



Tasmania

Submission No: .....141.....

PREMIER

19/7/07

Mr Geoff Prosser MP  
Chairman  
Standing Committee on Industry and Resources  
PO Box 6021  
Parliament House  
CANBERRA ACT 2600

Dear Mr Prosser

Thank you for your letter of 10 May 2007 requesting information to inform the Case Study into Renewable Energy in Australia. I note that while the Case Study was to examine the relative state of development of solar, wave, tidal, geothermal, wind and hydrogen renewable energies, the terms of reference have been amended to now include biofuels.

I would like to clarify that the meaning of a 'renewable energy sector', as one that covers all economic activity related to a particular method of generating useful energy from a particular renewable or sustainable energy source. I would like to note also that you might wish to consider renewable energies broadly, that is, not just as energy sources for electricity. For example, solar energy can be used to generate electricity that in turn can be delivered to homes for water heating, however solar energy can also be used by homes to heat domestic water directly from the sun.

While it may be possible to reduce the level of carbon dioxide emissions from carbon based fossil fuel technologies, the feasibility and costs of this are currently unproven and uncertain. Therefore it is prudent to further develop the potential of renewable energies. There are also commercial, environmental and social reasons for Australia to play a significant role in this. Apart from the low emissions imperative, there are three persuasive reasons to further develop renewable energy technologies:

- Australia has the natural resources that will provide the basis for further development of a number of renewable energy technologies and can maintain its comparative advantage in energy, even in a carbon-constrained world. For example, Australia has considerable supplies of hot rocks for geothermal technology, world-class wind resources for wind energy and sustainable forestry practices for biofuels;

- There will be many business opportunities if Australia develops technologies and experience in renewable energies that can be applied elsewhere; and
- Renewable energies also offer Australia a greater degree of energy security.

Tasmania produces more electricity from renewable sources than any other State, although this is mainly from hydro, which comprises over 90 per cent of Tasmania's energy. Tasmania also has Australia's best wind resource regime and the Woolnorth/Studland Bay wind farm is currently Australia's largest wind farm. However, due to our small economy, the solar, geothermal, wind and hydrogen renewable energy sectors in Tasmania are generally small.

The Tasmanian Government is not directly involved in sponsoring any research or development activities in renewable energy in Tasmania. However, the Government Business Enterprise, Hydro Tasmania, does have a range of activities underway, which are briefly described in an attachment to this letter.

In considering the relative state of development of the identified sectors, I would like to make the following observations:

- Large scale hydro electricity, biomass and solar thermal can already compete against fossil fuelled alternatives in many situations, even without a carbon penalty, and especially off-grid.
- If fossil fuelled energy had to pay for carbon capture and storage, then it may well end up more expensive than best practice wind energy.
- Energy efficiency and conservation are the cheapest and easiest options for carbon abatement and for supplying new demands. For example, turning off unnecessary lights saves money as well as emissions and makes the energy available to meet new demands.
- Distributed energy in the form of active and passive solar thermal and clean burning biomass are the next best options and these technologies also help to avoid expensive infrastructure investments to meet peak period demands.
- Large scale energy storage ideas also deserve more attention. For example, large scale compressed air systems, or pumped water storage between the upper and lower workings of disused mines. This would help offset the intermittency issues from some renewable energy technologies, but would also help to level load curves and reduce infrastructure costs.
- Regarding centralised production of electricity, renewable energies should be looked at not only in isolation, but also as a 'symphony' with each other or in conjunction with other technologies. For example, wind and hydro work very well together in Tasmania due to the flexibility of our hydro system. At Liddell in NSW solar energy is used to preheat feed water into a thermal coal fuelled power station. Further into the future, solar energy might be used to split water, with the hydrogen being used as a premium transport fuel (e.g. in aviation) and the oxygen being used for oxy-firing of fossil fuels with subsequent carbon capture and storage.

It could be argued that the potential for renewable energies has only begun to be explored. The large variety of possibilities and options is a potential drawback in that attention tends to be dissipated and seed funding can become spread over many ideas.

I would now like to provide comment on each of the renewable energy technologies to be considered by the Standing Committee.

#### *Solar*

Solar energy technologies can be considered in four parts: active and passive solar thermal energy and concentrated and dispersed solar photovoltaic energy.

Passive solar thermal is a widely overlooked opportunity. Simply by controlling the solar ingress into buildings a vast amount of energy can be saved in lighting, heating and cooling, and air conditioning. For example, much of the very expensive peak period electricity that is now directed to air conditioning commercial and residential buildings in Australia can be avoided. Best practices in design, construction, insulation, natural lighting and breeze control can more than halve the energy requirements of new buildings.

Solar thermal water heating is considered by some to be a mature technology, however further investigation could be undertaken into its integration into building design and mass production, which can greatly reduce unit costs.

Solar photovoltaics are a relatively expensive way to generate electricity and already have a high profile. This technology appears to be relatively well off in terms of the attention and support it is receiving.

#### *Wave/Tidal*

Wave energy has interesting potential but operates in a harsh marine environment with difficulties of access, corrosion, fouling and damage from extreme conditions, hazards to other ocean users and difficulties in getting the power ashore. Cost effective technologies are still being developed. Tasmania has good wave energy potential, including in Bass Strait.

Tidal energy (other than barrage systems) and kinetic energy from ocean currents share similar problems to wave energy.

#### *Geothermal*

Geothermal energy in the form of 'hot dry rocks' has had a resurgence in interest due to Australia's large scale resources and the fact that its output can be steady and predictable. The challenges seem to be the heat exchange process deep underground. Research and development of geothermal energy should be a high priority for Australia. It is predicted to offer clean, safe, extensive, sustainable base load energy.

Tasmania has issued two exploration licences for hot dry rocks.

### *Wind*

Wind energy has demonstrated the impressive technological and cost improvements that can come about once a renewable energy starts to receive attention and economies of scale. A state of the art wind turbine today can produce about as much energy as 45 state of the art turbines from two decades ago. Wind energy is probably one of the more highly developed of the renewable energy technologies, but can still develop further.

Tasmanian industry developed a capacity to produce steel support towers and to assemble nacelles for wind turbines following the development of the Woolnorth Bluff wind farm. The Vestas company was developing plans for a blade manufacturing plant at Burnie, however this did not proceed following the decision by the Commonwealth Government to not extend the Mandatory Renewable Energy Target scheme.

### *Hydrogen*

Hydrogen is not considered to be a renewable energy. Rather it is a clean energy fuel that must first be produced from other technologies. Hydro Tasmania and the University of Tasmania have demonstrated its use as a transport fuel and some aspects of its manufacture via electrolysis. The University of Tasmania has a purpose built laboratory and an active research program for the study of hydrogen applications.

### *Biofuels*

Use of forests and wood products is a significant part of the international climate change programme. For example, the European Union aims for 20 per cent renewable energy by 2020 and to have 10 per cent of petrol/diesel from biofuels by 2020. These targets have resulted in increasing interest by international companies for use of Tasmanian forest products and forest waste as renewable energy.

As the use of forest biomass for transport fuel is in its infancy in Australia (eg ethanol) more work and support is required to ensure commercialisation of this opportunity.

In closing I would like to note that Australia cannot achieve the kind of reductions that scientists agree are required to avoid the worst consequences of climate change without a massive increase in the use of renewable energies. My Government believes that renewable energies are an essential component to addressing climate change risks and that there are many opportunities for Australia to capitalise on our natural assets to become leaders in this area.

Yours sincerely



Paul Lennon  
**Premier**

## **ATTACHMENT: New Renewable Energy Activities in Tasmania undertaken by Hydro Tasmania**

### **Landfill (Biomass)**

(new, developed)

Retail licences were approved for two operators of landfill gas-fuelled generators. As a result, three generators have been built in Tasmania- one in the North of the State (Launceston), and two in Southern Tasmania, totalling 3.7 MW.

### **Geothermal**

(new, undeveloped)

Two companies have applied for exploration licences in Tasmania to explore Tasmania's potential as a source of geothermal energy. Sites on the east and west coasts will be investigated.

### **Wind**

(new, not commenced)

- Roaring 40's has development approval for the 129 MW Musselroe Wind Farm in North East Tasmania.
- The project was expected to be financially viable with support from Renewable Energy Certificate (REC) sales under a Mandatory Renewable Energy Target (MRET) scheme. Construction was aborted after the Federal Government decision not to extend MRET.
- The company that was to manufacture and supply wind turbines to the Musselroe project, Vestas, has closed down. Vestas established in Tasmania on the expectation that the Commonwealth Government would expand the MRET scheme. Vestas closed its Wynyard assembly plant late last year with the loss of 55 jobs.
- Two further wind farms have been proposed during the past few years – Heemskirk (160MW) on the West Coast and Robbins Island (140 MW) off the North West coast of Tasmania. Initial exploration showed potential at these sites for development, however neither has been progressed.
- Musselroe and other wind farms may yet be viable if MRET or similar schemes to encourage investment in renewable energy development are progressed.
- Hydro Tasmania is working on the King Island Wind Power-Carbon Block Energy Storage Project, in partnership with Lloyd Energy Systems. Approval has been given for two wind turbines and a carbon block that will reduce the reliance on diesel generation.
- Hydro Tasmania is awaiting council approval for a development application for additional wind turbines on Flinders Island, to reduce reliance on diesel generation.
- Hydro Tasmania has been involved in negotiations for a power solution for Cape Barren Island for some time. It has been decided by the Commonwealth that a power solution for the Island will be sourced through a tender process. Hydro Tasmania may propose a Wind-Hydrogen solution, to replace the current system that is heavily reliant on diesel.

## Hydro

(new, developed)

- In May 2007 Cascade Renewable Energy Pty Ltd (CRE) was granted an electricity generation licence to operate an impulse type hydro turbine to be connected to the existing irrigation pipe from the Cascade Dam. The generator is an induction generator with hydro turbine prime mover, with a capacity of 1.15 MW.

(existing, undeveloped)

- The ongoing upgrades to existing hydro power stations by Hydro Tasmania will improve the efficiency of these power stations.
- One potential upgrade is to Lake Margaret, a currently decommissioned site. Hydro Tasmania is looking at the best options to redevelop the site. If it is viable to redevelop the site as an operating power station, the capacity would be in the order of 10 MW.

## Solar Power

(new, undeveloped)

- Hydro Tasmania has development approval for a small solar power installation on King Island that will reduce reliance on diesel generation.

## Restrictive frequency technology

(new, undeveloped)

- Development approval has been granted to Hydro Tasmania for using a large resistor to help with frequency control on King Island, thus allowing allow better utilisation of wind-generated power for the local grid.