

THE CPRS AND CLIMATE CHANGE POLICY

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Climate Policy

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Contact: Andre Kaspura
Policy Analyst, International & National Policy, Engineers Australia
11 National Circuit Barton ACT 2600
Tel: 02 6270 6581 Fax: 02 6273 4200
Email: akaspura@engineersaustralia.org.au
www.engineersaustralia.org.au



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1. Introduction

Engineers Australia is the peak body for engineering practitioners in Australia, representing all disciplines and branches of engineering. Membership is now approximately 86,000 Australia wide and Engineers Australia is the largest and most diverse professional engineering association in Australia. All Engineers Australia members are bound by a common commitment to promote engineering and to facilitate its practice for the common good.

Engineers Australia has had in place sustainable development principles to guide members in the conduct of their engineering practice for over 20 years. Sustainable development is an integral component of Engineers Australia's code of ethics which are agreed by all members. Engineers Australia has also formally endorsed a Sustainability Charter and a comprehensive policy on Australia's energy future and climate change.

Engineers Australia strongly supports the implementation of the Carbon Pollution Reduction Scheme (CPRS) in Australia in July 2010. The debate about the most appropriate mechanism to ensure that carbon pollution attracts a market based cost has been resolved in favour of emissions trading by major reviews undertaken by both sides of Australian politics. Engineers Australia believes that an effective climate mitigation strategy requires that carbon pollution is priced. This is not the case at present and continuing debate about scheme details will not expedite change and will endanger Australian efforts to encourage a global mitigation solution. Climate change mitigation will require consistent and persistent policy application over many decades. In this context, change to detail down the track is inevitable. Engineers Australia strongly advocates that every effort be made to ensure that the CPRS can begin on time.

Although the Draft Legislation includes the Government's announced medium and long term emissions reduction targets, the CPRS can as effectively deliver more or less stringent emissions reduction targets. Engineers Australia believes that not enough attention has been paid to this distinction. Similarly, there has been a failure to appreciate that several parameters define an emissions reduction trajectory, including the start point (2010), when peak emissions are expected to occur (announced in the White Paper), annual emissions reductions and the year to which the stated emissions reduction relates (2020 for medium term and 2050 for long term). Engineers Australia believes that undue attention has been given to the latter and the other parameters have been ignored in the broader debate.

Engineers Australia supports emissions trading as the backbone for Australia's climate mitigation strategy. However, the CPRS must be complemented by other measures including energy efficiency, renewable energy and enhanced support for research, development and deployment of low emissions technologies. Each of these appears in the Government's suite of programs, but Engineers Australia is not yet convinced that Australia is aiming to realise the full potential of complementary measures. Engineers Australia is concerned that the inter-relationship between the CPRS and other measures has not been adequately dealt with. There is a danger that undue focus on short term, market driven, lowest cost measures could obscure the mix of policies and measures which could deliver lowest cost emissions over the long term. These issues can be overcome using relatively minor adjustments to the CPRS framework advanced in the White paper and in the Draft Legislation. Engineers Australia urges that such changes be considered.

2. Emissions Trading and Climate Policy

Engineers Australia supports the views of the International Panel on Climate Change (IPCC) that the principal cause of climate change is the accumulation of greenhouse gases in the earth's atmosphere. In turn, the principal reasons for the increasing annual releases of greenhouse gases since the industrial revolution are the burning of fossil fuels in their various forms and excessive clearing of the world's forests and other vegetation because there has been no economic penalty for the discharge of greenhouse gases or incentive to maintain forests. Climate mitigation policy aims to avoid the worst impacts of climate change by significantly reducing greenhouse emissions in the atmosphere.

The uncosted externality of greenhouse emissions is endemic to the structure of the Australian and global economies. Change requires a mechanism to change the economic structure so that greenhouse gas emitters bear a cost proportional to the emissions they discharge. Two approaches can achieve this structural shift, carbon taxes and emissions trading. In principle, under tight economic assumptions, the two are identical and both achieve emissions reduction at lowest cost, but in practice, there are major differences.

In recent years, several major inquiries¹ have considered the relative merits of the two approaches and all have come down in favour of emissions trading. There are several reasons in favour of emissions trading:

- There is more certainty about the greenhouse emissions reduction objective under emissions trading because the number of tradable permits issued each year reflects the trajectory towards the greenhouse emissions target.
- Emissions trading provides a flexible and robust mechanism for international trade in emissions permits and credits.
- Both emissions trading and a carbon tax pose similar implementation challenges and a carbon tax is just as likely to give rise to the special interest pleading which has characterised the Australian process since the release of the Green Paper, as emissions trading is.
- Carbon taxes require frequent resetting of the tax rate to ensure that progress towards the emissions reduction target is set. The most likely requirement will be increases in the tax rate and each increase is likely to give rise to pleas for special consideration as is now the case for the introduction of the CPRS.

Engineers Australia accepts the case for greenhouse emissions trading as the backbone of Australia's climate mitigation strategy. Although both emissions trading and a carbon tax address the need to price the costs of carbon polluting activities, there are clear advantages to the adoption of emissions trading.

¹ National Emissions Trading Taskforce, Possible Design for a National Greenhouse Gas Emissions Trading Scheme: Final framework report on scheme design, 2007, available on www.garnautreview.org.au ; Prime Ministerial Task Group on Emissions Trading, Report of the Task Group on Emissions Trading, Department of Prime Minister and Cabinet, 2007; The Garnaut Climate Change Review, Final Report, 2008, www.garnautreview.org.au ; and Carbon Pollution Reduction Scheme, Australia's Low Pollution Future, 2008, www.climatechange.gov.au

However, Engineers Australia believes that a comprehensive climate change strategy requires emissions scheme trading to be complemented by other measures, including:

- Comprehensive policies and programs to advance research, development and deployment of new low emissions technologies.
- An aggressive energy efficiency program linked to the emissions trading scheme cap.
- Policies and programs directed at sectors not included in the emissions trading scheme to ensure that emissions reduction is shared equitably across the economy.
- Comprehensive programs to change behaviours in businesses and households towards energy use, towards alternative transport options, towards the design of cities.

3. Emission Reduction Targets

Engineers Australia supports a long term emissions reduction target consistent with the recommendations of climate change scientists and global agreement for all major countries to accept their share of global emissions reductions. Engineers Australia believes that some confusion has developed concerning the Government's commitment for a long term emissions reduction target for 2050, how announced medium term targets for 2020 relate to this commitment and the Government's international negotiating position.

Engineers Australia believes that appraisals of greenhouse gas reduction targets must take into account the announced turning point² for Australian emissions as well as the medium and long term endpoints. The Government has expressed determination to meet its electoral commitment to reduce Australia's 2000 greenhouse emissions by 60% by 2050. In practical terms, allowing for the effects of rounding, the Government's unilateral 5% cut to 2000 emissions by 2020³ is on the trajectory required to achieve the long term target. Although this connection was made by the Prime Minister in response to questions at his National Press Club launch, it has been lost in the claims and counter-claims made in the media since.

The announced medium term emissions reduction target is a range from a unilateral 5% cut to a conditional 15% cut to 2000 emissions by 2020. Both extremities of the Government's medium term target range have the same end-point in 2050 (that is, 60% cut to 2000 emissions) but, the conditional medium term extremity of 15% by 2020 is far more ambitious than has been appreciated. Attention has focused on the fact that the 5% target is associated with greenhouse gas stabilisation in the atmosphere at 550 ppm and the 15% medium term target is associated with stabilisation at 510 ppm⁴. Unfavourable comparisons have been made with the Government's acceptance of the Garnaut Review finding that "stabilizing concentrations of greenhouse gases at around 450 ppm or lower would be in Australia's interests"⁵.

² Australian Government, Carbon Pollution Reduction Scheme: Australia's Low Pollution Future, White Paper, Volume 1 December 2009, p4-23, www.climatechange.gov.au

³ Estimates were based on sectors to be included in the CPRS. Excluded sectors would need to reduce emissions by an equivalent amount for these results to apply to total emissions, in other words, the CPRS cap only provides for emissions reductions in covered sectors. In all cases for years beyond the turning point defined in the White Paper linear reductions were assumed.

⁴ Australian Treasury, Australia's Low Pollution Future; The Economics of Climate Change Mitigation, 2008, p76, www.treasury.gov.au

⁵ Senator the Hon Penny Wong, Carbon Pollution Reduction Scheme Bill 2009, Commentary, www.climatechange.gov.au, pp 7 and 14

The real potential of the 15% conditional target lies in the annual emissions reductions required to achieve it by 2020. As things stand, the combination of the 15% medium term and the 60% long term targets mean that from 2021 to 2050 Australia's annual emissions reductions would be less than half the annual emissions reductions from the start of the CPRS to 2020. The aspirational target mentioned by the Government in the White Paper (atmospheric stabilisation at 450 ppm) requires a long term target of 90% cut to 2000 emissions by 2050⁶. Given the White Paper turning point for Australian emissions, the annual emissions reduction needed to achieve a 90% cut is less than required under the conditional 15% medium target. In other words, the conditional 15% medium term target keeps Australian options open. The overall outcome for Australian emissions will depend on what happens to emissions outside the CPRS.

When launching the White Paper, the Prime Minister said the Government would seek electoral endorsement before formal adoption of more ambitious greenhouse reduction targets that may be required by international negotiations. Engineers Australia appreciates that the Government needs to leave its options open for the Copenhagen discussions. However, the confusion about targets that is apparent in Australia must be addressed to demonstrate the Government's strategy to Australians.

The key weakness of the analysis of targets discussed in this section is that the CPRS will only apply to 75% of Australian emissions. Action is needed to ensure that sectors not included play their part in overall emissions reduction. The alternative is to shift the burden of adjustment to covered sectors. Further comments on this issue are provided in the following section.

Engineers Australia believes that a distinction must be drawn between emissions trading and emissions reduction targets. Emissions trading can support the announced emissions reductions target just as well as more or less stringent targets. Engineers Australia notes that at present, Australian greenhouse gas emissions continue to increase at an accelerating level. This underscores the urgency of action to change the status quo. The indicative national emissions trajectory announced in the White Paper and a start to the CPRS in July 2010 will achieve this. A later start due to continuing debate about the adequacy of targets could be very costly.

4. Complementary Measures

In the CPRS, it is proposed that national emissions reduction targets are converted into scheme caps to provide the constraint needed to set the price of carbon permits. The White Paper indicates that in any period Australia's emissions trajectory will comprise two components; the CPRS cap and emissions not covered by the scheme. Emissions not covered by the scheme are emissions from sectors not included (legacy waste emissions excluded until 2018, agriculture excluded at least until 2015, reforestation that does not elect to participate on a voluntary basis and deforestation and land use changes).

Engineers Australia sees the prospective inclusion of the agriculture sector in the CPRS from 2015 as a positive decision. Engineers Australia accepts that immediate inclusion from 2010 is not possible for a range of technical reasons, but foreshadowing future inclusion is an important step. Just as important are ways to reduce agricultural greenhouse emissions in the interim period. In the base for Australia's emission reduction targets, agriculture accounts for 17.1% of total

⁶ Australian treasury, op cit, p76

emissions. Although emissions have fallen in recent years this has been due to drought conditions and the latest available projections indicate that agricultural emissions will increase by 7% by 2020 and three-quarters of the increase will occur by 2015⁷. Measures to reduce emissions are included in this estimate and are expected to reduce business as usual emissions by only 1%. Engineers Australia believes that more effective measures are required to ensure that the agricultural sector shoulders its fair share of the emissions reduction burden.

It is difficult to assess the exclusion from the scheme of legacy waste emissions from old land-fill sites in the waste sector until 2018. However, Engineers Australia notes that efforts to reduce emissions from Australia's waste stream have been comparatively successful. The latest projections suggest that by 2010 emission reductions measures will have reduced 2000 emissions by about 9% and by 2020 by about 39%⁸. These are encouraging results and by reinforcing current measures the delay to including legacy emissions in the CPRS can be offset.

Australia is expected to meet its Kyoto Protocol emissions target. The most significant factor in this result is the net reduction in emissions from land use, land use changes and forestry which were large enough to completely offset a 50% increase in emissions from the stationary energy sector between 1990 and 2006⁹. Comparing the 2006 Greenhouse Gas inventory¹⁰ and data used to show that Australia would meet its Kyoto commitment suggests that a 40% reduction in emissions from land use and forestry between 2006 and the Kyoto accountability period (2008-12) will be needed. Australia's dependence on reductions in land use, land use changes and forestry emissions compares starkly to the low key inclusion of this sector in the Government's climate change mitigation strategy for the future. Measuring emissions from activities in this sector is notoriously difficult, but this caveat holds whether one is looking at the data supporting the achievement of the Kyoto target or future emissions. Engineers Australia is not convinced by the projections and is not convinced that past actions excuse additional efforts to contain emissions from land use and land clearing and to more aggressively pursue sequestration of emissions using reforestation.

The CPRS cap in principle is intended to distinguish between emissions from all sectors and emissions from those sectors included in the CPRS. The cap is the vehicle which will transmit progressive emissions reduction pressure into the emissions trading system. Taken at face value, the adjustment from the national emissions reduction target that applies to all sectors to the CPRS cap that applies to sectors in the scheme is an appropriate step. However, there has been no discussion of the mechanics of how this will be done and how the adjustment will deal with complementary measures such as additional voluntary measures by businesses and households to reduce emissions, the expanded renewable energy scheme and energy efficiency measures. The Draft Legislation (Part 2 Section 14 (5)) recognises that some adjustment beyond providing for sectors not covered by the scheme is necessary, but some issues are expressly included and others are not.

⁷ Australian Greenhouse Office, Agriculture sector Greenhouse Gas Emissions Projections 2006, www.climatechange.gov.au

⁸ Australian Greenhouse Office, Waste Sector Greenhouse Gas Emissions Projections, 2006, www.climatechange.gov.au

⁹ Department of Climate Change, Tracking to the Kyoto Target, Australia's Greenhouse Emissions Trends 1990 to 2008-12 and 2020, 2008, www.climatechange.gov.au

¹⁰ Department of Climate Change, National Greenhouse Gas Inventory 2006, Accounting for the Kyoto Target, 2008, www.climatechange.org.au

Part of the confusion is due to the difficulty of simply explaining the design of the cap. The cap is designed as a rolling 5 year average updated by one year, each year to provide flexibility to accommodate adjustment over time involving large capital assets that are not amenable to small annual incremental change. In other parts of the Draft Legislation examples have been used to illustrate the intent of the Legislation. Even though details of the cap are to be dealt with in regulations, Engineers Australia believes that unless the way in which the cap is to be set is more widely understood, the confusion could develop into a serious impediment to progress. Engineers Australia urges the Government to issue a statement, including worked examples, to clearly articulate how the scheme cap will be set over time and how various adjustments will be included.

Voluntary Action

Concern has been expressed that voluntary actions taken by households and businesses additional to changes brought about by the CPRS will not be taken into account. This concern has been heightened by the position taken in the Department of Climate Change discussion paper on the proposed Carbon Offset Standard which suggested that an entity's participation in the CPRS could be accepted as sufficient to declare its activities as carbon neutral¹¹.

Section 14 (5) (c) (iv) in the Draft Legislation provides for the Minister to consider voluntary emissions reductions when setting the scheme cap. The Minister for Climate Change and Water in an ABC interview¹² indicated that this was the most likely outcome. Engineers Australia accepts that additional voluntary emissions reductions are likely to be a small fraction of annual emissions reductions. However, these activities are the leading edge of changes in household and business culture and practices essential for the transition to a low carbon economy and are critical in building momentum. As mentioned above, some of the concern has arisen because the mechanics of setting the CPRS cap have not been explained. But there are also more fundamental concerns that voluntary actions to reduce emissions will be subsumed into general emissions reductions attributed to the operation of the CPRS irrespective of their origin. The risk in this approach is stifling the incentive of those engaged in additional voluntary action with the result that the CPRS will indeed need to shoulder the reductions foregone.

Energy Efficiency

Engineers Australia strongly supports employing an aggressive energy efficiency strategy to reduce greenhouse emissions quickly and at a cost significantly lower than measures based on new technologies. The International Energy Agency (IEA)¹³ and McKinsey and Company¹⁴, and many others, have drawn attention to the potential of energy efficiency. Both highlight two issues:

¹¹ Department of Climate Change, National Carbon Offset Standard Discussion Paper, December 2008, p10, www.climatechange.gov.au

¹² ABC TV, The 7.30 Report, Wong defends emissions trading scheme, 23 February 2009, www.abctv.com.au

¹³ IEA, Energy Technology Perspectives 2006, Scenarios and Strategies in support of the G8 Plan of Action, OECD/IEA 2006; Energy Technology Perspectives 2008, Scenarios and Strategies in support of the G8 Plan of Action, OECD/IEA 2008, www.iea.org

¹⁴ McKinsey and Company, An Australian Cost Curve for Greenhouse Gas Reduction, 2008, www.mckinsey.com

end user energy efficiency can lead to large reductions in emissions, up to 45% in IEA research; and, most energy efficiency measures produce cost savings and the remainder have very low costs. Energy efficiency measures are available to conserve energy in electricity consumption by businesses and households, energy used in industry and energy used in transport. Improved energy efficiency can come from investment in new facilities, motors and appliances and can be retro-fitted to existing facilities.

Some energy efficiency options will respond to the relative price changes resulting from emissions trading, but many energy efficiency measures are not price responsive, even ones that are cost effective, because the impediments here are market failures and information, institutional and regulatory barriers¹⁵. While over the long term the CPRS will result in the changed economic structure conducive to improved energy efficiency, initiating change will require more direct action. The case for this action is strengthened by the importance of keeping the costs of emissions reduction as low as possible in the early stages of the adjustment process.

The classical economics view of a cap and trade scheme, like the CPRS, attributes emissions reductions from energy efficiency measures to emitters with scheme liabilities, irrespective of the origin of the efficiency gains. In practice, this means, for example, in electricity generation, the scheme cap is set by adjusting downwards actual sector emissions by the targeted reduction for the period in question. The presumption is that the pressure to surrender emissions permits will mean that generators sponsor energy efficiency improvement projects because the cost of energy efficiency is less than the cost of carbon permits. The benefit to the economy is that because carbon permit prices are reduced costs are lower for liable entities and consumers are better off because the pass through to energy costs is not as great.

Engineers Australia believes that few energy efficiency measures will actually be implemented under these arrangements because;

- The CPRS impacts directly on liable entities and indirectly on all other entities and individuals to the extent that carbon permit prices are passed through in energy prices. Indirect impacts depend critically on price sensitivity. While the White Paper recognises that market failures exist, it is silent on how these are to be addressed and how these solutions relate to the scheme.
- Energy efficiency reduces the demand for energy, and thus emissions, generally. In integrated energy systems like the National Electricity Market there is no incentive for any particular generator to sponsor energy efficiency outcomes because the benefits will accrue to all generators in the market because electricity is homogeneous.
- The non-price barriers faced by energy efficiency measures (consumer behavioural patterns, licensing and planning arrangements, lack of information and understanding, lack of support infrastructure, split incentives, first cost barriers and consumer capital constraints)¹⁶ are well beyond the ambit of typical electricity generators and require Government attention.
- Energy costs are a relatively small fraction of average weekly expenditure for the majority of consumers even when the price effects of the CPRS are taken into account. Consumers have no incentive to invest their scarce capital to improved insulation, to purchase energy efficient appliances etc when the environmental credit is allocated to electricity generators.

¹⁵ IEA, op cit, 2006, pp 108-112

¹⁶ IEA, 2006, op cit, pp108-112

Several States and Territories have implemented energy efficiency trading schemes which aim to reduce the demand for electricity and greenhouse emissions. The points made above are reflected in the motivation for these schemes which are likely to continue after the CPRS is implemented¹⁷. The argument against including energy efficiency trading schemes in CPRS arrangements is the risk of double counting. Engineers Australia believes that when energy efficiency outcomes are correctly attributed to the agent who initiated them the risk of double counting is minimal. Clearly proponents of the State schemes are not convinced by Commonwealth arguments. Should these schemes continue past industry concerns about increased costs and confusion emanating from the plethora of emissions reduction programs and policies implemented by different Australian jurisdictions, each with their own guidelines and accountability arrangements, may be repeated. Engineers Australia is disappointed that a major source of inexpensive emissions reduction could simply replicate past mistakes.

The underlying principles in the design of State and Territory energy efficiency trading schemes can be adapted to complement the CPRS. In the CPRS individual electricity generators would have no incentive to engage to initiate energy efficiency projects because the benefits in integrated energy systems are shared across all generators. In the State schemes, the role of initiating energy efficiency projects is undertaken by energy efficiency service businesses which earn "energy efficiency abatement certificates"¹⁸. Engineers Australia believes there is scope for a single national arrangement to be integrated with the CPRS¹⁹.

Part 2 Section 14 (5) (v) of the Draft Legislation provides for the Minister to adjust the CPRS cap to take into account greenhouse gas emissions that are not covered, either directly or indirectly by the CPRS. In principle, this provision enables the Minister to reduce the scheme cap by the amount of expected energy efficiency improvements. Such an adjustment, Engineers Australia believes, would not change the carbon permit price because energy efficiency would not improve as a result of the operation of the CPRS for the reasons given above.

Energy efficiency services companies, operating in support of Government policies to support energy efficiency would be responsible for initiating energy efficiency measures dealing directly with households and businesses. Instead of State based energy efficiency certificates, energy efficiency services companies would receive carbon pollution reduction permits in line with the standards set out in the proposed National Carbon Offset Standard. The sale of these permits provides the revenue for the operation of these entities and reduces the overall carbon permit price in line with theoretical expectations. This arrangement appropriately recognises incentives as they apply to different groups in Australia. Electricity generators face a cap in line with realistic expectations of what they can do, that is, reduce emissions from their generating activities. Energy efficiency services companies initiate energy efficiency measures directly by providing services to households and businesses from which they earn emissions credits which aggregate into carbon pollution reduction permits sold back into the CPRS to earn revenue. The sale of carbon pollution

¹⁷ See the overview of State schemes in David Crossley, White Certificates in Australia, Workshop on White Certificates CESI Ricerca, Milan 22 October 2008, www.efa.com.au

¹⁸ See the summary in Crossley, op cit

¹⁹ See also the presentation by Frontier Economics, Alternative approaches to carbon reduction schemes, Parliamentary Library vital issues seminar, 17 March 2009, www.aph.gov.au and the evidence provided by the Managing Director of Frontier Economics to the Senate Standing Committee on Economics, Senate Hansard E70, 24 March 2009

reduction permits, most likely to generators, represents the effective delivery of energy efficiency outcomes.

Engineers Australia believes that this proposal offers the potential to harness a wide range of energy efficiency measures in a way which satisfies the intent of the CPRS to reduce Australian greenhouse emissions at the lowest cost. Only minor modifications to proposed arrangements are necessary.

Renewable Energy

The Government has committed to an expansion of the mandatory renewable energy (RET) scheme to provide 45,000 GWh of electricity generation by 2020, with the scheme progressively winding down by 2030. The objective of the scheme is primarily to position renewables to meet expected growth in electricity demand. Engineers Australia strongly supports the RET scheme because:

- It accelerates cost reductions in renewable technologies by increasing the scale of the renewables industry and through learning by doing which accompanies increasing penetration of the electricity market by renewables energy sources.
- The importance of balancing the incumbency advantages enjoyed by existing technologies; large scale coal-fired electricity generation expanded in Australia at a time when monopoly Government ownership was driven by developmental objectives. Although this has now given way to market oriented policies, its legacy continues to prevail.
- Economic modelling shows that the introduction of the CPRS alone will not lead to a significant increase in the uptake of renewable energy²⁰.

Engineers Australia believes that the assistance provided by the RET should be reflected in the setting of the CPRS cap. Unless the cap is reduced (from business as usual less the next years emission reduction) to take into account the increase in renewable electricity, the price of carbon permits will be lower than they should be, lessening the pressure for change. This would distort the market by attributing emission reductions from additional renewables to all generators, irrespective of fuel used.

In principle it would be relatively simple to adjust the CPRS cap to take into account additional generation from renewable energy. As was the case for energy efficiency, the Draft Legislation contains a general provision that can be used for this purpose. However, once again because the mechanics of setting the cap has not been made clear, considerable confusion has developed.

The RET is designed to bring forward investment in renewable energy earlier than would occur under the CPRS alone. The administrative mechanism is the same as for the current Mandatory Renewable Energy Target (MRET) and involves the buying and surrendering of renewable energy certificates (RECs) created by new renewable energy generation. Apart from the administrative sunset on the RET, the scheme will phase out naturally once CPRS permit prices increase sufficiently to influence investment decisions²¹. This means that to realize the benefits of scheme the bulk of investment is expected to occur prior to 2017 and is expected to favour those

²⁰ McLennan Magasanik Associates, Benefits and Costs of the Expanded Renewable Energy Target, Report to the Department of Climate Change, January 2009, p32, www.climatechange.gov.au

²¹ McLennan Magasanik Associates, op cit, p35

renewable technologies either commercially ready already or not far from being commercially ready. Modelling shows that biomass, wind and geothermal will account for the bulk of new renewable generation. The uptake of solar technology will, as now, be primarily in the form of water heaters, but even this is expected to fall as a share of renewables used. Increases in other forms of solar energy are expected to experience only small increases²².

To spread the risks involved in moving to a low carbon economy, Engineers Australia favours the encouragement and adoption of the widest possible portfolio of climate change mitigation measures, including the widest range of energy technologies. A key limitation of the RET, even in combination with the CPRS, is that it will deliver those renewable energy technologies with the least costs and risk, but it is unlikely to be as successful for those renewable energy technologies which are furthest from market ready. In Australia, Solar technology is the most important example.

Support for specific technologies is often criticized as misguided attempts at picking winners and that technology neutral policies should be preferred. However, as Lord Nicholas Stern observed in his Report “technology neutral policies may be cost efficient in the short term, but not over time” because untargeted support will assist both long established, developed technologies and emerging technologies to reduce costs and thus entrench the price advantage of the developed technologies for much longer. Stern instead argues in favour of complementing technology neutral policies, like the RET, with focused incentives to ensure the development of a broader portfolio of measures in the interests of achieving least cost emissions reduction over the long term²³. Stern saw this strategy as providing an insurance hedge against the risk of high abatement costs which may result from capital lock-in resulting from short to medium term reliance on fewer options. A recurring theme in the climate mitigation discussion is the difficulty in predicting technological breakthroughs which have major impacts. Unless policies are in place to encourage these breakthroughs their occurrence will be even rarer.

Engineers Australia believes that renewable energy feed-in tariffs provide the additional support that solar technologies require for inclusion in a comprehensive strategy to encourage renewable generation. The Australian discussions of feed-in tariffs have concentrated on smaller solar photovoltaic systems installed by households and businesses and connected to, or embedded in, distributional grids. Although COAG has begun deliberations of harmonized feed-in tariff policy for Australia to overcome the administrative complexity posed by separate schemes in States and Territories, progress has been slow and uneven.

The main objection to renewable energy feed-in tariffs is that this form of assistance is too expensive. Engineers Australia believes that this view is based on an incomplete enumeration of costs and benefits:

- Cost estimates typically ignore the lower transmission energy losses of embedded energy systems.
- Because part of the growth in electricity demand is met by embedded systems, future investment in transmission systems can be deferred.
- Solar photovoltaic systems are most effective in the summer peak demand period when grid spot prices are at their highest. Under present arrangements embedded generators do

²² McLennan Magasanik Associates, op cit, p36

²³ Nicholas Stern, The Economics of Climate Change, 2006, pp367-9, www.hmtreasury.gov.uk

not receive the benefit of these price premiums. Time of day pricing is the most appropriate approach and should be recognised in feed-in tariff arrangements.

- Part of the additional cost should be attributed to the cost of providing research, development and deployment assistance.

These arguments are difficult to represent in the econometric modelling that has been undertaken to support the development of the CPRS and the RET. While appreciating these difficulties, the fact remains that there has been a failure to fully consider the costs and benefits of a feed-in tariff policy in Australia. Engineers Australia believes that this should be addressed as a matter of urgency.

5. Other Issues

Global Emissions Reduction

Carbon accumulation in the atmosphere and its impact on climate are global problems which require global solutions. IPCC recommendations concerning atmospheric carbon concentrations for climate stabilisation refer to global data and are silent on the contributions from individual countries. Engineers Australia accepts that all countries, including Australia must accept responsibility for their share of carbon pollution abatement. Engineers Australia also believes that Australia should take all steps possible to conclude a successful global agreement on carbon pollution abatement. A key factor in this process is decisive action by Australia to convince other countries that it has legislated for emissions trading to commence in 2010, including a legislated turning point from which Australia's emissions will decline. Delay to the start of emissions trading will be counterproductive.

Research, Development and Deployment Programs

Emissions trading, by pricing carbon pollution, increases the marginal cost of producing electricity and other transformed energy and in the process reduces the cost gap between energy technologies in widespread use and new low emissions technologies. In some cases the gap may be eliminated for practical purposes, but in most instances a significant cost gap is likely to remain. Other policies and programs will be needed to bridge the remaining gap.

Engineers Australia cautions against undue reliance on emissions trading to achieve objectives that it is not designed for. The purpose of emissions trading is to put a price on carbon pollution consistent with the least cost framework of conventional economics. Emissions trading is not a substitute for research, development and deployment programs. Engineers Australia notes that the Australian Government has several programs in place that provide assistance to research, development and deployment to support the uptake of low carbon technologies. Several programs have been in place for some time and others have been introduced comparatively recently. Engineers Australia believes that, to coincide with the implementation of the CPRS, it would be appropriate for the Government to review the adequacy, coherence and consistency of these programs in the light of announced greenhouse emission reduction targets and the likely course of international negotiations.

Green Jobs

Both energy efficiency and renewable energy measures have the potential for significant jobs growth. Most studies of the potential of energy efficiency focus on the potential to reduce the demand for energy and so greenhouse emissions. In macroeconomic studies based on econometric models, energy efficiency is typically represented as an autonomous improvement whose values are assumed over time. This approach can take into account the impact of energy efficiency on key variables like gross domestic product, carbon permit prices etc. However, it silent on developments that are likely to occur in the energy efficiency sector because this sector is not explicitly represented.

Earlier in this submission there was a reference to International Energy Agency modelling which showed the potential for energy efficiency to reduce global emissions by up to 45%. The changes encapsulated in this result cover many sectors of the economy and their character provides an indication to the types of jobs that will follow the implementation of energy efficiency measures.

Energy efficiency improvements in industry account for 10 of the 45% emissions reduction potential, including energy and feedstock efficiency (6%), materials and product efficiency (1%), process innovation (2%) and efficiencies in cogeneration (2%). Energy efficiencies in buildings include more efficient space heating (3%), more efficient air conditioners (3%), more efficient lighting (3.5%), improved water heating and cookers (1%) and improved appliances (7.5%). The final contribution is from improved fuel economy in transport (17%)²⁴. These changes will not be implemented “autonomously”. They will require new products to be manufactured, installed and serviced leading to new job creation.

The potential for new jobs from renewable energy compared to new jobs from conventional fossil fuel energy technologies has been assessed for the USA and Europe by the Energy and Resource Group in the Goldman School of Public Policy at the University of California at Berkeley²⁵. This study reviewed 13 independent studies that reviewed the economic and employment impacts of renewables in the USA and Europe. The assumptions from these studies were synthesized into a job creation model which was used to analyse employment implications under several scenarios. Three employment components were considered, construction, manufacturing and installation, operations and maintenance and fuel extraction and processing. The conclusions reached were²⁶:

- Some jobs would be lost as a result of the decline in fossil fuel technologies and policy intervention will need to focus on structural adjustment issues.
- Jobs in the fossil fuels sector are declining for reasons that are unrelated to environmental policies and regulation.
- The renewable energy sector generates more jobs per megawatt of installed power, per unit of energy produced, and per dollar of investment, than the fossil fuel sector. In a 20% renewables scenario by 2020 (biomass 40%, wind, 55% and solar PV 5%) employment

²⁴ IEA, Energy Technology Perspectives 2006, Scenarios and Strategies in support of the G8 Plan of Action, OECD/IEA 2006; Energy Technology Perspectives 2008, Scenarios and Strategies in support of the G8 Plan of Action, OECD/IEA 2008, www.iea.org

²⁵ Daniel M Kammen, Kamal Kapadia and Matthias Fripp, Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate? Report of the Renewable and Appropriate Energy Laboratory, Energy and Resources group, Goldman School of Public Policy, University of California at Berkeley, 2004, <http://rael.berkeley.edu/old-site/renewables.jobs.2006.pdf>

²⁶ Kammen et al, op cit, p3

was 188,444 compared to 86,369 if the 20% were fossil powered instead (50% coal and 50% gas).

- Support for renewables as part of a broader strategy including energy efficiency, improved building standards and sustainable transport will result in enhanced economic, employment and environmental outcomes.

Engineers Australia strongly believes that both energy efficiency and renewable energy measures can result in strong employment growth which can more than offset employment losses in the fossil fuels sector. As in other significant structural changes assistance to those most adversely affected should be provided and has been promised in the White Paper.