Response to Queensland Productivity Commission

Issues Paper: Solar Feed-in Pricing in Queensland

23 November 2015

Stanwell Corporation Limited
ABN 37 078 848 674

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Stanwell welcomes the opportunity to provide this submission to the Queensland Productivity Commission's Solar feed-in Pricing Inquiry.

In recent years, electricity prices have increased considerably throughout Australia. This increase has been particularly felt by retail customers, for whom electricity costs have more than doubled in the past five years[1]. This price increase has been driven by network and policy costs, while energy costs have remained relatively stable.

This situation has the potential to be exacerbated by both the transition to renewable generation and associated new technologies, which will occur over coming years. In addition, there will be an increase in demand driven by the commissioning and operation of Queensland's liquid natural gas (LNG) plants. While the development of the LNG industry is an overwhelmingly positive development for the Queensland economy, as these LNG plants begin to export, gas-fired generation will no longer have access to the large volume of low cost 'ramp gas' associated with the emerging LNG industry. As balance between supply and demand tightens, particularly during summer, wholesale prices will increase.

Higher wholesale prices as a result of higher demand (or energy constraints) are an essential part of the electricity market's design and assist in delivering average wholesale prices that support the viability of generators. In the absence of other external influences, sustained higher wholesale prices are the signal for new market entrants. This market signal has been lost through various subsidy regimes.

The most effective way to ensure the affordability of retail electricity during the transition to renewables is to allow market forces to drive the process, rather than seeking to drive the process of change through subsidies or regulation.

Queenslanders' own need to manage household budgets will motivate them to adopt emerging technology in order to benefit from cost reflective network tariffs. This technology will include solar PV, electric vehicles, smart meters, smart controllers and household battery storage systems. Stanwell considers that it would be an inefficient use of scarce funding if the government were to incentivise the adoption of products which already provide their own financial incentive for purchase and are readily available.

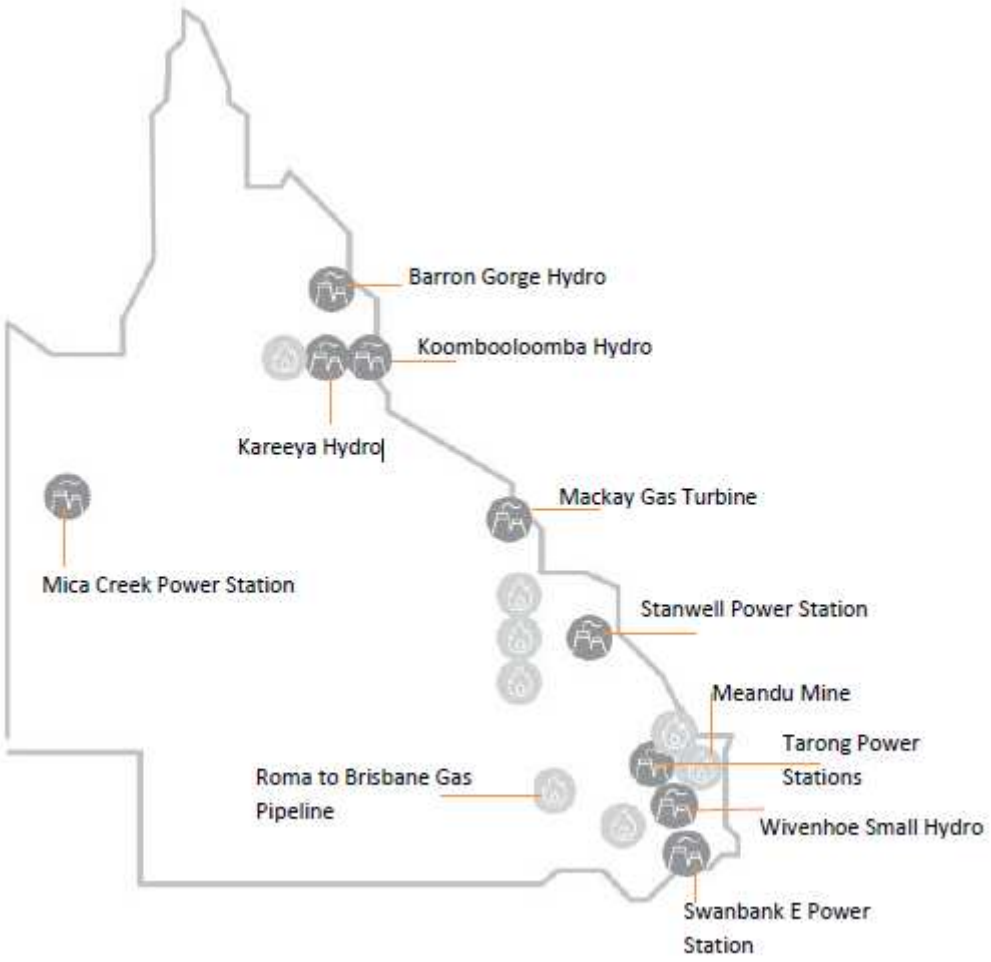
Where subsidies are employed, such as through renewable energy targets or solar feed in tariffs, the costs of these should be visible on all retail bills.

[1] Queensland Productivity Commission Issues Paper: Electricity Pricing in Queensland

INTRODUCTION

Stanwell Corporation Limited (Stanwell) is a diversified energy business which owns and manages assets worth more than $3 billion on behalf of the people of Queensland.

Stanwell owns coal, gas and water assets which it uses to generate electricity to either trade in the National Electricity Market (NEM) or sell directly to business customers. Stanwell also trades gas and coal in their respective commodity markets.



With a workforce of approximately 700 people (excluding Meandu Mine which is serviced by Downer EDI and employs approximately 350 people) located at 10 sites across Queensland, Stanwell contributes to Queensland's prosperity:

- through the safe and responsible provision of energy; and
- by providing commercial returns from its business operations to shareholders.

As a Government Owned Corporation, Stanwell's activities are overseen by a Board of Directors that is appointed by its two shareholding Ministers; the Queensland Treasurer and the Queensland Minister for Energy and Water Supply.

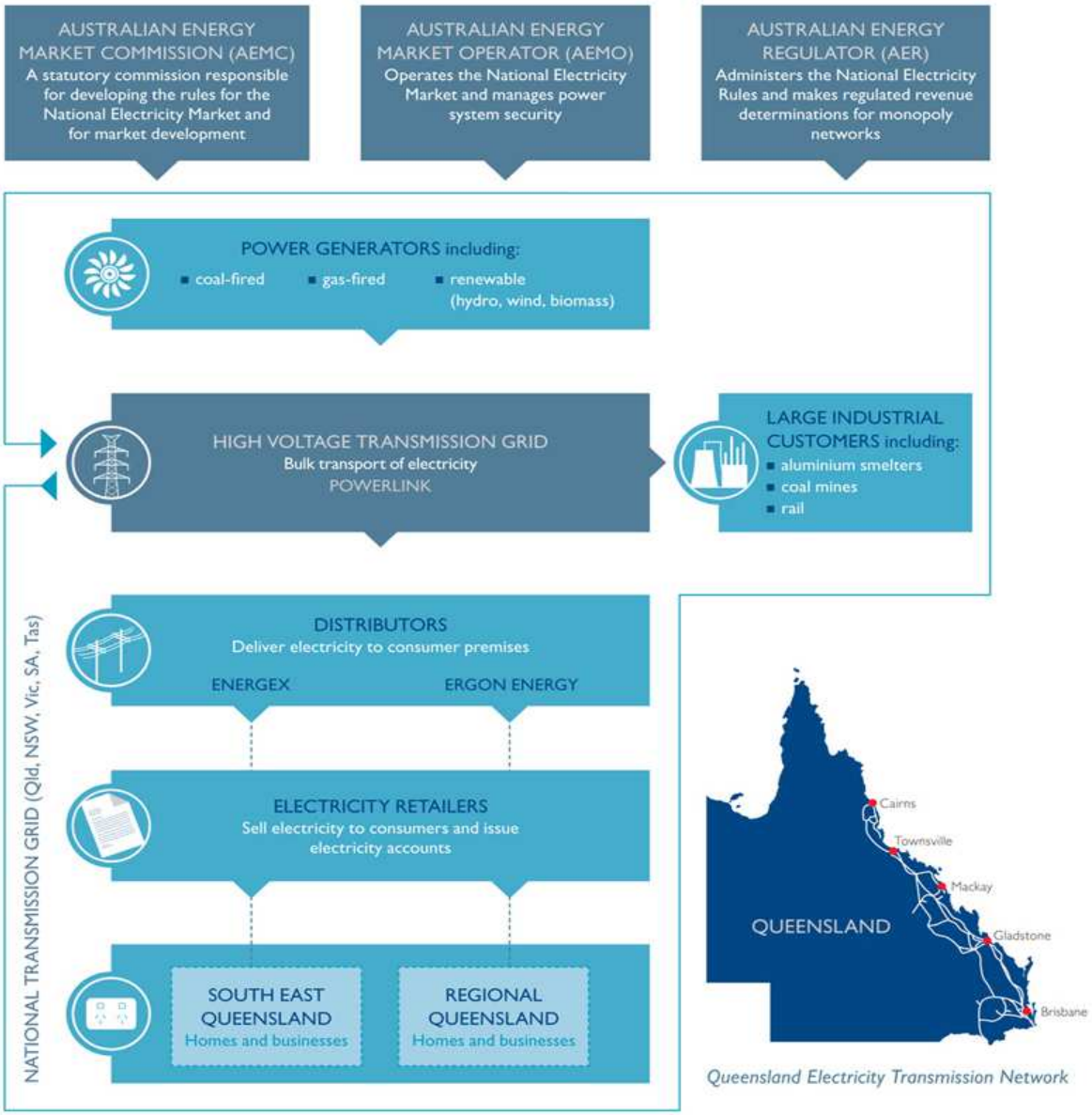
Stanwell's independent Board oversees the operations of Stanwell so that it is compliant with the Government Owned Corporations Act 1993 (Qld), the Corporations Act and the relevant laws associated with operating within the NEM.

Key role

As a power generator with a capacity of more than 4,100 megawatts (MW), Stanwell plays a key role in Queensland's electricity industry.

Stanwell has the capacity to supply more than 45 per cent of Queensland's peak electricity requirements through its coal, gas and hydro power stations.

Stanwell works closely with regulators at the national level (through the Australian Energy Market Operator, the Australian Energy Market Commission and the Australian Energy Regulator) and at state level (through the Queensland Competition Authority and the Department of Energy and Water Supply).



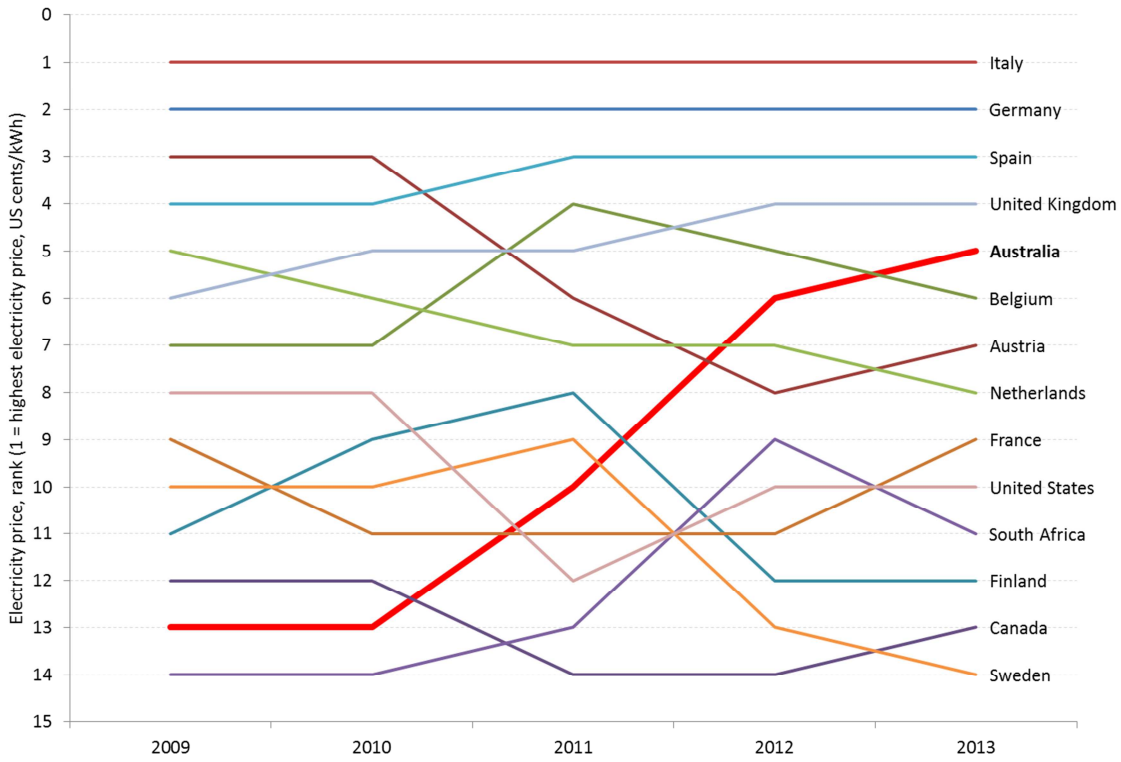
Source: Powerlink website

CONTEXT

Cost efficient reliable electricity is one of the most important economic influences on industry, and a key determinant of economic prosperity.

In recent years, electricity prices in Australia have increased considerably. The chart below shows the relative cost of retail electricity in a selection of countries. In the five year period from 2009 to 2013, Australia has slipped from being the second cheapest country in which to purchase electricity, to the fifth most expensive country. This increase in electricity price has been particularly felt by retail consumers, who have seen electricity costs for the period more than double. The loss of Australia's energy competitiveness has occurred despite the nation's abundance of low cost energy resources.

International electricity price comparison



Prices as at 1 July for the supply of 1,000kw with 450 hours use, excluding value-added taxes.
Electricity price in selected countries.
Source: NUS Consulting Group, International Electricity and Natural Gas Report and Price Survey

An increasing driver of these cost increases is the recovery of policy costs. The Federal Renewable Energy Targets[2], premium feed in tariffs (such as the Solar Bonus Scheme) and energy efficiency schemes (operating in other jurisdictions) all recover their cost through uplifts to the cost of grid sourced electricity. The Solar Bonus Scheme alone is estimated to contribute eight per cent to the average Queensland residential bill in 2015-16.

Consumers are rational, responding to incentives and price signals in order to minimise their individual costs. Stanwell believes that this must be a key consideration in the Queensland Productivity Commission's (QPC) review into *a fair price for solar energy generated by a small customer and exported to a Queensland electricity grid*.

[2] Large-scale Renewable Energy Target (LRET) and Small-scale Renewable Energy Scheme (SRES), collectively referred to as the Renewable Energy Target (RET).

Changing market

Throughout its history, the fundamentals of the electricity industry have remained comparatively unchanged: electricity was generated from central points in the grid (the majority of power stations were coal-fired), it travelled via a transmission network (in a single direction) to business and residential consumers who had little influence on the generation source of the electricity they purchased, or on the prices they paid.

In 2015, energy businesses throughout the world are facing unprecedented change. The drivers of change are global and their potential for influence reaches far beyond the energy industry. Increasing consumer choice and influence; an evolving energy mix; the exponential growth of digital technology; world leaders' support for carbon reduction and the resulting shift in global sentiment; and an anticipated step change in the demographics, skills and expectations of the workforce, will all radically affect the electricity industry over the next ten years.

These global change factors are reflected in the Queensland Government's target of achieving one million solar roofs by 2020 and investigating ways to achieve 50 per cent renewable energy by 2030. Stanwell acknowledges that the proportion of electricity from renewable sources will increase in coming years. The challenge for government and for the energy sector is to ensure the transition process is economically viable for Queensland; that the price of electricity is not artificially inflated or subsidised, and that the State continues to have an efficient, affordable and reliable supply of electricity.

A framework for assessing solar export pricing

Stanwell welcome the Commission's acknowledgement that

"The starting point to develop any policy framework is to identify and assess the size and scope of the policy problem the government is trying to address.

…

The adverse impacts of inefficient prices on producers and consumers mean that price regulation is generally confined to areas that exhibit substantial and enduring market failures, where there is no alternative policy and non-policy options to deal with those market failures".

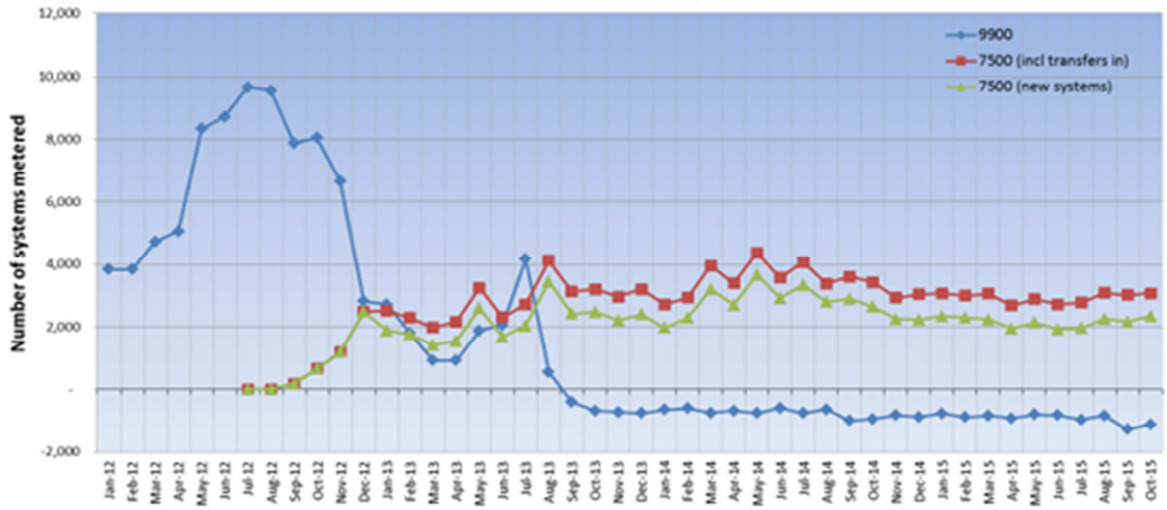
2.1 Is there evidence of significant and enduring market failures in the solar export market in Queensland?

Consumers are rational, responding to incentives and price signals in order to minimise their individual costs. Currently in Queensland, new domestic solar installations receive financial support from the Federal Government's Small scale Renewable Energy Scheme (SRES) and a state based feed in tariff (FiT). For customers in south east Queensland, this feed in tariff is determined by the market with seven retailers offering rates from 6c/kWh to 11c/kWh[3], while customers in regional Queensland receive a mandated minimum FiT slightly above 6c/kWh.

As noted in the issues paper, this incentive arrangement resulted in more than 40,000 new installations during 2014-15. Data from Energex indicates that installation rates have been consistent for over two years, indicating that there is a sustainable pipeline of work for installers despite changes in Federal and State incentives. Providers have recently shown innovation through the offering of "zero up front" systems, potentially overcoming historic barriers to uptake such as access to capital and split incentives. New installations are consistently reported to be larger than historical averages indicating that most customers are installing systems which export to the grid[4].

Stanwell believe that this indicates a functioning solar export market in Queensland that does not require regulatory intervention.

Number of metered systems – Change by month



Source: Energex

[3] QPC solar feed-in issues paper, page 5.
[4] While non-export connections appear to be gaining in popularity in the Ergon network they still represent the minority of new connections.

2.2 Where market failures are present, how are they best addressed?

While customers in South East Queensland have access to competitive provision of both retail and solar services, competition may be less significant in regional Queensland where Ergon Energy Queensland provides the majority of retail services in return for a Community Service Obligation payment. Stanwell believe that the rectification of this inconsistency falls within the remit of the QPC inquiry into Electricity Pricing.

There is also a growing risk that the Australian Energy Market Operator (AEMO) does not have access to sufficient information relating to embedded generation and storage, however, Stanwell believes that this issue is best addressed in a nationally consistent manner through the Council of Australian Governments (COAG), Australian Energy Market Commission (AEMC) or AEMO processes.

2.3 Do solar PV exports produce positive environmental and social impacts that are currently not paid for through existing programs and rebates?

Domestic solar PV systems are likely to gain financial support through the Federal Government's Small-scale Renewable Energy Scheme through the creation of Small-scale Technology Certificates (STCs).

"*STCs are created for these systems at the time of installation, according to the amount of electricity they are expected to produce or displace in the future. For example, the SRES allows eligible solar PV systems to create, at the time of installation, STCs equivalent to 15 years of expected system output.*"[5]

As embedded generation appears as "negative demand" it is considered to have displaced an equivalent volume of grid sourced generation, with STCs allowing monetisation of this "abatement". STCs are created on the basis of one certificate per MWh of generation, while the carbon intensity of grid sourced electricity is less than one tonne per MWh. While the price of STCs is not regulated, the scheme design acts to retain market prices close to the clearing price of $40 per certificate implying that solar installations are credited in excess of $40 per tonne of carbon avoided. Accounting for the time value of money associated with the system's deeming would increase this significantly further.

While the environmental impact of embedded generation is likely to attract significant debate, Stanwell notes that there are a number of other sources of abatement which receive less compensation, including the Federal Government's Emissions Reduction Fund, which has had clearing prices to date of $13.95/t and $12.25/t. Accordingly, Stanwell believes that the SRES already provides at least sufficient payment for the environmental benefits associated with the installation of solar PV.

There has been significant research into the cross-subsidies arising from incentives for embedded generation and energy efficiency in recent years. This research overwhelmingly indicates that already vulnerable households incur a disproportionate burden under such schemes. Similarly there is an increasing body of work discussing the negative impacts on supply chain efficiency arising from an increasing contribution from intermittent and non-dispatchable generation sources[6]. Accordingly, while individual customers can gain significant reductions in their electricity bills under current tariff design, it is unclear that there is any net benefit to society as a whole, and potentially a significant cost if vulnerable consumers are further disadvantaged.

[5] http://www.environment.gov.au/climate-change/renewable-energy-target-scheme
[6] International Energy Agency, World Economic Outlook 2015,
AEMO Renewable Energy Integration in the NEM.

2.4 If so, is the investment in solar PV suboptimal (from a societal point of view)?

See Question 2.3

2.5 Would a regulated solar feed-in tariff be an effective and efficient tool to address environmental externalities?

As indicated in the QPC issues paper, multiple electricity retailers currently offer solar FiT ranging in South East Queensland at rates which are typically above the regulated FiT applying to regional Queensland. Installation rates in each region appear broadly stable with Energex consistently reporting around 2,000 installations per month and Ergon reporting 700-1000 per month. In addition, the Federal SRES already appears to compensate domestic solar PV more favourably than competing abatement sources.

There appears to be sufficient incentives to support ongoing installations without a mandatory FiT.

2.6 What are the objectives of a solar export pricing policy?

As noted in the issues paper, *it is not unusual for government policies to be underpinned by a range of objectives, and invariably there may be some tension between competing objectives*. The issues paper references four possible objectives:

- encouraging solar PV investment
- solar industry development and job creation
- lowering electricity prices
- improving environmental outcomes

Encouraging solar PV investment

Stanwell believes that policy should encourage efficient investment, rather than explicitly encouraging exports from domestic solar installations.

Solar PV investment can occur either with, or without export, from PV systems. Efficient investment in solar PV is likely to vary by location, however, installations targeting self consumption are generally likely to produce less adverse consequences[7] than systems which export significant quantities into network locations which are traditionally associated with customer load.

In this respect it is notable that Ergon Energy has determined assessment criteria for new export capable inverter connections to ensure that it can "*…operate, maintain and protect its supply network to ensure the adequate, economic, reliable and safe connection and supply of electricity to its customers*".

[7] For example additional investment in network infrastructure which increases all consumer pricing for no or minimal overall economic gain.

These assessments can also help customers avoid over-investing in systems that are too large to operate effectively at their point in the network.

Why some applications need to be technically assessed

Micro EG units have the potential to compromise the efficiency of the electricity network and cause voltage levels to fall outside the statutory ranges.

An inverter capacity that is too large will trip off when the voltage rises above the set limit, and the system will not generate or export to the grid until the voltage comes back into an acceptable range.

Assessment thresholds

We may require up to eight weeks to technically assess applications for total inverter capacities rated greater than:

- 3.5 kVA exporting for a single and 2 phase premises on Ergon Energy's Main network
- 10 kVA exporting for a 3 phase inverter on a 3 phase premises on Ergon Energy's Main network
- 2 kVA exporting on SWER networks
- 0 kVA exporting or non-exporting on Isolated networks.

For total inverter capacities up to and including these thresholds, a minority will require assessment due to high PV penetration locally.

Assessments will not be required on applications for non-exporting total inverter capacities:

- up to 30 kVA on the Main network
- up to 10 kVA on the SWER network

Source: Ergon website, 16 November 2015

Solar industry development and job creation

Stanwell supports activities which sustainably grow the Queensland economy allowing both room and incentives for new investment. Policy which supports local industry development and job creation will be of significant benefit to Queensland. However, Stanwell notes that the *Issues Paper* is consistent with the Energy Supply Association of Australia's (esaa) analysis that job creation in one sector must be considered in light of its impact on the economy as a whole.

"if supporting solar power job creation increases employment in the solar energy sector, but this is achieved by shifting employment from other sectors and leaves aggregate employment unchanged, the Queensland community is no better off."

Lowering electricity prices

Stanwell supports efficient energy prices which require wholesale pricing high enough to support efficient generation investment and retail prices low enough to support efficient consumption investment.

Investment in domestic solar PV is the result of disaggregated decision making – each consumer makes the decision which is rational to them and the system as a whole is left to rebalance around those decisions. The actions of one consumer to lower the price they face often impacts on other consumers by raising the unit price of their consumption.

Conversely, investment in large scale generation is relatively centralised, relying on a small number of entities committing to supply customer demand over long time periods. A recent report by PWC – commissioned by esaa – highlighted that "*chronically weak wholesale electricity prices*

are seen as the most significant inhibitor to any new thermal or renewable generation projects obtaining finance – with insufficient equity returns being able to be made based on current and forecast future electricity prices"[8].

Stanwell encourages the QPC to focus its efforts on determining *fair,* or *efficient* prices in accordance with the Terms of Reference, rather than arbitrarily determining *higher* or *lower* prices.

Improving environmental outcomes

As noted above, the Federal Government's SRES already provides significant financial incentives for the installation of domestic solar PV, making these installations competitive with grid sourced electricity.

In an environment of constrained budgets, Stanwell does not consider that further expenditure on activities which are already rational and achievable is an effective use of resources for improving environmental outcomes. Where financial resources are available for such goals, Stanwell encourages that they be directed to their highest potential value.

Alternative objectives

While not addressed in the *Issues Paper*, solar export pricing policy will have a significant impact on both market operation and the viability and desirability of storage systems as they decrease in price.

Consumers are rational, responding to incentives and price signals in order to minimise their individual costs. An environment which incentivises exports – particularly net exports - will likely see larger systems installed in order to maximise value to individual consumers. Such action would exacerbate the "hollowing out" of demand which has been observed in recent years as many small solar systems generate simultaneously irrespective of market price. This was the experience under the Solar Bonus Scheme (coupled with federal incentives).

As solar systems cease generating at the same time (ie dusk) alternative generation sources are increasingly being relied on to maintain security of supply by ramping up generation quickly which comes at a cost. Experience in overseas markets indicates that this "ramping market" may become significant as solar installations increase. High concentrations of exporting solar PV units can also have significant impact on network operation and cost.

A high valuation of exports will also be a disincentive for the installation of storage systems. As indicated in Stanwell's submission to the electricity pricing inquiry, if implemented well, domestic storage systems may reduce the negative impact of high solar PV uptake (described above) by effectively "moving" excess generation from oversupplied to peak periods, thereby potentially reducing both network investment and wholesale generation costs.

An environment which places lower value on exports – or relatively high value on self consumed generation – will incentivise smaller and more tailored systems, such as the non-export connections being offered by Ergon Energy. While some hollowing out of demand will still occur, there will be less significant ramping and network operation concerns and more incentive for domestic storage.

While battery storage technologies are not yet a commercially viable proposition for consumers at the household level, Stanwell expects that significant private investment will continue and a suitably priced storage solution will be available within the next decade. We believe that this review should consider such likely developments and ensure that incentives are not created which prove to be inefficient when reviewed in only a short period of time.

[8] *State of the Debt Markets for the Energy Supply Industry*, PWC report to esaa, December 2014, p2

2.7 Where objectives are in conflict, which objectives take priority and why?

Stanwell supports the definition of economic efficiency contained in the *Issues Paper*, namely that "*Economic efficiency is about maximising the aggregate or collective wellbeing of the members of the community*". Accordingly we consider that objectives maximising the collective wellbeing of the community should take priority over incentivising value maximising behaviour for individuals.

2.8 What principles should be used to guide solar export pricing policy and any regulation of feed-in tariffs?

Stanwell supports the definition of economic efficiency contained in the *Issues Paper*, namely that *"economic efficiency is about maximising the aggregate or collective wellbeing of the members of the community".*

Stanwell strongly supports the QPC adhering to the *OECD principles for regulatory quality* and the *COAG National Principles for Feed-in Tariffs* as presented in the *Issues Paper*.

2.9 How should fairness be defined?

The *Issues Paper* appropriately draws a link between efficient prices and fair prices:

> *"… prices that reflect the cost to society of producing a good or service is fair in the sense that lower prices would imply that the beneficiary is not paying a fair share. Prices above [efficient] cost imply that the producer is receiving a benefit at the expense of the consumer.*

Economically efficient solar export pricing would send price signals to both consumers and suppliers of electricity to support efficient outcomes. The price would signal to consumers the costs of providing energy so that consumption occurs when consumers value the energy more than or equal to its cost of supply. Suppliers receive information which informs their production and investment decisions so that investment occurs when, where and in the firms and technologies that can more efficiently meet consumer demands, compared to alternatives. An efficient price would also support the efficient operation and use of existing assets".[9]

In relation to Solar PV exports, the nominal consumer is the *producer* in the passage above while the market (or retailer) is the *consumer*. Accordingly fair pricing would occur when the price is no more than the buyer values it and no less than the supplier is willing to provide it for. As the cost of electricity varies by time and location, and different retailers and consumers (solar PV generators) will apply different values to output, Stanwell considers that regulatory intervention is unlikely to find this price.

[9] Issues paper, page 11

Feed-in Tariffs: what should be regulated and how

3.1 What are the costs and benefits of exported solar electricity?

Stanwell addressed these issues in detail in response to question 2.3 and generally supports the analysis on pages 15-17 of the issues paper.

Stanwell questions the validity of including both merit order effect and wholesale electricity costs. Efficient wholesale prices are set by the combination of generation resources (including demand side participation) required to meet peak demand over both the long and short term.

Reducing peak demand, or meeting it with overall lower cost generation would lower the long run cost recovery and reduce wholesale prices.

Substituting one form of generation for another – at a non-peak time – will affect what *short run* costs need to be recovered but have minimal impact on *long run* cost. Solar PV reduces total energy by more than it reduces peak demand meaning that the long run cost is recovered over fewer units, and the unit costs of grid sourced electricity will rise over time.

Where wholesale prices are inefficiently high in the long term, this reduction in total energy may lead to overall cost reductions, however, wholesale prices in most states in recent years remain below public estimates of long run cost.[10]

Stanwell also notes the barriers to determining value highlighted on pages 21-22 of the issues paper.

3.2 Who incurs the costs and accrues the benefits from exported solar electricity? How will future market developments impact on costs and benefits?

Stanwell considers that the *Issues Paper* and the 2013 QCA inquiry into solar feed-in tariffs have addressed this issue adequately.

3.3 Where there is a case to regulate feed-in tariffs, is the existing approach to pricing solar exports appropriate? If not, what alternative approach would be the most effective and efficient way to price solar exports?

As indicated in response to question 2.1, Stanwell considers that – subject to the resolution of potential monopoly issues in regional Queensland – there is no case to regulate feed-in tariffs in Queensland.

Embedded generators which are not subject to the FiT can sell their output in one of two ways – either at the wholesale spot price or as agreed under bilateral contract[11]. Exposure to wholesale prices is likely to be impractical and improper in relation to domestic solar PV installations implying bi-lateral contracts would be used to treat embedded generators equitably.

Such an agreement could be a negotiated, retailer funded FiT – where that retailer values the supply – or alternatively a direct government payment as implied by the COAG National Principles for Feed-in Tariffs.

A number of processes are currently underway looking into the "unbundling" of ancillary or complementary services from the "essential service" of electricity retailing. While none of these

[10] *Critique of Bidding in Good Faith Second Draft Rule Determination*, Frontier Economics, November 2015. "From a dynamic efficiency perspective, with wholesale prices in Queensland and elsewhere presently well below any reasonable estimate of long-run marginal cost…"

[11] Such generators are generally referred to as market non-scheduled and non-market non-scheduled respectively.

processes currently provide an alternative to contracting with a retailer or Government, the proposed Demand Response Aggregator role[12] may provide such a service.

3.4 How should the price be structured and paid? Should feed-in tariffs account for variations in value due to location and time?

Tariff structure could be expressed in a variety of ways, however, Stanwell expects the c/kWh will remain the dominant form. For example, a FiT could include a component related to the impact of solar export on the local network – perhaps in c/kW during peak loading conditions or outages.

Stanwell does not consider that a mandatory feed-in tariff should vary due to location while the Uniform Tariff Policy remains active[13] as it may counteract existing Government subsidies leading to regulatory arbitrage. Variations due to time should occur where these reflect the underlying value of solar PV exports, subject to the requirement that the FiT have complexity appropriate for the target market and administration.

3.5 Would market, regulatory or policy changes be required to implement feed-in tariffs? If so, what changes would be required?

Stanwell believe that voluntary feed-in tariffs can continue to be offered under current market, regulatory and policy settings – subject to the resolution of potential monopoly issues in regional Queensland.

[12] http://www.aemc.gov.au/Rule-Changes/Demand-Response-Mechanism
[13] Other than the distinction between SEQ and regional customers which currently exists.