

Secretary: Michael McLean,
Senate Standing Committee on Environment,
Communications, Information Technology and the
Arts,
Parliament House
Canberra ACT 2600

19 January 2004

THE UNIVERSITY OF
NEW SOUTH WALES



CENTRE FOR PHOTOVOLTAIC ENGINEERING
RICHARD P. CORKISH
HEAD OF SCHOOL

RE: INQUIRY INTO THE KYOTO PROTOCOL RATIFICATION BILL 2003 [NO.2]

Dear Sir,

Please find enclosed a submission from:
**Centre for Photovoltaic Engineering
University of NSW
Sydney NSW 2052**

Yours sincerely,

Dr Richard Corkish

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The Centre for Photovoltaics Engineering

The Centre for Photovoltaic (PV) Engineering at the University of New South Wales is a global leader in research into silicon photovoltaics (solar cells) and home to the world's first Degree program in *Photovoltaic and Solar Energy Engineering*, from which the first graduates are now freshly available. Technology licensed from the Centre is manufactured on a massive scale in Europe and an Australian start-up company is currently commercialising another.

Ratification of the Kyoto Protocol

The Centre strongly supports the Bill as a small and inadequate first step along the road to recognition and acceptance by Australia of this country's extreme per capita greenhouse impact, its role in influencing increased fossil fuel use in other countries and the need to move towards a sustainable energy system. Although, as pointed out by Senator Eggleston, the measures included in the Kyoto Protocol are insufficient to have a significant effect on global warming, they represent the first international recognition of the problem and hence send critical signals for future international development. According to the IPCC, greenhouse gas reductions of 50-60% will be needed this century if atmospheric levels of CO₂ are to be stabilised at levels which would prevent climate change. The Centre agrees with Senator Brown that, as a developed country, and a member of the group of countries that is primarily responsible for the global warming problem, Australia should share the leadership role with other developed countries that have already ratified the Protocol. The Centre sees the initial exclusion of controls on developing countries not as an excuse for Australian inaction but as an opportunity for responsibility and leadership. Development of new technologies and energy strategies in the developed world will ultimately be of benefit to developing countries as well, and allow them to move straight to advanced sustainable energy systems and avoid the polluting technologies used by developed countries in the 1900's.

The Australian Prime Minister's Science, Engineering and Innovation Council has recently tabled a report, 'Beyond Kyoto – Innovation and Adaptation', using a 50% greenhouse gas reduction target for Australia by 2100. It appears that Australia wishes to go it alone in dealing with this global issue, thereby forgoing the many advantages a collaborative approach would provide. Ratifying the Kyoto Protocol would allow Australia to participate in shared mechanisms to reduce emissions, including the Actions Implemented Jointly and Common Development Mechanisms, as well as in international emissions trading. These approaches would significantly reduce the cost of emissions reduction for Australia, would facilitate future trading arrangements with countries serious about emission reduction and would allow us to influence the development of future emissions reduction strategies. Without ratifying, Australia will be out of the loop and its views increasingly insignificant.

Apart from the obvious global environmental benefits, already explained to the Senate by Senator Brown, and the signal of leadership that would ensue from Australia signing the Kyoto Protocol, Australia itself is one of the most vulnerable countries to the impacts of global warming. This is already evident in the increasing occurrence of droughts, high temperatures, destructive storms and other extreme weather events, which have been predicted by the detailed climate models developed by the CSIRO and others. It is in Australia's interests to encourage international efforts to reduce greenhouse gas emissions. A hotter, dryer continent will significantly reduce Australia's current advantages of excess food and fibre production, ability to support a growing population and attraction as a tourist

destination, amongst other things.

The Potential Contribution of Photovoltaics

This Centre has a direct and immediate interest in ratification of the Kyoto Protocol. The renewable energy industry, including photovoltaics, is booming in countries where governments have indicated sufficient concern about environmental consequences of fossil fuel use or about energy supply security, but progress in this country is much slower. Yet renewable energy sources, accompanied by significant improvements in energy use efficiency, must be the long term aim of sustainable energy supplies.

Australia's share of the world production of solar cells continues to fall. According to the International Energy Agency, the fractional renewable contribution to Australia's energy supply has been falling since 1998. Australia has already lost the industrial lead it could have established from its research excellence in many renewable energy technologies and the industrial jobs are being created elsewhere. Our lead in this "sunrise" industry appears to be being sacrificed for the short-term profits of the coal and aluminium industries.

As an example of the potential for new industry and employment from renewables, the international photovoltaics industry has been growing at an average rate of 24% per year, and as high as 43% per year over the past decade. Over the past 5 years, the international market has been driven by significant growth in the grid connected PV market, due to large incentive programs for end users operating in Japan, Europe and some US states. The empirical "learning curve" for PV shows prices dropping by 18% - 20% for each doubling of world production. The industry is now worth an estimated US\$2 billion per year. In the US alone, the PV industry employs 25,000 people directly and indirectly and expects this to grow to 300,000 by 2025, an industry equivalent to the current size of General Motors. Its value by then is estimated to be US\$10-15 billion. Significant industry development and employment has also accompanied growth in the wind, solar thermal and biomass industries in the US and Europe.

Australia has so far managed to capture only a fraction of the potential renewable energy market and associated benefits. However, an analysis done as part of the Australian PV Industry Roadmap shows that an aggressive push for the PV industry, such as has been achieved in countries such as Japan and the Netherlands, could see annual installations rise to 120 MWp per year (from 5 MWp at present) and installed capacity to 350 MWp (from 35 MWp). The industry could have sales of A\$1100m per year, employ around 5000 people by 2010, and supply around 7% of world production. This may be the minimum required growth to maintain an Australian industry. A local PV industry of this size would be of strategic importance for manufacturing and rural jobs, would reduce greenhouse gas emissions by over 500 Mt per year and would generate \$400m per year in exports.

The Centre for Photovoltaics Engineering urges the Committee to recommend Australian ratification of the Kyoto Protocol.