Issues Paper states:

"The current Scheme is funded by the distribution network businesses, Energex and Ergon Energy. This means the electricity distribution business is currently liable to pay the amount of the feed-in tariff which is then credited to the PV customer by the retailer. As distribution network charges are regulated, the costs incurred by the distribution business in funding the current Scheme are recovered through higher network charges for all customers."

So to paraphrase, because a financial benefit is passed through to all customers, it should be considered as a cost driven by PV systems.

PV's ability to provide transmission network support is not site-specific because the loads and PV generation are aggregated on the transmission network. PV with a capacity less than 5MW is classified as distributed generation, and so is not required to register with AEMO or participate in the NEM dispatch process. Thus, rather than being incorporated into TNSPs' ESOOs as a form of generation, it is assumed to reduce demand, and so also reduces the need for network capacity.

Recently, the Western Australian government released a new methodology for calculating the Capacity Credits available to intermittent generation. This is essentially based on the average output by the generator during the top 12 Trading Intervals drawn from separate days from the previous 5 years,

[4] BMU (2011) *Renewable Energy Sources in Figures: National and International Development*, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany.

[5] At the much higher penetration levels of renewable energy in Germany, the per kWh impact of the MOE decreases because lower cost generation is displaced.

less an adjustment for the variability of output. This approach implicitly recognises that intermittent generation such as PV can provide capacity at peak periods.

Issues Paper Section 3.2

(a) Has the Authority correctly determined which costs a retailer can avoid when on- selling PV exports?

(b) Is it reasonable to use cost estimates from notified prices to determine the feed-in tariff? If not, which cost estimates should the Authority consider using?

(c) What proportion of distribution losses are avoided when PV exports are on-sold?

(d) Is it reasonable to split retail margin and headroom between the retailer and the PV exporter? What are some of the considerations in providing a greater proportion of the costs to either party?

(e) Is it fair and/or reasonable to have different FIT based on geographical locations in a market with the Uniform Tariff Policy in place? What are some of the benefits or complications of creating geographically based FIT?

(f) What other issues should the Authority consider in determining the fair and reasonable value of PV exports.

APVA Response:

As stated above, the Authority has not included the suppression of wholesale electricity prices by PV electricity, when it is either used onsite or exported to neighbours. There are other benefits associated with this, including reduced market price volatility, which also benefits retailers.

At current penetration levels, and in fact even at significantly higher penetration levels, essentially all the exported PV electricity would be used by the neighbours – if on a net metering system. Of course, if on a gross metered system, a significant proportion would be used by the owner of the PV system, with the remainder used by their neighbours. Thus, in either case, all transmission losses and a significant percentage of distribution losses will be avoided.

Location-based feed-in tariffs are reasonable. The solar industry is sophisticated enough to handle the complications of geographically-varying Feed-in Tariffs, so long as there is sufficient difference (i.e. benefit) to warrant the additional complication.

Issues Paper Section 4.1

(a) What form of regulation should be applied when implementing a fair and reasonable feed-in tariff in Queensland? Alternatively, should the fair and reasonable tariff be determined by market competition alone, without regulatory intervention?

(b) Which regulatory approach is most appropriate to support competition in the Queensland electricity market, while recognising the need for certainty for small PV system owners?

(c) What evidence is available of the number of solar PV customers receiving voluntary feed-in tariff premiums in Queensland? Does the level of these tariffs represent a fair and reasonable value for the electricity exported by solar PV customers?

(d) What, if any, specific arrangements might be required when implementing the fair and reasonable feed-in tariff in the Ergon Energy distribution area? In particular, should different forms of regulation be used in the Energex and Ergon Energy network areas?

(e) Are there any other factors (besides the competitiveness of the retail electricity market) that the Authority should consider in determining an appropriate form of regulation to apply in Queensland?

APVA Response:

Queensland electricity tariffs and not set by the market and are not cost reflective in many areas. Hence, it is not possible for a fair and reasonable price for PV electricity to be determined by market competition alone.

In a market where electricity tariffs are regulated, PV customers need to have clear guidance from the regulator on their rights to connect and on the tariffs they will receive for exported power.

Until such time as customers can be provided with signals that value their contribution to energy, demand reduction, voltage support and other costs and benefits to the electricity system via a distributed energy market, the value of their contributions should be linked to prevailing retail tariffs. In particular, customers should be free to invest in displacing their own electricity use, be it via PV systems, energy efficiency or demand management without penalty. Exported power should be valued at prevailing tariffs less un-avoidable and justifiable costs. Costs incurred merely to maintain an existing system, which may not be the most efficient or suitable in the longer term, would not be considered justifiable.

Issues Paper Section 4.2

(a) Is a net or gross metering arrangement most appropriate in Queensland, and why?

(b) Are the benefits to retailers different under net and gross metering arrangements?

(c) Are there any other factors the Authority should consider when recommending an appropriate metering arrangement?

APVA Response:

(a) Solar water heaters (SWH) and energy efficiency (EE) reduce DUOS revenue in exactly the same way that on-site use of PV electricity does. As electricity costs increase, deployment of SWHs and EE is going to increase regardless of PV uptake and so the problem of reduced DUOS revenue is going to have to be addressed regardless of the findings of this review. In other words, forcing PV owners onto gross metering isn't going to solve the problem, it will just disadvantage people trying to produce low emission electricity, become more self-reliant and hedge against future electricity price rises. Of course, the main driver of increasing network costs is the increased use of air conditioners. This issue has been recognised most recently in the Power of Choice Review process and again, forcing PV owners onto gross metering isn't going to solve the problem.

Instead, as discussed above, there is a clear need for the development of a Distributed Energy market that provides appropriate incentives for distributed generation, energy efficiency and demand reduction.

It is worth noting that the implications for the findings of this Issues paper go well beyond PV. Grid-connected batteries have the potential to contribute to significant reductions in peak demand and so reduce network costs. Will they also be required to be on a gross meter? This would significantly reduce their financial viability and so delay their contribution to reducing costs to all consumers. With the advent of vehicle to home (V2H) electric vehicles (EV), such batteries are a real possibility within the next few years.

Most importantly, it is likely that forcing PV owners to be on gross tariffs may in fact be inconsistent with COAG's National Principles for Feed-in Tariff Schemes ie.

3c) assignment of tariffs to small renewable consumers should be on the basis that they are treated no less favourably than customers without small renewables but with a similar load on the network.

A customer that reduces their electricity use through EE, a SWH or even a grid-connected battery (such as a V2H EV) effectively earns the full retail tariff value on that electricity. For example, on a tariff of 25c/kWh, for every kWh that they no longer import from the grid, that customer will be 25c better off. Similarly, a customer that reduces their electricity use through on-site use of net metered PV electricity would also be 25c better off for every kWh that they no longer import from the grid.

However, if that same customer is required to be on a gross meter, they would be, for example, only 8c/kWh better off for the same electricity that otherwise would have reduced their imports from the grid. Therefore, the PV owner on a gross meter would be being treated less favourably than customers without a PV system but with a similar load on the network.

A requirement for gross meters may also be inconsistent the National Electricity Market's objective of technology and competitive neutrality. If it is considered fair to force PV generators to export all electricity before own use, then on a competitive neutrality basis, all other generators would also be required to do so. Own use by the average coal-fired generator can be as high as 20% of total generation. If under competitive neutrality arrangements this had to be exported before own use, it could well incur significant TNSP entry fees at the connection point to the transmission network.

Attachment A: Background on the APVA

The APVA is an association of companies, government agencies, individuals, universities and research institutions with an interest in solar photovoltaic electricity. In addition to Australian activities, we provide the structure through which Australia participates in an International Energy Agency (IEA) programme called PVPS (Photovoltaic Power Systems), which in turn is made up of a number of activities concerning PV performance and implementation. Further information is available from www.apva.org.au.

APVA Objective

The objective of the Australian PV Association is to encourage participation of Australian organisations in PV technology and industry development, policy analysis, standards and accreditation, advocacy and collaborative research and development projects concerning photovoltaic solar electricity.

APVA membership provides:

Information

- Up to date information on new PV developments around the world (research, product development, policy, marketing strategies) as well as issues arising
- Access to PV sites and PV data from around the world
- International experiences with strategies, standards, technologies and policies
- Australian PV data and information
- Standards impacting on PV applications

Networking

- Access to international PV networks (PV industry, government, researchers) which can be invaluable in business, research or policy development or information exchange generally
- Opportunity to participate in international projects, with associated shared knowledge and understanding
- Opportunity to meet regularly and discuss specific issues which are of international, as well as local interest. This provides opportunities for joint work, reduces duplication of effort and keeps everyone up to date on current issues.

Marketing Australian Products and Expertise

- Opportunities for Australian input (and hence influence on) PV guidelines and standards development. This ensures both that Australian products are not excluded from international markets and that Australian product developers are aware of likely international guidelines.
- Using the information and networks detailed above to promote Australian products and expertise.
- Working with international network partners to further develop products and services.
- Using the network to enter into new markets and open new business opportunities in Australia.

The International Energy Agency PV Power Systems Programme (IEA PVPS)

One principal activity of the APVA is to manage Australian participation in the PVPS Programme. This work is arranged by Tasks, each with its own commitments of time and resources. Support is provided by the Australian Solar Institute. At present Australia participates in:

Task 1: PV Information Exchange and Dissemination

Task 11: PV Hybrid Systems within Mini-grids

Task 14: High Penetration of PV in (Smart) Electricity Grids

and maintains an interest in:

Task 8: Very Large-Scale PV Systems

Task 9: PV in Developing Regions

Task 12: Environmental Health & Safety for PV Systems

Task 13: PV System Performance

For further information on the Australian PV Association visit: **www.apva.org.au**

For further information on the IEA PVPS Programme visit **www.iea-pvps.org.**