Australian Academy of Technological Sciences and Engineering (ATSE)

SENATE COMMITTEE ON FUEL AND ENERGY

SUBMISSION FROM THE AUSTRALIAN ACADEMY OF TECHNOLOGICAL SCIENCES AND ENGINEERING

The Australian Academy of Technological Sciences and Engineering (ATSE)[1] has in recent months produced a number of reports and submissions that are relevant to Terms of Reference **d.** (emissions trading scheme) and **g.** (alternative fuels) of the Senate Committee Inquiry.

These include –

- Energy and Nanotechnologies – a Strategy for Australia's Future
- Assessment of Climate Change on Australia's Physical Infrastructure
- Biofuels for Transport: A Roadmap for Development in Australia
- Energy Technology for Climate Change – Accelerating the Technology Response
- Submissions to the Garnaut Review and to the CPRS Green Paper.

Shortly an additional study will be completed addressing the external costs associated with different power generation technologies. These are the 'hidden' costs of electricity production not reflected in pricing, including the cost to the community of greenhouse gas emissions and of other gases and particulates, which can impact on health and amenity.

The detailed documents are available on the ATSE website[2] or could be provided in hard copy if required. The main points from each are summarised below.

Energy and Nanotechnologies

This study recognised that a group of enabling nanotechnologies could have a major impact on energy conversion, storage, distribution and use, identifying where the prosects for short, medium and long term benefits might arise.

[1] The Academy was established in 1975 with the mission to promote the application of scientific and engineering knowledge to the future benefit of Australia. The Academy is one of the four learned national Academies, which have complementary roles and work together both nationally and internationally. The Academy has about 750 elected Fellows who are the leaders of applied science and engineering across the country. The Academy is comprised of experts from a diversity of professions many of whom have been consulted on this submission.

[2] http://www.atse.org.au/index.php?sectionid=128

Assessment of Climate Change on Australia's Physical Infrastructure
The risks for various classes of infrastructure posed by climate change were analysed and a range of vulnerabilities identified. This includes adverse impacts of several factors such as a combination of drought, high temperatures and bushfires on power generation and distribution.

Biofuels for Transport
Policy development for commercially successful use of biofuels in Australia must focus on second-generation sources where there is little competition for food, land or water resources. If biofuels are to play a major component in the future energy mix, for greenhouse gas reduction and fuel security reasons, considerably more research will be required to optimise resources, processes and utilisation. Australian research is already of good quality but is fragmented and a more co-ordinated effort is required, ideally through the establishment of a national Biofuels Institute.

Energy Technology for Climate Change
This preliminary study analysed the various technology options available for reducing greenhouse gas emissions from power generation. It concluded that a portfolio approach should be taken to achieving the established future target reductions and that both the capital costs involved and the investment in research would be considerable. For announced 2050 targets to be achieved, capital outlays in the order of $250 billion will be needed and this would require an outlay on research into energy technologies of around $6 Billion in the next 10 years. This investment sum could be reduced considerably through higher efficiency of electricity usage and through conservation measures (including through a CPRS); these measures will correspondingly lower energy growth trajectories.

The Need for Investment in Existing Energy Production and Utilisation
ATSE is concerned that there is a major gap in the CPRS White Paper in the way it all but ignores the need to accelerate the use of technology. This includes both the application of existing technology and, to the development of new technology aimed at reducing energy use and reducing CO_2 emissions associated with electric power generation as outlined in the ATSE report *Energy Technology for Climate Change*.

ATSE is concerned that the under the CPRS the proposed price of carbon, at least initially, will be too small to justify investment in new technologies. Capital investment in technology makes a permanent change – it only needs to be done once. Many measures are available right now for improved energy efficiency and emissions reduction but the prevailing costs and returns are not sufficient to meet required rates of return. There is a win-win situation possible in the current economic climate from the adoption of measures that will accelerate capital improvements. A much greater component of the revenue from the CPRS that is focussed on encouraging investment will not only reduce emissions and make Australian industry more internationally competitive but it will also create jobs. Compensation for increased prices (the main preoccupation of the White Paper) and scheme costs and fees go on forever.

Aspiring to World Best Performance

The White Paper devoted much effort to the question of not impairing trade-exposed industries. This means the debate has become diverted into questions of degree of trade exposure, which has little to do with how energy efficient these industries are. Although it is acknowledged to be a far from trivial exercise it might have been better if free permits were issued on the basis of meeting benchmarked world industry energy use standards. Permit costs would only be incurred for the gap by which performance falls short of these standards.

There are 1000 or so businesses likely to be caught in the net of needing to buy emissions permits. It should be possible for them to be audited on their current performance and given free permits to allow them to emit at current world best minimum industry standards. Any argument would be about greenhouse gas efficiency not trade exposure, and any penalty paid would relate to the extent to which the firm fell short of acknowledged world benchmarks. As international technology improved the bar would continue to be raised. In addition an annual 'efficiency dividend' could encourage incremental improvements and allow national emission targets to be tightened.