

Submission from the Australian Nuclear Association to the  
House of Representatives Standing Committee on Industry and Resources**Inquiry into the development of the non-fossil fuel energy industry in Australia****Case Study into the strategic importance of Australia's uranium resources****1. Introduction**

The House of Representatives Standing Committee on Industry and Resources announced on 17 March 2005 that it is conducting an inquiry into the development of the non-fossil fuel industry in Australia. The committee will commence its inquiry with a case study into the strategic importance of Australia's uranium resources with specific consideration of the:

- global demand for Australia's uranium resources and associated supply issues;
- strategic importance of Australia's uranium resources and any relevant industry developments;
- potential implications for global greenhouse gas emission reductions from the further development and export of Australia's uranium resources; and
- current structure and regulatory environment of the uranium mining sector (noting the work that has been undertaken by other inquiries and reviews on these issues).

Interested organizations were invited to make written submissions addressing the terms of reference by 6 May 2005. The present submission presents the views of the committee of the Australian Nuclear Association which is a non-profit non-government Scientific Institution of individual persons interested in the peaceful applications of nuclear science and technology (for further information see Attachment 1).

**2. Global demand for Australia's uranium resources and associated supply issues**

The global demand for uranium from Australian uranium resources has increased from annual totals of 5,105 tonnes  $U_3O_8$  in 1995/96 to 9,533 tonnes  $U_3O_8$  in 2003/04. The calendar year production for export from Australian uranium mines was 10,951 tonnes  $U_3O_8$  in 2004 (data from Uranium Information Centre Briefing Paper on Australian Uranium Mines, April 2005). This production was from three operating mines at Ranger in the Northern Territory, Olympic Dam in South Australia, and Beverley in South Australia. In the five years to mid-2004, Australian companies exported 43,803 tonnes  $U_3O_8$  with a value of over A\$2 billion to eleven countries to support their nuclear power programs (UIC Briefing Paper No. 1, 2005). The recent annual production represented about 25% of the world's supply from uranium mines.

The approximate contracted exports of uranium oxide concentrates from Australia to major countries and the percentage of electricity supplied by nuclear power in those countries are given below (UIC Briefing Paper No. 1, 2005):

Country	Tonnes/year $U_3O_8$	Total reactors in country and % electricity
USA	4,500	103 20
Japan	2,500	54 25
South Korea	1,000	19 40
EU	2,600	131 24 - 77%

The amount of uranium required worldwide for production of electricity from over 400 nuclear reactors in 30 countries is about 80,000 tonnes  $U_3O_8$  per year. Of this total, about 40,000 tonnes  $U_3O_8$  per year is provided from mines and the rest is provided from stockpiles and recycled military uranium. As these stockpiles are run down and current programs of recycling military uranium are completed, and as more nuclear power reactors are constructed, it is expected that the demand for uranium from existing and new mines will increase. Australian uranium resources are about 38% of the world's uranium resources in the low cost category (ie. recoverable at less than US\$40/kg) and therefore Australian uranium companies will in principle be able to increase production and capture a larger share of world production. Australia's main competitors are in Canada, Kazakhstan, South Africa, Namibia, the Russian Federation, Brazil and Uzbekistan, with Canada being the leading producer at present.

The supply issues are whether Australian uranium companies can expand production to meet the expected increasing demand, and whether they can export uranium to two rapidly developing markets in China and India, to which export is currently not allowed because appropriate safeguards agreements are not in place. The ANA recommends that the Australian government should negotiate an appropriate safeguards agreement to enable Australian uranium to be exported at least to China which is a signatory to the NPT. India is not a signatory to the NPT and therefore the Australian government may not be willing to negotiate a safeguards agreement to enable uranium to be exported to that country for the near future.

### **3. Strategic importance of Australia's uranium resources and any relevant industry developments**

Since Australia has the largest low cost uranium resources in the world representing about 38% of the world's total, these resources are necessarily of great strategic importance. Its production of about 25% of world's production from mines is also of great strategic importance. It is likely that this percentage of world production will increase in the next few years, which will further increase the strategic importance. Australian mining companies should be encouraged to increase their production provided that this is done with protection of the environment, with the agreement of all involved stakeholders, including aboriginal interests, and under the strictest safeguards to prevent any possible misuse. Australia is a preferred uranium supplier in many markets, not only due to its low cost high-quality product, but also because it is seen to have high economic and political stability.

Western Mining Corporation has indicated its interest in expanding production of its combined copper/uranium/gold mining operations at the Olympic Dam deposit in South Australia at an indicated cost of several billion dollars. If this expansion is confirmed when the ownership of this deposit is resolved in the next few months following the proposed takeover by BHP Billiton or some other bidder, then this mine could become the largest uranium mine in the world. The first in-situ uranium mining venture in production in Australia is at the Beverley deposit in South Australia which produced 1,084 tonnes  $U_3O_8$  in 2004. It is likely that additional in-situ uranium mines will be developed in Australia in the next few years and these will add to the expansion of Australian production to well over its current level of about 9,500 tonnes  $U_3O_8$  per year. A list of Australia's prospective uranium mines based on known deposits is provided in a Briefing Paper from the UIC entitled "Australia's Uranium Deposits and Prospective Mines" dated April 2005.

**4. Potential implications for global greenhouse gas emission reductions from the further development and export of Australia's uranium resources**

As an example of the importance of the export of Australian uranium, the exports in 2002 alone fuelled the electricity production for about 33 million persons and saved the emission of about 290 million tonnes of carbon dioxide - UIC Briefing Paper on "Uranium Mining in Australia" ([www.uic.com.au/mines.htm](http://www.uic.com.au/mines.htm)).

Several reports have been published of the relative amounts of carbon dioxide emitted by different energy sources and some of these reports are summarised in a Briefing Paper by the UIC "Energy Analysis of Power Systems" dated January 2004. Reports which are critical of nuclear power are also discussed in this paper. The important contribution that nuclear power can make to reducing carbon dioxide emissions from power plants is demonstrated in the Table below for estimates made by Japanese, Swedish and Finnish experts.

g CO <sub>2</sub> / kWh for fuel source	Japan	Sweden	Finland
Coal	975	980	894
Gas thermal	608	1,170 peak-load, reserve	-
Gas combined cycle	519	450	472
Solar photovoltaic	53	50	95
Wind	29	5.5	14
Nuclear	22	6	10-26
Hydro	11	3	-

It is clear from these and other published data that uranium exports from Australia can reduce the amount of CO<sub>2</sub> produced in overseas countries by a large factor. The export of larger quantities of uranium would therefore contribute to the reduction of emissions in overseas countries producing electricity from nuclear power.

**5. Current structure and regulatory environment of the uranium mining sector (noting the work that has been undertaken by other inquiries and reviews on these issues)**

There has been public interest and concern at uranium mining and processing in Australia for over 30 years. This concern has led to all of the operations requiring major environmental assessments, extensive public consultation and on-going monitoring. The concerns of the public and the government to ensure that Australia's uranium should only be used for peaceful purposes has also led to a high level of regulation of the industry by the Commonwealth government.

"Australia's uranium industry is one of the most highly regulated mining industries in the world" - Quotation from Invited Paper "Uranium Mining and Environmental Issues in Australia" to the 14<sup>th</sup> Pacific Basin Nuclear Conference, Honolulu, March 2004, by Dr Clarence J. Hardy, Secretary, Australian Nuclear Association.

The ANA believes that the uranium mining industry in Australia is adequately controlled by the Commonwealth and state governments with respect to environmental protection and safeguards for the peaceful use of the exported product.

## 6. Conclusions

Australia has the largest uranium resources in the world amounting to about 38% in the low-cost category of which the majority is located in the Olympic Dam resource in South Australia. In contrast, Australia only exports uranium concentrates representing about 25% of the world's current production from mines. This difference is largely due to political factors which affected the industry over the last two decades when market forces alone did not determine Australian production. It is possible that with a more open market approach in the future, combined with the increase in uranium price in recent years, that Australian uranium production will increase and capture a larger share of world uranium production.

The ANA considers that the Australian uranium resources are so large a proportion of the world's low cost resources that they are of great strategic importance. Demand for these Australian resources will increase because Australia is regarded by current and potential customers as being an economically and politically stable country and a reliable supplier. Encouragement of an expansion of uranium exports by the government is therefore recommended not only to increase export revenue but also to make a contribution to the reduction of carbon dioxide emissions in countries overseas currently using nuclear power and planning to increase the proportion of this source in their mix of energy sources. It is further recommended that the government should negotiate safeguards agreements with all countries seeking to import Australian uranium for nuclear power production provided that these countries are signatories to the NPT.

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This Submission was prepared for the ANA Committee by Dr Clarence J. Hardy, ANA Secretary. Dr Hardy will be available to amplify this brief Submission and answer any questions at the invitation of the Standing Committee.

Dated: 5<sup>th</sup> May 2005

Attachment 1. Information on the Australian Nuclear Association.

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**Information on the Australian Nuclear Association**



The Australian Nuclear Association Inc (ANA) is an independent incorporated Scientific Institution made up of persons drawn from the professions, business, government and universities, with an interest in nuclear topics. An important aim of the ANA is to enable members to meet on a regular basis. A second aim is to publish a bi-monthly newsletter "Nuclear Australia" to report mainly on events in the nuclear field in Australia, and this is sent to members and subscribers worldwide. Other aims are to make awards to recognise outstanding contributions to nuclear science and technology, and to support education and training.

The ANA hosts international and national conferences, eg. the 9th Pacific Basin Nuclear Conference in Sydney, 1994, the Second International Conference on Isotopes in Sydney, 1997, and the First, Second, Third, Fourth and Fifth Conferences on Nuclear Science & Engineering in Australia, 1995, 1997, 1999, 2001 and 2003. The ANA has been chosen as the host of the 15<sup>th</sup> Pacific Basin Nuclear Conference which will be held in Sydney from 20-25 October 2006. The ANA is a Member of the International Nuclear Societies Council and the Pacific Nuclear Council, an Affiliate of the World Nuclear Association and has bilateral cooperation agreements with a number of overseas Nuclear Societies. Further information on the ANA can be obtained from:

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