LEGISLATIVE ASSEMBLY OF THE NORTHERN TERRITORY

Sessional Committee on the Northern Territory's Energy Future

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ELECTRICITY PRICING OPTIONS

December 2015

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Chair's Preface

The Committee's preliminary inquiry found that the security of the Northern Territory's energy future is not simply a matter of ensuring access to a reliable fuel source. Rather, it is also contingent upon the development of an efficient electricity market characterised by effective participation of both the supply and demand sides, with the capacity to adapt to changes in load profiles and deliver the most cost effective access to energy by all Territorians. Network tariff reform is widely acknowledged as an essential pre-requisite to support the efficient utilisation of the network by consumers, minimise cross-subsidies between customers, enable the efficient integration of new technologies, defer network augmentation, and put downward pressure on prices.

Dynamic pricing structures, in particular capacity and time-of-use tariffs, have proven to be an extremely effective way of managing peak demand by providing consumers with the means to compare the value they place on using the network with the costs caused by their use of it. While key stakeholders agreed that network tariff reform in the Northern Territory is well overdue, the Committee identified a number of issues that are currently impacting on the Territory's capacity to rollout cost reflective tariffs and other enabling technologies that allow consumers to respond to price signals.

The Committee found that effecting tariff reform in the Territory is largely constrained by the fact that the majority of smaller network users still have standard accumulation meters. While Jacana Energy's recently introduced *Switch to Six* time-of-use retail tariff incorporates a *Meter Cost Smoothing Plan* to assist with meeting the cost of meter upgrades, the Committee heard that costs associated with the removal and replacement of asbestos meter panels represents a significant barrier to the voluntary uptake of advanced meters and an undue cost burden on affected customers.

In line with other jurisdictions, the Committee has recommended that a *New and Replacement Electricity Meter* Policy is developed that supports a market-led rollout of advanced meters. The Committee has also recommended the establishment of an *Advanced Meter Upgrade Rebate* program to compensate residential and small business customers for installation costs associated with the removal and replacement of asbestos switchboard and meter panels.

A number of issues were also raised during the inquiry regarding the efficiency and transparency of the Territory's regulated retail price determination process. In light of the Australian Energy Market Commission's *Advice on Best Practice in Retail Price Methodology,* and the benefits of a nationally consistent approach to setting regulated retail prices, the Committee formed the view that it would be beneficial to review and consider options for improving current processes.

With regards to feed-in tariffs for micro generation, the Committee found that the Northern Territory's one-for-one gross metered *Solar Buyback Scheme* contravenes the 2012 *Revised National Principles for Feed-in Tariff Arrangements and* is out of step with other jurisdictions that have since moved to net metered schemes based on the avoided cost of generation.

The Committee heard that the cost of the Territory's scheme has doubled in the past 12 months and currently amounts to $1.5 million per annum. It is of particular concern to the Committee that the difference between the feed-in tariff rate and the avoided cost of generation is effectively borne by non PV owners in the form of higher retail prices. The Committee has therefore recommended that the scheme is reviewed and a formal policy for Feed-in Tariffs is developed in accordance with the *National Principles*.

While the Committee's recommendations seek to complement and progress the Territory's Electricity Market Reform Agenda, it was particularly concerning that the Committee was unable to identify the agency responsible for reviewing or developing associated policy. Consequently, the Committee has recommended that consideration be given to establishing and resourcing an electricity market reform policy unit within the Energy Directorate that has the capacity to formulate and implement policy advice and ensure that the Territory fulfils its commitments as a member of the Council of Australian Government's Energy Council.

On behalf of the Committee I would like to thank all those that provided submissions and attended hearings and briefings. In particular, the Committee thanks the Power and Water Corporation, Jacana Energy and Territory Generation for their willingness to provide the Committee with background briefings on various issues of interest to the Committee. I also thank my fellow committee members for their work on the Committee.

Hon Gary Higgins MLA

Chair

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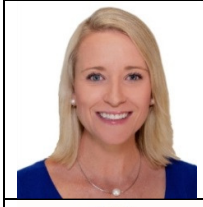	**Ms Nicole MANISON MLA:** Member for Wanguri	
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On 21 October 2014 Member for Casuarina, Mr Kon Vatskalis was discharged from the Committee and replaced by Member for Wanguri, Ms Nicole Manison. On 22 October 2014 Member for Drysdale, Mrs Lia Finocchiaro was discharged from the Committee and replaced by Member for Arafura, Mr Francis Kurrupuwu. On 17 February 2015 Member for Blain, Mr Nathan Barrett was discharged from the Committee and replaced by Member for Greatorex, Mr Matthew Conlan.		

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Acronyms and Abbreviations

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AMI	Advanced Metering Infrastructure
c/kWh	Cents per Kilowatt Hour
COAG	Council of Australian Governments
CPP	Critical Peak Pricing
CSO	Community Service Obligation
DRM	Demand Response Mechanism
DRED	Demand Response Enabling Device
DSM	Demand Side Management
DSP	Demand Side Participation
ENA	Energy Networks Association
ERAA	Energy Retailers Association of Australia
ESAA	Energy Supply Association of Australia
FiT	Feed-in Tariff
kWh	Kilowatt-hour
kVA	Kilovolt-ampere
MCE	Ministerial Council on Energy
MWh	Megawatt-hours
NEL	National Electricity Laws
NEM	National Electricity Market – incorporating SA, VIC, TAS, ACT, NSW and QLD
NER	National Electricity Rules
NERA	NERA Economic Consulting
PFIT	Premium Feed-in Tariff (Victoria)
PPA	Power Purchase Agreement
PV	Photovoltaic
PWC	Power and Water Corporation
RET	Renewable Energy Target
RTP	Real Time Pricing
SCI	Statement of Corporate Intent
SCER	Standing Council on Energy and Resources
SWIS	South Western Interconnected System
TOU	Time-of-use

Glossary of Terms

Accumulation Meters	Electricity meters that only measure total electricity used(kwh, Mwh) between meter readings and do not record the dates and times when the electricity usage occurs. Also referred to as 'flat rate' meters.
Advanced Metering Infrastructure	A specific form of smart metering capable of a range of functions including: recording electricity imported or exported from a metering point in half hourly intervals; remote disconnection and reconnection; load control; and remote detection of loss of supply.
Australian Energy Market Commission	Responsible for rule-making and energy market development at a national level, including in respect of the National electricity Rules, the National Gas rules and the National Energy Retail Rules.
Australian Energy Market Operator	Responsible for day-to-day operation and administration of both the power system and electricity wholesale market in the NEM, the retail electricity markets, the retail and wholesale gas markets and other support activities.
Australian Energy Regulator	Responsible for regulation and compliance at a national level, including in respect of the Australian Energy Market Legislation.
Block Tariff	Pricing structures that include either an incline or decline in price per kWh beyond a given threshold of electricity usage.
Capacity Tariff	Electricity tariff based on maximum demand rather than total electricity used over a period of time.
Controlled Load	Appliances (such as hot water systems, pool pumps, space heating) that are connected to a dedicated circuit which is only energised 'ON' at predetermined times of the day and are subject to separate metering.
Cost Reflectivity	Where the price of a service is based on the true cost of providing that service.
Critical Peak Pricing	When utilities observe or anticipate high wholesale market prices or power system emergency conditions, they may call critical events during a specified time period), the price for electricity during these time periods is substantially raised.
Cross Subsidy	Cross subsidies occur where prices do not reflect costs. This leads to some consumer groups subsidising the costs of other groups.
Demand Side Management	Activities or programs (education, financial incentives) undertaken by the load-servicing entity or its customers to influence the amount or timing of electricity they use – also referred to as load management.
Demand Side Participation	The ability of consumers to make informed choices about how much electricity they use at different times. These choices should efficiently relect the value they obtain from using electricity services. Examples of DSP can include, but are not limited to, such measures as electricity conservation, peak demand shifting, fuel switching, utilisation of distributed generation and energy efficiency.
Demand Response	Changes in electricity usage by end-use customers from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at

Mechanism	times of high wholesale market prices or when system reliability is jeopardized.
Dual Element Meter	A meter that separately records electricity usage for controlled loads and other circuits.
Flat Rate Tariff	Electricity tariffs with a fixed price for electricity use that neither varies according to the time of use nor according to the quantity used.
Feed-in Tariff	Price received by customers for selling renewable energy into the main electricity grid that they generate on their property; from roof-top solar PV panels for example.
Full Retail Contestability	Electricity market where customers have the capacity to choose between electricity retailers who may tailor different products to different customers that may provide price and non-price benefits.
Interval Meter	Meters that record how much electricity is used every 30 minutes. Also referred to as 'time of use' meters.
Maximum Demand	The maximum power drawn from the grid at any point in time
Smart Metering	A generic term to identify a meter with remote communication ability that can undertake a range of functions other than merely interval metering – see also advanced metering infrastructure (AMI)
Solar Grid-Parity	Where solar power, without subsidies, costs the same as conventional grid electricity.
Solar Penetration	Typically classified as energy penetration or power penetration. Energy penetration (average penetration [kWh/kWh]) is the fraction of total energy solar provides to the system, usually assessed on a per annum basis. Power penetration (instantaneous penetration [kW/kW]) is the fraction of power solar provides instantaneously to the power system. For example, a solar system may reach 80 % instantaneous power penetration at times and provide 30 % annual energy penetration overall.
Real Time Pricing	Real-time pricing is generally a half hourly or hourly rate which is applied to usage on a half hourly or hourly basis.
Tariff Structure	Electricity retailers quote tariffs in different formats. The 'tariff structure' refers to how the various costs are incorporated and presented to consumers.
Time Coincident Tariff	A tariff that charges consumers for their demand when the network is at its maximum demand.
Time of Use Pricing	Time-of-use pricing typically applies to usage over broad blocks of hours (e.g peak, off-peak and shoulder) where the price for each period is predetermined and constant.
Two Part Tariff	Typically a tariff with a fixed charge component and usage charge component.

Committee's Terms of Reference

On 21 August 2013 the Assembly resolved that:

1. A Sessional Committee to be known as the Committee on the Northern Territory's Energy Future be appointed.
2. The Committee's membership to comprise three Government Members, two Opposition Members and one Independent Member.
3. The Committee shall elect a Government Member as Chair.
4. The Committee may elect a Deputy Chair of the Committee, who may act as the Chair when the Chair is absent from a meeting or there is no Chair of the Committee.
5. A quorum of the Committee shall be three members of the Committee.
6. The Committee shall inquire into, report from time to time and make recommendations regarding:
    i) the Territory's current energy capability;
    ii) the Territory's probable and proven energy capability;
    iii) the prospect for additional energy resources;
    iv) the future energy needs of the Territory and the continuity of supply;
    v) the most cost effective means of meeting the Territory's energy needs;
    vi) regulatory impacts on the cost of energy insofar as these can be reasonably ascertained.
    vii) alternative sources of energy supply available to the Territory, including oil, gas, coal, uranium, and the renewable energy sources such as hot rock, solar, biofuels, wind and tidal energy;
    viii) emerging technologies and their applicability to the Northern Territory.
7. The Committee will give priority to its terms of reference insofar as they apply to onshore energy resources.
8. The Committee may appoint subcommittees comprising two or more of its members and refer to any such subcommittee any matter which the committee may examine, and the quorum of a subcommittee shall be two.
9. The provisions of this resolution, insofar as they are inconsistent with the Standing Orders, have effect notwithstanding anything contained in the Standing Orders.

Recommendations

Recommendation 1

The Committee recommends that the Utilities Commission of the Northern Territory, in consultation with Jacana Energy and other relevant stakeholders:

a) undertake and publish a review of the regulated retail price determination process incorporating options for improving the efficiency and transparency of retail price setting in the Northern Territory; and

b) The Treasurer, as the Regulatory and Shareholding Minister, table a copy of the review in the Assembly by June 2016.

Recommendation 2

The Committee recommends that the Government, in consultation with the Australian Energy Regulator, Power and Water Corporation, Jacana Energy and other relevant stakeholders:

1. Develop and implement a *Northern Territory Policy for New and Replacement Electricity Meters* in line with the *Minimum Services Specification,* as proposed by the Australian Energy Market Commission, that supports:
    a) a market-led rollout of advanced meters that ensures competition in metering services; and
    b) facilitates uptake of dynamic retail tariff offers and associated products by small consumers.
2. The Treasurer, as the Regulatory and Shareholding Minister, table a copy of the *Northern Territory Policy for New and Replacement Electricity Meters* in the Assembly by the end of the first quarter 2016.

Recommendation 3

The Committee recommends that the Government, in consultation with the Power and Water Corporation and Jacana Energy, establish and implement an *Advanced Meter Upgrade Rebate* program that:

a) compensates residential and small business customers that elect to upgrade their accumulation meter to an advanced meter for installation costs associated with the removal and replacement of switchboard and meter panels manufactured from an asbestos/resin or asbestos/coal tar pitch composite; and

b) the Treasurer, as the Regulatory and Shareholding Minister, table a copy of the *Advanced Meter Upgrade Rebate* program in the Assembly by the end of the first quarter 2016.

Recommendation 4

The Committee recommends that the Government, in consultation with the Power and Water Corporation, Territory Generation, Jacana Energy and other relevant stakeholders:

1. Undertake and publish a review and evaluation of the *Solar Buyback Scheme* currently operating in the Northern Territory.
2. Develop and implement a *Northern Territory Policy for Feed-in Tariffs for Micro Generation* in accordance with the *Revised National Principles for Feed-in Tariff Arrangements* that, as a minimum, addresses:

a) methodology for calculating 'fair and reasonable' feed-in tariff rates;

b) mandatory requirements to offer feed-in tariffs;

c) independent regulatory oversight of FiT rates; and

d) transitional and legacy arrangements .

3. The Treasurer, as the Regulatory and Shareholding Minister, table copies of the review and *Northern Territory Policy for Feed-in Tariffs for Micro Generation* in the Assembly by June 2016.

Recommendation 5

The Committee recommends that the Government give consideration to establishing and resourcing an electricity market reform policy unit within the Energy Directorate that has the capacity, in consultation with key stakeholders, to formulate and implement policy advice as and when required.

1 Introduction

Background to Inquiry

1.1 The Committee's preliminary inquiry sought to gain an understanding of the Territory's energy market, and identify the key challenges and opportunities associated with meeting the Northern Territory's future energy needs. The Committee found that the security of the Northern Territory's energy future is not simply a matter of ensuring access to a reliable fuel source. Rather, it is also contingent upon the development of an efficient electricity market characterised by effective participation of both the supply and demand sides, with the capacity to adapt to changes in load profiles and deliver the most cost effective access to energy by all Territorians.[1]

1.2 As highlighted in the literature, technological advances in recent years have effectively "changed the nature of electricity supply and consumption."[2] Since 2009 Australia's overall consumption of electricity has been steadily decreasing as a result of more energy efficient appliances, the uptake of rooftop solar PV and the decline in energy intensive manufacturing. However, peak demand driven by an increasing number of electronic household devices, in particular air conditioners, continues to rise. In turn, costly network upgrades required to meet the rise in peak demand and avoid blackouts has led to an unprecedented escalation in electricity prices as network and distribution businesses endeavour to recoup their costs.[3]

1.3 Although household consumption accounts for less than one third of Australia's total electricity use, the Committee understands that "peak demand growth is most largely driven by demand within the residential sector, despite average demand decreasing for this sector."[4] As noted by the Productivity Commission, some estimates suggest that the residential sector "may account for more than two-thirds of peak loads."[5] This situation has raised significant concerns regarding the on-going affordability of electricity and the potential for what has been termed an energy *death spiral:* a scenario whereby peak demand growth continues unabated and associated investment in infrastructure maintains upward pressure on electricity prices, encouraging customers to further reduce consumption or opt to offset costs through the uptake of increasingly affordable

[1] Committee on the Northern Territory's Energy Future, *Key Challenges and Opportunities,* Legislative Assembly of the Northern Territory, Darwin NT, May 2014, pp. 112-3

[2] Australian Energy Market Commission (AEMC), Power of Choice Review – giving consumers options in the way they use electricity, Australian Energy Market Commission, Sydney, 30 November 2012, p.x; see also Productivity Commission, Electricity Networks Regulatory Frameworks Vol 2, Australian Government, Melbourne VIC, April 2013

[3] AEMC, Power of Choice, pp.11-12; see also Tony Wood et.al., *Shock to the System: Dealing with falling electricity demand,* Grattan Institute, Victoria, December 2013 and Tony Wood et.al., *Fair Pricing for Power*, Grattan Institute, Victoria, July 2014, p.1

[4] AEMC, Power of Choice, p.12

[5] Productivity Commission, Electricity Networks Regulatory Frameworks Vol 2, Australian Government, Melbourne VIC, April 2013, p.348

rooftop solar PV, leaving fewer customers to foot the bill for network augmentation.[6]

1.4 The Australian Energy Market Commission (AEMC) notes that achieving an efficient demand-supply balance within this new operating context requires more active participation by the demand side and "better integration of the potential of the demand side into supply side investment decisions …"[7] Providing consumers with the means to more effectively manage their electricity consumption and expenditure through network tariff reform is widely acknowledged as key to encouraging a greater level of demand side participation (DSP) in the market.[8]

1.5 While the Northern Territory tends to have a comparatively flat load profile due to the climate and far less penetration from rooftop solar PV than other jurisdictions, it is certainly not immune from the challenges currently facing the NEM. As the Utilities Commission of the Northern Territory advised the Committee in October 2013:

> We have noticed the load factors falling very slightly in Darwin, Katherine and Alice Springs. Arguably that is not a good thing; that suggests in fact peak demand is growing at a slightly higher rate than average demand or total energy consumption. [9]

The slower than expected growth in demand is no doubt partly attributable to the 30% rise in electricity prices since 1 January 2013.[10] Higher rooftop solar PV uptake rates were also observed in 2013-14 with the number of units installed up by almost 30% on 2012-13 figures; further impacting on demand and prompting a review of solar PV uptake projections. [11]

1.6 Given the above, and in light of the Northern Territory's Government's current focus on electricity market reform[12], the Committee considered it timely to undertake a review of electricity pricing in the Territory as it pertains to residential and small business customers.

Inquiry Terms of Reference

1.7 At its meeting of 20 August 2014, the Committee subsequently adopted the following terms of reference:

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[6] see for example, Paul Simhauser and Tim Nelson, *The Energy Market Death Spiral – Rethinking Customer Hardship*, *Working Paper No. 31,* AGL Energy Ltd, Brisbane QLD, June 2012, pp. 13-14; Tony Wood et.al., *Shock to the System: Dealing with falling electricity demand,* Grattan Institute, Carlton, December 2013, pp. 19-20

[7] AEMC, *Power of Choice*, p.x

[8] COAG Energy Council, *Meeting Communiqué: Adelaide/11 December 2014,* viewed 17 March 2015, http://www.scer.gov.au/council-meetings/; Department of Industry and Science, *2015 Energy White Paper,* Australian Government, Canberra ACT, April 2015, p.11

[9] Utilities Commission of the Northern Territory, Committee Transcript, 11 October 2013, p.9

[10] Hon Adam Giles MLA, Chief Minister, Giles acts on power and water concerns, (Media Release), Northern Territory Government, 14 March 2013, http://newsroom.nt.gov.au/mediaRelease/7926

[11] John Baskerville, CEO: Power and Water Corporation, in Northern Territory Estimates Committee Transcript, 4 June 2015; Northern Territory Utilities Commission, *Power System Review 2013-14,* Northern Territory Utilities Commission, Darwin NT, May 2015, pp. 23-5

[12] Department of Treasury and Finance, *Northern Territory Electricity Market Reform: Information Paper,* NT Government, Darwin, February 2014

That the Committee inquire into and report on Electricity Pricing Options with specific reference to:

a) The advantages and disadvantages of different electricity tariff designs;

b) Factors to be taken into consideration in the design and implementation of electricity tariffs; and

c) Options for Feed-in Tariffs for renewable electricity generation

Conduct of the Inquiry

1.8 Following adoption of the inquiry terms of reference the Committee called for submissions to be received by 17 October 2014. The call for submissions was advertised in the NT News, Katherine Times, Centralian Advocate, Tennant and District Times, Arafura Times, Territory Regional Weekly, and The Australian, and placed on the Committee's website. The Committee also directly contacted a number of key stakeholders to advise them of the call for submissions.

1.9 As listed at Appendix 1, the Committee received 14 submissions.

1.10 Over the course of the inquiry the Committee held two public hearings in Darwin with a total of 13 organisations appearing – see Appendix 2. The Committee also held private briefings with the Power and Water Corporation and Jacana Energy.

2 National Electricity Market Reform

National Reform Agenda

2.1 The Council of Australian Governments' (COAG) Energy Council[13], consisting of ministers with portfolio responsibility for energy and resources from the Commonwealth, each state and territory, and New Zealand, has overarching responsibility for policy leadership and pursuing key reforms in the Australian electricity market including:

- Development of secure, effective and competitive markets;
- Promotion of energy affordability and efficiency;
- Stimulation of technical and economic efficiency in the supply, distribution and consumption of energy;
- Oversight of governance and regulatory frameworks; and
- Promotion of energy efficiency and energy productivity including encouragement of technological innovation.[14]

2.2 Acknowledging that opportunities for the efficient operation of demand side participation in the electricity market are not as well developed as supply side opportunities, in 2011 the former Ministerial Council on Energy directed the AEMC to identify the:

> market and regulatory arrangements needed across the electricity supply chain to facilitate the efficient investment in, operation and use of DSP in the NEM.[15]

The information graphic at Figure 1 below provides an overview of the AEMC's subsequent recommendations as presented in its 2012 *Power of Choice Review*.

2.3 In December 2012 COAG endorsed a comprehensive package of national electricity market reforms.[16] Incorporating the AEMC's recommendations, the reforms are designed to respond to the challenges of rising electricity prices and restore the focus of the electricity market on the *National Electricity Objective*, namely to "promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity…"[17]

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[13] Up until 2013 the COAG Energy Council was previously known as the Standing Council on Energy and Resources or SCER

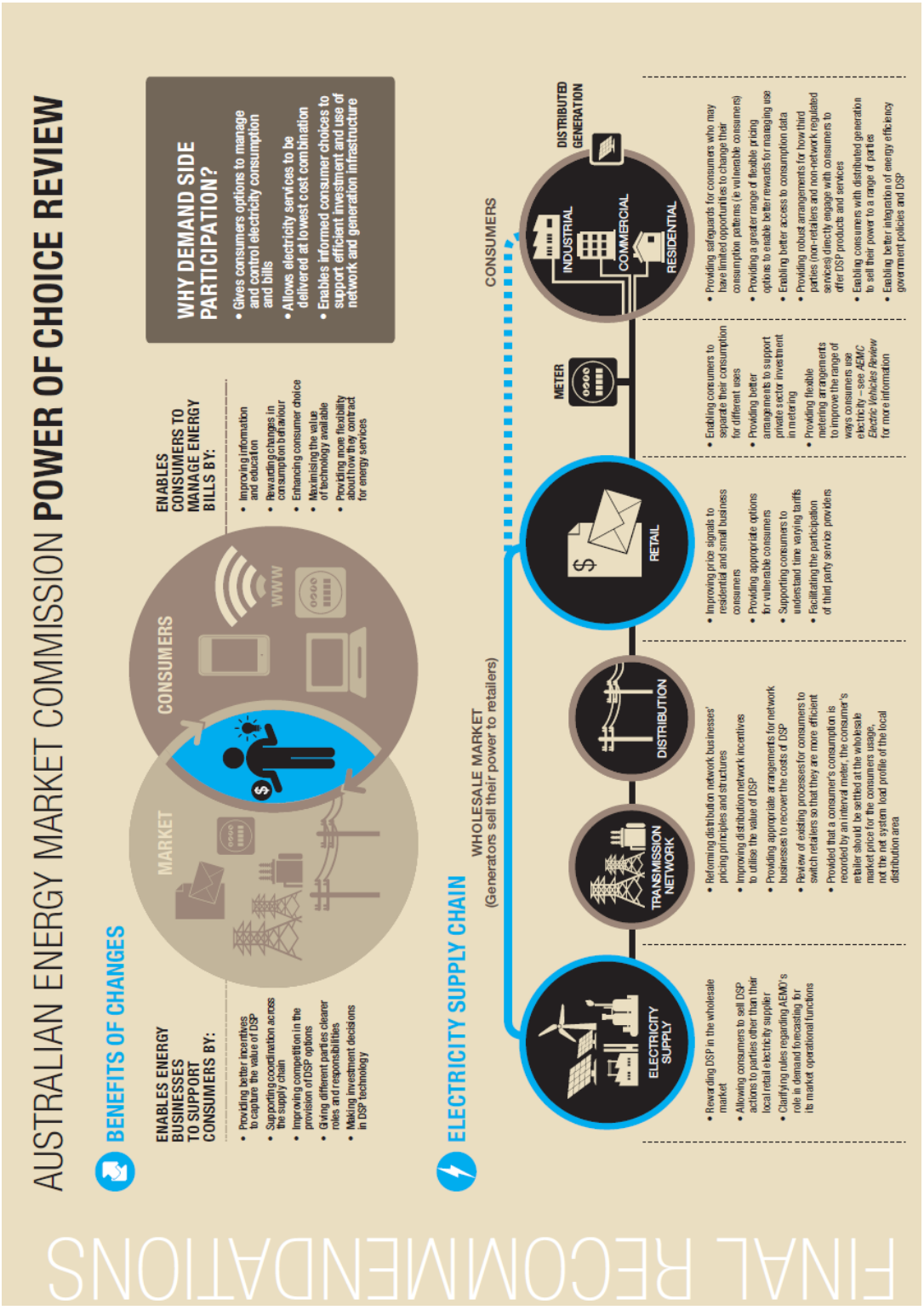
[14] COAG Energy Council, *Terms of Reference,* viewed 4 August 2015, https://scer.govspace.gov.au/about-us/terms-of-reference/

[15] AEMC, *Directions Paper: Power of choice – giving consumers options in the way they use electricity,* Australian Energy Market Commission, Sydney, p. 1

[16] COAG Energy Council, COAG Energy Council, *COAG Energy Market Reform – Implementation Plan December 2012,* viewed 18 November 2014, https://www.coag.gov.au/node/481

[17] *National Electricity (South Australia) Act 1996,* Schedule: National Electricity Law, s 7

Figure 1: Power of Choice Review: Final Report – Information Graphic[18]



[18] AEMC, *Power of Choice Review: Final Report – Information Graphic,* Australian Energy Market Commission, Sydney, 30 November 2012

2.4 Nevertheless, over the past couple of years there has been mounting concern regarding the pace at which reforms are being implemented. As the Australian Government noted in its *Energy White Paper – Green Paper* released in September 2014:

> Continuous reform in the electricity sector since the early 1990s has resulted in better outcomes for consumers. However, there is increasing concern that reform has slowed. The pace of reform needs to accelerate to provide downward pressures on further price rises.[19]

2.5 At its December 2014 meeting the COAG Energy Council subsequently identified network tariff reform as the key priority for Ministers and an essential next step to "support the efficient utilisation of the network by consumers, enable the efficient integration of new technologies and lower future network costs."[20] Reiterating the importance of competition and demand side participation as a means of putting downward pressure on prices, the Australian Government's priorities detailed in the *2015 Energy White Paper* include the:

- rollout of cost-reflective tariffs to reduce cross-subsidies between consumers and drive better uptake of enabling technologies (particularly advanced metering) that allow consumers to respond to price signals; [and]
- further development of market frameworks to encourage innovative products and services that give consumers more choice in managing bills and support greater competition.[21]

2.6 The Committee notes that modelling indicates that the potential benefit from peak demand reduction through cost reflective tariffs is significant. As the Grattan Institute points out, between 2009 and 2013 power networks in Australia spent $17.6 billion on infrastructure upgrades to cope with rising peak demand.[22] However, it is estimated that,

> if prices had encouraged consumers to use less power in periods of peak demand, $7.8 billion of this investment could have been avoided and the savings passed on as lower power bills.[23]

Network Tariff Reform

2.7 For the majority of Australian households and small businesses the default tariff is a two-part, flat rate tariff; often referred to as the traditional or conventional tariff. Dating back to the early 1890's, the two-part tariff was originally designed to reflect the "atypical cost characteristics of power systems – a non-storable commodity with a cost structure overwhelmingly driven by periodic demand

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[19] Department of Industry, *Energy White Paper – Green Paper*, Australian Government, Canberra ACT, September 2014, p. 27

[20] COAG Energy Council, *Meeting Communique: Adelaide/ 11 December 2014,* viewed 17 March 2015, http://www.scer.gov.au/council-meetings/; see also COAG Energy Council, *COAG Energy Council Reform Agenda Implementation Plan – Progress Report, Issue Date 23 July 2015,* viewed 10 August 2015, http://www.scer.gov.au/general-council-publications/council-reform-implementation-plan/

[21] Department of Industry and Science, *2015 Energy White Paper,* Australian Government, Canberra ACT, April 2015, p. 6

[22] Tony Wood et.al., *Fair Pricing for Power,* p.1

[23] Tony Wood et.al., *Fair Pricing for Power,* p.1

rather than annual energy demand".[24] Consequently, the theoretically optimal two–part tariff consisted of:

> a demand charge (expressed in dollars per kilowatt or $/kW) reflecting peak capacity utilised by a customer, and a variable energy charge (expressed in cents per kilowatt hour or c/kWh) reflecting the real-time marginal running costs of the power system.[25]

2.8 However, since the metering technology of the time was unable to measure both total sales volume (kWh) and peak consumption (kW) the demand charge was substituted by a fixed charge; installing a second meter was deemed cost prohibitive for all but the largest customers.[26] Levied on a uniform basis the fixed charge component was designed to be reflective of the underlying cost structure of supplying electricity given that "a significant proportion of costs (in particular, generation and network costs) are fixed, particularly in the short to medium term."[27]

2.9 In Australia, two-part tariffs are dominated by the variable component of the charge with the fixed component accounting for approximately 10% of the overall tariff structure for the average small customer.[28] While the fixed component has degraded over time, Deloitte note that it is also the case that:

> the fixed component of the charge is usually set below the level that would be reflective of the fixed costs of the electricity system, in part due to customers' desire to have control over their bills.[29]

As such, the simple two-part network tariff recovers most costs based on the volume of energy sold within each billing period.[30]

2.10 Introduction of the flat rate usage charge further eroded the efficiency and equity of the theoretically optimal two-part tariff since an average cost variable tariff inevitably understates the value of peak energy while overstating the value of off-peak energy.[31] As Deloitte point out in their recent review of residential electricity tariffs in Australia:

> where the per unit charge rate of a Two Part Tariff does not vary with time or usage patterns, it results in cross subsidisation of electricity usage at peak times. During times of peak usage, the marginal cost of supplying an additional unit of electricity can be very high (either due to network constraints, or the requirement for high-cost generation, or both) with the result that a flat charge will tend to understate the cost of supply. In this case, flat charges will tend to result in cross subsidies between customers who consume more electricity at peak times and those with a more balanced consumption profile.[32]

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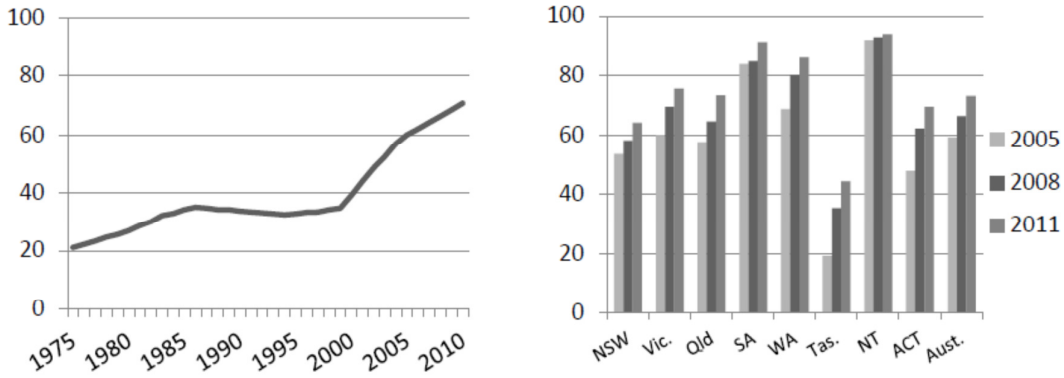
[24] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs, Working Paper No. 41,* AGL Energy Ltd, Brisbane QLD, June 2014, p.1
[25] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* p.1
[26] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* pp.1-2
[27] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* Deloitte Access Economics Pty Ltd, Sydney NSW, 22 January 2014, p.19
[28] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* p..3
[29] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.19
[30] Submission No. 13, Energy Networks Association, p. 4
[31] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs*, p. 3
[32] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.19

2.11 Moreover, as the Committee heard from a number of witnesses, the potential for cross subsidisation has been exacerbated in recent years by the uptake of energy intensive appliances, in particular air conditioners, and the installation of roof-top solar PV systems.[33] In the absence of tariff reform, the AEMC notes that further cross subsidisation is projected to result with the uptake of electric vehicles.[34]

2.12 Growth in the penetration of air conditioning, particularly in the residential sector, has been cited by network businesses as a key contributor to increasing maximum demand and, as such, "a significant factor in the need to expand network capacity to meet peak demand."[35] As depicted in Figure 2 below, the number of households with air conditioning has increased markedly since 1975. Noting that the national stock of air conditioners doubled in the 10 years to 2008, the Productivity Commission points out that "by 2020, the associated use of electricity is projected to be five times greater than it was in 1990."[36]

Figure 2: Percentage of Households with Air Conditioning[37]



2.13 Modelling undertaken by NERA Economic Consulting (NERA) indicates that in Victoria, for example, "the air conditioner load profile contributes around 84% of its installed capacity to the system maximum demand."[38] It is estimated that use of a large (5kW) air conditioner during peak times results in additional network costs of approximately $1,000 per annum. However, based on the extra air conditioner electricity usage, the conventional two-part volumetric tariff only provides the customer a price signal of around $300 per annum in

[33] see for example: Submission No. 5, United Energy Distribution Pty Ltd; Submission No. 10, Power and Water Corporation; Submission No. 12, Ms Vickki McLeod; Submission No. 13, Energy Networks Association

[34] AEMC, *Power of Choice Review,* p.18; see also AECOM Australia Pty Ltd, *Impact of Electric Vehicles and Natural Gas Vehicles on the Energy Markets: Final Advice*, AECOM Australia Pty Ltd, Sydney NSW, 15 May 2012

[35] Submission No. 13, Energy Networks Association, *The Road to Fairer Prices,* p. 2; see also AEMC, *Power of Choice Review,* p.12

[36] Productivity Commission, Electricity Networks Regulatory Frameworks Vol 2, p.350

[37] Productivity Commission, Electricity Networks Regulatory Frameworks Vol 2, p.350

[38] NERA Economic Consulting, *Efficiency of Tariffs for Current and Emerging Technologies*, NERA Economic Consulting, Sydney NSW, July 2014, p.

additional charges with the balance recovered through higher annual network prices for all other customers.[39]

2.14 The Committee heard that all air conditioners sold in Australia must now be equipped with load management terminals. As Mr Trevor Horman (Manager Sustainable Energy, Power and Water Corporation) explained, demand response enabled air conditioners provide network businesses with the means to minimise the impact of air conditioners during peak load events:

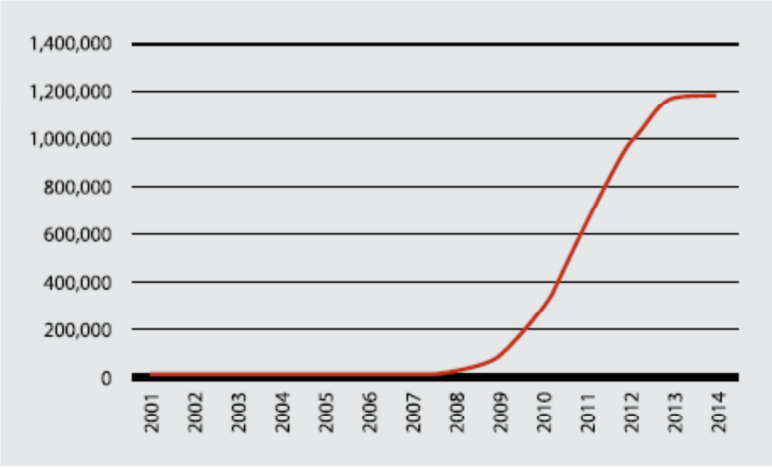
> For instance, in this building you could interrupt the air conditioning compressor for five minutes but the air handling system would keep going so nobody in this room would notice that major load has been interrupted for five minutes. That would certainly be a big help to mitigate those peak loads that we experience only one or two days per year. The technology is advancing but we need price signals to underpin it.[40]

2.15 Direct load control of air conditioners is currently being trialled by Ausgrid in NSW. Funded through the *Demand Management Innovation Allowance*, the primary objective of the *CoolSaver* trial is to:

> Explore ways to reduce the impact of peak demand from residential air conditioners by partnering with customers and offering direct incentives for controlling their air conditioners on peak summer days.[41]

2.16 As highlighted in Power and Water Corporation's (PWC) submission to the inquiry, the uptake of roof-top solar PV has given rise to further cross subsidisation.[42] Although, the rate of household solar PV installations in Australia has slowed slightly in recent years, due primarily to the removal of government subsidies, as Figure 3 indicates, there has been a significant increase in solar penetration since 2008.

Figure 3: Rising Penetration of Solar PV in Australia[43]

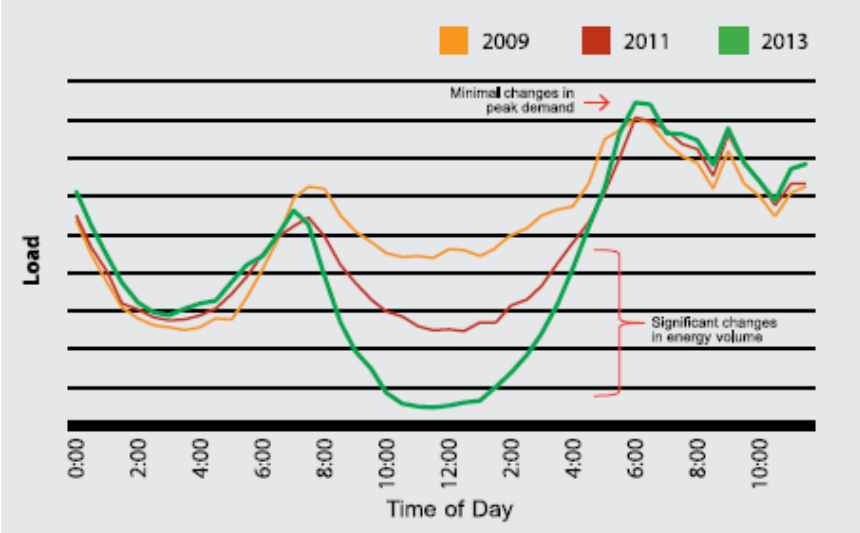


Source: Data from the Clean Energy Regulator, small scale installations summary data
http://ret.cleanenergyregulator.gov.au/REC-Registry/Data-reportsmall scale

[39] NERA Economic Consulting, Efficiency of Tariffs for Current and Emerging Technologies, pp. 16-17; Productivity Commission, Electricity Networks Regulatory Frameworks Vol 2, pp. 351-2;
[40] Power and Water Corporation, Committee Transcript, 11 October 2013, p. 22
[41] Ausgrid, *Ausgrid Demand Management CoolSaver Interim Report,* Ausgrid, Sydney, September 2015, p. 3
[42] Power and Water Corporation, Submission No. 10, p.8
[43] Submission No. 13, Energy Networks Association, *The Road to Fairer Prices,* p.2

2.17 While it is acknowledged that the reduction in electricity demand from solar PV owners has the capacity to lower required network investment, Figure 4 illustrates that where peak demand tends to occur late in the day "solar panels do not appear to materially reduce the peak demand; the key driver of network expenditure." [44]

Figure 4: Impacts of Solar PV on Energy Consumption and Peak Demand[45]



2.18 As NERA points out:

> The network benefits provided by PVs are a function of their output and system profile of demand. In networks where the system peak occurs at times when PV output is high, it can be expected that PVs may have a considerable effect on system demand. In contrast, if the system peak tends to occur at a time when PV output is low, there may be few network benefits from PV systems.[46]

2.19 For example, analysis of a South Australian consumer on the standard two-part flat rate tariff with a 2.5 kW north-facing roof-top solar PV system found that, as a consequence of their reduced energy consumption, they pay approximately $200 a year less in network costs than a similar consumer without solar panels. However, since north-facing solar panels only generate about 18% of their maximum capacity during the time of peak network demand, the actual benefit to the network is around $80 per annum in reduced costs. As is the case with air conditioners, the $120 difference is recovered by other consumers facing higher prices.[47]

2.20 NERA also notes that while west-facing panels produce 15% less energy than north-facing systems, they generate around 38% of their installed maximum capacity during South Australia's system peak when energy is more valuable. Consequently, the reduction in network costs is much higher effectively limiting

[44] Submission No. 13, Energy Networks Association, *The Road to Fairer Prices,* p.2
[45] Submission No. 13, Energy Networks Association, *The Road to Fairer Prices,* p.3
[46] NERA Economic Consulting, *Efficiency of Tariffs for Current and Emerging Technologies,* p.24
[47] NERA Economic Consulting, *Efficiency of Tariffs for Current and Emerging Technologies*, pp.16-17

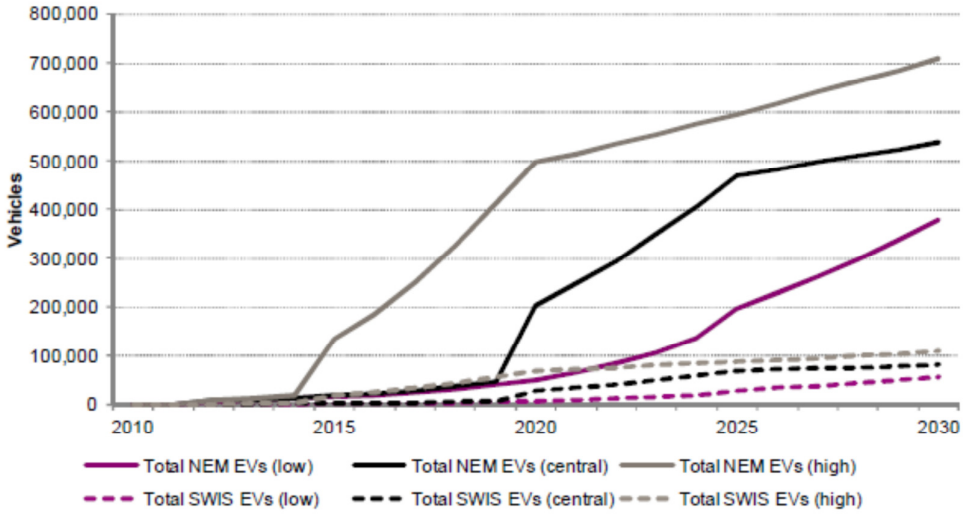
the extent of cross subsidisation by non PV owners. In summary, NERA points out that their analysis indicates that:

> Current network tariffs are providing a price signal to PV systems that exceeds the benefits of those systems to the network. Moreover, the price signal encourages customers to use PVs in a manner that is sub-optimal for the network, i.e., by orienting their PV to the north and not the west.[48]

Furthermore, the AEMC also points out that current network pricing structures provide no incentive for customers to install battery storage, "despite its ability to significantly reduce network costs."[49]

2.21 With regards to the potential impact of emerging technologies the Committee heard that the uptake of electric vehicles could impose significant network and generation costs on the electricity system and result in further cross subsidisation between customers.[50] As illustrated in Figure 5, it is estimated that there could be up to 500,000 electric vehicles in the National Energy Market (NEM) and the South West Interconnected System (SWIS) of Western Australia by 2020.

Figure 5: Estimated Annual Sales of Electric Vehicles in the NEM and SWIS[51]



2.22 AECOM's analysis of the uptake of EV's notes that the potential impact on the energy market is largely dependent upon the extent to which drivers can be incentivised to charge in off-peak periods.[52] EV trials to date indicate that, in the absence of outside influence such as cost reflective tariffs, smart metering or controlled charging, EV charging demand tends to align with existing periods of peak load; with most drivers choosing to charge their cars as soon as they get

[48] NERA Economic Consulting, *Efficiency of Tariffs for Current and Emerging Technologies,* p.27
[49] AEMC, *Why do we need to restructure distribution network prices?,* AEMC, Sydney NSW, 28 August 2014, p.2
[50] AEMC, *Power of Choice Review,* p.18; see also AECOM Australia Pty Ltd, *Impact of Electric Vehicles and Natural Gas Vehicles on the Energy Markets: Final Advice*
[51] AECOM, *Impact of Electric Vehicles and Natural Gas Vehicles on the Energy Markets,* p.30
[52] AECOM, *Impact of Electric Vehicles and Natural Gas Vehicles on the Energy Markets,* p.vi

home from work.[53] The potential impact of 'unmanaged charging' on the NEM and SWIS for the low, central and high uptake scenarios are shown in Table 1.

Table 1: Impact of EV's on the Energy Market with Unmanaged Charging[54]

EVs	2015		2020		2030	
	NEM	SWIS	NEM	SWIS	NEM	SWIS
Central take up scenario						
Energy consumption (MWh)	88,300	10,400	648,800	80,900	8,536,700	1,173,800
% of total MWh in NEM	0.0%	0.0%	0.2%	0.2%	2.2%	2.6%
Increase in peak load if unmanaged charging (MW)	35	5	385	50	1,005	155
% increase in additional peak load	0.7%	0.3%	3.8%	2.5%	4.3%	3.3%
Low take up scenario						
Energy consumption (MWh)	66,400	7,800	323,700	38,900	4,039,300	545,800
% of total MWh in NEM	0.0%	0.0%	0.1%	0.1%	1.1%	1.2%
Increase in peak load if unmanaged charging (MW)	30	5	95	15	710	110
% increase in additional peak load	0.7%	0.4%	1.2%	0.8%	4.1%	3.1%
High take up scenario						
Energy consumption (MWh)	273,100	32,600	3,035,400	389,000	14,261,400	1,948,700
% of total MWh in NEM	0.1%	0.1%	1.1%	1.0%	3.7%	4.3%
Increase in peak load if unmanaged charging (MW)	250	35	930	130	1,325	200
% increase in additional peak load	3.9%	2.1%	6.9%	5.1%	4.1%	3.3%

2.23 In the case of the central uptake scenario, AECOM suggests that if 50% of EV users charge their vehicles during peak periods the cost of increased capacity in the NEM alone "could be around $1.8 billion by 2020 and $4.6 billion by 2030."[55] Equating to approximately $10,000 per EV depending on location and use profile:

> Approximately $3,000-$3,500 of these costs between 2015 and 2020 would be paid for by the EV consumer. The remainder ($6,500-$7,000) would be borne by all consumers if charging is unmanaged. Over a five year period, this equates to just over an extra $1000 per EV per year of costs that would be recovered from all consumers.[56]

2.24 Then too, as noted in the mid-term report from the Victorian electric vehicle trial currently underway, flat rate tariffs provide no incentive for EV owners to invest in smart home charging solutions:

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[53] Department of Economic Development, Jobs, Transport and Resources, *Creating A Market: Victorian Electric Vehicle Trial Mid-Term Report,* State Government of Victoria, Melbourne VIC, 2013, p.66; see also AECOM, *Impact of Electric Vehicles and Natural Gas Vehicles on the Energy Markets,* pp. 48-52

[54] AECOM Australia Pty Ltd, Impact of Electric Vehicles and Natural Gas Vehicles on the Energy Markets, p.vii

[55] AECOM Australia Pty Ltd, Impact of Electric Vehicles and Natural Gas Vehicles on the Energy Markets, p.ix

[56] AEMC, *Power of Choice Review,* p.18

> The best case/least cost home charging solution for around $500 will provide no charge management capability or insight into energy use ... For an average household seeking basic charge management capability, a home charging solution will cost $2,000-$3,000 ... Most of this investment gets written-off for EV owners who move house.[57]

2.25 Apart from the impacts of disruptive technologies such as those discussed above, the Committee's discussions with the Power and Water Corporation highlight the fact that while a range of new technologies are coming on the market, such as washing machines and dishwashers that can be programmed to operate at off-peak times, or demand response enabling devices (DRED) such as air conditioners, heat pumps and pool pumps, without the right price signals there is no incentive for customers to spend a little extra for these types of appliances or to change their behaviour and use energy intensive appliances in a manner that benefits the network.[58]

2.26 The Committee notes that a recent review of the international status of residential tariffs indicates that a number of countries around the world are experiencing similar network challenges to Australia for similar reasons.[59] While policy responses differ depending on local market conditions and cultural considerations, the study found that there is a growing recognition of the important role small consumers play in creating efficient electricity markets; that "empowering consumers to participate in the market and respond to appropriate incentives provides benefits for both end-users and the economy as a whole."[60]

Dynamic Pricing Structures

2.27 As highlighted in the preceding discussion, "tariff design choices ... will have a profound impact on future network price increases, customer bills and potential cross subsidies."[61] Although a number of network businesses across Australia are currently trialling and beginning to introduce more cost reflective pricing structures, tariff design options under consideration tend to be fairly limited. While acknowledging that tariffs need to be designed to address local market distortions, AECOM and the Brattle Group suggest that Australia could benefit from a consideration of international experience and global tariff trends.[62]

2.28 As detailed in Appendix 3, in recent years, countries with electricity systems analogous to Australia have introduced a wide range of dynamic pricing structures that aim to improve cost reflectivity and minimise cross subsidies. In

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[57] Department of Economic Development, Jobs, Transport and Resources, *Creating A Market: Victorian Electric Vehicle Trial*, p. 70

[58] Power and Water Corporation, Committee Transcripts, 28 November 2014 and 20 February 2015

[59] Lampard, M., and Aspinall, M., *Managing Energy for Our Future: Power Pricing Internationally – Learnings for Australia,* AECOM Australia Pty Ltd., Melbourne VIC, June 2014, p.35

[60] Lampard, M., and Aspinall, M., *Managing Energy for Our Future,* p.37

[61] ENERGEIA, *Network Pricing and Enabling Metering Analysis,* Energy Networks Association, Kingston ACT, November 2014, p.7

[62] Lampard, M., and Aspinall, M., *Managing Energy for Our Future,* p.37; see also Brown, T., and Faruqui, A., *Structure of Electricity Distribution Network Tariffs: Recovery of Residual Costs,* the Brattle Group Inc., London UK, August 2014, pp.13-23

addition to the two part, flat rate volumetric tariff discussed previously, the various tariff designs employed can be broadly categorised as:

Tariffs that vary with customer's electricity usage such as:

- Inclining Block: tariff rates increase as consumption increases
- Declining Block: tariff rates decrease as consumption increases
- Capacity or Demand Tariff: tariff is based on demand at a particular time, rather than consumption; and

Tariffs that vary with the time at which customers consume electricity, including:

- Seasonal Pricing: tariff rates vary depending on the season reflecting the typical annual network load profile
- Time of Use Tariffs: tariff rates vary for different time periods within the day reflecting the typical daily network load profile
- Peak Time Rebates: customers are paid for load reductions relative to their baseline load during critical peak events
- Critical Peak Pricing: customers pay higher rates during critical peak price events and receive a discount on the standard tariff during other hours of the season or year. [63]
- Controlled loads: tariff rates are lower at off-peak times for separately metered and time controlled loads such as hot water heaters and pool pumps.

2.29 To better understand the merits and likely consumer acceptance of different tariff designs, in 2014 the Energy Supply Association of Australia (ESAA) engaged Deloitte Access Economics Pty Ltd (Deloitte) to examine and report on the effectiveness, simplicity, and equity of the aforementioned tariffs.[64] Each tariff design was evaluated against four factors that Deloitte considered reflected "generally positive or desirable attributes of tariffs in the Australian context",[65] namely,

1. **Cost reflectivity -** Electricity prices should reflect the cost, including the economic cost, of service provision. Cost reflectivity also promotes equity because it reduces or limits cross subsidies between customers.
2. **Simplicity -** A tariff's operation should be easy for customers to understand. It should be easy to convey the tariff's operation to a large group of customers. The tariff design should be simple to implement and administer.
3. **Stability -** In the absence of significant changes in use, customers should not experience unduly large, sudden increases in their electricity bill. Once customers are on a particular tariff design, their charges should be reasonably predictable.

[63] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* Deloitte Access Economics Pty Ltd, Sydney NSW, 22 January 2014
[64] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.3
[65] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.3

4. **Revenue variability -** Network electricity businesses should be able to recover their efficient costs and should not experience significant under or over-recovery from one period to the next.[66]

2.30 As illustrated in Table 2 below, each of the tariff designs evaluated has its own strengths and weaknesses. For example, although capacity tariffs are the strongest performers on cost reflectivity and revenue variability for network businesses, they are generally considered to be relatively complex and, depending on their design and implementation, may impact on customer bill stability.[67] Conversely, while Time of Use (TOU) tariffs do not perform as strongly on cost reflectivity and revenue variability, they tend to be more readily understood by customers and, "once bedded down…are likely to provide reasonably stable bill outcomes for customers, unless large changes in timing of consumption occur."[68]

Table 2: Evaluation of Tariff Designs[69]

Key: ● Strong performers ○ Poor performers

	Cost reflectivity	Simplicity	Stability	Revenue variability
Two Part Tariff (flat charge)	◔	●	◕	◑
Inclining Block Tariff	◔	◕	◑	◔
Declining Block Tariff	◔	◕	◕	◑
Seasonal Pricing	◔	◕	◕	◑
Time of Use	◑	◑	◑	◑
Capacity Tariff	◕	◔	◑	◕
Peak Time Rebate	◑	○	◕	○
Critical Peak Pricing	◕	◔	◑	○
Controlled Load Tariff*	◑	◕	●	●

Note: * Controlled Load Tariffs shift certain electrical loads to off peak times and charge off peak rates. It is not a stand-alone tariff as it is generally only available for specific, permanently installed appliances such as water and space heating, and must be combined with another tariff design.

2.31 As summarised in Table 3 below, in the context of current and expected disruptions to the electricity sector, tariff designs with a demand-based

[66] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.3
[67] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* pp.3-4
[68] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* pp.22-3
[69] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.29

component perform best. However, up until very recently, capacity or demand charges have not been considered for residential customers in Australia.[70] Given that simplicity and bill stability are key indicators of customer acceptance, "a transition to Time of Use pricing … is a smaller deviation from traditional tariff designs than transitioning to Capacity Tariffs."[71]

Table 3: Summary of scenario-based tariff analysis[72]

Scenario	Impact on system	Tariff analysis
Increasing solar PV uptake	Reduced energy taken from the grid. Limited impact on peak demand and consequent deterioration of load factor.	Best performing tariffs: • Tariffs with a demand-based component: Capacity Tariffs. Poorly performing tariffs: • Tariffs that do not reflect peak costs: Two Part Tariffs (flat charge), Inclining Block, Declining Block • Peak Time Rebates also perform poorly due to challenges in setting baseline usage for rebates under the increasing solar PV uptake scenario.
Penetration of time- controllable distributed generation and storage	Reduced use of system supplied electricity. Increased ability for sophisticated response to price signals.	Best performing tariffs: • Tariffs with the ability to provide sophisticated pricing signals and take advantage of customer response capability: Capacity Tariffs, Critical Peak Pricing and well-designed Time of Use Tariffs Poorly performing tariffs: • Tariffs that do not reflect peak costs: Two Part Tariffs (flat charge), Inclining Block, Declining Block.
Electric vehicle uptake	Increased electricity usage. Uncertain peak impacts – unconstrained charging could lead to deterioration of load factors, while co-ordinated use could improve system stability and security.	Best performing tariffs: • Tariffs that reflect different costs across the day and encourage electric vehicle owners to shift charging to off-peak times: Capacity Tariffs, Time of Use Tariffs • Controlled load tariffs, due to their ability to set a defined charging period (subject to practicalities of varying patterns of vehicle usage). Poorly performing tariffs: • Volume based tariffs: Two Part Tariffs (flat charge), Inclining Blocks, Declining Blocks and Seasonal Pricing.

2.32 Nevertheless, as highlighted in Appendix 3, various capacity based pricing mechanisms have been successfully incorporated into residential tariff offerings in many other countries. Noting the importance of ensuring tariffs are designed with both simplicity and cost reflectivity in mind, AECOM's review of power pricing internationally found that while:

> tariff simplicity is considered essential in developing a knowledgeable consumer group … simplicity is a function of many parameters, including: the tariff structure, the number of tariff products presented to consumers and the way information is communicated. AECOM commonly found that countries with many tariff options were considered more complex than those who had sophisticated pricing mechanisms with few options.[73]

[70] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.25
[71] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.5
[72] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.41
[73] Lampard, M., and Aspinall, M., *Managing Energy for Our Future,* p.37

2.33 Recognising the benefits of combining tariff designs to enhance a tariff's incentive properties or mitigate risks that customers may face with a standalone tariff design, in 2014 the electricity industry association of Europe (Eurelectric) released a manifesto to advise policy makers how to develop a more balanced, efficient and competitive energy market. Reflecting the findings of the AEMC's *Power of Choice Review*, the manifesto highlights the importance of facilitating demand side participation in the electricity market and recommended that network tariffs should progressively be more capacity-based and peak time differentiated.[74]

2.34 With potential productivity gains in the order of $1.6 billion per annum in the NEM alone, AGL points out that:

> From an economic perspective, the case for default tariff reform is as clear as it is unremarkable. But like most microeconomic reforms, winners and losers arise when benchmarked against (an inequitable) status quo.[75]

Research to date indicates that 60% of Australian households would benefit from more cost reflective electricity tariffs. At the same time it is acknowledged that not all consumers will want, or be able to shift their usage to off peak periods and could potentially be worse off.[76]

2.35 Based on the household load profiles and demographic characteristics of residential electricity customers in Victoria, AGL's study into the inequity of flat-rate tariffs provides an insight into the likely impact of cost reflective pricing on residential customers. The primary objective of the study was to:

> analyse the extent of wealth transfers within and between household cohorts [and] compare the annual electricity bills facing 160,000 households using the two products in Table 1, (1) Flat-Rate tariff, and (2) time-of-Use plus Critical Peak Price (TOU+CPP) - both of which are set within two-part tariff structures.[77]

Table 1: Tariff Structure

Tariff Structure	Unit	Flat Rate	TOU+CPP	Period
Fixed Charge	c/day	100	100	
Single Rate	c/kWh	25.9		All periods
Peak Rate	c/kWh		33.2	3pm-9pm Workdays
Shoulder Rate	c/kWh		25.6	7am-3pm, 9pm-10pm*
Off Peak Rate	c/kWh		15.6	10pm-7am All Days
Critical Peak Price	c/kWh		85.0	12 Days, 3pm-9pm
*Shoulder Period on Weekends: 7am-10pm				

2.36 Accounting for demand response and network rebalancing, Figure 6 illustrates that while 64% of households are likely to be better off under the TOU+CPP tariff, the impact of cost reflective pricing varies quite considerably both within and between household cohorts.

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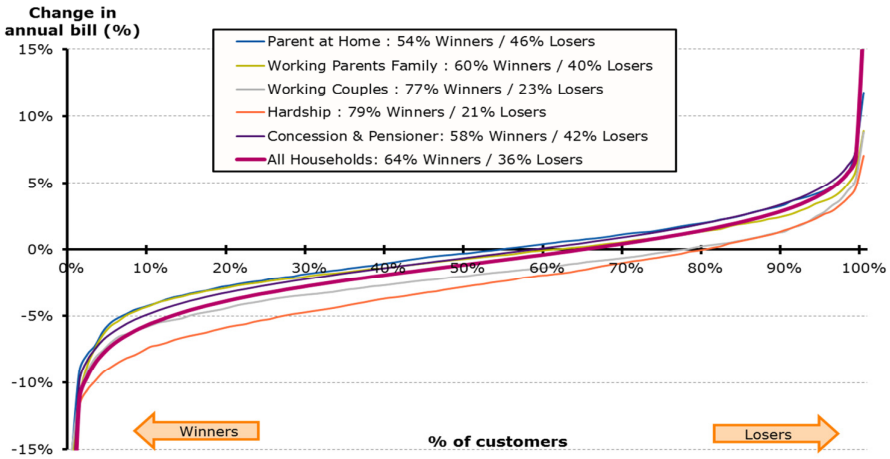
[74] Eurelectric, *Manifesto For a Balanced, More Efficient European Policy: Power for a Competitive Europe,* Eurelectric, Brussels Belgium, February 2014, pp.2-3; see also, Eurelectric, *Network Tariff Structure for a Smart Energy System,* Eurelectric, Brussels Belgium, May 2013

[75] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* p.19

[76] Department of Industry and Science, *2015 Energy White Paper,* pp. 15-16; see also

[77] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* p.14

Figure 6: Winners and Losers *after* Demand Response and Network Rebalancing[78]



2.37 As AGL point out, the 36% of households that are immediately worse off are the households that are cross subsidised under a flat rate tariff; "that is, they have higher peak loads than average and cause greater power system operating costs."[79] Further, the data indicates that under a flat rate tariff it is the 'Parent at Home' cohort that receives the highest level of cross subsidy, financed primarily by the 'Hardship'[80] and 'Working Couples' cohorts. Importantly for policymakers, while hardship in relation to energy supply tends to be seen as an issue primarily affecting pensioners, the medically ill, and the unemployed, AGL's results suggest that households in the 'Family Formation' cohort (Parent at home and Working Parents Family) are also at risk of experiencing energy related financial hardship.[81]

2.38 To facilitate the introduction of cost reflective network tariffs, Mr Chris Pattas (General Manager Networks: Australian Energy Regulator) advised the Committee that the AEMC has set a new pricing objective for distribution businesses whereby prices are to reflect the efficient costs of providing network services to each consumer.[82] The AEMC points out that "this will allow consumers to compare the value they place on using the network with the costs caused by their use of it."[83]

2.39 To achieve this objective, distribution business will be required to comply with four new pricing principles:

- Each network tariff must be based on the long run marginal cost of providing the service. If consumers choose to take actions that will

[78] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* p.18
[79] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* p.16
[80] 'Households in Hardship' are defined as those households who have the willingness, but not the financial capacity, to pay their electricity account and have, in turn, been placed on AGL Energy's 'Staying Connected' program - Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* footnote 20, p. 10
[81] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* pp. 20-1
[82] Australian Energy Regulator, Committee Transcript, 28 November 2015, pp.2-3
[83] Australian Energy Market Commission, *New rules for distribution network pricing,* Australian Energy Market Commission, Sydney NSW, 27 November 2015, p.1

reduce future network costs, such as by reducing peak demand, then they will be rewarded with lower network charges.

- The revenue to be recovered from each network tariff must recover the network business's total efficient costs of providing services in a way that minimises distortions to price signals that encourage efficient use of the network by consumers.
- Tariffs are to be developed in line with a new consumer impact principle that requires network business to consider the impact on consumers of changes in network prices and develop price structures that are able to be understood by consumers.
- Network tariffs must comply with any jurisdictional pricing obligations imposed by state or territory government. But if network businesses need to depart from the above principles to meet jurisdictional pricing obligations, they must do so transparently and only to the minimum extent necessary.[84]

2.40 Mr Pattas noted that the rule change strengthens and expands the role of the AER and introduces a new network pricing process. The process begins with the AER making a determination on the total revenue a network business can recover from its customers. Network business will then be required to:

> develop a Tariff Structure Statement (TSS) outlining the tariff classes, tariff structures and the methodologies associated with the new pricing principles and submitting these to the AER for approval. Before submitting the proposed TSS to the AER, distribution business will need to engage in discussions with stakeholders, particularly retailers and consumers, about the network tariff structures and indicative price levels that it is considering proposing.
>
> The AER will assess the TSS against the pricing principles in conjunction with the businesses' five year regulatory proposal. We would approve the TSS where it meets the pricing principles and other rule requirements. Secondly, the distribution businesses would develop and submit their annual pricing proposals to the AER. This annual tariff adjustment would apply pricing levels to the tariff structures outlined in the AER approved TSS.[85]

2.41 While cautioning against making generalisations about which types of consumers may or may not benefit from network tariff reform, the AEMC also recommends that, as part of the network pricing process, "governments review the structure of their energy concessions schemes so that they deliver on their purpose in an efficient and targeted way."[86] As highlighted in AGL's study on the inequity of flat-rate tariffs cited previously, research related to identification of the demographic incidence of hardship indicates that the design of concession schemes and energy efficiency initiatives has not necessarily kept pace with the changing nature of the electricity market and customer consumption patterns. Based on energy market and demographic data, AGL's 2012 review of the credit characteristics of its customer base, representing approximately one quarter of all households in the NEM, found that:

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[84] Australian Energy Market Commission, *New rules for distribution network pricing,* p.2
[85] Australian Energy Regulator, Submission No. 6, p. 2; see also Australian Energy Regulator, Committee Transcript, pp. 3-4
[86] Australian Energy Market Commission, *Restructured distribution network prices and consumers,* Australian Energy Market Commission, Sydney NSW, 28 November 2014,, p. 2

> dominant thought on the primacy of customer hardship, aged pensioners, pales into insignificance by comparison to those in the family formation cohort, and in particular, those known as Australia's 'working poor'.[87]

Retail Tariffs

2.42 The new requirement for network businesses to engage with retailers and consumers during the network pricing process is particularly important. As Mr John Baskerville (CEO, Power and Water Corporation) noted, ensuring the end-use customer faces network cost signals, understands them and is able to respond to them by adjusting their demand is a considerable problem for network providers:

> The network service provider is in a unique and unenviable position, in that it is restricted in its ability to engage with its end-user customer to develop a relationship that can drive beneficial outcomes for both parties[88]

2.43 Moreover, since consumer behaviour is influenced primarily by retail prices rather than network prices, the effectiveness of network tariff reform inevitably depends on the extent to which network costs are reflected in retail tariff offerings. As the Productivity Commission points out:

> while retailers will often incorporate time-varying network charges into their retail tariffs, their effects are diluted because other costs are also important in determining final retail charges ... Consequently, a TOU *network* charge that varies significantly over peak and off-peak periods is usually translated into much smaller price relativities at the *retail* level … This dilution of network charging variations is important in modelling demand responses.[89]

2.44 With reference to the latter point, the Committee notes that trials of cost reflective tariffs consistently show that highly dynamic retail tariff structures are required if significant reductions in peak demand are to be achieved and customers are to realise tangible savings:

> For an annual consumption level of 8 MWh, significant reductions in peak consumption (of around 18% of original usage) are required to achieve savings in the order of $200 on an annual bill.[90]

2.45 While the cumulative effect of consumers opting to take up more cost reflective tariff structures has the potential to defer network augmentation and place downward pressure on prices over the longer term, encouraging customers to switch from the default flat rate tariff is, in part, dependent upon retailers' capacity to overcome the "historical, low level of consumer interest and awareness"[91] in the electricity market. This is particularly pertinent for those consumers where the potential gains from switching, or potential losses from remaining on the default tariff, are likely to be quite negligible:

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[87] Simhauser, P., and Nelson, T., *The Energy Market Death Spiral – Rethinking Customer Hardship*, *Working Paper No. 31,* AGL Energy Ltd, Brisbane QLD, June 2012, p.1

[88] Power and Water Corporation, Committee Transcript, 20 February 2015, p. 2

[89] Productivity Commission, *Electricity Networks Regulatory Frameworks: the costs and benefits of demand management for households*. pp.7-8

[90] Frontier Economics Pty. Ltd., *Retail Tariff Model,* Frontier Economics Pty Ltd., Melbourne VIC, August 2012, p. 43

[91] Department of Industry, *Energy White Paper – Green Paper*, p.26

> Experience from US pilots indicates that where flat tariffs are the default product, less than 20% of customers will 'opt-in'. If more cost-reflective time–differentiated tariffs represent the product default, less than 20% of customers will 'opt-out'.[92]

2.46 Nevertheless, given the potential for the financial position of some consumers to deteriorate quite markedly as a consequence of the "unwinding of inter- and intra- segment cross subsidies",[93] the AEMC is of the view that implementation of cost-reflective retail pricing structures incorporating time-varying network tariffs should be undertaken on an opt-in, "voluntary basis where consumers have the choice to move to a new tariff."[94]

Enabling Technology

2.47 Although most Australian households and small businesses now have access to more cost reflective retail tariff choices, a major reason for slow uptake rates is the basic nature of most residential meters. The oldest and most common type of residential meter, the accumulation meter is no more capable of supporting the implementation of dynamic pricing structures than its predecessor was in the 1890's. As summarised in Table 4, more advanced metering technology is a pre-requisite for sophisticated time-varying and capacity based tariff structures.[95]

Types of Electricity Meters[96]

Accumulation meters	Interval meters	Smart meters
» Currently in place in approximately 70% of Australia homes and businesses. » Only record the total electricity consumption since the last meter reading (typically three months). » Do not permit tariffs which reward customers for using less energy at peak times (ie. time varying tariffs). » Data is read manually from the meter at a consumer's premises. » May be used by Networks in conjunction with simple load control devices , such as ripple control, to provide benefits to all users	» Relatively low level of use, except for large commercial and industrial customers. » Can record both total electricity consumption and when it occurs (eg. half hourly intervals). » Permit tariffs which reward customers for using less energy at peak times (ie. time varying tariffs). » Data may be retrieved manually at the premises or may be read remotely via communication technology (that is, without having to visit the consumer premises). » May be used by Networks in conjunction with simple load control devices , such as ripple control, to provide benefits to all users.	» In use in Victoria and some NSW locations. » Have all the capabilities of Interval Meters and communication technology enabling data to be retrieved remotely. » Enables additional functions such as remote energisation and de-energisation and appliance control » Improve network performance, including reliability and quality of supply, and permit fault identification and network load management. » Can link to household devices such as through a Home Area Network (HAN) and In Home Display (IHD) to enable instant access for the consumer to their electricity use profile.

2.48 The primary difference between interval and smart meters is that the latter incorporate a range of additional capabilities that are of benefit to consumers, retailers and network providers. As COAG points out, apart from providing the

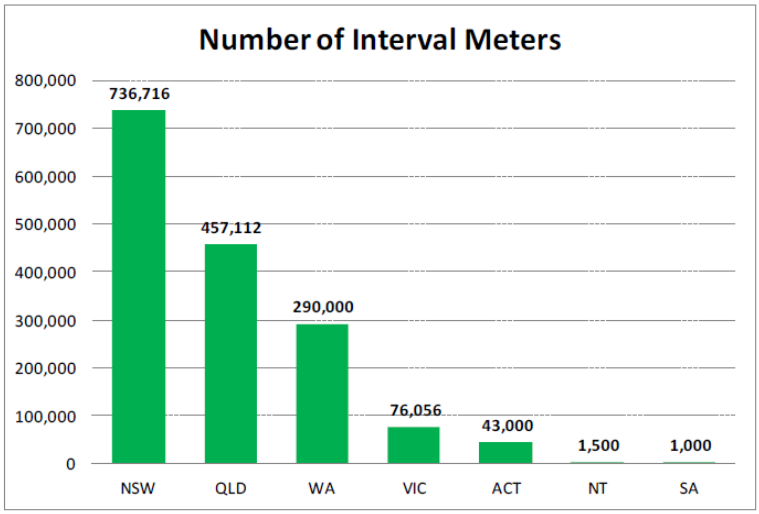
[92] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* p.20
[93] Paul Simshauser and David Downer, *On the inequity of flat-rate electricity tariffs,* p.20
[94] Standing Council on Energy and Resources, *Electricity: Putting Consumers First,* Standing Council on Energy and Resources, Canberra ACT, December 2012, p. 7
[95] Deloitte Access Economics Pty Ltd, *Residential Electricity Tariff Review,* p.43
[96] Energy Networks Association, *Smart Choices in Metering: A contestable metering framework that benefits all customers,* Energy Networks Association, Kingston ACT, April 2014, p.1

necessary information to allow financial settlement of the electricity market and billing of customers, advanced metering can also provide:

> a platform for consumers and other parties to make more informed decisions about how they participate in the electricity market, for example through:
>
> - access to improved information about the timing and quantity of electricity consumption to support decisions about managing consumption and costs;
> - innovative product and service offerings, including an increased range of tariff options and services such as direct load control;
> - new business practices that reduce costs, such as remote reading and remote connection and disconnection; and
> - grid management technologies such as outage and supply quality detection.[97]

2.49 In response to the *Power of Choice Review,* the COAG Energy Council agreed that all jurisdictions would review their policies on new and replacement meters.[98] A subsequent evaluation of the status of advanced metering deployments throughout Australia found that there was considerable variation across jurisdictions. While interval meters have been standard for large business customers since the 1990s, it has only been in recent years that they have been provided to residential or small business customers with a number of jurisdictions rolling out interval meters as part of new and replacement meter polices.[99]

Figure 7: Number of Interval Meters per State as of 2013[100]



[97] Australian Energy Market Commission, *Draft Rule Determination: National Electricity Amendment (Expanding competition in metering and related services) Rule 2015, National Energy Retail Amendment (Expanding competition in metering and related services),* Australian Energy Market Commission, Sydney, 26 March 2015, p. 1

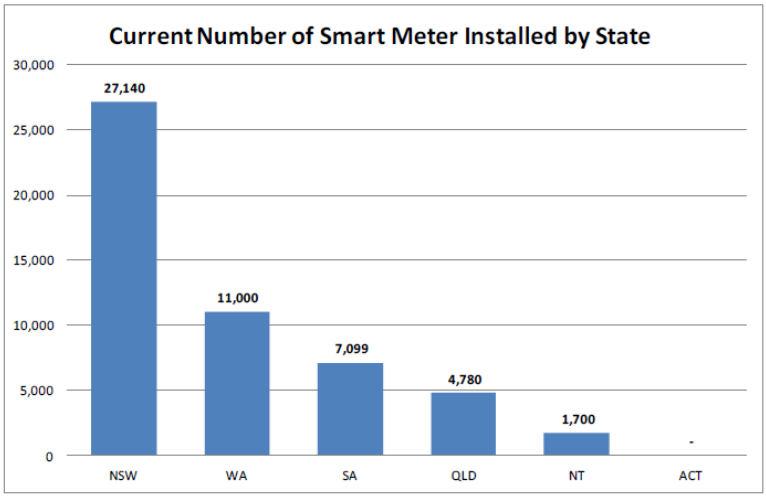
[98] Standing Council on Energy and Resources, *SCER Response to the Power of Choice Review,* Standing Council on Energy and Resources, Canberra ACT, December 2012, p.5

[99] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report,* Australian Government, Canberra ACT, 4 February 2013, pp. 3-7

[100] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p. 17

2.50 With the exception of Victoria, which undertook a mandated rollout of smart meters for all small and medium sized customers between 2009 and 2013, smart meter deployments have generally been associated with small scale technology and pricing trials.[101] Figure 8 shows the number of installed smart meters by state excluding Victoria as of 2013. The high number of smart meter deployments in NSW reflects the level of distributor involvement in a range of pilots from smart grid programs, Solar City projects, and individual opt in deployments for the Ausgrid AMI pilot.[102] The Committee notes that smart meter deployments in the Northern Territory relate specifically to the Alice Springs Solar Cities Project and the requirement that customers installing rooftop PV upgrade their meter to a smart meter.[103]

Figure 8: Number of Smart Meters per State as of 2013 excluding Victoria[104]



2.51 Despite the benefits associated with advanced metering, the *Power of Choice Review* identified a number of barriers that are inhibiting investment in metering technology which were reiterated in the aforementioned *National Smart Meter Infrastructure Report*. On the one hand, it is noted that the potential for industry led rollouts may be limited by split incentives between the various industry players, consumers and society:

> The introduction of AMI [Advanced Metering Technology] and wider smart grid functionality could have benefits to both retailers and distributors. If the rollout is only driven by one of the parties it may not capture the full benefits available to other parties. There are also considerable consumer benefits from reduced consumption that may require investments by a third party in customer education.[105]

2.52 Consequently, cost benefit analyses associated with industry led rollouts are generally inconclusive as "the customer, retailer and distributor benefits are

[101] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, pp.29-35
[102] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p. 54
[103] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p. 30
[104] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p. 37
[105] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p.111

difficult to robustly quantify and allocate."[106] However, it is acknowledged that as the prices associated with AMI technology come down distributors and retailers are more likely to be "able to make an internal business case or establish appropriate contracts to aggregate benefits across the supply chain."[107]

2.53 On the other hand, current market rules and regulations effectively inhibit market-led deployments of advanced metering technology. In particular, the fact that metering services for residential and small business customers are currently classified as '*standard control' or 'regulated network access services'.* As such, they have been provided exclusively by local network service providers (LNSPs) with charges subject to the regulatory determination process and generally bundled into distribution use of system charges that all network users pay.[108] As the COAG Energy Council points out:

> the exclusivity arrangements which limit who can take responsibility for the provision of metering services ... impede competition and potentially encourage the continued use of accumulation meters. Additionally, ... certain exit fees and the structure of metering charges create a disincentive for retailers to invest in advanced meters.[109]

2.54 To facilitate a market-led and consumer driven approach to the deployment of advanced meters, in October 2013 COAG submitted a rule change request to the AEMC which sought to "open up the provision of metering services to more competition to promote efficient investment and increased consumer choice in products and services."[110] In March of this year the AEMC published its draft determination on the *Competition in Metering and Related Services* rule change request and provided the following overview of the draft rule:

- The draft rule changes who has overall responsibility for metering services under the NER [National Electricity Rules] to promote competition in the provision of metering and related services by:
  - providing for the role and responsibilities of the existing "Responsible Person" to be provided by a new type of registered participant - a Metering Coordinator;
  - allowing any person to become a Metering Coordinator, subject to meeting the registration requirements;
  - permitting a large customer to appoint its own Metering Coordinator; and
  - requiring a retailer to appoint the Metering Coordinator, except where a large customers has appointed its own Metering Coordinator.
- It requires a Metering Coordinator to take on roles additional to those currently performed by the Responsible Person so that the security of,

[106] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p.63
[107] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p.111
[108] Australian Energy Market Commission, *Draft Rule Determination: National Electricity Amendment (Expanding competition in metering and related services) Rule 2015,* pp. *3-5*
[109] Australian Energy Market Commission, Draft new arrangements for the provision of metering services, Australian Energy Market Commission, Sydney, 26 March 2015, p. 1
[110] Australian Energy Market Commission, Draft new arrangements for the provision of metering services, p. 1

and access to, advanced meters and the services they provide are appropriately managed.

- It specifies the minimum services that a new or replacement meter installed at a small customer's premises must be capable of providing.
- It sets out the circumstances in which small customers may opt out of having a new meter installed at their premises.
- It clarifies the entitlement of parties to access energy data and metering data to reflect the changes to the roles and responsibilities of parties providing metering services.
- It provides for LNSPs to use network devices installed at customers' premises that assist them to monitor and operate their networks.
- It permits a retailer to arrange for a Metering Coordinator to remotely disconnect or reconnect a small customer's premises in specified circumstances.
- It makes changes to the model terms and conditions of standard retail contracts to reflect the changes to the roles and responsibilities of parties providing metering services.[111]

The Committee understands that the final determination is due to be published on 26 November 2015 with an anticipated implementation date of 1 December 2017.[112]

2.55 As noted above, advanced metering also facilitates the introduction of a range of other products and services to customers. For example, home energy management devices such as in-home display units, web interfaces, phone apps that can provide detailed energy consumption information to allow customers to better manage their electricity consumption. Similarly, advanced metering facilitates uptake of demand response enabling devices that can be managed remotely by customers or service providers. As the Energy Networks Association points out:

> it is widely acknowledged that smart meters are an important element ... but it is the combination of the smart meter with the other enabling technologies and the educated engagement of all parties including consumers that will enable the full benefits of a smart network to be realised.[113]

2.56 However, as the Power and Water Corporation noted, apart from the costs associated with the deployment of advanced meters, network providers also need to have appropriate communications systems and processes in place to capture and utilise the data from advanced meters.[114]

[111] Australian Energy Market Commission, Draft new arrangements for the provision of metering services, pp.1-2
[112] Australian Energy Market Commission, *Extension of time for final rule on provision of metering services,* Australian Energy Market Commission, Sydney, 2 July 2015, p. 1
[113] Energy Networks Association, *Pilots and Trials Report on Smart Metering and Related Matters,* Energy Networks Association, Kingston ACT, 3 June 2012
[114] Power and Water Corporation, Committee Transcript, 20 February 2015, p. 15

Feed-In Tariffs – Micro Generation

2.57 Feed-in tariffs (FiTs) were first introduced in Australia between 2008 and 2010. Apart from acknowledging that micro generators "should have the right to export electricity to the grid in return for payment"[115], the primary aim of the FiT was to:

> encourage the adoption of renewable energy. ... Early adopters of new technologies tend to pay high prices for systems which are often not as efficient as later designs. By using a FiT to stimulate demand, governments assist early adopters financially but also, through increased demand, drive the industry to develop new and more efficient systems.[116]

Fixed rate power purchase agreements (PPAs) were generally offered for a 15 to 20 year term, the expected payback period for installation, thereby providing consumers with a degree of investment certainty.[117]

2.58 As a consequence, most jurisdictions established FiTs that were set considerably higher than the wholesale price of electricity. As Frontier Economics point out:

> The most egregious case was the NSW gross FiT, which continues to apply to PV units of up to 10KW and purchased before 28 October 2010. It offers a payment or rebate of 60c/kWh for all energy produced by such units up to the end of 2016. This rate compares to a typical retail electricity tariff of approximately 28c/kWh.[118]

Needless to say, take up rates far exceeded expectations and premium FiTs quickly became unsustainable; particularly given that, in the absence of public funding, consumers without solar were effectively subsidising these schemes.[119] In the five years to 2013, the cost of a fully installed domestic rooftop PV system also fell substantially from approximately $12,000/kW in 2008 to $2,600/kW in 2013.[120]

2.59 In December 2012, COAG endorsed a revised set of *National Principles for Feed-in Tariff Arrangements* whereby all state and territory governments agreed to close premium schemes to new participants by 2014.[121] As summarised in Appendix 5, with the exception of the Northern Territory, all jurisdictions have since set FiTs for new or upgraded solar PV systems that more accurately reflect the “value of the avoided cost of wholesale electricity and value to the retailer of avoided costs at peak periods.”[122]

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[115] Council of Australian Governments, *National Principles for Feed-in Tariff Schemes,* Council of Australian Governments, Canberra, 29 November 2008, p.1
[116] K., Loynes, *Overview of Feed in Tariffs: a quick guide,* Parliamentary Library Research Paper Series, 2013-14, Department of Parliamentary Services, Canberra, 1 April 2014, p.1
[117] K., Loynes, *Overview of Feed in Tariffs: a quick guide,* pp.1-2
[118] Frontier Economics, *Time for Solar to pay its way,* Frontier Economics Pty Ltd, Sydney, March 2014
[119] D., Warburton AO LVO et. al., *Renewable Energy Target Scheme: Report of the Expert Panel,* Commonwealth of Australia, Canberra, August 2014, p.95
[120] Frontier Economics, *Time for Solar to pay its way,* p.3
[121] Council of Australian Governments, *National Principles for Feed-in Tariff Arrangements,* Council of Australian Governments, Canberra, 7 December 2012, p.1
[122] D., Warburton AO LVO et. al., *Renewable Energy Target Scheme,* p.96

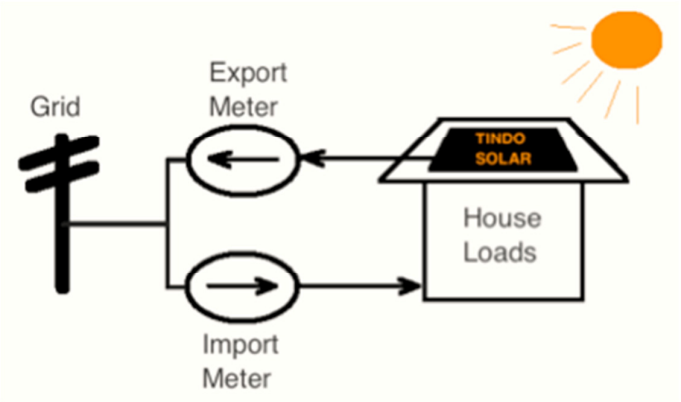
2.60 Nevertheless, the Committee notes that "there are still significant numbers of households receiving legacy tariffs, the costs of which are passed through to all electricity users as higher tariffs."[123] For example, while Victoria's premium feed-in tariff (PFIT) closed to new applicants at the end of 2011, eligible properties with an effective PFIT contract will continue to receive 60 cents per kilowatt (c/kWh) hour for excess electricity fed back into the grid through to 2024.[124] Similarly, customers who applied for the *Queensland Solar Bonus Scheme* before 10 July 2012 or the SA *Solar feed-in scheme* prior to 30 September 2013 are guaranteed 44 c/kWh for electricity exported to the grid through to 2028.[125] Furthermore, it has been noted that for recipients of these legacy schemes there is little incentive to invest in battery storage despite the benefits to the overall operation of the electricity market.[126]

2.61 Apart from significantly reducing FiT rates, long term fixed rate contracts are no longer offered. Rather, PPA's now tend to be open ended contracts with FiT rates generally subject to a similar tariff setting process as that applying to retail tariffs and reviewed on an annual basis.[127] Given that the perceived need to incentivise investment in residential micro generation is no longer the primary motivator for offering FiTs, most jurisdictions in Australia have also replaced gross metered FiTs with net based schemes.[128]

2.62 Figure 7 below, illustrates a gross metering arrangement whereby imported and exported electricity is measured independently. All electricity produced by a micro generator is exported direct to the grid with the customer earning a FiT rate for every kWh exported. All electricity consumed by the customer is imported from the grid with the user paying the normal retail tariff for every kWh consumed.[129] At the end of the billing period, customer invoices detail the total amount of energy produced, the total amount consumed with the difference expressed as either a credit or amount due.[130]

[123] D., Warburton AO LVO et. al., *Renewable Energy Target Scheme,* p.95
[124] Energy and Earth Resources, Victoria State Government, *Premium Feed-in Tariff,* viewed 3 November 2015, < http://www.energyandresources.vic.gov.au/energy/environment-and-community/victorian-feed-in-tariff/closed-schemes/premium-feed-in-tariff>
[125] Department of Energy and Water Supply, Queensland Government, *Solar Bonus Scheme,* viewed 6 June 2014, https://www.dews.qld.gov.au/energy-water-home/electricity/solar-bonus-scheme; Government of South Australia, *Solar feed-in scheme,* viewed 2 September 2015, <http://www.sa.gov.au/topics/water-energy-and-environment/energy/energy-supply-and-sources/renewable-energy-sources/solar-energy/solar-photovoltaic-systems/solar-feed-in-scheme>
[126] Roof Juice, *The end of solar FiTs?,* viewed 30 October 2015, http://roofjuice.com.au/the-end-of-solar-fits/
[127] Victorian Competition and Efficiency Commission, *Power from the People: Inquiry into distributed generation, summary report,* Victorian Competition & Efficiency Commission, Melbourne VIC, July 2012, pp. 1-5
[128] International Energy Agency Photovoltaic Power Systems Programme, *2014 Snapshot of Global PV Markets,* International Energy Agency, Switzerland, 2014,, pp. 9-10
[129] K., Loynes, *Overview of Feed in Tariffs*, p.2
[130] Moreland Energy Foundation Ltd, *Submission to the Victorian Competition & Efficiency Commission Inquiry into Feed-in tariff Arrangements and Barriers to Distributed Generation,* Moreland Energy Foundation Ltd., Brunswick Victoria, 23 March 2012, Appendix 1

Figure 9: Gross Metering Arrangement[131]

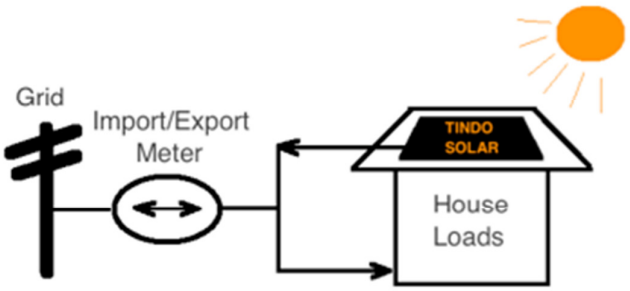


2.63 In a net metering or import/export arrangement as depicted in Figure 8, the FiT only applies to the electricity that is exported in excess of what is consumed by the customer at any given time during the day.[132] Unlike gross metering, under an import/export arrangement the electricity meter does not record the total amount of electricity generated by the micro generator or the total amount of electricity that is consumed. Rather, the meter only records the imported electricity that is required when there is insufficient power from micro generation to cater to consumption demands:

> Under net metering, the 'your average daily energy use' figure presented on an electricity bill … is actually your average daily energy import. Households' or businesses' total consumption is this figure plus the amount of electricity generated by the PV system that has been consume on site (IE: Use = import + generation – export).[133]

Furthermore, it has been argued that the inability for net metered customers to track their actual in-home consumption over time "may actually serve to undermine the core purpose of FiT schemes; that is to stimulate energy conservation."[134]

Figure 10: Net Metering Arrangement[135]



[131] Tindo, *Metering,* viewed 2 November 2015 < http://www.tindosolar.com.au/metering/>
[132] K., Loynes, *Overview of Feed in Tariffs*, p.2
[133] Moreland Energy Foundation Ltd, *Submission to the Victorian Competition & Efficiency Commission Inquiry into Feed-in tariff Arrangements*, p.10
[134] Shaping Tomorrows World, *Feed in Tariffs – the Devil Lies in the Details,* viewed 20 March 2015, < http://www.shapingtomorrowsworld.org/greggfeedins.html>
[135] Tindo, *Metering,* viewed 2 November 2015 < http://www.tindosolar.com.au/metering/>

2.64 The advantages and disadvantages of gross vs net models are largely dependent upon policy settings, customer consumption characteristics, and the FiT rate relative to the applicable retail tariff. For example, where the FiT is set at the retail rate for electricity it makes no difference whether a gross or a net model is used. However, under a gross metering arrangement if the FiT is set higher than the retail tariff, as was the case with the early premium solar schemes, then:

> the credit to the customer for the electricity generated could be equivalent to, or possibly even higher than, the cost of the electricity consumed by the household, even if the household consumes more electricity than it generates.[136]

2.65 Conversely, where the FiT is set below the retail tariff gross metered FiTs favour electricity retailers since customers do not receive the effective retail rate for the energy they produce and subsequently consume on-site.[137] Consequently, it has been argued that where gross metered schemes are the only option and the FiT is lower than the retail tariff they may be inconsistent with clause 3c of the *National Principles for Feed-in Tariff Arrangements* which requires that:

> 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.[138]

2.66 Similarly, it has been further argued that a requirement for gross metering may also be inconsistent with the NEM'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 [Transmission Network Service Provider] entry fees at the connection point to the transmission network.[139]

2.67 Unlike gross based FiTs, net metered schemes differentiate on the basis of patterns of energy consumption. For example, where the value of exported energy exceeds that of imported energy net metering is of most benefit to customers that are able to limit their power consumption during the period of the day when their solar system is producing the most power; such as working couples. However, where the FiT is less than the retail tariff net metering is more beneficial to those customers that are able to utilise the power produced by their solar system and limit the amount they need to draw from the grid; such

[136] Tasmanian Government, *Tasmanian Energy Reform: Feed-in Tariffs: Transition to Full Retail Competition - Final Position Paper,* Tasmanian Government, Hobart, August 2013, p. 14
[137] Tasmanian Government, *Tasmanian Energy Reform: Feed-in Tariffs,* p. 14
[138] Australian PV Association, *APVA Response to the Queensland Competition Authority's Issues Paper on 'Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland',* Australian PV Association, Sydney, September 2012, pp. 6-7
[139] Australian PV Association, *APVA Response to the Queensland Competition Authority's Issues Paper on 'Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland',* p. 7

as retirees and households where parents with children are at home during the day. As noted by the Moreland Energy Foundation:

> Clearly, this inequity has a number of concerns – the most notable is the perverse incentive for these premises to shift their load to the daytime in order to get the higher value for the electricity generated, exacerbating peak demand and associated network costs.[140]

2.68 Nevertheless, with the uptake of battery storage net metering policies are becoming increasingly popular. As the International Energy Agency points out:

> The idea that PV producers could be considered as "prosumers" – both producers and consumers of energy – is evolving rapidly and policies are being adapted accordingly in several countries. Net metering policies are being considered in some countries such as Mexico … The Netherlands, Portugal, Sweden and partially in Belgium and many countries around the world are either discussing its introduction or a variant through self-consumption. Therefore, self-consumption is becoming a major driver of distributed PV installations.[141]

2.69 As highlighted in Appendix 5, FiT arrangements for micro generation in Australia vary across jurisdictions. In some jurisdictions FiTs are mandated and provided for within legislation. In others, particularly where there is a competitive retail electricity market, retailers provide FiTs on a voluntary basis with the rate subject to market forces. For example, in the regional areas of Qld the FiT is mandated whereas in the more competitive market of South East Qld it is voluntary.[142] In July 2014 the NSW Independent Pricing and Regulatory Tribunal (IPART) established a "benchmark range for feed-in tariffs that retailers may voluntarily offer PV customers".[143]

2.70 In WA, the requirement for retailers to offer a buyback scheme was established through the *Electricity Industry (Licence Conditions) Regulations 2005.* In accordance with the provisions of the regulations:

> retailers establish their own terms and conditions (including rates) for buying excess energy and are responsible for running the Renewable Energy Buyback Scheme (REBS). The Public Utilities Office approves the terms and conditions of each retailers buyback offer.[144]

.Acknowledging that energy losses incurred in transporting electricity across large distances is a significant cost driver in the supply of electricity in the more remote areas of the state, Horizon Power in WA offers 33 location specific FiTs. These range from a low of 7.1350 c/kWh for customers in the larger centres of

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[140] Moreland Energy Foundation Ltd, *Submission to the Victorian Competition & Efficiency Commission Inquiry into Feed-in tariff Arrangements*, pp. 9-10

[141] International Energy Agency Photovoltaic Power Systems Programme, *2014 Snapshot of Global PV Markets,* p.10

[142] Queensland Competition Authority, *Solar feed-in tariff for regional Queensland for 2014-15,* Queensland Competition Authority, Brisbane, May 2014, p.11

[143] Independent Pricing and Regulatory Tribunal, *Solar feed-in tariffs: The subsidy-free value of electricity from small-scale solar PV units from 1 July 23014,* Independent Pricing and Regulatory Tribunal of New South Wales, Sydney, 2014, p.1

[144] Queensland Competition Authority, *Renewable Energy Buyback Scheme,* viewed 11 November 2015, https://www.finance.wa.gov.au/cms/Public_Utilities_Office/Energy_Initiatives/Renewable_Energy_Buyback_Scheme_-_Residential.aspx

Exmouth, Derby and Broome in the North West Integrated, which is the same as that offered by Synergy to customers in the SWIS, to 50.55 c/kWh in Kalumburu in the state's north east and 51.41 c/kWh in Menzies situated in the goldfields north of Kalgoorlie.[145]

2.71 Determining the most appropriate method for calculating the subsidy-free value of electricity from micro generation has been the subject of significant debate both in Australia and elsewhere. As with advanced metering deployment, there are split incentives with costs and benefits from solar-PV accruing to distributors, retailers, PV owners and the wider society. In response to the Queensland Competition Authority's 2013 issues paper *Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland,* the Clean Energy Council (CEC) made a number of observations which are worth noting.

2.72 In accordance with the *Revised National Principles for Feed-in Tariff Arrangements*, the CEC is of the view that consumers with grid connected micro generation should have the right to export energy to the grid and receive a 'fair and reasonable' payment for such. Reflecting the view of the Independent Pricing and Regulatory Tribunal of New South Wales (IPART), the CEC notes that this should be interpreted as:

> a 'subsidy-free' value that reflects the benefits of electricity generated from small-scale PV generators to electricity retailers, and to other parties (e.g. distribution network service providers, other businesses and entities in the electricity supply value chain and other customers). It is fair and reasonable that the benefits brought by PV owners should be captured by PV owners.[146]

2.73 However, the CEC does not concur with IPART when it comes to the offer and level of FiT rates being voluntary and subject to market forces. As the CEC points out "an unregulated price limits the ability for the price to include contribution for factors not otherwise directly captured by retailers, such as reduced network losses."[147] It is further noted that the system effectively requires customers to negotiate on a one-on-one basis with electricity retailers placing them "in an extraordinarily weak negotiating position";[148] which is neither fair nor reasonable. CEC also discounts the argument from proponents of light handed regulation that suggest:

> PV customers are more likely to be well informed and to actively seek out competitive market offers. This is doubtful. Many owners of PV systems have been motivated by a simple desire to reduce their electricity bills and have no more interest than anyone else in understanding a plethora of electricity price offers.[149]

[145] Horizon Power, *Renewable Energy Buyback: Terms and Conditions,* Horizon Power, Perth, 1 July 2015, p.18; Synergy, *Renewable Energy Buyback Scheme and Net Feed-In Tariff Price Schedule,* Synergy, Perth, 1 July 2015, p. 3

[146] Clean Energy Council, *Submission to the QCA Issues Paper: Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland,* Clean Energy Council, Melbourne, October 2013, p.1

[147] Clean Energy Council, *Submission to the QCA Issues Paper,* p.3

[148] Clean Energy Council, *Submission to the QCA Issues Paper,* p.3

[149] Clean Energy Council, *Submission to the QCA Issues Paper,* p.4

Based on the findings and recommendations of the Victorian Competition & Efficiency Commission's inquiry into distributed generation, the Committee notes that the Victorian Government has taken a more cautious approach. Despite the fact that Victoria has a very competitive electricity retail market, in 2013 the Government opted to set FiTs by regulation until 2017 with a view to transitioning responsibility for price setting to the retail energy market from 1 January 2017.[150]

[150] Victorian Competition & Efficiency Commission, *Power from the People: Inquiry into distributed generation, Summary Report,* Victorian Competition & Efficiency Commission, Melbourne, July 2012, p.11

3 Northern Territory Electricity Market Reform

COAG Energy Market Reform - Implementation Plan

3.1 While acknowledging the diversity in decision making across jurisdictions, the *Energy White Paper* notes that effecting energy market reforms requires cooperative action by all states and territories:

> the goal should always be harmonised national regulation within the objectives of the national electricity and gas market legislation. This will benefit both energy suppliers and consumers who operate across jurisdictional borders. ... A consistent national energy market will remove the costs consumers pay to support different jurisdictional regulatory environments, improve reliability and introduce more competition to lower costs.[151]

3.2 The *COAG Energy Market Reform - Implementation Plan* seeks to achieve this by providing the context and informing the content of jurisdictional reform measures. While a number of the reforms relate specifically to the operations of the NEM, the Committee notes that, where net benefit can be demonstrated, the Northern Territory Government agreed to consider implementation of reform initiatives associated with the following key issues:

- **Deregulation of retail prices:** ensuring efficient and competitive retail energy markets for the benefit of consumers and the energy sector alike by working towards effective competition where it does not exist to allow greater opportunities for innovation in and choice of retail offers.
- **More power to consumers:** ensuring consumers have the tools to control their bills by understanding and managing the quantity and timing of their energy consumption through the introduction of new principles and reforms to encourage the market-driven, competitive roll-out of advanced metering.
- **Demand side participation:** phasing in of efficient and cost-reflective retail energy prices through the application of time varying network tariffs, including suitable protections for vulnerable consumers; thereby ensuring consumers are supported by energy supply businesses to make consumption decisions that control bills and provide long term benefits to the market.
- **Micro-generation:** implementation of the revised *National Principles for Feed-In Tariff Arrangements* to ensure that payment for electricity exported to the grid from embedded micro-generation more accurately

[151] Department of Industry and Science, *2015 Energy White Paper,* Australian Government, Canberra ACT, April 2015, pp. 8-9

reflects the true value of that electricity, regardless of the form of micro-generation technology deployed.[152]

Northern Territory Reform Agenda

3.3 In September 2013 the Treasurer announced that the Government had approved the introduction of a package of electricity market reforms designed to promote more effective competition in the NT's electricity supply industry. As noted in the associated *Information Paper:*

> the reforms are all about removing inefficiencies and more effectively keeping a lid on costs and prices. To this end, nothing is more effective in capping costs and prices than promoting competition in the Territory's electricity supply industry.[153]

3.4 To this end, the package includes two interrelated and particularly significant reform components: disaggregation of the Power and Water Corporation; and reform of the regulatory framework governing the Northern Territory's electricity market.[154] Structural separation of PWC's monopoly and contestable businesses into stand-alone government owned corporations commenced as of 1 July 2014, with the retail business transferring to Jacana Energy and the generation business transferring to Territory Generation.[155] The Committee understands that this process will be finalised by 1 July 2016.[156]

3.5 The regulatory reform program, to be introduced progressively over the ensuing 18 months to two years, aims to address any other barriers to competition and align the regulatory framework governing the Territory's electricity market with that of the NEM:

> Fundamentally, the Government has committed to the electricity markets in Darwin, Katherine, Tennant Creek and Alice Springs becoming subject to relevant provision of the national energy laws and rules, and so the jurisdiction of the Australian Energy Market Commission (AEMC) and the Australian Energy Regulator (AER)[157]

3.6 As of 1 July this year, responsibility for the economic regulation of the NT's prescribed electricity networks and retail energy market, apart from retail price regulation, was transferred from the Utilities Commission of the Northern Territory to the Australian Energy Regulator (AER). However, Mr Chris Pattas, General Manager Networks AER, advised the Committee that it was not anticipated that the full extent of the national electricity rules would apply in the

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[152] COAG Energy Council, *COAG Energy Market Reform – Implementation Plan July 2013,* viewed 18 November 2014, https://www.coag.gov.au/node/508; see also, AEMC, *Power of Choice Review: Final Report Implementation Plan,* Australian Energy Market Commission, Sydney, 30 November 2012

[153] Department of Treasury and Finance, *Northern Territory Electricity Market Reform: Information Paper,* NT Government, Darwin NT, February 2014, p.2; Hon David Tollner, MLA, Treasurer, *New Structure to Fix Labor's Mess,* (Media Release), Northern Territory Government, 27 September 2013, pp. 1-2

[154] Department of Treasury and Finance, *Northern Territory Electricity Market Reform: Information Paper,* NT Government, Darwin NT, February 2014, pp.2-3; see also Department of Treasury and Finance, Committee Transcript, 27 March 2015, pp. 2-4

[155] Department of Treasury and Finance, *Northern Territory Electricity Market Reform,* p. 2

[156] Power and Water Corporation, Committee Transcript, Government Owned Corporations Scrutiny Committee Hearing, 4 June 2015, p.7

[157] Department of Treasury and Finance, *Northern Territory Electricity Market Reform,* p. 3

Northern Territory until 2019/20 when it enters its next regulatory control period.[158]

3.7 The Committee was further advised that the *Australian Energy Market Agreement* provides for jurisdiction-specific exemptions to be negotiated where the costs of implementing or applying specific rules are likely to exceed the benefits for consumers in the medium term:

> jurisdictional derogations related to the National Distribution and Retail Regulatory Functions [are] to be clearly specified, with provision for phasing out as appropriate according to identified timelines.[159]

3.8 To facilitate the entry of new generators, where economically efficient, and promote competition among generators operating in the NT electricity supply industry, the regulatory reform package also provides for the establishment of a Northern Territory wholesale electricity market similar to that operating in the NEM or WA Wholesale Energy Market:

> What's needed, initially in the Darwin-Katherine generation market, are wholesale market arrangements that are suitable to the Territory's circumstances and capable of cost-effectively replacing sole reliance on bilateral contracting. Fostering actual competition in the generation sector will result in greater efficiency in the supply of electricity, and more time investment in, and take up of, new technology. As a result, more effective competition will put downward pressure on retail tariffs by putting downward pressure on the generation cost component - around two-theirs - of electricity tariffs.[160]

The Committee notes that in July of this year the COAG Energy Council agreed to establish and support a working group to "pave the way for a wholesale electricity market in the Territory [that] mirrors as closely as possible the market systems used in the NEM."[161]

Tariff Reform

3.9 While the Territory's electricity market reform agenda does not specifically address tariff reform, it does provide the structural and regulatory foundations required to facilitate such. In its response to the *Energy Green Paper,* the Government indicated its support of market-driven deployments of advanced metering and noted that tariff reform in the Northern Territory could include:

- increasing the range of tariff choices that are available to customers to provide greater cost-reflectivity, including time-of-use pricing and inclining block tariff options;
- creating a regulatory environment which encourages networks to provide opportunities for customers to participate in demand management programs as an alternative to network capacity investment;

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[158] Australian Energy Regulator, Committee Transcript, 28 November 2014, p. 4

[159] COAG Energy Council, *Australian Energy Market Agreement: as amended 9 December 2013,* viewed 22 November 2014, <http://www.scer.gov.au/governance/agreements/; Australian Energy Regulator, Committee Transcript, 28 November 2014, p.3

[160] Department of Treasury and Finance, *Northern Territory Electricity Market Reform,* pp. 6-7

[161] Hon David, Tollner., Minister for Mines and Energy, *COAG backs electricity competition in the Territory,* (Media Release), Northern Territory Government, Darwin, 23 July 2015, p.1

- introducing tariff options to ensure equity and appropriate apportionment of electricity costs to the users of those services; and
- implementing demand management and energy efficiency measures aimed at improving electricity price affordability over the long term.[162]

3.10 As noted by Mr John Baskerville, Chief Executive Officer, Power and Water Corporation, and reflected in the comments of a number of witnesses to the inquiry:

> It is time pricing options are discussed and we commend the committee for providing this forum for further discussion. It is now overdue and we must move to cost reflective pricing so that electricity prices are transparent and reflect the real cost of providing the service. Not only will cost reflectivity provide a better pricing model, it would also put some capacity in the hands of the customer to make choices around their behaviours and manage their electricity accounts.[163]

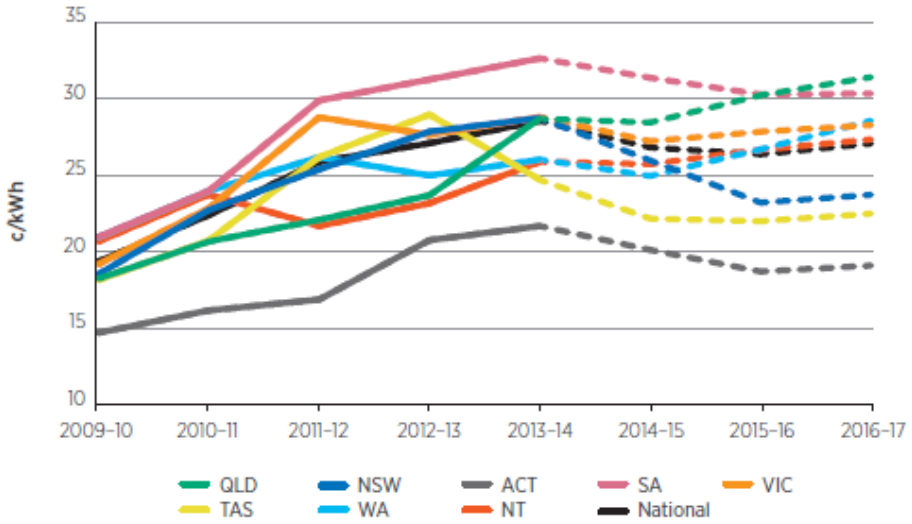
[162] Northern Territory Government, *The Northern Territory Government Response to the Energy Green Paper,* Northern Territory Government, Darwin NT, 19 November 2014, p. 12
[163] Power and Water Corporation, Committee Transcript, 20 February 2015, p.3

4 Electricity Pricing in the NT

Price Trends

4.1 In a move towards achieving a greater level of cost reflectivity, in November 2012 the Government announced a 30% increase in electricity prices which was phased in over the two year period 1 January 2013 to 1 January 2015. As Figure 11 indicates, while the AEMC forecasts that prices will moderate over the next two years, increases in the order of 3.7% in 2015/16 and 2.5% in 2016/17 are expected.[164]

Figure 11: Trends in retail electricity prices by jurisdiction, 2008-09 to 2013-14 and forecasts to 2016-17[165]



4.2 As the AEMC points out, higher network costs in the 2014-19 regulatory period are a key driver of supply costs in the Northern Territory:

> operational expenditure for the 2014-19 regulatory period is 45 per cent higher than in the previous five year period. This is due to a new asset management regime that has an increased focus on condition monitoring and preventative maintenance. In recent years, there have been several instances of wide-spread power outages in the Darwin-Katherine system, including the System Black events on 12 March 2014 and 30 January 2010.[166]

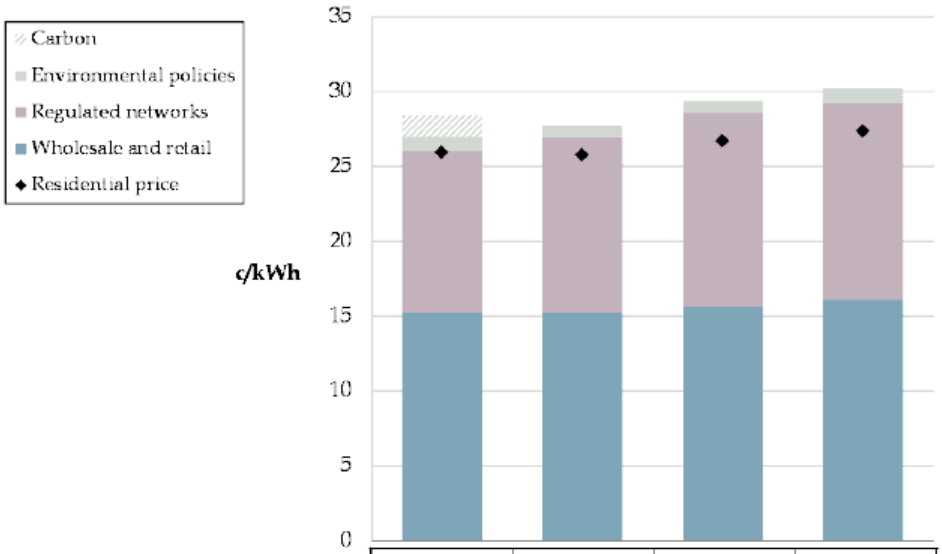
4.3 Figure 11 also indicates that application of the new rules regarding distribution network pricing is expected to put downward pressure on retail prices in the NEM with forecasts to 2016-17 indicating a fall in prices for most jurisdictions. As noted in the *Energy White Paper:*

[164] Australian Energy Market Commission, *Final Report: 2014 Residential Electricity Price Trends,* Australian Energy Market Commission, Sydney NSW, 5 December 2014, p.167
[165] Department of Industry and Science, *2015 Energy White Paper,* p. 10
[166] Australian Energy Market Commission, *Final Report: 2014 Residential Electricity Price Trends,* p.174

> the most recent draft (revenue) determinations by the AER propose to reduce retail prices markedly ... The determinations and associated new 'benchmarking' reports have highlighted significant opportunities for continuing improvements by network businesses. Progress among the states and territories in moving toward effective levels of competition and deregulation of electricity retail pricing is also contributing to improved price competition.[167]

4.4 Figure 12 shows the expected trends in the residential price and supply chain cost components for the Darwin-Katherine regulated system. While acknowledging that supply costs are higher outside of the Darwin-Katherine region, the AEMC points out that given the Government's uniform tariff policy, its analysis of prices applies to all residential consumers in the Northern Territory.[168]

Figure 12: Expected Trends in Supply Chain Cost Components[169]



		2013/14 Base year	2014/15 Current year	2015/16	2016/17
Environmental policies	**c/kWh**	**2.32**	**0.83**	**0.88**	**0.97**
Carbon	c/kWh	1.39	0.00	0.00	0.00
LRET	c/kWh	0.38	0.38	0.44	0.54
SRES	c/kWh	0.54	0.46	0.44	0.44
Regulated networks	**c/kWh**	**10.77**	**11.65**	**12.88**	**13.20**
Network	c/kWh	10.77	11.65	12.88	13.20
Wholesale and retail	**c/kWh**	**15.27**	**15.28**	**15.66**	**16.06**
Residual		-2.46	-2.03	-2.73	-2.86
Residential price	**c/kWh**	**25.90**	**25.74**	**26.69**	**27.36**

Note: The "residual" is the difference between the residential price and the aggregate of the supply chain costs. Its represents part, but not all, of the government subsidy. Renewable Energy Target costs were provided by the Northern Territory Government on a calendar year basis for 2013 and 2014. We have adjusted these costs by inflation to report on the 2013/14 and 2014/15 financial years.

[167] Department of Industry and Science, *2015 Energy White Paper*, p. 10
[168] Australian Energy Market Commission, *Final Report: 2014 Residential Electricity Price Trends,* p.167
[169] Australian Energy Market Commission, *Final Report: 2014 Residential Electricity Price Trends,* p.170

4.5 The AEMC further notes that since the Northern Territory Government;

> subsidises electricity prices such that the prices paid by consumers are less than the cost of supply ... the retail prices paid by consumers do not necessarily reflect underlying cost, nor follow cost trends."[170]

The Committee understands that a 'representative consumer' in the Northern Territory is estimated to receive a subsidy of approximately $705 per year for their electricity consumption.[171]

Tariff Reform

4.6 The Committee found that tariff reform in the Northern Territory is still very much in its infancy and widely acknowledged by key stakeholders as well overdue. As noted in PWC's *2014-15 Network Pricing Principles Statement* and reiterated in their submission to the inquiry*:*

> The structure of Power and Water's network tariffs has remained unchanged since it was first introduced in 2000. It is an overly complex tariff structure that is out of step with current industry practice and is no longer cost reflective.[172]

4.7 As mentioned previously, as of 1 July 2015 responsibility for network price regulation and oversight of network access was transferred from the Utilities Commission of the Northern Territory to the Australian Energy Regulator. Given that the Power and Water Corporation (PWC) entered into a new five year regulatory control period as of 1 July 2014, the Committee understands that:

> approval of network tariffs for the remainder of the 2014-19 regulatory control period will be undertaken by the Australian Energy Regulator, in accordance with the *Electricity Networks (Third Party Access) Act* and Code and the 2014 Network Price Determination.[173]

4.8 With regards to the key drivers of network tariff reform, the Committee heard that:

> Power Network's peak demand occurs in the wet season and is to a large extent driven by air conditioning usage. In the northern part of the Territory, high peak demands occur during hot and humid conditions, which correspond with periods when the elements of the system operate at high capacity and power factor of loads is poor. In inland areas, both summer and winter conditions can result in high load demand.
>
> A considerable proportion of Power Networks' capital expenditure on the network during the 2014-19 regulatory control period is demand related. That expenditure is driven by the need to augment and expand the network to adequately meet peak demand and provide for the connection of new customers.
>
> Managing peak demand is thus a priority for Power Networks' tariff strategies. This leads to an emphasis on providing network price signals

[170] Australian Energy Market Commission, *Final Report: 2014 Residential Electricity Price Trends,* p.167
[171] Australian Energy Market Commission, *Final Report: 2014 Residential Electricity Price Trends,* p.168
[172] Power and Water Corporation, *Power Networks: Network Pricing Principles Statement,* p.19
[173] Utilities Commission of the Northern Territory, *Tariff Pricing 2014-19,* viewed 12 November 2015, http://www.utilicom.nt.gov.au/Electricity/pricing/NetworkPricing/Pages/Tariff-Pricing-2014-19.aspx

> that will encourage both domestic and commercial customers to moderate their consumption during periods of high demand.[174]

4.9 Noting that the existing declining block energy tariff structure is out of step with many other Australian distributors and does not provide the appropriate price signals, PWC advised that over the 2014-19 regulatory control period it would be progressively phased out in favour of an inclining block tariff.[175] Nevertheless, as discussed below, PWC advised that effecting tariff reform was largely constrained by the fact that the majority of smaller network users only have standard accumulation meters.[176]

4.10 For residential and small to medium sized business customers consuming <750MWh of electricity per annum, the Committee heard that retail tariffs are regulated by the Government in 'Pricing Orders' which set the maximum amount retailers are able to charge these categories of customers.[177] Up until very recently the only tariff option available to residential and small business customers in the Territory under the Pricing Order was the flat (single rate) tariff. However, as 1 January 2015, Jacana Energy introduced a Time of Use tariff.[178]

> The Switch to Six Pricing Offer operates over two 12-hour windows ... During peak periods, between 6am and 6pm Monday to Friday and public holidays, the tariff is charged at a premium rate [31.72c/kWh]. During off-peak periods, between 6pm and 6am Monday to Friday and all weekend, the tariff is charged at a discounted rate [24.19c/kWh].[179]

In the absence of a Time of Use network tariff, the Committee understands that the *Switch to Six* peak and off-peak periods are aligned to Territory Generation's peak and off-peak wholesale electricity prices which represent the lion's share of Jacana Energy's costs.[180] However as discussed in the section on metering technology below, uptake of the tariff is necessarily dependent upon customer access to advanced metering.

4.11 With regards to the regulated retail pricing framework, PWC pointed out that:

> any changes to network and system control tariffs charged to electricity retailers currently have a limited impact on the behaviour of the majority of electricity customers. The majority of residential and small commercial customers are subject to electricity retail tariffs that are set by the Northern Territory Government's Electricity Pricing Order, which does not allow for a direct pass through of the electricity network and system operation and control cost components. ... Therefore, implementing network tariffs to manage peak demand are limited in their effectiveness if the end use electricity customer is not subject to these pricing signals.[181]

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[174] Power and Water Corporation, *Power Networks: Network Pricing Principles Statement*, p. 24; see also Power and Water Corporation, Committee Transcript, 20 February 2015, pp. 2-3
[175] Power and Water Corporation, Submission No. 10, 2015, p.6
[176] Power and Water Corporation, Submission No. 10, 2015, p.6
[177] Jacana Energy, Submission No. 8, 2015, p. 2
[178] Jacana Energy, Submission No. 8, 2015, p.2
[179] Jacana Energy, *Switch to six and save: Terms and Conditions,* viewed 12 November 2015, http://switchtosix.com.au/terms
[180] Jacana Energy, Committee Transcript, 27 March 2015, p. 14; see also Mr Tim Duignan, Chief Executive Officer, Territory Generation, Committee Transcript, 28 November, p.2
[181] Power and Water Corporation, Submission No. 10, 2015, p.9

4.12 From a retailer's perspective, Jacana Energy noted that the effectiveness of new retail pricing structures was dependent upon the extent to which:

> other elements of the electricity value chain are aligned. It is important that peak and off-peak time splits are in alignment and that the timing around price changes should align. Price signals can become muted if network, wholesale and retail rates are all set at different times of the year.[182]

4.13 However, with reference to the Territory's current pricing framework, the Committee heard that since Jacana Energy only has direct control over approximately 1.5% of costs, it has limited ability to:

> absorb any additional cost should any other cost inputs increase. The current Electricity Pricing Order sets the maximum price that may be charged but does not allow for the pass-through of variations in the regulated charges.[183]

4.14 In contrast to the Northern Territory, where electricity prices are, or have been subject to government regulation, industry regulators such as the Queensland Competition Authority, the Tasmanian Economic Regulator, or the Independent Pricing and Regulatory Tribunal of NSW have a role in advising governments on the level of retail tariffs for small customers.[184] As noted by the Utilities Commission of the Northern Territory, this is generally subject to detailed terms of reference with the subsequent advice, and the methodology used in the preparation of draft determinations made publicly available; as is the case with network price determinations.[185] Moreover, as Jacana Energy pointed out in their submission to the inquiry, elsewhere in Australia "one of the key components facilitating effective competition has been the adoption of independent price setting frameworks."[186]

4.15 Acknowledging the benefits of a nationally consistent method for setting regulated retail prices, in 2013 the COAG Energy Council requested that the AEMC provide advice on "a best practice method for setting regulated retail electricity prices for small customers."[187] In its subsequent report, the AEMC highlights the importance of ensuring that retail price regulation is clear, transparent and set through an open and consultative process which engages customers and industry, noting that:

> regulated retail prices can influence the level of competition, or development of completion in a market. When there is uncertainty (or less predictability) about how retail prices are regulated, retailers may be less likely to enter into a market. This is because as uncertainly about the regulated retail price that retailers compete against increases, so too does the risk that they will not realise their expected revenue.

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[182] Jacana Energy, Submission No. 8, 2015, p.6
[183] Jacana Energy, Submission No. 8, 2015, p.6
[184] Jacana Energy, Submission No. 8, 2015, p.7
[185] Utilities Commission of the Northern Territory, *Review of Retail Price Monitoring,* Utilities Commission of the Northern Territory, Darwin, October 2010, p.6; see also Australian Energy Market Commission, Australian Energy Market Commission, *Advice on best practice retail price methodology, Final Report,* Australian Energy Market Commission, Sydney NSW, 27 September 2013, p.1
[186] Jacana Energy, Submission No. 8, 2015, p.7
[187] Australian Energy Market Commission, *Advice on best practice retail price methodology, Final Report,* Australian Energy Market Commission, Sydney NSW, 27 September 2013, p.1

> An efficient, nationally consistent and stable method for setting regulated retail prices provides potential new entrant retailers with more confidence when deciding whether to enter a market. This increases the likelihood of entry, resulting in increased competition, and more innovative products for customers while competition develops.
>
> Most retailers in the NEM operate portfolios of retail contractors across multiple regions. Consistency and predictability in the method for setting regulated retail prices *between* regions helps retailers to manage portfolio risk. It also reduces administrative costs for these parties which should result in lower retail prices for customers over the longer term.[188]

4.16 The Committee notes that in WA, where retail prices are also subject to Government regulation, based on the evidence received during phase one of its Electricity Market Review that is currently underway, the Electricity Market Review Steering Committee has recommended that:

> the task of setting regulated retail electricity tariffs should be undertaken by the Economic Regulation Authority. Over time, as retail competition improves, price regulation should evolve from a tariff setting to a price monitoring function.[189]

Recommendation 1

The Committee recommends that the Utilities Commission of the Northern Territory, in consultation with Jacana Energy and other relevant stakeholders:

a) undertake and publish a review of the regulated retail price determination process incorporating options for improving the efficiency and transparency of retail price setting in the Northern Territory; and

b) The Treasurer, as the Regulatory and Shareholding Minister, table a copy of the review in the Assembly by June 2016.

Metering Technology

4.17 Metering services in the Northern Territory are currently classified as 'Standard Control' or 'Regulated Network Access Services'. As such, they are performed exclusively by the Power and Water Corporation (PWC) with costs bundled into the overall system availability component of the network tariff.[190] However, costs associated with consumer or retailer initiated meter upgrades or meter reprogramming are classified as 'Alternative Control Services' or 'Excluded Network Access Services not subject to effective competition'. As such they are provided on a fee for service basis in accordance with the schedule of charges as approved by the network regulator.[191]

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[188] Australian Energy Market Commission, Sydney NSW, 27 September 2013, p.3
[189] Electricity Market Review Steering Committee, *Electricity Market Review Options Paper, Government of Western Australia, Perth, 25 July 2014,* p.12
[190] Power and Water Corporation, *Power Networks 2014-15 Electricity Network Tariffs and Charges and Future Price Trends,* Power and Water Corporation, Darwin, August 2014, p. 5 & 20
[191] Power and Water Corporation, *Power Networks 2014-15 Electricity Network Tariffs and Charges,* p.5 & 17

4.18 While it is widely acknowledged that advanced meters are crucial to the rollout of cost reflective tariff structures; implementation of demand management strategies; minimisation of cross-subsidisation; and consumer choice, the Committee heard that the vast majority of Territory customers in the *Domestic Tariff Class* still have accumulation meters. As noted in the *National Smart Meter Infrastructure Report*, as at 2013 PWC had deployed approximately:

> 1,500 remotely read interval meters used by commercial customers with Current Transformers (CT's). 1,000 of these would be customers using less than 160MWh per annum.[192]

4.19 The Committee understands that PWC has since rolled out between 1800 and 2100 interval meters to customers in new housing developments.[193] In addition, the Committee notes that it is a requirement that customers upgrade their meter to a smart meter when installing roof-top solar PV. It is understood that there are currently around 3,250 smart meters in use across the electricity customer base in the Northern Territory; 300 of which were installed in Alice Springs as part of the Solar Cities Project.[194]

4.20 Ms Lucy Moon, Manager Economic Reform, PWC, advised the Committee that over the 2014-19 regulatory control period PWC will progressively rollout interval meters to customers with an annual consumption between 40 MWh and 750 MWh.[195] According to PWC's *Network Pricing Principles Statement and 2014-15 Network Pricing Proposal,* the Committee further notes that PWC:

> will also develop a trial for customers with annual consumption in the range of 15 to 40 MWh, to determine the cost effectiveness of proceeding with a full rollout of interval meters to customers with annual consumption down to 15 MWh in the 2019-24 regulatory control period.[196]

However, given that the average household in the Territory has an annual consumption of 9.13 MWh, it is evident from these timeframes that in the short to medium term small customers that wish to take up a more dynamic tariff offering will more than likely have to fund the required meter upgrade themselves.[197]

4.21 Furthermore, while it is intended that interval meters will eventually become the new standard for *Domestic* customers, the Committee was particularly concerned to learn that PWC is still in the process of "running down our stocks of existing accumulation meters."[198] Given this, Mr Danny Moore, Executive Manager Sales and Strategy, Jacana Energy, advised the Committee that

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[192] Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p.14
[193] Mr Danny Moore, Executive Manager Sales and Strategy, Jacana Energy, Committee Transcript, 27 March 2015, p.14
[194] Power and Water Corporation, Committee Transcript, Government Owned Corporations Scrutiny Committee Hearing, 4 June 2015, p.20; Department of Resources, Energy and Tourism, *National Smart Meter Infrastructure Report*, p.30
[195] Power and Water Corporation, Committee Transcript, 20 February 2015, p. 17
[196] Power and Water Corporation, *Power Networks Network Pricing Principles Statement and 2014-15 Network Pricing Proposal,* Power and Water Corporation, Darwin, May 2014, p. 34
[197] Australian Energy Market Commission, *Final Report: 2014 Residential Electricity Price Trends,* Australian Energy Market Commission, Sydney NSW, 5 December 2014, p.169
[198] Mr Jim McKay, Senior Manager Network Development and Planning, PWC, Committee Transcript, 28 November 2014, p.5

Jacana has requested access to PWC's meter replacement schedule so that they can advise customers that are due for a new meter if they are interested in moving to the *Switch to Six Tariff* Jacana can ensure that the meter is replaced with an interval meter at no additional cost to the customer.[199]

4.22 The Committee was advised that the costs associated with upgrading to an advanced meter are in the order of $250 for the meter and around $350 for installation.[200] However, Mr John Baskerville, Chief Executive Officer, PWC, noted that in many instances installation costs could be closer to $1,000 given that:

> a lot of the [meter] panels in Darwin and the northern suburbs rightly or wrongly are asbestos, so when the guy goes along, if he has to drill a hole it's a big chore. So that is a big problem. Tennant Creek and Alice Springs, it would all be asbestos, most them, some them are Bakelite but most of them are asbestos.[201]

According to NT WorkSafe, where asbestos switchboard or meter panels are identified, a risk assessment and asbestos management plan must be prepared and, where possible, the panels should be replaced.[202]

4.23 Mr Moore, Executive Manager Sales and Strategy, Jacana Energy also advised the Committee that even though customers in new developments already have interval meters in place, they will still incur costs if they wish to take up the *Switch to Six Tariff* as, "unfortunately they have been programmed a different way. We need to get someone to reprogram them ... We are thinking it will be around $100 or so."[203] While the *Switch to Six Tariff* incorporates a *Meter Cost Smoothing Plan,* which allows customers to spread the initial meter replacement or reprogramming costs across eight instalments over 24 months, the Committee understands that costs associated with meter board replacements are not included.[204]

4.24 In addition to the issues outlined above, Mr Moore further advised that meter upgrades and reprogramming can take anything up to eight weeks to perform given the capacity of PWC installers to provide alternative control services.[205] As Mr Stuart Pearce, Chief Executive Officer, Jacana Energy pointed out, the current metering arrangements are out of step with both the needs of the electricity supply industry and those of the consumer:

> In most jurisdictions in Australia metering has been a network responsibility, but part of the Power of Choice, which was the Australian Energy Market Commission review of the energy industry in Australia - one

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[199] Jacana Energy, Committee Transcript, 27 March 2015, p.14
[200] Mr Paul Ascione, Chief Engineer, Power Networks, Power and Water Corporation, Committee Transcript, 20 February 2015, p.15
[201] Power and Water Corporation, Committee Transcript, 20 February 2015, p.14
[202] NT WorkSafe, *Electrical switchboard panels and meter panels containing asbestos,* Bulletin, Northern Territory Government, Darwin, undated, p.1
[203] Jacana Energy, Committee Transcript, 27 March 2015, p.14
[204] Jacana Energy, *Switch to six and save: Terms and Conditions,* viewed 12 November 2015, http://switchtosix.com.au/terms
[205] Jacana Energy, Committee Transcript, 27 March 2015, p.14; see also Jacana Energy, *Switch to six and save: Terms and Conditions*

> of their key recommendations was that metering should become contestable. One reason for that is the technology in metering is moving quite rapidly, and smart metering certainly does not appeal to everyone and it is not suitable for everyone. Retailers are probably the best placed to look at who would and would not benefit from a smart meter...As the energy retailer, the theory is I should be able to say, 'You have the best and cheapest meter and you can do the best installation, so I would like you to the meter installations for my 20,000 customers over the next two years.' That could be the network company. Some network companies do not want to do metering, some do, so it works out for both parties.[206]

4.25 As noted previously, in its response to the AEMC's Power of Choice Review, COAG agreed that jurisdictions would review their new and replacement electricity metering policies. However, as far as the Committee can ascertain this has yet to occur in the Northern Territory. While the rule change regarding competitive metering services will become applicable to the Northern Territory once the transition to the National Electricity Rules is completed, the Committee is of the view that interim arrangements need to be put in place to support and facilitate a market-led rollout of advanced meters for small customers.

Recommendation 2

The Committee recommends that the Government, in consultation with the Australian Energy Regulator, Power and Water Corporation, Jacana Energy and other relevant stakeholders:

1. **Develop and implement a *Northern Territory Policy for New and Replacement Electricity Meters* in line with the *Minimum Services Specification,* as proposed by the Australian Energy Market Commission, that supports:**
    a) **a market-led rollout of advanced meters that ensures competition in metering services; and**
    b) **facilitates uptake of dynamic retail tariff offers and associated products by small consumers.**
2. **The Treasurer, as the Regulatory and Shareholding Minister, table a copy of the *Northern Territory Policy for New and Replacement Electricity Meters* in the Assembly by the end of the first quarter 2016.**

4.26 The Committee is concerned that the costs associated with the removal and replacement of asbestos meter panels represents a significant barrier to voluntary uptake of advanced meters and an undue cost burden on affected customers. A similar situation occurred some years back when consumers were actively encouraged to upgrade electric hot water systems to solar systems. For those customers living in homes built prior to 2000, costs associated with additional plumbing and required upgrades to the roof structure were often prohibitive. In the interests of equity, the Government of the day introduced the *Solar Hot Water Retrofit Rebate* program which was designed to

[206] Jacana Energy, Committee Transcript, 27 March 2015, p.8

compensate for these additional installation costs. The Committee is of the view that a similar rebate program is warranted to compensate consumers for costs associated with the removal and replacement of asbestos electricity meter panels.

Recommendation 3

The Committee recommends that the Government, in consultation with the Power and Water Corporation and Jacana Energy, establish and implement an *Advanced Meter Upgrade Rebate* program that:

a) compensates residential and small business customers that elect to upgrade their accumulation meter to an advanced meter for installation costs associated with the removal and replacement of switchboard and meter panels manufactured from an asbestos/resin or asbestos/coal tar pitch composite; and

b) the Treasurer, as the Regulatory and Shareholding Minister, table a copy of the *Advanced Meter Upgrade Rebate* program in the Assembly by the end of the first quarter 2016.

Feed-in Tariffs

4.27 Unlike other jurisdictions in Australia, the gross metered one-for-one *Solar Buyback Scheme* currently operating in the Northern Territory is neither provided for in legislation nor government policy. As Mr Craig Graham, Assisting Under Treasurer, Department of Treasury and Finance, advised the Committee:

> At the moment there is no formal government feed-in tariff policy. I think it is fair to say in the past there has been a reliance on national renewable energy and climate change policy initiatives to drive the take up of renewable energy in the Northern Territory through the renewable energy target and various initiatives. That has been seen as a way to encourage retailers, and it has really been Power and Water Retail until recently to adopt feed-in tariffs as a commercial principle or a commercial measure. That has been the historical driver for their feed-in tariff.[207]

As a result of the recent structural separation of the Power and Water Corporation, the Committee was advised that administration and payment of the FiT has been inherited by Jacana Energy as the incoming retailer.[208]

4.28 In the absence of the premium tariffs that were offered elsewhere in Australia, historically low electricity prices, and the comparatively high cost of goods and services, uptake of solar PV in the Territory has been extremely modest compared to elsewhere in Australia. However, the combination of rising electricity prices and the downward trend in solar PV costs has resulted in a significant increase in the number of installations over the past twelve months in particular. As Mr John Baskerville, Chief Executive Power and Water

[207] Department of Treasury and Finance, Committee Transcript, 27 March 2015, p.10
[208] Jacana Energy, Committee Transcript, 28 November 2014, p.7

Corporation, advised the Government Owned Corporations Scrutiny Committee:

> The uptake in solar in the Darwin region is significant ... The Darwin/Katherine installation number for 2013-14 – the number installed was 2425 and that was up from 1715 in 2012-13, so that is a fairly large increase. In Alice Springs from 2012-13 it was 573 and 2013-14, 725, so that is a fairly moderate increase.[209]

4.29 Acknowledging that there was certainly an opportunity for a far greater penetration of rooftop solar PV in the Territory, Mr Noel Faulkner, Board Chairman, Jacana Energy, advised that the increase in installations over the past 12 months has doubled the cost of the FiT to $1.5m per annum.[210] As Mr Faulkner pointed out, the current gross metered 1:1 FiT:

> puts a fairly onerous obligation on us as a retailer because the benefit we derive from a rooftop PV is the avoided cost of generation, which is significantly less than the cost of the total tariff, In a one-for-one we are talking about 25c or 26c per kilowatt hour and the avoided cost of generation is probably more like 6c to 8c, which is in line with feed-in tariff schemes in most other jurisdictions.[211]

4.30 In the absence of any compensation from public funds, the Committee heard that the difference between the FiT rate and the avoided cost of generation is effectively met by non-PV customers. Moreover, if the upward trend in installations continues it will further exacerbate the disproportionate burden the current FiT imposes on other energy consumers without micro generation. As Mr Pearce, Chief Executive Officer Jacana Energy, explained:

> It is cross-subsidisation. We have probably 2500 people getting the benefit of the FiT and probably around 83,000 customers carrying the cost of that. ... As Noel mentioned, the amount we pay in FiTs has doubled in the last 12 months. That is something we probably would not be comfortable with going forward.[212]

The Committee notes that cost pressure from the FiT was highlighted as a key challenge in Jacana Energy's 2015-16 *Statement of Corporate Intent*.[213]

4.31 While not as generous as some of the earlier solar buyback schemes offered in other jurisdictions, the Territory's 1:1 FiT can, nonetheless, be considered a 'premium' FiT since the price paid for exported electricity exceeds the value of that energy in the electricity market. As such, the Committee notes that in accordance with COAG's *Revised National Principles for Feed-in Tariff Arrangements*, the scheme should have been closed to new participants by 2014.[214] If, however, the Government is of the view that it should be retained as

[209] Power and Water Corporation, Committee Transcript, Government Owned Corporations Scrutiny Committee Hearing, 4 June 2015, p.20
[210] Jacana Energy, Committee Transcript, 28 November 2014, p.6
[211] Jacana Energy, Committee Transcript, 28 November 2014, p.6
[212] Jacana Energy, Committee Transcript, 28 November 2014, p.7
[213] Jacana Energy, *Power Retail Corporation trading as Jacana Energy Statement of Corporate Intent 2015-16,* Jacana Energy, Darwin, 2015, p.2
[214] Council of Australian Governments, *Revised National Principles for Feed-in Tariff Arrangements,* Council of Australian Governments, Canberra, 7 December 2012, p. 1

a means of encouraging further uptake of solar PV, the *National Principles* state that such premium schemes must:

a) give explicit consideration to compensation from public funds or specific levies rather than cross-subsidised by energy distributors or retailers; and

b) not impose a disproportionate burden on other energy consumers without micro generation.[215]

4.32 Given the costs of legacy programs in other jurisdictions, it would be advantageous to review the sustainability and operation of the Territory's solar buyback scheme sooner rather than later. In Queensland for example, the penetration rate had reached 21% before the *Solar Bonus Scheme* was closed to new customers in July 2012. As the AEMC pointed out in its *2014 Residential Electricity Price Trends* report, meeting the on-going costs of this legacy scheme is one of the main cost drivers in electricity price increases forecast over the next two years.[216] In 2013 the Queensland Competition Authority found that the distributor funded scheme is expected to cost around $3.4 billion by 2028 when it closes. With costs to be recovered through higher network charges for all Queensland electricity consumers, it is estimated that this will translate into an increase of $67 per annum to the average customer's bill in 2013-14 and up to $276 per annum in 2015-16 before starting to taper off in future years.[217]

4.33 While there was a considerable level of agreement among key stakeholders regarding the need to review the Territory's *1:1 Solar Buyback Scheme*, the Committee was unable to identify the most appropriate agency to lead the review or prepare policy advice on the most suitable FiT arrangements for the Northern Territory.

Recommendation 4

The Committee recommends that the Government, in consultation with the Power and Water Corporation, Territory Generation, Jacana Energy and other relevant stakeholders:

1. **Undertake and publish a review and evaluation of the *Solar Buyback Scheme* currently operating in the Northern Territory.**
2. **Develop and implement a *Northern Territory Policy for Feed-in Tariffs for Micro Generation* in accordance with the *Revised National Principles for Feed-in Tariff Arrangements* that, as a minimum, addresses:**
   a) **methodology for calculating 'fair and reasonable' feed-in tariff rates;**

[215] Council of Australian Governments, *Revised National Principles for Feed-in Tariff Arrangements.* p.1
[216] Australian Energy Market Commission, *Final Report: 2014 Residential Electricity Price Trends,* Australian Energy Market Commission, Sydney NSW, 5 December 2014, p.31
[217] Queensland Competition Authority, *Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland,* Queensland Competition Authority, Brisbane QLD, March 2013, 56-63

b) mandatory requirements to offer feed-in tariffs;

c) independent regulatory oversight of FiT rates; and

d) transitional and legacy arrangements.

3. The Treasurer, as the Regulatory and Shareholding Minister, table copies of the review and *Northern Territory Policy for Feed-in Tariffs for Micro Generation* in the Assembly by June 2016.

Energy Policy

4.34 It was of particular concern to the Committee that key stakeholders were unable to assist the Committee in identifying which agency is responsible for the development and implementation of energy policy advice as it pertains to the electricity market. For example, with regards to changes to the FiT rate, Jacana Energy noted that while they could put forward recommendations:

> at the end of the day it is a question for the shareholder [Shareholding Minister] to decide what prices actually get set ... It is a policy decision on the level of subsidy to encourage those installations.[218]

4.35 Clarification was subsequently sought from the Department of Treasury and Finance who advised that:

> While the Shareholding Minister has legislative authority under the *Electricity Reform Act* to set electricity retail prices he has no legislative authority to set feed-in tariff rates. Hence there is no determination or prescript of a feed-in tariff included in Pricing Orders. However, in practice, it would seem prudent for the retailer (Jacana Energy's Board) to keep its Shareholding Minister informed of any material policy or pricing changes that may impact on the performance of the Government Owned Corporation. As such, we would recommend that Jacana Energy's Board should consult with the Shareholding Minister prior to making any changes to the feed-in tariff. The Shareholding Minister could issue a direction to the Jacana Board (under the GOC Act) to set or amend the feed-in tariff rate but has not issue a direction in relation to the current feed-in tariff.[219]

4.36 Noting that their focus is primarily one of economic regulation of the industry, the Department of Treasury and Finance further advised that the Energy Directorate was probably best placed to undertake a review of the FiT scheme.[220] The Power and Water Corporation was of a similar opinion:

> So it's probably a combination of ourselves, given I guess the technical expertise element around that and Jacana as retailer, or the predominant retailer, and also the energy directorate within the Department of Mines and Energy.[221]

4.37 In its response to the *Energy Green Paper,* the Government noted that it had established the Energy Directorate within the Department of Mines and Energy to:

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[218] Jacana Energy, Committee Transcript, 28 November 2014, p. 8
[219] Department of Treasury and Finance, Answers to Questions Taken on Notice, Public Hearing, 27 March 2015, p.1
[220] Department of Treasury and Finance, Committee Transcript, 27 March 2015, p.11
[221] Power and Water Corporation, Committee Transcript, 20 February 2015, p. 7

> develop a policy framework to ensure optimal resource development and energy security. The Directorate's responsibilities including forming and implementing energy policy advice and regulating the energy supply chain. Regulatory responsibilities do not cover the electricity market.[222]

While this statement would suggest that development and implementation of policy advice pertinent to the electricity market would be within the Directorate's remit, Mr Ron Kelly, Chief Executive Officer, Department of Mines and Energy advised the Committee, that this was not, in fact, the case.[223]

4.38 As this chapter serves to highlight, there are a number of key areas associated with the electricity market reform process that need to be addressed if the Territory is to develop an efficient, equitable and affordable electricity market capable of meeting its future energy needs. The Committee notes that ensuring electricity market reform in the Territory is informed by appropriate and timely policy advice is a critical component in the process.

Recommendation 5

The Committee recommends that the Government give consideration to establishing and resourcing an electricity market reform policy unit within the Energy Directorate that has the capacity, in consultation with key stakeholders, to formulate and implement policy advice as and when required.

[222] Northern Territory Government, *The Northern Territory Government Response to the Energy Green Paper,* p.5
[223] Department of Mines and Energy, Committee Transcript, 27 March 2015, p.4

Appendix 1: Submissions and Tabled Papers

Submissions

1. Mr Kenneth Guest
2. Mr P. Turner
3. Council on the Ageing NT
4. Arid Lands Environment Centre Inc.
5. United Energy Distribution Pty Ltd
6. Australian Energy Regulator
7. Energy Retailers Association of Australia
8. Jacana Energy
9. NT Council of Social Service Inc.
10. Power and Water Corporation
11. Territory Generation
12. Ms Vikki McLeod
13. Energy Networks Association
14. Environment Centre NT

Tabled Papers

TP1 Jacana Energy Presentation (Public)

Note: Copies of Submissions and Tabled Papers are available at:
http://www.nt.gov.au/lant/parliamentary-business/committees/future%20energy/Inquiries.shtml

Appendix 2: Hearings and Briefings

Public Hearings

Darwin, Friday 28 November 2014

- Power and Water Corporation
- Territory Generation
- Jacana Energy
- NT Council of Social Service Inc.
- Council on the Ageing NT
- Environment Centre NT
- Australian Energy Regulator
- Energy Networks Association
- Energy Retailers Association of Australia
- Arid Lands Environment Centre Inc.

Darwin, Friday 27 March 2015

- NT Department of Treasury and Finance
- NT Department of Health
- NT Department of Mines and Energy: Energy Directorate

Private Briefings

Darwin, Friday 20 February 2015

- Power and Water Corporation

Darwin, Friday 27 March 2015

- Jacana Energy

Note: Copies of transcripts are available at: http://www.nt.gov.au/lant/parliamentary-business/committees/future%20energy/Inquiries.shtml

Appendix 3: Summary of International Tariff Structures[224]

Location	Current Residential Tariff Structure Outlined	Possible Reform and Key Commentary
UK	- Two part tariffs - Usage charge either fixed rate or time-of-use	The key agenda for the UK Electricity Market Reform is to provide simple, clear and fair pricing.
Canada	Ontario Two part tariffs Home delivery charge consists of a flat distribution charge depending on location, distribution volume charge (per kWh) and transmission connection and network charge (per kWh adjusted to include estimate of losses). Usage rates either tiered pricing (one step inclining block) or time of use pricing (peak times vary seasonally) Quebec Capacity premium for usage above 50 kW (rate varies seasonally)	Ontario and Quebec utilities have developed slightly advanced tariff structures aimed to be cost-reflective. Ontario's multi-faceted delivery rate system aims to capture the true cost of supplying a certain amount of energy to a household. Ontario's inclined block and time of use pricing also aims to recover costs from customers that use high amounts of energy in peak periods. Quebec's capacity premium charge for high energy users is also aimed at improving cost reflectivity. Both tariff structures discussed do not include time coincident capacity charges. Research indicates that consumers and industry consider the current tariffs adequate.
Italy	- Two part tariffs - Fixed service fee includes a standard service charge and a network charge proportional to contracted capacity (kW). - The usage charge rate increases with higher usage, categorized by four stepped increments. - Compulsory time of use pricing	The tariff structure includes a contracted capacity charge as part of the fixed service fee, which aims to improve cost reflectivity; however does not incorporate energy levels coinciding with peak times. The current debate in Italy regarding the market distortion caused by high solar PV penetration is important for Australia to monitor.
France	- Two part tariffs - Fixed charge termed "annual subscription" (varies according to the contract power rating, kVA) - Usage charge either fixed rate or time-of-use. - Two time-of-use products: 1) daily time periods for peak and off-peak usage 2) day of year categorisation	The French tariff structure shows a notable method of incorporating capacity based pricing with the aim of achieving cost reflectively. Consumers may be initially confused by this type of tariff structure; however, French consumers seem to have adapted over time. Importantly, the tariff structure discussed does not include time coincident capacity charges.
Germany	- Two part tariffs - For E.ON products, the fixed charge and usage rate does not vary with energy use. - For LEW products, the fixed charge varies according to annual consumption.	The current LEW residential tariff structure contains a service charge that increases when annual consumption exceeds a nominated amount. This structure aims to improve cost reflectivity by using high consumption as an indicator for high capacity. Importantly, this tariff structure does not incorporate maximum energy demand or energy levels coinciding with peak times. The current debate in Germany regarding rising energy costs due to high solar PV penetration is important for Australia to monitor.
Belgium	- Advertised as a three part tariff: electricity price, network costs and taxes. - Electricity price consisting of a fixed charge and a usage charge (per kWh). Three usage rates are offered: flat rate pricing, peak and off-peak time of day pricing and night pricing (which can only be installed with certain appliances) - Network costs consisting of a distribution charge (per kWh), metering charge (per year) and transport charge (per kWh).	The Belgian retailer Electrabel has employed time-of-use pricing and night metering for certain appliances. Electrabel has also included network costs relative to usage (per kWh). These initiatives are aimed at improving cost reflectivity; however they do not incorporate capacity charges or maximum energy usage charges. The current challenges facing the Belgium electricity market due to high renewable energy penetration and increasing electricity prices are important for Australia to monitor.
Denmark	- Advertised as a four part tariff: electricity price, network costs, taxes and state fees. - Flat rate usage charges (per kWh) - Network charges include a fixed amount per month and an amount proportional to usage (per kWh). - State electricity tax, also known as the Public Service Obligation, is a compulsory services fee to financially support energy policy programmes in line with public interest.	It is noted that Denmark has not prioritised implementing advanced tariff mechanisms in recent years, such as time-of-use pricing or maximum demand charges. It would be beneficial for Australia to monitor the implementation strategy associated with the upcoming smart meter rollout in Denmark, as well as adjustments to residential tariff structures that follow.
Czech Republic	- Two part tariffs - Distribution charge proportional to the size of circuit breaker and energy usage in "high-tariff" periods. - Price of energy includes a fixed fee and a usage rate for "high-tariff" periods only.	Interesting method of incorporating capacity based pricing and incentivising off-peak electricity usage, with the aim of achieving cost reflectively. There is no active criticism from the media voicing concerns of the tariff mechanism. The ČEZ pilot smart meter rollout indicated a low level of customer interest in the benefits associated with smart metering. This is an important aspect to consider when smart meters rollouts are being deliberated.
USA – Hawaii	- Inclining block tariffs - Time-of-use plus inclining block tariff combination (for customers with time-of-use meters) - Electric vehicle specific tariffs (trial), with time-of-use pricing and inclining block tariff combination - All tariffs include a supply charge (per day) and a minimum monthly charge.	It is beneficial for Australia to monitor the implementation of the upcoming smart meter rollout in Hawaii in light of public concern. The electric vehicle tariff pilot program by HEC is noteworthy and the network impacts should be monitored by Australia as our penetration of electric vehicles increases.
USA – Maryland	- Seasonal flat rate tariff (summer vs. non-summer) - Seasonal time-of-use tariff (summer vs. non-summer) - Trial electric vehicle seasonal time-of-use tariff (reduced off-peak prices) - Demand response tariffs: 1) Critical peak pricing days 2) Remote operation of heating and air conditioning - Tariffs include minimum charge, time-of-use periods change depending on season	BGE's Smart Energy Rewards program has been very successful in signing up customers to participate in demand response. It has also helped customers see the value in smart meters.

[224] Lampard, M., and Aspinall, M., *Managing Energy for Our Future: Power Pricing Internationally – Learnings for Australia,* AECOM Australia Pty Ltd., Melbourne VIC, June 2014, Appendix A

Location	Current Residential Tariff Structure Outlined	Possible Reform and Key Commentary
Spain	- Two part tariffs - Capacity charge (kW) - Usage charge (flat rate or time-of-use option, varies seasonally)	Spain uses a supply charge proportional to the household power rating. Consumers are able to contact their suppliers and request for their household power rating to be upgraded or downgraded (in increments of 1.1 kW). This empowers consumers to consider their impact on the electricity grid, and smooth out simultaneous demand.
South Korea	- Two part tariffs - Capacity charge (kW) - Usage charge (inclining block, or seasonal time-of-use) - Electric vehicle tariffs with off-peak rates - Demand management optional tariff, which includes critical peak pricing	The South Korea example provides seemingly contradictory message on cost-reflective pricing. While a complex tariff structure has been arranged to pass through price indicators of market conditions, a political reluctance to pass through increases in electricity prices has led to significant financial losses. Additionally, artificially suppressed prices diminish the business case for energy efficient practices and projects.
South Africa	- network access charge (per day) - service charge (per day) - environmental levy (per kWh) - energy usage charge (per kWh, priced over 2 inclining blocks) - Controllable load options - Critical peak day program (trial)	Eskom is taking a new approach, viewing consumers as active partners in the market. The new critical peak day pricing aims to empower customers to become active participants in demand response to aid energy security. Australia has the same potential to utilise electricity consumers to become active energy savers.
Japan	Capacity charge (per kVA), which a contracted amount representing a maximum allowable draw from the grid, managed by circuit breaker settings which automatically cut power if the maximum demand is exceeded An energy usage charge (per kWh) A levy for renewable energy policy cost recovery (per kWh)	In Japan, the use of capacity charges is standard practice, which encourages users to minimise their impact on electricity grid. TEPCO is actively looking for ways to promote reduced demand by advocating energy efficiency and demand side response. It would be advantageous for Australia to monitor future progress in the Japanese electricity network.
New Zealand	Contact Energy offers two part tariffs consisting of a fixed daily charge and a usage charge. There are four different arrangement of this type of tariff, including: Anytime use (per kWh) Low user (cheaper per day charge , more expensive per kWh charge to encourage energy efficiency) Discount tariffs, where the utility can turn off selected appliances (typically hot water) Day/night tariffs (two time time-of-use)	New Zealand has a similar cultural context to Australia, and hence it is very relevant for Australia to observe trends in the New Zealand electricity market, initiatives and consumer response. New Zealand's controllable load discount tariffs are noteworthy. New Zealand has a progressed rollout of smart meters and time-of-use pricing. Opt-in time-of-use tariffs are the most effective and simple method of realising behavioural change without raising equity concerns.
USA – California	- Tiered Base Plan (i.e. inclining block tariff) - Residential time-of-use - Electric Vehicle Base Plan (time-of-use, no usage tiers) - SmartRate Add-on (critical Peak Pricing)	Price increase restrictions on tiered pricing structures led to very large prices for large energy consumers (i.e. usage above the first 2 cost-controlled tiers). This is evidence of the potential snow-balling effect of over-regulation and enforcing non-cost reflective pricing. Recent reform to reduce the price gap between inclining blocks was passed in the Californian Senate with overwhelming support (33 votes to 5). Time-of-use pricing tariffs are widely available in California, but they typically come with bill insurance or a grace period. This "no-risk" model appears to be an effective way of addressing public concern regarding time-of-use pricing.

Source: AECOM Australia Pty Ltd[225]

[225] Lampard, M., and Aspinall, M., *Managing Energy for Our Future: Power Pricing Internationally – Learnings for Australia,* AECOM Australia Pty Ltd., Melbourne VIC, June 2014, Appendix A

Appendix 4: National Principles for Feed in Tariff Arrangements

Council of Australian Governments Meeting

Canberra, 7 December 2012

National Principles for Feed-in Tariff Arrangements

Micro generation to receive fair and reasonable value for exported energy

1. Governments agree that residential and small business consumers with grid connected micro generation[226] should have the right to export energy to the electricity grid and market participants should provide payment for exported electricity which reflects 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.

Any premium rate to be jurisdictionally determined, transitional and considered for public funding

2. That any jurisdictional or cooperative decisions to legislate rights for micro generation consumers to receive more than the value of their energy must:

    a) be a transitional measure (noting that a national emissions trading system will provide increasing support for low emissions technologies), with clearly defined time limits and review thresholds and be closed to new participants by 2014;

    b) for any new measures, or during any reviews of existing measures, undertake analysis to establish the benefits and costs of any subsidy against the objectives of that subsidy (taking into account other complementary measures in place to support micro generation consumers);

    c) give explicit consideration to compensation from public funds or specific levies rather than cross-subsidised by energy distributors or retailers; and

    d) not impose a disproportionate burden on other energy consumers without micro generation.

SCER to ensure fair treatment of micro generation

3. That the Standing Council on Energy and Resources (SCER) should maintain regulatory arrangements for micro generation customers, consistent with the objectives of the relevant electricity legislation, whereby the:

    a) terms and conditions for compliant micro generation customers should be incorporated into the regulation of the minimum terms and conditions for retail contracts such that they are no less favourable than the terms and conditions for customers without micro generation;

[226] These national principles apply to grid connected micro generation compliant with the relevant Australian Standard (AS4777).

b) connection arrangements for micro generation customers should be standardised and simplified to recognise the market power imbalance between micro generation customers and networks; and

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

FiT policy to be consistent with previous COAG agreements (particularly the Australian Energy Market Agreement and COAG complementary principles)

4. That the arrangements for micro generation consumers by SCER and jurisdictions:

   a) should not deter competition for their business from electricity retailers in jurisdictions where there is full retail contestability and innovation in the tariff offerings available to micro generation customers;

   b) in relation to jurisdictions in the National Electricity Market (NEM), should not interfere with the regulation of distribution tariffs or operation of the NEM under the National Electricity Law or duplicate the regulatory arrangements that are part of that Law;

   c) should be subject to independent regulatory oversight according to clear principles; and

   d) should be consistent with implementation of other intergovernmental agreements relating to energy, competition policy or climate change. [227]

[227] Standing Council on Energy and Resources, *Revised National Principles for Feed in Tariff Arrangements,* Council of Australian Governments, Canberra ACT, December 2012

Appendix 5: State and Territory Feed-in Tariffs[228]

Jurisdiction	Scheme Name	Rates c/kWh	Details of operation or scheduled changes
ACT	Solar buyback scheme	7.5	ActewAGL tariff. A very small number of customers may be with other retailers.
NSW	Feed-in-tariffs for surplus generation	4.9 – 9.3 (2014-15)	The benchmark range, determined by IPART, is a guide to retailers and customers on the likely value of electricity exported to the grid by customers from their solar PV and is not compulsory. Electricity retailers in NSW have the flexibility to set their own feed-in-tariffs.
NT	Gross feed-in-tariff	27.13	Maximum connection size is 4.5 kW.
QLD	Feed-in-tariff	8	Mandated feed-in-tariff for customers in regional Queensland (outside the Energex supply network) set by the Queensland Competition Authority based on the market value of the electricity exported. For South East Queensland (covering the Energex supply network), electricity retailers can set and pay their own feed-in-tariffs.
SA	Minimum retailer payment	7.6	All residential and small business PV customers can receive a minimum retailer-paid feed-in-tariff from their retailer for the calendar year 2014. Rate will decrease to 6 c/kWh upon the repeal of the carbon tax.
TAS	Feed-in-tariff	6.1	This rate is from 1 July 2014 and is set by the Tasmanian Economic Regulator.
VIC	Feed-in-tariff	8	Must be offered as a minimum tariff by all retailers with more than 5,000 customers. The rate will decrease to 7.4 c/kWh upon the repeal of the carbon tax, and to 6.2 c/kWh from 1 January 2015. The tariff is available to solar and other eligible forms of renewable energy, such as wind, hydro or biomass, with a system size less than 100 kW. The tariff will also be open to other low emission technologies, but at the time of writing these technologies have not been announced.
WA	Renewable Energy buy back scheme	8.85	Mandated scheme for customers in the SWIS.

Note: Following removal of the carbon tax and taking into consideration recent price increases, as of 1 January 2015 domestic customers in the Northern Territory are currently eligible for a flat buyback, or 1:1 rate of 26.88 cents/kWh.

[228] D., Warburton AO LVO et. al., *Renewable Energy Target Scheme,* p.96

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