Submission to the Victorian Competition and Efficiency Commission Feed in Tariff Inquiry

March 19, 2012

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Overview:

Beyond Zero Emissions recognises the importance and efficacy of Feed in Tariffs and distributed renewable generation in reducing emissions and moving towards a zero emission future. We welcome the opportunity to respond to the Victorian Competition and Efficiency Commission's Inquiry into Feed-in Tariffs & Barriers to Distributed Generation.

The Issues Paper identifies two main elements to be addressed: *"assessing the design, efficiency, effectiveness and future of FiT schemes"* and *"identifying barriers to connecting distributed renewable and low emission technologies into the distribution system"*[1]. We would agree the importance of these objectives, and the (arguably even more important) subsequent actions: implementation of an effective feed in tariff and removal of barriers to distributed generation.

Unfortunately, we believe the following discussion within the Issues Paper misses some key points with respect to distributed generation, and misrepresents the costs of distributed solar photovoltaics (or other distributed generation) and feed in tariffs. In this submission we firstly identify some of the shortfalls, misrepresentations and missed concepts in the Issues Paper, and then also answer the 'Information Requests'.

The key issues include:

- **Incorrect use of Productivity Commission analysis**
    - **Analysis methodology is not suitable for distributed generation**
    - **(does not value distributed generation at the retail price with which it competes)**

- **Use of outdated Productivity Commission analysis**
    - **(Incorporates outdated cost data)**

- **Failure to acknowledge the 'Merit Order Effect', a key Feed in Tariff cost offset**

- **Failure to acknowledge the inherent market failure with the carbon price mechanism**

- **Failure to accept efficacy of Feed in Tariffs and distributed renewable generation in reducing emissions and moving towards a zero emission future.**

- **Consideration of fossil gas as a feasible distributed technology**

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1. **Productivity Commission Analysis:**

There are two substantial issues with respect to the use of the Productivity Commissions Analysis. Firstly, the cost of abatement quoted in the Issues Paper is inaccurate and out of date. Secondly, and more importantly, the methodology used in the Productivity Commission analysis is inappropriate for distributed generation.

1.1. Cost of Abatement

"The PC also found that implicit abatement subsidies for solar PV amounted to between $432-1043 per tonne of carbon dioxide abated." (Issues Paper)

The numbers used in the Issues Paper is out of date. In December last year, the Productivity Commission released a *Supplement to Research Report* in which it updated its abatement costs to between $177 and $497 per tonne[2]. Whilst this too may seem high or unreasonable, there are two important things to be considered:

Firstly (and as discussed in the next section), the methodology is not suitable for distributed generation.

Secondly, these numbers themselves are out of date as it is based on solar subsidies provide to Solar PV in 2010 (2 years ago). This has substantial implications as:

1. ***The cost of Solar has fallen dramatically in recent years***
    - Due to the substantial growth in the industry, there have been cost reductions through learning by doing and scale effects. PV costs are currently halving every 2.5 years.[3]
    - To incentivise deployment, new Feed-in Tariffs would not have to be nearly as high as they were in 2010.

2. ***The cost used in the Productivity Commission analysis includes the costly and poorly designed NSW gross feed in tariff scheme***
    - It is widely acknowledged that the NSW 'gross' scheme was poorly designed, and created windfall profits and incurred costs
    - The NSW scheme was too inflexible and could not adapt to the rapidly falling PV costs (contributing to the scheme cost blowout)
    - In the Productivity Commission analysis, the NSW scheme is responsible for up to 40% of the 'Total Subsidy Cost' used in the analysis

3. ***A 'Solar Multiplier' (used in the calculation of REC certificate revenue) of 3.2 was used in the Productivity Commission analysis.***
    - It is currently 3, and in two months it will reduce to 2

Should the productivity analysis be updated again, with up to date PV costs (reflected in lower Feed-in Tariffs), and not including old inefficient, poorly designed schemes, and including the new multiplier, the cost of abatement would be substantial lower.

1.2. Productivity Commission Methodology

The productivity commission analysis would be better suited to renewable technologies that sell in to the National Electricity Market (NEM). It does not acknowledge or address the fact that distributed technologies such as rooftop PV effectively 'sell into' (or compete with) the retail

market (not the wholesale market). That is, PV competes with the meter: the choice is between buying electricity from the grid, and buying it from the roof. As such, PV competes with electricity valued at ~$200-$250 / MWh (compared with a wholesale price of ~$50/MWh). If solar electricity were properly valued at this retail rate, then the implicit carbon price (the carbon price that would be required to singlehandedly incentivise PV) is substantially smaller than the Productivity numbers would suggest.

The other key concept the Productivity Commission methodology misses is the merit order effect (discussed in more detail in the next section). This effect may completely offset any Feed in Tariff cost, which substantially changes the overall cost of abatement. The merit order effect may result in the support mechanisms and schemes put in place to incentivise renewables being cost neutral, in which case the cost of abatement is $0/tonne.

2. The Merit Order Effect

The Issues Paper inaccurately assumes that:

"Regardless of how the premium is determined, a subsidy would need to be paid either by electricity users or taxpayers"

This is an inaccurate claim, which ignores the merit order effect. This is an effect that can completely offset the cost of schemes such as the Renewable Energy Target and Feed-in Tariffs.

2.1. How it works

In electricity markets that use a merit order dispatch system, generation capacity is ranked by the price that it is bid into the market. Demand is then met by dispatching electricity according to this rank, from lowest to highest bid. The last capacity dispatched sets the price received by all generation, ensuring the lowest cost provision of electricity. A consequence of this system is that significant deployments of low marginal cost electricity generators, including renewables, can reduce the cost of electricity.

2.2. Melbourne Energy Institute Study

Modelling conducted by the Melbourne Energy institute indicates that the Merit Order Effect could substantially offset the cost of feed in tariffs (or other schemes) used to incentivise renewable technologies[4].

In the analysis, it was calculated that for 5GW of capacity, comparable to present per capita installation of photovoltaics in Germany, the reduction in wholesale prices would have been worth in excess of A$1.8 billion over 2009 and 2010, all other factors being equal. The implications of the paper findings for Feed-in Tariff policies was that they could deliver savings to consumers, contrary to prevailing criticisms that they are a regressive form of taxation. The paper suggested Feed in Tariffs as high as 30 cents would "breakeven" (i.e. the merit order effect would completely offset a feed in tariff of 30 cents, meaning that a 30 cent feed in tariff is cost neutral). Figure 1 illustrates the impact of PV on demand and wholesale electricity prices, through the 'Merit Order Effect'.

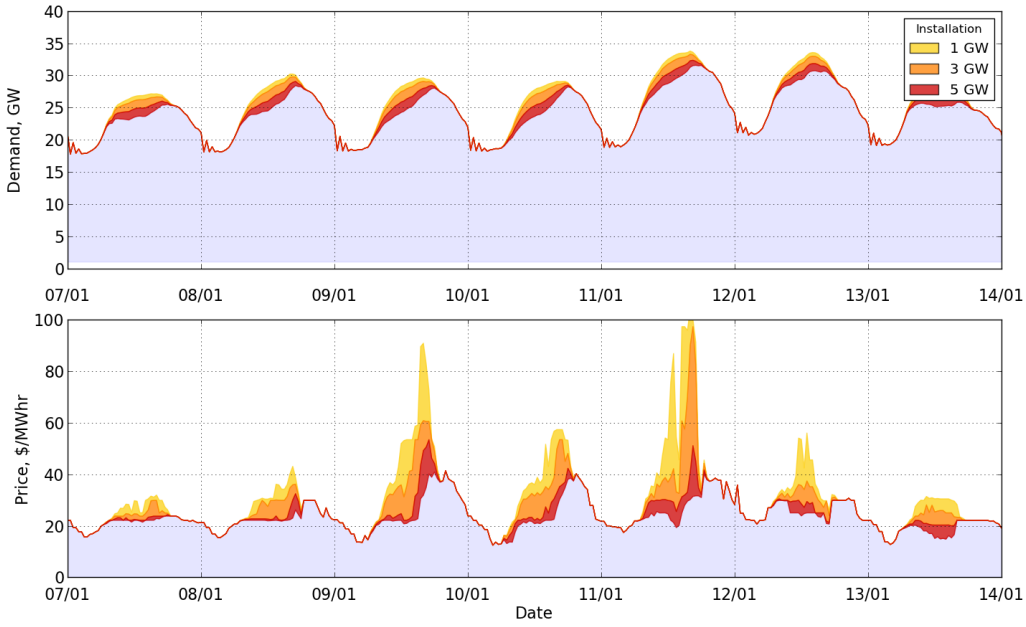

Figure 1: Merit Order Effect [source: Melbourne Energy Institute]

2.3. International Experience

The Merit Order Effect is a phenomenon that is well recognized around the world. The German experience has shown that Merit Order Effect can completely offset the cost of the scheme, and in some case return a net saving to consumers. This occurs when the merit order effect is greater than the scheme (e.g. FiT or LRET), and (could already be the case in Australia, with the wind industry under the LRET). Germany's Federal Ministry for the Environment considers the merit order effect induced by renewables in their analysis of the cost of the various support mechanisms used to deploy them.

Unequivocally claiming that schemes cost consumers is a gross simplification of the schemes and the impact they have on the energy market. Without further analysis it is deceptive to unreservedly claim that feed-in tariff subsidies will cause a price rise to consumers or tax payers: it is incorrect to state that "*a subsidy would need to be paid either by electricity users or taxpayers*".

3. Efficacy of Feed in Tariffs

Feed-in Tariffs are the most effective mechanism deploying renewables around the world, and driving the important cost reductions and economies of scale. Last year, the German Feed-in Tariffs drove investment in over 7.5 GW of PV (roughly 50 times the Federal government's proposed Moree farm). Over 80 countries around the world use Feed-in Tariffs to drive the investment in renewable, and Australia (and Victoria) should continue to do so with Feed-in Tariffs

It essential to continue driving renewable deployment, to further reduces technology cost (through learning by doing and economies of scale), to ensure the lowest cost and rapid transition to a zero emissions economy.

4. **Market Failures in Carbon Pricing**

The Issues Paper continually argues that 'supplementary measures' (such as feed-in tariffs) are irrelevant with carbon pricing:

- *"Introduction of a price on carbon has led to some [..] to argue subsidies through policies such as FiTs should be discontinued."*
- *"The introduction of a price on carbon will encourage more energy generation from low emissions sources."*
- *"With the introduction of the carbon tax the Commission's initial view is that the objective of using FiTs to reduce greenhouse gas emissions is no longer valid."*

This argument would only hold true if carbon pricing fully accounted for the externalities associated with carbon emissions and climate change. A $23/tonne is not in any way a cost reflective carbon price and is a substantial market failure. In a true carbon market, where the carbon price fully represented the externalised cost associated with carbon, then the carbon price would be substantially higher (hundreds of dollars a tonne). Under this circumstance, the above statements would be correct. Until the carbon price represents this cost, then one of the objectives of Feed-in Tariffs must remain to reduce greenhouse gas emissions (in order to address this market failure).

It should be noted that while Garnaut argues that the "renewable energy target and subsidies for new roof top solar can be phased out" he also critically notes that this should occur "as the carbon price rises". Until the price has risen far enough (to accurately reflect costs), these schemes must not be phased out.

It should also be noted that until the full externalized cost of carbon is accounted for in the price, *the introduction of a price on carbon will **NOT** encourage much more energy generation from low emissions sources* (as suggested in the Issue Paper).

5. Gas: Co-Generation and Tri-Generation

Fossil fuels such as gas (co-generation and tri-generation) should not be considered as appropriate distributed technologies. First and foremost, gas is dirty fossil fuel that emits greenhouse gases and has no place in a zero emissions, renewable power economy. Secondly, gas is an outdated and unnecessary technology. Supporting gas and encouraging the further rollout of redundant gas infrastructure is a flagrant waste money.

- **Gas is a fossil fuel**

  Supporting further expansion of gas (and the gas network) locks in emissions for years to come. If full accounting (including fugitive and lifecycle emissions) was included, and a more appropriate 'Global Warming Potential' was used for gas, then the emissions for co-generation and tri-generation could be substantial.

  This is a completely unnecessary outcome, when considering the option of electric heat pumps (which are increasingly become more efficient). Even if powered by coal fired electricity, the best heat pumps can offer greater emission reductions than gas co-generation or trig-generation. As the grid becomes increasingly less emissions intensive, heat pumps have even greater and great emission reduction potential. As we moved to zero emission generation, embedded fossil generators will become a great source of emissions.

- **Redundant Infrastructure**

  The services provided by co-generation and tri-generation can be provided by heat pumps (and as illustrated above, these have lower emissions outcomes, even when powered by coal fired electricity). If the same service can be provided by electricity and gas, the question remains why we should continue to support and incentivise the expansion of the gas network. Billions and billions are spent on network infrastructure (both Gas and Electricity) annually. Redundant Gas infrastructure will increasingly become an unnecessary cost burden, and supported gas (co-generation and tri-generation) only serves to further develop this redundancy.

There is no need to support the development of a redundant energy service network, which delivers fossil powered systems, when they can be replaced with a lower emissions alternative (that can utilise the existing electricity network). It would be more appropriate to develop incentive measures for heat pumps (for both heating and cooling), and then incentivise distributed gas.

6. Information Requests

6.1. Information Request 1:

> *What criteria should the Commission use to define distributed renewable and low emissions generation for the purposes of this inquiry? Are the characteristics outlined above appropriate for distinguishing the relevant generation systems? What size of system should the Commission define as distributed energy for the purpose of this report? Should the Commission include medium scale generation, such as wind farms, in its definition of distributed generation?*

'Distributed renewables' and 'low emissions generation' should only include technologies with zero emissions. Specifically, gas technologies (co-generation and tri-generation) should be excluded for the reasons described in Section 5.

We agree with the characteristics outlined in the Issues Paper (generators less than 30MW), as long as they do not include gas technologies. As noted, generators above 30MW fall under the national electricity rules, and the rules for network connection. Distributed generation should cover every non-gas generator that falls below this capacity.

6.2. Information Request 2:

> *What is the problem that feed-in tariffs are addressing? What are the intended outcomes for FiTs? What are the most appropriate objectives for the feed-in tariffs? Is a regulated feed-in tariff an efficient way of achieving these objectives? Does the introduction of an emissions trading scheme remove the case for FiTs as an instrument for reducing greenhouse gas emissions?*

Feed in Tariffs are addressing multiple problems. Firstly, they address the market failure inherent in carbon pricing (as discussed further in Section 3); the failure to properly account for the full cost of carbon (commensurate to the cost of climate change) with the current carbon pricing. The introduction of a carbon tax or an ETS certainly does not remove the case for Feed-in Tariffs as an instrument for reducing greenhouse gas emissions.

Secondly, they also address the 'deployment policy gap': the gap between research and development, and a fully mature technology, at the end of its cost reduction curve. Deployment policies are needed to get the require learning-by doing and economies of scale to drive further cost reductions. Importantly, once cost reductions have driven cost to a point where technologies are fully competitive without support (expected to occur with PV in the next decade), the cost of carbon further carbon abatement becomes zero. It is essentially to drive renewable energy technologies down the cost curve to have an affordable zero emission economy.

Thirdly feed in tariffs should also remunerate PV system owners, commensurate to the value they give to the electricity system. In the determination of this value, the merit order effect must be included. PV system owners lower the wholesale price of electricity for everyone, (through the merit order effect), thus any analysis of cost should most certainly include the offset of the merit order effect (as is done in Germany).

The objective of a feed in tariff should consider all of the above. Particularly, it should support the industry to drive cost reductions, and support the industry until such point as they are no longer needed. A regulated feed in tariff is the best way to achieve these outcomes.

6.3. Information Request 3:

> *What should the Commission take into account when assessing feed-in tariffs (FiTs)? Should FiTs be regulated? Should the current FiT arrangements be changed and if so, how? If a regulated FiT is set what methodology should be used? If there are changes to the current FiT arrangements what, if any, transitional arrangements should apply and to whom should they apply?*

Assuming the objective is to drive cost reductions through deployment, and support the industry until support is no longer needed, then the *'FiT [should] be set on the basis of a given payback period to allow households or others to recover the costs of installing distributed generation technology'*, as noted in the Issue Paper. This would drive the deployment required (and deployment targets can be set, as in the German system).

This tariff most definitely should be regulated. Ideally, any methodology would be based on the German system, which has been effectively and efficiently operating for many years. In the German system, cost are regulated in line with the cost of PV; the tariffs a flexible to move with the falling PV costs (unlike what occurred in the NSW system, where by falling system cost and a static tariff created windfall profits for system owners). In the German system, the tariff rates 'regress' (decrease) on a three monthly basis. The regression rate is dependent on the installation rate: should the installation rate increase, it is likely due to cost reductions in the industry, and the regression can occur faster. This system has resulted in tariffs tracking the cost of solar and limiting the potential for windfall profits and cost blowouts.

It was suggested in the Issue Paper that *"This approach is relatively simple to calculate, but it may not ensure the benefits of the scheme outweigh its costs."* It is essential that any analysis of the scheme costs include the Merit Order Effect (as is done in Germany), as it likely that the cost of the scheme on consumers in non-existent (or there is even a net saving to consumers) – as has been found in Germany.

For the existing recipients of Feed-in Tariffs no change would be required.

6.4. Information Request 4:

> *What are the major barriers and impediments (for example, price, connection, technical or regulatory) to the adoption of distributed renewable and low emission generation in Victoria? Which barriers can be influenced by the Victorian Government or local governments in Victoria? Which barriers are the result of national or Commonwealth regulation or processes?*

Currently, the major barrier is the lack of acceptance of the value of distributed generation, evidenced by the lack of support for feed in tariff policies, at a reasonable rate. As deployments increase, the major barriers will shift most likely to connection (network) and regulatory.

The Victorian government can influence the price barrier, by legislating an effective feed in tariff, to recognise to value of distributed renewable generation (such as solar PV). Such a tariff would be sufficient to drive deployment, and would included a 'purchase obligation', ensuring 'the grid' is obliged to pay for the electricity at the regulated tariff rate (this is a critical component of the Feed-in Tariff Scheme in Germany).

7. **About Beyond Zero Emissions**

Beyond Zero Emissions Inc. is a not-for-profit research and education organisation developing blueprints for the implementation of climate change solutions. Our goal is to transform Australia from a 19th century fossil fuel based economy to a 21st century renewable powered clean tech economy. Through the Zero Carbon Australia research project BZE is encouraging climate change policy that is in line with the science. By sharing this research with thousands of Australians via the Repower Australia talks program, BZE is engaging, educating and inspiring the community with real and positive solutions to climate change.

In partnership with the University of Melbourne Energy Research Institute we are undertaking the award-winning Zero Carbon Australia 2020 Project, which is putting together fully costed transition plans for getting Australia to zero emissions in ten years using commercially available technology. The ZCA project covers the 6 sectors of energy, buildings, transport, land use, industrial processes and coal exports.

We are involved in the following activities:

- research
- education
- transition planning
- corporate education
- network building
- solutions development

We accept the findings of the most current science, which shows that we have already allowed climate change to go too far, and must act immediately to reduce our levels of greenhouse gas emissions to zero and below.

8. **References**

[1] VCEC, 2012. *Issues Paper: Inquiry into Feed-in Tariff Arrangements and Barriers to Distributed Generation,* available at: http://www.vcec.vic.gov.au/CA256EAF001C7B21/WebObj/VCECFeed-inTariffIssuesPaperPDF/$File/VCEC%20Feed-in%20Tariff%20Issues%20Paper%20PDF.pdf

[2]Productivity Commission, (2011). *Supplement to Research Report,* Available at: http://www.pc.gov.au/__data/assets/pdf_file/0016/114244/carbon-prices-supplement.pdf

[3] Melbourne Energy Institute, (2011) *Renewable Energy Technology Cost Review*, Available at: http://www.earthsci.unimelb.edu.au/~rogerd/Renew_Energy_Tech_Cost_Review.pdf

[4] Melbourne Energy Institute (2012), *The Merit Order Effect*, available at: http://energy.unimelb.edu.au/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=112&cntnt01origid=158&cntnt01returnid=22