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Dear Professor Garnaut

ANZSES Submission to Garnaut Review

Thank you for the opportunity to make a submission to this review. ANZSES is the Australian and New Zealand Section of the International Solar Energy Society. ANZSES is supported by several government and state organisations and with a membership base of over 1,000 sustainable energy and renewable energy professionals. For over 45 years ANZSES members have been on the technical and policy forefront of Australian sustainable energy achievements.

This submission outlines the key issues and principles that the ANZSES believes are critical to an effective greenhouse mitigation strategy and abatement response for the energy sector in Australia.

We recognise that because of the small total contribution by Australia to global emission, action by Australia alone to reduce emissions will have limited direct impact. The major point of Australia's actions is to demonstrate and give effect to its commitment to playing its share in international efforts, and thereby encourage other nations to do so, and perhaps to give leadership in demonstrating and assessing particular techniques or approaches to emissions reduction.

Level of Greenhouse Cuts

Following the election of the Rudd government there is a commitment to emissions reduction of 60% below 2000 levels by 2050. During the Bali United Nations Framework Convention on Climate Change (UNFCCC) negotiations Australia stated it supported the in-principle science based targets of 25% to 40% reduction by 2020 for developed nations and at least 50 percent reduction in global greenhouse pollution by 2050.

This level of reduction implies the need for a 33% reduction over the next 12 years, at a cost to governments, producers, exporters and consumers of at least 5% of gross domestic product, or \$50 billion a year (BCSE, 2007).

Traditionally the energy sector has been the main area of policy intervention for greenhouse reduction. To achieve this level of cuts every sector (LULUCF, agricultural sector, transport, end use energy) will need to be pressed into service and deliver emissions cuts and turn around the trend of increasing emissions to decreasing emissions by 2010.

Traditionally the energy sector has been the main area of policy intervention for greenhouse reduction. To achieve this level of cuts every sector (LULUCF, agricultural sector, transport, end use energy) will need to reverse the trend of increasing emissions by 2010.

The Australian Greenhouse Report "Tracking the Kyoto Target" released in December 2006 confirms that Australian government's current and committed policies are inadequate to meet Australia's Kyoto Target and that 6 Million Tonnes are required. Even more concerning, the AGO report indicates greenhouse emissions are on track to continue to increase strongly to 2020 and that Australia's emissions will be 127% higher than 1990 levels. Incorporating the ALP election commitments the 2007 "Tracking the

Kyoto Target" report released Feb 2008 states that by 2020 Australia's emissions will be 120% higher than 1990.

The scale of requisite emissions reductions indicates that a systemic approach will be necessary, with technological, cultural, attitudinal and behavioural aspects, and programs that address each of these aspects.

Making the case for interim targets and policy flexibility

There have been media reports regarding the application of interim targets for greenhouse reduction. ANZSES is strongly of the opinion that due to the cumulative nature of greenhouse gasses and the radiative forcing effect of greenhouse gases already in the atmosphere continuing for a century that targets must in place be deliver reductions as soon as possible. The possibility that the atmospheric system may reach one or more critical tipping points adds to the urgency of the need for action.

Targets must be based on science. Already we are committed to climate change impacts and reduction targets are now a matter of how much climate change we are willing to risk. Once a science-based target is set, we must then sensibly and coherently work out how to achieve it at least cost and as equitably as possible.

Climate change scientists are saying that global warming is accelerating faster than predicted and most certainly faster than has been previously modelled. We do not know how close to dangerous climate change we are. As a consequence policy must be flexible enough to deliver deeper cuts as more information comes to hand.

The economic arguments for not including interim targets but rather setting a longer term emission budget, a version of which is outlined in the Mckibbin-Wilcoxon model, may or may not be justified in containing the economic shock but is not justified when compared to economic shock associated with dangerous climate change.

Early and decisive action, including legislated interim targets will provide the community and industry with investment certainty, and better capacity to avoid dangerous climate change.

Recommended Policy Framework

ANZSES believes a major role of Governments is to create the investment environment for low carbon activities. Market mechanisms are supported in order to drive investment and promote innovation and commercialisation. However complementary policy measures and actions to support pre-commercialisation of technologies and behaviour change are needed.

Complementary measures include:

- Addressing and removing regulatory barriers. This applies in the area of energy market reform. For example renewable energy by its nature will be distributed through the grid however there are both explicit regulatory barriers and implicit cultural barriers to distributed generation.
- Strong regulatory framework to set Minimum Energy Performance Standards (MEPS) for appliances, housing and buildings. The rate of implementation for MEPS has been slow. There exist enormous potential for reducing emissions from the building stock and actions taken today will have effect for hundreds of years. As importantly, failure to implement early will lock high emissions in place for decades.
- Energy efficiency programs, which have the capacity to provide substantial emissions reductions using existing technologies at low cost
- Behaviour change programs directed to support change in emissions related behaviour.

- Information and education to support the rapid levels of change that will be required.
- Action to support pro-environmental consumer choice and regulation of emerging environmental markets, particularly products such as offsets as the desire for voluntary action becomes stronger.
- Research, development, demonstration and commercialisation funding.
- Taxation reform.

Above all policy stability is required. Unfortunately there has been a history of stop / start policies or one off regulatory requirements which result in policy failure. Recent International Energy Agency research shows that stable policies are necessary to ensure the investment certainty that is needed to support industry development. Governments cannot ensure policy stability beyond their own period in office. However they can work toward long term policy stability by engaging other political parties in the policy setting process, and creating the climate in which the issue is seen as larger than a purely party political one. In part policy stability can be achieved by engaging those players, like the fossil fuel industry, whose interests are most clearly disadvantaged by the necessary policy changes, and devising and implementing policies that make the transition to a low carbon economy less painful.

Investment certainty is also linked to setting targets, key performance indicators, monitoring and verification of policies against the objectives. Assessing effectiveness would seem like common sense however the lack of critical policy assessment means that too often bad policy stays in place while good policies are removed.

What measures are essential to low cost transition to low carbon economy

The Rudd government has announced its commitment to an Emissions Trading Scheme (ETS) which is likely to take the form of an emissions cap on large industrial polluters – principally power stations.

It is accepted by policy makers that introducing a single carbon price signal, through an ETS alone will neither deliver the level of emissions cuts that Australia has committed to nor support the progress of energy efficiency and renewable energy industry development, especially if the price of carbon is low.

Through economic modelling undertaken by the State governments, the market discovery price of one Tonne of abatement through emissions trading is likely to be in the range of \$6 to \$10 per tonne. At this price the outcome will be electricity generation fuel switching from coal to gas. This cost per tonne will not result in driving renewable energy investment. Similarly energy efficiency is specifically excluded from a conventional ETS design because of the double counting problem.

Complementary policies need to be progressed in association with an ETS in order to deliver the least cost path to emission reduction from the energy sector while ensuring energy security. This is achieved through a combination of aggressive energy efficiency, a transition to and higher contribution from renewable energy and strategic use of fossil fuels.

Therefore expansion of the Mandatory Renewable Energy Target (MRET) scheme and an introduction of an Energy Efficiency Target are key and critical policies.

Investment Environment for Renewable Energy

Since 2001, MRET has been the main driver of renewable energy investment in Australia. Since commencing operation in 2001, MRET has been so successful, that the renewable energy industry cost effectively met the 2010 target 4 years early. The MRET scheme has been fully subscribed since 2006 and has overshoot the original 2008 target by an estimated 7,000 GWh.

The ALP election policy stated that at least 20% of electricity is to be generated from renewable sources by 2020. However for process and administrative reasons the MRET target is unlikely to be expanded until 2010.

Without an expansion in the target there is an insufficient investment driver to maintain an ongoing and sustainable renewable energy industry. Failure to expand the target from 2008 would not only result in economic and employment loss, it will also result in increased greenhouse emissions.

It is estimated that renewable generation projects totalling more than 1,500 MW, with a value of around \$1.5 billion have received planning approval or are at an advanced development stage. Without expanding the MRET targets these projects will be delayed substantially.

Total electricity consumption in Australia is predicted to grow almost 35% from 2008 to 2020 under a business as usual scenario – that is assuming current policies and market conditions. Demand is growing over 6,000 GWh per annum and will grow to over 300,000 GWh and require an additional 75,000 GWh electricity generation by 2020.

Any economic analysis recognises the avoided greenhouse emissions have a significant economic value.

Without expanding MRET from 2008, increased energy demand will be met from fossil fuel generated electricity (coal or gas) and at the expense of renewable energy projects. Greenhouse emissions from the electricity generation sector will increase to over 60 million tonnes by 2010,. It will certainly mean that Australia will fail to meet its Kyoto target by 2012. Bringing the expansion of the MRET forward to 2008 will deliver additional greenhouse emissions abatement of 30 million tonnes annually with a market value of over \$1,200 million per annum (based on an average price of \$40 per tonne).

Economic Benefits of Renewable Energy

The direct investment in Australian-based manufacturers and service companies will be more than \$1 billion, with flow-on stimulus of more than \$2 billion throughout the economy. More than 3,300 jobs will be created in the construction of these projects with flow-on jobs of 7,500 due to expenditure associated with these 3,300 jobs, providing a total employment stimulus of over 10,000 jobs. (BCSE, 2004).

A University of New South Wales study demonstrated there are more jobs per installed capacity unit by investment in renewable electricity projects than for conventional power plants – up to 6.6 times greater on average. In addition, over 80 per cent of these jobs and investment are in regional areas.

Renewable energy technology costs are reducing as installed capacity increases globally. Already Australian developed technologies are being built under licence in China to supply the demand created by the Chinese renewable energy target. Global cost curves for wind show that installed costs drop 6 per cent with every doubling in capacity. Similarly, cost curves for solar photovoltaic modules show a drop of 5% with each doubling of capacity while global installations are growing at over 30% per annum.

Australia is well positioned to support an export market to New Zealand, the Pacific region and South East Asia. In particular, opportunities in the Asia-Pacific regions are emerging as a result of the Clean Development Mechanism of the Kyoto Protocol.

Additional demand through the MRET scheme by expanding the MRET target from 2008 will result in a robust local market and will see cost reductions, economies of scale, expansion of local manufacturing and service provision. Australia will be better

positioned to build on export opportunities and participate in the global technology supply chain.

Investment Environment for Energy Efficiency

Energy efficiency is the least cost greenhouse abatement activity and results in real productivity gains and the reduction in energy consumed and therefore reduction in energy bills and real savings to the householder or business.

The joint State and Federal Government National Framework on Energy Efficiency (NFEE) process has progressed some valuable economic modelling confirming that energy efficiency is a front line and cost effective greenhouse gas abatement activity. This work was undertaken in 2004 by "The Allen Consulting Group" and McLennan Magasanik Associates for the "Ministerial Council on Energy".

The results are still relevant and the headline results showed that:

- If only a one percent national energy efficiency target was adopted and achieved by implementing only those energy efficiency activities that have less than a 4 year payback, and
- 60% of these less than 4 year payback energy efficiency activities can be implemented at no cost or at low cost.
- Where less than four year payback energy efficiency opportunities are those cost effective energy efficiency activities that will pay for themselves within 4 years. That is a 25% return on investment. This compares with the current bond rate of 6.25%.

Australia's historical performance and rate of energy efficiency improvement has been poor compared to other countries. Since 1973, Australia's annual rate of energy efficiency improvement has been significantly lower than major industrialised countries such as Canada and the US.

In 2005 the International Energy Agency in its review of Australia's energy market and policies recommended that the Australian Government:

- Develop a co-ordinated energy efficiency strategy that aims to realise all the benefits of improved efficiency such as emissions mitigation, increased productivity and hence competitiveness, the advantages of delaying infrastructure investments to gain technology advancements, and enhanced energy security.
- Consider targets for improved energy efficiency on a national or sector specific basis and the appropriate means of achieving them.
- Address means of curbing peak electricity demand, for example through more cost-reflective pricing in meeting summer peaks and/or more stringent efficiency standards for peak energy consumers such as air-conditioning.
- Consolidate the different levels of energy efficiency programs to simplify them for users and/or improve their effectiveness.

Unfortunately these recommendations were never properly followed through. Australia's energy efficiency policy to date has been to encourage voluntary action only. The national Energy Efficiency Opportunities program was put in place to encourage large energy-using businesses to improve their energy efficiency. Participation to prepare a plan to identify energy efficiency opportunities is mandatory for an estimated 250 companies that use more than 0.5 petajoules of energy per year. However there is no obligation for implementation of even low or zero cost energy efficiency actions.

While the NFEE process also outlined a policy framework and implementation program, the process has been ineffective. This has been due to a combination of inter-jurisdictional disputes and rivalries, a lack of senior ministerial interest and suitable level of funding, active resistance from vested interests such as Electricity Retailers, carbon intensive industries, electricity retailers and sections of the bureaucracy.

Australia is one of the most wasteful energy users in the world and its per capita energy use is as high as the US. Energy efficiency is a key policy action to affordable Emissions reduction action and smooth cost effective transition to low emissions generation technology.

However, these very clear economic, productivity and environmental benefits from energy efficiency will be lost as long as the decision to implement cost effective energy efficiency opportunities through voluntary action is delayed.

The policy direction must be to introduce an energy efficiency target, to be delivered by incentive mechanisms either through white certificate trading or other mechanism. The incentive mechanisms are recommended to drive the retrofit market and other hard to get at energy efficiency opportunities. A clear regulatory framework to define the minimum energy efficiency performance is also required so as to define the benchmark and make the administration of the incentive mechanism possible.

The Victorian government has introduced a legal framework for energy efficiency / white certificate trading. This approach was recommended as NFEE stage 2 and was intended to be applied nationally and economy wide.

Importance of the Transport Sector

The transport sector and the stationary energy sector are the largest greenhouse emitters. The stationary energy and other sectors have a much lower capacity for greenhouse gas reductions than the transport sector. Motor vehicles are responsible for approximately 80% of transport emissions, with public transport responsible for 3% of transport emissions.

With crude oil at \$80 a barrel in 2007 compared to \$35 in 2004 - the rising global oil price translates to rising domestic fuel costs and household affordability pressures and debt levels. In order to have continued energy security, minimise the impact to our economy and reduce greenhouse emissions - means we need to reduce our dependence on oil and switch to sustainable alternatives.

Market mechanisms, such as an ETS, are appropriate for the electricity sector, but not for the transport sector which would require more direct or specific policy interventions on both transport supply and demand side. On the demand side, Australia should increase the fuel efficiency of the national fleet, increase expenditure, availability and patronage of public transport, mass transit, rail and light rail infrastructure. Other ideas such as greatly expanded use of the already developed electric car, with energy supplied from the electricity grid, in turn supplied through renewable intermittent sources like solar photo-voltaics and wind, should also be explored. This alternative could provide a useful coupling of the stationary generation and transport sectors, and a means of storing energy supplied by intermittent sources.

With oil approaching \$US100 a barrel, demand for mass transport has risen 20% since the beginning of last year and is likely to rise another 10% next year. Australia is highly vulnerable because it has fallen behind in the provision of public transport. The government can act quickly by abolishing subsidies and tax concessions given to road transport, eg through Fringe Benefit Tax legislation.

Economic modelling Methodology

The main innovation of the Sir Nicholas Stern approach for the UK government report was that the cost of impacts due to climate change were compared to the cost of action to limit climate change and adapt to it.

In undertaking similar economic modelling and testing policy options it is important that the assumptions that inform the modelling are accurate for existing and developing technologies.

Some Australian and State government departments have commissioned modelling work which included errors and omissions leading to development of compromised policies.

Examples are coal fired generation with carbon capture and storage is currently costed at anywhere between \$70 and \$150 per tonne – the policy consequences are far ranging with such a large variation in cost. Another issue is the use of short run marginal costs for conventional fossil fuel and long range marginal costs for proven sustainable energy options. In other instances specific available types of technologies have been excluded from the mix considered in the models.

Given the critical importance of producing effective and appropriate policy, it is imperative that the modelling be based on robust assumptions. Hence it is recommended that any economic modelling assumptions are made transparent and informed through a process of consultation with the sustainable energy industry, CSIRO, relevant university academics, and more widely.

The capacity of the sustainable energy industry:

It is crucial the government supports sustainable energy research, product commercialisation, skills and industry capacity. Australia is being left behind the rest of the world Europe, Japan, USA, China are forging ahead in industry and skills development. The solar industry alone was estimated to be worth about \$25 billion in 2006 and projected to increase to \$100 billion by 2011 and \$1 trillion by 2020. This will make the sustainable energy industry larger than the defence and ITC industries.

If you have any points of clarification please do not hesitate to contact me. ANZSES looks forward to opportunity for further engagement with the review and the release of the more detailed reports.

Behaviour change programs

Emissions could be substantially reduced through individuals changing their emissions-related decisions in industry, commerce, transport and residential situations. In the private transport and residential sector the potential is very large, and multiple benefits can be achieved, eg through the change from private vehicle use to walking and cycling, with the associated fitness and health benefits. Behaviour change programs have been in use for a number of years, and the factors critical to success are increasingly understood. They need to be introduced widely, with frequent review, and wide cross-fertilisation of different programs. A National Centre for Social Marketing and Behaviour Change Research and Development should be established as an intrinsic part of a comprehensive emissions reduction policy.

Yours sincerely,
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