Australian
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APVA Response to The Australia Institute Policy Brief No. 21 "The Australian Government's Solar Rebate Program – an evaluation of its cost effectiveness and fairness"

November 2010

The PV Rebate Program (PVRP), then renamed the Solar Homes & Communities Program (SHCP), operated from 2000 to 2009. Its aims were to:

- promote the uptake of renewable energy;
- reduce greenhouse gas emissions;
- help in the development of the Australian PV industry; and
- increase public awareness and acceptance of renewable energy.

The Australia Institute recently released a paper claiming that "Government subsidies for residential photovoltaic (PV) energy systems are ineffective, costly and unfair". Its main criticisms are that:

- Despite the support, PV contributes only 0.1% of Australia's electricity supply
- The program was "environmentally ineffective and costly", with greenhouse gas abatement costs of \$257-\$301/tCO_2-eq
- The program has had a relatively minor impact as an industry assistance measure.
- 66% of rebates were made to residents in medium to high socio-economic status postcodes

APVA Assessment of the Program

The PVRP / SHCP changed the PV market in Australia significantly by creating a grid-connect market. Prior to this, the main market in Australia was for off-grid PV and Australia's early leadership in PV technology and uptake was being rapidly eroded by substantial increases in grid-connect PV markets internationally. By 2009 Australia was in the top 10 of the world's PV installers and had seen a substantial increase in the number of PV companies operating here, both locally owned and international.

Thus, the SHCP was a very successful Program in that it met and exceeded its objectives. Australia now has a competent, responsive, and competitive solar industry, capable of reducing purchasers' electricity costs, with the beneficial side-effects of immediate emissions abatement and local employment. As a consequence, solar power prices are decreasing and grid parity (when the levelised cost of PV electricity equals retail electricity prices), is expected this decade. When parity is reached, Australian households will enjoy the benefits of a highly-competitive solar power industry offering affordable clean energy, without need for further subsidies. In the meanwhile, most large solar providers are offering financed-packages whose electricity price savings are greater than repayments on system purchase – thus making solar affordable to all. And those households wise enough to take advantage of government support mechanisms, such as the SHCP, to invest in solar power for their future are already enjoying far lower electricity bills.

With regard to the specific Program aims:

Promote the uptake of renewable energy

The market for PV increased from 2.80MW installed in 2000 to 79.13MW in 2009, a 28 fold increase (Watt). For the PV rebate program itself, customer numbers increased 30 fold from 1,600 in 2000 to 47,888 in 2009, while installations increased 37 fold from 1.5MW in 2000 to 56.9MW in 2009. By any measure, these numbers would indicate that the program has been successful in promoting the use of renewable energy.

Reduce greenhouse gas emissions

The total installed capacity under the Program to May 2010 was 128 MW (TAI uses 126 MW). The TAI calculations result in ghg savings of 3.45 $MtCO_2$–eq over the life of the systems or an annual average of 0.09 $MtCO_2$-eq. They base this on PV manufacturing emissions of 50g CO_2-eq/kWh and output starting at 1294kWh/kW/yr and degrading to 1035kWh/yr over 30 years.

According to (Fthenakis) input emissions are 30-45 g CO2-eq/kWh for crystalline Silicon modules and 24g for Cadmium Telluride modules. The method used by TAI to estimate lifetime generation appears to have double counted the drop in production over the first 15 years. This reduction factor is already included in ORERs calculations of PV output, since deeming is over 15 years. Hence the total PV output could be expected to be around 184 GWh/yr in 2010, rather than 163 and total program output would be around 565GWh higher than the TAI report calculates. Taking into account likely lower manufacturing inputs and higher PV outputs, GHG savings would be around 0.5 Mt higher than the TAI estimate.

Australia's electricity has one of the highest emission intensities in the world so, yes, this is a relatively small proportion of Australia's total emissions. Nevertheless, it represents emission reduction at a time when electricity use, mainly from coal-fired power stations, has continued to grow and when no commitment has yet been made to a carbon price.

In addition, when expanding an industry such as PV from such a low base, it can in fact be dangerous to move too quickly. As discussed in the APVA Briefing Paper "Response to Media Reports Regarding Photovoltaics" released in Oct 2010, gradual expansion is necessary to maintain safety standards and quality control, as well as to avoid any potential negative impacts of PV on the grid and to maximise positive impacts. Also highlighted in this Briefing Paper was the rapidly decreasing cost of PV, with grid parity approaching, at which time the abatement cost to the owner of the PV system will be \$0/tonne CO_2-eq. Snapshot views of a rapidly expanding industry, such as that taken by TAI, especially when reliant on historical data, are simply unable to take these considerations into account.

The PVRP/SHCP was instrumental in developing a grid-connect PV market in Australia and installed capacity has continued to grow strongly after the program ended. In 2010 alone, over twice the total PVRP/SHCP capacity will be installed. Hence the Program's legacy will see PV making an increasing contribution to both electricity supply and greenhouse gas reductions in Australia over the decades to come.

Help in the development of the Australian PV industry

With the Program accounting for over 70% of PV installations in 2009, it obviously accounted for a significant portion of the 5300 people employed in the sector, and the 550 or so companies involved

with PV. Employment has continued to grow and is now estimated to be well over 10,000, including 3,000 accredited installers.

While the many interruptions and changes to the program over its life made it very difficult to justify long-term industry investment in local manufacture, there has been significant capacity building in the downstream aspects of system design, delivery and installation, as well as in marketing and finance. The latter, combined with the significant increase in competition, has contributed to the cost reductions that have occurred over the life of the Program. While residential PV systems in 2000 were individually designed and installed over several days, with customers having little choice of modules or installer, by 2010 there are standard systems, streamlined half-day installations and wide choice. The industry has also developed several Standards, as well as training and accreditation programs. These are all necessary for increased PV uptake in future.

With the market now large enough to be of real interest, it is hoped that a stabilisation of PV support policies, combined with approaching grid parity, will encourage more investment in local manufacture. Specific manufacturing support would also assist, particularly as generous support is provided in the many countries around the world vying for PV manufacture and its associated high technology research and employment.

Increase public awareness and acceptance of renewable energy

The runaway success of the Program, which resulted in the imposition of a means test and then cancellation of the Program, clearly indicate that the public is now well aware of PV and has not merely accepted it, but has embraced it enthusiastically.

The issues now facing the PV sector are caused by this successful acceptance and include, not just the sudden changes to support mechanisms, but increasing concern from the electricity sector, as PV reduces customer demand and hence retail revenue, and as PV inverters all disconnect together in response to the tight voltage windows placed on them by the electricity networks.

Additional Issues Raised by TAI

66% of rebates were made to residents in medium to high socio-economic status postcodes

In making this assessment, TAI has ignored a recent study undertaken on PV systems installed under the Program in NSW (that was based on actual incomes of system owners, not simply on post code-level demographics), and the fact that the majority (85%) of installations were made after the $100,000 household means test was introduced in 2008. Bruce et al found that income levels of PV rebate recipients were relatively evenly divided, with the highest proportion of uptake in households with incomes more than $100,000 being around 40% pre July 2007 (when uptake rates were relatively low), as shown in Figure 1. Occupation categories for recipients in NSW over the entire period were spread as follows: 40% professionals, 28% retired and 32% other. This Program benefitted a wide range of household types and incomes in Australia, with 80% of post 2008 recipients indicating that they would not have installed PV without the rebate (Figure 2).

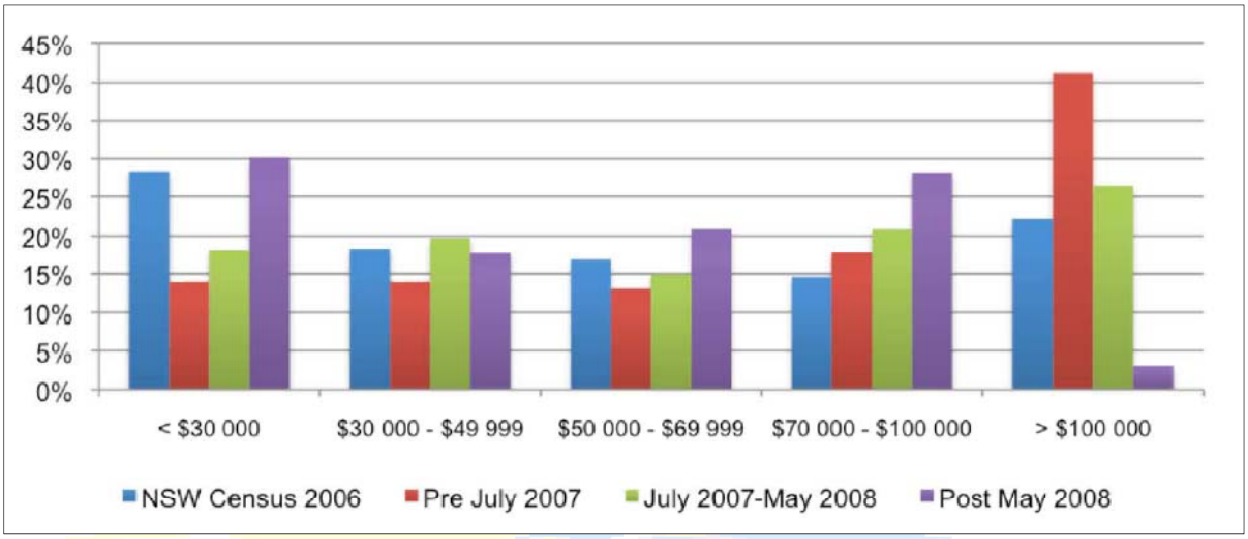

Figure 1: Income of NSW PV Rebate recipients 2000-2008 compared with census data (Bruce)

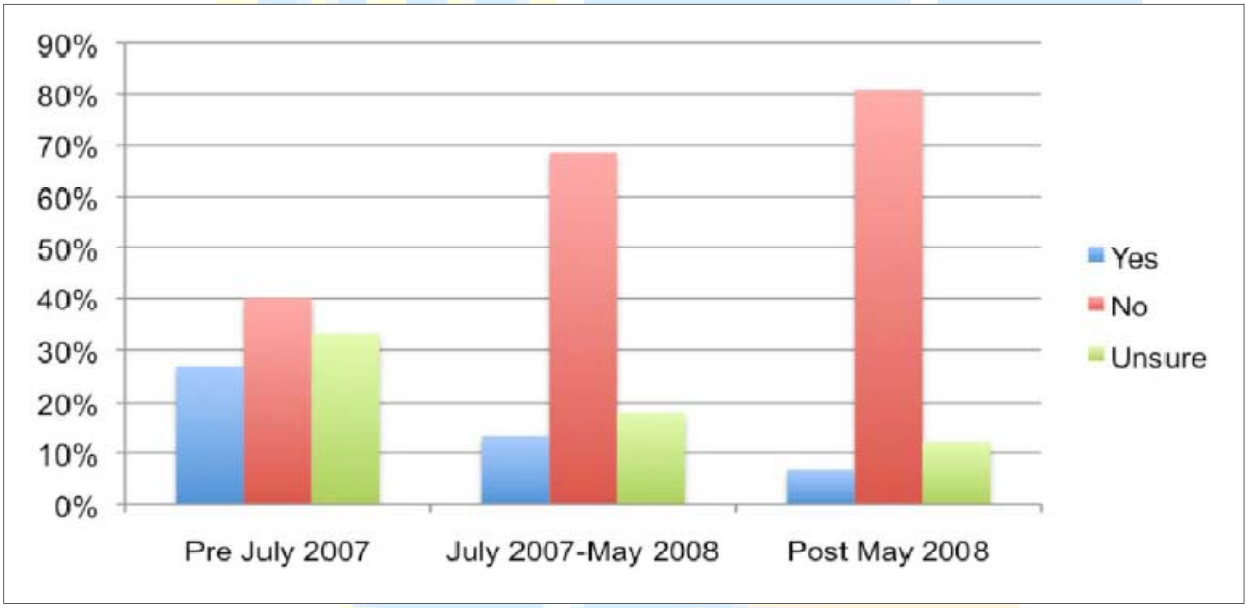

Figure 2: Responses from NSW rebate recipients when asked if they would have installed PV without the rebate (Bruce)

Further evidence is provided by (Johnson), who has analysed installations in the Energex areas of Queensland and found that suburbs with income brackets of $350-$649 per week were historically more likely to have installations than suburbs with income brackets exceeding $1200 per week.

Although implemented after the SHCP ended, it is clear from a review undertaken for the NSW Solar Bonus Scheme, cited in (Parkinson) that solar programs benefit average Australian families. It found:

"the greatest demand in Sydney for solar PV under the scheme came from the western and south-western "Aussie battler" suburbs of Prospect, Seven Hills, Mt Druitt and Liverpool. And the highest numbers per locality were recorded in country areas – Including Lismore, Coffs Harbour, Taree, Port Macquarie, Ballina and Gosford in the north, Bega in the south, Armidale and Wagga Wagga further inland, and in numerous localities in the central coast.

APVA Conclusion

Thanks to the institutional capacity and market momentum created by the Program, PV remains one of the fastest growing renewable energy sectors in Australia. It is likely reach an installed capacity of 3.5GW by 2020 and to make up more than 10% of the Renewable Energy Target. In fact, its very success has been the cause of several dramatic policy changes over recent years.

The incentive provided through the SHCP enabled Australian households to invest wisely for the future. Their investments will reap benefits for themselves and for Australia for 30 or more years, at a time when even the simplest energy efficiency measures, let alone an emissions trading scheme, are still at the first hurdle.

PV may not be the cheapest greenhouse gas mitigation option right now, but it is an important component of the mix of measures Australia needs urgently to adopt. PV is one of the easiest generating technologies to deploy, especially in urban areas, and so is an essential component of longer term aims for net zero energy buildings. It is also increasingly being deployed internationally for medium-scale power stations, an application likely to grow in Australia over the next decade and take the industry into the next level of development.

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