



**REC AGENTS ASSOCIATION
(RAA)**

RESPONSE

TO

**THE CLIMATE CHANGE AUTHORITY'S
STATUTORY RENEWABLE ENERGY
TARGET REVIEW**

14 SEPTEMBER 2012.

REC AGENTS ASSOCIATION RESPONSE TO THE CLIMATE CHANGE AUTHORITY'S STATUTORY RENEWABLE ENERGY TARGET REVIEW SEPTEMBER 2012.

1. INTRODUCTION

1.1 The REC Agents Association¹.

The REC Agents Association (**RAA**) was established in late 2011 by a group of some of the largest independent traders of Renewable Energy Certificates (**RECs**) in Australia as a national not-for-profit industry association. The RAA represents agents registered with the Clean Energy Regulator (**CER**) that creates RECs and other environmental certificates.

The RAA defines, encourages and promotes best practice in the REC industry to new and potential REC Agents as well as other stakeholders primarily through the Committee of Management ensuring its members adhere to its Code of Conduct and Accreditation requirements.

The RAA has been established to allow for different levels of membership from Gold, Silver, Associate and General membership levels to allow for all REC Agents to become members and work towards accreditation.

1.2 Outline of RAA's Response

RAA is delighted to respond to the Renewable Energy Target Review (Issues Paper) August 2012 as part of the Climate Change Authority's (**CCA**) statutory review of the Renewable Energy Target (**RET**) implemented pursuant to the Renewable Energy (Electricity) Act 2000 (**RE Act**) and the Renewable Energy (Electricity) Regulations 2001.

In support of our submission we have also included the following supporting documents:

- Impact on electricity prices (**Attachment 1**);
- RAA Fact Sheet 1 – Solar Systems creating RECs (15 August 2012) (**Attachment 2**); and
- Report: Impact of Market Based Measures on NEM power Consumption (June 2012) (**Attachment 3**).

RAA has specifically focused its submission on the Small-scale Renewable Energy Scheme (**SRES**) and we believe that the SRES is successfully working to deliver on the "objects" of the RE Act² namely:

- To encourage the additional generation of electricity from renewable sources; and
- To reduce emissions of greenhouse gases in the electricity sector; and
- To ensure that renewable energy sources are ecologically sustainable,

¹ See: <<<http://www.recagents.asn.au>>> last accessed 13 September 2012.

² s.3 of the Renewable Energy (Electricity) Act (Cth) 2000

through the issuing of certificates for the generation of electricity using eligible renewable energy sources and requiring certain purchasers (**Liabe Entities**) to surrender a specified number of certificates for the electricity they acquire during a year.

RAA supports the Government's appreciation of the need to continue to support the SRES by its position that if the uptake of small-scale technologies is greater than anticipated, the Large-scale Renewable Energy Target (**LRET**) will not be reduced³.

RAA also takes comfort in the Howard Government's endorsed Tambling Review (2003), which categorically endorsed the position for a fixed GWh target in order to reduce market and investment uncertainty. With the 2020 electricity demand unknown, the uncapped nature of the SRES and the future output of pre-1997 capacity (mainly hydro strongly affected by rainfall), it is in RAA's view dangerous to review the output of the RET at a point in time as justification for reducing the output of renewable energy under the RET from the current targets. Due to these uncertainties, the current RET target could be less than 20% of electricity generation, especially if GDP growth and electricity consumption increases noting that we are about to enter into an El Nino weather pattern which is likely to increase consumption⁴ and reduce the level of rainfall and subsequent hydro generation from pre-existing generators.

The fact that electricity demand has decreased recently is positive from many perspectives, however, the very nature of the electricity market is uncertain as is historically proven with many factors contributing to demand reductions.

RAA believes that the RET is complementary to the:

- Carbon Pricing Mechanism (**CPM**) in that the CPM incentivises the lowest form of abatement of GHG gases, not necessarily renewable energy generation. With the removal of the "floor price" from 1 July 2015, the top up benefit of the RET to deliver renewable energy is even more important as there is increased uncertainty of the carbon price during the flexible price period which is likely to place pressure on the "objects" of the RE Act; and
- the Clean Energy Finance Corporation (**CEFC**) because with an oversupply of RECs, liable parties have not been required to enter into Power Purchase Agreements (**PPAs**) in any meaningful way. Further, the liable entities are likely to only enter into PPAs from established technologies such as wind generation and thus other technologies will not receive funding support and diversify Australia's electricity mix without the CEFC funding.

As a general comment about the RET, the RAA believes that a transparent, long living and clear (**TLC**) approach to the RET should be endorsed by the Government to ensure private sector investment in the industry continues to enable the "objectives" of the RE Act to be achieved and to facilitate the delivery of the environmental, equitable and economic returns to the Australian public and Australian Government.

2. SRES SCHEME PERFORMANCE

2.1 Introduction

The SRES has been successful in developing the solar industry in Australia. It has

³ Australian Government, "Enhancing the Renewable Energy Target Discussion Paper" March 2010.

⁴ Australian Government Climate Change Authority, "Renewable Energy Target Review, Issues Paper, August 2012" at 23.

resulted in more than 1.5 million solar systems being installed across the country with nearly one in five families having embraced solar.

The cost of solar PV systems has reduced considerably over the last few years with around 2,200 MW of PV capacity expected to be installed by end of 2012⁵.

The roll-out of solar has led to a material reduction in electricity consumption which in turn has contributed to a reduction in wholesale electricity prices.

The SRES has largely worked as expected and is assisting households, small businesses and community groups with the upfront cost of installing small-scale renewable energy systems. The importance of the SRES should not be underestimated because prior to the SRES, small-scale renewable energy systems could not attract funding from financiers due to transactional costs and scale. The rationale for creating the SRES scheme (the RET was split into the large-scale and small-scale components from 1 January 2011) was to have an uncapped scheme with a fixed price. Control over a possible cost blow-out was through the ability of the Minister to reduce the \$40 Clearing House (CH) price.

The SRES was implemented so as to achieve a self-correcting target over a two-year period. It was critical to set an annual target (in advance) to enable liable parties to recover the cost of acquiring the small-scale technology certificates (STCs) from their customers. The CH was to operate as a fall-back and the \$40 would only effectively be received once the supply of certificates was close to the target.

The dramatic reduction in the cost of Solar PV, the solar credits multiplier and delays in the winding back of state feed-in tariffs (FITs) has meant that over the last two years the level of PV installations has significantly exceeded expectations. Due to the leveraging impact of the solar credits multiplier that applies to PV a significant STC oversupply has resulted. The oversupply of STCs has meant that the STC price has been considerably below the \$40 CH price.

2.2 STC price lower than one would expect due to regulatory risk

As the STC target is self-correcting over a two year period one would expect that the spot STC price would be higher and the discount to the CH price of \$40 explained by the interest cost of holding or banking certificates. The spot price over the last three months has ranged from \$26 to \$31. As an example, if we expected the market to get back into balance (i.e. CH to settle) say in two years – then at a 6% interest rate (cost of carry) we would expect the spot price to be \$36.

The significantly lower price can be explained by:

- Regulatory risk around possible changes to the SRES scheme (eg. that might arise as a result of the RET review);
- Risk around the Minister reducing the \$40 CH price;
- Risk that STC target setting process continues to understate actual STC creation; and
- Short term market factors due to trading strategies of market participants.

Perceived issues or problems around the STC market include the following:

⁵ RAA Research Notes No.2 & 3 to be provided separately.

- Inability to predict the dramatic reduction in the installed costs of PV (this has caught policy makers by surprise);
- State policy settings (e.g. FiTs) being wound back too slowly (in response to fall in installed PV costs);
- Regulatory risk associated with possible changes to the STC scheme (including reduction in \$40 clearing house price); and
- Systemic understating of target.

The solar credit multiplier has now reduced to two (2) times, and will step down to one (1) times by 1 July 2013. The 2012 STC oversupply will be absorbed into the target next year and all states have now wound back their FiTs. The first two issues above have now been effectively dealt with. With a one (1) times multiplier from 1 July 2013 the STC supply and demand balance is not likely get materially out of balance compared to that seen over the 2011-2012 period.

Therefore, the RAA believes that very little needs to be done to ensure that the SRES works and achieves its objectives (including the operation of the CH). The key remaining issues are then to reduce regulatory risk around the scheme and to achieve a more accurate target setting process.

The RAA's core recommendations to reduce regulatory risk:

- Remove requirement for a two year review – the timing for any formal review process should be a minimum of four years and then matters to be reviewed should be quite narrow and specific. The objective being to provide a framework that minimises uncertainty and supports long term investment;
- Remove the ability for the Minister to reduce the \$40 CH price. A review of the appropriateness of the CH price could be included as part of any formal review process with a minimum of 12 months' notice of any changes in the CH price and a requirement that anyone that has submitted STCs into the CH should not be disadvantaged;
- Improve the accuracy of the STC target setting process through:
 - including pending registration STCs as part of the surplus that is carried forward into the following years target⁶. This change may not involve changes to the RET legislation;
 - making allowance for Section 38 AF of the RE Act revisions by revising upwards by 5% each of the quarterly targets. Under section 38 AF of the RE Act, Liable Parties are able to request a reduction in their liability if they can demonstrate that their electricity sales in the current year will be less than the previous years. This means that less STCs get surrendered on a quarterly basis. In 2012 as an example, we expect that quarterly surrenders will be 5% less and that the final square up in February 2013 will be 20% - not 15%.

⁶ STCs submitted for registration before 31 December can be used to meet the Liable Parties' February 14 surrender requirement (when approved) however these certificates are not included in the calculation of the surplus that is carried forward into the following year.

2.3 Cost of the SRES Scheme

Concerns over rising residential electricity prices have focused attention on the cost of so called “green schemes”. On analysis of the composition of electricity prices detailed in the Report at Attachment 3⁷ it was network charges that had increased dramatically recently with the cost of renewables and other schemes accounting for only 5.4% of the residential electricity price. Further discussion of electricity prices is included as Attachment 1.

In a paper prepared for the RAA (provided separately to this submission) the average cost of meeting the STC scheme has been around \$30 per STC, which is significantly less than the \$40 CH price. The cost to consumers is expected to peak in 2012 at 2.7% of retail prices then is expected to reduce significantly over the next three years as the solar credits multiplier gets wound back to less than 1% of retail electricity prices.

Electricity consumers will also benefit from lower wholesale electricity prices (energy component) as the level of electricity consumption has reduced due the roll out of small-scale solar systems. In the three years to the end of 2011 solar systems supported by the RET have been responsible for 2,400 GWh of reduced consumption in the National Electricity Market (**NEM**). This is equivalent to a 1.2% reduction. The contribution from solar is expected to more than double over the next three years to more than 3% of total electricity consumption. This reduced consumption is meeting the “objects” of the RE Act and has obvious environmental, economic and equitable benefits to the Australian public.

2.4 Installations of small-scale renewables

In the RAA Fact sheet on the number of systems creating certificates (Attachment 3) 754,000 solar PV and 744,000 SWH systems had created certificates to 30 June 2012. This amounted to more than 14% penetration for each of PV and SWH when compared to the number of owner occupied detached and semi-detached dwellings (refer to Table 1 below).

When we factor in the PV systems expected to be installed in 2012 (total of 322,000) and the projected level to be installed in 2013 of 230,000 we expect that by end 2013 nearly 1.1 million PV systems will have been installed – equivalent to a penetration rate of 21%.

⁷ Included separately as part of this submission

Table 1 - Systems creating certificates – penetration rates

| | Number of Dwellings | Market Penetration Rate | | |
|--|---------------------|-------------------------|--------------------|-----------|
| | | Solar PV | Solar Water Heater | Total |
| Number of Systems | | 753,844 | 743,842 | 1,497,686 |
| Housing Type | | | | |
| Separate or semi-detached (owner occupied) | 5,235,300 | 14.4% | 14.2% | 28.6% |
| Separate or semi-detached dwellings | 7,479,000 | 10.1% | 9.9% | 20.0% |
| Total Households | 8,398,500 | 9.0% | 8.9% | 17.8% |

Note: Dwelling data from ABS for 2009-10 (2012 Yearbook, 1301.0) and based on 70% of dwellings being owner occupied.

In a report prepared for the RAA (provided separately to this submission) an assessment and evaluation was undertaken of the postcode locations of solar PV and SWH system installations. The analysis found that most solar systems (53%) were installed in regional and rural communities with only 43% installed in the major capital cities (refer to Table 2).

The level of penetration amounted to 13% in the major capital cities of Australia (58% of households) and was 60% greater at 21% outside of the major capital cities.

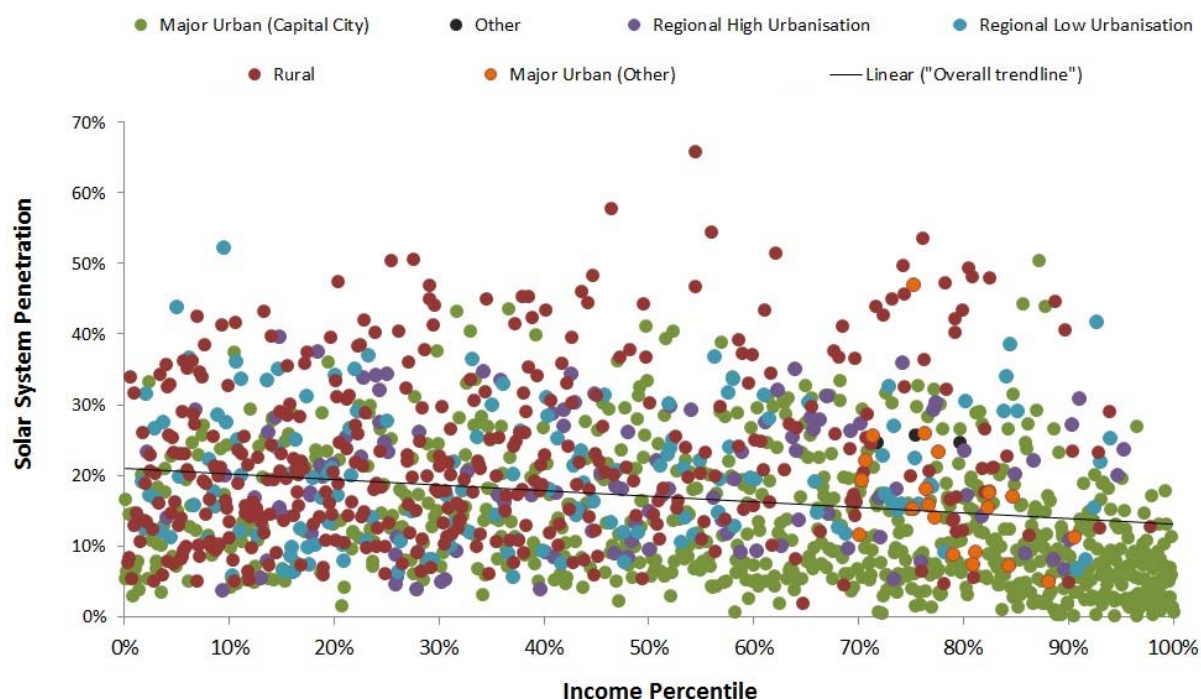
Table 2 – Solar system installation compared to income levels

| Urban Classification | Number of systems | % share of total systems | Number of dwellings | % share of total dwellings | Average penetration | Average Income (per dwelling) |
|----------------------------|-------------------|--------------------------|---------------------|----------------------------|---------------------|-------------------------------|
| Major Urban (Capital City) | 662,240 | 46.7% | 5,068,447 | 57.9% | 13.1% | \$ 69,491 |
| Major Urban (Other) | 191,523 | 13.5% | 1,111,786 | 12.7% | 17.2% | \$ 52,008 |
| Regional High Urbanisation | 221,416 | 15.6% | 1,067,421 | 12.2% | 20.7% | \$ 48,776 |
| Regional Low Urbanisation | 120,404 | 8.5% | 581,306 | 6.6% | 20.7% | \$ 42,985 |
| Rural | 221,584 | 15.6% | 913,519 | 10.4% | 24.3% | \$ 43,119 |
| Other | 1,311 | 0.1% | 5,262 | 0.1% | 24.9% | \$ 54,079 |
| Total Australia | 1,418,478 | 100.0% | 8,747,741 | 100.0% | 16.2% | \$ 60,216 |

Of the systems installed in capital cities, those suburbs with the highest penetration (number of systems installed in suburb divided by the number of dwellings in that suburb) were typically in the outer metropolitan mortgage belt.

The analysis also found that there was a slight inverse relationship between average incomes and solar penetration levels (refer to Figure 1). The suburbs with the highest income levels did not correspond to those with highest penetration, if anything the opposite was more likely. The slope of the line (solar penetration) in Table 3 slopes downwards as income levels increase.

Figure 1 – Solar system installation compared to income levels



A broad range of communities have accessed solar under the RET scheme and the above figures explode the myth that the RET is supporting metropolitan middle class welfare and is evidence of the RET's equitable effectiveness.

3. ANSWERING SPECIFIC CCA QUESTIONS

In the following section we specifically address the questions that the CCA sought comment.

(i) What do you consider to be the costs and benefits of having a separate scheme for small-scale technologies? Should there be a separate scheme for small-scale technologies?

RAA believes that there is no case for the SRES to be rolled back into the LRET. Both the small-scale and large-scale schemes are currently working through an oversupply of certificates and will get back to a more normal form of operation soon.

The nature of investment tends to be different, with the large scale renewable power generation industry making long term investments with certificates created progressively over the life of the project as generation takes place. Residential scale renewables, which receives deemed certificates “up-front” can respond more readily to market prices (for certificates) and conversely changes in supply dynamics can quickly cause changes to market prices.

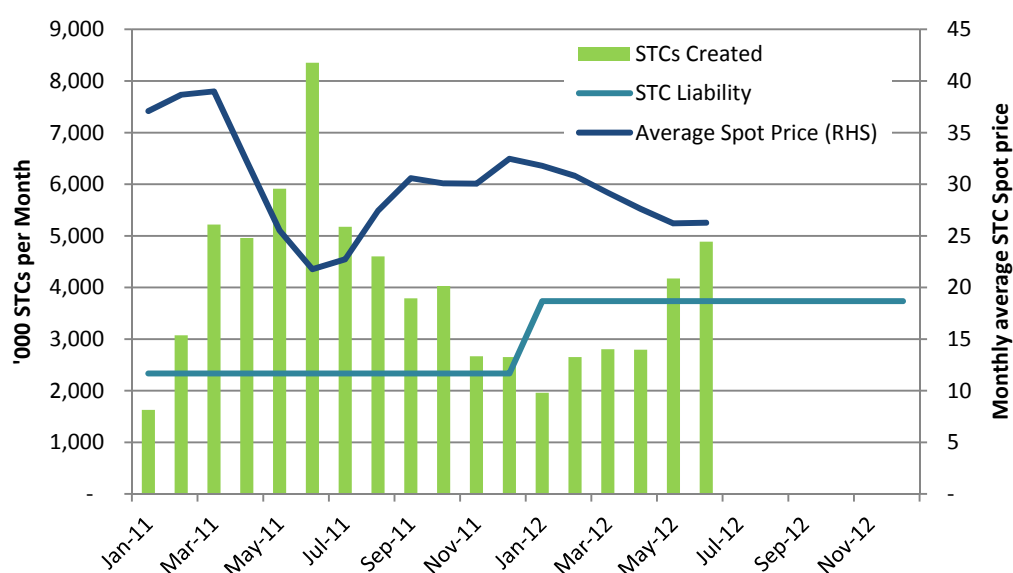
Small-scale energy systems also do not typically require bank funding. Large scale projects on the other hand typically require specific financing arrangements.

- (ii) **Is the uncapped nature of the SRES appropriate? What are the costs and benefits of an uncapped scheme in terms of economic efficiency, environmental effectiveness and equity? Is the SRES driving investment in small-scale energy systems? Is it driving investment in skills?**

RAA believes the uncapped nature of the SRES is appropriate and achieves the policy objectives when the scheme split was announced.

The SRES has largely worked as expected and is assisting households, small businesses and community groups with the upfront cost of installing small-scale energy systems. The rationale for creating the SRES scheme (the RET was split into the large-scale and small-scale components from 1 January 2011) was to have an uncapped scheme that did not constrain the development of the solar industry and a stable price mechanism that reduced volatility in certificate prices. Control over a possible cost blow-out was through the ability of the Minister to reduce the \$40 CH price.

Figure 2 - Systems creating certificates and Spot STC Price



The CH has not come into play in any meaningful way (currently more than 6 million STCs are queued) due to the oversupply of STCs caused by large numbers of PV systems installed, which was exacerbated by the solar credits multiplier (refer to Figure 2). This could not have been foreseen in setting of the STC target. The CH will work when the supply and demand for STCs comes back into balance as the solar credit multiplier reduces.

The SRES and the ability to monetise certificates on a “deemed” basis has supported the large scale roll out of solar PV and SWH systems. On any measure the SRES has been successful and has been embraced by Australians with unparalleled enthusiasm.

Some key dimensions are as follows:

- More than 1.5 million solar systems installed and claiming certificates under the RET by 30 June 2012. This is equivalent to 18% of Australian families having a solar system. (See Attachment 2);

- We expect that 2,200 MW of solar PV will be installed by end of 2012 which will be contributing to reducing peak demand (RAA Research Notes will be provided separately);
- Australia installed more residential rooftop solar panel systems in 2011 than any other country, clearly supporting Australia's response to climate change⁸;
- Solar PV and SWH accounted for nearly 50% of the 3.2% reduction in NEM electricity consumption since 2008 leading to environmental and economic benefits to the Australian public;
- The lower level of power consumption in turn has meant that wholesale power prices have been the lowest they have been for more than 10 years bringing economic and equitable returns to the Australian public;
- The roll-out of around 800,000 SWH systems and 2,200 MW of PV installations by end 2012 will mean that around 4.7 million tonnes per annum of greenhouse gas emissions will be avoided (based on an average emission intensity of 1 tonne per MWh) evidence of the SRES's environmental effectiveness and supporting the Australian Government's response to climate change;
- Peak power consumption will be lower which in turn will result in lower network investments over time which will reduce network charges delivering economic and equitable returns to the Australian public;
- The solar industry currently employs approximately 25,000 people driving an investment in skills from the installation and manufacture through to the financing of such systems, bringing clear economic benefits to businesses, workers and communities;
- Solar has been embraced by the Australian community across the board with in fact more systems installed in regional and rural Australia than in the major capital cities. Solar penetration has been higher in those suburbs with lower incomes. In terms of solar system installations in capital cities, wealthy inner suburban suburbs are under-represented. The suburbs with the greatest level of installations are those in the outer metropolitan mortgage belt. Often stated claims that the RET support for solar amounts to middle class welfare are patently incorrect and not supported by the facts. In fact, the SRES is clearly delivering a clear equitable return to those suburbs by enabling them to reduce their exposure to rising electricity prices.

(iii) What is the appropriate process for considering and admitting new technology to the SRES? Should any additional small-scale technologies be eligible to generate STCs? Is it appropriate to include displacement technologies in the SRES? Should additional eligible technologies be limited to generation technologies?

⁸ See: <<<http://www.recagents.asn.au/gold-medal-for-australian-solar/>>> last accessed 10 September 2012.

RAA believes that the RET should remain as a renewables support measure with “non-renewable” displacement technologies being subject to energy efficiency schemes, either from a national white certificate scheme or relevant state scheme.

RAA supports other small-scale generation renewable generation technologies receiving support under the SRES provided that the compliance arrangements are robust enough and the deeming methodologies properly represent system performance over time.

RAA believes, that a demonstration phase could be introduced to test any new renewable technologies prior to their introduction to the SRES. Initial 5 by 5 year deeming as happens with small wind and hydro could be implemented.

(iv) Is deeming an appropriate way of providing certificates to SRES participants? Are the deeming calculations for different small-scale technology systems reasonable?

RAA believes “deeming” is the best way of providing STCs for small-scale renewable energy technologies. The relatively small system size means that an approach other than deeming would involve significant transaction costs. The RAA draws the CCA’s attention to the changes that were made to deeming for PV back in 2005/6 where 5 years (at a time) deeming was expanded to 15 years, and system size increased from 10kW to 100 kW. Prior to this change only around 5 to 10% of certificates that could be created were ever created due to high transactional costs for the values involved.

Given that Australia has one of the highest penetration rates for solar PV in the world, it is clear that the RET and its “deeming” arrangements have been the most successful policy support measure. Most other countries have FiTs, with very few having “up front” support such as provided by the RET (refer to Figure 3).

Figure 3 – PV Installation by Country (Largest 10 PV Markets)

| 2011 Installations by country | Installed Capacity MW | Residential Proportion MW | Residential Capacity MW |
|-------------------------------|--------------------------|------------------------------|----------------------------|
| Italy | 9,301 | 8% | 744 |
| Germany | 7,500 | 9% | 675 |
| China | 2,200 | 27% | 600 |
| US | 1,867 | 37% | 698 |
| France | 1,634 | 16% | 261 |
| Japan | 1,296 | 90% | 1166 |
| Belgium | 958 | 68% | 651 |
| UK | 899 | 56% | 503 |
| Australia | 865 | 95% | 822 |
| Spain | 345 | 5% | 17 |

Data Sources:

IEA-PVPS (National Survey Reports) www.iea-pvps.org

European Photovoltaic Industry Association - Global Market Outlook (May 2012)

US Solar Market Trend 2011, Interstate Renewable Energy Council (August 2012)

The RAA also believes that the current deeming calculations are reasonable and appropriate and no case has been made to change these.

(v) What are the lessons learned from the use of multipliers in the RET? Is there a role for multipliers in the future?

The “multiplier” has been successfully used to assist with reducing the installed cost for small-scale technologies. The fact that Australia installed more residential solar PV systems than any other country in 2011 is testament to this.

The use of the multiplier has not however been without issue and it is possible in hindsight the 5 times multiplier was too slow in being reduced. The introduction of the “out of pocket expense” provisions allowed the STC to link with falling technology costs as a means of “digression” is prudent.

(vi) Is the STC Clearing House an effective and efficient mechanism to support the operation of the SRES? Should changes be made to the Clearing House arrangements? If so, what would be the costs and benefits of any suggested alternative approaches? Is \$40 an appropriate cap for STCs given the recent fall in cost of some small-scale technologies, particularly PV?

We have made the case in the initial part of this submission that the CH mechanism has worked exactly as it was intended and should be left as it is.

The CH will work when the supply and demand for STCs comes back into balance as the multiplier reduces. A CH type approach is required, as we do not have a fixed annual target.

RAA also notes that financiers now have taken security over STCs under the Personal Property & Securities Act (2009) based on a \$40 price in some instances if the STCs reside in the CH. The removal of the CH or reduction to the CH price is likely to result in an event of default under such security arrangements and lead to financing issues for the parties concerned.

RAA believes the CH should remain unchanged and it will start to settle within the next 9-12 months due to the reduced “multiplier” and progressive winding back of state based feed-in tariffs. Implementation of our recommendations in Section 2.2 of this submission to improve the accuracy of the target setting process would make the CH work more effectively.

(vii) Is \$40 an appropriate cap for STCs given the recent fall in cost of some small-scale technologies, particularly PV?

With the removal of the solar credits multiplier from 1 July 2013 and the reduction in state based feed-in tariffs the level of policy support for solar PV reduces significantly.

Whilst falling installed costs for PV have increased its attractiveness, it is the availability of solar credits and reasonably attractive feed-in tariffs have made solar PV affordable for most Australians delivering equitable results. With rising residential power prices many industry commentators are claiming that PV has or is about to reach “grid-parity”. This does not however mean that PV does not require further support!

The concept of grid parity typically involves discounting the future benefits at some nominal discount rate that perhaps reflects the cost of mortgage financing say around 6 to 7%, which implies a nominal payback period of around 10 years. The

significant reduction in the value of PV electricity exported to the grid in nearly all states now and the move to fixed or demand based pricing (that is hard to avoid by distributed generation) means that effective grid parity is longer away than expected

In any event low up-front cost is a major consideration of system affordability and this is clearly apparent when we consider that most other countries that have feed-in tariffs generally have low levels of residential system installations (refer to Figure 3). This is not to under-estimate the importance of attractive feed-in tariffs as we have seen recently in Queensland.

We have seen other technologies and applications achieve so called “grid parity” years ago but it has only when there has been up-front support through rebates or deemed certificates have we seen customers embrace the activity. Some recent examples are:

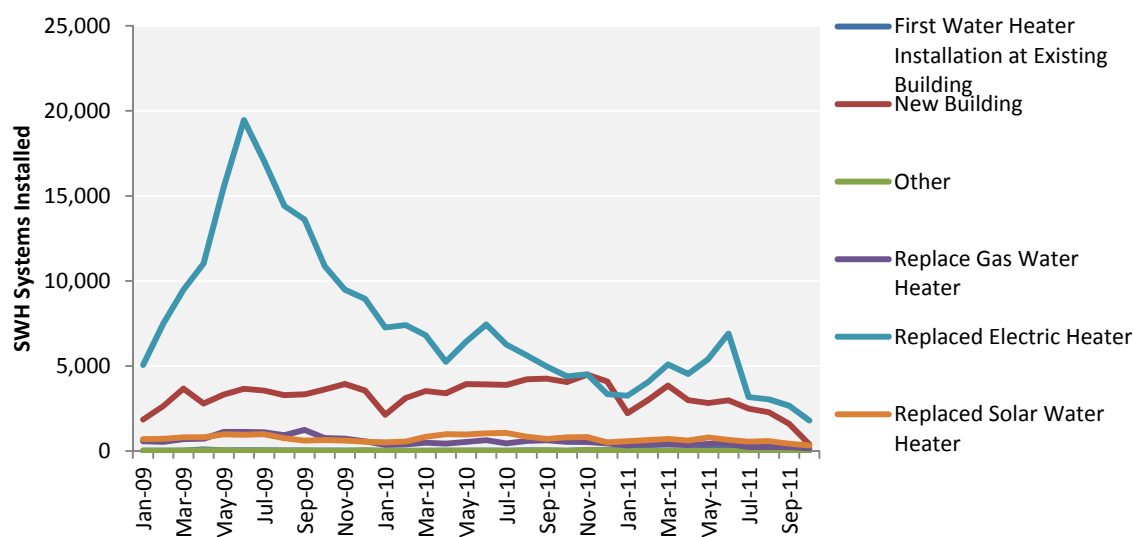
- Efficient residential lighting “CFLs” reached “grid parity” many years ago but it was only when NSW Greenhouse Gas Abatement certificates (and VEECs in Victoria) were available and could be used to significantly reduce or eliminate the up-front cost did we see large scale take up;
- SWH also reached “grid parity” a number of years ago and it was only when (i) rebates were introduced at Commonwealth and State level did the market expand or (ii) new home regulations were introduced. This situation is shown clearly in Figure 4. Once rebates were removed the level of SWH installations reduced markedly. and
- Efficient commercial lighting technologies – “T5s” achieved grid parity years ago but it is only once energy efficiency certificates are available (in NSW and soon in Victoria) that reduce the up-front cost were they be rolled out in any meaningful quantities. New building efficiency standards effectively require these fittings on new buildings.

The issue here is that PV will face the type of barriers that other energy efficiency technologies face (high up-front costs, split incentives etc.). This will make it more difficult to sell PV systems when the up-front cost increases with the removal of solar credits. As a result without policy support a sub-optimal level of investment will take place.

It is likely that PV installations will track what has happened to SWH installations as the multiplier reduces. When we track the number of PV systems installed in 2011 that created certificates we see a massive reduction in installation levels once the multiplier is reduced from 5 times to 3 times (refer to Figure 5). The same outcome is currently being observed for 2012 installations from July when the multiplier reduced from 3 times to 2 times;

Figure 4 - SWH system installations by system type

(Source: Green Energy Markets Report on STC Modelling for ORER, November 2011)

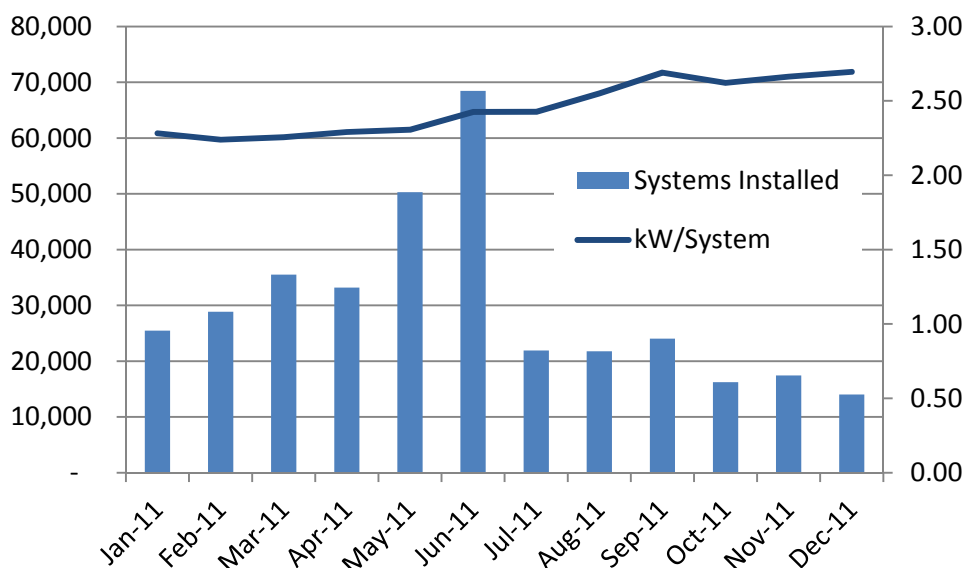


Note: certificates can be created up until 12 months after installation so figures in later months are incomplete

The RAA believes that the \$40 is an appropriate cap to ensure that a sustainable level of solar installations take place.

Figure 5 - PV system creating certificates by installation month during 2011

(Source: CER, Postcode Data, July 2012)



The RAA believes that the minimum ongoing level of certificate creation for small-scale technologies should be based on delivering a sustainable level of annual installations of PV and SWH. Recent activity suggests that this should be at least 300,000 solar systems per annum (based on 200,000⁹ PV systems and 100,000 SWH systems). Any ongoing

⁹ Average system size of around 2.5 kW

consideration of future renewables target needs to ensure that at a minimum this level is allowed for.

(viii) Are the SRES administration arrangements appropriate and working efficiently?

The RAA believes that the administration and compliance arrangements are working very well. The compliance and inspection arrangements have also worked well to ensure high levels of compliance and good quality installations.

The only suggestion we make relates to concerns around improving the accuracy of the STC target setting process (refer to section 2.2 of our submission).

(ix) What is the appropriate frequency for reviews of the RET? What should future reviews focus on?

RAA believes the RET review should be extended from 2 to a minimum of 4 years. The current 2 year review increases investment uncertainty for the renewable energy industry.

ATTACHMENT NO. 1

IMPACT ON ELECTRICITY PRICES

Forecast residential electricity price rises

RAA acknowledges that the renewable energy component of national “domestic” electricity prices is “projected” to increase electricity costs for retail consumers for 2013/14 by:

- (a) 3.8% for the LRET; and
- (b) - 0.8% for the SRES.

By far the largest contributor to retail electricity price increases is projected to be (with a carbon price):

- (c) Distribution costs (33.6%);
- (d) Wholesale costs (40.2%) (Generally set by the jurisdictional regulator: save WA, NT and Vic); and
- (e) Retail costs (12.1%)¹⁰.

Wholesale and Retail Electricity Prices

The SRES is “projected” to exert downward pressure on the price paid for energy by domestic consumers. Compliance costs for the liable parties will further reduce as the “multiplier” and “feed-in tariffs” are reduced leading to reduced wholesale and retail costs.

Wholesale energy costs reflect the costs incurred by the retailers in purchasing electricity from the National Electricity Market (**NEM**) and managing the associated risks. Some jurisdictional regulators have indicated that these rising wholesale costs are attributed to:

- Changes in the generation mix;
- Increasing natural gas prices (unrelated to the SRES);
- Financing risks associated with the uncertainty of carbon pricing (hopefully now resolved); and
- Price volatility.

So, one may argue that with the carbon price having been implemented, wholesale prices should stabilise or reduce in the future as the uncertainty has reduced. In NSW, South Australia, Queensland and the ACT a retail margin of around 5% on all costs (including wholesale costs, retail operating costs and network costs) has been determined by the jurisdictional regulators. The retail cost generally comprises 13% of the total residential electricity price as set by the jurisdictional regulator¹¹.

¹⁰ Australian Energy Market Commission, “Final Report: Possible Future Retail Electricity Price Movements – 1 July 2012 to 30 June 2014” 25 November 2011 at 6. (Table 2).

¹¹ Australian Energy Market Commission, “Final Report: Possible Future Retail Electricity Price Movements – 1 July 2012 to 30 June 2014” 25 November 2011 at 14,

It is claimed that the cost of STCs increases the wholesale costs, however RAA notes that¹²:

- some jurisdictional regulators have allowed a pass-through of the CH price of \$40 – however, we note that the average cost of STCs purchased by retailers has been 25% less than this at around \$30 over the past 12 - 18 months. As that CH has rarely been used, there appears to have been a misunderstanding by the jurisdictional regulators on how the SRES works leading to a pass through in excess of real cost;
- the SRES (in conjunction with the NSW/Vic Energy Savings Schemes) have saved 3,455 GWh of electricity in 2001 leading to a 1.7% in total electricity consumption and this contribution to reduced power consumption is set to treble over the next three years¹³;
- with the reduction of the SRES “multiplier” and state FiTs, wholesale prices are expected to reduce;
- vertical integration between generators and retailers is being used as an alternative to manage the risk of “spot” price volatility (traditionally managed through entering into hedging contracts with each other and through the Sydney Futures Exchange) which is reducing liquidity and contracting options in futures markets – driving up energy costs for independent retailers and may pose a barrier to entry and expansion for both independent generators and retailers)¹⁴;
- strategic bidding on the NEM (i.e. prices not reflecting the underlying cost of generation) in some instances using re-bidding large amounts of capacity at times of high wind generation and low demand driving the spot price close to the market floor price causing other generators (including wind farms) to shut down¹⁵; and
- the RET actually places some downward pressure of wholesale costs partially offsetting the RET compliance costs¹⁶.

The AER note that the big three retailers now jointly supply over 80% of small electricity retail customers, and they control almost 30% of generation capacity in the mainland regions on the NEM¹⁷.

¹² Australian Energy Market Operator, “2012 Electricity Statement of Opportunities for the National Electricity Market” at Figure 2-3.

¹³ See: <http://www.recagents.asn.au/category/news/media-releases/> last accessed 5 September 2012.

¹⁴ Australian Energy Regulator, “State of the Energy Market 2011” at 4.

¹⁵ Australian Energy Regulator, “State of the Energy Market 2011” at 4 & 14.

¹⁶ Australian Energy Market Commission, “Final Report: Possible Future Retail Electricity Price Movements – 1 July 2012 to 30 June 2014” 25 November 2011 at 3.1.4.

¹⁷ ¹⁷ Australian Energy Regulator, “State of the Energy Market 2011” at 12.

Transmission and Distribution Costs

We note that “distribution” costs have increased dramatically due to both increasing levels of capital works and increases in the cost of undertaking those works. Current energy network expenditure for the current 5 year regulatory cycle is running at historical levels: over \$7 billion in electricity transmission, \$35 billion in electricity distribution and \$3 billion in gas distribution. These costs represent an increase on investment in the previous regulatory periods of around 82 per cent in electricity transmission, 62 per cent in electricity distribution and 74 per cent in gas distribution. This investment is being driven by: more rigorous licencing conditions; load growth and rising peak demand; new connections; and ageing assets. The increase in costs is partly driven by the higher cost of capital post GFC and operating/maintenance costs¹⁸

We highlight that the Australian Energy Regulator (**AER**) has raised concerns with the current regulatory framework leading to price increases that are difficult to justify and submitted a draft change to the National Electricity Rule (**NER**) in 2011 to the Australian Energy Market Commission (**AEMC**) which has consulted and now published its draft determination and rule changes rules on 23 August 2012 for consultation until mid September 2012 with a final determination made by October 2012¹⁹.

The input costs for these upgrades (i.e. aluminium, steel, and copper) are forecast to increase – however, this may change due to the reduction in commodity prices from China possibly leading to lower domestic prices.

Transmission costs drivers are similar to the drivers for the distribution section.

¹⁸ See: <<<http://www.aer.gov.au/sites/www.aer.gov.au/files/State%20of%20the%20energy%20market%202011%20-%20complete%20report.pdf>>> at Figure 1 last accessed 4 September 2012.

¹⁹ See: <<<http://www.aemc.gov.au/Electricity/Rule-changes/Open/economic-regulation-of-network-service-providers-.html>>> last accessed 27 August 2012.

ATTACHMENT NO. 2

**RAA FACT SHEET – SOLAR SYSTEMS CREATING
RECS (15 AUGUST 2012)**

FACT SHEET No 1

Updated: 15 August 2012



Solar Systems creating RECs

Highlights:

- 1.5 million solar systems installed and creating Renewable Energy Certificates (RECs)
- 1,700 MW of installed PV capacity
- nearly 18% of Australian families have a solar system

Small-scale renewable energy is supported under the Renewable Energy Target (RET) Scheme and many Australian households have embraced renewable energy by purchasing a solar power or solar hot water system.

The Clean Energy Regulator releases information on the number of systems that have created renewable energy certificates on a quarterly basis. This Fact Sheet will be updated as new information becomes available.

The following figures summarise the number of systems that have created certificates since the RET Scheme came into force on 1 April 2001. Note that not all systems installed will have created certificates so the figures below will understate the level of system installations to date.

Systems creating Certificates

(as at 30 June 2012)

Small Generation Units

| | | |
|----------------------|------------------------|---------------------|
| Solar Panel (Deemed) | 753,844 systems | 1,671,489 kW |
| Wind (Deemed) | 370 systems | 1,326 kW |
| Hydro (Deemed) | 13 systems | 21 kW |
| | 754,227 systems | 1,672,836 kW |

Solar Water Heater

| | |
|------------------------------------|------------------------|
| Solar Water Heater (SWH) - Solar | 590,311 systems |
| SWH - Air Sourced Heat Pump (ASHP) | 153,531 systems |
| | 743,842 systems |

Market Penetration Rate

| | Number of Dwellings | Solar PV | Solar Water Heater | Total |
|--|---------------------|----------|--------------------|-----------|
| Number of Systems | | 753,844 | 743,842 | 1,497,686 |
| Housing Type | | | | |
| Separate or semi-detached (owner occupied) | 5,235,300 | 14.4% | 14.2% | 28.6% |
| Separate or semi-detached dwellings | 7,479,000 | 10.1% | 9.9% | 20.0% |
| Total Households | 8,398,500 | 9.0% | 8.9% | 17.8% |

Note: Dwelling data from ABS for 2009-10 (2012 Yearbook, 1301.0) and based on 70% of dwellings being owner occupied.

The REC Agents Association represents the interests of Registered Agents under the Renewable Energy Scheme. Please refer to our website: www.recagents.asn.au

ATTACHMENT NO. 3

RAA REPORT: IMPACT OF MARKET BASED MEASURES ON NEM POWER CONSUMPTION (JUNE 2012)



Impact of market based measures on NEM power consumption

June 2012

Report for the REC Agents Association and The Energy Efficiency Certificate Creators group

REC Agents Association (RAA)

The RAA was established in late 2011 to represent and self-regulate the activities of businesses that are “Registered Agents” to create and trade in Renewable Energy Certificates and other environmental credits.

www.recagents.org.au

Energy Efficiency Certificate Creators group (EECC)

The EECC was established in 2009 as a forum to represent the interests of businesses that were registered as “Accredited Parties” under the Victorian Energy Efficiency Scheme.

Disclaimer

The data, analysis and assessments included in this report are based on the best information available at the date of publication and the information is believed to be accurate at the time of writing. Green Energy Markets does not in any way guarantee the accuracy of any information or data contained in this report and accepts no responsibility for any loss, injury or inconvenience sustained by any users of this report or in relation to any information or data contained in this report.

1. Summary

Power consumption across the eastern states National Electricity Market (NEM) has reduced over the last three years, falling 6,565 GWh (3.2%) from 207,400 GWh in 2008 to 200,800 GWh in 2011. This seems to have caught policy makers and some industry participants by surprise as the accepted wisdom seemed to be that power consumption would keep increasing in Australia with continued population growth and with continued economic growth.

Commonwealth and state market based schemes that have supported distributed energy technologies have under-pinned the large scale rollout of solar energy and energy efficiency technologies such that these can explain a significant part of the reduction in power consumption. Solar energy installations supported by the Commonwealth Renewable Energy Target (RET) and energy efficiency activities supported by the Victorian and NSW Energy Efficiency schemes are estimated to account for 3,500 GWh or 53% of the reduction in power consumption since 2008. These activities currently account for around 1.7% of total power consumption and this is expected to increase to around 5% by 2015.

| Electricity avoided (GWh per annum) | 2011 | 2015 |
|--------------------------------------|--------------|---------------|
| SWH - RET | 1,181 | 1,839 |
| PV - RET | 1,180 | 3,460 |
| Victorian – Energy Efficiency Scheme | 667 | 3,393 |
| NSW - Energy Efficiency Scheme | 427 | 1,972 |
| Total | 3,455 | 10,664 |

One of the consequences of the reduction in power consumption is that existing scheduled generators have greater competition for being dispatched and as a result the regional reference price across all states has fallen to the lowest levels seen for more than 10 years. The lower regional reference price will progressively flow through to lower wholesale prices so that all customers benefit from the roll-out of solar and energy efficiency activities under these schemes.

It is a different story however with peak demand as continued roll-out of cheap and inefficient air conditioners has driven higher summer maximum demand with peak demand across NEM states expected to increase at around 800 MW per annum (2.4% per annum).

Rising maximum demand and the need to refurbish aging network infrastructure means more than \$40 billion of regulated distribution and transmission expenditure has been committed for the current five year regulatory period. This in turn has driven a dramatic increase in retail electricity prices as regulated transmission and distribution charges make up around 45% of the residential power price. The cost of so called 'green schemes' which includes the RET, energy efficiency schemes and feed-in tariffs accounts for only 5.4 % of the residential price.

Residential electricity prices, according to the Australian Energy Market Commission (AEMC) are expected to increase by 37% over the three year period to 2013/14. The largest contributor to the increase is distribution charges which account for 34% of the increase, the carbon price accounting for 21% and green schemes accounting for only 10%.

2. Introduction

Green Energy Markets (GEM) has been engaged by the REC Agents Association (RAA) and the Energy Efficiency Certificate Creators group (EECC) to assess the impact that market based measures have had on the reduction in power consumption in the National Electricity Market (NEM) over the last three years and to estimate their likely impact over the period to 2015.

In undertaking this assessment GEM has only considered power consumption in the NEM and therefore excluded Western Australia, the Northern Territory and off-grid power consumption.

The market based schemes and activities that we have considered are:

- Solar PV and solar hot water installations supported under the Commonwealth's Renewable Energy Target (RET)
- Energy efficiency activities supported under the Victorian Energy Efficiency Scheme
- Energy efficiency activities supported under the NSW Energy Efficiency Scheme

In this report we have expressly excluded consideration of energy efficiency and distributed generation activities supported by other programs such as:

- Non-scheduled renewable energy projects supported by the Commonwealth's Renewable Energy Target, these are estimated to have accounted for 1,500 to 2,000 GWh in 2011¹.
- Insulation installed under the Commonwealth's insulation program where more than 1 million homes were insulated with possible annual savings in electricity of around 250 to 300 GWh per annum from 2011.
- More efficient appliances installed as part of Minimum Energy Performance standards

Our approach has been to determine the level of activity that has been supported by the three schemes considered and then determine the level of electricity reduction that can be expected on an annual basis. We have only considered and assessed the activities that have claimed certificates under these schemes and as a result this is a conservative estimate of the contribution of the activities as not all solar energy or energy efficiency installations and activities will claim certificates.

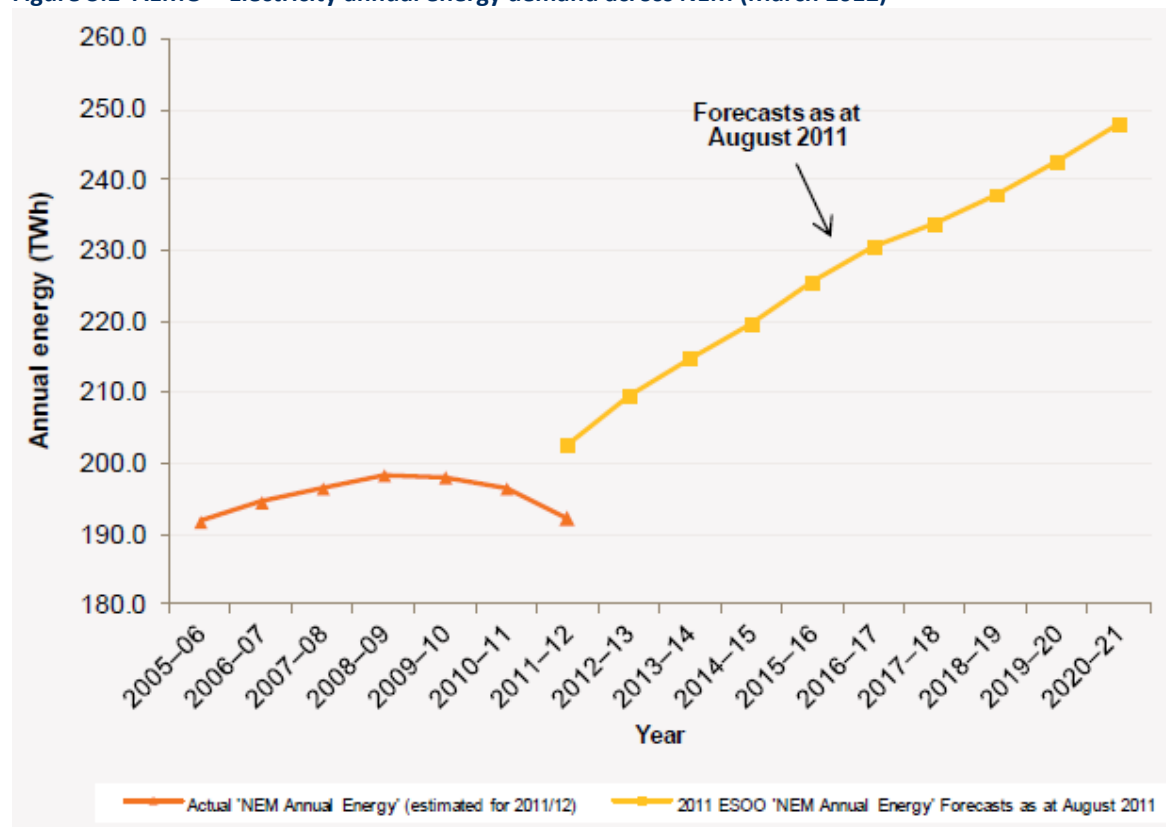
¹ Some of this non-scheduled renewable generation will be included in the Australian Energy Market Operator's power consumption figures.

3. Electricity consumption in the NEM

3.1 Review of AEMO power consumption data

Electricity consumption across the NEM, as measured by Australian Energy Market Operator (AEMO) has been falling for the last four years. AEMO recently published an update to its “Statement of Opportunities” in March 2012 which revised downwards by 5% the expected power consumption for 2011/12. An extract from the report is included as Figure 3.1.

Figure 3.1 AEMO – Electricity annual energy demand across NEM (March 2012)



Forecasts beyond 2011/12 have not been updated although AEMO has advised that it will be changing the way in which it undertakes its projections in future.

“AEMO has changed the way it develops and publishes demand forecasts for the electricity industry. AEMO is for the first time developing an independent set of electricity demand forecasts for each of the five NEM regions.”

In the past – “AEMO developed demand forecasts for South Australia and Victoria, whilst the regional transmission network service providers (TNSPs) developed demand forecasts for the remaining three regions in the National Electricity Market (NEM), namely Queensland, New South Wales (including the Australian Capital Territory), and Tasmania.”

AEMO, Economic Outlook Information Paper – National Electricity Forecasting (May 2012)

Using AEMO data we have analysed electricity consumption across the NEM states on a calendar year basis over the last 10 years (refer to Figure 3.2 and 3.3). Electricity consumption across the NEM had been increasing at around 2% per annum until 2007 and then plateaued and from 2008 has been decreasing. Over the last three years electricity consumption has fallen by an average of 1.1% per annum, with some states such as Victoria reducing by an average of 1.5% per annum. Electricity consumption data by state is included as Attachment 1.

Figure 3.2 Power consumption in NEM states since 2001 (excluding Tasmania)

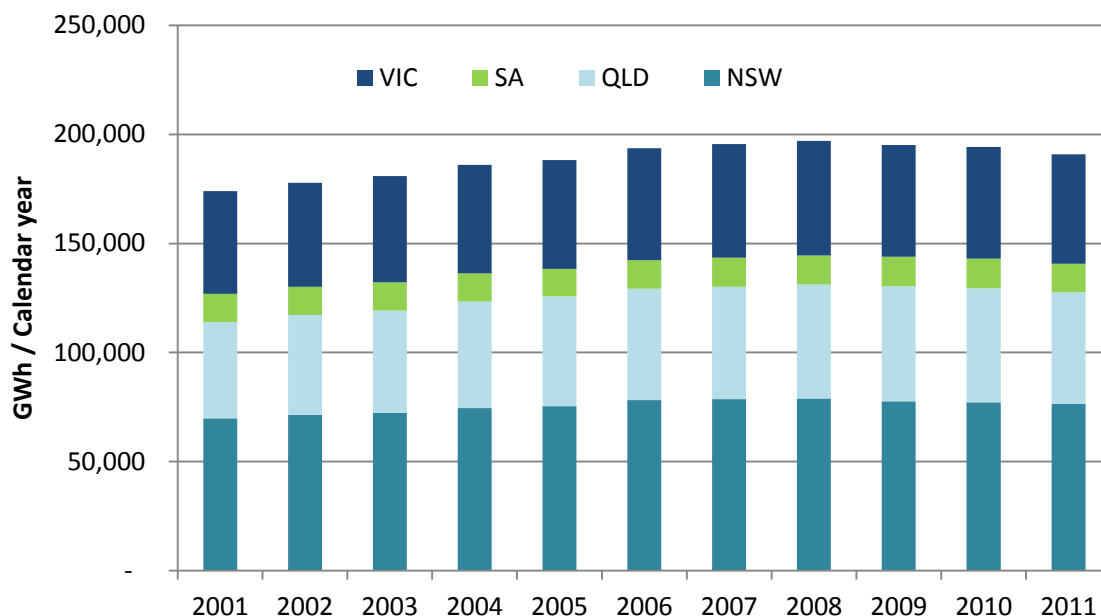
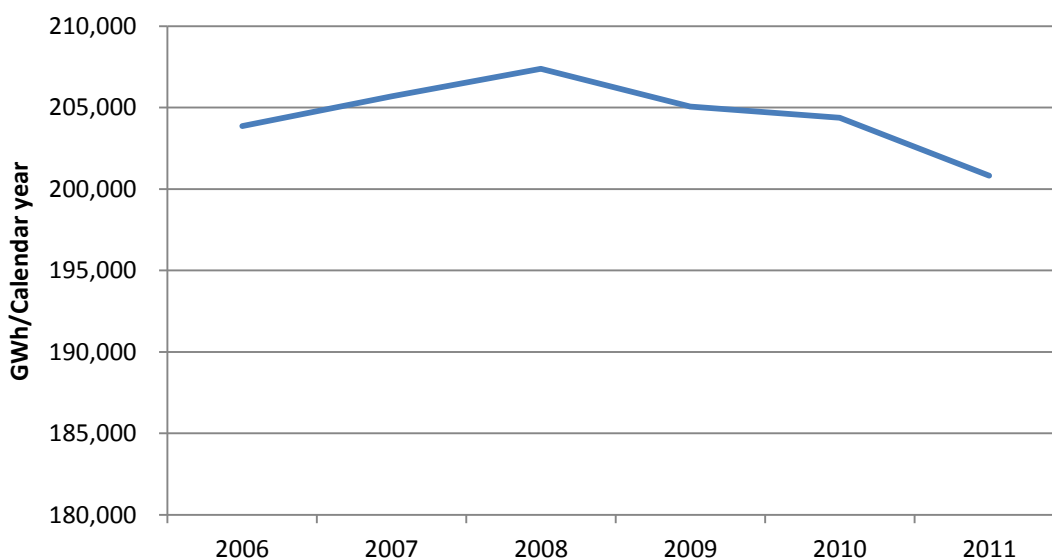


Figure 3.3 Power consumption in NEM states since 2006 (including Tasmania)



The electricity consumption and demand figures published by AEMO essentially represent the level of demand at the transmission system. As such it understates the level of power consumption as the

demand figures also include the impact of smaller generation that is connected at the distribution system.

Calculating energy and maximum demand

The energy projections account for the sent-out energy from scheduled, semi-scheduled, and significant non-scheduled generation. Calculating the amount of energy supplied by generation controlled through the NEM dispatch process (scheduled and semi-scheduled generation) requires subtracting the energy supplied from significant non-scheduled generation.

The MD² projections account for the as-generated demand supplied from scheduled, semi-scheduled, and significant non-scheduled and exempt generation. Calculating the MD supplied by generation controlled through the NEM dispatch process requires subtracting the MD met by significant non-scheduled generation.

AEMO – 2011 Electricity Statement of Opportunities, August 2101

Electricity consumption in 2011 is 6,565 GWh lower than the level three years earlier. There will be a number of reasons to explain this that could include:

- milder weather;
- reduction in industrial energy consumption due to lower manufacturing output³;
- customer response to higher prices by reducing consumption;
- dramatic increase in the level of solar PV;
- impact of a range government programs outlined in Section 2.

Over this period we have however, seen increased population, increases in real GDP and an increase in the number of dwellings.

3.2 Rises in peak demand

In contrast to falling power consumption, the continued roll-out of cheap and in-efficient air conditioners has meant that peak summer demand continues to increase (refer to Figure 3.4). Peak summer demand has increased by around 600 MW per annum to 2011 and AEMO expect it to increase at around 800 MW per annum over the next 10 years.

As an example of the significant impact that air-conditioners have, it is estimated that the installation of a 2 kilowatt (electrical input) reverse-cycle air conditioner costs a consumer around (on average) \$1500 yet imposes costs on the energy system as a whole of up to \$7000 when adding to peak demand⁴. The \$7000 system-wide cost must then be spread across all other customers."

Rising peak demand and the need to replace aging network assets has underpinned more than \$40 billion of regulated network investment over a five year period. This in turn has resulted in significant

² MD = Maximum Demand

³ Lower manufacturing output could be the result of the global financial crisis, higher exchange rate our outsourcing manufacturing overseas

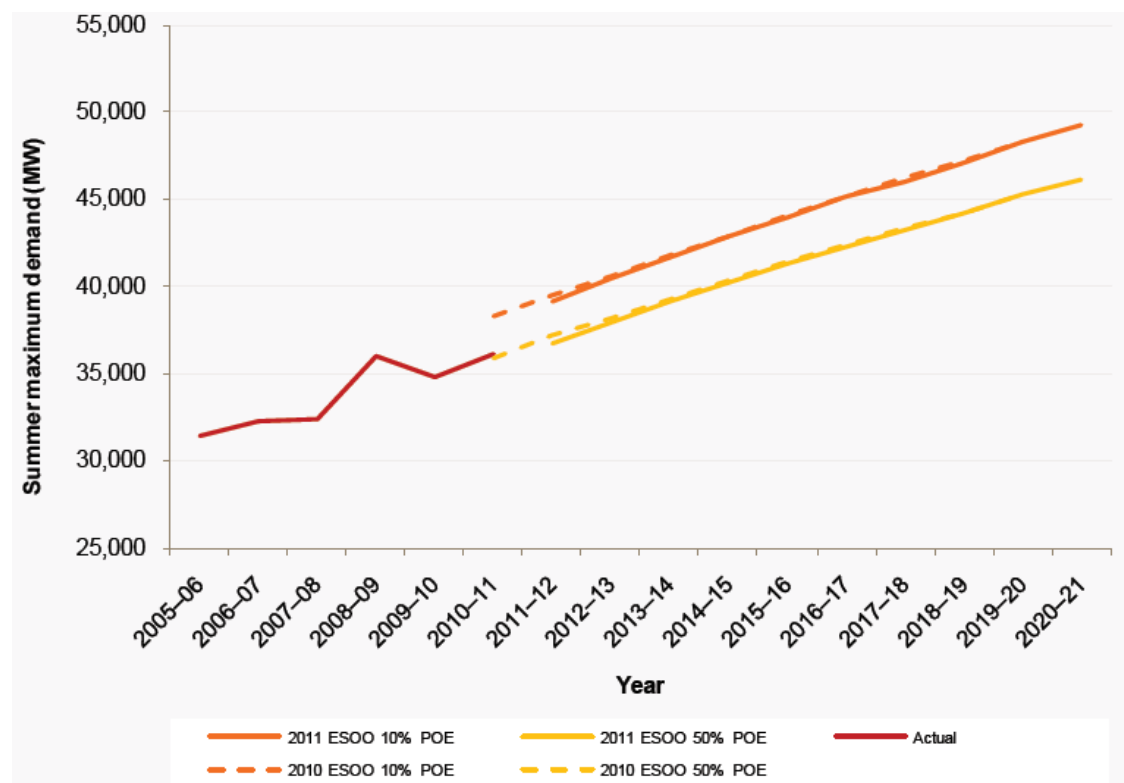
⁴ Department of Employment, Economic Development and Innovation, *Queensland Energy Management Plan*, Queensland Government, Brisbane, 2011.

Green Energy Markets - Impact of market based measures on NEM power consumption

increases in residential prices and as a result Australia now has some of the highest residential power prices in the developed world.

The carbon price and green schemes have been blamed by some sectors for significantly higher residential power prices. This however is not the case as rising regulated network charges are responsible for the bulk of the increase in residential prices.

Figure 3.4 AEMO – Peak demand across NEM (Statement of Opportunities, August 2011)



What is clear is that something needs to be done to curtail the growth in peak demand as this will lead to continued spiralling power prices. The need to address rising peak power demand has been under consideration for more than 10 years and efforts to date have largely been inadequate or in-effective. It is also clear that we need to do something different to what has been considered to date.

We have seen market based schemes deliver reduction in electricity consumption. These schemes have worked because the incentive or price-signal can be captured by service and equipment providers and as a result energy efficient appliances and distributed generation have been rolled out in significant numbers. There is no reason why this approach would not work for equipment, products and services that reduce peak demand.

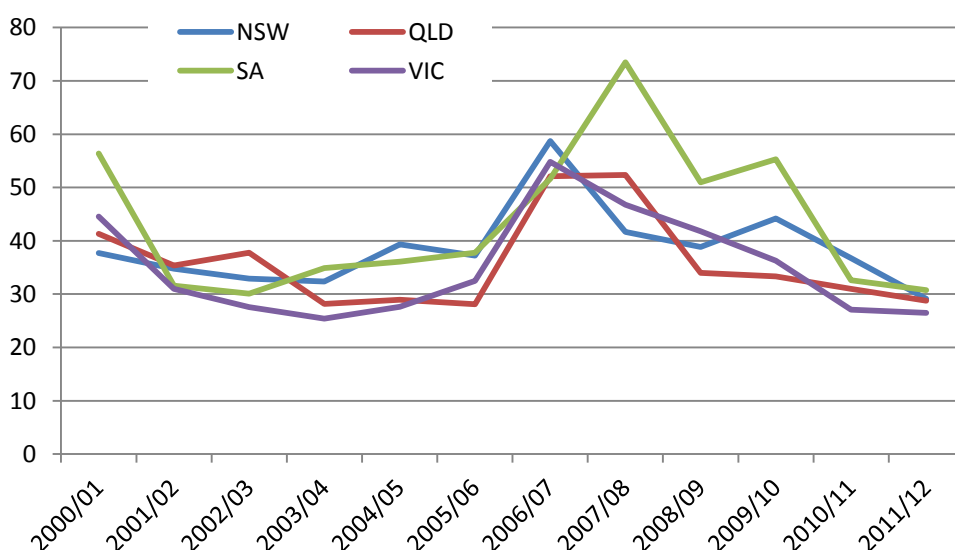
3.3 Wholesale prices have been falling

One of the consequences of lower electricity consumption is that there is more competition between generators to be dispatched to supply the available load. Whilst electricity consumption has been falling,

new generation has also continued to be commissioned. Focusing on renewables we have seen more than 1,100 MW of renewable projects get committed over the last three years which will result in an additional 3,500 GWh of generation. There has also been additional gas-fired generation projects committed, particularly in NSW and Queensland.

Lower demand, combined with additional generation, has resulted in considerably lower wholesale power prices. The average Regional Reference Price (RRP) for all states, as published by AEMO, has dropped considerably over the last five years to levels not seen for around 10 years. Figure 3.5 incorporates the average RRP for New South Wales, Victoria, Queensland and South Australia. In real terms prices in 2011/12 are between 52% to 60% of the level over the 2000-2002 period (details included in Attachment 2).

Figure 3.5 Average Regional Reference price (AEMO)



The forward contract prices for wholesale electricity according to data published by d-cypha trade⁵ are currently trading at between \$53/MWh in Victoria to \$58/MWh in NSW for a base contract for 2013 calendar year. These figures include impact of the carbon price at \$23/tonne from 1 July 2012.

To meet the 41,000 GWh large scale renewables target by 2020 we can expect that an additional 22,000 GWh of renewable generation will come on line by 2020 which will serve to continue to keep downward pressure on wholesale power prices.

3.4 Retail prices have been increasing

Residential electricity prices have increased dramatically in Australia to reach more than 22 cents per kWh in 2010/11 according to the AEMC report 'Possible Future Retail Electricity Price Movements: 1 July 2011 to 30 June 2014' released in November 2011. Residential electricity prices are expected to increase by 37% over the period (refer to Figure 3.6).

⁵ <http://d-cyphatrade.com.au/> (13 June 2012)

Green Energy Markets - Impact of market based measures on NEM power consumption

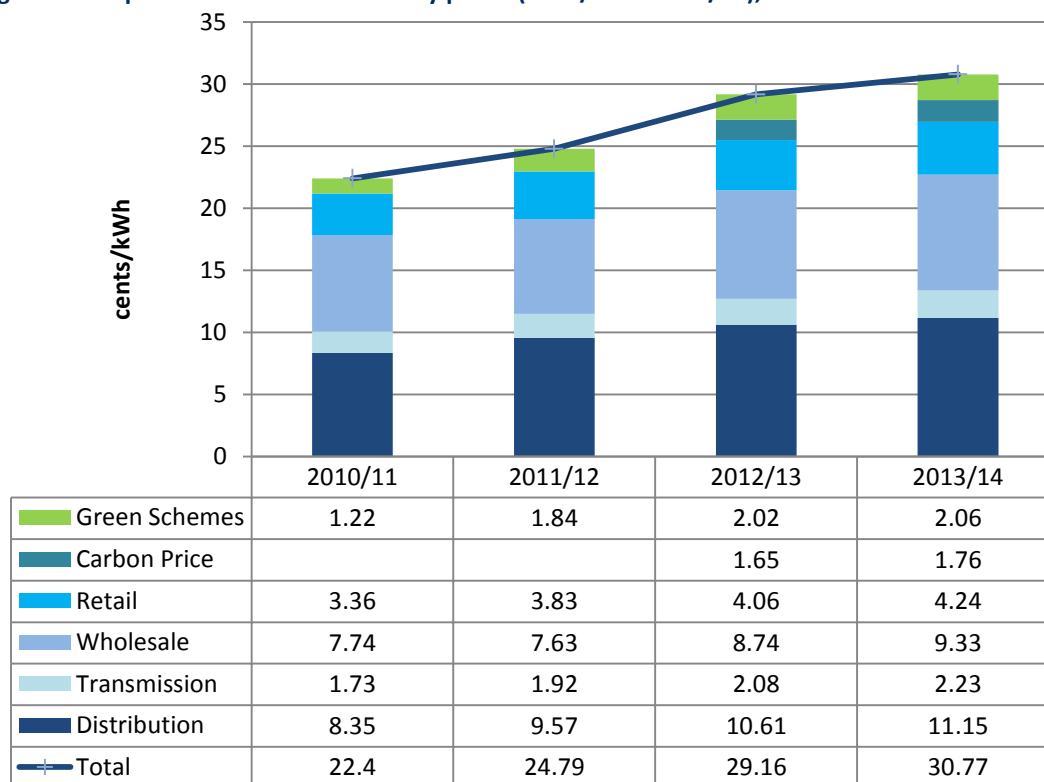
The AEMC have assumed that wholesale prices (before the impact of the carbon price) will rise over the next few years due to rising gas prices, higher capital costs and a tighter supply/demand balance. It appears that their estimates have been based on AEMO's increasing power consumption projections (refer to Figure 3.1). Whilst peak demand might increase, lower power consumption due to solar energy and energy efficiency and new large scale renewables coming on line will mean that there will be a surplus of generation capacity which should have a dampening impact on wholesale prices.

When we consider the components that make up the 8.37 cent/kWh (37%) increase, the largest contributor is distribution charges accounting for 34% of the increase, the carbon price accounting for 21% and green schemes accounting for only 10%.

Table 3.1 . Breakdown in expected electricity price increases (2010/11 to 2013/14), AEMC

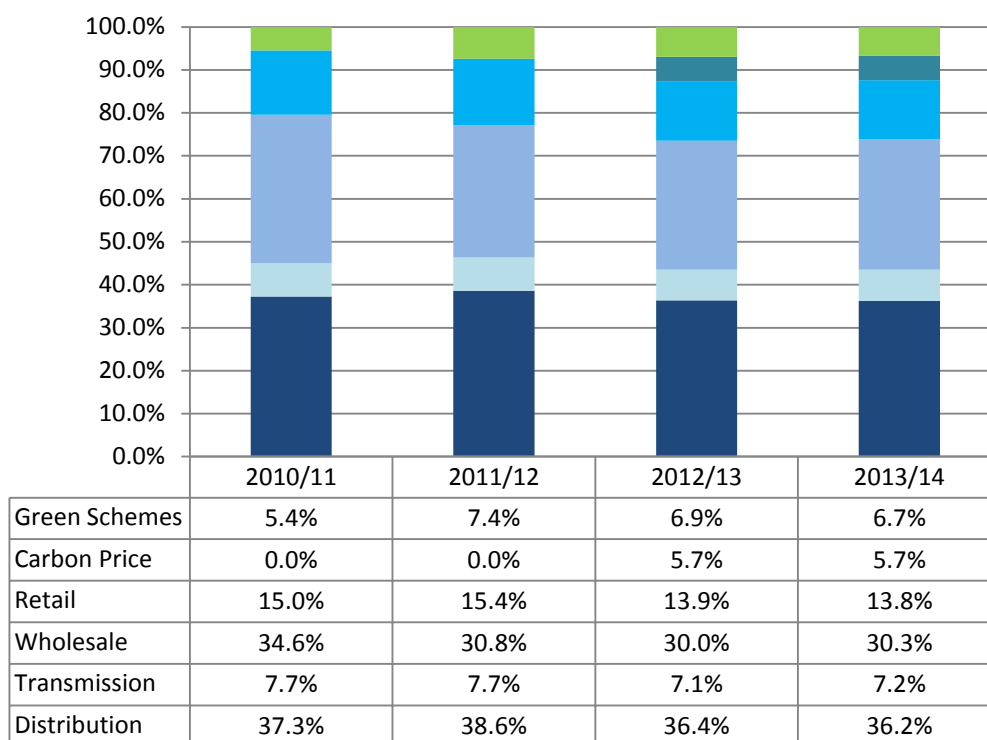
| | Increase in cost (c/kWh) | % Increase |
|---------------|--------------------------|---------------|
| Green schemes | 0.84 | 10.0% |
| Carbon price | 1.76 | 21.0% |
| Transmission | 0.5 | 6.0% |
| Distribution | 2.8 | 33.5% |
| Wholesale | 1.59 | 19.0% |
| Retail | 0.88 | 10.5% |
| Total | 8.37 | 100.0% |

Figure 3.6 Expected residential electricity prices (2010/12 to 2013/14), AEMC



Regulated distribution and transmission costs make up 45% of electricity prices with the cost of green schemes comprising 5 to 7% of the final electricity price.

Figure 3.7 Components of expected residential electricity prices (2010/12 to 2013/14), AEMC



3.5 International comparison of retail prices

Australia no longer has one of the lowest retail electricity prices in the world. This may have been the case once, but it is not the case anymore with residential electricity prices in Australia now one of the highest in the developed world.

The Energy Users Association of Australia commissioned CME to undertake an international comparison of retail electricity prices and published a report in March 2012⁶. At 2011 exchange rates Australian retail power prices were the highest as can be seen in Figure 3.8 which is an extract from the CME report.

According to the CME report, residential electricity prices in Australia had been stable from 2002 to 2007 but since then have risen around 40% in real terms. This is in contrast to other developed countries where electricity prices had been reasonably stable over the 2002 to 2011 period. Figure 3.9 shows this situation graphically and clearly shows the significance of recent rises in electricity prices.

⁶ Electricity Prices in Australia and International Comparison, CME for the Energy Users Association of Australia (March 2012)

Figure 3.8 International comparison of residential electricity prices (2011 exchange rates)
(Extract from the CME report for the Energy Users Association of Australia, March 2012)

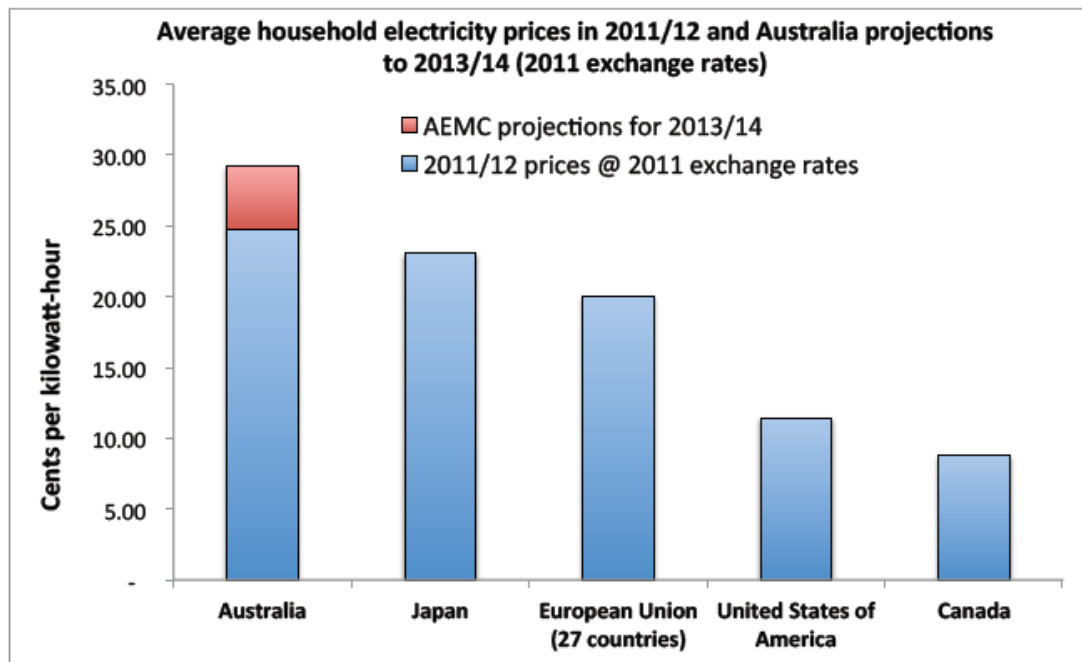
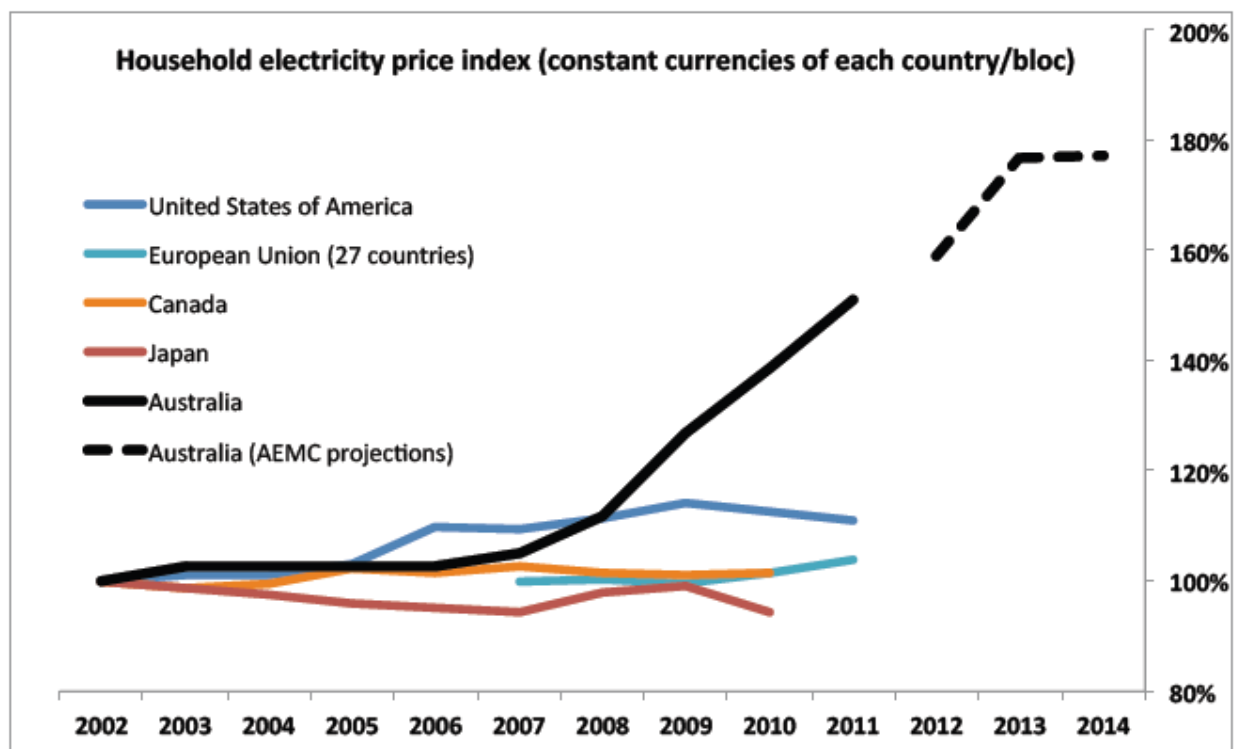
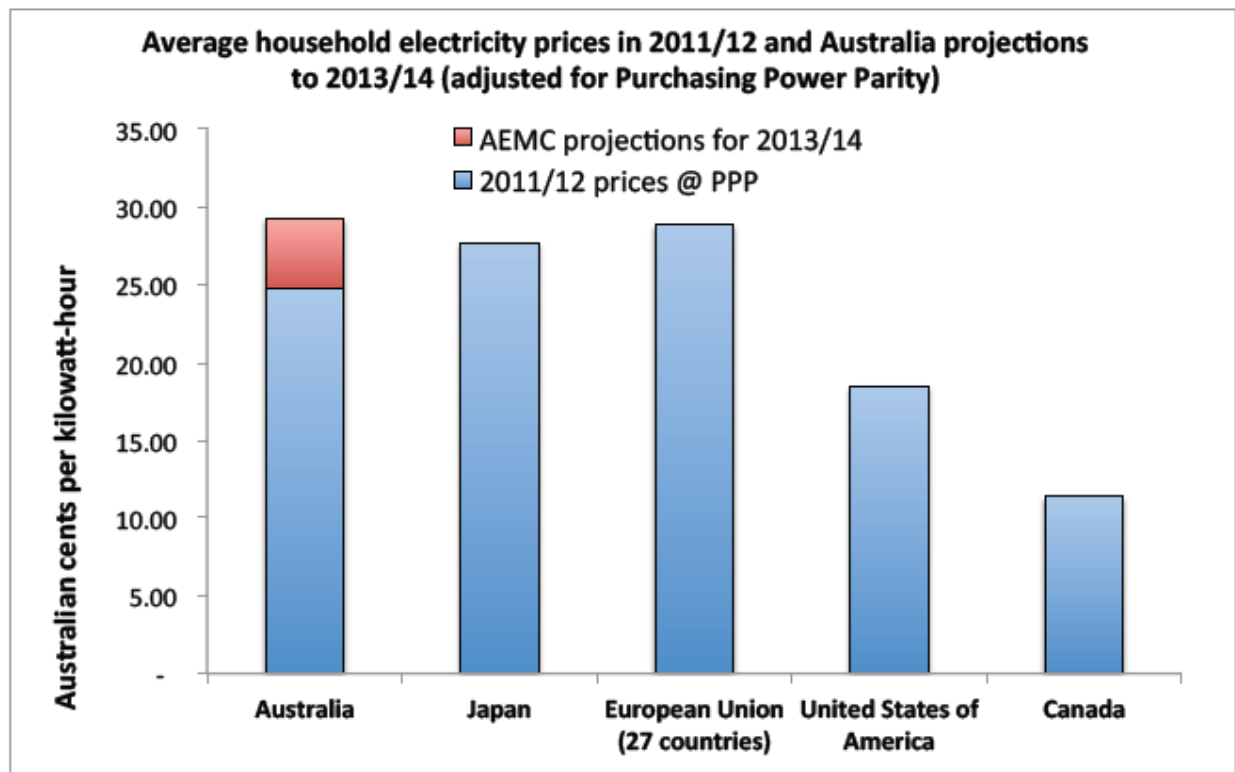


Figure 3.9 Historical electricity price comparison
(Extract from the CME report for the Energy Users Association of Australia, March 2012)



Discounting the impact of exchange rates and using the 'purchasing power parity' approach adopted by the OECD, Australia whilst not the highest, is still higher than other comparable countries and clearly no longer enjoys an electricity price advantage, at least not at the retail level. Australia is likely to have one of the lowest wholesale or generated electricity prices due to the availability of low priced fossil fuels. However due to significantly higher costs for transmission and distribution, our delivered electricity price is quite high.

Figure 3.10 International comparison of residential electricity prices (Purchasing Power Parity)
(Extract from the CME report for the Energy Users Association of Australia, March 2012)



4. Contribution of solar installations under the RET

The Renewable Energy Target (RET) came into effect on 1 April 2001 and was the cornerstone greenhouse policy measure of the Howard Government at the time. The key objective of the RET was and remains to increase renewable generation.

From 1 January 2011 the RET was split into two separate schemes, the large-scale scheme was to support larger renewable energy projects and the small-scale scheme is to support smaller renewable system installations.

Solar PV and solar hot water are the key distributed energy technologies that have been supported by the RET. Solar PV and solar hot water are 'deemed technologies' where certificates can be created up-front on the installation of these systems.

4.1 Solar PV under the Renewable Energy Target (RET)

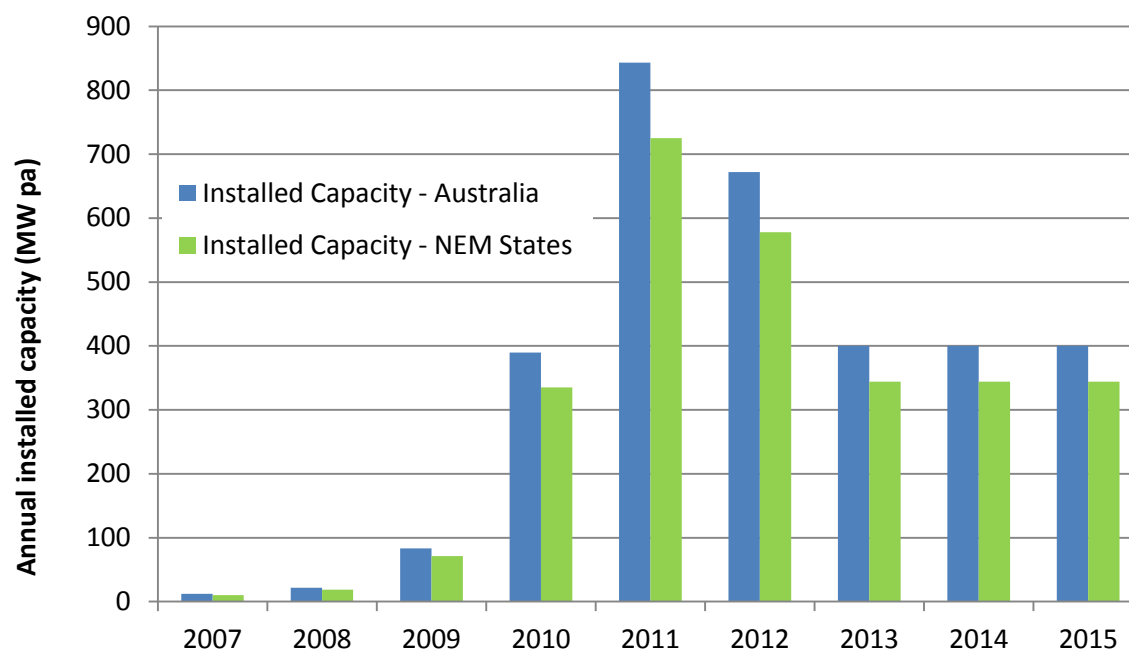
In the case of Solar PV, certificates equivalent to 15 years' worth of electricity generation can be created once the system has been installed. Additional certificates referred to as 'solar credits' can be created for eligible premises. A multiplier of 3 times up to the first 1.5 kW capacity can be claimed for installations until 30 June 2012 and then it reduces to 2 times on 1 July 2013 and then one times on 1 July 2014. In the case of solar hot water certificates, the equivalent of 10 years of avoided electricity consumption can be claimed on system installation.

In determining the level of electricity that has been avoided, we have adopted the following approach:

- The postcode system data for Solar PV released by the Clean Energy Regulator in April 2012 has been used as the key data source. This summarises on a monthly basis, the number of systems and system capacity installed up until 31 March 2012 that have created certificates.
- PV systems installed in Western Australia and Northern Territory have been excluded and these account for 13.6% of total PV installations that had claimed certificates to March 2012.

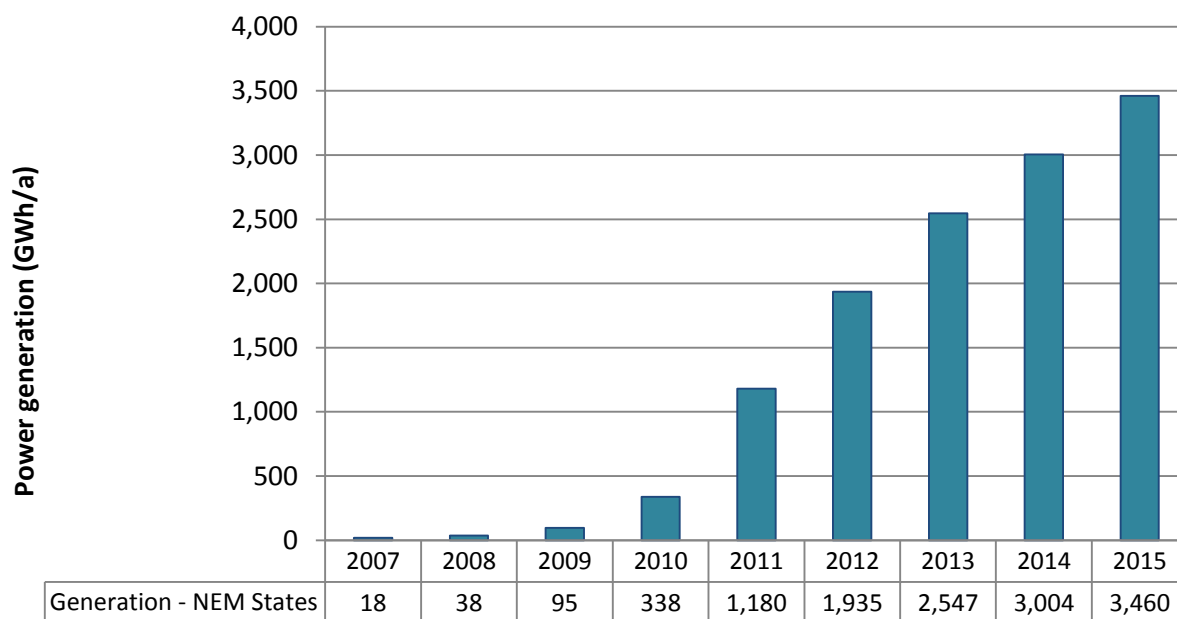
Solar PV installations have grown by an average of 336% per annum from 2008 to 2011. Installations in 2012 are expected to reduce by 20% to 672 MW. We have assumed that ongoing PV installations amount to at an average of 400 MW per annum across Australia. Continued reduction in installed costs and the recovery in the small-scale certificate (STC) price should offset the adverse financial impact of the progressive reduction in the solar credits multiplier.

Figure 4.1 Installed capacity of PV systems submitted for certificate creation



The level of electricity produced by PV has been determined by using the zone rating applied in each state. For Queensland, New South Wales, the ACT, Western Australia and South Australia we have used 1.382 MWh per annum for each kW installed and in Victoria and Tasmania we have used 1.185 MWh per annum per kW. The level of power generated by PV in NEM states amounted to 1,200 GWh in 2011 and is expected to increase to 3,500 GWh by 2015.

Figure 4.2 Electricity generated from PV systems claiming certificates in NEM states



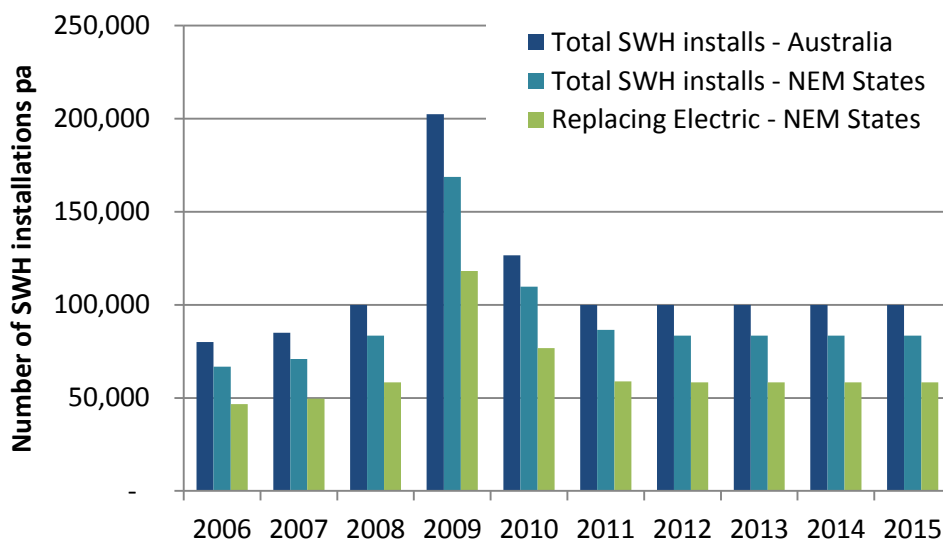
4.2 Solar hot water systems under the Renewable Energy Target (RET)

Solar hot water systems (SWH) can claim certificates up-front on a deemed basis for 10 years of avoided electricity. In determining the level of electricity that has been avoided, we have adopted the following approach:

- The postcode system data for SWH (including air sourced heat pumps) released by the Clean Energy Regulator as at 31 March 2012 has been used. This summarises on a monthly basis, the number of systems installed up until 31 March 2012 that have created certificates.
- SWH systems installed in Western Australia and Northern Territory have been excluded and these account for 16.6% of total SWH installations that had claimed certificates to March 2012.
- We have assumed that 30% of SWH system installations replace gas or solar and have excluded these from our analysis
- Each SWH system is assumed to displace 3 MWh of electricity per annum, this is equivalent to 30 certificates per system, which corresponds to the average over the last two years.

Solar hot water installations in Australia increased dramatically in 2009 with more than 200,000 systems claiming certificates under the RET. The surge in installations was due to additional rebates from both Commonwealth and state governments in response to the global financial crisis. Since 2009 the level of solar hot water systems claiming certificates has fallen with around 100,000 systems expected to claim STCs in 2012. We have maintained this level of installation out to 2015.

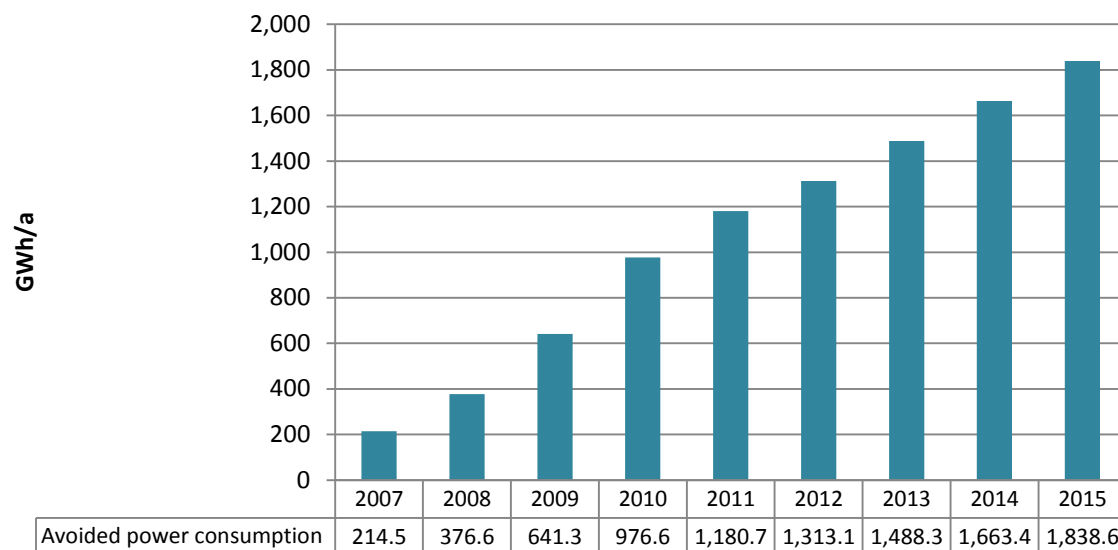
Figure 4.3 Solar hot water installations submitted for certificate creation



The level of electricity avoided has been determined by assuming that 70% of systems are replacing an electric water heater⁷ and an average of 3 MWh of electricity avoided per system. The level of power avoided by solar hot water in NEM states amounted to 1,200 GWh in 2011 and is expected to increase to 1,840 GWh by 2015.

⁷ Green Energy Markets report for the Renewable Energy Regulator on modelling for the 2012-14 STC Target (November 2011)

Figure 4.4 Electricity avoided from solar hot water systems claiming certificates in NEM states

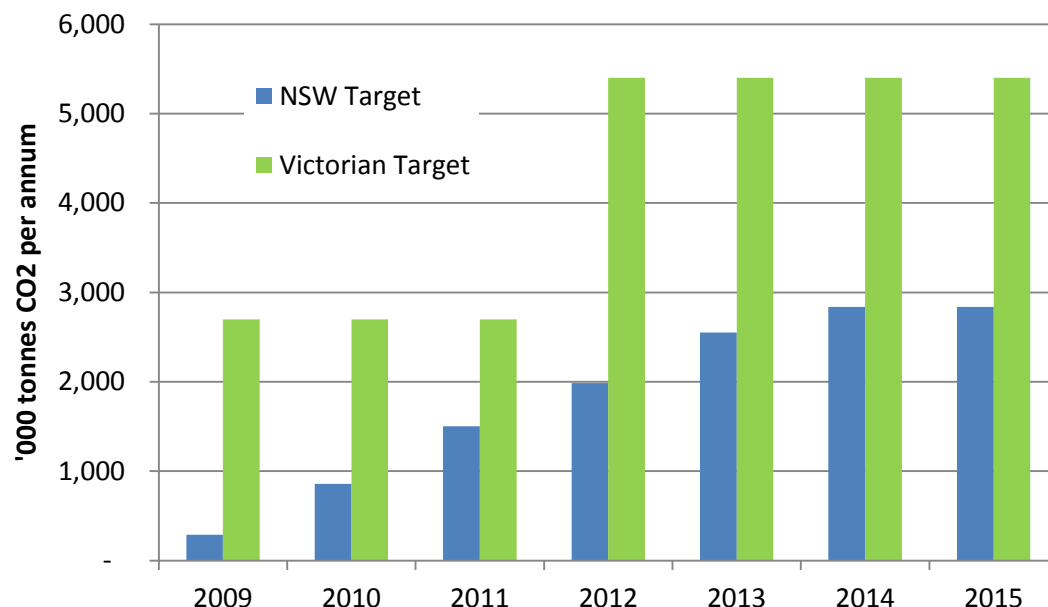


5. Contribution of energy efficiency schemes

The Victorian Energy Efficiency Scheme also known as the Energy Saver Incentive, was introduced at the beginning of 2009 and applied to electricity and gas consumption in the residential sector. The scheme was expanded from 2.7 million tonnes to 5.4 million tonnes from the beginning of 2012 and extended to also include commercial and industrial energy consumption. Those larger sites that are covered by the Environmental and Resource Efficiency Plan (EREP) initiative are excluded from participating.

The NSW scheme was introduced from 1 July 2009 and builds up to 5% of eligible electricity consumption and excludes gas. The target build-up under the Victorian and NSW Energy Efficiency Schemes is shown as Figure 5.1. In determining the number of certificates to be created we have assumed that eligible electricity in NSW remains at 2011 levels through to 2015 (ie. no growth in electricity consumption). As a result, the NSW energy efficiency target increases steadily from 2.0 million certificates in 2012 to 2.8 million certificates in 2015.

Figure 5.1 Victorian and NSW energy efficiency targets



The certificates created under both the New South Wales and Victorian Energy Efficiency Schemes are measured in terms of avoided greenhouse gas emissions. Victoria and New South Wales use different conversion methodologies and factors to convert electricity savings into greenhouse gas emissions. Current factors used are 0.963 tonnes/MWh in Victoria and 1.06 tonnes/MWh in New South Wales⁸. We have applied these factors to determine the level of electricity savings to 2015.

⁸ We understand that the differences in methodologies relate to Victoria using a marginal abatement factor whereas an average abatement factor is used in New South Wales

5.1 Energy Efficiency activities under the Victorian Energy Efficiency Scheme

Victorian Energy Efficiency Certificates (VEECs) can be created by Accredited Persons (APs) on the installation of approved products. Energy suppliers as liable parties under the scheme are required to surrender certificates representing their share of energy supply or pay a penalty. The number of certificates that may be created is 'deemed', based on the level of energy savings over the life of the particular product appropriately discounted to reflect uncertainty around the savings.

A list of the activities that have created VEECs is included as Table 5.1. In addition to these a range of commercial activities have also been approved on a deemed basis in 2012. These include commercial lighting, efficient motors, refrigeration fans and refrigeration cabinets. The Victorian government plans to roll out a number of other activities and methodologies progressively during 2012. We anticipate that in addition to deemed methodologies, project impact assessment and metered baseline methodologies which have been used in New South Wales, will also be used.

Table 5.1 VEECs created by activity on an installation year basis (as at May 2012)

| VEEC Activity | 2009 | 2010 | 2011 |
|---|------------------|------------------|------------------|
| 11 - Ceiling Insulation | 56,918 | | |
| 12 - Under Floor Insulation | | 17 | |
| 15 - Weather Sealing | 21 | 152 | 1,713 |
| 16 - Lighting (revoked from 1 Jan 2011) | 3,379,443 | 1,872,157 | 16,247 |
| 17 - Low Flow Shower Rose | 154,193 | 65,812 | 70,865 |
| 18 - Purchasing HE Refrigerator or Freezer | 1 | | |
| 19 - Destruction of Pre-1996 Refrigerator or Freezer | 7,047 | 16,837 | 30,636 |
| 1A - Water Heating - Gas/LPG Storage Replacing Electric | 13,103 | 19,547 | 29,340 |
| 1B - Water Heating - Gas/LPG Instantaneous Replacing Electric | 17,512 | 31,826 | 104,286 |
| 1C - Water Heating - Electric Boosted Solar Replacing Electric | 510,459 | 102,575 | 107,131 |
| 1D - Water Heating - Gas/LPG Boosted Replacing Electric | 186,831 | 80,519 | 70,809 |
| 2 - Water Heating - Solar Retro-Fit Kit | 66 | 89 | |
| 20 - HE Ducted Gas Heater | | 168 | 461 |
| 21A - Lighting - GLS Lamps | | 544 | 398,364 |
| 22 - HE Refrigerators and Freezers | | | 2 |
| 24 - HE Television | | | 840 |
| 29 - Standby Power Controller | | | 1,299,399 |
| 3 - Water Heating - Solar Replacing Gas/LPG | 46,049 | 21,402 | 13,496 |
| 4 - Water Heating - Solar Pre-Heater | 21 | | |
| 5 - Space Heating - HE Ducted Gas Replacing Ducted Gas | 728 | 868 | 1,731 |
| 6 - Space Heating - HE Ducted Gas Replacing Central Electric Heater | 28,089 | 36,160 | 122,863 |
| 8 - Space Heating - HE Ducted Heat Pump Replacing Cent Elect Heater | 171 | | 724 |
| 9 - Space Heating - Gas/LPG Space Heater | 493 | 444 | 1,498 |
| Grand Total | 4,401,145 | 2,249,117 | 2,270,405 |

In determining the level of electricity that has been avoided we have adopted the following approach:

- i. Excluded those activities that result in a reduction in gas use rather than power use (eg. replacing inefficient ducted gas heating);
- ii. Excluded those activities that have already been accounted for under the Renewable Energy Target (eg. solar replacing electric water heater); and
- iii. Applied the relevant deeming factor (10 years for most residential activities) to the number of certificates that have been created in that year, to arrive at the level of electricity avoided on an annual basis.

We have developed projections for the breakdown in certificate creation by broad activity types to 2015 (refer to Table 5.2). Standby power controllers (SPCs) dominated the creation of certificates in 2011 and this is expected to continue in 2012. We anticipate that SPCs creating certificates will reduce considerably from 2013 onwards as saturation is achieved. Commercial lighting and a number of other activities were included as eligible activities from May 2012. We anticipate that commercial lighting will produce the largest number of certificates from 2013 onwards. We expect that methodologies other than the deemed ones available at present will be progressively rolled out and we have assumed that project impact (or similar approach) and metered baseline approaches will be available from 2013.

Under a project impact methodology (as applies in New South Wales) savings are discounted and brought forward on the basis of 100% of year 1, 80% of year 2, 60% of year 3, 40% of year 4 and 20% of year 5. This is equivalent to getting 3 years of savings (equivalent certificates) on installation and then claiming the remaining savings after year 5. Under a metered baseline approach, certificates are created annually as the savings are achieved.

Table 5.2 Projected VEECs to be created by broad activity type

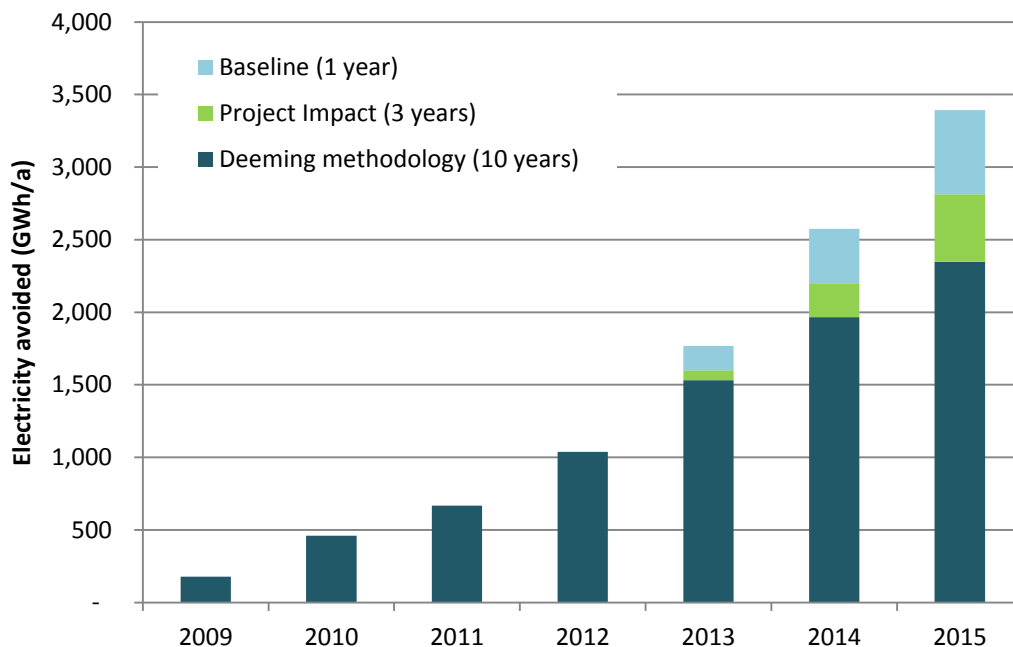
| Summary Certificates Created | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Residential activities - replacing gas/covered by RET | 955,780 | 272,046 | 268,546 | 279,852 | 292,745 | 306,282 | 320,496 |
| Residential activities - replacing electric | 3,445,365 | 1,977,071 | 2,001,859 | 4,111,951 | 1,961,951 | 1,311,951 | 1,411,951 |
| Commercial lighting | - | - | - | 958,197 | 2,345,304 | 2,511,767 | 1,873,553 |
| Other Deemed Commercial | - | - | - | 50,000 | 100,000 | 120,000 | 144,000 |
| Project impact assessment | - | - | - | - | 500,000 | 700,000 | 950,000 |
| Metered Baseline | - | - | - | - | 200,000 | 450,000 | 700,000 |
| | 4,401,145 | 2,249,117 | 2,270,405 | 5,400,000 | 5,400,000 | 5,400,000 | 5,400,000 |

In determining the amount of electricity that has been avoided we have assumed that commercial lighting and a range of other deemed technologies have 10 years of savings brought forward. For project impact methodology we have assumed that an average of 3 years of savings have been brought forward. We have also assumed that 80% of the certificates created under the project impact and metered

baseline methodologies relate to avoided electricity, with the 20% covering avoided gas consumption being excluded from our analysis⁹.

The level of power avoided by energy efficiency activities supported by the VEEC scheme amounted to 667 GWh in 2011 and is expected to increase to 3,393 GWh by 2015.

Figure 5.2 Electricity avoided by activities installed under the Victorian Energy Efficiency Target



5.2 Energy Efficiency activities under the NSW Energy Efficiency Scheme

The NSW scheme only covers avoided electricity consumption but incorporated savings from commercial and industrial activities since the scheme started on 1 July 2009. A range of methodologies were developed including ‘deemed’ creation for residential activities, commercial lighting and a range of other commercial activities. Project impact assessment and metered baseline methodologies were also available and these had been used extensively for commercial and industrial activities. NSW Energy Saving Certificates (ESCs) created up until May 2012 by methodology are summarised in Table 5.3.

Methodologies used in the NSW scheme are summarised below:

- **Project Impact Assessment Method**
Certificate creation is based on an engineering assessment of only the equipment, process, or system that is the subject of energy Savings.
- **Metered Baseline Method**

⁹ The major gas (and electricity) consuming sites in Victoria are covered by EREP and have been excluded from creating VEECs. As there are less energy reduction options and activities available to reduce gas consumption (compared to electricity) we have assumed that only 20% of certificates created under project impact and metered baseline methodologies are for reducing gas consumption.

Certificate creation is based on the difference in measurements of the electricity consumption before and after the recognised energy saving activity has taken place.

Sub-methodologies: Baseline per unit output, Baseline unaffected by output, normalised baseline, NABERS baseline.

- **Deemed Energy Savings Method**

Certificate creation is based on common end-user equipment formulas determined by the administrator over a specific period of time.

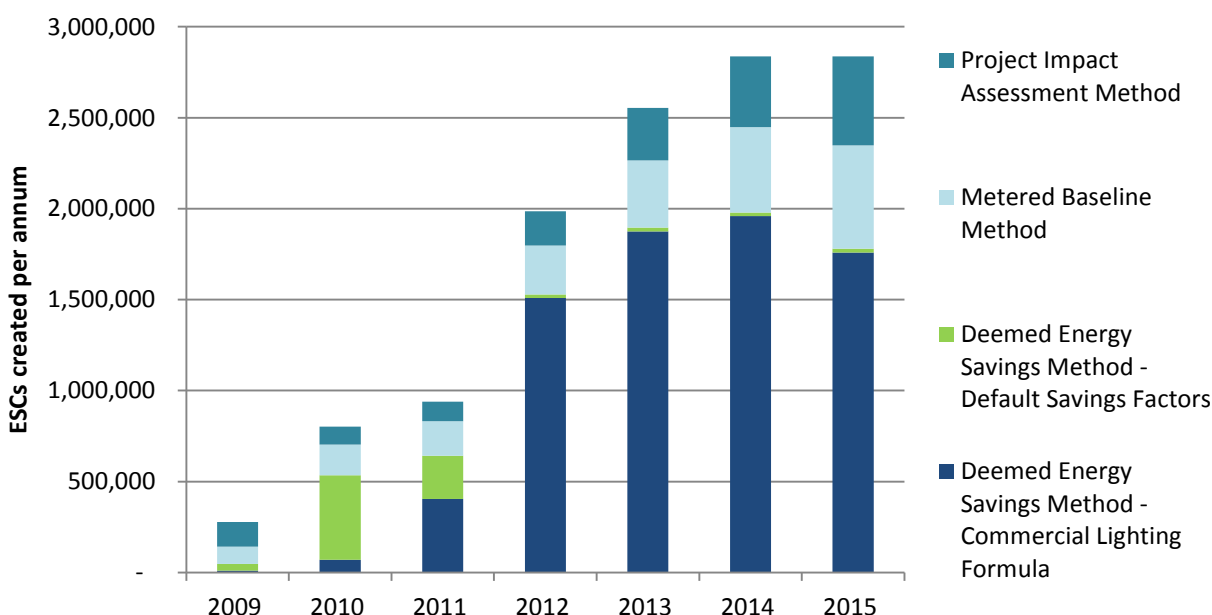
Sub-methodologies: Default Savings Factor, Commercial Lighting Energy Savings formula, High Efficiency Motors and Power Factor Correction Energy Savings Formulas.

Table 5.3 ESCs created by methodology by installation year (as at May 2012)

| | 2009 | 2010 | 2011 |
|--|----------------|----------------|----------------|
| Deemed Energy Savings Method - Commercial Lighting Formula | 10,123 | 70,357 | 394,897 |
| Deemed Energy Savings Method - Default Savings Factors | 37,733 | 463,389 | 236,747 |
| Metered Baseline Method - baseline per unit of output | 89,497 | 153,475 | 144,229 |
| Metered Baseline Method - baseline unaffected by output | 730 | 887 | 3,054 |
| Metered Baseline Method - normalised by NABERS scheme | 4,073 | 14,339 | 37,577 |
| Project Impact Assessment Method | 134,886 | 99,390 | 105,463 |
| | 277,042 | 801,837 | 921,967 |

We have developed projections for certificate creation by broad methodology types to 2015. Most residential deemed activities have been phased out and we expect that commercial lighting will become a very significant creator of ESCs. Project impact assessment and metered baseline are expected to continue to grow.

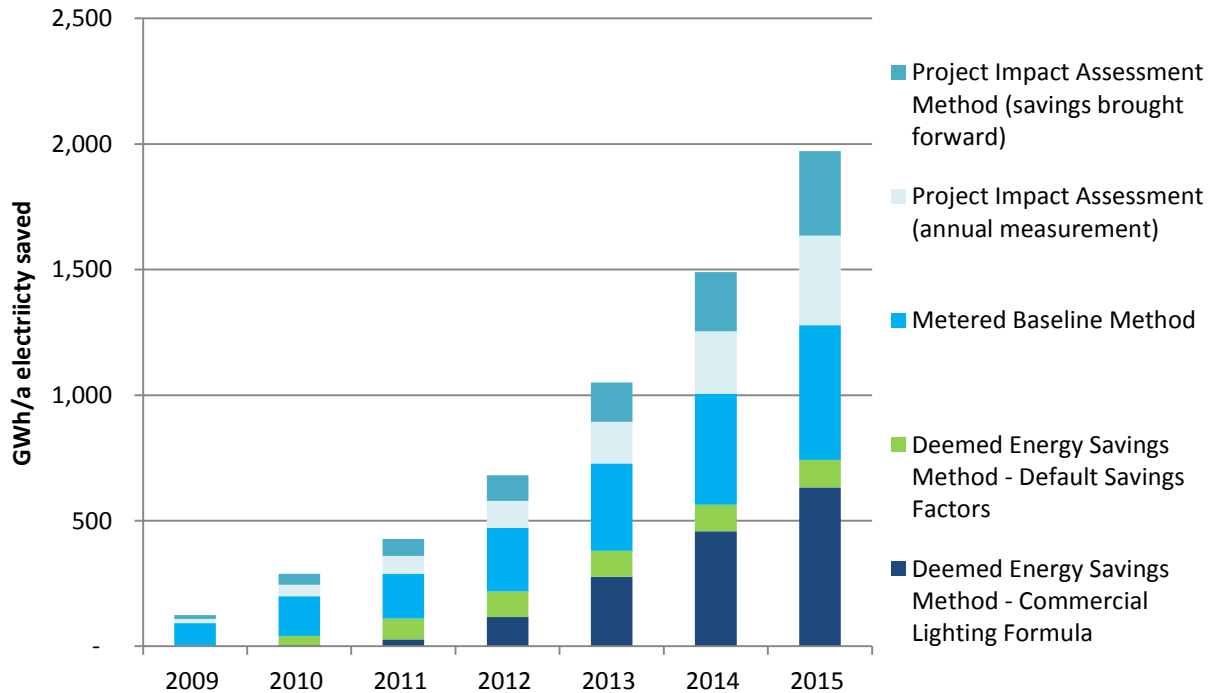
Figure 5.3 Projected ESCs to be created by broad methodology type



Similar to our approach for the Victorian Energy Savings Scheme, in determining the amount of electricity that has been avoided, we have assumed that commercial lighting and other deemed technologies have 10 years of savings brought forward. For project impact methodology, we have assumed that an average of 3 years of savings is brought forward for 74% of the certificates created and only one year brought forward for 26% of certificates¹⁰.

The level of power avoided by energy efficiency activities supported by the NSW Energy Saving scheme amounted to 427 GWh in 2011 and is expected to increase to 1,972 GWh by 2015.

Figure 5.4 Electricity avoided by methodology under the NSW Energy Efficiency Target



¹⁰ The breakdown of 74% /26% has been sourced from IPARTs 2011 annual report

6. Summary of results

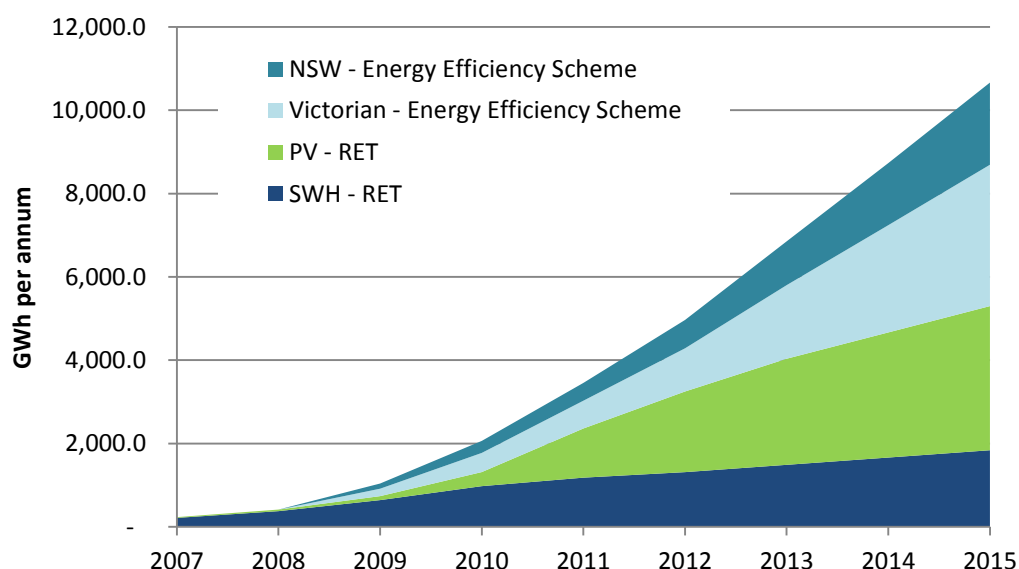
The three market based schemes that we assessed have supported solar and energy efficiency activities which have resulted in nearly 3,500 GWh of avoided electricity in 2011 across the NEM states. This equates to 1.7% of electricity consumption. Importantly however, power consumption across NEM states reduced by 6,600 GWh in the three years from 2008 to 2011. The contribution of solar and energy efficiency activities supported by the market based schemes was material at 53%. By 2015 the contribution of these schemes is expected to more than treble to 10,708 GWh.

A breakdown of the contribution by scheme is summarised in Table 6.1 and Figure 6.1.

Table 6.1 Electricity avoided in NEM States

| GWh per annum | 2011 | 2015 |
|--------------------------------------|--------------|---------------|
| SWH - RET | 1,181 | 1,839 |
| PV - RET | 1,180 | 3,460 |
| Victorian – Energy Efficiency Scheme | 667 | 3,393 |
| NSW - Energy Efficiency Scheme | 427 | 1,972 |
| Total | 3,455 | 10,664 |

Figure 6.1 Electricity avoided in NEM States by scheme



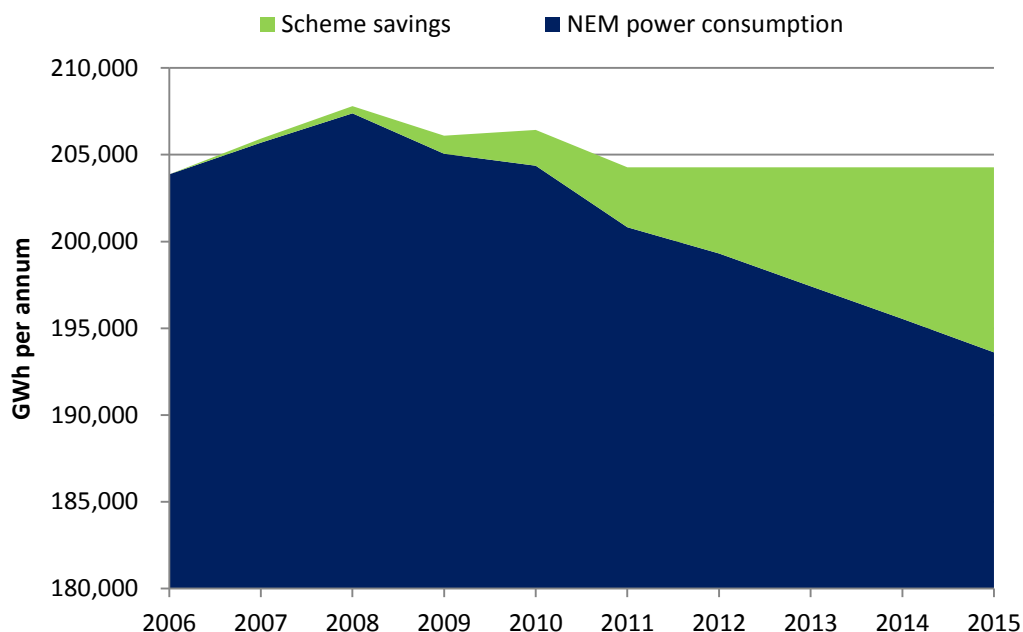
In considering the impact on NEM power consumption to 2015, we have notionally assumed that gross power consumed prior to the contribution of solar and energy efficiency activities remains the same to 2015. We would normally expect that both continued population growth and economic growth would support increases in power consumption. However, the expected closure of some large electricity consuming facilities (eg. the Point Henry and Kurri Kurri aluminium smelters) and the contribution of other energy efficiency and distributed generation activities not covered by the above schemes, means

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that continuing gross electricity consumption at 2011 levels, whilst simplistic is likely to be a reasonable estimate.

Based on the above approach, gross electricity consumption was 204,300 GWh in 2011 and after allowing for the contribution of solar and energy efficiency supported by the market based schemes, net consumption amounted to 200,800 GWh. Assuming that gross consumption remains at 2011 levels to 2015 then solar and energy efficiency's contribution, amounts to 5.2% of total consumption (refer to Figure 6.2).

Figure 6.2 Electricity avoided relative to NEM power consumption



Attachment 1

Power Consumption in the NEM

Source: AEMO

GWh per state on a calendar year basis

| | NSW | QLD | SA | VIC | TAS | Total NEM | Total Excl TAS |
|------|--------|--------|--------|--------|--------|-----------|-------------------|
| 2001 | 69,898 | 44,057 | 12,887 | 47,128 | - | 173,970 | 173,970 |
| 2002 | 71,490 | 45,798 | 12,910 | 47,599 | - | 177,796 | 177,796 |
| 2003 | 72,364 | 46,952 | 12,821 | 48,768 | - | 180,904 | 180,904 |
| 2004 | 74,531 | 48,902 | 12,890 | 49,724 | - | 186,046 | 186,046 |
| 2005 | 75,413 | 50,378 | 12,564 | 49,804 | 6,399 | 194,558 | 188,159 |
| 2006 | 78,162 | 51,065 | 13,096 | 51,379 | 10,164 | 203,867 | 193,703 |
| 2007 | 78,629 | 51,562 | 13,351 | 51,972 | 10,179 | 205,693 | 195,514 |
| 2008 | 78,963 | 52,183 | 13,416 | 52,411 | 10,412 | 207,386 | 196,973 |
| 2009 | 77,664 | 52,711 | 13,477 | 51,305 | 9,900 | 205,057 | 195,157 |
| 2010 | 77,151 | 52,324 | 13,554 | 51,184 | 10,153 | 204,366 | 194,213 |
| 2011 | 76,459 | 51,107 | 13,093 | 50,142 | 10,019 | 200,820 | 190,801 |

Note: Snowy consumption to 2008 has been allocated one third to Vic and two thirds to NSW

Attachment 2

NEM – Regional Reference Price

Average annual prices (financial year)

Source: AEMO (16 May 2012)

1. Nominal Power Prices (\$/MWh)

| Year | NSW | QLD | SA | VIC |
|---------|-------|-------|-------|-------|
| 2000/01 | 37.69 | 41.33 | 56.39 | 44.57 |
| 2001/02 | 34.76 | 35.34 | 31.61 | 30.97 |
| 2002/03 | 32.91 | 37.79 | 30.11 | 27.56 |
| 2003/04 | 32.37 | 28.18 | 34.86 | 25.38 |
| 2004/05 | 39.33 | 28.96 | 36.07 | 27.62 |
| 2005/06 | 37.24 | 28.12 | 37.76 | 32.47 |
| 2006/07 | 58.72 | 52.14 | 51.61 | 54.8 |
| 2007/08 | 41.66 | 52.34 | 73.5 | 46.79 |
| 2008/09 | 38.85 | 34.00 | 50.98 | 41.82 |
| 2009/10 | 44.19 | 33.30 | 55.31 | 36.28 |
| 2010/11 | 36.74 | 30.97 | 32.58 | 27.09 |
| 2011/12 | 29.14 | 28.77 | 30.73 | 26.51 |

2. Real Power Prices (\$/MWh)

| Year | NSW | QLD | SA | VIC | CPI Factor |
|------------------------|-------|-------|-------|-------|------------|
| 2000/01 | 37.69 | 41.33 | 56.39 | 44.57 | 133.8 |
| 2001/02 | 33.80 | 34.36 | 30.74 | 30.11 | 137.6 |
| 2002/03 | 31.16 | 35.78 | 28.51 | 26.10 | 141.3 |
| 2003/04 | 29.91 | 26.04 | 32.21 | 23.45 | 144.8 |
| 2004/05 | 35.46 | 26.11 | 32.52 | 24.90 | 148.4 |
| 2005/06 | 32.29 | 24.38 | 32.74 | 28.16 | 154.3 |
| 2006/07 | 49.88 | 44.29 | 43.84 | 46.55 | 157.5 |
| 2007/08 | 33.86 | 42.55 | 59.75 | 38.03 | 164.6 |
| 2008/09 | 31.13 | 27.24 | 40.85 | 33.51 | 167.0 |
| 2009/10 | 34.36 | 25.89 | 43.00 | 28.21 | 172.1 |
| 2010/11 | 27.57 | 23.24 | 24.45 | 20.33 | 178.3 |
| 2011/12 | 21.54 | 21.27 | 22.72 | 19.60 | 181.0 |
| Change from 00/01-01/2 | 60.3% | 56.2% | 52.1% | 52.5% | |