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Environment and Heritage Committee
House of Representatives
Parliament House
Canberra ACT 2600

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RE: Inquiry into a Sustainability Charter

Abstract

The terms of reference state that the charter must be aspirational, it must provide targets for the Australian community to meet and once targets are met they should be re-assessed and new targets set. This submission will address energy and the environmental and economic issues associated with it. The different options that exist for producing clean energy and the barriers to their use. It will also look at current and future energy demand trends and how energy consumption can be reduced by residential house holds, commercial building and industry. What measures can be put in place to increase renewable energy uptake. The main aim of this paper will be to high light the need for the Australian government to adopt serious sustainable energy policies as soon as possible. Also to bring to light how feasible it is to make the transition from reliance on non-renewable energy to renewable energy.

Energy and the Environmental and Economic Issues

Currently in Australia, 78% of energy generated is from coal fired power plants (Energy information Administration, July 2005). A coal fired powered plant is the dirtiest mechanism for producing electrical energy. It emits the most green house gases into the atmosphere. There is a broad consensus that these gases cause global warming which is responsible for changing weather patterns around the globe and in Australia. These weather changes include more powerful cyclones, longer periods of drought which can

cause desertification and so on. Continued emission of these gases at current rates will lead to even more harsh and varied climate which will affect Australia's economy significantly. "Two areas of Australia's economy which are vulnerable to climate change are tourism and agriculture" (Hueston et al. April 2006, p. 4). "A rise of the global mean temperature of 2°C or more above pre-industrial levels would mean a dramatic increase in damage to ecosystems and disruption to the climate system" (Teske, S. September 2005, p. 3). "For example the Great Barrier Reef supports a 1.5 billion industry but with a 2 degree temperature rise, 97% of the ref could be bleached"(Hueston et al. April 2006, p. 4). Today we are already committed to 1.2 or 1.3°C warming, even if all greenhouse emissions were stopped immediately. To keep global mean temperature below the 2°C level, we have a very short time window to act. Within no more than one to two decades, we have to change our energy system to meet this target (Teske, S. September 2005, p. 3).

CISRO has concluded that reduction in global greenhouse emissions will reduce the rate and magnitude of climate change (Hueston et al. April 2006, p. 4). Even if we cannot avoid further warming, we will have more time to adapt to more extreme climate. Acting early to cut emissions not only reduces damage, but buys time. A group of business leaders that represent a cross section of Australia's economy formed the Business Round Table which commissioned an independent study by Allen consulting group into quantifying climate impacts on Australia and their study has shown that Australia can deliver significant reductions at an affordable cost. Furthermore, the longer we delay acting, the more expensive it becomes for business and for the wider Australian economy (Hueston et al. April 2006, p. 4)

To quantify the impact of climate change, economic modeling was done on two scenarios where the same reduction in emissions internationally (60% by developed countries) is done over the same time period (2000-2050) at different trajectories. One being early action taken where a carbon signal is introduced is in 2013, and the other being a delayed action scenario which assumed that the carbon signal would be delayed until 2022. The base case was specified as no global carbon price and no global action post-2012, that is,

no further action beyond programs already existing in 2005. This would result in 2050 GHG emission levels in Australia being 80% higher than current levels (Hueston et al. April 2006, p. 5).

Some of the key findings of Allen consulting group state that:

- Achieving a 60% reduction in greenhouse gas emissions from year 2000 levels by 2050 is possible. Early action will only decrease the GDP average growth by 0.1% compared with the base case.
- Economic impact by 2020 under early action would be modest.
- Delayed action may lead to a major disruptive shock.
- Early action favours employment growth compared with delayed action.
- Electricity price impacts are lower under early action than delayed action.

(Hueston et al. April 2006, p. 5).

The Different Options That Exist for Producing Clean Energy and Their Barriers

Currently today there are several proven technologies that can be used to produce clean energy for generation of electricity. These technologies are being used all round the globe and in some countries the use of renewable energy is growing at a fast rate. These include photovoltaics to harness solar energy, solar water heaters, wind turbines to harness wind energy, mini-hydro, biomass and geothermal. The scope for renewable energy use in Australia is very great because of the vast amount of land available for producing biomass and the high levels of solar irradiation that Australia receives due to its geographic location. Also there is large wind power potential that exist in the remote areas of Australia.

Photovoltaics

Although the worldwide photovoltaic market has been growing at over 30% per annum in recent years, the contribution this technology makes to electricity generation is still very small. Today off grid systems in remote areas have dominated installation. This is because installing a photovoltaic system is still an expensive option compared to

connecting up to the grid once you are in close proximity to the network. The main barrier to PV is cost. Substantial reduction in capital costs is required for solar power technologies to compete with the least-cost fossil fuel options. On average PV energy is five times more expensive than fossil fuel power (Solar Buzz, May 15th 2006). PV is at a disadvantage because it is not widely subsidized by the government. There is not a level playing field in the energy sector. PV grid connected houses are only sometimes allowed net metering which means the energy retailers has to pay customers for any energy it generates at the same electricity rate of consumption. Even a net metered rate is unfair since solar power does not produce harmful GHG that affect the climate. The true cost of fossil fuel energy due to environmental damage is not reflected in the electricity prices. Some of energy strategies to promote the use of PV like the PV rebate program are too short term. Information, evaluation and resource backups for PV are still lacking. PV systems work best when the power generated is distributed as opposed to a centralized power plant. The advantages of a distributed power system are that the infrastructure cost of the utility company can be reduced. Also grid connected PV systems require little maintenance. Off grid PV systems also have low maintenance once the users have a clear understanding of its limitations and how it works.

Wind

Within a short period of time, the dynamic development of wind power has resulted in the establishment of a market of relevance to the energy economy. Wind is the fastest growing energy source world wide. In some states in the US (Texas) wind energy prices are Competitive to traditional energy generation forms (Brown, L. march 2006). However wind is site specific and can not be implemented every where. So the main barrier to wind is intermittency. The need for storage and reserve capacity are cited as reasons for not using significant quantities of wind but this reason is not valid since loads can be more variable than energy sources and the network deals with this now (Watt, M. 2006, Lecture 4 p. 4) Wind power industry creates 27% more jobs than coal and 66% more than natural gas (Watt, M. 2006, Lecture 2 p. 1). From developing wind energy, opportunity for new manufacturing and service industries plus associated professional and trade jobs in regional Australia can be created (Watt, M. 2006, Lecture 2 p.7).

Biomass

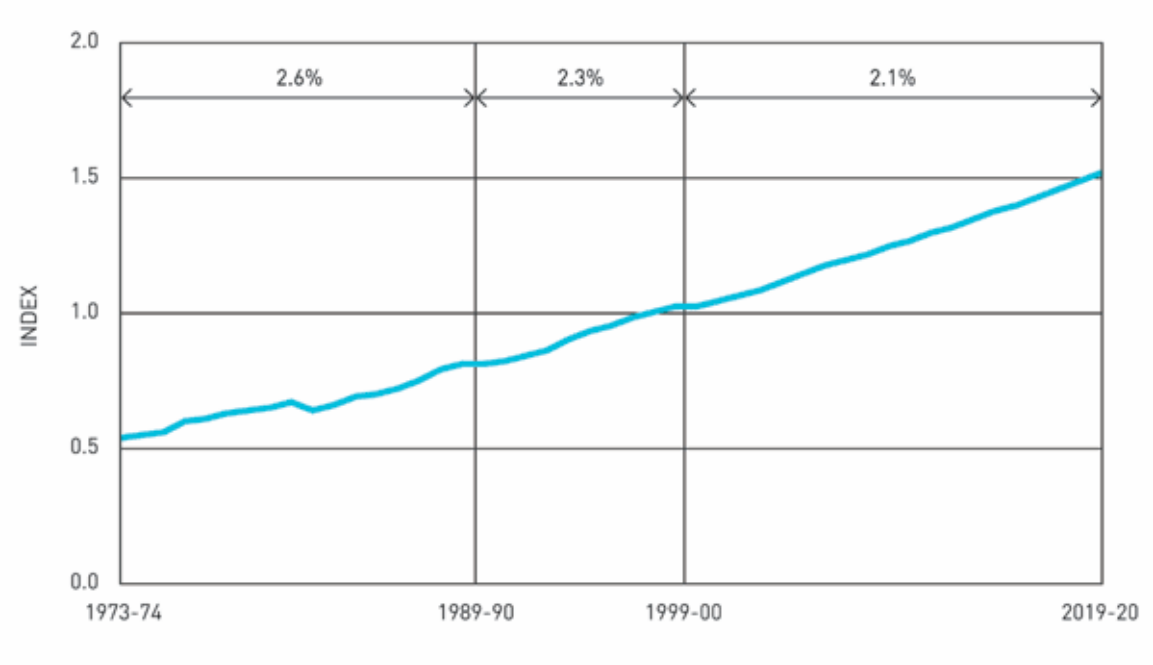
"Biomass is the oldest energy source, still mainstay for 2 billion people in developing countries" (Aberle, A. 2006, Lecture 1 p.6). There is tremendous scope for use of biomass in Australia. One source of biomass that is produced in large quantities in Australia is the waste product of sugar cane mills (bagasse). If all 31 sugar mills in Australia upgraded to utilize the bagasse and woody biomass in the non-crushing season efficiently for cogeneration of heat and electricity, then the potential electrical energy generated would be 20 TWh per year. This would reduce 16 Mt of Carbon dioxide per year. The generating cost would only be slightly higher than that of a coal fired plant. (Aberle, A. 2006, Lecture 3 p.4). Also specific plants could be grown to be used only as an energy source. Farmers can diversify and easily grow these crops and sell them at market energy prices to biomass fired power plants and they would make more profit from these energy crops than growing and selling food crops. However they would need the government to guarantee that their energy crops would be bought by power generators. There fore policy needs to be put in place to help farmers diversify into energy crops. In Europe, this is already a common practice.

Energy Demand Trends and Energy Reduction

In Australia the energy consumption trends show that per capita, energy consumption is increasing and is currently very high. Also Australia has the second highest energy intensity of all OECD countries (Watt, M. 2006, Lecture 9 p.2). This means that Australia requires a lot of energy to produce a unit of GDP. According to ABARE, Australia's energy consumption for the last 30 years since 1974 has grown by 2.6 % per year. In year 2000 Australia's energy consumption was 5037 PJ (1 petajoule equals the energy consumption of 20,000 Australian households) and it is predicted that energy consumption will grow at 2.1 % per year for the next 20 years. With these assumptions it is predicted that energy consumption will be approximately 7515 PJ. From these statistics

it can be seen clearly that Australia needs to reduce their energy demand if GHG impacts are to be limited. (ABARE Australia's Energy 2000). Figure 1 shows the trends.

Figure 1 **Energy Consumption Trends**



Source: ABARE Australian energy: National and state projections to 2019-20, 2003

Energy consumers can be categorized into three sections: residential, commercial and industrial. The National Framework of Energy Efficiency has been designed to address demand side management by constructing a framework to promote more energy efficiency. Key Elements of the energy efficiency component of the commercial and residential package include:

- Nationally consistent minimum standards adopted and enhanced over time with nationally consistent 5 star standards for all homes and appropriate standards for commercial buildings adopted in all jurisdictions by no later than August 2007.
- Agreed method(s) for measuring building energy performance on a "like-with-like" basis with a nationally consistent legislated regime for mandatory disclosure of

energy performance of residential and commercial buildings in place no later than December 2007.

The key elements of the energy efficiency opportunities component of the commercial and industrial package include:

- The requirement for large energy users to undertake mandatory energy efficiency assessments and public reporting on the opportunities identified, as announced in the Australian Government's energy white paper, securing Australia's energy future.
- Nationally coordinated training and accreditation for energy assessors and energy performance contractors (NFEE, 2006)

I would like to see the government build on this frame work and add penalties for non compliance.

Measure to Increase Renewable Energy Uptake

To overcome the barriers that prevent large increases in renewable energy uptake, there needs to be serious government policies that need to be constructed and implemented. The main goal is to reduce carbon emissions while maintaining a "good quality of life" or high standard of living. Below are the major steps that can be taken to achieve this goal.

Carbon Trading

One major mechanism that can spur carbon abatement is the introduction of a carbon trading scheme. This mechanism will offer cost effective emissions reduction by allowing all the players to share the cost of abatement. The round table recommendation states that the mechanism should be designed to have comprehensive national coverage by 2013.

Increase Mandatory Renewable Energy Targets

MRET has so far been very effective in growing the renewable energy industry significantly. Therefore to further increase growth of the renewable energy sector it should be increased because sustainability is not a destination but a journey.

Long Term Subsidies for RE

Long term subsidies are important because it makes it feasible for big players and banks to get involved. A stop and start type subsidies only destroy the industry growth rate.

Implement feed-in-tariffs

Feed in tariff are hugely successful in Germany. Germany has one of the biggest solar energy industries because of FIT. FITs offer premium rates for customers that export energy into the grid. Also FIT requires little administrative cost to be monitored and controlled.

Increase Education

It is important to educate the general public about techniques to reduce energy consumption. Similar campaigns can be run as the reducing water usage. Create a stronger science and technology culture through targeted school and university campaigns, and increased funding for centres of excellence to support the development and deployment of breakthrough technologies in RE in Australia (Hueston et al April 2006 p.7)

Build on the National Framework for Energy Efficiency

Australian government must build on the national framework for EE. Energy demand reduction is another way of reducing GHG emissions. Demand side management can be done by simply building houses and commercial buildings with more energy efficient fixtures also orienting homes or buildings to take advantage of passive solar heating. Using convection currents powered by solar heat to cool the building. There are many technologies than can be incorporated into building design to reduce energy footprint. Therefore the government needs to build on the framework.

Conclusion

Carbon emissions must be reduced on a much larger scale and the necessary action must be taken now in order to avoid the worst case scenario in the future. In the world today there are a number of countries that are making good strides to reduce carbon emission and increase energy security. The job creation capabilities of investing in renewable energy are much larger than that of conventional energy. If the government continues to hold back on reducing emissions then it will be left behind by other countries in this sector. If all the measures are taken to increase renewable energy uptake now, then the economy will be less affected by the cost of making the transition to green energy. In the future it may be quite possible world bodies might become stricter with countries that do not reduce their carbon emissions and they may impose sanctions or trade restrictions. Besides using cleaner energy sources, there must be demand side management. So the problem should be tackled at both ends. The technology is there to tackle climate change. What is needed more importantly is political will.

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