Supplementary Submission to the House of Representatives Standing Committee on Industry and Resources

'The Strategic Importance of Australia's Uranium Resources'

by

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Energy inputs to the nuclear fuel cycle and resulting carbon dioxide emissions

It is evident that some misleading assertions are being made in these regards. They centre on the notion that uranium ore grades used will decline in the next few decades and that energy required to extract the uranium will rise to the extent of making the net energy yield from nuclear power (considering full life cycle) very small. Correspondingly carbon dioxide emission will rise to near fossil fuel levels.

These assertions ignore hard data and misunderstand the concept of mineral resources.

A typical life cycle analysis of nuclear energy shows that total energy inputs are about two percent of outputs. Using the presuppositions of much lower ore grades, that figure rises to 2.5%.

An audited life cycle analysis of the Forsmark nuclear power plant in Sweden shows (using 2002 data) that inputs are 1.35% of output. In this case over 90% of the energy used in enrichment is nuclear, and carbon dioxide emissions are 3.1 g/kWh - less than 1% of those from comparable coal-fired plant.

Various reputable data and estimates put carbon dioxide emissions from nuclear power at up to 3% of those from coal-fired plants.

The misunderstanding of mineral resources gives rise to the suggestion that current known resources are a sensible quantification of what will be economically available in the Earth's crust in years to come, and hence the need to mine low grades is imminent. As is well established since the "Limits to Growth" fiasco of the 1970s, published figures simply represent our state of knowledge and bear much more relationship to past mineral exploration expenditure than to what is actually there. We can be confident that known economic resources of uranium (as of other metal minerals) will increase in line with exploration effort. While ore grades may well decline to some extent, the energy required to utilise them will not become excessive.

Further information and data on energy analysis is in the UIC's briefing paper *Energy Analysis of Power Systems.*

The need for continuous, reliable supply

While the UIC has a positive view of the role of wind and solar power in the overall electricity supply, we wish to emphasise that the main demand in any urbanised country is for continuous, reliable supply on a large scale, and these intermittent renewables simply cannot meet that, let alone on an economic basis. Nor is there any prospect of them doing so.