AUSTRALIAN NUCLEAR FORUM

Uranium Mining in Australia

Policy

Primary determinants of uranium mining activities in Australia should be the commercial uranium market, within environmental, non-proliferation and national energy supply constraints. (Adopted 24/2/05.)

Summary and Conclusions

Uranium was produced in Australia before World War II as a by-product of the mining of radium ores. After WWII uranium was exported to the UK and the US in support of their nuclear weapons programs, but now all uranium mined here is exported solely for use in foreign nuclear power programs. Domestic uranium reserves are greater than that of any other country and are roughly equivalent (in primary energy terms) to all of the world's economically recoverable fossil fuels. This places Australia in the position of being able to use its uranium to significantly influence world energy utilisation and living conditions while also protecting the world environment - prospects that can only be realized if this resource is administered free from outdated political constraints.

Considerations

1. Australian Uranium Mining

Approximately 2.1 million tonnes of uranium have been mined in the world with Australia contributing about 5%. The first production in this country was as a by-product of radium mining at Radium Hill in SA. This was used as a yellow pigment in glass and ceramics. Starting in about 1953 the UK and the US jointly contracted local mines to supply their military and developing nuclear power programs. Currently operating uranium mines are Ranger (NT), and Olympic Dam (SA) and Beverly (SA). Production of U308 from these mines from 94/95 to 02/03 has averaged about 6700 tonnes per year and total annual production is now approximately 10,000 tonnes with the largest contribution being from Ranger. However, the mine with the largest reserves is Olympic Dam with the largest known uranium ore body in the world.

2. Uranium Reserves and Future Markets

Australian uranium reserves total about 989,000 tonnes of recoverable uranium resources (recoverable at up to US$80/kgU). This represents 28% of the total world comparable reserves of 3,537,000 tonnes and places this country as first in the world in this respect with the next nearest being Kazakhstan (18%) Canada (12%), and South Africa (8%) constituting two thirds of the total between them all. The current world consumption of uranium is about 67,000 tonnes per year and Australia provides about 8,500 tonnes of this. The 3.537 million tonnes of uranium mentioned above will last about another 50 years if used at the current rate and with it's huge reserves, Australia is well placed to take advantage of this demand.

The 50 year figure assumes use in the present types of reactors producing a total annual generation of about 2.5PWhe. However, if fast breeder reactors (FBRs) become widely adopted within this time frame the market demand for any remaining uranium reserves will probably reduce. Breeder reactors will extend uranium utilisation by about a factor of 60; in other words rather than 50 years the quantity of world reserves quoted will last for another 3000 years. Also, if the 2.1 million tonnes of uranium already mined are taken into account (most of the U238 still remains) then the total rises to nearly 5000 years. Of course more reserves certainly remain to be discovered albeit at higher recovery costs, but fuel costs are not a large contributor to generating costs so the basic 50 year figure is probably conservative. Nevertheless, by the time breeder reactors are being widely deployed, Australia should probably have sold most of its uranium reserves.

3. National Energy Supply

Australia has plentiful supplies of natural gas, coal and uranium but relies primarily on coal and increasingly natural gas for domestic energy. Currently most of the fossil fuels are exported as is all of the uranium, with uranium exports constituting 40% of the primary energy value of these exports (95% if used in FBRs). Any of these fuels would meet the domestic energy needs of this country until well into the future, but if this country were serious about reducing its emissions of greenhouse gases, the only practical contender at this time is nuclear power. If nuclear power were used in this country there would be no shortage of fuel provided, of course, that it were not all exported as at present.

4. Other Considerations

World War II was brought to an end through the use of nuclear weapons, but led to several countries obtaining this capability for themselves. The subsequent cold-war made many believe that nuclear technology itself was to be avoided, a sentiment that exists to this day in spite of the demonstrated advantages of such peaceful applications as nuclear power, nuclear medicine and scientific research using nuclear methods. This sentiment has also influenced Australian governments at various times to prevent the establishment of a nuclear power industry, uranium enrichment or fuel fabrication facilities and nuclear waste repositories (even for LL wastes). Uranium mining was also limited at one time to “the three mines policy” that effectively acknowledged that it was acceptable for foreign countries to have nuclear power while this country had to rely on coal fired generation - an industry that produces more pollution but has more politically redeeming features. The ANF does not agree that domestic politics should be a primary consideration in determining the operation of Australia’s uranium mining industry.

Amongst the proven major electricity generating technologies nuclear power generates the least greenhouse gases. Thus if the world is serious about lessening this environmental consequences in an increasingly populated and industrialised world, then it should switch to nuclear power in a major way. By utilisation of its vast uranium reserves Australia can play an important part in ensuring that this is achieved – not by restricting uranium exports, but by allowing them to be governed by market demands.

5. References.

1. “WNA Market Report 2003” World Nuclear Association.

2. “Former Australian Uranium Mines,” UIC Paper, December 2001

3. “Australia’s Uranium Mines,” UIC Paper, June 2004

4. “Australia’s Uranium and Who Buys it,” UIC Nuclear Issues Briefing Paper #1, October 2004.