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14th June 2007

Jerome Brown,
Inquiry Secretary,
House of Representatives Standing Committee
On Industry and Resources,

Submission No:48.....

PO Box 6021
Parliament House
Canberra ACT 2600

Dear Mr Brown,

Submission to: Case Study into Renewable Energy in Australia
the relative state of development of selected renewable energy sectors in Australia

EnGen Institute has particular expertise and interest in –

Tidal and Ocean Current Power.

This submission addresses the inquiry foci of -

1. the current state of play among the renewable electricity-generating and energy storage technologies in Australia, and
2. the prospects for economically viable electricity generation, storage and transmission in each sector

by providing information for the Tidal Power sector.

However as the Hon Ian Macfarlane and the Committee have accepted representations on the scope of the inquiry and modified the original scope of the enquiry to include 'bioenergy', which has serious deleterious impacts on the environment leading to the long term degradation of the nations soil resource, a precedent to accept representations regarding the scope of the inquiry has been set.

The purpose for government support of production of zero-emission power is to reduce climate change, hence if this can be achieved by means other than the reduction of CO2 emissions such information is relevant to the underlying purpose of the inquiry. Open flow tidal turbines have highly significant environmental benefits beyond zero-emission electricity.

Climate driven ocean currents move heat energy in the oceans and so are intimately related to mechanisms of climate change. Changing ocean temperatures affect weather and rainfall distribution, lead to melting ice-caps and sea level rise, and currents of hot equatorial seawater damage the environment including bleaching the Great Barrier Reef.

Ocean current turbines not only provide access to a vast renewable energy resource (130GW in Australia – equivalent to our transport and electricity use) but can be used to slow ocean

current heat transfer to sensitive areas and thus help retard climate change. A website has been established to promote this benefit (www.sealevelcontrol.com). Calculation on this site show an array of ocean current turbines producing 14.3GW to power New York and Long Island, which is the same size as a 350MW wind farm, would reduce significantly slow climate change by protecting Atlantic Arctic Ice. Australia is well situated to apply the same 'cure' to the South Pacific and Indian Ocean Gyres which are key to the global climate.

There are also other advanced ocean engineering technologies such as OTEC (Ocean Thermal Energy Conversion) which can be used in combination with turbines to cool and hence save the Great Barrier Reef. The business backed 'Barrier Reef Foundation' has saving the Great Barrier Reef as it's stated goal but as yet are funding biological research rather than technical solutions.

EnGen Institute has commenced a dialogue with the Australian Maritime College and the University of Melbourne with a view to forming a Centre for Ocean Energy Technology. This technology solutions approach to Climate Change abatement and adaptation could be funded via the Bureau of Meteorology and/or CSIRO's 'Wealth from Oceans' or new 'Climate Change Adaptation' programs.

The development of new technology and industries with export potential is an objective of government support for renewables as recently stated by Ian Macfarlane. Tidal and hence Ocean Current turbines by regulating excess heat flows in the oceans achieve the underlying goal of government support for renewables, slowing Climate Change, more effectively than other renewables which can only reduce CO2 emissions.

I now return to the topics of 'state of development of renewable technologies' and 'prospects for economical electricity generation'.

1. Development of Tidal and Ocean Current Technology

Briefly, the technology is set for major expansion with –

- The first commercial plants under construction in Korea (48MW) and Delaware, USA (12MW) both using large arrays of smaller turbines in high speed, high energy intensity sites. Similar sites exist in Australia but have not been adequately surveyed.
- The European Marine Energy Centre in the UK has been established by the EEC and is testing commercial scale tidal turbine systems.
- Three companies Marine Current Turbines Ltd, Lunar Energy and SMD Hydrovision have large scale (1MW+ turbine) technology undergoing final test before commercial application
- Large scale tidal turbines are as yet still too expensive for economical power production
- Four small companies in Australia have developed small scale prototype tidal turbine plant. The companies, HydroGen Power Industries, Tidal Energy Australia, Atlantis Energy and BioPower Systems are all starved for funds and hence have constrained growth.

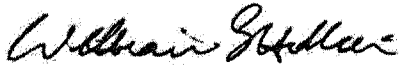
2. Prospects for Economical Electricity Generation

- There is currently a viable market in Australia for small scale tidal systems at remote off-grid high energy sites particularly in the tropics. These small scale turbines in large arrays could provide megawatt sized installations to townships in Northern Australia.
- Australia has a vast tidal energy resource (130GW – equivalent to our transport and electricity use) much of it in high energy sites in the Kimberley however due to the

remote location the only significant market is the mineral and fossil fuel producers in the Kimberley which have been totally disinterested even hostile to the use and potential development of this potentially very large renewable.

- The lack of a National Tidal Current Atlas (such as the UK, USA, Europe all have) hampers the development of tidal power and the application of Ocean Current Turbines to Climate Change abatement. This was raised by the author with the Industry and Resources Standing Committee in Broome in 2003 however no funding has been allocated to the National Tidal Centre of the Bureau of Meteorology for this purpose.

Yours sincerely,



William Hollier
Director