



Green Energy
Markets

Small-scale technology certificates Data modelling for 2014 to 2016

Report to the Clean Energy Regulator

January 2014

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Executive Summary

The Clean Energy Regulator (CER) has engaged Green Energy Markets Pty Ltd (GEM) to provide a forward estimate of the Small-scale technology certificates (STCs) likely to be created during the 2014 calendar year, and for the 2015 and 2016 calendar years.

Projections have been developed on the basis that current policy settings remain in place. We have assumed that the carbon price is removed with effect from 1 July 2014 and we have assumed that the Million Solar Roofs Program is funded from 1 January 2015. We have not incorporated the impact of changes to the Renewable Energy Target that may arise from a review of the Renewable Energy Target to be undertaken in 2014. We have assumed that a wholesale spot STC price of \$38 applies for the 2014 to 2016 period.

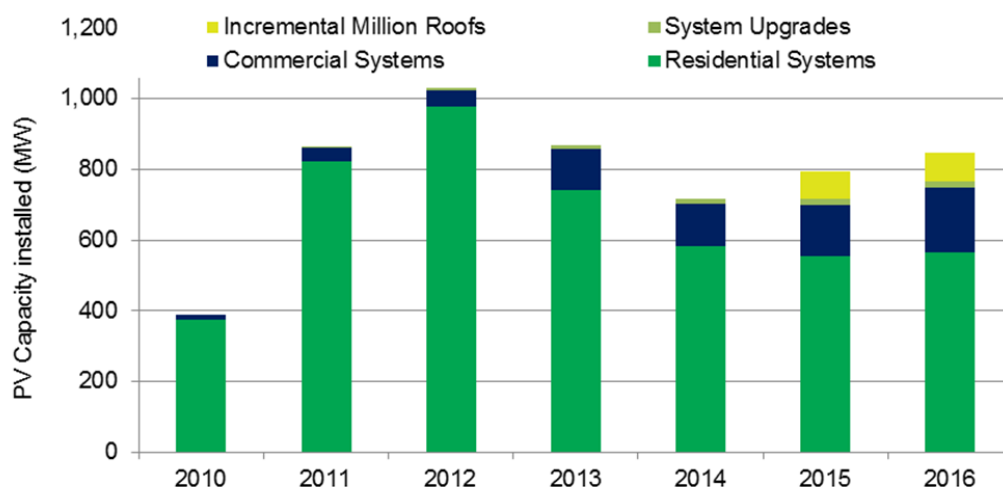
In developing our projections for small generating units (SGUs) and solar water heater (SWH) we utilised our existing models and databases and those of our sub-contractors SunWiz and SolarBusinessServices. We have also made extensive use of the registry data provided by the CER and interviewed a range of solar industry participants. Our forward estimates exclude solar PV systems above 100 kW in size which will be registered as power stations and not eligible to create STCs.

We have separately analysed the following solar market segments in order to more accurately forecast future demand:

- SGU PV – Residential market
- SGU PV – Non-residential (commercial market)
- SGU PV – Upgrade market
- SWH – New dwelling market
- SWH - Replacement or existing dwelling market
- Million Solar Roofs – we have determined the incremental impact

The financial and economic drivers for each of these sectors vary and where possible we have segmented the CER data to separately identify the level and size of installations in each segment. This has formed the basis of our projections for the 2014 to 2016 period.

Solar PV is expected to continue to dominate STC creation with a projected 88 per cent of total creation in 2014. The Solar PV market is expected to continue to decline in 2014 reaching 718 MW which is 18 per cent lower than 2012 installations and 30 per cent below the peak of 1,032 MW in 2012.



The residential market is the largest solar PV segment and has been the most volatile over the last four years. We expect that residential installed capacity will fall by 24 per cent in 2014 to reach 583 MW and will represent 173,000 installations which are half the level seen in 2011 and 2012. The phase out of attractive feed-in tariffs across nearly all states and territories means that STCs will be the primary support mechanism for solar PV, and the lower level of installations in 2014 reflect this. The Million Solar Roofs program is assumed to start supporting systems by the start of 2015.

The SWH market has continued to contract over the last four years with 59,000 systems expected to be installed in 2013 a reduction of 15 per cent on 2012 levels. We expect that the number of SWH systems installed moderately increases over the next few years as it becomes less affected by competition with solar PV for consumer's discretionary expenditure. We expect that 65,000 SWH systems are installed in 2014 a 10 per cent increase on 2013 levels.

The Government is currently developing the detail of its Million Solar Roofs Program which will make an increasingly important contribution to the solar market from 2015. This program will provide a rebate of up to \$500 for a solar system (PV or SWH) and will support up to 100,000 systems each year. The program is assumed to be eligible to Commonwealth Concession Card holders and we expect that 80 per cent of rebates paid are for systems that would not have otherwise have been installed. We have modelled the impact of this program on an incremental basis and estimate that an additional 40,200 solar PV systems and 19,800 SWH systems will be supported on a full-year basis.

We expect that a total of 16.4 million STCs will eventually be created for small-scale system installations occurring in 2014. The level of STCs created is expected to grow to 18.7 million in 2015 and 19.8 million in 2016 largely due to the contribution of the Million Solar Roofs Program

There is considerable uncertainty around the estimates in particular around the following factors:

- Variability in international PV system prices and exchange rates
- Extent of the contraction in the residential PV market
- Extent of the growth in the commercial PV market; and
- Impact of the Million Solar Roofs Program

We have undertaken a sensitivity analysis and believe that the lower bound estimate for the 2014 installations is 15.0 million and the upper bound estimate is 17.6 million STCs.

The expected STC creation on an installation year basis is set out in the table below:

'000 STCs	2012	2013	2014	2015	2016
Total Certificates - Base Case	37,870	19,529	16,370	18,672	19,763
	0	0	0	0	0
Total Certificates - High Case	37,870	19,529	17,640	20,779	22,283
Total Certificates - Low Case	37,870	19,529	14,994	15,970	16,538

1. Project Scope

The Clean Energy Regulator (CER) has engaged Green Energy Markets Pty Ltd (GEM) to provide a forward estimate of the Small-scale technology certificates (STCs) likely to be created during the 2014 calendar year, and for the 2015 and 2016 calendar years.

Based on its in-depth knowledge of the renewable energy industry and using all the factors that impact the uptake of solar water heaters (SWH) small scale PV, wind and hydro-electricity systems, GEM is to provide a range of qualified projections. These projections will reflect the likely creation of STCs from eligible installations for the calendar year 1 January 2014 to 31 December 2014, and the following two calendar years 2015 and 2016.

Data input into the model to estimate the number of STCs should include (but not be limited to):

- Eligible system REC/STC creation for the last two years. Showing the historical trend in small-scale technology uptake;
- Impact of the introduction of the “One Million Solar Roofs” initiative on STC creation;
- State and Commonwealth incentive schemes and any potential changes to these schemes over the timeframe;
- Relevant historical legislative changes to the eligibility rules and criteria for SWH and SGUs;
- Existing and potential changes to, building codes and regulations including energy efficiency measures which impact the uptake of various technologies (particularly relating to hot water systems);
- Change in cost of STC eligible systems due to new technological and manufacturing improvements and changes in the cost of system components;
- Global financial conditions and changes in currency values and changes to the cost of raw materials;
- Impact of price of STCs on creation rates to the extent to which they are applicable to the modelling; and
- Any other relevant factor

Out of Scope of this consultancy:

- Certificates remaining in the Registry from the previous compliance period (stock of certificates);
- Overhang of STCs from 2013; and
- Large Generation Certificates as defined by the amended legislation.

2. Methodology and Assumptions

GEM has developed forward estimates separately for each of the small-scale technologies that are able to produce STCs over the 2014 to 2016 period. Modelling approaches have been tailored to the specific market attributes of each technology and market segment.

Modelling solar PV certificates

The demand for and installation of solar photovoltaic (PV) systems in Australia continues to be driven by up-front cost, industry marketing, rising electricity prices, environmental awareness and government incentives through feed-in tariffs; and STCs. System payback periods continue to be a useful proxy for determining the attractiveness of PV and these incorporate the impact of up-front cost, electricity prices (including structure of network charges) and feed-in tariffs forms the basis of our modelling.

Our modelling for solar PV STCs is split into four categories, with each treated differently due to different drivers:

- Expansions or system upgrades (systems less than 2 kW installed from 1 January 2011);
- Commercial (or non-residential) systems (systems with a capacity of 10kW or greater);
- Million Solar Roofs systems (additional systems supported by the program); and
- Residential systems (representing all other systems).

Modelling residential PV system installations

Modelling for these systems will be based on inputs to our payback model, with the resultant payback period feeding into a demand curve for each state. These demand curves will then forecast the proportion of eligible households which will install systems. Then based on this figure, the solar zone rating and the average system sizes, STC creation will be forecast.

Payback period will be modelled using Green Energy Markets payback model. Explicit assumptions used in the model include:

- The STC price;
- State feed-in tariff rates, eligibility and other factors;
- System prices; and
- Electricity prices.

System prices will be forecast based on industry forecasts of equipment prices, installation costs and exchange rates. Changes in the cost of raw materials will be implied in the above. We will assume that current feed-in tariff arrangements or export pricing that is currently in place remains the same for the three year forecast period.

Based on these factors average payback period for systems are generated for each state/territory for each of the three years.

Modelling upgrades, expansions and replacements of residential PV systems

We expect that this market sector is increasing albeit from a low base. Many small 1 kW systems were installed that were eligible for the initial \$8,000 grant and a number of customers are expanding their systems in response to higher power prices and lower panel prices. While this market sector is still very small we expect it to continue to grow and become a much more important feature of the industry in future years as saturation increases.

As a result we separately assess this segment to determine its relative size and importance. We assume that systems less than 2 kW and denoted as not being a complete unit installed from 1 January 2011 are system upgrades.

Modelling non-residential (commercial) PV systems

The number of commercial systems being installed is increasing and is becoming a more important part of the market as saturation levels for residential PV increases. We develop a historical picture of these systems based on the data provided and assume that systems of 10 kW or greater are commercial systems.

We make extensive use of SunWiz's experience and knowledge of this market sector to develop a market profile and demand curve based on system payback.

Modelling million solar roofs PV systems

Under the Governments proposed million solar roofs program up to 100,000 solar systems (PV and SWH) systems per annum will be eligible to receive up to a \$500 rebate. From publicly available information to date the likely key features of the program are assumed to be:

- Eligibility limited to low income households (assumed to be concession card holders);
- Funding start from 1 January 2015;
- Limit of 100,000 rebates paid per annum; and
- Systems to be eligible to create STCs.

Modelling solar water heating certificates

Water heater systems are essential appliances and subject to state regulations increasingly limiting choice in some applications. As such, water heater system choices are based on different factors which include: the existing system type (if being replaced); the relevant state regulations; the type of premises; access to reticulated gas, and also net system up-front costs (after taking incentives into account). Operational costs, such as future electricity and gas prices (particularly in the case of LPG) are also factors that need to be considered.

The solar water heater (SWH) market (including air sourced heat pump water heaters) has three sub-markets which are each subject to different incentives and regulations – these are the new building market (residential), the replacement market (for existing water heaters in residences) and the million solar roofs market. The commercial market which had been important in previous years, is not significant and will not be separately analysed.

SWH systems in each state and each sub-market are separately modelled. Major inputs into this analysis include building forecasts (new and total), system replacement rates and market shares for each water heater technology by year.

The model considers relative market shares together with the following factors:

- State regulations for new/replacement systems;
- Access to reticulated gas;
- STC price;
- System prices (prior to incentives);
- Other state and federal government incentives (if any);
- We assume that the regulated phase out of electric resistant water heaters does not happen or at least is deferred beyond the forecast period; and
- Economic factors including GDP.

SWH system installations forecasts will be combined with average system certificate creation forecasts (based on current and historical data) to estimate total certificate creation in each state and each submarket.

Modelling for SWH systems installed under the million solar roofs program will be based on the approach used for solar PV outlined previously.

Modelling other small generation unit certificates

Certificate creation for small wind and hydro power systems are presently not material.

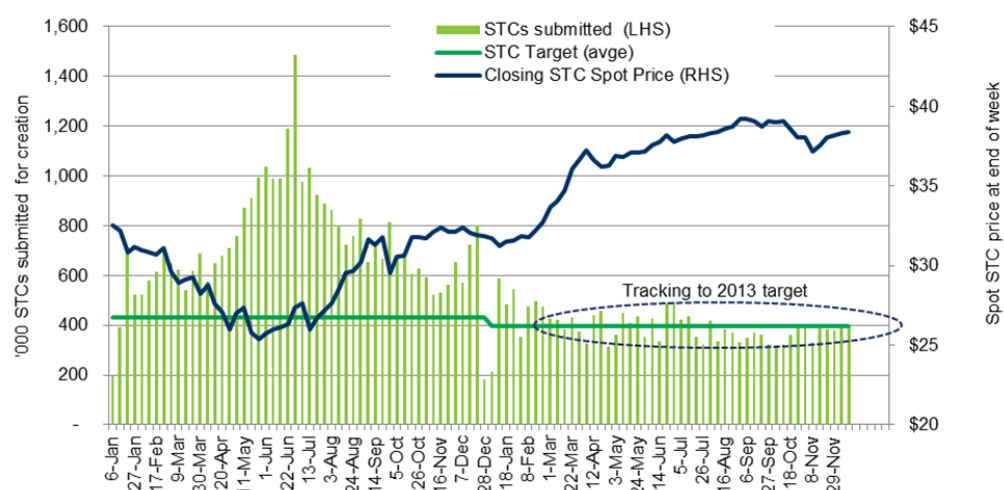
3. Industry and Market Review

STC market

The level of solar systems installed and creating STCs has dropped considerably in 2013. The level of STCs submitted for registration over 2013 has been relatively stable as can be observed in Figure 3.1. This is in stark contrast to the level of creation in 2012 which was quite volatile and impacted by changes to the Solar Credits Multiplier and changes to state feed-in tariffs.

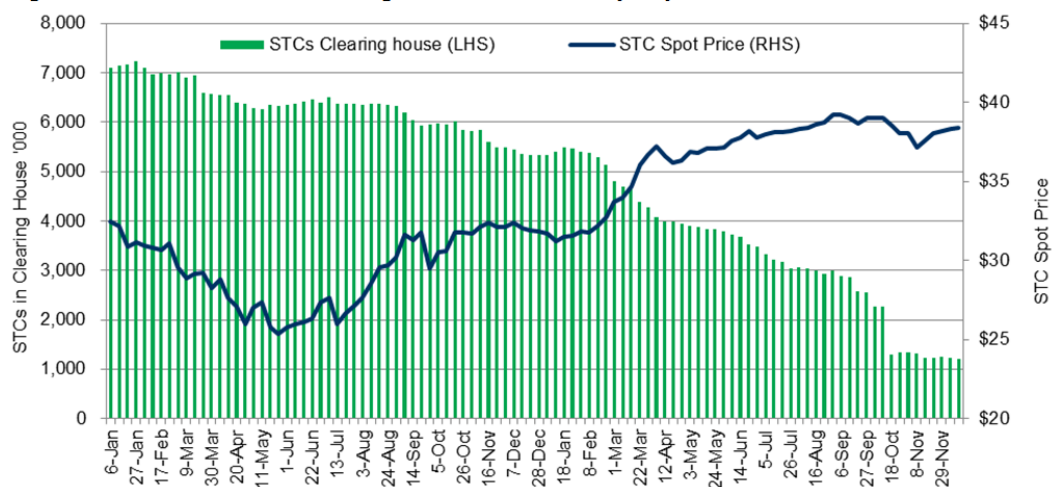
The level of weekly creation in 2013 has tracked very closely to the STC target expressed as a weekly average. As a result the STC spot price has progressively increased through 2013 reaching levels just below the \$40 Clearing House price.

Figure 3.1 STC spot price and weekly STCs submitted for registration



The number of STCs queued in the Clearing has progressively reduced over the last two years reaching 1.2 million at the end of November 2013 (Figure 3.2).

Figure 3.2 STCs in the Clearing House and STC spot price since Jan 2012



As the STC spot price has increased it has become financially attractive to remove certificates from the Clearing House and sell them on the spot market. The STC market now appears to be working as it was initially designed. The reduced volatility in creation and the progressive absorption of the oversupply of certificates has meant that the price of certificates has become less volatile and has settled at close to the Clearing House price.

The average STC spot price over 2013 was \$36.70. For the purposes of our analysis we have assumed that the average STC price for 2014 is \$38 and remains at this level for 2015 and 2016.

Market Survey

As part of the data modelling exercise we interviewed a number of market participants for their views of the solar PV and SWH market over the coming three years. The views of these businesses assisted in the development and refinement of our assumptions.

Solar PV

Australia had installed nearly 3,300 MW of small-scale solar PV by the end of 2013. Queensland had installed the most PV with more than 1,070 MW installed accounting for 33 per cent of the total (refer to Table 3.1).

Table 3.1 Installed capacity by state (MW)

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
Pre 2011	182.3	84.3	123.3	51.8	60.4	5.4	2.5	7.1	517.1
2011	195.0	139.8	224.7	163.2	118.1	5.9	1.8	17.2	865.8
2012 est.	144.4	207.1	416.9	137.8	98.6	20.2	2.2	5.0	1032.3
2013 est.	148.6	139.4	313.0	140.5	79.7	32.1	5.1	11.5	870.0
Total	670.4	570.7	1,077.9	493.2	356.9	63.6	11.6	40.8	3,285.2
% of Total	20.4%	17.4%	32.8%	15.0%	10.9%	1.9%	0.4%	1.2%	100.0%

More than 1.21 million PV systems had been installed by the end of 2013. Queensland had the most installed systems accounting for 31 per cent of the total. If we exclude system upgrades then a total of 1.19 million individual sites had a PV system installed (Table 3.2).

Table 3.2 Systems installed by state

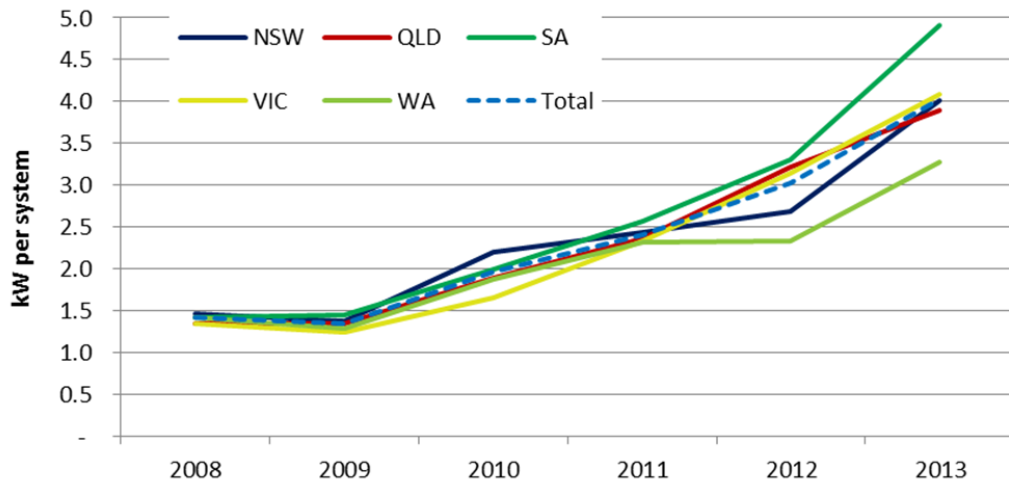
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
Pre 2011	90,560	59,879	72,258	29,675	36,693	3,806	1,005	3,586	297,462
2011	80,174	60,063	95,073	63,410	51,124	2,468	400	6,854	359,566
2012 est.	53,840	66,067	129,381	41,777	42,382	6,339	507	1,518	341,810
2013 est.	37,032	34,057	80,506	28,575	24,330	7,639	996	2,583	215,719
Total	261,605	220,065	377,218	163,437	154,529	20,252	2,909	14,541	1,214,557
less Upgrades	1,166	1,827	13,002	2,138	5,435	638	16	69	24,291
Number of Sites	260,440	218,238	364,216	161,299	149,094	19,614	2,893	14,472	1,190,266

Average System Size

The average size of PV system installed has been progressively growing over the last five years. In 2013 the average system in Australia was 4 kW per system compared to just 1.5 kW per system in 2008 (refer to Figure 3.3). South Australia is noticeably above average and conversely Western Australia is significantly lower than average.

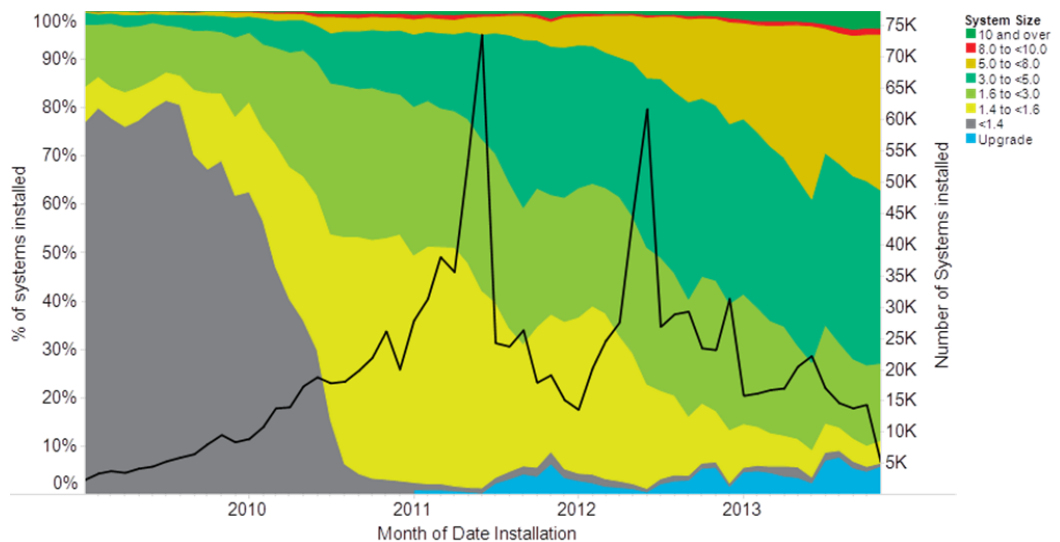
The key factors that have impacted on larger system size include (i) significant fall in PV module prices, (ii) attractive feed in tariffs (particularly in South Australia until recently) and (iii) strong growth in commercial sized systems

Figure 3.3 Average size of PV system installed in largest states



In Figure 3.4 we analyse the market by bands of system sizes which clearly shows the trend to much bigger systems. The PV market prior to 2011 was significantly impacted by the \$8,000 rebate for up to 1 kW, and the Solar Credits Multiplier for systems up to 1.5 kW which resulted in smaller systems being installed.

Figure 3.4 Relative size (kW) of system installations (Australia as a whole)



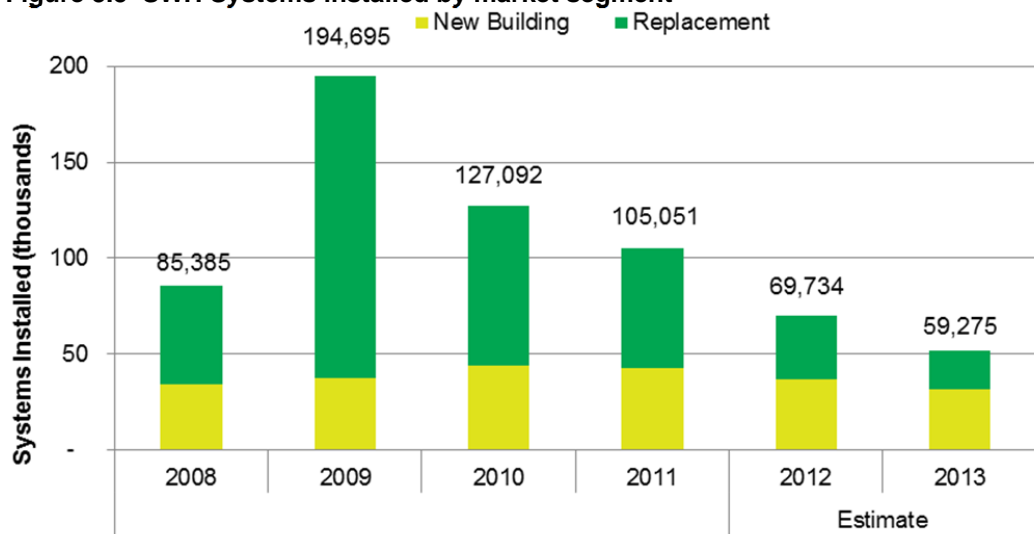
Note: The line on the above chart shows the monthly level of system installations (not all systems installed in 2013 will have created certificates)

A more detailed assessment of system size for each PV market segment is included in Sections 5, 6 and 7.

SWH market

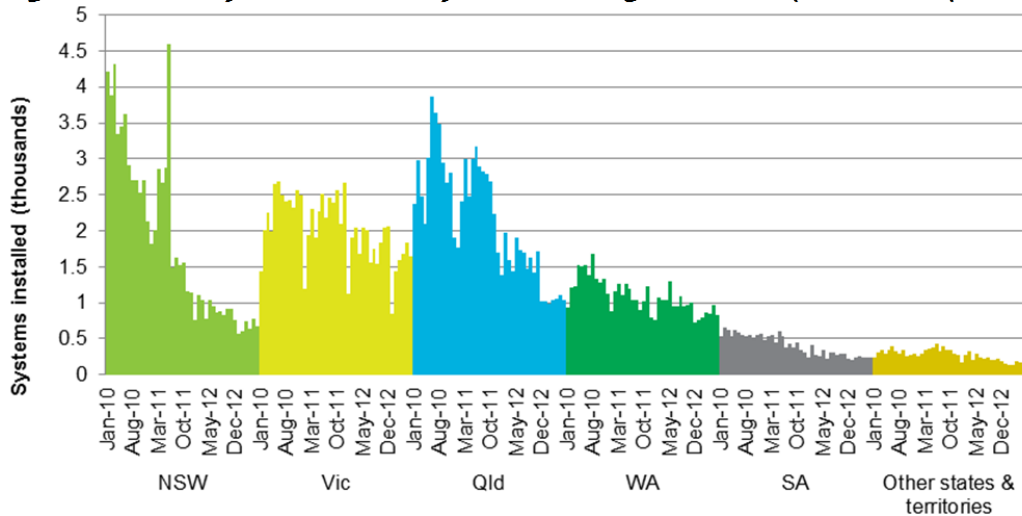
The Solar Water Heater (SWH) market in Australia has declined each year since 2010. We estimate 59,275 SWH systems will be installed in 2013, installations at this level are 15 per cent lower than estimated installations for 2012 (69,734). It is important to note that not all SWH systems installed create certificates. Most of the non-created certificates are a result of the new-build market failing to create certificates. Industry estimates place the non-creation of SWH certificates at between 10 to 15 per cent of total systems installed.

Figure 3.5 SWH Systems installed by market segment



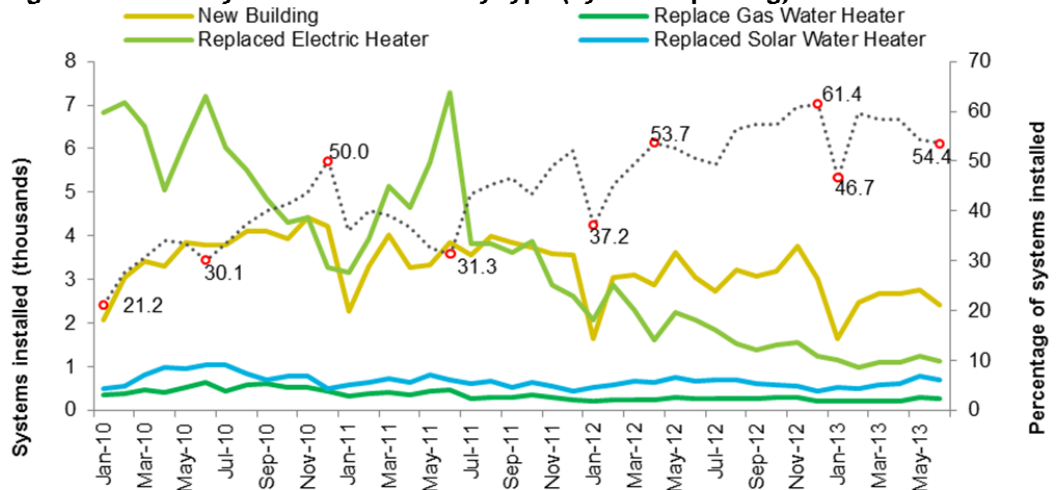
The replacement market for SWH has been more volatile than the market for new-build SWH systems (Figure 3.5). For the most part the volatility in the replacement market has been driven by policy and regulatory changes. Installation levels in the replacement market has been affected by the removal of the \$1000 commonwealth rebate; competition for household discretionary expenditure (in particular with solar PV); and the stop-start phase-out of electric hot water systems at state and territory level.

The new home market has shown itself to be reasonably stable over the last six years ranging from 32,000 to 44,000 systems each year. For 2013 we expect that new home market will be 14 per cent lower than 2012 levels and the replacement market to be 16 per cent lower.

Figure 3.6 Monthly installed SWH systems creating certificates (16 Nov 2013)

Installations of SHW systems have reduced across all states and territories. The most marked reduction in system installation rates comes from those states with relatively low access to gas and high proportions of electric water heaters (i.e. NSW and Queensland). Commonwealth and state support programs had created significant incentives for residents in these states to replace their electric water heaters and created significant growth in the replacement market as a result (refer to Figure 3.6). The removal of rebates has had a dramatic impact on the level of SWH systems installed in NSW and Queensland.

Victoria remains a key market for SWH over the past three years. The strong Victorian market reflects the support provided by the Energy Saving Incentive Scheme for replacing electric water heaters with SWH and strong growth in new homes.

Figure 3.7 SWH system installations by type (system replacing)

The new building market and the solar replacement market although declining recently has underpinned the SWH industry over the last three years.

Delay in creation of certificates

Registered Agents and their customers have 12 months from the date of installation of a small-scale system to create the certificates. This means that we will only know at the end of 31 December 2014 the number of certificates created from the installation of solar systems in 2013.

The data provided by the CER incorporated details for those systems that had been submitted for certificate creation by 24 November 2013 in the case of PV and 16 November in the case of SWH systems. To get a full picture on likely level of installations during 2013 we need to estimate the number of certificates that are yet to be created for systems installed in 2013. The same applies for systems installed in 2012, there will be a small number of systems that were still to create certificates for installations last year.

Our starting point is to consider the delay in certificate creation for 2011, the most recent year for which we have complete data and then apply this to 2012 installations.

For system installations in 2013 we have made an estimate of the expected level of creation to the end of 2013 and then applied the delay in creation for 2012 installations to 2013 installations¹. The total number of solar PV systems and SWH systems expected to be installed in 2012 and 2013 are summarised by market segment in Tables 3.3 and 3.4.

Table 3.3 PV Systems yet to create Certificates

Solar PV (no of Systems)	Created to date (24 Nov)	Still to create in 2013	Total created in 2013	To be Created in 2014	Total Created	% yet to create
2012 Install Year						
Commercial	2,880	6	2,886		2,886	0.21%
Residential	330,983	192	331,175		331,175	0.06%
Upgrade	7,739	10	7,749		7,749	0.13%
	341,602	208	341,810	-	341,810	0.06%
2013 Install Year						
Commercial	4,273	555	4,828	1,611	6,439	33.6%
Residential	152,942	15,235	168,177	30,721	198,898	23.1%
Upgrade	7,917	1,030	8,947	1,435	10,382	23.7%
	165,132	16,820	181,952	33,767	215,719	23.5%

Table 3.4 SWH Systems yet to create Certificates

SWH (no of Systems)	Created to date (16 Nov)	Still to create in 2013	Total created in 2013	To be Created in 2014	Total Created	% yet to create
2012 Install Year						
New Building	36,315	242	36,557		36,557	0.66%
Replacement	33,117	60	33,177		33,177	0.18%
	69,432	302	69,734	-	69,734	0.43%
2013 Install Year						
New Building	22,391	3,535	25,926	5,624	31,550	29.0%
Replacement	20,425	3,225	23,650	4,075	27,725	26.3%
	42,816	6,760	49,576	9,698	59,275	27.8%

¹ We have first normalised 2012 installations to account for the surge in activity for solar PV during the middle of the year due to changes in the Solar Credits Multiplier and State feed-in Tariffs.

4. Australian PV Industry Overview

The Australian PV market has gone through a transformative change in recent years with industry dynamics again changing in 2013.

By the end of 2013, there were an estimated 3,780 businesses active in the PV industry in Australia, a decline of at least 12per cent compared to the previous year. Measuring exits and changes in activity levels is extremely difficult² with the number of industry exits possibly being as high as 25per cent, with more consolidation to come.

It has clearly been a difficult year for PV industry participants with installed capacity falling by 16 per cent on 2012 levels. The industry has experienced intense competition driven by the desire to maintain volume and market share which has led to significant margin erosion and increased cash flow risks. The benefits of declining PV price are predominately going to consumers, leaving PV retailers in a position where they are often selling the same volume as previous years with similar workloads and yet, returning less revenue and margin along the way.

A significant consequence of the cessation of feed-in tariffs has been the added complexity and risk in the sales process. Retailers now have to estimate or calculate self-consumption and export ratio's to provide an accurate financial evaluation. This has not only created substantial changes to sales engineering and processes, but ultimately has confused some customers and in all probability, left the industry exposed to dissatisfied customers.

The cessation of virtually all feed-in tariff schemes and a significant change in foreign exchange rates also had significant impacts in 2013. Consumers who had previously rushed in to beat feed-in tariff and Solar Credits change deadlines have largely had little incentive to do so in 2013³.

On the positive side, in the medium to long term this should stabilise the consumer market's behaviour and thus, should create a more stable demand pattern. The enhanced sophistication required in the sales process may also support industry consolidation as it is not as easy to sell a system as it once was.

Excess global inventory also played an important role in the early part of 2013, although more sporadic and opportunistic than we have seen in the past. PV trade tariffs (anti-dumping rulings) in the US and in Europe had the effect of diverting some stock and maintaining strong pressure on price, although this also arguably provided an opportunity for lower quality product from smaller manufacturers too.

SolarBusinessServices has conducted analysis on industry participants using the following segmentation of primary activity types:

PV Wholesalers - companies engaged primarily in the wholesaling of PV equipment and rarely if ever in the retailing or installation of such equipment (where possible, wholesale and retail volumes have been split and explicitly noted)

Large PV retailers - companies engaged primarily in the retailing of PV equipment, in significant volume or with significant profile. Typically use a mix of in house and or sub-contracted installers. Typically >1MW p.a. in volume.

² SolarBusinessServices estimates utilising a range of industry sources

³ Some surge in activity has been seen with announced changes to Tasmanian and South Australian feed-in tariffs and there was a slight increase in Queensland installations by the 30 June 2013 installation cut off date.

Medium PV retailers - companies engaged primarily in the retailing of PV equipment in reasonable volume or with reasonable profile. Typically use a mix of in-house and or sub-contracted installers. Typically 200kW-1MW p.a.

Small PV retailers - companies engaged primarily in the retailing of PV equipment, in small volume or with small profile. Typically installations are handled in-house at <200kW p.a.

Utilities - companies licensed and engaged primarily in the retailing of electricity who are active in the PV market

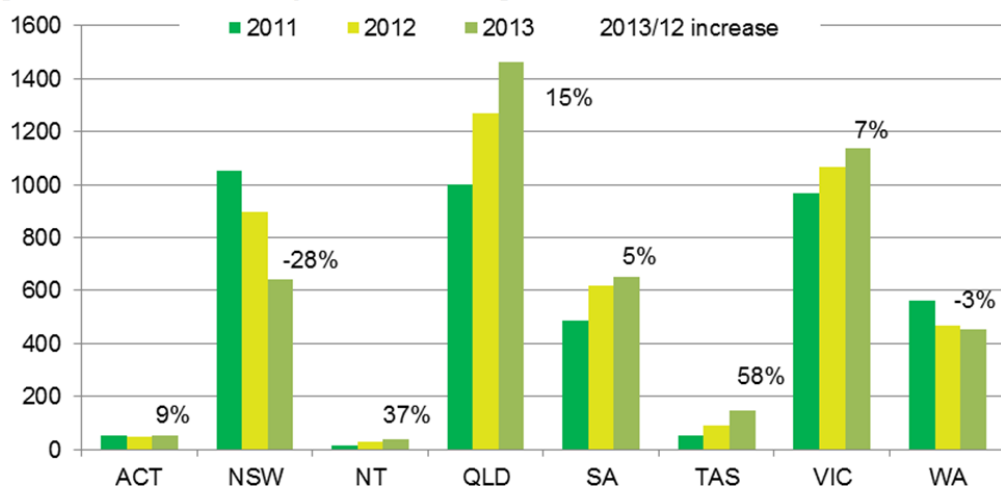
Electrical contractors - companies engaged primarily in electrical contracting which includes the installation of PV systems but rarely the retailing of PV

Engineering Procurement and Construction (EPC) Specialists – companies focused primarily on the engineering, construction and procurement of commercial PV systems

The highest number of companies represented is electrical contractors who represent around 53 per cent of the total number of businesses active in the PV industry in 2013. Electrical contractors play a vital role in the installation of PV and their number is a crucial measure of the industry's capacity to install any given volume. However, our analysis suggests that as many as 20 per cent of the contractors are now far less active in PV, or indeed have refocused entirely on other sectors.

It has typically been the case that this segment of the channel is on the whole far less engaged in the development of or advocacy for the industry. This can be seen in a statistical sense when we analyse the locations of installers relative to the changes in state demand, represented in Figure 4.1. Of particular interest is the continued reduction in the number of installers as a result of unattractive or absent feed-in tariffs (eg. NSW and WA) and increases in states that still had attractive feed-in tariffs during 2012/2013 (Queensland, Victoria, South Australia and Tasmania).

Figure 4.1 PV installers by state and change in 2013 cf: 2012



Based on our industry segment categorisations the companies currently active in the Australian PV market have been identified by their primary 2013 activity level (Figure 4.2).

The industry channels have historically demonstrated a relatively organic reaction to demand, however there are lagging affects that have been observed this year. More business exits from the market are expected predominantly in electrical contractors and Large PV Retailers.

The number of players have ebbed and flowed with the needs of the market and 2013 has seen industry participation levels decreasing compared to 2012, in line with decreasing annual volumes (Figure 4.1 and Table 4.1). The number of remaining industry participants has been measured in two key ways; firstly through the number of accredited installers and secondly, through the estimated number of active businesses.

These two metrics differ due to the fact that multiple installers work for the same company in some cases, some installers retain registration despite being non active and a number of companies use subcontractors and thus are not listed as accredited installers. Data from the Clean Energy Council has been used to measure accredited installers and data from SolarBusinessServices to measure the number of businesses.

In terms of the sales channel to market, best measured through the number of businesses, on average each business sold an estimated 4 per cent less volume per company than in the previous year (Figure 4.2). In terms of the number of accredited installers, the decrease is even more pronounced, with 18 per cent less volume per installer available in 2013 compared to 2012 (Table 4.1).

Figure 4.2 Number of active businesses in the solar PV market

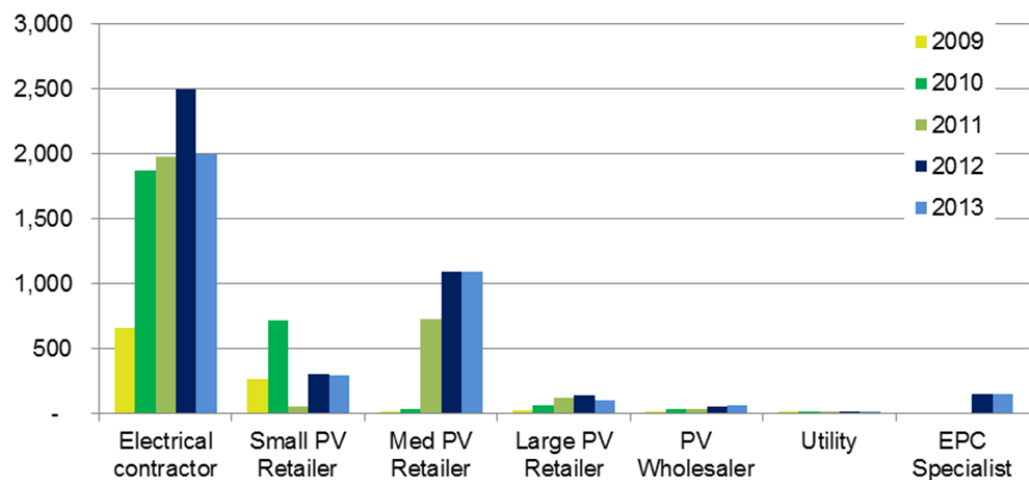


Figure 4.3 Level of Installations per active solar PV business

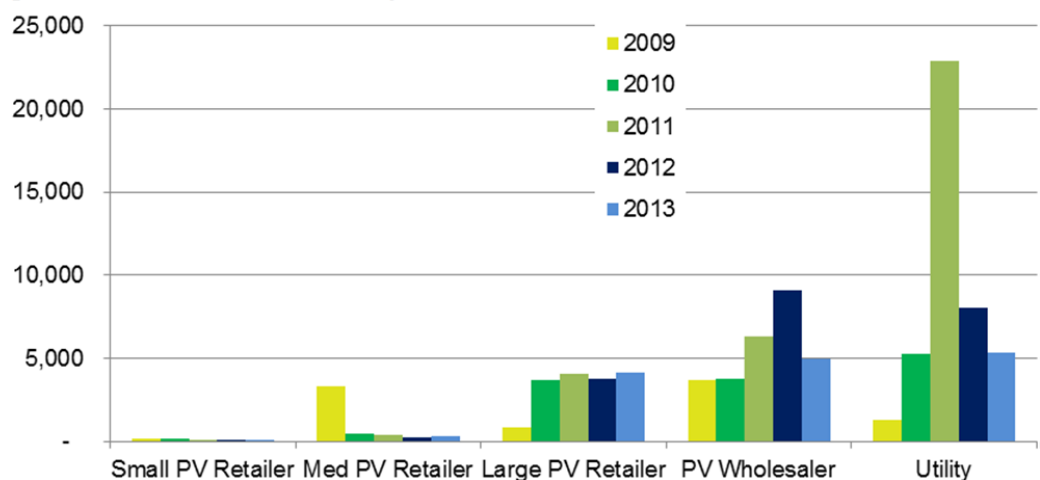


Table 4.1 Active businesses and volume per business

	Annual MW Installed	Number of Businesses	kW per Business	Annual Change	No of Accredited Installers	kW per Installer	Annual Change
2009	83	961	86		1,619	51	
2010	389	2,758	141	64%	3,081	126	147%
2011	866	2,954	293	108%	4,189	207	64%
2012	1,032	4,272	242	-18%	4,484	230	11%
2013	870	3,742	232	-4%	4,584	190	-18%

Based on lower market volumes for 2013 and beyond, the number of participating solar businesses is likely to reduce and consolidation to increase. Although not exhaustive, a minimum of 180 businesses have liquidated in 2012/2013, or are in various stages of deregistration, which is an indicator of the pressure on the sector.

Based on an analysis of known active solar businesses who we identified on ASIC registries in 2013, the majority of pressure in terms of closures appears to be on Large Retailers. These are the businesses that are the most exposed to major fluctuations in price and volume and also have the highest overheads. Small retailers have also suffered, likely due to a lack of scale or ability to compete. A number of these companies were also likely to be very new entrants who we expect entered the market late with insufficient knowledge to survive the volatility.

Notably, only a small percentage of electrical contractors have been identified as closing but we believe that this is because many simply switch market sectors rather than closing and because they are not necessarily readily identifiable as solar companies. However, an October 2013 phone survey of accredited installers revealed that as many as 20 per cent accredited installers were “no longer active in solar due to the volatility and pressure”.

Table 4.2 summarises closures by company type that were identified through ASIC in 2013.

Table 4.2 Closures and liquidations in 2013

	Number of Businesses	Share
Electrical contractor	3	6%
Large PV Retailer	24	47%
Medium PV Retailer	10	20%
PV Wholesaler	1	2%
Small PV Retailer	13	25%

5. Installed PV system cost projections

The typical factory gate price in Australia for PV modules continued to fall in 2013, declining by approximately 18% over the year compared to 2012. This is a significant change from the 47% drop recorded in 2012, over 2011 and evidence that PV prices are stabilising somewhat.

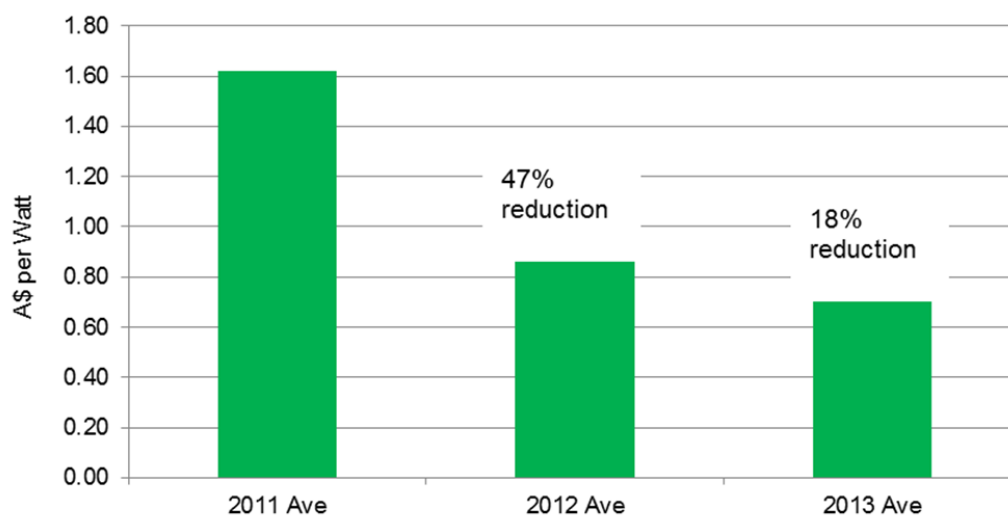
The extent of any further decreases in Australia depends on a number of critical factors, most notably:

- Foreign exchange rates;
- The relative size and attractiveness of the market, compared to other global markets; and
- The relative size, quantity and attractiveness of the Australian buying channels.

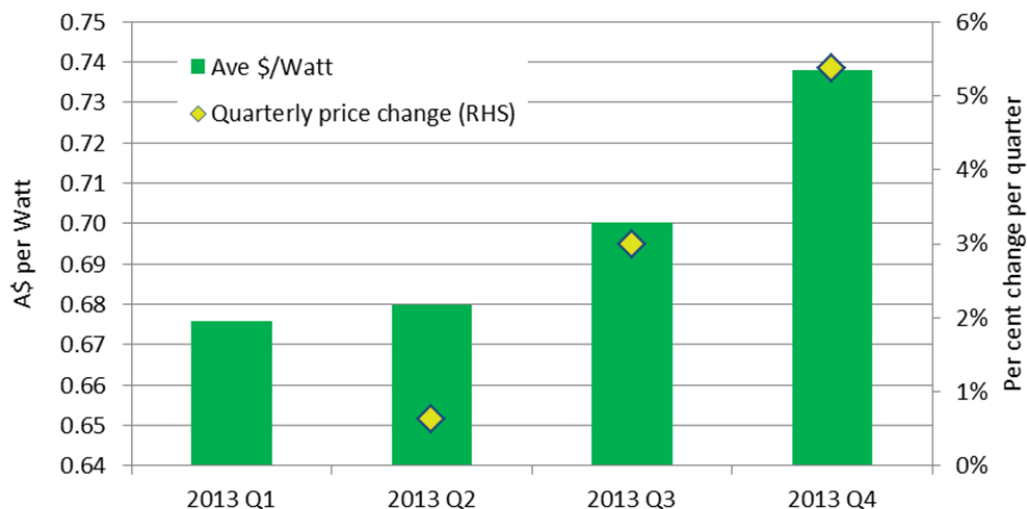
Anecdotal evidence suggests the Australian market lost some of its appeal for International PV manufacturers in 2013 and in all likelihood, this trend will continue in 2014 as the market contains to contract.

Although the price drop is good news for consumers it disguises several key issues. The first is that of quality with strong evidence that in the early part of 2013 a significant amount of low cost Tier2 and Tier 3 product was shipped to Australia as a result of trade barriers in the US and Europe. Although this trend faded quickly, the resulting (low) price expectations remained and the market took some time to correct.

Figure 5.1 PV Module – average annual price decline



However, it is vital to note that the market has been correcting. Analysing prices on a quarterly basis we can see a clear trend and evidence that average PV prices rose in local terms by an estimated 9 per cent (Figure 5.2).

Figure 5.2 PV Module price increase through 2013

An analysis of locally sampled PV “factory gate” prices appears below, highlighting the range and average price points.

Figure 5.3 Range of PV Module prices from Jan 2012
(average price for month is shown as a diamond)

System prices dropped markedly in Australia between 2009 and 2012 (Figure 5.4). As expected, system prices stabilised in 2013 to around \$2.05/W installed (on an “out of pocket” basis). Using data from SolarBusinessServices, the IEA/APVA and the SolarChoice Price Index, we can see that in line with the module price change, average system prices declined by an estimated 11% in 2013, compared to a 41% decline in 2012.

It should be noted that in previous analysis we were able to utilise CER data in this analysis through its collection and analysis of “out of pocket expense” data but since July 2013, the requirement to collect and analyse this information has ceased as a result of legislative change. The last published data for Q2 2013 (Figure 5.5) shows that net “out of pocket expenses” declined to approximately \$2,000 per kW by Q2 2013.

Figure 5.4 Average net installed cost of PV in Australia (<5kW system)

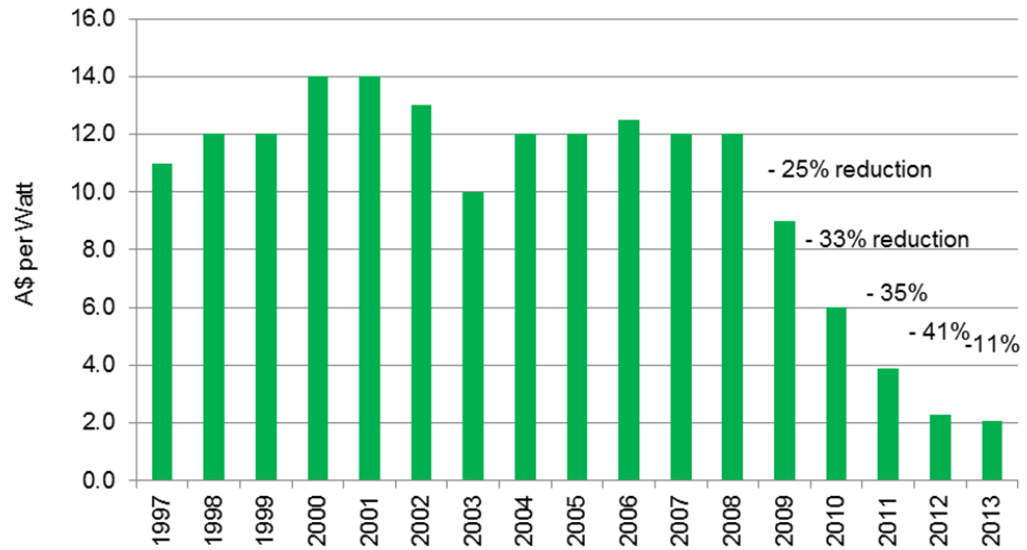
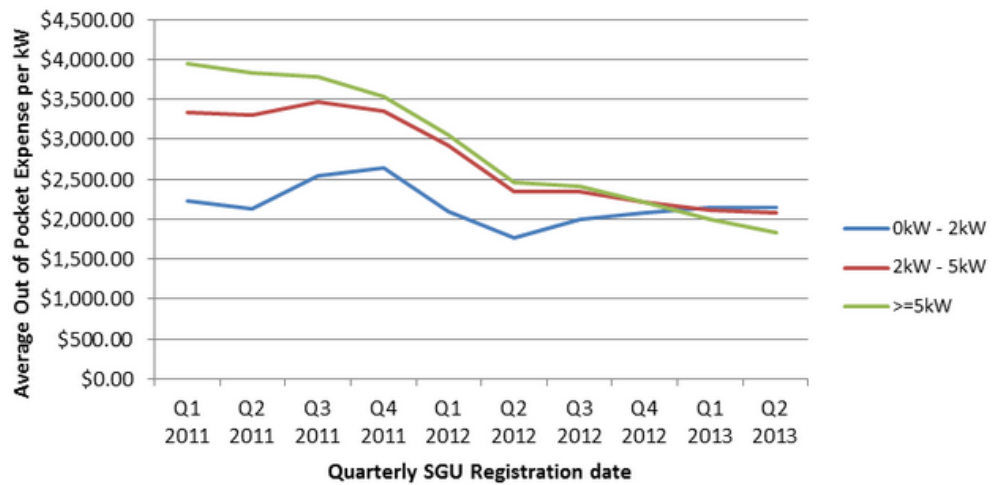


Figure 5.5 Average “out-of-pocket” costs (Extract from CER website)

Quarterly average out-of-pocket expense per kW by installed capacity



In analysing system component prices we have based our analysis on residential system sales which make up more than 95 per cent of the current market and define price build up consisting of the following:

- PV cost (modules);
- Inverter cost;
- Mounting hardware cost;
- Installation cost;
- Other ancillary hardware cost;
- Administration costs; and
- Gross Profit margin (effectively the cost of sales plus net margin).

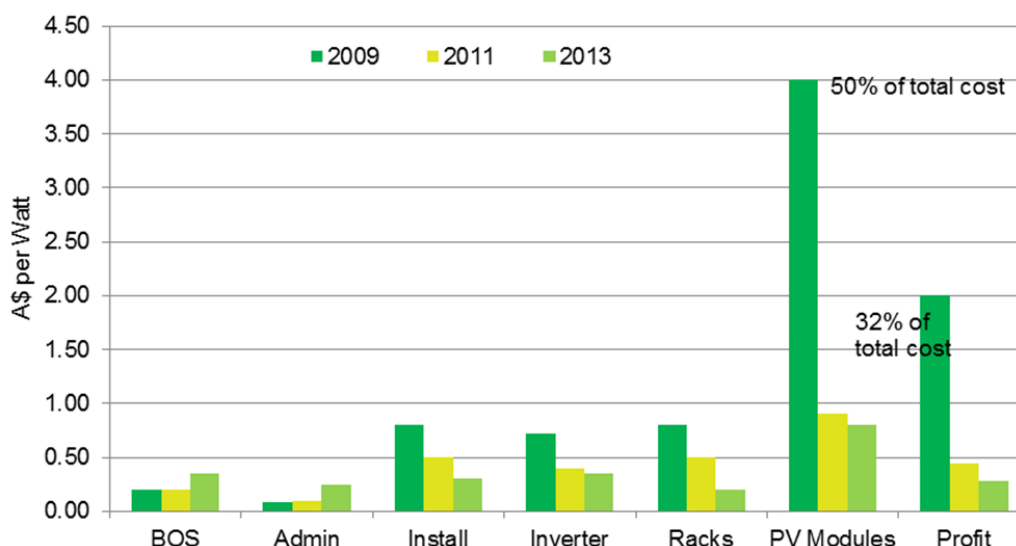
Figure 5.6 includes sample pricing taken from the Australian market prior to allowing for the value of up-front support from renewable energy certificates. Although PV module price is

decreasing in importance as a component of system prices, it remains the largest single component of cost build up. Cost reductions have occurred through all components of a PV system in 2013 compared to 2012 with balance of system (BoS) and administration costs being the two exceptions.

The cost of safety related ancillary BOS equipment (predominantly cable protection and fusing) has increased as standards have changed and almost all installers described rising compliance and sales administration costs. It is arguable that these costs may have increased as a proportion of sales as a result of diminished sales volume, rather than an outright increase in the compliance requirements.

A number noted that the increased complexity of sales (predominantly self-consumption versus export modelling) was a factor and also that many electricity network operators now require studies to be conducted prior to connection approvals.

Figure 5.6 Changes in PV module and balance of system (BOS) prices



International PV cost influences

Whilst Australian PV module and balance of system pricing generally follow international trends, there are two factors that influence International pricing in the local Australian market.

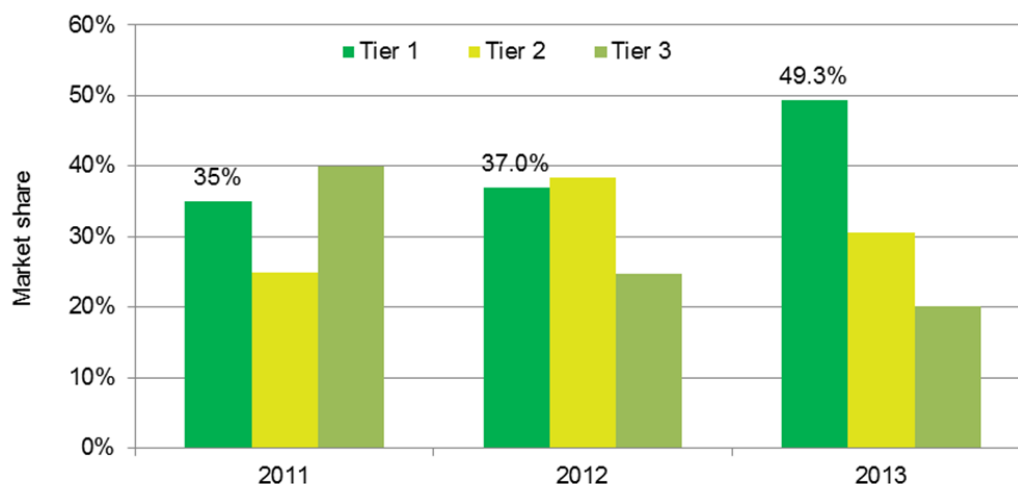
The first factor is the uniqueness of the Australian market relative to International markets. Australia is a relatively late starter in terms of being a “material” sized market and has comparatively low barriers due to its predominant residential nature (more than 95 per cent of systems). As such, International companies seeking to test new products, clear old models or sell Tier 2 or Tier 3 products have been attracted to Australia.

With limited PV brand recognition or bankability requirements compared to more mature markets, prices in Australia can in many cases be categorised as “market entry prices”, “stock clearance prices” and or “non brand-name pricing”.

Australia has thus been viewed seen as an attractive market and had one of the highest proportions of Tier 2 and 3 products, estimated at 65% in 2011 resulting in average PV prices at or below the lowest average world prices. However, this has been steadily

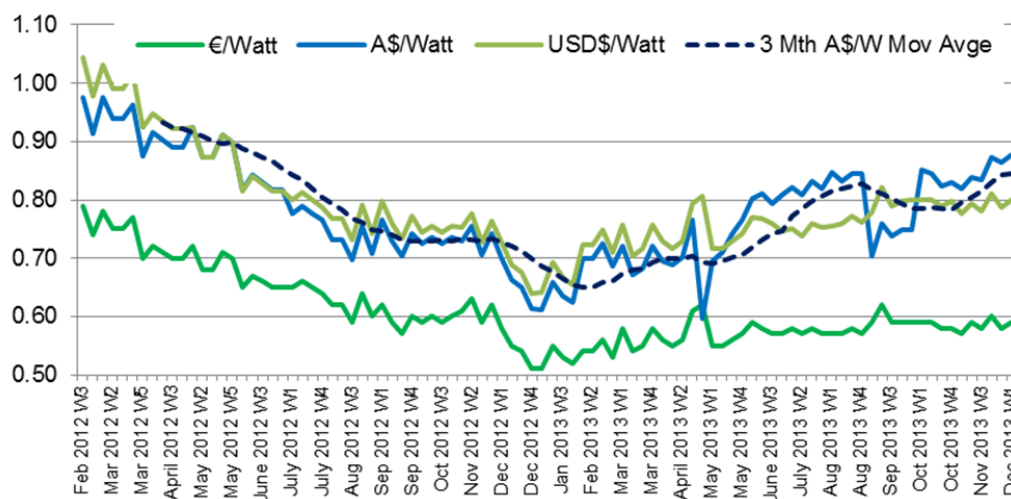
changing as the price differential diminishes and upstream consolidation takes effect. It is also clear that consumers are learning that the cheapest offers come at a price. By the end of 2013 a significant shift appears to have occurred and the majority of consumers (just on 50%) are choosing Tier 1 product (Figure 5.7).

Figure 5.7 Changes in nature of panels installed in Australia



International prices recorded in Germany and tracked against foreign exchange rates on a monthly basis highlight the impact of foreign exchange on International prices. This data is from a far larger market with larger data set and with different pricing dynamics. It does however demonstrate and highlight the same trend we have seen locally with rising price making our market less attractive to smaller more opportunistic manufacturers.

Figure 5.8 Module prices expressed in Euro, USD and AUD



Key factors that will influence module pricing over the near term include:

- Any changes to the foreign exchange rate;

STC Modelling 2014

- If commercial and project sales continue to increase as a proportion of sales, this will continue to favour more bankable Tier 1 brands and thus, may potentially increase average prices;
- Depending on the timing and severity of Chinese PV industry consolidation, some large manufacturers will lift scale and thus, may potentially reduce average prices; and
- Local consolidation across the supply chain and the reduction in industry volumes will put increased pressure on margin requirements and thus increase average prices.

6. Solar PV Projections – Residential

The Australian PV market is somewhat unique in a global context as it has been dominated by residential PV installations. Other international markets have seen policy support drive larger commercial or utility sale systems.

The residential market is the key segment in Australia and has accounted for 95 per cent of capacity installed in 2011 and 2012. The residential sector has been specifically targeted through the Solar Credits multiplier and through state feed-in tariffs. As these policy support measures have been unwound the residential sector market share fell to 85 per cent in 2013.

Systems into this market are being sold generally on the basis of financial attractiveness ie. payback. Our projections for the residential sector have been made on a state basis and are derived from our payback model, with the resultant payback period feeding into a state demand curve. From the state based demand curves the proportion of eligible owner occupied households expected to purchase a solar PV system is determined. Then based on this figure and estimates of the average system size, expected certificate creation is determined.

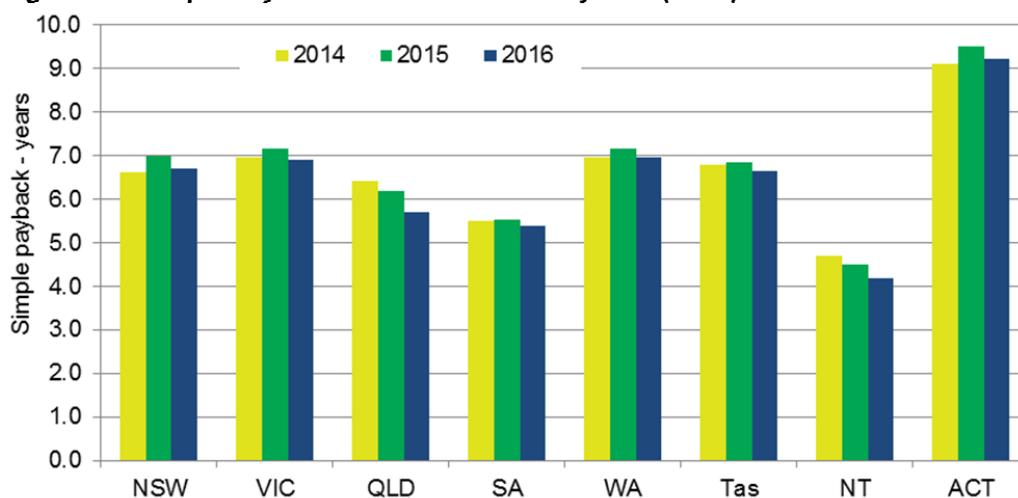
Forecasting payback periods

A simple payback approach has been used to represent the relative financial attractiveness of PV to consumers in each state. The approach to payback used is to divide the installed cost of the system (less the value of STCs) by the value of electricity produced in the year of installation. This generally overstates the real payback as electricity prices are expected to rise over the forecast period.

Payback period has been modelled using SunWiz's payback model. Explicit assumptions input into the model include:

- The STC price of \$38 from 2014-2016
- The structure of retail electricity prices to remain the same in all states over the forecast period.
- Removal of the carbon price with effect from 1 July 2014
- Retail electricity prices are based on current ruling prices remaining constant in 2014 and then increasing by 3 per cent per annum thereafter
- Export price received reflecting removal of carbon price and assumed to be 6 cents/kWh other than in SA (7.6 cents), WA (7.4 cents) and NT (25.9 cents)
- Average system size of 3 kW
- An export rate of 46 percent for a 3 kW system
- Exchange rate fixed at USD 0.91 per AUD

The installed cost of a 3 kW PV system in 2014 is assumed to be \$7,670 in 2014 prior to the value of STCs. This equates to a cost of \$2,560 per kW and is assumed to reduce only slightly (less than 1 per cent per annum) over the remaining forecast period. The installed cost for a range of PV system sizes is included in Attachment 2.

Figure 6.1 Simple Payback for residential PV system (3 kW)

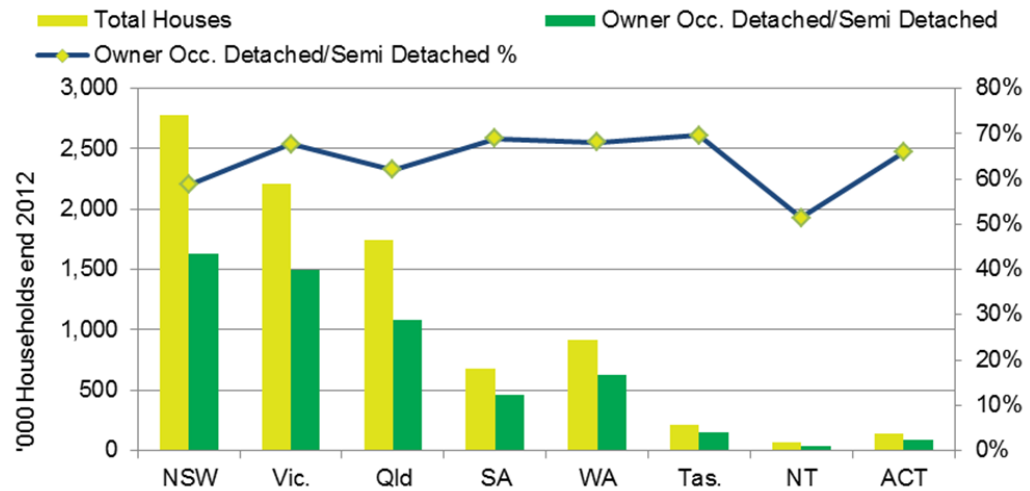
System paybacks are generally expected to increase slightly in 2014 and 2015 as a result of the removal of the carbon price and a reduction in the value of exported electricity. Paybacks in most states will improve into 2016 as power prices start to rise. A summary of payback periods by state over the 2013 to 2015 period is included in Attachment 2.

Demand for solar PV

Solar PV is a discretionary purchase for most households so financial attractiveness will be the key determinant of the underlying demand. Like other discretionary purchases uptake will also be significantly impacted by the level of sales, marketing and promotion activity. In addition concerns regarding the future economic outlook and the impact that any economic and budget contraction will have on discretionary household expenditure will constrain the near term outlook for solar PV. Offsetting this to some extent is the emergence of financing solutions that result in the customer not having to outlay any expenditure for a system.

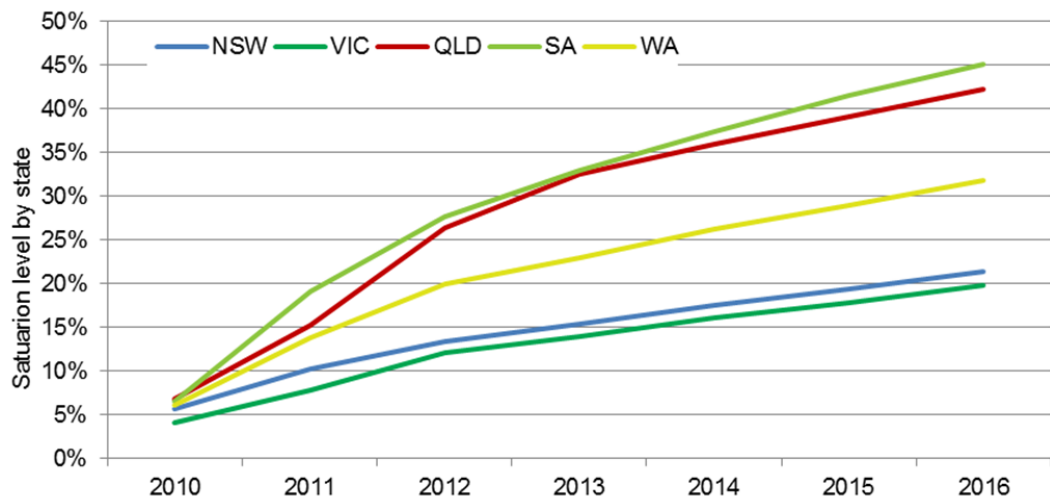
As a result we expect that system sales during 2013 are likely to be maintained at levels slightly lower than in 2013, but significantly lower than 2011 and 2012 levels.

Demand curves have been developed on a state basis based on historical monthly REC creation for residential systems. Demand curves are represented as a proportion of owner occupied relevant dwellings (separate and semi-detached houses) for that state (expressed as the average number of systems per month) for a given simple payback level. Based on ABS data we estimate that there were 8.7 million occupied dwellings in Australia at the end of 2012 of which 63.7 percent (5.6 million) were owner occupied detached or semi-detached (refer to Figure 6.2).

Figure 6.2 Dwellings by state (source: ABS)

Demand curves have been further refined to take account of the level of marketing and promotion activity, and the relative attractiveness of the state (that is not picked up through the factors incorporated in the payback model) and covers factors such as state economic conditions, relevant level of retirees, income levels etc.

The demand curves are then further scaled based on the level of saturation in each state. Over the next three years the number of cumulative PV systems installed in each state grows considerably with quite high saturation rates achieved Queensland and South Australia, reaching over 35 percent by 2014.

Figure 6.3 Saturation level by state

Note: Saturation rate represents the cumulative proportion of residential systems installed as a proportion of owner occupied houses (separate and semi-detached dwellings).

Projected system installations and saturation levels for each state is included in Attachments 3. An extract of the data is summarised in Table 6.1 and shown diagrammatically as Figure 6.4.

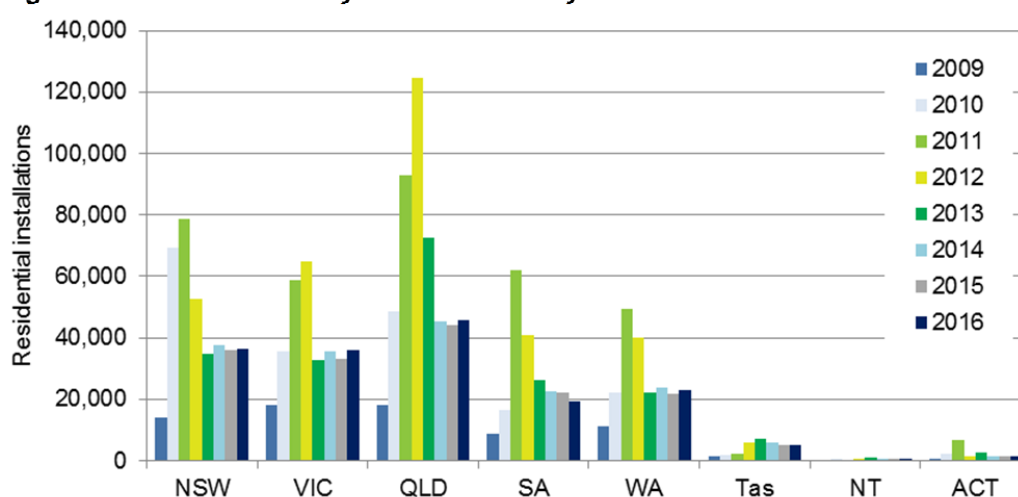
The level of residential system installations across all states has reduced markedly from the peak in 2011. Systems installations in Queensland and South Australia in 2013 had also been supported by residual installations receiving attractive feed-in tariffs. System installations in NSW, Victoria and Western Australia during 2013 were not receiving any additional support (other than through STCs) and their level of installations in 2013 represents a reasonable base level for forecasting future years.

Table 6.1 Residential PV systems installed by state

	NSW	VIC	QLD	SA	WA	Tas	NT	ACT	Total
Residential Systems installed (No.)									
2010	69,496	35,650	48,512	16,655	22,141	1,877	620	2,306	197,257
2011	78,466	58,854	92,695	61,990	49,421	2,362	356	6,747	350,891
2012	52,753	65,013	124,713	40,843	39,885	6,021	474	1,473	331,175
2013	34,868	32,669	72,616	26,071	22,190	7,050	955	2,479	198,898
2014	37,425	35,715	45,360	22,596	23,882	5,750	771	1,559	173,059
2015	36,058	33,067	44,153	22,200	21,589	5,174	756	1,366	164,364
2016	36,331	36,108	45,642	19,374	22,946	5,234	796	1,520	167,952

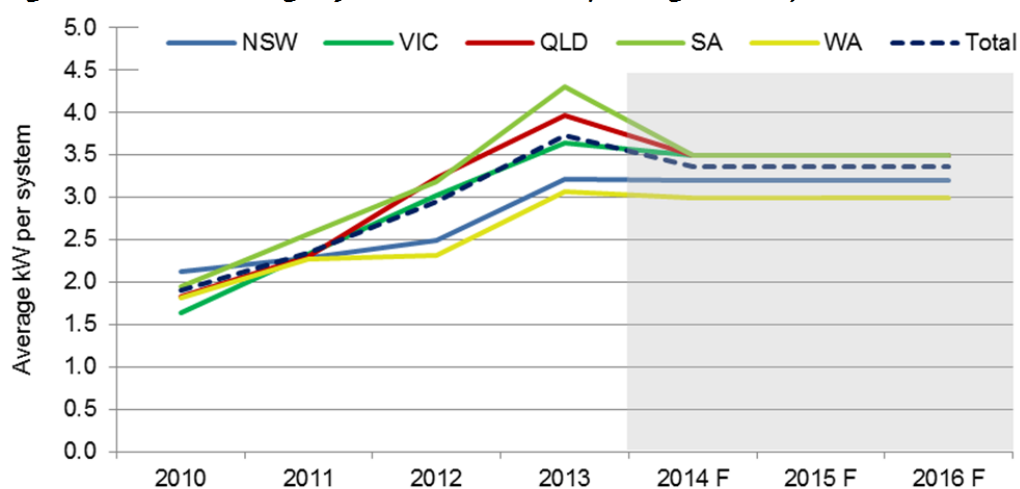
Queensland is expected to remain the leading state for solar PV installations into the foreseeable future with installations falling to levels seen back in 2010. Together with South Australia, Queensland has reached saturation rates above 33 per cent in 2013.

Figure 6.4 Residential PV systems installed by state



Determining the level of certificate creation

The average residential system size installed has increased significantly over the last three years from 1.9 kW per system in 2010 to 3.7 kW per system in 2013 (refer to Attachment 4 for details). All states have seen an increase in system size through 2013 (refer to Figure 6.5). Importantly however, Queensland and South Australia have maintained the highest system sizes largely due to attractive feed-in tariffs.

Figure 6.5 Average system size installed (for larger states)

We have assumed that as feed-in tariffs are removed average system sizes will tend towards 3.5kW per system. The exceptions being NSW at 3.2 kW per system and WA at 3 kW per system (Figure 6.5).

The total number of systems installed and associated certificates created for grid-connected residential systems is summarised in Table 6.2.

Table 6.2 Residential PV system installations and certificates (all states)

	Actual	Actual	Estimate	Estimate	Forecast	Forecast	Forecast
Year of installation	2010	2011	2012	2013	2014	2015	2016
Number of Systems Installed	197,257	350,891	331,175	198,898	173,059	164,364	167,952
Avge systems per mth	16,438	29,241	27,598	16,575	14,422	13,697	13,996
Avge kW/system	1.91	2.35	2.95	3.73	3.37	3.37	3.37
Avge Certificates/System	129.7	149.0	104.7	76.3	67.3	67.5	67.3
MW Installed	376.3	824.2	977.2	742.0	582.5	553.7	565.5
Eligible Certificates ('000)	25,587	52,283	34,672	15,181	11,653	11,088	11,301

7. Solar PV Projections – Non Residential (Commercial)

The commercial or non-residential sector continues to be seen by industry participants as an important market as the residential solar market declines. We have generally segmented the commercial market into those systems where the installed capacity of the system is greater than 10 kW. This is a proxy for commercial systems and while in some ways is an arbitrary delineation, it does generally reflect industry conventions.

Data provided by the CER included creation figures to 24 November 2013. As STC creation can occur up to 12 months from the date of system installation we have had to estimate the level of systems that will be installed in 2012 and 2013 and will eventually create certificates. A total of 4,273 systems with a capacity of 76,800 kW were installed in 2013 and had created Certificates to 24 November (refer to Attachment 8). After allowing for another five weeks of creation in 2013 and assuming the same level of creation lag as in 2012 we estimate that a total of 6,439 systems with a capacity of 116,700 kW will be installed in 2013 (refer to Table 7.1 and 7.2).

The number of commercial systems installed in 2013 increased by 123 per cent to 6,439 systems. In capacity terms the increase was even greater at 150 per cent. The commercial sector in 2013 accounted for 14% of total capacity installed up from 4.5 per cent in 2012.

Table 7.1 Number of Commercial PV systems installed by state

	2008	2009	2010	2011	2012 est	2013 est
ACT	1	1	16	63	25	99
NSW	5	24	628	1,346	761	1,686
NT	13	9	17	33	31	39
QLD	4	24	135	508	522	903
SA	1	10	42	197	535	1,989
TAS	0	0	5	35	103	237
VIC	1	0	18	74	688	1,061
WA	4	16	67	259	220	425
	29	84	928	2,515	2,886	6,439

Table 7.2 Capacity of Commercial systems installed by state (kW)

	2008	2009	2010	2011	2012 est	2013 est
ACT	11	30	301	1,115	425	1,452
NSW	168	558	7,008	15,059	12,705	36,093
NT	196	144	357	887	511	778
QLD	53	377	2,611	9,543	10,267	17,516
SA	30	214	805	2,645	7,306	27,696
TAS	0	0	92	480	1,376	3,597
VIC	20	0	308	1,139	10,135	19,786
WA	67	271	1,461	4,795	3,940	9,817
	544	1,593	12,943	35,661	46,665	116,734

In assessing the market for commercial sized systems it is important to account for the impact of government support programs that have been phased out so as to determine the true level of the underlying market. Over the 2012 and 2013 period in particular there have been three programs that have supported commercial sized systems that are no longer operative, these are:

- National Solar Schools Program (NSSP);

- Clean Technology Investment Program (CTIP); and
- Feed-in tariffs (FiT) in some states that supported larger systems

Our assessment of the capacity supported by the above programs is summarised in Table 7.3.

Table 7.3 Commercial PV capacity (kW) supported by discontinued programs

	2011	2012	2013	2014
NSSP	177	320	175	
CTIP			4,547	2,274
State FiT	15,953	19,307	10,086	0
	16,130	19,627	14,808	2,274

Removing the solar PV capacity supported from the above programs we arrive at the underlying capacity of 26,900 kW in 2012 and 101,300 kW in 2013.

From 2008 to the end of 2013 we expect that a total of 12,900 commercial sized PV systems will have been installed in Australia accounting for a total of 214 MW installed capacity. From any measure considered this represents a very low penetration rate. According to the Energy Supply Association of Australia there were just over 1.2 million business electricity consumers at 30 June 2011 (Figure 8.1). If we assume that perhaps half of this level were suitable for solar PV this amounts to a saturation rate of only 2.6 per cent.

Figure 7.1 Electricity customers and consumption (Extract from Energy Supply Association website Data and statistics- energy in Australia)

Figure 5: Number of electricity customers as at 30 June 2011

Customer type	NSW & ACT	VIC	QLD	SA	WA	TAS	NT	TOTAL
Residential	3,116,809	2,312,250	1,806,860	732,350	961,804	229,663	64,808	9,224,544
Business	378,233	321,226	215,740	99,723	124,490	48,293	12,900	1,200,605
Total	3,495,042	2,633,476	2,022,600	832,073	1,086,294	277,956	77,708	10,425,149

Source: [Electricity Gas Australia 2012](#). Classification of customers is based on information provided by companies in the industry.

Figure 6: Electricity Consumption (GWh) 2011-12

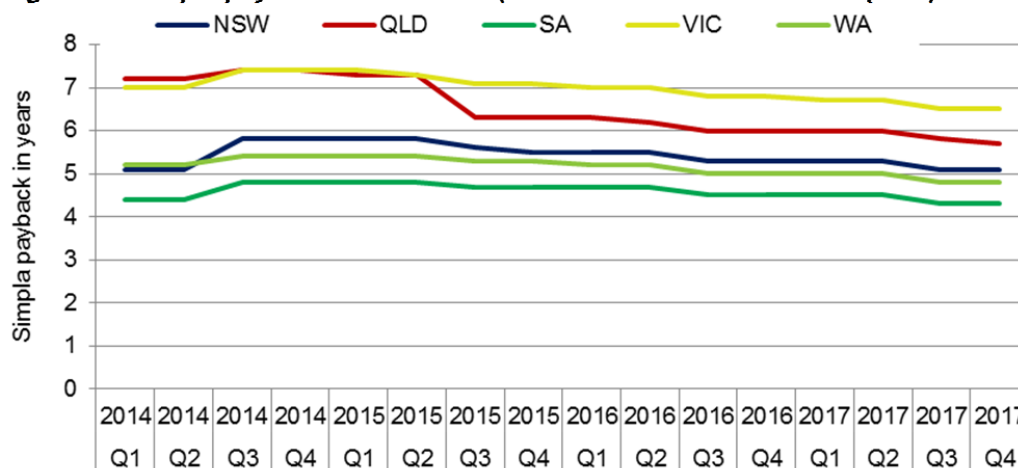
Customer type	NSW & ACT	VIC	QLD	SA	WA	TAS	NT	TOTAL
Residential	20,102.5	12,057.2	11,739.0	4,139.1	5,478.4	1,991.3	573.7	56,081.3
Business	48,956.7	31,077.1	32,201.1	8,576.5	12,794.2	8,047.5	1,227.8	142,880.8
Unmetered	409.8	350.7	150.8	108.1	31.7	37.3	14.5	1,102.9
Total	69,469.0	43,485.0	44,090.9	12,823.7	18,304.3	10,076.1	1,816.0	200,065.0

Financial attractiveness

Most business sites consume less than 160 MWh of electricity per annum and pay electricity tariffs that are equal to or higher than residential prices. To the extent that these businesses can mainly offset their on-site power use (and avoid exporting significant levels of power) then an investment in PV can be profitable. The simple payback for a commercial system of average size (18kW) is shown diagrammatically in Figure 7.2. It assumes the system is installed on a business that attracts the standard offer from Synergy in Western Australia, and Origin Energy in other states. System paybacks are assumed to increase

from mid 2104 across all states as a result of the removal of the carbon price. System paybacks range from less than 5 years to just over 7 years over the projection period. This amounts to an internal rate of return of between 14 per cent to over 20 percent.

Figure 7.2 Simple payback for an 18 kW (small business with bundled price)



Assumptions used in the payback analysis are consistent with the assumptions used for residential systems only with a lower proportion (20 per cent of power is assumed to be exported) and the value of the electricity exported (other than for the NT) is assumed to be zero.

In assessing the potential market for solar PV, a relative attractive investment may not get implemented as high up-front cost activities such as PV suffer a number of barriers, these include:

- The split incentive: most small-to-medium businesses lease their premises. Payback may take longer than the lease term, and the building owner does not pay the electricity bill;
- Businesses' preference to invest in their own operations rather than in non-core activities;
- The frequency of non-working periods (eg weekends) for such businesses, which leads to power export and a consequent reduction in profitability; and
- Electricity represents a relatively small proportion of a business's costs and as such gets little attention from business owners.

Research that the Australian Industry Group (AIG) undertook illustrates that these barriers lead to a low level of take-up of energy efficiency and distributed generation. The AIG July 2012 Report – "Energy shock: pressure mounts for efficiency action" found that:

- "to date most efficiency improvements have been modest, indicating that business capital for investment is either not available or is largely reserved for other purposes"
- "While a growing number of businesses are taking action to improve their energy efficiency, most are looking for quick wins and would only consider an energy efficiency project where the expected payback period was less than three years"
- "The biggest drivers for efficiency action were concerns about energy prices and the desire to maintain or enhance business profit margins"

Consistent with findings of previous Ai Group surveys, it was found that:

- 27 per cent of respondents spent the equivalent of more than 2 per cent of their sales revenue on energy (73% less than 2%);

- while only 7 per cent of respondents spent the equivalent of more than 5 per cent of their sales revenue on energy; and
- Forty-six per cent of businesses reported an energy spend of less than 1 per cent of their turnover.

In developing projections for 2014 to 2016 we have considered the following factors:

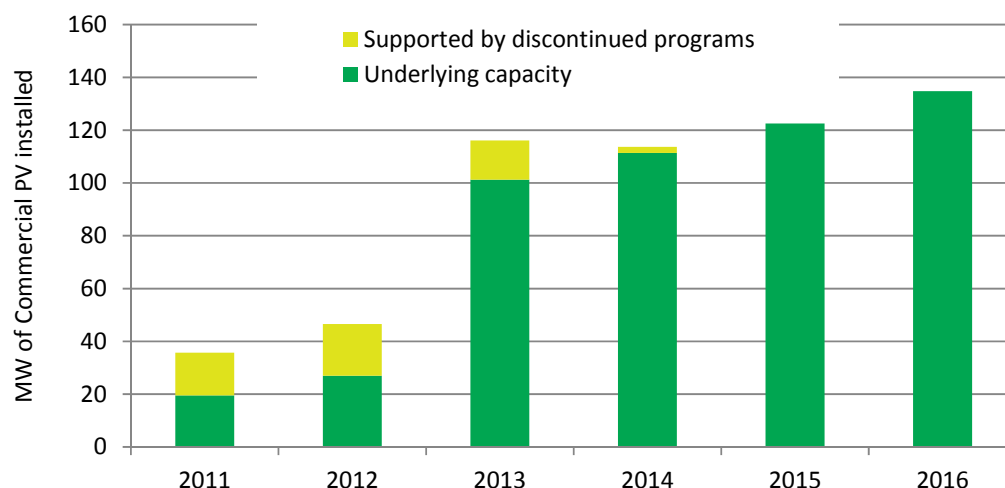
- Falling power prices over the 2014/15 period takes the urgency out of having to deal with this cost;
- With the fall in electricity demand there is a movement by network business and retailers to restructure electricity charges so that they are less avoidable by the customer. This means that higher standing charges and demand based charges are becoming more common;
- Selling PV to commercial customers is a more complex and longer sales process; and
- Economic uncertainty still prevails with concerns of a stagnant economy reducing the inclination of many businesses to invest.

Countering the above negative factors are:

- PV retailers' increasing need to sell commercial PV to offset a contracting market for residential systems;
- Increasing experience and competence of the solar industry in delivering commercial PV with businesses starting to build a pipeline of potential projects; and
- Financing solutions are progressively being made available to customers to assist with up-front capital cost.

We assume that the underlying level of commercial PV demand increases in a more organic manner by 20 per cent per annum from 2014 to 2015 and by 25% in 2016.

Figure 7.3 Commercial PV Capacity



Total Commercial systems installed are expected to grow by 4 per cent in 2014 reaching 122 MW (including 4.5 MW installed receiving CTIP grants). We expect that capacity to grow by 20 per cent in 2015 and 25 per cent in 2016 (refer to Table 7.4).

Table 7.4 Commercial System installations and certificates (all states)

	Actual	Actual	Estimate	Estimate	Forecast	Forecast	Forecast
Year of installation	2010	2011	2012	2013	2014	2015	2016
Number of Systems Installed	928	2,515	2,886	6,439	6,703	8,044	10,055
Average kW/system	14	14	16	18	18	18	18
Average Certificates/System	399	389	362	367	376	376	376
MW Installed	13	36	47	117	122	146	182
Eligible Certificates ('000)	370	978	1,044	2,362	2,519	3,023	3,779

To account for uncertainty in the future level of commercial systems we have developed a “High” and “Low” scenario. Under the High scenario we assume that the underlying level of demand increases by 25 per cent in 2014 and 2015 and then by 35% in 2016. Under the Low scenario the underlying level of demand is assumed to increase by 10 per cent from 2014 to 2016. The resultant capacity for each of the scenarios is included in Table 7.5.

Table 7.5 Sensitivity Analysis – Commercial Systems

Year of installation	2010	2011	2012	2013	2014	2015	2016
Low Case (kW)	12,943	35,661	46,565	116,077	111,400	122,540	134,794
Increase % pa			31%	149%	-4%	10%	10%
Base Case (kW)	12,943	35,661	46,565	116,077	121,527	145,833	182,291
Increase % pa			31%	149%	5%	20%	25%
High Case (kW)	12,943	35,661	46,565	116,077	126,591	158,239	213,622
Increase % pa			31%	149%	9%	25%	35%

8. Solar PV Projections – Upgrades

With the increase in the number of residential PV systems and rising saturation rates solar resellers and installers are targeting the upgrade market. This market can best be characterised as consumers that may have installed a smaller system than their available roof space and electricity demand might otherwise support. This is likely to have been done due to cost considerations. As system prices have fallen and power prices have continued to rise, it has become more attractive for consumers to upgrade their system.

When we consider that the average size of system installed has nearly trebled over the last four years from 1.3 kW per system in 2009 to 3.7 kW per system in 2013 (refer to Attachment 8). The \$8000 rebate for 1 kW systems applying in 2009 and the initial 5 times solar credits multiplier applying up to 1.5kW have acted to keep systems smaller up to mid-2011. As a result there are many smaller systems that have been installed that are capable of being upgraded.

A number of larger solar retailers are also selling systems with larger inverters that are capable of being upgraded. We expect growth in this sector over the next few years, albeit from a low base. There is however a constraining factor, with some customers unlikely to expand if they were on an attractive feed-in tariff that they might lose.

The data that was provided by the CER identified where the system was not the first system installed on the site. We have assumed that from 1 January 2011, any system so identified and did not receive the solar credits multiplier and was less than 2 kW was an upgrade system.

In 2013, 10,400 upgrade systems are expected to be installed a 34% increase on 2012 levels. We have assumed that the level of upgrade systems increases at 20 per cent per annum from 2014 onwards. For 2014 this amounts to 12,460 systems with an installed capacity of 13.6 MW (refer to Table 8.1).

Table 8.1 Residential upgrade systems and certificates

	Actual	Estimate	Estimate	Forecast	Forecast	Forecast
Year of installation	2011	2012	2013	2014	2015	2016
Number of Systems Installed	6,160	7,749	10,382	12,458	14,950	17,940
Average kW/system	1.0	1.1	1.1	1.1	1.1	1.1
Average Certificates/System	20	20	20	20	20	20
MW Installed	5.9	8.5	11.3	13.6	16.3	19.5
Eligible Certificates ('000)	121	155	209	251	301	361

9. SWH and Air Sourced Heat Pump Projections

Water heaters are essential appliances and are subject to regulations which will increasingly limit consumer choices. As such, solar water heaters are subject to very different drivers than solar PV systems.

In the market for water heater systems there are three distinct sub-markets that have traditionally driven the market. These are:

- installations of water heater systems at new dwellings
- replacement of water heater systems at existing dwellings
- installation of water heater systems of commercial size (both at new buildings and replacement at existing buildings)

For the purposes of our analysis, we have combined Solar Water Heaters (SWH) with Air-Sourced Heat Pumps (ASHP) into one category. We refer to this category simply as Solar Water Heaters (SWH).

ASHPs with capacity greater than 425L have not been eligible to create certificates since June 2010. Most systems with a capacity of more than 425L will be commercial systems, and since this system size is no longer able to create certificates, the quantity of commercial sized SWH systems have declined markedly. With little prospect of growth the commercial SWH market will remain an insignificant component of the broader SWH market, therefore we have not forecast this market separately.

For the remaining sub-markets (installations of water heater systems at new dwellings and replacement of water heater systems at existing dwellings) it is worth considering the primary drivers that influence consumer behaviour in these sub-markets. The most important drivers influencing choice of water heaters – electric, gas (storage or instantaneous) or solar (including heat pumps), include:

- regulations – i.e. uncertainty of state-based electric water heater (EWH) phase-out regulations
- comparative capital costs of the technologies
- access to reticulated gas
- financial incentives – rebates and REC/STCs
- consumer perceptions of energy prices i.e. electricity, natural gas and LPG

The drivers above play out differently in each of the two market segments. For example, the most important driver influencing the choice of water heating system in the replacement market is the incumbent system the new system will replace. At the time of replacement most systems are replaced with the same or similar type of system. The dynamics of the replacement market, which are often dictated by a rush to replace a broken or failed water heater, mean there is little time and/or financial liquidity to make thoroughly researched decisions. Thus, historically, the majority of water heater replacements have been on a 'like-for-like' basis.

Overall Solar Water Heater market drivers

Within the 2 primary water heater submarkets, there are 6 further 'system type' classifications. These are:

- 1) New building primary submarket
 - New Building
- 2) Replacement primary submarket
 - First Water Heater Installation at Existing Building
 - Other
 - Replace Gas Water Heater
 - Replaced Electric Heater
 - Replaced Solar Water Heater

A breakdown of the number of systems in each of the above classifications that have created certificates is included as Figure 3.2 in Section 3 of this report.

At a high-level, forecasts on systems installations were based on the market share of each of these 6 'system types'. Further, and because of varying state-based schemes, incentives and/or regulations, the system type forecast was performed at state level. State and federal rebates no longer impact on the market; and, in particular, there is considerable uncertainty regarding the Electric Water Heater (EWH) phase-out which was to be implemented by all states except Tasmania.

In Victoria the Energy Saver Scheme includes SWH as an eligible activity. For example, a EWH system replaced by a SWH system can generate between 30 to 50 Victorian Energy Efficiency Certificates (VEECs). VEEC prices are not as strong as they once were, yet at circa \$15 to \$20 per certificate, VEECs still provide added financial incentive that helps drive extra SWH system installations in Victoria.

The installed cost of SWH is an obvious driver of SWH purchasing behaviour. The install cost (without considering any support from STCs) is forecast to remain stable over the next 3 to 5 years according to interviews conducted with industry participants. There is little upside to the STC price over and above the current price, therefore the installed cost is predicted to remain steady in the short-term.

Water heater market drivers – specific to the new building submarket

The primary drivers behind purchase behaviour in this segment include:

- The number of new dwellings
- Building regulations
- The availability of gas to the new development
- Other factors — such as builder influence, environmental performance and industry marketing, as well as capital and operating costs

SWH sales data, sourced from Industry, seems to suggest the number of SWH that create certificates is between 10 to 15 per cent lower than the number of systems sold. This is not a new trend, and we see no reason for this to change. The SWH systems that do not create certificates are thought to be the result of difficulties that home builders/renovators face when faced with the prospect of creating certificates. The difficulties arise from the confusion and uncertainty as to who has the right to create the certificates, specifically when the future owner of the home/building may not own the system at the time it was installed.

Using the data provided by the CER we have isolated the SWH systems installed in new buildings and analysed historic trends. We used this analysis as the basis for forecasting

SWH installations for the new-build submarket. According to the primary CER data, 22,391 SWH systems were installed (and created certificates) into new buildings in 2013 (as at 16 November 2013). If we allow for the traditional lag in STC creation, total systems installed in new buildings is forecast to increase to 31,550 (an extra 9,159 systems installed and creating certificates).

The level of new buildings is expected to fall by 1 per cent in 2014 according to the Housing Industry Association (HIA) Economics Group (Table 9.1).

Table 9.1 Percentage Growth in New Dwelling Completions

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Australia
2014	4.0	-9.0	9.0	9.0	-7.0	2.0	-10.0	-30.0	-1.0
2015	-3.0	2.0	12.0	7.0	-3.0	14.0	-9.0	-2.0	2.0
2016	1.0	2.0	-3.0	0.0	2.0	-3.0	5.0	2.0	1.0

Data based dwelling completion data from the Housing Industry Association Nov 2013 report.

We have used the HIA forecast of new home completions as a guide and have adjusted these rates for other market factors. The number of SWH systems installed in new buildings is expected to experience a modest increase in 2014. SWH systems installed in new buildings in 2014 are expected to increase to 31,978. Victoria, a key market for new-build SWH installations is not expected to grow but is still likely to account for 52 per cent of installations in this segment. New home installations in the Queensland market are expected to decline as the full impact of the recent changes in new-build regulations become the new baseline for which growth is calculated.

We estimate installations in new buildings to be 32,500 in 2015 and 32,700 in 2016, representing growth of 1.5 and 0.7 per cent respectively.

Water heater market drivers – specific to the replacement submarket

Historically, the replacement market has been driven by the replacement of electric resistance water heaters. In a situation where an electric resistance water heater is due to be replaced, whether the property has access to reticulated gas has traditionally influenced the type of water heater system chosen as a replacement. Therefore, access to reticulated gas is a good predictor of the potential size of a SWH market. In Table 9.2 below we show the share of houses with EWH with no access to reticulated gas. Residents in New South Wales and Queensland have limited access to reticulated gas; therefore we can expect larger growth of SWH installations in these states.

Table 9.2 Share of houses with electric water heaters and no access to gas

State	Percentage of Electric Water Heaters
NSW	56.0%
VIC	22.0%
QLD	58.0%
WA	23.0%
TAS	43.0%
SA	14.0%
ACT	0.0%
NT	100.0%

Data based on Table 17 in Regulation Impact Statement for the EWH Phase-out (Wilkenfeld 2009), includes only houses which are 'not connectable'.

Using the data provided to us by the CER we isolated the SWH systems installed in existing buildings and analysed historic trends. We have used our analysis as the basis for forecasting SWH installations for the replacement submarket. Specifically, we analysed each of the following components of the replacement submarket:

- First Water Heater Installation at Existing Building
- Other
- Replace Gas Water Heater
- Replaced Electric Heater
- Replaced Solar Water Heater

According to the primary CER data a total of 20,425 SWH systems were installed and created certificates in existing buildings in 2013 (as at 16 November 2013). Once we allow for the lag in creation, we forecast 27,725 systems will be installed and creating certificates in 2013.

SWH systems installed at existing buildings fell 16 per cent into 2013. The market for replacing water heaters with SWH declined in all the states and territories for the second consecutive year. The decline in New South Wales, Victoria, and Queensland represented 85 per cent of the decline in the replacement market in 2013.

We expect the replacement market for SWH to recover in 2014 and beyond, this recovery will be driven by the following:

- slowdown in PV sales reducing competition to SWH for discretionary household expenditure;
- modest increases in electricity prices caused predominantly by rising network charges;
- fast rising gas prices;
- recovery will be hindered by the uncertainty surrounding the phase out of EWH; and
- slightly lower install costs caused by a higher STC price.

We expect the number of SWH systems installed in existing homes to increase in 2014 to 32,838 systems (representing 18 per cent growth). We expect to see further growth in replacement SWH system installations in 2015 and 2016, with strong growth of 7.8 and 5.0 per cent respectively.

Certificates created from the installation of water heater systems

We forecast the total number of certificates created by SWH systems to be installed in 2013 at 1,776 million. We forecast this to increase by 9.6 per cent (to 1,946 million) in 2014; a further 4.8 per cent (to 2,039 million) by 2015; and a further 3.1 per cent (to 2,101 million) by 2016.

In Table 9.1 (below) we show the forecast proportion of 2012-15 SWH installations for each state and territory from 2013 to 2016.

Table 9.3 State and Territory share of SWH installations

State	Percentage share of SWH installations (forecast by state and territory)			
	2013	2014	2015	2016
NSW	16.1	17.0	18.4	19.3
VIC	33.0	34.4	34.3	34.6
QLD	23.7	22.5	21.9	2.7
WA	19.3	18.2	17.7	17.6
TAS	1.2	1.2	1.2	1.2
SA	4.6	4.7	4.7	4.7
ACT	0.7	0.7	0.7	0.7
NT	1.3	1.3	1.2	1.2

When forecasting the number of STCs to be created we have estimated the level of STCs per system on a state by state basis. Smaller SWH systems tend to be installed in the new building market as this is largely driven by building regulation. We estimate the average certificates per system for the new building market in 2013 to be 27.1. We expect this to increase to 29.2 in 2013. With respect to new-build market forecasts from 2014-2016, we have used 29.2 certificates per system.

We estimate the average certificates per system in the replacement market at 30.3 in 2012. We expect this to increase slightly to 30.9 in 2013. With respect to replacement market forecasts from 2014-2016, we have used 30.9 certificates per system.

In total nearly 2 million certificates (1.999 million) are expected to be created for SWH systems installed in 2013. This is expected to decrease slightly in 2013 to 1.8 million. Over the forecast period steady growth is expected. With 1.9 million; 2.0 million and 2.1 million certificates created for 2014, 2015, and 2016 respectively.

Table 9.4 Certificate creation from SWH

Year of installation	Actual 2011	Forecast 2012	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016
No. of Systems Installed	105,050	69,734	59,275	64,966	67,989	70,028
Ave. Certificates/System	29.7	28.7	30.0	30.0	30.0	30.0
Eligible Certificates ('000)	3,123	1,999	1,776	1,946	2,039	2,101

13. Other small generating units

Wind and Hydro SGUs remain an extremely small part of STC creation. Only 5 wind and hydro systems were installed and created certificates during 2013. We have assumed that that similar levels of creation are maintained over the forecast period.

14. Million Solar Roofs Initiative

The Government is currently developing the framework and eligibility criteria for the proposed Million Solar Roofs (MSR) Initiative which will make an impact on the solar market from the beginning of 2015.

Our modelling of the impact of the MSR program is based on our current understanding of how the program is likely to operate based on announcements made to date. Key features are as follows:

- rebate of up to \$500 for a solar system (PV or SWH);
- program to support for up to 100,000 systems each year;
- program to be eligible to low income households;
- systems receiving the rebate will also be eligible for STCs and STC compliance arrangements to apply; and
- Scheme is assumed to start making payments from 1 January 2015, slightly later than announced due to possible delays in funding being available due to its inclusion as part of the carbon price repeal package.

Our approach to modelling the MSR has been to show its contribution on an incremental basis – showing its impact beyond what would have occurred under a “business as usual” scenario.

There are three key issues that need to be considered in assessing the impact on STC creation:

- (i) Take-up rate: As the program will be limited to low income households there is concern that at \$500 the rebate will still leave a considerable amount to be funded by the household. As such the \$500 may not be sufficient to ensure that the total budget for 100,000 systems per annum is taken up. The number of Commonwealth concession card holders is approximately 18 per cent of the population, with the proportion of households likely to be higher. Including households receiving Family Tax Benefit A, which could under some criteria, also be seen as low income will significantly increase the number of eligible households. For the forecast period under our base case scenario we have assumed a Take-up rate of 80 per cent. Under the High scenario we have assumed 100 per cent Take-up and we have assumed 50 per cent Take-up in the Low scenario. If less than 100 per cent Take-up is achieved for any extended period we would then expect changes in the program design. The impact of any subsequent changes is assumed to happen beyond the forecast period.
- (ii) Level of additionally: low income households will also include old age pensioners that own their own homes and may purchase a solar system on the basis of its financial merits. At less than 7 year payback for a solar PV system (more than 15 per cent return) it may be an attractive return for some households. Under our Base case scenario we have assumed that 25 per cent of rebates paid are for solar systems that would have been purchased and installed in any case. This means that only 75 per cent of MSR rebate systems are additional. The non-additional proportion under the High scenario is 20 per cent and we have assumed 40 per cent under the Low scenario.
- (iii) Level or reservation for SWH: in earlier statements on the design of the MSR there had been consideration given to specifically support SWH. It is not clear how this might work with the eligibility requirement to focus on low income households. We

have assumed that SWH accounts for one-third of rebates, which is higher than its expected share under a “business as usual” scenario of 27 per cent.

Other assumptions we have made include:

- The average system sizes for both PV and SWH are expected to be smaller to reduce the level of “up-front cost” and we have assumed that the average PV system supported that is additional to the existing market would be 2.0 kW and a SWH system would account for 28 STCs.
- As we expect that pre-approval process will be in place to manage the annual budget allocation we expect that there will be a month delay from when the application for the rebate is made to when the system is installed. For the purpose of our analysis we have effectively assumed a Scheme start date on 1 December 2014 with system installations and rebate payments occurring from 1 January 2015.

A breakdown of MSR systems is included as Attachment 7.

15. Resources

Resources utilised in our modelling have included:

- Clean Energy Regulator data
- ABS publications including: 8750.0 Dwelling Unit Commencements; 1301 Year Book Australia (for current dwelling types); 3236 Household and Family Projections; 4602.0 Environmental Issues (for water heater system and gas usage data)
- Latest information of electric resistance water heater phase-out and state regulations
- GEM and SunWiz solar water heater and solar PV installation models
- GEM and SunWiz solar PV payback model
- Australian PV Association reports
- Relevant legislation
- State and territory building and plumbing regulations
- State and territory government information on feed-in tariffs, SWH rebates and other programs such as the Victorian Energy Efficiency Target
- PV industry analyst module and inverter price forecasts
- Documents from state governments (where applicable) on regulated retail tariff increases
- REC Agents Association, Research Notes and Media Releases
- Housing Industry Association Reports.
- Regulation Impact Statement for the EWH Phase-out (Wilkenfeld 2009),
- ESAA, Electricity Gas Australia 2012 and 2013
- Australian Energy Regulator, State of the Energy Market 2013
- Australian Energy Market Commission, Residential Electricity Price Trends report, 13 December 2013

Summary of Results

Base Case

Year of installation	Actual 2010	Actual 2011	Estimate 2012	Estimate 2013	Forecast 2014	Forecast 2015	Forecast 2016
1. SGUs (PV)							
1.1 New Residential							
Base Case							
Number of Systems Installed	197,257	350,891	331,175	198,898	173,059	164,364	167,952
Avg systems per mth	16,438	29,241	27,598	16,575	14,422	13,697	13,996
Avg kW/system	1.91	2.35	2.95	3.73	3.37	3.37	3.37
Avg Certificates/System	129.7	149.0	104.7	76.3	67.3	67.5	67.3
MW Installed	376.3	824.2	977.2	742.0	582.5	553.7	565.5
Eligible Certificates ('000)	25,587	52,283	34,672	15,181	11,653	11,088	11,301
1.2 Non Residential							
Base Case							
Number of Systems Installed	928	2,515	2,886	6,439	6,703	8,044	10,055
Avg kW/system	13.95	14.18	16.17	18.13	18.13	18.13	18.13
Avg Certificates/System	399.1	388.7	361.6	366.9	375.8	375.8	375.8
MW Installed	12.9	35.7	46.7	116.7	121.5	145.8	182.3
Eligible Certificates ('000)	370	978	1,044	2,362	2,519	3,023	3,779
1.3 Residential System Upgrades							
Number of Systems Installed	0	6,160	7,749	10,382	12,458	14,950	17,940
Avg kW/system	0.00	0.96	1.09	1.09	1.09	1.09	1.09
Avg Certificates/System	0.0	19.6	20.0	20.1	20.1	20.1	20.1
MW Installed	0.0	5.9	8.5	11.3	13.6	16.3	19.5
Eligible Certificates ('000)	0	121	155	209	251	301	361
1.4 Incremental Million Solar Roofs							
Base Case							
Number of Systems Installed					0	40,200	40,200
Avg kW/system					2.00	2.00	2.00
Avg Certificates/System					41.5	41.5	41.5
MW Installed					0.0	80.4	80.4
Eligible Certificates ('000)					0	1,667	1,667
Total PV Systems							
Number of Systems Installed	198,185	359,566	341,810	215,719	192,220	227,558	236,146
Avg Systems/Mth	16,515	29,964	28,484	17,977	16,018	18,963	19,679
Avg kW/system	1.96	2.41	3.02	4.03	3.73	3.50	3.59
Avg Certificates/System	131.0	148.5	104.9	82.3	75.0	70.7	72.4
MW Installed	389.3	865.8	1,032.3	870.0	717.6	796.2	847.7
Eligible Certificates ('000)	25,958	53,381	35,871	17,753	14,423	16,079	17,108
2. SWH Systems							
2.1 SWH System (excl MSR)							
Number of Systems Installed	127,093	105,050	69,734	59,275	64,966	67,989	70,028
Avg Certificates/System	33.6	29.7	28.7	30.0	30.0	30.0	30.0
Eligible Certificates ('000)	4,274	3,123	1,999	1,776	1,946	2,039	2,101
2.1 Incremental Million Solar Roofs							
Base Case							
Number of Systems Installed					0	19,800	19,800
Avg Certificates/System					28.0	28.0	28.0
Eligible Certificates ('000)					0	554	554

Summary of Results**Base Case**

Year of installation	Actual 2010	Actual 2011	Estimate 2012	Estimate 2013	Forecast 2014	Forecast 2015	Forecast 2016
Total SWH Systems							
Number of Systems Installed	127,093	105,050	69,734	59,275	64,966	87,789	89,828
Avg Certificate/System	33.6	29.7	28.7	30.0	30.0	29.5	29.6
Eligible Certificates ('000)	4,274	3,123	1,999	1,776	1,946	2,593	2,655
3. Small Wind/Hydro Systems							
Number of Systems Installed	140	65	11	5	5	5	5
Avg Certificate/System	99.7	90.0	45.0	30.0	30.0	30.0	30.0
Eligible Certificates ('000)	14	6	0	0	0	0	0
TOTAL Certificates ('000)	30,246	56,510	37,870	19,529	16,370	18,672	19,763

The "Total Certificates" figure derived above reflects the level of STCs that will eventually be created for systems installed in that year. It does not allow for the lag in the registration of STCs for each year.

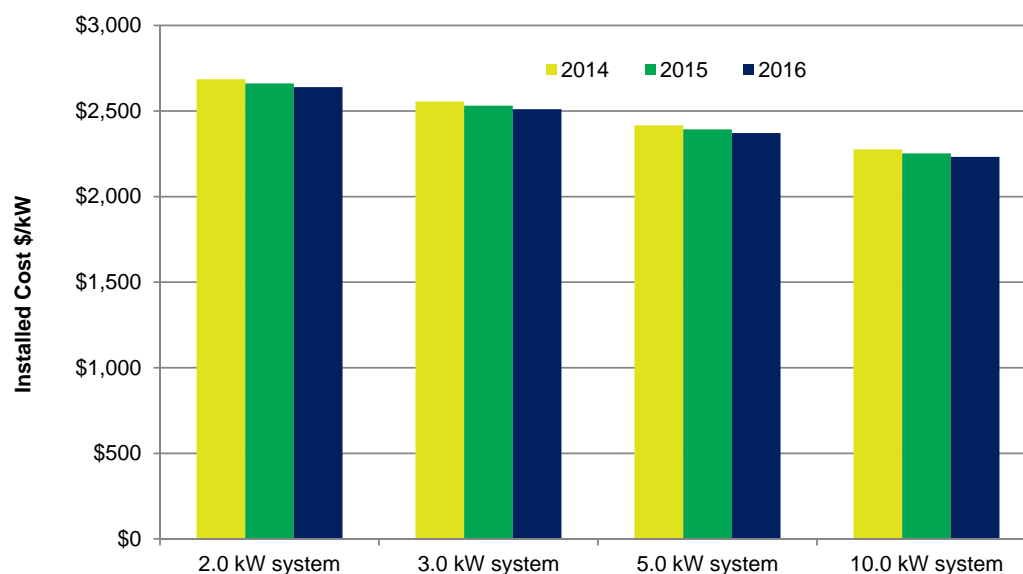
Sensitivity Analysis

'000 STCs	2012	2013	2014	2015	2016
Total Certificates - Base Case	37,870	19,529	16,370	18,672	19,763
	0	0	0	0	0
Total Certificates - High Case	37,870	19,529	17,640	20,779	22,283
Total Certificates - Low Case	37,870	19,529	14,994	15,970	16,538

Financial Attractiveness

Residential PV systems

Projected Installed cost (\$/kW) prior to value of STCs



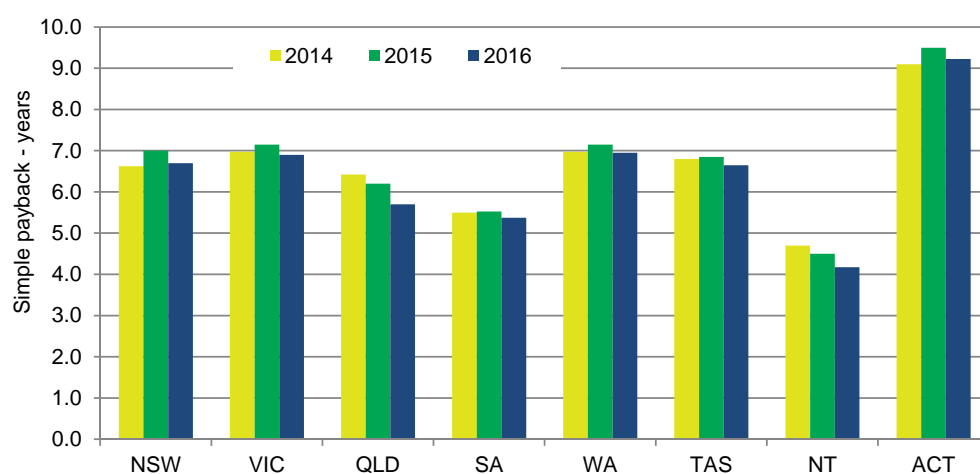
Extract of Results from SunWiz's Payback Model

Expressed in simple payback terms (no discounting) ie. Net cost to customer divided by annual benefit

Average Simple Paybacks (annual)

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
2014	6.6	7.0	6.4	5.5	7.0	6.8	4.7	9.1
2015	7.0	7.2	6.2	5.5	7.2	6.9	4.5	9.5
2016	6.7	6.9	5.7	5.4	7.0	6.7	4.2	9.2

Average Simple Paybacks on annual basis



Solar PV Residential Systems by State

	NSW	VIC	QLD	SA	WA	Tas	NT	ACT	Total
Cumulative grid systems installed to end 2011	165,483	115,660	161,707	88,156	83,963	6,002	1,247	10,038	632,256
<i>Market share</i>	<i>26.2%</i>	<i>18.3%</i>	<i>25.6%</i>	<i>13.9%</i>	<i>13.3%</i>	<i>0.9%</i>	<i>0.2%</i>	<i>1.6%</i>	<i>100.0%</i>
Owner Occupied Dwellings end 2011 ('000)	1,615	1,465	1,062	461	609	145	34	91	5,482
Proportion of Owner Occupied Dwellings	10.2%	7.9%	15.2%	19.1%	13.8%	4.1%	3.6%	11.0%	11.5%
Estimates for 2012									
Total Est 2012 systems	52,753	65,013	124,713	40,843	39,885	6,021	474	1,473	331,175
Cumulative installations	218,235	180,673	286,421	128,998	123,849	12,024	1,721	11,511	963,431
Owner occupied dwelling at year end ('000)	1,631	1,493	1,083	466	622	146	35	92	5,569
Proportion of Owner Occupied Dwellings	13.4%	12.1%	26.4%	27.7%	19.9%	8.2%	5.0%	12.5%	17.3%
Projections for 2013									
Average number of systems installed/mth (derived)	2,906	2,722	6,051	2,173	1,849	587	80	207	16,575
Annulised installations	34,868	32,669	72,616	26,071	22,190	7,050	955	2,479	198,898
Cumulative installations	253,104	213,342	359,037	155,069	146,039	19,073	2,676	13,990	1,162,329
Owner occupied dwelling at year end ('000)	1,647	1,522	1,104	471	635	148	35	94	5,656
Proportion of Owner Occupied Dwellings	15.4%	14.0%	32.5%	32.9%	23.0%	12.9%	7.7%	14.9%	20.6%
Projections for 2014									
Average number of systems installed/mth (derived)	3,119	2,976	3,780	1,883	1,990	479	64	130	14,422
Annulised installations	37,425	35,715	45,360	22,596	23,882	5,750	771	1,559	173,059
Cumulative installations	290,529	249,057	404,397	177,665	169,921	24,824	3,446	15,549	1,335,388
Owner occupied dwelling at year end ('000)	1,663	1,550	1,126	476	649	149	35	95	5,743
Proportion of Owner Occupied Dwellings	17.5%	16.1%	35.9%	37.3%	26.2%	16.7%	9.8%	16.3%	23.3%
Projections for 2015									
Average number of systems installed/mth (derived)	3,005	2,756	3,679	1,850	1,799	431	63	114	13,697
Annulised installations	36,058	33,067	44,153	22,200	21,589	5,174	756	1,366	164,364
Cumulative installations	326,588	282,125	448,550	199,865	191,510	29,998	4,203	16,914	1,499,752
Owner occupied dwelling at year end ('000)	1,680	1,578	1,147	481	662	150	35	97	5,830
Proportion of Owner Occupied Dwellings	19.4%	17.9%	39.1%	41.5%	28.9%	20.0%	11.9%	17.4%	25.7%
Projections for 2016									
Average number of systems installed/mth (derived)	3,028	3,009	3,804	1,615	1,912	436	66	127	13,996
Annulised installations	36,331	36,108	45,642	19,374	22,946	5,234	796	1,520	167,952
Cumulative installations	362,919	318,232	494,192	219,239	214,456	35,232	4,998	18,434	1,667,704
Owner occupied dwelling at year end ('000)	1,696	1,606	1,169	486	675	151	36	99	5,917
Proportion of Owner Occupied Dwellings	21.4%	19.8%	42.3%	45.1%	31.8%	23.4%	14.0%	18.7%	28.2%
Summary by State									
	NSW	VIC	QLD	SA	WA	Tas	NT	ACT	Total
Saturation rates									
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
2010	5.6%	4.2%	6.9%	6.5%	6.1%	2.7%	2.9%	4.0%	5.5%
2011	10.2%	7.9%	15.2%	19.1%	13.8%	4.1%	3.6%	11.0%	11.5%
2012	13.4%	12.1%	26.4%	27.7%	19.9%	8.2%	5.0%	12.5%	17.3%
2013	15.4%	14.0%	32.5%	32.9%	23.0%	12.9%	7.7%	14.9%	20.6%
2014	17.5%	16.1%	35.9%	37.3%	26.2%	16.7%	9.8%	16.3%	23.3%
2015	19.4%	17.9%	39.1%	41.5%	28.9%	20.0%	11.9%	17.4%	25.7%
2016	21.4%	19.8%	42.3%	45.1%	31.8%	23.4%	14.0%	18.7%	28.2%
Systems installed									
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
2009	13,985	18,131	18,259	8,563	11,141	1,452	206	802	72,539
2010	69,496	35,650	48,512	16,655	22,141	1,877	620	2,306	197,257
2011	78,466	58,854	92,695	61,990	49,421	2,362	356	6,747	350,891
2012	52,753	65,013	124,713	40,843	39,885	6,021	474	1,473	331,175
2013	34,868	32,669	72,616	26,071	22,190	7,050	955	2,479	198,898
2014	37,425	35,715	45,360	22,596	23,882	5,750	771	1,559	173,059
2015	36,058	33,067	44,153	22,200	21,589	5,174	756	1,366	164,364
2016	36,331	36,108	45,642	19,374	22,946	5,234	796	1,520	167,952

Attachment 4

Certificate Creation - Solar PV Residential

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
Residential Systems installed (No.)									
2010	69,496	35,650	48,512	16,655	22,141	1,877	620	2,306	197,257
2011	78,466	58,854	92,695	61,990	49,421	2,362	356	6,747	350,891
2012	52,753	65,013	124,713	40,843	39,885	6,021	474	1,473	331,175
2013	34,868	32,669	72,616	26,071	22,190	7,050	955	2,479	198,898
2014	37,425	35,715	45,360	22,596	23,882	5,750	771	1,559	173,059
2015	36,058	33,067	44,153	22,200	21,589	5,174	756	1,366	164,364
2016	36,331	36,108	45,642	19,374	22,946	5,234	796	1,520	167,952
Average system size (kW/system)									
2010	2.12	1.64	1.84	1.95	1.81	1.54	1.83	2.08	1.91
2011	2.29	2.34	2.30	2.57	2.27	2.26	2.50	2.38	2.35
2012	2.49	3.02	3.22	3.18	2.31	3.08	3.61	3.07	2.95
2013	3.21	3.65	3.97	4.30	3.07	3.98	4.56	4.04	3.73
2014	3.20	3.50	3.50	3.50	3.00	3.50	3.50	3.50	3.37
2015	3.20	3.50	3.50	3.50	3.00	3.50	3.50	3.50	3.37
2016	3.20	3.50	3.50	3.50	3.00	3.50	3.50	3.50	3.37
Installed Capacity (MW)									
2010	147.3	58.6	89.1	32.4	40.1	2.9	1.1	4.8	376.3
2011	179.6	137.5	213.5	159.4	112.0	5.3	0.9	16.1	824.2
2012	131.4	196.5	402.1	130.1	92.3	18.5	1.7	4.5	977.2
2013	112.0	119.2	288.2	112.2	68.0	28.1	4.3	10.0	742.0
2014	119.8	125.0	158.8	79.1	71.6	20.1	2.7	5.5	582.5
2015	115.4	115.7	154.5	77.7	64.8	18.1	2.6	4.8	553.7
2016	116.3	126.4	159.7	67.8	68.8	18.3	2.8	5.3	565.5
Zone Rating	1.382	1.185	1.382	1.382	1.382	1.185	1.536	1.382	
Multiplier (average)									
2012									
2013									
2014	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
2015	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
2016	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Average Certificates/System									
2010	149.2	92.3	136.0	129.5	120.3	60.0	135.9	136.1	129.7
2011	163.3	129.8	151.1	146.0	148.0	125.3	178.9	163.4	149.0
2012	99.3	95.1	111.9	114.0	96.9	91.8	132.9	111.8	104.7
2013	68.6	66.0	83.8	88.5	64.4	71.5	106.8	83.1	76.3
2014	66.3	62.2	72.6	72.6	62.2	62.2	80.6	72.6	67.3
2015	66.3	62.2	72.6	72.6	62.2	62.2	80.6	72.6	67.5
2016	66.3	62.2	72.6	72.6	62.2	62.2	80.6	72.6	67.3
Calculated Certificates ('000) ##									
2010	10,369	3,291	6,598	2,156	2,664	113	84	314	25,587
2011	12,810	7,640	14,007	9,048	7,316	296	64	1,102	52,283
2012	5,236	6,183	13,953	4,657	3,863	553	63	165	34,672
2013	2,393	2,156	6,083	2,307	1,430	504	102	206	15,181
2014	2,483	2,222	3,291	1,639	1,485	358	62	113	11,653
2015	2,392	2,057	3,204	1,611	1,343	322	61	99	11,088
2016	2,410	2,246	3,312	1,406	1,427	326	64	110	11,301

Notes

These are certificates that are eligible to be created on a generation year basis and do not allow for the a delay from system installation to certificate approval

Certificate Creation - Other PV Sectors

Year of installation	Actual 2010	Actual 2011	Estimate 2012	Estimate 2013	Forecast 2014	Forecast 2015	Forecast 2016
1. GridConnect - Non Residential Systems Installed							
ACT	16	63	25	99			
NSW	628	1,346	761	1,686			
NT	17	33	31	39			
QLD	135	508	522	903			
SA	42	197	535	1,989			
TAS	5	35	103	237			
VIC	18	74	688	1,061			
WA	67	259	220	425			
	928	2,515	2,886	6,439	6,703	8,044	10,055
Average Capacity per System	13.9	14.2	16.2	18.1	18.1	18.1	18.1
Average Certificates per System	399.1	388.7	361.6	366.9	375.8	375.8	375.8
MW Installed	12.9	35.7	46.7	116.7	121.5	145.8	182.3
Certificates Created	370,360	977,697	1,043,701	2,362,203	2,519,259	3,023,111	3,778,888
2. GridConnect - Upgrades Systems Installed							
ACT		44	20	5			
NSW		362	326	477			
NT		11	2	3			
QLD		1,870	4,145	6,987			
SA		1,223	400	515			
TAS		71	214	353			
VIC		1,135	365	327			
WA		1,444	2,276	1,715			
		6,160	7,749	10,382	12,458	14,950	17,940
Percentage Increase			25.8%	34.0%	20.0%	20.0%	20.0%
Average Capacity per System		1.0	1.1	1.1	1.1	1.1	1.1
Average Certificates per System		19.6	20.0	20.1	20.1	20.1	20.1
MW Installed		5.9	8.5	11.3	13.6	16.3	19.5
Certificates Created		120,517	154,852	209,000	250,800	300,960	361,152

SWH systems and certificates by state

Attachment 6

	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
2012: systems installed YTD (16 Nov 2013)									
New building	2,579	17,716	9,033	1,056	4,709	137	653	432	36,315
Replacement systems	8,228	3,866	9,930	2,411	7,101	762	517	302	33,117
Total	10,807	21,582	18,963	3,467	11,810	899	1,170	734	69,432
Average number of certificate per sys	32.0	25.6	30.0	28.3	29.0	29.4	28.0	29.8	28.7
Systems still to create (2012)									
New building	17	118	60	7	31	1	4	3	242
Replacement systems	15	7	18	4	13	1	1	1	60
Total	32	125	78	11	44	2	5	3	302
Projected systems installed 2012									
New building	2,596	17,834	9,093	1,063	4,740	138	657	435	36,557
Replacement systems	8,243	3,873	9,948	2,415	7,114	763	518	303	33,177
2012 total systems	10,839	21,707	19,041	3,478	11,854	901	1,175	737	69,734
2013: systems installed YTD (16 Nov 2013)									
New building	1,727	11,863	4,655	516	3,112	53	352	113	22,391
Replacement systems	5,248	2,086	5,500	1,494	5,210	482	213	192	20,425
Total	6,975	13,949	10,155	2,010	8,322	535	565	305	42,816
Average number of certificate per sys	32.4	28.0	31.0	29.3	30.3	30.1	26.9	31.7	30.0
Systems still to create (2013)									
New building	706	4,853	1,904	211	1,273	22	144	46	9,159
Replacement systems	1,876	746	1,966	534	1,862	172	76	69	7,300
Total	2,582	5,598	3,870	745	3,135	194	220	115	16,459
Projected systems installed 2013									
New building	2,433	16,716	6,559	727	4,385	75	496	159	31,550
Replacement systems	7,124	2,832	7,466	2,028	7,072	654	289	261	27,725
2013 total systems	9,557	19,547	14,025	2,755	11,457	729	785	420	59,275
Expected growth rates (2014-2016)									
2014									
New building	20.0%	0.0%	-2.0%	10.0%	0.0%	10.0%	0.0%	-5.0%	1.4%
Replacement systems	25.0%	15.0%	25.0%	10.0%	11.0%	5.0%	5.0%	5.0%	18.4%
2015									
New building	8.0%	3.0%	-5.0%	7.0%	0.0%	10.0%	0.0%	0.0%	1.5%
Replacement systems	10.0%	5.0%	10.0%	5.0%	5.0%	5.0%	5.0%	5.0%	7.8%
2016									
New building	5.0%	3.0%	-9.0%	0.0%	2.0%	-3.0%	5.0%	2.0%	0.7%
Replacement systems	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Expected system installations									
2014									
New building	2,920	16,716	6,428	800	4,385	82	496	151	31,978
Replacement systems	8,905	3,256	9,332	2,231	7,850	687	304	274	32,838
Total	11,825	19,972	15,760	3,031	12,235	769	800	425	64,816
2015									
New building	3,154	17,217	6,107	856	4,385	90	496	151	32,456
Replacement systems	9,795	3,419	10,265	2,342	8,242	721	319	287	35,392
Total	12,949	20,636	16,372	3,198	12,627	812	815	439	67,847
2016									
New building	3,311	17,733	5,557	856	4,473	88	521	154	32,693
Replacement systems	10,285	3,590	10,779	2,459	8,655	757	335	302	37,161
Total	13,596	21,324	16,336	3,315	13,127	845	855	456	69,854

SWH systems and certificates by state

Attachment 6

Summary of projections

		NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
Summary of system installations										
	2011	25,331	26,446	30,937	5,444	12,862	1,725	1,267	1,038	105,050
	2012	10,839	21,707	19,041	3,478	11,854	901	1,175	737	69,734
	2013	9,557	19,547	14,025	2,755	11,457	729	785	420	59,275
	2014	11,825	19,972	15,760	3,031	12,235	769	800	425	64,816
	2015	12,949	20,636	16,372	3,198	12,627	812	815	439	67,847
	2016	13,596	21,324	16,336	3,315	13,127	845	855	456	69,854
Cerificates per system										
	2011	31.9	27.1	30.5	29.5	29.8	26.3	27.4	31.1	29.7
	2012	32.0	25.6	30.0	28.3	29.0	29.4	28.0	29.8	28.7
	2013	32.4	28.0	31.0	29.3	30.3	30.1	26.9	31.8	30.0
	2014	32.4	28.1	31.0	29.3	30.3	30.1	26.9	31.7	30.0
	2015	32.4	28.1	31.1	29.3	30.2	30.1	27.0	31.7	30.0
	2016	32.4	28.1	31.1	29.3	30.2	30.1	27.0	31.7	30.1
Certificate creation ('000)										
	2011	809	716	943	160	383	45	35	32	3,123
	2012	347	556	572	98	344	26	33	22	1,999
	2013	309	548	434	81	347	22	21	13	1,776
	2014	383	561	489	89	370	23	22	13	1,946
	2015	419	580	509	94	382	24	22	14	2,039
	2016	440	599	508	97	397	25	23	14	2,100

Million Solar Roofs

Year of installation	Forecast 2014	Forecast 2015	Forecast 2016
Program limit (systems)	-	100,000	100,000
Take-up level each year	0%	80%	80%
Number of Systems funded	-	80,000	80,000
SWH proportion	33%	33%	33%
SWH systems supported	-	26,400	26,400
PV Systems supported	-	53,600	53,600
Non Additional PV %	25%	25%	25%
Non Additional SWH %	25%	25%	25%
Non Additional PV Systems	-	13,400	13,400
Non Additional SWH Systems	-	6,600	6,600
Non Additional PV kW/system	3.0	3.0	3.0
Non Additional PV capacity (kW)	-	40,200	40,200
Non Additional SWH STCs/ systems	30	30	30
Additional PV Systems	-	40,200	40,200
Additional SWH Systems	-	19,800	19,800
Additional PV kW/system	2.0	2.0	2.0
Additional SWH STCs/ systems	28	28	28
Additional PV Capacity Installed (kW)	-	80,400	80,400
PV - Zone Rating (MWh/kW)	1.382	1.382	1.382
Additional PV STCs '000	-	1,667	1,667
Additional SWH STCs '000	-	554	554
Total Additional STCs ('000)	-	2,221	2,221
Systems Funded by MSR Program			
PV Systems	-	53,600	53,600
SWH Systems	-	26,400	26,400
Total Systems	-	80,000	80,000
Rebates Paid @ \$500/system \$ million	-	40.0	40.0
PV Capacity Installed (kW)	-	120,600	120,600
Total PV STCs from MSR Systems '000	-	2,500	2,500
Total SWH STCs from MSR Systems '000	-	752	752
Total STCs from MSR Systems '000	-	3,252	3,252

Solar PV by Segment
Incl. Pending Registration
Summary of REC-Registry Data
(Certificates created as at 25 November 2013)
Attachment 8

Installation Year		2008				2009				2010			
	State	Commercial	Residential	Upgrade	Total	Commercial	Residential	Upgrade	Total	Commercial	Residential	Upgrade	Total
Capacity Installed (kW)	ACT	11	481	0	492	30	1,253	0	1,283	301	4,807	0	5,108
	NSW	168	4,046	0	4,214	558	18,642	0	19,200	7,008	147,275	0	154,283
	NT	196	218	0	414	144	366	0	510	357	1,136	0	1,493
	QLD	53	4,104	0	4,157	377	24,134	0	24,510	2,611	89,102	0	91,713
	SA	30	4,853	0	4,883	214	12,223	0	12,437	805	32,415	0	33,220
	TAS	0	236	0	236	0	1,722	0	1,722	92	2,899	0	2,991
	VIC	20	2,711	0	2,731	0	10,513	0	10,513	308	58,594	0	58,902
	WA	67	2,858	0	2,924	271	14,030	0	14,301	1,461	40,115	0	41,576
		544	19,507	0	20,051	1,593	82,883	0	84,476	12,943	376,344	0	389,287
Valid RECs created	ACT	217	9,593	0	9,810	740	42,956	0	43,696	8,228	313,756	0	321,984
	NSW	3,479	81,587	0	85,066	12,511	552,392	0	564,903	218,901	10,368,746	0	10,587,647
	NT	4,621	5,099	0	9,720	3,811	18,767	0	22,578	9,486	84,252	0	93,738
	QLD	953	82,881	0	83,834	8,984	768,723	0	777,707	68,040	6,597,734	0	6,665,774
	SA	615	98,460	0	99,075	4,478	338,115	0	342,593	21,001	2,156,015	0	2,177,016
	TAS	0	4,054	0	4,054	0	38,204	0	38,204	1,725	112,622	0	114,347
	VIC	357	47,037	0	47,394	0	337,483	0	337,483	6,556	3,290,580	0	3,297,136
	WA	1,422	58,080	0	59,502	6,214	372,455	0	378,669	36,423	2,663,523	0	2,699,946
		11,664	386,791	0	398,455	36,738	2,469,095	0	2,505,833	370,360	25,587,228	0	25,957,588
No of Systems Installed	ACT	1	277	0	278	1	802	0	803	16	2,306	0	2,322
	NSW	5	2,886	0	2,891	24	13,985	0	14,009	628	69,496	0	70,124
	NT	13	75	0	88	9	206	0	215	17	620	0	637
	QLD	4	3,083	0	3,087	24	18,259	0	18,283	135	48,512	0	48,647
	SA	1	3,456	0	3,457	10	8,563	0	8,573	42	16,655	0	16,697
	TAS	0	161	0	161	0	1,452	0	1,452	5	1,877	0	1,882
	VIC	1	2,036	0	2,037	0	8,429	0	8,429	18	35,650	0	35,668
	WA	4	2,064	0	2,068	16	11,141	0	11,157	67	22,141	0	22,208
		29	14,038	0	14,067	84	62,837	0	62,921	928	197,257	0	198,185
kW/system	ACT	10.50	1.74	-	1.77	29.70	1.56	-	1.60	18.84	2.08	-	2.20
	NSW	33.58	1.40	-	1.46	23.25	1.33	-	1.37	11.16	2.12	-	2.20
	NT	15.06	2.91	-	4.71	15.98	1.78	-	2.37	20.99	1.83	-	2.34
	QLD	13.36	1.33	-	1.35	15.70	1.32	-	1.34	19.34	1.84	-	1.89
	SA	29.70	1.40	-	1.41	21.37	1.43	-	1.45	19.16	1.95	-	1.99
	TAS	-	1.47	-	1.47	-	1.19	-	1.19	18.49	1.54	-	1.59
	VIC	20.10	1.33	-	1.34	-	1.25	-	1.25	17.12	1.64	-	1.65
	WA	16.65	1.38	-	1.41	16.96	1.26	-	1.28	21.81	1.81	-	1.87
		18.76	1.39	-	1.43	18.97	1.32	-	1.34	13.95	1.91	-	1.96

Solar PV by Segment
Incl. Pending Registration
Summary of REC-Registry Data
(Certificates created as at 25 November 2013)
Attachment 8

Installation Year		2011				2012				2013			
	State	Commercial	Residential	Upgrade	Total	Commercial	Residential	Upgrade	Total	Commercial	Residential	Upgrade	Total
Capacity Installed (kW)	ACT	1,115	16,064	47	17,225	424	4,514	24	4,962	955	7,495	3	8,453
	NSW	15,059	179,603	380	195,041	12,678	131,280	336	144,294	23,739	83,826	419	107,984
	NT	887	889	13	1,789	510	1,709	2	2,221	512	3,255	4	3,771
	QLD	9,543	213,523	1,651	224,717	10,245	401,789	4,526	416,561	11,521	215,677	5,625	232,823
	SA	2,645	159,355	1,165	163,165	7,290	129,983	415	137,688	18,216	83,943	467	102,625
	TAS	480	5,333	76	5,888	1,373	18,503	298	20,173	2,366	20,994	380	23,740
	VIC	1,139	137,471	1,236	139,846	10,113	196,384	470	206,967	13,013	89,178	336	102,527
	WA	4,795	111,964	1,362	118,121	3,932	92,242	2,382	98,555	6,456	50,926	1,428	58,810
		35,661	824,202	5,929	865,792	46,565	976,403	8,453	1,031,421	76,777	555,293	8,662	640,733
Valid RECs created	ACT	29,380	1,102,339	939	1,132,658	9,307	164,497	488	174,292	19,863	156,337	56	176,256
	NSW	459,711	12,809,834	7,643	13,277,188	296,378	5,232,389	6,763	5,535,530	497,679	1,815,311	8,544	2,321,534
	NT	22,953	63,674	303	86,930	13,328	63,011	51	76,390	12,031	77,344	81	89,456
	QLD	237,710	14,006,779	33,202	14,277,691	231,738	13,943,102	91,741	14,266,581	241,346	4,615,377	114,378	4,971,101
	SA	70,196	9,048,142	23,372	9,141,710	171,900	4,653,546	8,362	4,833,808	376,898	1,750,434	9,447	2,136,779
	TAS	10,327	296,064	1,311	307,702	26,831	552,547	5,195	584,573	42,108	382,439	6,623	431,170
	VIC	24,354	7,639,875	21,874	7,686,103	202,464	6,179,282	8,238	6,389,984	238,889	1,635,801	5,878	1,880,568
	WA	123,066	7,316,443	27,354	7,466,863	89,552	3,860,572	48,070	3,998,194	131,824	1,084,790	28,957	1,245,571
		977,697	52,283,150	115,998	53,376,845	1,041,498	34,648,946	168,908	35,859,352	1,560,638	11,517,833	173,964	13,252,435
No of Systems Installed	ACT	63	6,747	44	6,854	25	1,472	20	1,517	66	1,906	4	1,976
	NSW	1,346	78,466	362	80,174	759	52,722	326	53,807	1,119	26,812	364	28,295
	NT	33	356	11	400	31	474	2	507	26	734	2	762
	QLD	508	92,695	1,870	95,073	521	124,641	4,140	129,302	599	55,838	5,328	61,765
	SA	197	61,990	1,223	63,410	534	40,819	399	41,752	1,320	20,047	393	21,760
	TAS	35	2,362	71	2,468	103	6,018	214	6,335	157	5,421	269	5,847
	VIC	74	58,854	1,135	60,063	687	64,975	365	66,027	704	25,121	249	26,074
	WA	259	49,421	1,444	51,124	220	39,862	2,273	42,355	282	17,063	1,308	18,653
		2,515	350,891	6,160	359,566	2,880	330,983	7,739	341,602	4,273	152,942	7,917	165,132
kW/system	ACT	17.69	2.38	1.06	2.51	16.96	3.07	1.20	3.27	14.47	3.93	0.69	4.28
	NSW	11.19	2.29	1.05	2.43	16.70	2.49	1.03	2.68	21.21	3.13	1.15	3.82
	NT	26.88	2.50	1.21	4.47	16.45	3.60	1.12	4.38	19.68	4.44	1.76	4.95
	QLD	18.79	2.30	0.88	2.36	19.67	3.22	1.09	3.22	19.23	3.86	1.06	3.77
	SA	13.43	2.57	0.95	2.57	13.65	3.18	1.04	3.30	13.80	4.19	1.19	4.72
	TAS	13.71	2.26	1.07	2.39	13.33	3.07	1.39	3.18	15.07	3.87	1.41	4.06
	VIC	15.39	2.34	1.09	2.33	14.72	3.02	1.29	3.13	18.48	3.55	1.35	3.93
	WA	18.51	2.27	0.94	2.31	17.87	2.31	1.05	2.33	22.90	2.98	1.09	3.15
		14.18	2.35	0.96	2.41	16.17	2.95	1.09	3.02	17.97	3.63	1.09	3.88

Summary of REC-Registry data for Solar Water Heaters (SWH) by market segment

Attachment 9

*Note: certificates created are up and until 16 November 2013 and include Pending Registration. 2012 and 2013 installations years are incomplete.***1. SWH certificates created**

	New Building					Replacement					Total market				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
ACT	18,125	7,501	13,138	12,503	3,660	50,226	22,897	19,099	9,354	6,022	68,351	30,398	32,237	21,857	9,682
NSW	131,981	172,125	145,847	83,677	57,163	3,022,287	1,167,684	662,809	262,332	168,529	3,154,268	1,339,809	808,656	346,009	225,692
NT	10,468	13,429	13,929	18,070	9,007	65,827	31,740	20,807	14,644	6,209	76,295	45,169	34,736	32,714	15,216
QLD	374,412	340,115	275,652	259,405	141,264	1,046,070	793,454	666,949	309,898	173,247	1,420,482	1,133,569	942,601	569,303	314,511
SA	38,281	54,845	51,260	29,581	15,220	321,935	170,447	109,092	68,566	43,662	360,216	225,292	160,352	98,147	58,882
TAS	11,377	8,115	4,994	3,889	1,523	144,547	61,940	40,322	22,517	14,582	155,924	70,055	45,316	26,406	16,105
VIC	457,949	533,484	531,557	434,620	325,606	1,653,449	399,653	184,298	118,505	65,497	2,111,398	933,137	715,855	553,125	391,103
WA	143,026	188,152	162,685	144,163	99,489	385,280	310,668	220,663	198,830	152,666	528,306	498,820	383,348	342,993	252,155
Grand Total	1,185,619	1,317,766	1,199,062	985,908	652,932	6,689,621	2,958,483	1,924,039	1,004,646	630,414	7,875,240	4,276,249	3,123,101	1,990,554	1,283,346

2. SWH systems installed

	New Building					Replacement					Total market				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
ACT	507	236	422	432	113	1,467	724	616	302	192	1,974	960	1,038	734	305
NSW	3,361	5,098	4,522	2,579	1,727	82,095	33,427	20,809	8,228	5,248	85,456	38,525	25,331	10,807	6,975
NT	346	436	522	653	352	1,385	867	745	517	213	1,731	1,303	1,267	1,170	565
QLD	10,652	10,497	9,359	9,033	4,655	26,007	23,765	21,578	9,930	5,500	36,659	34,262	30,937	18,963	10,155
SA	1,126	1,669	1,677	1,056	516	7,668	5,143	3,767	2,411	1,494	8,794	6,812	5,444	3,467	2,010
TAS	177	266	192	137	53	2,092	1,167	1,533	762	482	2,269	1,433	1,725	899	535
VIC	17,124	20,119	20,559	17,716	11,863	24,996	7,614	5,887	3,866	2,086	42,120	27,733	26,446	21,582	13,949
WA	4,123	5,728	5,077	4,709	3,112	11,569	10,337	7,785	7,101	5,210	15,692	16,065	12,862	11,810	8,322
Grand Total	37,416	44,049	42,330	36,315	22,391	157,279	83,044	62,720	33,117	20,425	194,695	127,093	105,050	69,432	42,816

3. Certificates per SWH system

	New Building					Replacement					Total market				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
ACT	35.7	31.8	31.1	28.9	32.4	34.2	31.6	31.0	31.0	31.4	34.6	31.7	31.1	29.8	31.7
NSW	39.3	33.8	32.3	32.4	33.1	36.8	34.9	31.9	31.9	32.1	36.9	34.8	31.9	32.0	32.4
NT	30.3	30.8	26.7	27.7	25.6	47.5	36.6	27.9	28.3	29.2	44.1	34.7	27.4	28.0	26.9
QLD	35.1	32.4	29.5	28.7	30.3	40.2	33.4	30.9	31.2	31.5	38.7	33.1	30.5	30.0	31.0
SA	34.0	32.9	30.6	28.0	29.5	42.0	33.1	29.0	28.4	29.2	41.0	33.1	29.5	28.3	29.3
TAS	64.3	30.5	26.0	28.4	28.7	69.1	53.1	26.3	29.5	30.3	68.7	48.9	26.3	29.4	30.1
VIC	26.7	26.5	25.9	24.5	27.4	66.1	52.5	31.3	30.7	31.4	50.1	33.6	27.1	25.6	28.0
WA	34.7	32.8	32.0	30.6	32.0	33.3	30.1	28.3	28.0	29.3	33.7	31.1	29.8	29.0	30.3
Grand Total	31.7	29.9	28.3	27.1	29.2	42.5	35.6	30.7	30.3	30.9	40.4	33.6	29.7	28.7	30.0

Delay in Certificate Creation for PV System Installations

Rows show the quarter in which the system was installed. The columns show the percentage created within the specified number of days

	more than 75% of certificates created
	more than 85% of certificates created
	more than 90% of certificates created

* Not all systems installed in Q1 and Q2 2013 have created certificates yet.

* Based on 2012 experience, 3% of Q1 2013 installations are yet to create certificates and 6% of Q2 installations are yet to create certificates.

Australia	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	64%	81%	88%	91%	93%	95%	96%	97%	97%	98%	99%	100%
Q2 2011	57%	75%	83%	88%	92%	94%	95%	97%	97%	98%	99%	100%
Q3 2011	54%	75%	85%	90%	92%	94%	95%	97%	97%	98%	99%	100%
Q4 2011	65%	83%	89%	93%	94%	96%	96%	97%	98%	98%	99%	100%
Q1 2012	76%	87%	91%	93%	95%	96%	97%	98%	99%	99%	99%	100%
Q2 2012	67%	82%	88%	92%	94%	95%	96%	97%	98%	98%	99%	100%
Q3 2012	69%	83%	89%	92%	94%	96%	97%	98%	98%	99%	99%	100%
Q4 2012	66%	82%	89%	93%	95%	96%	97%	98%	99%	99%	100%	100%
Q1 2013 *	67%	84%	90%	94%	96%	98%	99%	99%	100%	100%	100%	100%
Q2 2013 *	72%	86%	93%	97%	99%	100%	100%	100%	100%	100%	100%	100%

NSW	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	66%	83%	90%	92%	94%	95%	96%	97%	97%	98%	99%	100%
Q2 2011	64%	79%	86%	90%	92%	94%	95%	96%	97%	97%	98%	100%
Q3 2011	56%	74%	82%	87%	90%	92%	93%	95%	96%	96%	97%	100%
Q4 2011	67%	83%	89%	91%	93%	95%	96%	97%	97%	98%	99%	100%
Q1 2012	77%	85%	89%	92%	94%	95%	96%	97%	98%	99%	99%	100%
Q2 2012	67%	82%	88%	91%	94%	96%	97%	98%	98%	99%	99%	100%
Q3 2012	71%	83%	89%	93%	94%	96%	97%	98%	98%	99%	100%	100%
Q4 2012	64%	80%	89%	93%	95%	97%	97%	98%	99%	99%	100%	100%
Q1 2013 *	66%	82%	89%	94%	96%	97%	99%	99%	100%	100%	100%	100%
Q2 2013 *	75%	86%	93%	97%	99%	100%	100%	100%	100%	100%	100%	100%

Queensland	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	67%	82%	88%	92%	94%	96%	97%	97%	98%	99%	99%	100%
Q2 2011	61%	77%	84%	90%	93%	95%	96%	97%	98%	99%	99%	100%
Q3 2011	51%	73%	86%	92%	94%	96%	97%	98%	99%	99%	99%	100%
Q4 2011	69%	87%	92%	94%	96%	97%	97%	98%	98%	99%	99%	100%
Q1 2012	78%	89%	93%	95%	96%	97%	98%	98%	99%	99%	99%	100%
Q2 2012	72%	84%	89%	92%	94%	95%	96%	97%	98%	98%	99%	100%
Q3 2012	70%	84%	90%	93%	95%	96%	97%	98%	98%	99%	99%	100%
Q4 2012	68%	83%	89%	93%	95%	96%	97%	98%	99%	99%	99%	100%
Q1 2013 *	66%	82%	90%	94%	96%	97%	98%	99%	100%	100%	100%	100%
Q2 2013 *	72%	86%	93%	97%	99%	100%	100%	100%	100%	100%	100%	100%

Victoria	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	46%	72%	82%	86%	88%	91%	94%	96%	97%	98%	99%	100%
Q2 2011	39%	63%	74%	82%	87%	91%	93%	96%	97%	98%	99%	100%
Q3 2011	48%	71%	81%	86%	90%	92%	94%	96%	96%	97%	98%	100%
Q4 2011	55%	77%	86%	91%	93%	95%	96%	97%	97%	98%	99%	100%
Q1 2012	70%	86%	91%	93%	95%	97%	98%	99%	99%	99%	99%	100%
Q2 2012	59%	81%	88%	91%	94%	95%	97%	98%	98%	99%	99%	100%
Q3 2012	58%	77%	85%	89%	93%	95%	97%	98%	98%	99%	99%	100%
Q4 2012	54%	78%	88%	92%	95%	96%	98%	99%	99%	99%	100%	100%
Q1 2013 *	61%	83%	90%	94%	96%	98%	99%	100%	100%	100%	100%	100%
Q2 2013 *	67%	86%	93%	97%	99%	100%	100%	100%	100%	100%	100%	100%

SA	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	60%	76%	84%	89%	91%	93%	94%	95%	95%	97%	98%	100%
Q2 2011	53%	72%	81%	88%	93%	95%	96%	97%	98%	98%	99%	100%
Q3 2011	57%	77%	86%	90%	92%	94%	95%	96%	97%	97%	98%	100%
Q4 2011	63%	82%	88%	91%	93%	95%	95%	96%	97%	98%	99%	100%
Q1 2012	70%	83%	87%	90%	92%	94%	95%	97%	98%	98%	99%	100%
Q2 2012	62%	77%	85%	90%	93%	95%	96%	97%	98%	99%	99%	100%
Q3 2012	71%	85%	90%	93%	95%	96%	97%	98%	99%	99%	100%	100%
Q4 2012	66%	82%	89%	93%	95%	97%	98%	99%	99%	99%	99%	100%
Q1 2013 *	73%	87%	93%	95%	97%	98%	99%	99%	100%	100%	100%	100%
Q2 2013 *	77%	89%	95%	97%	99%	99%	100%	100%	100%	100%	100%	100%

Delay in Certificate Creation for PV System Installations

Rows show the quarter in which the system was installed. The columns show the percentage created within the specified number of days

	more than 75% of certificates created
	more than 85% of certificates created
	more than 90% of certificates created

* Not all systems installed in Q1 and Q2 2013 have created certificates yet.

* Based on 2012 experience, 3% of Q1 2013 installations are yet to create certificates and 6% of Q2 installations are yet to create certificates.

WA	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	77%	88%	92%	94%	96%	97%	98%	98%	99%	99%	99%	100%
Q2 2011	69%	82%	87%	91%	93%	95%	96%	97%	98%	98%	99%	100%
Q3 2011	64%	82%	89%	92%	94%	95%	96%	97%	98%	98%	99%	100%
Q4 2011	73%	86%	92%	95%	97%	97%	98%	98%	99%	99%	99%	100%
Q1 2012	82%	91%	94%	95%	96%	97%	98%	99%	99%	99%	99%	100%
Q2 2012	76%	85%	89%	93%	95%	95%	96%	97%	97%	98%	99%	100%
Q3 2012	79%	89%	93%	95%	96%	97%	97%	98%	99%	99%	99%	100%
Q4 2012	76%	88%	92%	94%	96%	97%	98%	99%	99%	100%	100%	100%
Q1 2013 *	76%	86%	91%	95%	97%	99%	99%	100%	100%	100%	100%	100%
Q2 2013 *	76%	86%	93%	98%	99%	100%	100%	100%	100%	100%	100%	100%

Tasmania	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	59%	77%	84%	87%	90%	91%	92%	94%	97%	99%	100%	100%
Q2 2011	58%	77%	84%	89%	92%	95%	95%	96%	97%	98%	99%	100%
Q3 2011	71%	85%	90%	92%	94%	97%	98%	99%	99%	99%	99%	100%
Q4 2011	70%	84%	91%	96%	97%	98%	98%	99%	100%	100%	100%	100%
Q1 2012	74%	90%	96%	97%	97%	98%	99%	99%	99%	99%	100%	100%
Q2 2012	75%	86%	91%	94%	96%	97%	98%	98%	99%	99%	99%	100%
Q3 2012	78%	90%	94%	96%	96%	97%	97%	98%	99%	99%	99%	100%
Q4 2012	64%	84%	90%	93%	95%	97%	97%	98%	99%	99%	99%	100%
Q1 2013 *	62%	86%	93%	96%	98%	98%	99%	100%	100%	100%	100%	100%
Q2 2013 *	74%	91%	95%	97%	99%	100%	100%	100%	100%	100%	100%	100%

ACT	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	48%	74%	84%	88%	90%	94%	96%	98%	99%	99%	99%	100%
Q2 2011	43%	65%	80%	88%	93%	95%	96%	98%	98%	98%	99%	100%
Q3 2011	41%	61%	73%	82%	89%	94%	95%	97%	98%	98%	99%	100%
Q4 2011	36%	62%	77%	88%	91%	91%	92%	92%	93%	95%	96%	100%
Q1 2012	41%	67%	77%	81%	84%	87%	92%	94%	95%	96%	97%	100%
Q2 2012	40%	71%	79%	83%	85%	87%	89%	91%	92%	97%	99%	100%
Q3 2012	44%	68%	75%	78%	82%	83%	86%	90%	94%	97%	98%	100%
Q4 2012	52%	68%	80%	84%	86%	92%	95%	96%	98%	99%	100%	100%
Q1 2013 *	49%	83%	89%	92%	94%	98%	99%	99%	100%	100%	100%	100%
Q2 2013 *	61%	82%	89%	94%	98%	100%	100%	100%	100%	100%	100%	100%

NT	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	44%	49%	56%	64%	64%	73%	87%	89%	89%	89%	89%	100%
Q2 2011	30%	53%	74%	79%	83%	89%	90%	93%	95%	97%	98%	100%
Q3 2011	14%	44%	65%	70%	78%	81%	86%	89%	90%	91%	98%	100%
Q4 2011	24%	44%	54%	62%	73%	84%	87%	92%	97%	98%	100%	100%
Q1 2012	26%	49%	65%	76%	85%	93%	94%	97%	97%	99%	100%	100%
Q2 2012	30%	70%	79%	86%	88%	94%	97%	98%	99%	99%	99%	100%
Q3 2012	37%	57%	73%	78%	90%	94%	94%	97%	98%	100%	100%	100%
Q4 2012	39%	59%	74%	88%	91%	93%	94%	97%	98%	99%	99%	100%
Q1 2013 *	49%	74%	84%	91%	96%	99%	99%	99%	99%	99%	100%	100%
Q2 2013 *	47%	73%	88%	95%	98%	98%	100%	100%	100%	100%	100%	100%

Delay in Certificate Creation for SWH System Installations

Rows show the quarter in which the system was installed. The columns show the percentage created within the specified number of days

	more than 75% of certificates created
	more than 85% of certificates created
	more than 90% of certificates created

* Not all systems installed in Q1 and Q2 2013 have created certificates yet.

* Based on 2012 experience, 3% of Q1 2013 installations are yet to create certificates and 6% of Q2 installations are yet to create certificates.

Australia	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	0.51	0.69	0.78	0.84	0.87	0.90	0.92	0.94	0.96	0.97	0.98	1.00
Q2 2011	0.47	0.67	0.79	0.84	0.87	0.90	0.92	0.93	0.95	0.97	0.98	1.00
Q3 2011	0.41	0.61	0.74	0.80	0.84	0.86	0.89	0.92	0.95	0.97	0.99	1.00
Q4 2011	0.38	0.56	0.70	0.77	0.85	0.90	0.93	0.94	0.96	0.97	0.98	1.00
Q1 2012	0.45	0.63	0.74	0.81	0.87	0.92	0.95	0.96	0.98	0.99	0.99	1.00
Q2 2012	0.40	0.62	0.76	0.84	0.89	0.92	0.94	0.95	0.97	0.98	0.99	1.00
Q3 2012	0.44	0.64	0.76	0.82	0.87	0.90	0.93	0.95	0.97	0.98	0.99	1.00
Q4 2012	0.42	0.62	0.71	0.80	0.87	0.92	0.95	0.96	0.97	0.98	0.99	1.00
Q1 2013 *	0.49	0.70	0.80	0.87	0.91	0.94	0.96	0.99	1.00	1.00	1.00	1.00
Q2 2013 *	0.54	0.78	0.88	0.94	0.98	0.99	1.00	1.00	1.00	1.00	1.00	1.00

NSW	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	0.62	0.74	0.82	0.86	0.88	0.90	0.92	0.95	0.96	0.98	0.99	1.00
Q2 2011	0.55	0.74	0.83	0.87	0.90	0.92	0.93	0.94	0.96	0.97	0.98	1.00
Q3 2011	0.55	0.69	0.76	0.81	0.84	0.87	0.90	0.93	0.97	0.98	0.99	1.00
Q4 2011	0.60	0.73	0.81	0.86	0.91	0.94	0.95	0.97	0.97	0.98	0.98	1.00
Q1 2012	0.63	0.76	0.84	0.88	0.91	0.93	0.95	0.96	0.97	0.98	0.99	1.00
Q2 2012	0.60	0.78	0.86	0.91	0.93	0.95	0.95	0.96	0.97	0.98	0.99	1.00
Q3 2012	0.62	0.75	0.85	0.89	0.91	0.93	0.94	0.96	0.97	0.98	0.99	1.00
Q4 2012	0.60	0.73	0.81	0.86	0.90	0.93	0.95	0.97	0.98	0.98	0.99	1.00
Q1 2013 *	0.65	0.78	0.87	0.91	0.94	0.96	0.98	0.99	1.00	1.00	1.00	1.00
Q2 2013 *	0.70	0.85	0.91	0.96	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Queensland	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	0.59	0.74	0.81	0.85	0.88	0.90	0.92	0.93	0.95	0.96	0.97	1.00
Q2 2011	0.54	0.70	0.79	0.84	0.87	0.89	0.91	0.92	0.94	0.96	0.98	1.00
Q3 2011	0.47	0.66	0.78	0.82	0.86	0.88	0.91	0.94	0.97	0.98	0.99	1.00
Q4 2011	0.46	0.64	0.75	0.81	0.87	0.94	0.96	0.97	0.98	0.98	0.99	1.00
Q1 2012	0.51	0.68	0.76	0.83	0.88	0.92	0.94	0.96	0.98	0.99	0.99	1.00
Q2 2012	0.40	0.60	0.72	0.78	0.83	0.87	0.90	0.92	0.95	0.98	0.98	1.00
Q3 2012	0.43	0.60	0.70	0.74	0.80	0.84	0.89	0.94	0.96	0.97	0.99	1.00
Q4 2012	0.45	0.60	0.68	0.79	0.85	0.91	0.95	0.97	0.98	0.99	0.99	1.00
Q1 2013 *	0.47	0.67	0.78	0.85	0.91	0.97	0.98	0.99	0.99	1.00	1.00	1.00
Q2 2013 *	0.58	0.78	0.90	0.96	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Victoria	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	0.29	0.57	0.72	0.80	0.86	0.90	0.93	0.94	0.96	0.97	0.99	1.00
Q2 2011	0.28	0.57	0.75	0.82	0.87	0.90	0.92	0.94	0.96	0.98	0.99	1.00
Q3 2011	0.25	0.52	0.70	0.79	0.83	0.87	0.91	0.93	0.95	0.97	0.99	1.00
Q4 2011	0.19	0.40	0.60	0.70	0.82	0.88	0.91	0.93	0.95	0.96	0.98	1.00
Q1 2012	0.27	0.50	0.64	0.75	0.86	0.92	0.96	0.97	0.98	0.98	0.99	1.00
Q2 2012	0.26	0.55	0.71	0.84	0.90	0.93	0.94	0.96	0.97	0.98	0.99	1.00
Q3 2012	0.32	0.60	0.76	0.83	0.89	0.93	0.95	0.96	0.97	0.98	0.99	1.00
Q4 2012	0.29	0.58	0.71	0.80	0.88	0.93	0.95	0.97	0.98	0.99	1.00	1.00
Q1 2013 *	0.40	0.70	0.82	0.90	0.94	0.96	0.97	0.99	1.00	1.00	1.00	1.00
Q2 2013 *	0.41	0.77	0.88	0.94	0.97	0.99	1.00	1.00	1.00	1.00	1.00	1.00

SA	to 30 days	to 60 days	to 90 days	to 120 days	to 150 days	to 180 days	to 210 days	to 240 days	to 270 days	to 300 days	to 330 days	to 365 days
Q1 2011	0.39	0.59	0.67	0.75	0.81	0.85	0.89	0.95	0.96	0.98	0.99	1.00
Q2 2011	0.39	0.61	0.71	0.77	0.82	0.86	0.91	0.94	0.95	0.97	0.99	1.00
Q3 2011	0.38	0.60	0.71	0.76	0.80	0.83	0.87	0.92	0.94	0.96	0.97	1.00
Q4 2011	0.44	0.62	0.72	0.80	0.86	0.91	0.93	0.94	0.96	0.97	0.98	1.00
Q1 2012	0.45	0.70	0.79	0.85	0.90	0.95	0.97	0.97	0.98	0.99	0.99	1.00
Q2 2012	0.40	0.61	0.78	0.83	0.88	0.94	0.95	0.97	0.98	0.98	0.98	1.00
Q3 2012	0.43	0.60	0.72	0.81	0.86	0.89	0.95	0.96	0.97	0.98	0.99	1.00
Q4 2012	0.41	0.57	0.64	0.76	0.83	0.89	0.93	0.95	0.96	0.97	0.98	1.00
Q1 2013 *	0.43	0.59	0.71	0.77	0.84	0.90	0.95	0.98	1.00	1.00	1.00	1.00
Q2 2013 *	0.54	0.69	0.78	0.86	0.96	0.99	1.00	1.00	1.00	1.00	1.00	1.00

Delay in Certificate Creation for SWH System Installations

Rows show the quarter in which the system was installed. The columns show the percentage created within the specified number of days

	more than 75% of certificates created
	more than 85% of certificates created
	more than 90% of certificates created

* Not all systems installed in Q1 and Q2 2013 have created certificates yet.

* Based on 2012 experience, 3% of Q1 2013 installations are yet to create certificates and 6% of Q2 installations are yet to create certificates.

WA	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	0.51	0.70	0.81	0.85	0.90	0.91	0.92	0.94	0.96	0.98	0.98	1.00
Q2 2011	0.49	0.67	0.78	0.81	0.84	0.88	0.92	0.93	0.94	0.95	0.98	1.00
Q3 2011	0.44	0.57	0.71	0.77	0.82	0.85	0.87	0.90	0.92	0.96	0.99	1.00
Q4 2011	0.43	0.59	0.73	0.77	0.83	0.86	0.90	0.93	0.94	0.97	0.98	1.00
Q1 2012	0.50	0.65	0.78	0.83	0.87	0.91	0.94	0.98	0.98	0.99	0.99	1.00
Q2 2012	0.46	0.65	0.79	0.91	0.94	0.95	0.96	0.97	0.97	0.99	0.99	1.00
Q3 2012	0.54	0.71	0.81	0.88	0.90	0.92	0.95	0.96	0.97	0.98	0.99	1.00
Q1 2013 *	0.50	0.66	0.73	0.78	0.87	0.89	0.92	0.93	0.93	0.96	0.98	1.00
Q2 2013 *	0.53	0.70	0.78	0.83	0.85	0.87	0.91	0.97	1.00	1.00	1.00	1.00
Q2 2013	0.64	0.80	0.89	0.93	0.96	0.99	1.00	1.00	1.00	1.00	1.00	1.00

Tasmania	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	0.62	0.78	0.85	0.90	0.94	0.94	0.95	0.96	0.98	0.98	0.99	1.00
Q2 2011	0.55	0.71	0.80	0.84	0.87	0.95	0.97	0.97	0.98	0.99	1.00	1.00
Q3 2011	0.55	0.75	0.81	0.85	0.87	0.88	0.90	0.91	0.91	0.92	0.92	1.00
Q4 2011	0.41	0.60	0.67	0.72	0.75	0.77	0.78	0.79	0.79	0.85	0.90	1.00
Q1 2012	0.58	0.77	0.84	0.89	0.92	0.93	0.94	0.97	0.97	0.98	0.98	1.00
Q2 2012	0.57	0.75	0.82	0.86	0.87	0.88	0.90	0.95	0.96	0.98	0.99	1.00
Q3 2012	0.63	0.79	0.84	0.85	0.87	0.88	0.90	0.91	0.93	0.95	0.97	1.00
Q4 2012	0.58	0.76	0.85	0.90	0.94	0.95	0.97	0.98	0.98	0.99	1.00	1.00
Q1 2013 *	0.59	0.79	0.86	0.91	0.93	0.95	0.96	0.98	0.99	1.00	1.00	1.00
Q2 2013 *	0.59	0.74	0.88	0.93	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00

ACT	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	0.59	0.67	0.71	0.81	0.97	0.98	0.98	0.99	0.99	1.00	1.00	1.00
Q2 2011	0.48	0.70	0.80	0.92	0.94	0.95	0.96	0.97	0.97	0.98	1.00	1.00
Q3 2011	0.36	0.53	0.58	0.60	0.61	0.61	0.61	0.62	0.66	0.93	0.97	1.00
Q4 2011	0.41	0.53	0.62	0.65	0.67	0.69	0.87	0.96	0.98	0.99	0.99	1.00
Q1 2012	0.53	0.64	0.73	0.88	0.96	0.98	0.98	0.99	0.99	1.00	1.00	1.00
Q2 2012	0.28	0.79	0.91	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Q3 2012	0.32	0.52	0.77	0.83	0.88	0.96	0.96	0.96	0.97	0.97	0.97	1.00
Q4 2012	0.43	0.59	0.73	0.91	0.95	0.96	0.96	0.98	0.98	0.99	1.00	1.00
Q1 2013 *	0.54	0.77	0.86	0.87	0.96	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Q2 2013 *	0.59	0.74	0.77	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

NT	30 days	60 days	90 days	120 days	150 days	180 days	210 days	240 days	270 days	300 days	330 days	365 days
Q1 2011	0.33	0.53	0.59	0.68	0.79	0.86	0.88	0.92	0.94	0.96	0.98	1.00
Q2 2011	0.21	0.37	0.46	0.57	0.67	0.74	0.77	0.86	0.90	0.97	0.99	1.00
Q3 2011	0.23	0.41	0.55	0.67	0.72	0.79	0.90	0.93	0.95	0.97	0.98	1.00
Q4 2011	0.14	0.25	0.39	0.55	0.59	0.61	0.74	0.82	0.97	0.98	0.99	1.00
Q1 2012	0.12	0.24	0.39	0.59	0.66	0.74	0.82	0.88	0.94	0.98	1.00	1.00
Q2 2012	0.24	0.51	0.59	0.67	0.75	0.84	0.92	0.97	0.98	0.98	0.99	1.00
Q3 2012	0.24	0.46	0.66	0.72	0.79	0.90	0.91	0.94	0.96	0.97	0.98	1.00
Q4 2012	0.16	0.30	0.46	0.51	0.61	0.82	0.90	0.94	0.97	0.98	0.98	1.00
Q1 2013 *	0.23	0.38	0.59	0.72	0.81	0.92	0.95	0.97	0.99	1.00	1.00	1.00
Q2 2013 *	0.37	0.68	0.78	0.84	0.91	0.95	1.00	1.00	1.00	1.00	1.00	1.00