Submission to Senate Select Committee on Climate Policy by Mr Scott N. George.

Key Points

- Do not rush into or rubber stamp the governments climate policy. An effective house of review might have prevented a change of government at the last federal election. Climate and Energy Policy are too important to get wrong and should not be implemented by an arbitrary date.

- Irrespective of one's belief in Climate Change and the science behind it, Investing in research, development and large scale deployment of Renewable generation, particularly generators which are able to be highly integrated into the network will have an effect on reducing the rate of natural resource depletion. What will we burn after Coal/Gas?

- That Australia's response, whether an Emissions Trading Scheme (ETS) or other form can effect a world wide response through R&D conducted in Australia reducing costs to levels where technology, for example Solar Thermal generation can become cost competitive on an unsubsidised basis leading to an uptake in the technology from other countries who may not have an ETS or specific climate policy.

- Make sure that Australia's emissions reduction targets are effective and achieveable with technology economically available for large scale deployment today. Targets can be refined later as more technology becomes economically available for large scale deployment.

- That an Emissions Trading Scheme could delay ultimately essential research, reducing the time frame between when the research is started and when its needed causing it to be rushed and possibly inferior. This would happen due to easy and cheap abatement options being used to meet the current liabilities leading to delay of the investigation of more expensive abatement options necessary to meet the higher targets.

- That a market based system which allows the Least Cost abatement option to be utilised may not result in the Lowest cost abatement options for the given emissions reduction level. For a 5 % emissions reduction, It may be cheaper to focus on technologies which reduce emissions from the electricity generation sector by 10-15% than to examine many possible ways to achieve a 5% reduction across all sectors.

- That emissions from the electricity generation sector is determined by the equation

  *Emissions = Consumption * Average Emissions Intensity of All Generators*

  So while the governments recently announced insulation initiative goes to reduce Consumption, and save X emissions calculated on the emissions intensity today. By 2020, where 20% of electricity should be renewable, the amount of emissions a similar scheme would save would be less. It may be better just to focus on reducing the emissions intensity of all generators and that way the consumption side of the equation isn't as important. Many ways to reduce labour by electrification exist, a reduction in consumption can result in a loss of productivity. Also, to give houses a green makeover and then reduce the emissions intensity of the generators could be double handling, leading to a higher cost response and possibly more emissions manufacturing newer, more efficient appliances. A house powered entirely by Hydro or Geothermal power has no emissions, even if it has an electric element hot water, incandescent light bulbs in every socket and runs the air-conditioner 24 hours a day.

- That modelling of future electricity networks could be flawed due to the increased participation of renewables combined with the assumptions which may hold true now, but may not be true with increased intermittent generation. Specifically modelling of electricity networks with a high intermittent generator participation which simulates the electricity network at 5 minute intervals or longer may not take into account times of rapid output fluctuations from intermittent generations such as wind farms. The modelling process should focus on whether the system will work reliably in a given configuration.

- That in Software engineering, the cost of fixing a bug increases the longer the bug is left unresolved with the highest costs being bugs fixed after the software has been released. The same concept applies to a transition to a low carbon/pollution economy, if problems can be identified and avoided before they happen then the cost of our transition will be lower.

- That the MRET scheme favoured Wind Turbines as the cheapest renewable technology, however Wind Turbines largely deliver energy, not capacity. With enough wind power online, some wind power will always be being fed into the system, but wind power cannot be relied upon to generate at-least a given amount at an arbitrary nominated time. In contrast to this, Hydro-electric power stations similar to the Guthega Power station can produce a given amount of power at a nominated time, but because it is limited by water flows, it cannot generate electricity all of the time. Conceptually, these two generators types can effectively work together as a cluster of units as the hydro-electric turbine can increase/decrease output based upon the current winds and use less water for the same amount of electricity generated.

- Solar Thermal and Coal power stations can combine as a cluster to leverage synergies. Once a Solar Thermal generator has sufficient storage it could run throughout the night, although probably at reduced levels and the supporting coal station would likely increase its output. Once enough Solar Thermal generation is deployed, it may be possible for coal power stations to turn off, but remain commissioned to turn on and ensure security of supply should the 7 day forecasts for sites with Solar Thermal generation show a possible shortfall in Solar plant output. In this case it would be ideal to pay generators to have capacity available, even if they do not generate.

- Alternative transport options including plug-in vehicles should be considered a national priority to avert a possible crisis due to increased oil prices as the worlds oil supply runs out. If powered by renewable electricity, then transport would be largely emissions free.

What I'd be attempting/doing if I was a Senator.

Its my view the lowest cost, highest probability of success path to reduce the countries emissions is to invest in renewable electricity generation and promote the associated flow on to the transport sector via plug-in vehicles. The best technology i see that is able to effect a worldwide response is Solar Thermal, and to effect a world wide response, my aim would be to lower its production cost to attempt to get it cost competitive with coal generation on an unsubsidised basis so that other countries would likely take up the technology. Countries may pay a premium price for indigenous energy generation facilities.

With the current electricity transmission network based around several large coal generators, there would be little risk in augmenting the network with several large Solar Thermal generators as long as there was sufficient energy storage capability for them to run 24 hours during favourable weather and sufficient notice so that the generating responsibilities can be shifted from one generator to another. EG. From one Solar station to another if inclement weather was present at one site or from

a Solar station to a coal station which could be either operating at low output or turned off but still available to operate. Unexpected shortfalls could be met by gas or hydro-electric generation.

With a reduction of emissions from the electricity generation sector by 90%, it is possible to achieve a cut of about 45% in Australia's total emissions without examining reduction options in other sectors or churning appliances to more efficient ones and the associated emissions in manufacture, transport and installation.

- Proposing legislation modifying the Emissions Trading Scheme legislation to become a Hybrid Solution so that a small (circa $3/tonne) Carbon tax is payable with the revenue to fund renewable energy research, development and deployment. I would also seek to allow voluntary contributions to the fund with the contributor able to nominate where the funds are to be used.

- Seek funding for the development of a high fidelity open-source simulation tool for the electricity network to identify and avoid potential technical issues with the integration of a large amount of low emissions generation with possibly volatile output. By simulating various responses, the best value emissions reduction options can be determined and implemented, not only in Australia, but in other countries.

  This is a subject which I believe is vital to a significant and effective Climate Change response and I have been working to achieve, initially independently and more recently it has involved a return to University to be progressed as part of a Research Higher Degree.

  I raised this issue with the Prime Minister at a Community Cabinet, I told him that I had a letter suggesting an analysis tool which could improve our Climate Change response, and asked whether i could give the letter to him after the meeting and would he guarantee a response. The Prime Minister wrote back, but his response did not indicate he would be looking to take the idea further as the Department of Climate Change in consultation with the Renewable Energy Sub Group of the Council of Australian Governments Working Group on Climate Change and water has engaged a consultant to conduct economic and electricity market modelling and analysis to inform objective evaluation of scheme design options.

- Seek funding for a review which would be conducted annually which is to report on technology development and deployment to meet the required emission cuts. This review would become a driver for future policy and research development and deployment funding.

- Seek funding for Solar Thermal augmentation of existing generation facilities like that which has been conducted at the Liddell power station. The facility there has an array of mirrors which focus light to create steam, and the heat from that steam is used to pre-heat water before it enters the boiler, reducing the amount of coal needed to heat the water to a given temperature. The same technology could be deployed with other coal stations or even Combined Cycle Gas Turbines (CCGT's) through augmentation of the steam cycle.

- Seek funding in the budget for direct government assistance for the construction of stand alone Solar Thermal pilot plants. Solar Thermal plants generate electricity through the process of focusing light to create heat, store the heat, and then use the stored heat to run a conventional steam turbine or a something similar. Stations could be built in stages, Stage 1 would be a pilot plant with about an hours heat storage and would mostly displace

conventional generation during the day. Stage 2 would be larger and have enough storage to run the station continuously (during suitable weather) with the station reducing output to run through the night. Stage 3 is large scale plants with enough storage so that fossil-fueled stations are able to be turned off but remain commissioned to be brought online during times of prolonged inclement weather. Funding for the next stage would be contingent on success of the current stage.

- Seek funding for trials of large scale demand side management programs. Such programs could include refitting residential, commercial or industrial users with non-essential power circuits which could allow utilities to temporarily interrupt supply to non-essential equipment during times of peak demands so that a blackout could be avoided. In some cases the interruption could happen without user knowledge, there exists devices which turn off an air-conditioners compressor for a few minutes of the hour while the device continues to circulate air.

- Attempting to have Australia take on the challenge of Climate Change head on in a nation building program surpassing the Snowy Scheme with a leadership commitment similar to what John F. Kennedy's showed at Rice Stadium.

- Make Allowances for fossil-fueled generators who operate to allow increased participation of intermittent renewable generation.

- Seek to avoid schemes or legislation which distorts the underlying economics of renewable technologies.

- Examine Hansard because the former Member for Calare, Mr Peter Andren who had intended to run as an Independent Senator for New South Wales before losing a battle with pancreatic cancer could provide a valuable contribution to this committee through his views as recorded in Hansard.

I would be willing to appear as a witness to the Committee, should the Committee feel it appropriate.

Mr Scott George.