Submission by

Alternative Technology Association

on

QCA's Issues Paper on Solar Feed-in Tariffs:

'Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland'

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By Email to: electricity@qca.org.au

For further information or enquiries contact:

Damien Moyse
Energy Policy Manager
ATA – Alternative Technology Association
(03) 9631 5417
E-mail: Damien.Moyse@ata.org.au

1.0 Introduction

The Alternative Technology Association (ATA) welcomes the opportunity to provide comment on QCA's Issues Paper on *Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland* ("the Issues Paper").

ATA is a national, not-for-profit organisation representing consumers and communities in the renewable energy and energy efficiency marketplace. The organisation currently provides service to 5,500 members nationally who are actively engaged with small, medium and large scale renewable energy projects, energy efficiency and the national electricity market (NEM).

ATA provides an 'independent' consumer advice role, both to our members in Queensland and throughout Australia, and also more broadly to the public general in Queensland. As we are not funded by, and do not have direct links with industry or government, the ATA is a trusted source of advice for our membership and the general public in regards to the economics and environmental benefits of energy technologies.

A key specialist area of the ATA's in this regard is the economic impact, both at the customer level and with respect to the dynamics of the electricity market, of solar investment. Through our work as consumer advocates on broader issues within the NEM, ATA has developed a solid understanding of the optimal role of distributed generation technologies such as solar photovoltaic (PV) in the energy market.

ATA has been actively involved in development of feed-in tariff (FiT) policy across all Australian jurisdictions over the last four years and more recently has submitted to following state-based solar FiT reviews:

- May 2012 –Victorian Competition and Efficiency Commission's (VCEC) *'Inquiry into Feed-in Tariff Arrangements and Barriers to Distributed Generation'*;
- January 2012 – NSW Independent Pricing and Regulatory Tribunal's (IPART) *'Setting a fair and reasonable value for electricity generated by small-scale solar PV units in NSW'*;
- May 2011 – Review of the South Australian feed-in tariff.

1.1 Overview

Properly designed and implemented, FiTs offer the best opportunity to address the substantial market failures that exist in the NEM with respect to the cost effective utilisation of solar PV.

As a policy mechanism, FiTs also offer the greatest potential for investment certainty for consumers and industry players in the relevant technology space.

To date, Australia has primarily used FiTs to drive small solar photovoltaic (PV) generation. In Queensland the Solar Bonus Scheme, beginning in mid-2008, had the aims of supporting the solar industry and making solar power more affordable[1] when the installed price of PV technology was high – in the order of $10 – $12 per watt (pre- incentives).

[1] http://www.cabinet.qld.gov.au/documents/2011/may/queensland%20solar%20bonus%20scheme/queensland%20solar%20bonus%20scheme.doc

There has been a rapid reduction of installed prices for solar PV systems over the last four years and as such, FiTs in both Queensland and nationally have required adjustment to ensure that those objectives have been maintained whilst preventing over-incentivisation of the market.

The adjustment of FiT mechanisms nationally has led in some quarters to a perception that FiT policies are problematic – when their continued adjustment is entirely appropriate in the context of the overall policy objective.

In 2012, the levelised cost of energy from solar PV systems is now lower than the average levellised cost (at the retail level) of energy from the electricity grid. As such, the primary issue for FiT design going forward is not one associated with providing a 'subsidy' or 'incentive' to potential solar proponents, but how to remunerate the pure economic value of any solar electricity exported into the energy market.

2.0 Fair and Reasonable

In considering the term 'fair and reasonable' it is important to carefully consider the objectives of the FiT policy that is being assessed.

The focus on FiT policy in Australia on primarily deploying solar PV technology has led to the misconception that the objective of FiT policy is primarily associated with the delivery of emissions reductions. This has in turn led to assertions that FiTs themselves are a high cost policy mechanism to deliver carbon abatement.

In reality, it is not the policy mechanism itself but the technology choice (e.g. solar) that leads to the relative cost of abatement. And emissions reduction is only one of the market benefits provided by solar technology. However the primary objective of investing in solar PV from a societal-wide perspective is not to deliver emissions reductions.

ATA contends that ***the primary objective of a well designed and structured FiT mechanism is to correct market failure*** – and to capture cost benefits and other potential benefits (e.g. carbon) of a particular technology choice, where the market alone cannot realise those benefits, or indeed is actively preventing them from occurring[2].

2.1 Principles for FiT Policy Design

The management of FiT policy going forward requires a principled approach, upon which a long term policy can be established for Queensland. ATA proposes the following principles to guide forthcoming Queensland FiT policy:

- To address market failure – where the Queensland energy market cannot capture, or is actively preventing the realisation of the cost benefits that solar generation can provide to all electricity consumers.
- To require no subsidy by other consumers, with particular attention to low-income or disadvantaged consumers. 'Subsidy' in this context refers to when a payment is made by electricity consumers where the benefit they receive is lower than the value of that payment (e.g. if a 44c/kWh FiT is paid when the benefit or value of that exported electricity is 20c/kWh, then a 'subsidy' of 24c/kWh would exist within that payment).
- To support innovation and ongoing development of the solar industry.

[2] A classic example of the NEM preventing benefits from being realised is the fact that distributed solar cannot trade directly into the wholesale market – thereby preventing the monetisation (to the solar proponent) of merit order wholesale price reductions that occur from reduced demand on supply side generators at times of peak demand. FiTs redress this situation by offering part of the wholesale price savings back to solar owners.

2.2 'Value Stack' Approach

In keeping with the principles outlined above, ATA suggest that fair and reasonable value for solar and other distributed generation technology be based on a value stack – i.e. the components of value that distributed generation offer to the market.

A number of energy market economists recognise that net exported energy from solar has an inherent value within the energy market. As an example, SKM MMA in a recent report[3], attribute the following value components to solar generation:

- *"Energy value, comprising the value that the net exports would earn if it was traded on the wholesale market or if the equivalent amount of electricity had to be purchased from the wholesale market. This value comprises not only the spot value on the wholesale market but, at low levels of installation within a region, the avoided losses from central supply sources and any costs incurred by retailers in contracting for wholesale energy.*

- *"Network savings mainly in the form of deferred investment in fixed cost assets. The magnitude of this value depends on the correlation between PV generation and peak demand at the regional level.*

- *"Ancillary savings, such as avoided market fees."*

SKM MMA go on to state that:

> *"Other benefits are also possible such as a reduction in the wholesale price to other customers during peak periods, reduced network losses faced by customers in regions with a high level of uptake, and environmental benefits through reduced emissions and reduced water use."*

Given that typically solar PV generation and residential load curves are not aligned, ATA do not believe that the deferral of distribution network assets represents sufficient value to warrant recognition within a FiT rate.

In areas with a higher penetration of commercial and industrial development, where generation and load curves do more closely match, asset deferral is likely to be an economic benefit provided by solar that warrants remuneration through a FiT.

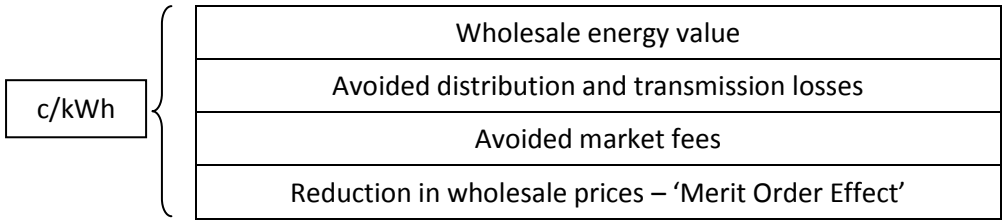
ATA do contend that the energy value, avoided distribution and transmission losses and avoided market fees, as described by the SKM MMA analysis, are absolutes economic values that are delivered by solar PV generation and should be remunerated through any FiT arrangement.

ATA also contend that the reduction in the wholesale price to other customers during peak periods – known as the *merit order effect* – is a material economic benefit that is delivered by distributed solar.

[3] SKM MMA, 2011. '*Value of Generation from Small Scale Residential PV Systems*'. A Report to the Clean Energy Council, Melbourne.

In line with the above, a 'value stack' can then be developed upon which the design of ongoing FiT arrangements in Queensland should be based:

Figure 1: Value Components of Solar PV



In recognising this value stack, the question then becomes, by what methodology to quantify the value of each of these benefits, and to ensure that part of their value is returned to all electricity consumers in the form of lower retail prices.

Wholesale Energy Value

The approach taken by QCA for the calculation of wholesale energy value in their retail electricity price determinations has more recently been a market-based approach including hedging costs. This approach has merit in reflecting the value of energy purchase costs by retailers and ATA agrees that it is an appropriate method for calculating the value of wholesale energy.

ATA is also comfortable with the methodology put forward by a number of energy market economists in attributing wholesale energy value in the form of a regulated FiT – that is, broadly based on a volume weighted price of energy for Queensland, which based on a recent study[4] is expected to fall in the range of 8c to 10c/kWh.

Avoided Distribution and Transmission Losses

The value of avoided transmission and distribution losses also needs to take into account, and at the time at which net exports from a solar generator are taking place.

Electricity from solar PV is often exported at times when network elements are likely heavily loaded, meaning that customers in a region may benefit from lower network loss factors. This should be taken into account when appropriating a value using standard network loss factors.

Further, ATA would highlight the approach taken in the Western Australian Market (WEM) with respect to avoided losses from distributed generation. In WA, a higher value is attributed within the FiT to distributed generation systems that are installed in more remote parts of the electricity network. Given Queensland's significant geographic area, ATA would suggest this is a logical economic basis upon which to incorporate values within a future FiT to remunerate for avoided losses.

[4] SKM MMA, 2011. '*Value of Generation from Small Scale Residential PV Systems*'. A Report to the Clean Energy Council, Melbourne.

Avoided Market Fees

ATA is also comfortable with typical energy market estimates of the value of avoided market fees and costs. This generally represents a value less than 1c/kWh.

Reduction in Wholesale Prices – Merit Order Effect

Solar generation at or near the location of demand reduces the demand for electricity from the wholesale market. This in turn translates into downward pressure on wholesale electricity prices.

This effect is known as the 'merit-order effect' (MOE) and it results in a benefit for all electricity consumers through lower wholesale electricity prices.

The downward pressure on energy prices due to the MOE occurs through the following mechanisms:

- A reduction in the need to dispatch the next (more expensive) market generator which sets the price for wholesale energy traded on the spot market.

  This effect occurs immediately after each new DG system starts to generate, the value of which is generally considered to slowly reduce in magnitude over the course of a number of years as market bidding behaviour is adjusted in response to the reduction in energy spot prices.

- The lowering of the value of price hedging instruments, and thus the retail cost of energy, in the medium to longer term.

  This comes in to effect as existing hedging arrangements expire and are renewed, typically over the course of three years following the installation of new system, and is also generally considered to slowly reduce in magnitude over the course of a number of years.

The MOE occurs for all energy generated by solar PV, regardless of whether it is used on site or exported as surplus. The reason for this is that all of the solar PV generation is seen by the wholesale market as a reduction in demand.

It should also be noted that while the MOE can occur for all distributed generation technologies, the value of the MOE produced by solar PV is higher than for most other distributed generators. This is because solar generation lowers the demand from the wholesale market during periods of higher electricity use and higher wholesale prices – being during the daytime and during the hotter and sunnier seasons.

Therefore, it is important to recognise, and furthermore remunerate, a value in recognition of the MOE that is provided by solar PV generators as a benefit to all other electricity consumers in the form of lower electricity prices.

Ignoring this benefit, on any basis, would be short-changing solar PV and other distributed generation owners, and therefore cannot be considered to be fair and reasonable.

Estimating the MOE for Solar PV Generation

While it may be difficult to confidently predict or accurately measure the value of the MOE in the longer term, the MOE caused by solar PV is generally agreed be of a material value – to the extent that concern over this materiality has previously been raised by coal fired generators[5].

Research[6] by the Melbourne Energy Institute (MEI) at the University of Melbourne has estimated the installation of solar PV above the current installation penetrations would have been worth, all other factors being equal, 'in excess of $1.8 billion over 2009 and 2010'. This amount represents potential savings to all consumers brought about by the effect solar PV has on the wholesale market.

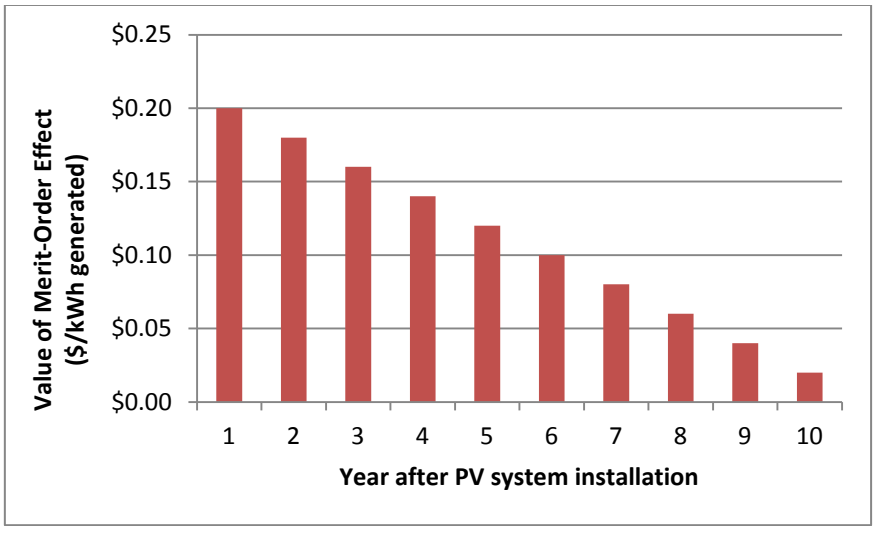
Based on this wholesale market estimated saving of the $1.8 million, energy from solar PV generation is worth 20c per kWh in the first year after installation.

Over a number of years, the value of the MOE from a particular installation would be expected to reduce in magnitude, eventually nearing zero. From our own investigations and understanding of the energy market, ATA are of the view that the period over which the MOE for new solar PV reduces to zero is likely to be in the order of 5 to 15 years.

After this time, the value of solar PV generation would continue to include the average volume weighted wholesale electricity price at the times of solar generation, as well as avoided network losses and market fees, as outlined above.

ATA suggest that for the purposes of estimating the value of the MOE over time, it would be appropriate that the MOE reduces linearly from 20c/kWh generated down to 0c over the course of 10 years, as shown in **Figure 2** below.

Figure 2: Value of the Merit-Order Effect for Solar PV Generation over 10 years



[5] During considerations of an expansion to the former Victorian Renewable Energy Target (VRET), brown coal generators expressed concern that a larger share of renewable energy, including distributed systems in the electricity market, would negatively impact their revenue due to downwards pressure on the wholesale price.

[6] http://energy.unimelb.edu.au/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=112&cntnt01returnid=22

Apportioning the Merit Order Effect

In light of the benefit that the solar PV provides to all electricity consumers through the MOE, ATA are of the view that it should be remunerated as part of FiT arrangements.

In keeping with the lessening of the effect with time, the remuneration in the FiT based on merit order value should apply a for fixed time period following the installation of each new system, after which FiT remuneration reverts to the value of the remaining energy market components identified earlier in this submission.

As noted earlier, the merit order effect is caused by all energy generated by a solar PV generator, regardless of whether it is exported by the generator or used on site. This also needs to be considered in the calculation of the MOE for a net feed in tariff.

ATA are of the view that at the household scale it is reasonable to assume that the value of the MOE for all energy generated be monetised via the FiT. For a net FiT, this requires the value of MOE for the portion of generation used on site (i.e. not exported) to be applied to the FiT for exported energy.

If we assume:

- an average system export rate of approximately 50%;
- a ten year merit order effect as described above; and
- 2012 value of money (i.e. non-discounted cash flows);

then ATA recommend that a value of:

- 20c/kWh be remunerated in any net FiT; or
- 10c/kWh be remunerated in any gross FiT;

for 10 years from the installation of each new system up to 5kW, after which time the system qualifies for a FiT simply based on the value of the remaining energy market components as identified earlier.

ATA's proposed methodology aims to achieve this sharing of benefits, the 20c/kWh value included in the FiT value stack is below the estimated value of the MOE for solar PV on the NEM.

ATA also believe this is an emerging area of understanding within the energy market, and through the course of this review, QCA and the Queensland Government should seek to work closely with those academic institutions and energy market consultants who have developed comprehensive modelling to analyse and assess the benefits of the MOE for solar PV.

2.3 Completed Value Stack for Solar PV

Taking into account all of the benefits of solar PV outlined above, the value stack under a net metering arrangement results in the remuneration values outlined in **Table 1**:

Table 1: Complete Value Stack for Solar PV under a Net Metering Arrangement

Wholesale energy value	8c to 10c/kWh
Avoided distribution and transmission losses	Needs calculation
Avoided market fees	0c to 1c/kWh
Reduction in wholesale prices – 'Merit Order Effect'	20c/kWh for 10 years

This results in a minimum FiT payment of 29 cents to 34 cents per kWh for the first 10 years after installation, falling to 9c to 14c per kWh after that.

The above analysis represents a fair and reasonable value for solar PV payment, taking into account the economic benefits of solar PV and passing back to this form of generation some of the benefit that it produces in the wholesale electricity price for all consumers.

3.0 Form of Regulation and Reviewing FiT Value

The Issues Paper requested feedback on the how the term 'fair and reasonable' should be interpreted (section 3.1, p9).

In relation to this, the Issues Paper discusses the first principal in COAG's set of national principles to apply to feed-in tariff schemes and reviews:

> "Governments agree that residential and small business consumers with small renewables (small renewable consumers) should have the right to export energy to the electricity grid and require market participants to provide payment for that export which is at least equal to the value of that energy in the relevant electricity market and the relevant electricity network it feeds in to, taking into account the time of day during which energy is exported."

Specifically ATA would like to draw attention to the phrase "... and ***require market participants to provide payment for that export which is at least to the value of that energy***...".

The phrase from COAG's national principles indicates that under no circumstance could the payment for solar energy be zero when it is clear that the exported energy has value to the energy market.

As an initial point, ATA would state that for a future Queensland feed-in tariff to be fair and reasonable, it must have a legislated minimum rate that is higher than zero cents per kilowatt-hour.

The need for any future rate to be legislated, as opposed to market driven, is outlined below.

3.1 The Market alone will not provide Fair and Reasonable FiTs

Further to COAG's principles, an important reason to put in place a legislated minimum rate is the current abuse of market power by electricity retailers in the distributed generation market, and as evidenced in NSW.

The majority of electricity retailers around the country now have some level of vertical integration – i.e. they own some degree of centralised generation assets that trade directly into the wholesale market.

As vertically integrated businesses, part of their vested interest is to ensure that the wholesale market trades as high as possible (with respect to price) to ensure that they get the best return for their generation assets as is possible.

As the evidence from 2009 now suggests, the prevalence of solar PV in the NEM is leading to demand reductions and a lowering of wholesale electricity prices. As such, the increasing prevalence of distributed generation such as solar is in direct conflict or competition with gen-tailers business models – and will ensure that as solar proliferates, gen-tailers will become increasingly resistant towards offering fair and reasonable FiT rates.

As a primary example, it is clear to see the current behaviour of retailers in NSW since IPART released the recommended range for FiT rates on 27 July 2012.

Currently, the FiT range recommended by IPART to retailers is from 7.7 to 12.9 cents per kilowatt-hour[7]. ATA has performed an analysis of the FiT rates offered by NSW retailers and there is very little evidence of fair and reasonable in their offered tariffs, as outlined in **Table 2**.

Table 2: Feed-in Tariff Rate offers for NSW Retailers

Retailer	Feed-in Tariff Offered[8]	Residential Customers[9]
ActewAGL Retail	-	24,449
AGL Sales	8.0 c/kWh	406,358
Australian Power and Gas	-	35,065
Country Energy	-	0
Dodo Power and Gas	-	0
Energy Australia	7.7 c/kWh	0
Integral Energy	-	0
Lumo	7.7 c/kWh	1,721
Momentum	-	2
Origin Energy Electricity	6.0 c/kWh	1,372,793
Power direct	7.7 c/kWh	5,852
QEnergy	-	0
Red Energy	5.0 c/kWh	18,467
TRUenergy	-	1,041,125

Out of the 14 retailers in NSW:

- 8 retailers (57%) are not offering a FiT payment to new solar customers at all; and
- only 4 retailers (29%) are offering a FiT payment within IPART's recommended range.

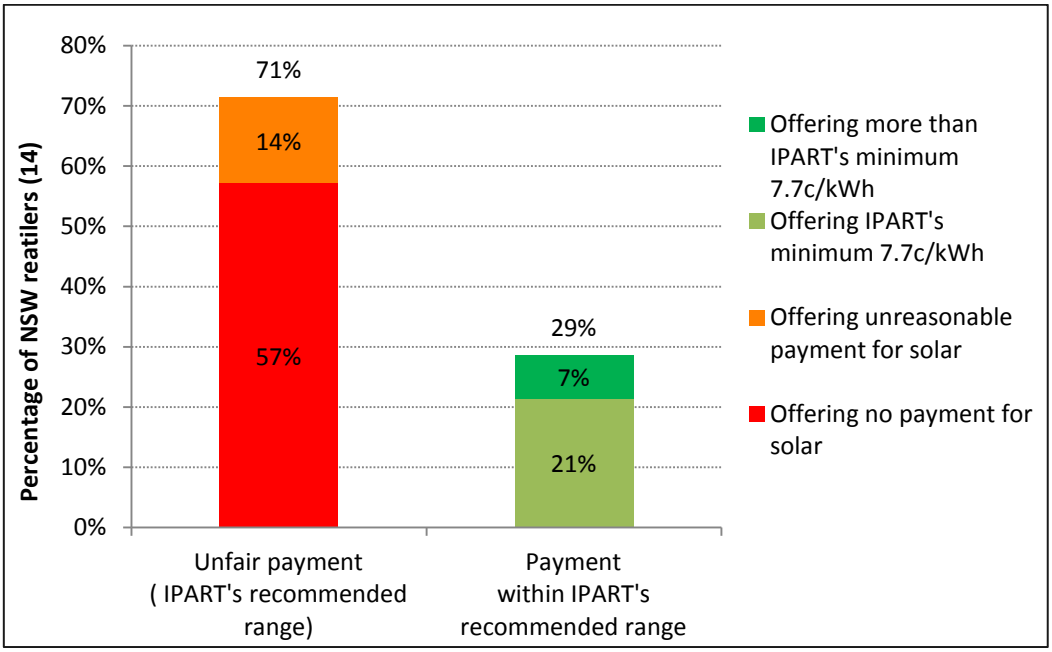
[7] http://www.ipart.nsw.gov.au/Home/Industries/Electricity/Reviews/Retail_Pricing/Solar_feed-in_tariffs_-_2012-2013/27_Jun_2012_-_Media_Release_-_A_fair_and_reasonable_solar_feed-in_tariff_for_NSW/Media_Release_-_A_Fair_and_Reasonable_Solar_Feed-In_Tariff_for_NSW_-_June_2012

[8] http://www.myenergyoffers.nsw.gov.au/useful-information/solar-feed-in-tariffs.aspx

[9] http://www.ipart.nsw.gov.au/files/43f052df-c49c-4cd9-a315-9f5c00bcdc32/InformationPaper-ElectricityRetailbusinessesperformanceagainstcustomerserviceindicatorsinNSW.pdf

Figure **3** below shows these FiT offers in relation to IPART's recommended range.

Figure 3: Solar FiT offers for NSW Retailers



Further to this, it is estimated that more than 80% of residential electricity customers in NSW are not offered a solar FiT rate within the range recommended by IPART.

The above offers can hardly be considered fair or reasonable.

NSW is the only market in Australia so far where FiT rates have been left to the market to determine – i.e. there is no legislated minimum rate. On the basis of this market, there is little evidence to suggest that retailers will offer fair and reasonable solar FiT rates without a legislated minimum rate in place.

3.2 Reviewing the Value of FiT Rate

In their response[10] to VCEC's *Power from the People, Inquiry into distributed generation*[11], the Victorian Government has recently decided to legislate a minimum FiT rate, reviewed annually, for the years 2013 to 2016.

In South Australia the price regulator ESCOSA, has also determined that a regulated minimum FiT rate is appropriate, with annual increases that are currently determined and published for each final year until 2013-14.

ATA supports this approach as by having annually determined, legislated minimum FiT rates, the government can ensure that Queensland FiT policy has the ability to react to changing market conditions, and in particular changing wholesale energy prices.

[10] http://www.vcec.vic.gov.au/CA256EAF001C7B21/WebObj/Victoriangovernmentresponse-Aninquiryintodistributedgeneration%28PDF%29/$File/Victorian%20government%20response%20-%20An%20inquiry%20into%20distributed%20generation%20%28PDF%29.pdf

[11] http://vcec.vic.gov.au/CA256EAF001C7B21/WebObj/PowerfromthePeople-FinalReport/$File/Power%20from%20the%20People%20-%20Final%20Report.pdf

4.0 Responses to Specific Questions

Defining fair and reasonable	
(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?**	The merit order effect described above in section 3.2.5 outlines the benefit of lower electricity prices provided to all electricity consumers through solar generation.

Geographical considerations and the Uniform Tariff Policy	
(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?	ATA broadly supports this approach where it can be reasonably and independently determined.

Form of regulation	
(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?	As shown above in section 3.1 there is no evidence to suggest that the market alone will deliver a fair and reasonable FiT payment. Indeed the evidence from the only market where this is currently occurring is that it will not.
(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?	As described in section 3.1 there is considerable disregard by retailers for recommended ranges for payments.

Review of the fair and reasonable value	
(d) What are the implications for the current review of a potential transition to a national feed-in tariff established through COAG processes?	Our involvement in FiT policy in all jurisdictions over the past five years has left us with little confidence that there is a concerted move towards a national FiT arrangement. As such, ATA's view is that it would be inappropriate to leave Queensland consumers without FiT policy certainty in the short to medium term.

5.0 Further Contact

Thank you for the opportunity to provide comment to this process and please do not hesitate to contact us at Damien.Moyse@ata.org.au or on (03) 9631 5417.

Yours sincerely

Damien Moyse
Energy Projects and Policy Manager