

Stakeholder Perspectives on Australia's Greenhouse and Energy Policy

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Abstract

To reduce Australia's greenhouse gas emissions, the federal government has proposed an emissions trading scheme, known as the Carbon Pollution Reduction Scheme (CPRS), and several 'complementary' measures to support efficient energy use, renewable energy and the development of carbon capture and sequestration. Its policies are set out in a White Paper on the CPRS published in 2008, some 2009 revisions on the Department of Climate Change website, and a White Paper on Energy to be published in 2009. This paper examines the potential effectiveness of the government's greenhouse and energy policies, existing and proposed, in expanding renewable sources of energy, the only set of energy supply technologies that have zero greenhouse gas emissions and are commercially available in Australia. The method is to review overseas experience and then conduct interviews of selected non-government expert stakeholders from academia, business, NGOs and a minor political party. On this basis, additional and improved policies for renewable energy are recommended.

Introduction

This paper investigates the adequacy of Australian federal government policies, both existing and proposed, for increasing the manufacture and use of renewable energy technologies.

Renewable sources of energy are important because they include the only set of energy supply technologies that have very low¹ greenhouse gas emissions and are commercially available in Australia: solar hot water, wind power, bioelectricity and solar photovoltaic (PV) electricity. In addition, renewable energy includes two technologies with huge potential that are currently on the brink of becoming commercially available in Australia: solar thermal electricity (otherwise known as concentrated solar thermal power) and hot rock geothermal power (Diesendorf 2007; RISE 2009).

The Australian Government has set unconditional greenhouse gas emissions reduction targets of 5% by 2020 and 60% by 2050, both compared with the 2000 level. To achieve these targets, its principal proposed mechanism is an emissions trading scheme, called the Carbon Pollution Reduction Scheme (CPRS) (Australian Government 2008, 2009a), and several so-called ‘complementary’ measures to support efficient energy use, renewable energy and the development of carbon capture and sequestration. The principal complementary measures are various grants to fund the development of carbon capture and sequestration (CCS), some incentives to householders and landlords to increase the efficiency of energy use in buildings, an expanded Renewable Energy Target (RET), and grants for research and demonstration of renewable energy (DCC 2009).

This paper assesses the potential effectiveness of the Australian government’s greenhouse/energy policies to assist renewable energy. It does this by interviews of Australian-based non-government stakeholders in renewable energy. The interviewees stakeholders from academia, business, NGOs and a minor political party, expressing views that have not received much attention in the government’s White Paper on the CPRS (Australian Government 2008, 2009a) and are not represented on the high-level consultative committee for the 2009 Energy White Paper which is dominated by the fossil fuel and

¹ The greenhouse gas emissions in manufacturing most renewable energy systems with fossil energy are relatively small (ISA 2006). In most cases they are offset within a few months or years of operation of the systems.

uranium industries (DRET 2009). Therefore, their views help to redress the balance in the national greenhouse/energy debate.

Review of previous work

Overseas experience can provide insight into the appropriate policies for renewable energy in Australia. Experience from the European Union is predominantly considered, given the significant policy experience and renewable energy development in this region. Policy areas are then reviewed in terms of the limited experience and existing policy context in Australia.

Emissions trading

The European Union Emissions Trading Scheme (EU-ETS) provides the best example of a large-scale cap and trade emissions trading scheme, similar to the proposed Australian CPRS. The early phases of the EU-ETS highlighted significant issues that undermined the fairness and effectiveness of the scheme, including high levels of free allocation and over-allocation of permits due to poor emissions reporting and low targets (Betz & Sato 2006).

Under the EU-ETS a significant proportion of permits were given away for free resulting in windfall profits for those firms that received the free allocation of permits (Betz & Sato 2006). A number of studies in Europe have demonstrated that free allocation of permits can be directly correlated with the appreciation of the company share price (Oberndorfer 2009; Veith et al. 2009). Domestic companies such as electricity companies are most likely to benefit from windfall profits as they are more easily able to pass permit costs onto the consumer, for example when compared to trade-exposed industries (Egenhofer 2007).

The EU-ETS also suffered from an over-allocation of permits due to poor emissions reporting and minimal targets. This over-allocation resulted in the permit price crashing when emissions information and verification became well established under the scheme, and resulted in significant price volatility (Betz 2006; Betz & Sato 2006). The European experience demonstrates the critical nature of effective information being available on actual emissions as well as setting targets well below business as usual levels (Egenhofer 2007).

Low permit prices has meant that the EU-ETS has had little impact on generating investment into renewable energy technologies. Price impacts have been modelled for the EU-ETS indicating that current and projected carbon prices alone are insufficient to generate

investment into wind energy and that the price would need to reach at least 40 Euros per tonne of CO₂ before investment would become attractive (Blanco & Rodrigues 2008).

Similar issues are likely to be faced in the early stages of the CPRS. The White Paper indicates that 24–30% of emission permits will initially be allocated free of charge to coal-fired generators and energy intensive industries, increasing to up to 45% by 2020 (Australian Government 2008). In addition, unconditional targets under the CPRS are low, with an unconditional target being set at a 5% reduction below 2000 levels by 2020. If this target is put in place then the carbon price at introduction is estimated to be \$23 per tonne of CO₂ equivalent, reaching \$35 (2005 equivalent) by 2020 (Australian Government 2008).

In May 2009 the Australian Government announced a number of changes to the CPRS, in an attempt to gain acceptance of the legislation in the Senate. These included a delayed start date of one year to July 2011, a fixed \$10 permit price cap for the first year and an increase in support to emissions-intensive trade-exposed industries. In addition, the potential upper target for emissions reductions was increased to 25% dependent on an ambitious comprehensive global agreement being reached (Australian Government 2009a). These changes were met with a negative response from the Opposition and other non-government senators, making it appear unlikely that the CPRS legislation would be passed through the Senate in its existing form (Rodgers 2009).

Feed-in tariffs and renewable energy targets

Policy measures targeted directly towards renewable energy have played a much greater role in driving the development of renewable energy industries overseas, particularly in Europe. Feed-in tariffs and renewable energy targets are two policy measures that have been used extensively within the European Union with positive results.

A feed-in tariff (FIT) is a premium price paid for units of electricity sold to the grid by renewable energy generators who could be individual households or large power stations. FITs have been demonstrated to be a successful policy measure in Germany, generating investment into technologies such as wind, solar PV and biomass (Gan et al. 2007; Wüstenhagen & Bilharz 2006). Spain can also attribute significant growth in wind and solar energy to their FIT system (del Río González 2008; del Río & Gual 2007; Toke et al. 2008). FITs have been shown to provide a high level of certainty to investors and to be transparent and flexible (Gan et al. 2007; Wüstenhagen & Bilharz 2006). Key factors that have been

correlated with successful FIT systems are that they are set at a significant level and remain stable for a number of years. Systems which are inherently unstable and change every few years as, for example, in the Netherlands, are less likely to promote successful results (Toke et al. 2008).

International schemes, similar to the Australian Mandatory Renewable Energy Target (MRET), have also shown success in encouraging adoption of lower-cost renewable energy technologies. The UK provides an example of a form of renewable energy target (RET) known as a Renewable Obligation (RO). The RO system is similar to the MRET as it requires electricity providers to acquire 'renewable obligation certificates' to meet targets or else they face a penalty fee (Toke 2007). This scheme has significantly expanded wind energy in the UK, although it has been criticised as being an expensive way to encourage renewable energy when compared to other mechanisms such as FITs (Toke et al. 2008).

Analyses of experiences in a number of different countries in Europe suggest that FITs can contribute to greater penetration of renewable energy at lower cost than tradeable green certificates under a RET (Fouquet & Johansson 2008; Toke & Lauber 2007). However other analyses indicates that both mechanisms are important in promoting renewable energy deployment. Detailed comparison of effectiveness is extremely complex and linked to individual design considerations and the policy context (Agnolucci 2007; Ringel 2006).

Both FITs and RETs have been utilised in Australia to a limited extent. The main focus for future renewable energy policy at the Federal level has been on the proposed 20% expanded RET.

FITs only exist in Australia at the State level, with the majority supporting solar photovoltaics (PV) in households, under net metered schemes that pay a premium rate for excess renewable electricity exported to the grid. The main exception is in the Australian Capital Territory (ACT) where all renewable electricity generated receives the premium tariff (gross metered) and both solar and wind are covered, not just PV (Senate 2008). While the FIT is currently limited to systems generating up to 30 kilowatt-hours per year (Legislative Assembly for the ACT 2009), the intention is that this will be expanded to include large scale generation, once full implications and design are considered (Corbell 2009).

There have also been some efforts to promote FITs on a national scale with a Senate inquiry being undertaken into a bill put forward by the Australian Greens (Milne 2008; Senate 2008). This inquiry noted strong support for this scheme and recommended that development of a

national FIT proceed as quickly as possible through the Council of Australian Governments (COAG) (Senate 2008). However, national principles released by COAG to date indicate that FITs should only be used to provide transitional support for small renewable generators (COAG 2008). Given the Federal focus on the expanded RET, it appears unlikely that FITs will be pursued by the Federal Government.

Australia has previous experience in the implementation of a very small Mandatory Renewable Energy Target (MRET) which commenced in 2001. Due to the amount of increased electricity generation being set at a fixed amount, in real terms the target only amounted to an increase of 0.2% of renewable energy by 2010 instead of the anticipated 2% (Kelly 2007; Kent & Mercer 2006). Wind energy and solar hot water experienced rapid growth after the introduction of the MRET in 2001 and MRET helped to improve the viability of many new projects (MMA 2006). However, once the target was saturated and the scheme failed to be expanded, commercialisation incentives for renewable energy projects through MRET were exhausted, resulting in the reduction of investment into new renewable energy projects (Diesendorf 2007; MMA 2006).

Other Policy Considerations

A number of other policy areas are also critical to the development of renewable energy. These include levels of government funding and grid connection policies.

A study into the US Government spending on energy technologies found that government funding allocated to fossil fuels was excessive and that performance from research and development was actually declining despite the high investment. On the contrary, renewable energy sources were found to be underfunded and that with modest investment, these technologies would become economically comparable to fossil fuels over a period of time (Schilling & Esmundo 2009). In Australia, the Garnaut review (Garnaut 2008), found that funding into low emissions technologies has been low when compared to other OECD countries and recommended that funding be increased to \$3 billion per year by 2013. In the 2009-2010 budget, the Government increased funding to a total of \$4.5 billion to be invested into clean energy programs, with \$2.4 billion going to CCS, \$1.6 billion going to Solar and \$465 million allocated to the remaining renewable energy technologies (Australian Government 2009b).

Connection to the electricity grid also presents a significant barrier to the commercialisation of renewable energy technologies. The policy approach in Germany, the Netherlands and Slovenia is that renewable energy generators only pay for the cost of connecting a plant to the electricity grid and not for grid reinforcement (Swider et al. 2008). Germany has taken this further for offshore wind development, whereby grid operators are responsible for costs of a new offshore grid, rather than the renewable energy generators, providing significant incentive for expansion (Swider et al. 2008). Electricity market reform in this area in Australia is still in the early stages with the recommendation for a ‘national transmission planner’ to be introduced, however proposals do not yet include any discussion of financial support for new generators (Garnaut 2008).

Method of interviews

To complement the variety of information and views found in literature, semi-structured interviews of key expert stakeholders by the first author over the period August 2008 to February 2009. The interviewees were chosen from academia, renewable energy businesses, and a politician from a party that does not aspire to gain government in the foreseeable future. All these key stakeholders have substantial experience and knowledge in the area of renewable energy policy.

Table 1 lists the interviewees and Appendix A outlines the key topics discussed. Research ethics approval was granted for this project by UNSW and the named interviewees have given permission to be identified in this paper.

Table 1: Interviewees

Name	Position	Stakeholder category
John Connor	CEO, the Climate Institute	NGO
Dr Mark Diesendorf	Institute of Environmental Studies, UNSW	Academic: interdisciplinary
Andrew Durran	Executive Director, EPURON	Business
Dr Frank Jotzo	ANU Research Fellow & former adviser to the Garnaut Report	Academic: economist
Dr John Kaye	Greens MP, Legislative Council,	Minor political party and

	Parliament of NSW	academic electrical engineer
Dr Iain MacGill	Joint Director (Engineering), Centre for Energy and Environmental Markets, UNSW	Academic: engineer
Peter Meurs	Managing Director, EcoNomics, WorleyParsons	Business
Alan Pears	Senior Lecturer Environment & Planning, RMIT	Consultant; academic: engineer
Artur Zawadski	Manager, Business Development & Project Delivery, Wizard Power	Business

Stakeholder perspectives

This section provides an overview of a range of renewable energy stakeholder views on the importance of key potential policy options required to help develop the innovation and adoption of renewable energy. Stakeholders interviewed either have an interest in renewable energy or are directly involved in the renewable energy industry.

Emissions trading scheme

Interviewees were asked to comment on the use of an emissions trading scheme (ETS) as the primary policy measure and the impact that this would have on renewable energy.

While all of the stakeholders interviewed here agreed that a price on carbon was necessary and that an effective ETS could help to achieve this, it was seen as unlikely to have much effect on the innovation and adoption of renewable energy over the short term. Thus they said that complementary policies are critical if one of the goals is to promote renewable energy.

Frank Jotzo, ANU research fellow and former adviser to the Garnaut review, said that the Australian policy context puts an emphasis on market solutions and cost effectiveness with a focus on price signals and that this goes hand in hand with the need for a sizable reduction of greenhouse gas emissions. This approach puts an emphasis on cost-effective emission reductions, however it may create tensions with policy objectives intended to promote the

development of renewables. Renewable energy may meet policy objectives other than just low cost CO₂ emissions in the short term.

John Connor, CEO of the Climate Institute, said that emissions trading was a necessary part of the policy mix as it was low risk and cost effective, however it was insufficient in the face of technological uncertainty and difficulties for new technologies to break into the market.

John Kaye, Greens MP in the NSW Legislative Council, said that the focus on emissions trading for meeting abatement targets at least cost to the community failed to take a long term view of cost effectiveness over the next 50 years. Although some form of carbon pricing would be necessary, there are renewable energy technologies that currently have no cost-effective niche and would not make it. Kaye felt that most of the objections raised against additional policy measures relate to electricity purchase price impacts on large, mainly industrial consumers and concerns over consequent loss of profits.

Alan Pears, senior lecturer at RMIT University in Melbourne, who has worked on policy strategies with government, business and community groups, also questions the short-term benefits of the ETS, when free permits, unlimited importing of low priced international permits and price caps will mean low carbon prices. In the context of emerging technologies, until there are stable and well-agreed market prices at reasonable levels, investors will automatically apply a risk premium to these projects, and the level of the price effect will be too small to influence purchasing.

Key reasons highlighted by interviewees as to why emissions trading would be insufficient for promoting renewable energy in the short term included concerns over the overall effectiveness of the CPRS and also that initial carbon prices were not expected to be high enough to encourage investment into renewable energy.

A key point raised was that the CPRS is a new scheme and there will be an initial learning phase. Iain MacGill, Joint Director of the Centre for Energy and Environmental Markets, emphasized that, while it is extremely important to have a price on carbon, emissions trading is a strategy that hasn't yet been proven effective and efficient for reducing greenhouse gases. There is uncertainty in the future and nature of the policy, and policy effectiveness can vary in different countries due to a wide range of factors. It is particularly problematic to use an essentially experimental policy as a primary policy instrument to achieve assured action on climate change.

Andrew Durran, Executive Director of wind farm developer EPURON, said that, although emissions trading is not going to have much of an impact on renewables in the short to medium term, it is vital that we start straight away, to have a target and a system in place for learning.

Mark Diesendorf, from the Institute of Environmental Studies at UNSW, expressed concerns with the current design, stating that the CPRS may actually do more harm than good. Diesendorf indicated that it is unlikely to be effective for encouraging renewable energy in the first decade and almost seems to be designed to exclude renewables. Key weaknesses highlighted were the low abatement targets, the availability of cheap overseas offsets, the initial permit price cap and also the levels of free allocation to coal-fired generators, which was likely to translate into windfall profits.

Most interviewees indicated that the carbon price would have to be in the order of \$40 to \$50 per tonne of CO₂ before lower-cost renewables would start to attract investment, in the absence of other policies. Mark Diesendorf pointed out that the initial price of \$20-23 suggested by modelling may not even be enough to encourage further development of gas fired power. Iain MacGill also highlighted that it was important to consider the projections of future prices as this will be what industry and investors are planning around. The future price will depend on a number of factors, the more important being future targets and faith in the government and its policy intent and effectiveness into the future.

Renewable Energy Targets

Most of the interviewees said that the expanded Renewable Energy Target (RET) was the most important mechanism currently proposed for promoting the innovation and adoption of renewable energy, however FITs were cited as a possible alternative or complement to a RET by a number of interviewees including Mark Diesendorf, Artur Zawadski and Peter Meurs.

Andrew Durran said that the RET is vital to the renewable energy industry; that thousands of jobs currently depend on it; and that the industry is capable of delivering three to four times the proposed targets. Although design could be better, the promised expanded target is needed as soon as possible. Durran believes that the target is small compared to possible capacity and the target could be saturated by 2015, exposing the industry to uncertainty. If there is no process in place for reviewing and expanding the target before 2015, then the

industry will face a similar stop/start situation that it did with the previous small MRET. This will lead to businesses having to shut down, adding cost and time and jeopardising jobs.

Alan Pears highlighted the importance of the expanded RET scheme to drive investment in renewable energy until the carbon price levels from the CPRS become sufficiently high to drive investment. Pears believes there will be a natural evolution where the RET is met prior to 2020, at which point the price of renewable energy certificates will start to collapse and the carbon price will firm up, taking over from the RET.

Iain MacGill stated that the current design for the expanded RET has some serious flaws, which risk poor effectiveness, efficiency and equity outcomes and there need to be targets with some clear mechanisms for how to achieve them. Andrew Durran and Mark Diesendorf indicated that the inclusion of solar hot water was of concern and could undermine the value of the scheme. Another concern that Diesendorf raised was that, if high-emissions trade-exposed industries were excluded from paying for RECs, this would drive electricity prices up for other consumers.

Frank Jotzo, Mark Diesendorf and Alan Pears pointed out that the RET is a market-based system which is designed to implement the cheapest renewable energy technologies. Wind is currently the cheapest renewable electricity technology and will therefore be favoured. Jotzo argued that, if the aim is to support the development of renewable technologies, then the focus should be on less mature technologies, for example geothermal and solar thermal. Diesendorf indicated the only way to change this within the RET scheme is to have different targets for different technologies. Andrew Durran suggested that to support solar thermal, the RET be supplemented with grants or alternative support rather than distorting the RET markets. Alternatively, John Kaye suggested, other mechanisms would be needed to incubate and develop other emerging technologies.

Pears added that, as with any market based system, it is important to ensure that other criteria are met to ensure that options are environmentally and socially adequate.

Kaye said that although a commitment has been made to implement an expanded RET, the new government is well into its term and the RET is still a long way from being finalised.

Government funding/grants

Government funding is considered an important part of the policy mix, however many raised concerns that the funds would not have much overall impact and that other policy measures

would have greater success in promoting renewables. There were mixed opinions as to what the policy mix should be.

Frank Jotzo believes that there is a strong case for funding combined with an emissions trading scheme. The carbon price will help to push low cost technologies and this combined with targeted funding to overcome externalities could provide a better approach than the RET and may avoid some of the issues relating to over reliance on wind technology. Jotzo also indicated that there is a strong case for technology spending and diffusion, but that it needs to be well targeted.

John Kaye said that funds need to be insulated from Carbon Capture and Storage (CCS), as this should not be in competition with renewable energy. Funding should be focused on development of particular industries and money used strategically. As Australia is late into the market, funding should be focused into areas where Australia can gain competitive advantage, with a view to export technology.

Artur Zawadski and Mark Diesendorf pointed out that just a few renewable energy projects could very quickly consume the grants available, leaving no opportunity for technologies and projects that are not yet ready to proceed. Zawadski welcomed the announcement of \$1.4 billion for 4 solar projects as part of the 2009-2010 budget as an excellent development. However, he added that sole reliance on funding fails to provide an incentive for follow-on projects utilising the successfully demonstrated technologies. Instead, it could actually facilitate moving these technologies offshore, as they will become more bankable in countries with FITs and tax incentives once they are proven at scale in Australia. A more sustainable and strategic way to get new technologies up to scale is to establish market mechanisms that provide incentives to invest in innovative technologies.

Diesendorf also commented that while it's helpful to have increased funding for renewable energy research and for four demonstration solar power stations, the government is still avoiding policies, such as feed-in tariffs, that would build the market for large-scale commercial solar power stations on a continuing basis. Diesendorf was also concerned about the high level of funding that is being spent on CCS versus solar and other renewables.

Peter Meurs, Managing Director of EcoNomics at WorleyParsons, indicated that funding may have some impact, however getting the first \$1.2 billion solar thermal power project in place will require more than just funding assistance. Also, while government funding is

important, it does put the government in a position where they have to pick winners and technologies that look good on paper will be selected.

Andrew Durran also commented that funding targeted to commercialise research is a difficult area to get right. It requires picking a technology and getting it into the market. Most projects tend to fail in Australia, except for limited examples including Suntech from UNSW, which ended up being developed in China. It is difficult to know whom to fund. The process could be improved by use of an industry panel to help pick the projects, with people carefully chosen for the role.

Iain MacGill commented that Australia's level of effort looks ridiculously small compared to the amount being spent by some other countries. We don't see anywhere near the serious investment in renewables that is really required. However, there may be drivers other than climate change in other countries that have contributed to the faster development of renewables

Feed-in tariffs

FITs generally received a very positive response from interviewees, particularly from those in the renewable energy industry. However, there were also some concerns raised.

Frank Jotzo commented that FITs give the opportunity to directly distinguish between different technologies, however there are concerns over economic inefficiencies if tariffs for particular technologies are set too high – an example being heavy investment in PV driven by FITs in Germany where the technology has comparatively low energy yields. There is also a potential problem for negative interaction between a RET and FITs. If both are used in conjunction there is opportunity for double dipping, which does not necessarily make good policy sense.

Alan Pears commented that there are some benefits to upfront one-off payments over and above ongoing payments, such as FITs. Rational businesses will discount future revenue by 20% per year, so when reviewing ongoing subsidies within a business case, payments in five years will be valued at zero. An upfront subsidy will be lower cost and may provide a better tool for promoting investment decision-making. However, ongoing incentives encourage reliable ongoing performance, so a combination of up-front and ongoing incentives seems likely to be most effective.

Peter Meurs commented that FITs provide a clever way of getting a lot of investment quickly without the government having to come up with the dollars and they provide a clear market signal for 10 to 15 years. Countries that use FITs have been very successful at stimulating renewable energy investment. They can provide significant levels of flexibility, for example, they can be tuned to the amount of power produced and the time of day. This is important when the goal is to be able to support peak-load requirements as you can set higher tariffs for peak times. It is also possible to set a time limit on the tariff providing sufficient time to incentivise development.

Artur Zawadski supported FITs strongly. As demonstrated in other countries such as Spain and India, having a guaranteed price for renewable electricity over an economic lifecycle makes investment in these technologies more attractive. FITs can be tailored to particular technologies. FITs are also compatible with a carbon pricing scheme. Government can reduce tariffs as the carbon price goes up. In addition, overseas financial institutions are now very comfortable with dealing with FITs. Use of this type of policy support in Australia will help to make financial institutions more comfortable in investing in renewable energy.

Mark Diesendorf commented that experience in countries such as Germany, Spain, Portugal and Italy has shown that FITs can be effective and they are also supported by the public. However the federal government appear to have lost interest in them.

Andrew Durran saw FITs as an excellent way to support PV in Australia. In terms of support for large-scale renewables, Durran believes that a RET and FITs could provide the required support if the design is effective, however is important to consider that we already have a RET in place, so it makes sense to get that working properly.

Iain MacGill commented that FITs have a proven track record to drive deployment, however with significant levels of deployment they become much harder to support. Mark Diesendorf provided the example of PV, where it would not be possible for everyone in the ACT to have PV on their rooftop as prices would go from 12–14c per kilowatt hour to 44c per kilowatt hour.

Grid connection

Grid connection was generally considered an important area where a lot more effort is needed, particularly in terms of better overall planning for transmission infrastructure in Australia to support new energy sources.

Mark Diesendorf emphasized the importance of adding new links to the grid and strengthening existing links. For instance, the wind power capacity of South Australia could be greatly increased by strengthening the SA-NSW and SA-Vic links. A change in the overall system is also required so that the government pays for new transmission links rather than the individual project developer. We also need to make the grid a smarter carrier with smart meters at the customer end and also greater control for adding new technologies. The US provides a good example with their SmartGrid.

Voluntary actions

Alan Pears raised the point that voluntary activities by households and individuals are not recognised as additional abatement under the CPRS. For example, if Greenpower contributes to Australia's overall emissions reduction targets, then individuals who purchase Greenpower will be freeing up more permits for large emitters and essentially subsidising their ability to pollute. This reduces voluntary motivation for emission reduction, including motivation for individuals who wish to promote renewable energies.

Community based projects

John Kaye highlighted the need for ownership institutions to work with communities, as people are more likely to object to the actual or predicted impacts of wind turbines installed and operated in their surrounds by an external company than they are if they have a financial interest in the project and a direct say in the siting of the turbines. Alan Pears also raised some interesting points about promoting regional opportunities, for example Bendigo spends approximately \$250 million on energy requirements, sent to entities outside the region, which could be mobilised into a business opportunity for implementing energy efficiency measures or producing alternative energy to meet local energy requirements with excess generation exported at a profit. This type of project involves mobilising regional councils along with regional economic development and is a different group of people to community projects run by community groups.

Conclusions and recommendations

Based on the interviews conducted and the experience from Europe, no single policy mechanism is going to meet all policy objectives or overcome all market failures and policy barriers. Therefore, it is important to get the policy mix right to encourage a viable renewable energy industry and support technologies with high potential in the various stages of maturity.

While all interviewees agreed that an ETS (or an alternative means of putting a price on CO₂, such as a carbon tax) is necessary to achieve deep cuts in CO₂ emissions, they stated it is insufficient. While it may provide the least-cost solution to emissions abatement in the short term, it does not provide the most cost-effective solution over the longer term. It also fails to overcome many of other market failures and barriers that are faced by technologies in various stages of maturity. Renewable energy also has other benefits, some of which are intangible and cannot be measured in simple economic terms and can contribute to other policy objectives.

Emissions trading alone is unlikely to provide sufficient incentive to invest in renewable energy in the short term, as permit prices may not reach a high enough price level until at least 2020. Therefore, complementary policy measures are needed. Despite concerns over picking winners, there is a strong case for policy that is targeted to different levels of technology maturity. However, this requires sufficient technological knowledge and industry support.

New initiatives by the Government to implement the 20% expanded RET and provide targeted funding to renewable energy are considered a positive step forward, but are not sufficient to promote the necessary diversity in renewable energy.

Different renewable energy technologies require different levels of policy support, for example solar thermal power generation is less mature and higher cost than wind. The expanded RET is the most promising policy support for the continued development of wind, however a few considerations remain. Firstly, the design of the RET scheme should exclude solar hot water, which is supported by other schemes. Secondly, to ensure market certainty, targets should be reviewed regularly to assess whether the scheme needs to be expanded or additional support is required. Thirdly, there should be greater emphasis on policies that

provide direct benefit to communities directly impacted by renewable energy developments, for example in the form of reduced electricity prices or a community development fund to be administered by local government.

Since solar thermal is expected to gain limited benefit from the expanded RET, additional policy measures are considered important. As this technology is yet to be commercialised in Australia, solar thermal is likely to be eligible for government funding. However, funding levels are currently insufficient and would need to be increased to have any significant ongoing impact. Given that funding programs have mixed success, if there is a serious objective to expand solar thermal, then stronger policy support will be required to stimulate investment. This could come in the form of a well-designed FIT, by a special band within the expanded RET, or by some form of investment tax credit as is used in the US.

Renewable energy technologies – especially wind, biomass, solar thermal and geothermal – will also benefit from more comprehensive strategic planning and funding of transmission infrastructure.

Australia is entering an era where there are exciting opportunities in the area of renewable energy. Given the rapid growth in renewable energy industries worldwide, the success of the local renewable energy industry depends on decisions being made now to design and implement the best possible mix of policy support mechanisms. Successful deployment of a mix of renewable energy is a critical component of a sustainable Australian economy in the future.

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Appendix A: Semi-Structured Interview Outline

The following topic areas were covered as part of the semi-structured interviews:

Interviewee background

- Established prior to interview by conducting Internet search including review of key publications where available

Views on an emissions trading system (ETS)

- Views on an ETS as the primary policy measure for emissions abatement
- Views on price required to be reached before an ETS will help to promote innovation and adoption of renewable energy

Views on the Mandatory Renewable Energy Target (MRET) scheme

- Views on whether this policy measure is appropriate
- Views on interaction with an ETS
- Views on appropriate target
- Views on whether individual technologies are favoured

Other policy measures to promote renewable energy

Views on additional policy measures discussed depending on knowledge/ interest levels:

- Government funds for renewable energy including Renewable Energy Fund and Energy Innovation Fund
- Feed-In tariffs
- Government subsidies (Fossil fuels/ Renewable energy)
- Grid connection regulation and pricing
- Discussion of any other policy measures as deemed important to the interviewee