



Australian ITER Forum

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The Secretary,
Senate Select Committee on Fuel and Energy,
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Submission to Senate Select Committee on Fuel and Energy

In this submission to the Senate Select Committee on Fuel and Energy the Australian ITER Forum focuses on the potential of fusion energy to provide energy security as a sustainable long-term global energy solution. Nuclear fusion for energy production requires committed multilateral programs to realize the potential of this technology. ITER is the only viable global program to achieve this objective.

The Australian ITER Forum is a network of scientists, engineers, research administrators and policy specialists advocating sustainable Australian engagement in ITER, the experimental fusion reactor that will be built in France over the next 10 years. Fusion, co-discovered by Australian Sir Marc Oliphant in 1934, is the process whereby lower atomic weight elements join to form a heavier element. This is the fundamental process that powers the Sun and the stars. Fusion energy offers millions of years of baseload energy generation, with almost no greenhouse gas emissions and very little radioactive waste compared to nuclear fission energy and coal. It is also intrinsically safe – a fusion power plant can not melt down, and the fuel can not be used as a weapon.

Remarkable progress has been made over the decades towards viable energy production using fusion. ITER marks the next step. ITER, one of the world's largest science projects, is an outstanding example of a technology that is being developed with substantial international support, including support of developing nations. The seven ITER parties include two developing countries, namely the People's Republic of China and India, as well as the EU, Japan, the Republic of Korea, the Russian Federation and the USA. The research outcomes of ITER will guide design of a prototype power plant, and the fusion engineering community envisages that fusion will become a commercial technology in the second half of this century. Although Australia is not yet a party, there are clear and established means of participating in ITER and these linkages maintain, for Australia, the option of fuller engagement in the future. Australia has a respected position in some focused areas of fusion research.

Our comments on the terms of reference of the select committee follow:

(g) the role of alternative sources of energy to coal. Fusion, while not yet a developed technology, has the recognized capability to displace coal and uranium as the provider of base-load electricity. The fuel is a mixture of heavy isotopes of hydrogen, deuterium and tritium. Deuterium is naturally abundant in water. Tritium is manufactured by neutron activation of lithium, an element common in the Earth's crust (one mine in Western Australia has 60% of the world's known mineral salts deposit of

lithium), and is the same metal used for laptop batteries. Concept-designs for fusion power plants are typically of order 1GW electric, equivalent to a medium size coal power plant.

(h-iv) securing Australia's future domestic energy supply. The Forum maintains that security of supply can not be properly assessed without consideration of the influence of global developments in energy supply, which will have an impact on cost. For Australia to secure its options in any technology, it needs to have the recognized scientific capability to assess and deploy that technology. In the case of a paradigm-shifting technology such as fusion, the Forum believes this can only be achieved by an appropriate Australian scientific participation in the ITER project.

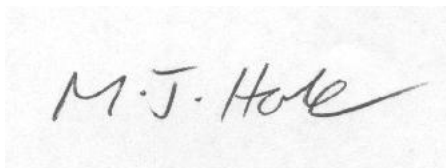
The Forum has worked with the Australian Government, research, and public communities to formulate a strategic plan for science and engineering. The strategic plan, available at

http://www.ainse.edu.au/fusion/iter/fusion_energy_strategy_for_australia.html

proposes an appropriate Australian participation in ITER through provision of an ITER machine contribution and internationally embedded fellowships. This plan is now supported by the ITER organization, 7 Universities, ANSTO, 5 learned societies, the H-1 board, Minister Ferguson and several members of Parliament, including the Greens. While the May 2009 budget invested in much-needed infrastructure to prepare the H-1 National Plasma Fusion Facility to support development of an ITER contribution, project research funding and human capacity, which actually deliver fusion energy security and a participation in ITER, are unfunded. We would be pleased to meet with the Committee to discuss fusion energy and the options available to Australia to deliver fusion energy security. For example, one such option, that the Forum recommended to the Senate Select Committee on Climate Change Policy, was that investment in R&D itself could form a type of carbon credit, to encourage increased investment as well as take-up of lower emissions technologies.

More information on the Forum can be found at www.ainse.edu.au/fusion.html and on ITER at www.iter.org

Yours Sincerely,

A handwritten signature in black ink that reads "M. J. Hole". The signature is written in a cursive style with a long, sweeping tail on the letter "e".

Dr M. J. Hole
Chair, Australian ITER Forum
<http://www.ainse.edu.au/fusion.html>