Geophysical Research Abstracts
Vol. 14, EGU2012-2544, 2012
EGU General Assembly 2012

Global Uranium And Thorium Resources: Are They Adequate To Satisfy Demand Over The Next Half Century?

I.B Lambert

Geoscience Australia, Secretary General 34th IGC, Canberra, Australia (ian.lambert@ga.gov.au, +61 2 6249 9983)

This presentation will consider the adequacy of global uranium and thorium resources to meet realistic nuclear power demand scenarios over the next half century. It is presented on behalf of, and based on evaluations by, the Uranium Group - a joint initiative of the OECD Nuclear Energy Agency and the International Atomic Energy Agency, of which the author is a Vice Chair. The Uranium Group produces a biennial report on Uranium Resources, Production and Demand based on information from some 40 countries involved in the nuclear fuel cycle, which also briefly reviews thorium resources.

Uranium: In 2008, world production of uranium amounted to almost 44,000 tonnes (tU). This supplied approximately three-quarters of world reactor requirements (approx. 59,000 tU), the remainder being met by previously mined uranium (so-called secondary sources). Information on availability of secondary sources – which include uranium from excess inventories, dismantling nuclear warheads, tails and spent fuel reprocessing – is incomplete, but such sources are expected to decrease in market importance after 2013. In 2008, the total world Reasonably Assured plus Inferred Resources of uranium (recoverable at less than $130/kgU) amounted to 5.4 million tonnes. In addition, it is clear that there are vast amounts of uranium recoverable at higher costs in known deposits, plus many as yet undiscovered deposits. The Uranium Group has concluded that the uranium resource base is more than adequate to meet projected high-case requirements for nuclear power for at least half a century. This conclusion does not assume increasing replacement of uranium by fuels from reprocessing current reactor wastes, or by thorium, nor greater reactor efficiencies, which are likely to ameliorate future uranium demand. However, progressively increasing quantities of uranium will need to be mined, against a backdrop of the relatively small number of producing facilities around the world, geopolitical uncertainties and strong opposition to growth of nuclear power in a number of quarters – it is vital that the market provides incentives for exploration and development of environmentally sustainable mining operations.

Thorium: World Reasonably Assured plus Inferred Resources of thorium are estimated at over 2.2 million tonnes, in hard rock and heavy mineral sand deposits. At least double this amount is considered to occur in as yet undiscovered thorium deposits. Currently, demand for thorium is insignificant, but even a major shift to thorium-fueled reactors would not make significant inroads into the huge resource base over the next half century.