The Evolution and Future Direction of Australian White Certificate Schemes

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ABSTRACT

Australia has had 'white certificate' schemes and energy savings schemes operating since 2003. These are mandatory State based schemes and involve the creation of instruments which guarantee that a specific level of energy savings or greenhouse gas abatement has been achieved.

For white certificate schemes to remain effective the energy savings targets of energy suppliers need to be regularly revised, as do the methods of energy savings that will be considered acceptable under the schemes. Changes in government policies and regulations, changes in energy usage behaviour and products, and changes in relevant technologies all need to be monitored and considered when revising the white certificate schemes.

This paper describes how the Australia white certificate schemes have evolved over the last 10 years and reviews the major policy, regulatory, technology and market factors impacting on the schemes over this period. The impact of focusing on 'low hanging fruit' is reviewed and methods to encourage deep retrofits considered.

Introduction

Australia has had 'white certificate' or energy savings schemes (ESS) operating since 2003, and presently has ESS operating in three separate states. These ESS have had to adapt and evolve in response to the changes in government policy, regulations, technologies and markets that have occurred over the last decade. The ESS are independent and operate in different markets, which has allowed them to learn from the successes, and less successful initiatives, of the other schemes. One particular issue for these schemes has been the challenge of 'low hanging fruit', i.e. the positives and negatives of low-cost and relatively easily implemented energy savings actions.

This paper describes how the Australia energy savings schemes have evolved over the last 10 years, reviews the performance of the schemes over that period, and identifies the major changes in the policy and regulatory environment which have led to changes in the schemes, especially the proposed introduction of the national carbon tax scheme. It also reviews the challenges of low-cost energy savings actions, the changing importance of different energy efficiency actions or technologies, and the emerging importance of standby power controllers (or advanced power strips) to the schemes. Future challenges, such as the escalating cost of obtaining energy savings, and future directions for the ESS are explored.

The Three Australian Energy Savings Schemes

Australia's three main energy savings schemes operate in the State of New South Wales (NSW), Victoria and South Australia (SA). There is also a fourth smaller ESS operating in the Australian Capital Territory, which works closely with the NSW ESS and is administered by the same body.

The three ESS have a number of elements in common:

- Their savings is measured in greenhouse abatement
- Independent government agencies administer the schemes
- Annual emission/energy savings targets for the ESS are set by the responsible government minister and proportionally assigned to obliged parties, depending on the parties energy use/sales
- The parties obliged to create energy/emission savings must meet annual savings targets through the creation and surrender of energy-saving certificates (1 tonne CO2e saved per certificate)
- Energy savings certificates may be created directly by the obliged parties or by approved third party providers.

A key component of the schemes is the selection of obliged parties and the obligations imposed on them. The selection of the obliged parties is a policy decision and generally has been made to include major energy retailers, and sometimes major energy consumers, operating in each jurisdiction. Annual emission/energy savings targets for each ESS are set by the responsible government minister and a proportion of the target is assigned to each obliged parties, with the proportion varying with the parties' share of the jurisdictions total energy use/sales. This means each obliged parties must meet their energy/emission savings targets through the creation and surrender of a specified number of energy-saving certificates (1 tonne CO2e saved per certificate). Failure to surrender sufficient certificates to meet their targets results in penalties corresponding to the difference between number of certificates surrendered and the target.

The obliged parties can meet their emission/energy savings targets through undertaking energy savings activities themselves, or by purchasing certificates created by accredited providers. The certificates are created when proof of undertaking projects or activities is submitted to the relevant authority that indicates a certain amount of energy savings has been measured or deemed to have occurred. Tradable certificates can then be bought and sold on the market, with government authorities tracking the ownership of the certificates. Non-tradable certificates are created by providers under contact to obliged parties.

Some of the other similarities and differences in the three schemes are shown in the table below.

Table 1. Summary of Three State ESS

State	NSW	Victoria	South Australia
Name	NSW Greenhouse Gas Reduction Scheme (GGAS) NSW Saving Scheme (NESS)	Victorian Energy Efficiency Target Scheme (VEET)	Residential Energy Efficiency Scheme (REES)
Started	2003 as GGAS 2009 as NESS	2009	2009
Obliged Parties	Energy retailers and major consumers	Energy retailers	Energy retailers
Target market	Generators, large to small enterprises and residential	Residential and SMB	Residential
Tradable certificates	Yes	Yes	No
State Population	7.3 M	5.6 M	1.7 M
Certificates target 2010	22.7 M	2.7 M(target to double from 2012)	0.235 M
Non-certificate target	No	No	Yes, number of energy audits
Penalty (per tonne CO2e)	A$15.50 (2011)	A $40	A$70
Percentage certificates made from DSM	Of GGAS: 5.7% in 2010 Of NESS: 100%	100%	100%
Certificates created from project measured activities	Yes	No	No
Deemed Saving Activities allowed	Residential and commercial sectors	Residential and SME sectors	Residential sector

One of the key differences in the three schemes is that the New South Wales GGAS allowed for emission certificates to be created through improved efficiency/lower emission in electricity generation, through carbon sequestration activities, through demand side energy savings and fuel switching in industry and commercial organizations, and through demand-side energy savings in the residential sector by undertaking deemed savings activities. Consequently the energy savings or 'white certificate' component of the GGAS was only part of the total greenhouse abatement scheme, while in Victoria and South Australia their entire scheme was focused on energy savings. In July 2009 the demand side energy saving component of the GGAS was separated out, re-labeled as the NESS and now operates as an energy savings scheme in the same way as the VEET and REES do.

Another important difference is the REES imposes other obligations on obliged parties, beyond the need to just undertake emission savings.

Evolution of Energy Saving Schemes

The evolution of the Australian energy savings schemes illustrates both the number of factors impacting on such schemes and the need to build in flexibility into schemes if they are to remain appropriate for changing conditions. The main factors that have impacted on the Australian schemes are changes in:

- government policy
- regulations relevant to activities
- markets and technologies

The NSW GGAS scheme is clearly illustrates the impact of changes in government policy. The NSW GGAS was introduced to encourage greenhouse emission abatement in NSW in the absence of any similar national ESS or policy. Consequently when on 10 July 2011 the Commonwealth Government announced its proposals for a national carbon pollution reduction scheme, which has now been changed to a carbon pollution tax, the GGAS scheme participants quickly began to forecast the end to the GGAS. However, in 2012 this is yet to happen, though NSW legislation does indicate that the GGAS will be terminated by public proclamation once the NSW government is convinced that a national ESS with similar outcomes has been or will be implemented in NSW.

In the meantime, the GGAS policy makers and program managers have adapted to the potential impact of a national Carbon Pollution Reduction Scheme or carbon pollution tax. The energy efficiency activities were removed from GGAS in July 2009 and the new NSW ESS was established. This will allow those energy efficiency activities to continue and removes the threat to these activities even if the GGAS is terminated.

A more recent policy announcement affecting the Australian schemes include on 14 December 2011 the announcement that Victorian and NSW energy-saving schemes would be harmonized. Such a move will reduce the risk to these energy-saving schemes from the introduction of a national energy-saving scheme, a policy which has also been announced.

Regarding regulatory changes, the most relevant new regulations to affect the Australian energy saving schemes have been those concerning Minimum Energy Performance Standards (MEPS) being introduced or raised for the appliances or technologies. The most dramatic impact of such regulation has been the introduction of MEPS for general purpose lighting. The installation of compact fluorescent lamps (CFLs) in place of incandescent lamps had become the major energy savings activity in the GGAS, and the introduction of an import restriction in February 2009 on incandescent lamps undermined the additionally arguments for this activity. The result was the deemed energy savings from CFL retrofits was reduced, and has undergone further reductions in the GGAS, VEET and REES schemes since.

Other impacts of MEPS regulations have been to reduce the deemed energy savings from the installation of high-efficiency televisions, air-conditioners, shower roses, and hot water systems. The technical specification of what is an appropriately, high-efficiency appliance/equipment to install have also changed in response to raised MEPS and hence what is regarded as a business-as-usual installation.

The impact of changes in markets and technologies on energy savings activities, and the need to adapt those activities, are also illustrated by changes in the lighting market. General purpose CFLs have dramatically dropped in price over the past few years and, in part also due to the introduction of MEPS on lighting, CFL's are now the ‘norm’ for most lamp installations. This is taken into account when calculating the deemed energy savings from CFL retrofit, so consequently the savings from CFL installations is significantly reduced. The rapid improvement of LED lamps for spot lamp purposes has also led to them being introduced as a replacement for halogen spot lamps, and to allow for such a rapid changes in technologies, efforts are now being made to define the technical specifications of lamp retrofits to be ‘technology neutral’.

These examples of factors impacting on the Australian energy-saving schemes, and how the schemes have been adapted in response to these factors, illustrate the need for flexibility in the design, implementation and modification of the schemes in order for them to survive.

The Challenge of Low Hanging Fruit

Energy-saving schemes that are driven through savings obligations assigned to energy suppliers will attempt to obtain low-cost energy savings, in order to reduce the cost to energy suppliers and to avoid flow on costs to energy customers. Energy suppliers and providers of energy-savings will chase the low hanging fruit, i.e. the energy savings activities that are lower on the cost curve and relatively easy to administer and implement. This however produces a number of medium and long-term challenges to energy savings schemes, such as:

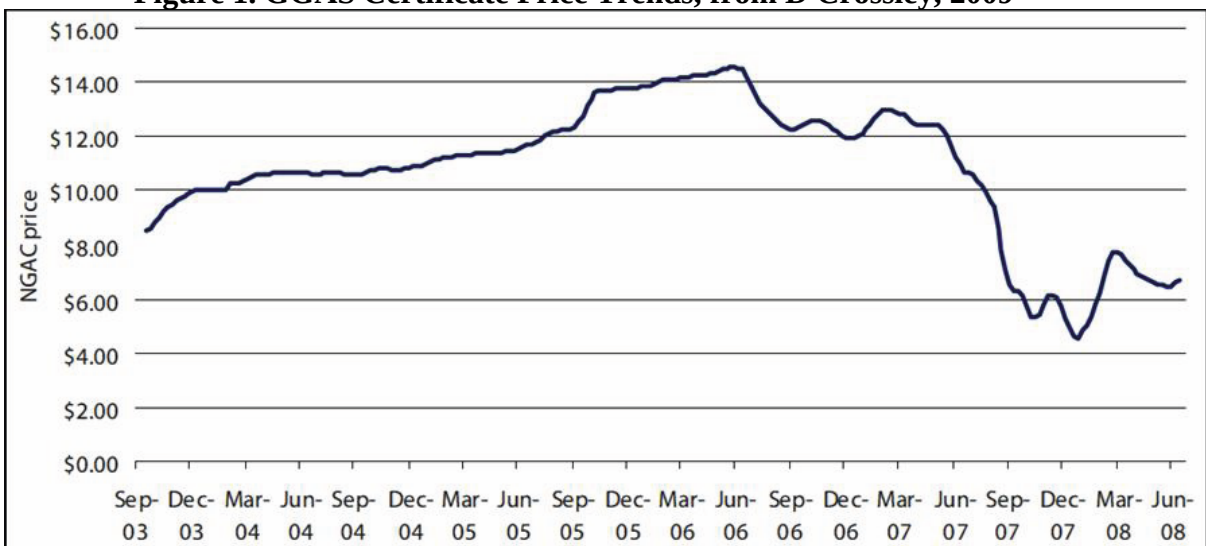
- Easy retrofits encouraging of opportunistic energy-saving suppliers and undermining the financial viability of the scheme
- Regulation and escalating costs
- Deep retrofits may be discouraged

Easy Retrofits

The supply and installation of CFL lamps and of low flow shower roses provide a good example of some of the problems of the low hanging fruit. In the mid-2000s CFL is significantly declined in price and the provision of these started to dominate the NSW GGAS in 2006. Energy savings activities jumped from 4.8% of all abatement undertaken in GGAS in 2005 to 43.8% in 2008, and the scheme's administrator reported more than 800,000 households had received lighting and/or showerhead upgrades since the ESS started (IPART 2009). It appears the opportunity to 'give away' CFL's to householders in order to financially benefit from the sale of the resulting emissions certificates encourage many suppliers to enter the market, some of whom were accused of shonky practices. Low quality CFL's were distributed and their poor quality could potentially undermine the public confidence in CFL's. A market survey in mid 2006 revealed that over half of the CFLs and showerheads that had been given away were not installed. These concerns were recognized by the scheme's administrator, who responded in late 2006 by reducing the deemed savings attributed to shower heads and CFLs that were given away, and then further reducing the deemed abatement for CFLs due to the introduction of lighting MEPS from January 2009 (D Crossley, 2009).

The emission certificate price was also affected by the number of low-cost activities undertaken and concerns regarding a national emissions trading scheme being introduced. The certificate price in the early days of the ESS had been close to $11.0 (MacGill 2005) but in mid 2007 the price quickly dropped from a high of around A$12.00 to a low of A$6.00, before falling to around A$4.0. (D Crossley, 2009). See table below. The result was that one large energy-saving provider business collapsed, and the public credibility of the ESS was threatened. Subsequent tightening of the activity specifications and the announcement of an ongoing energy saving scheme for NSW, the NESS, has restored stability to prices and the NSW certificate market.

Figure 1. GGAS Certificate Price Trends, from D Crossley, 2009



The introduction of a new energy-saving activity, the installation of standby power controllers, potentially could be a repeat of the CFL and shower rose issues. These appliances are relatively cheap and easily installed, potentially allowing them to be given away to householders, and there could be a very large potential market for the devices. However, unless these devices are properly installed and used they will not fulfill their potential to save significant standby energy. In other words, of standby power controllers have very similar characteristics to CFLs or low flow showerheads in the mid-2000s.

The lessons for scheme administrators from the GGAS experience with easy, low cost retrofits appear to be:

- Prepare the technical specifications to ensure the minimum quality of the devices
- Ban giving away devices and require the appropriate installation of efficiency devices
- Consider limiting the proportion of certificates that can be created or surrendered in a given year from a specific activity

Regulation and Escalating Costs

Another challenge to energy savings schemes is the impact of regulation and increasingly stringent MEPS on the availability of low cost actions. The introduction of MEPS on incandescent lamps has already been discussed, but MEPS are also rising for products such as televisions, air-conditioners, and potentially water heaters and space heaters. This may reduce the availability of products which exceed the average efficiency of those in the market and make energy savings activities based on the supply of such products more difficult to implement. Regulations requiring the retrofitting of insulation in renovated homes will reduce the opportunities for insulation retrofit actions. Another regulation in Australia, the banning of electric water heaters in single household dwellings, will also reduce the potential to install high-efficiency water heaters as an energy efficiency action or reduce the deemed energy savings from such actions. The impact of these changes is likely to be an increase in the cost of the 'low cost'

energy savings actions as upgrading to appliances or equipment with efficiencies beyond business-as-usual standards will be more difficult, and probably more costly.

Deep Retrofits

Deep energy efficiency retrofits maybe discouraged if the market concentrates on only separate low-cost energy-saving activities. For example, installing efficient shower roses may discourage the later installation of high efficiency hot water systems, or the installation of higher efficiency space heaters may later discouraged the installation of installation. This is because the initial activity will save energy but this will reduce the potential energy savings, and hence cost savings, of undertaking the second activity at a later time. This means householders will need to be given greater incentives to undertake the second round of energy-saving actions. By concentrating on the 'easy' energy-saving options, and providing financial incentives in the energy savings program design which encourage this, energy savings schemes may be raising the cost of obtaining energy savings in the future and discouraging deep retrofits.

Another impact of concentrating on separate low-cost activities will be the wasted marketing efforts and costs, plus the possibility of market fatigue developing. It takes considerable effort and cost on part of energy-saving providers to obtain agreement by householders or business owners to undertake even simple energy-saving activities, and if the activity involves somebody travelling to the house or office to undertake an installation, then the costs increase further. The more the public are approached to undertake energy savings activities, the more likely it is that activity providers will be attempting to convince people who has already undertaken in energy-saving activity to undertake a further activity. People can be expected to quickly fatigue if constantly approached to undertake small, separate energy-saving activities. This will further increase the costs of undertaking energy-saving activities in the future.

The best way to avoid the risk of a focus on separate, low-cost energy action is appears to be for the schemes to encourage deep energy-saving retrofits of houses or businesses and their appliances. Providing incentives for undertaking a bundle of appropriate energy-saving actions in a house or business may be an appropriate method to ensure such deep retrofits are undertaken. For example, the energy saving certificates created from installing both a high efficiency air-conditioner and ceiling insulation might be deemed to be greater than the certificates created if each action is undertaken separately. Alternatively, providing additional incentives to undertake the harder, but still important, energy efficiency actions may also encourage deep retrofits. For example, the installation of wall cavity insulation might receive additional incentives but ceiling insulation may receive no additional incentives.

Another approach may be to simply stipulate targets for the number of deeper retrofit actions that must be taken. The use of targets to encourage particular actions has been the approach taken in the South Australian REES, where requirements to undertake a certain number of energy audits in low income homes exist together with an emissions savings requirement.

It is recognized that providing such incentives or requirements will increase the immediate cost of the resulting energy savings, but using such incentives may avoid the additional escalation of costs which can occur through undertaking a series of separate energy-saving actions. Such incentives may also encourage service providers not to purely focus on the latest, apparently profitable separate energy-saving activity and this in turn will encourage a more stable energy efficiency industry. There is also scope to provide such incentives as a

review of the NSW ESS program (IPART 2011) indicated that the present energy savings actions are achieving a net savings of over $20 per ton of emission saved.

Conclusion: Future Directions

What do such findings suggest regarding the future of energy saving schemes? The evolution of the Australian energy-saving schemes strongly suggests that schemes need to be flexible, and their designers and administrators need to be willing to adapt to changing policy, regulatory, technology and market conditions. The findings also suggest that the schemes need to consider how to avoid a focus on separate, low-cost energy-saving actions if they are to reduce the risks to the ESS and an escalation in costs of energy-saving activities in the medium and long term.

If energy savings schemes are to maximize encouraging energy savings in the longer term, then the Australian experience suggest it may be necessary that program designers review their program goals and question if an emphasis on simple market mechanisms will achieve this goal. If the focus is on encouraging energy savings in the long term, then different mechanisms may be required to encourage deep retrofits, such as the use of targets for particular types of energy efficiency actions, added incentives for undertaking such actions, or as a incentives for bundling of energy efficiency actions. Mechanisms which encourage relevant energy efficiency industries should also be considered, as this may be the most effective way to lower the costs and encourage the uptake of deep retrofits in the longer term. Such mechanisms can be developed and economically justified, provided we are clear about what the goals of our schemes should be.

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