



Australian Uranium Resources and Production in a World Context.

BOB CLEARY

Chief Executive, Energy Resources of Australia Ltd,
Ground Floor, 120 Christie Street, St Leonards, Sydney NSW 2065

SUMMARY. The aim of the paper is to discuss Australian uranium resources and production from the perspective of ERA, the world's third-largest uranium producer, and one of only three producing uranium mining companies in Australia. ERA is a long-term supplier of uranium concentrates for the nuclear power generation industry overseas, a key part of clean global energy supply. ERA's Ranger plant was designed to produce 3,000t U_3O_8 /yr, with expansion of the plant in the early 90s to a 5,700t U_3O_8 /yr capacity. Australia continues to have the world's largest reserves of uranium recoverable at costs of US\$40/kg or less, but lags behind Canada in primary production of uranium. This paper discusses some of the reasons for the gap between resources and production, with examples from the company's own experience. Political, social and environmental factors have played a big role in the development of the uranium industry – ERA has been in the forefront of these issues as it pursues sustainable development practices.

Introduction

It is good to be with you today to speak to you about uranium mining from my perspective as CEO of one of only three producing uranium mining companies in Australia.

The subject of my paper is Australian uranium resources and production in a world context. As I go through the paper I will attempt to differentiate the situation for Australia versus other producers. Today I want to bring you up to date with developments in Australia with uranium resources and production. Then I want to share my thoughts about perception versus reality for an Australian uranium producer.

But firstly, who are we at ERA?

Energy Resources of Australia Ltd

Energy Resources of Australia, with the Ranger and Jabiluka leases (Fig. 1), is a long-term supplier of uranium concentrates for the nuclear power generation industry, supplying the industry for more than 20 years.

We are proud to be associated with an industry that is starting to get the recognition it deserves as a key part of clean global energy supply.

It was most gratifying at the World Nuclear Association (WNA) conference in London in September to listen to presenters talking about the hydrogen economy, and the undeniable role that nuclear power will play in making all of this possible in a clean and efficient way. It was a clear signal that companies like ERA will have a vital role to play for the generations to come.

ERA has successfully operated uranium mining and production facilities in an area surrounded by the World Heritage Kakadu National Park, without any impact on the ecosystems within that park. Much research and ongoing testing has been done for more than 20 years to ensure that this is the case, and achieving that outcome has been a top priority for ERA since inception. And it has been achieved. That is the consistent view of the Office for the Supervising Scientist whose job it is to track our environmental performance.

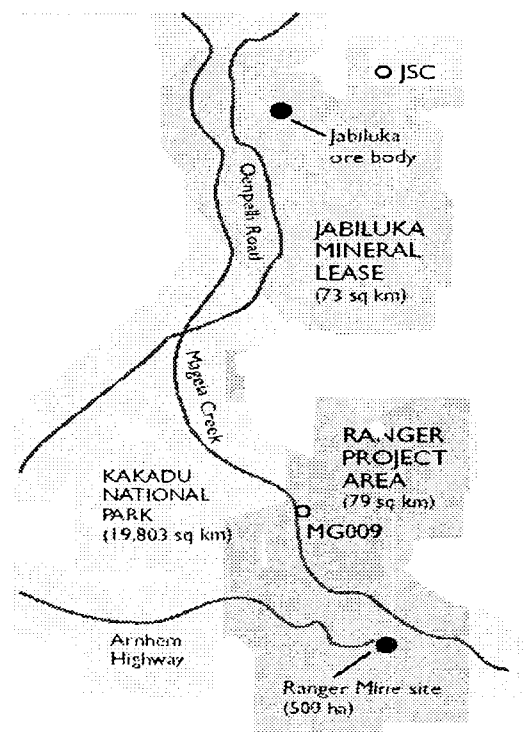


Fig. 1: ERA's current leases

ERA is the world's third-largest uranium producer. Since 1980, the Company has mined uranium ore to produce uranium oxide at the Ranger Mine located 250 kilometres east of Darwin in the Northern Territory. Our Jabiluka project remains on environmental care and maintenance, with a new Agreement covering the area soon to be finalised, and I'll speak a bit more about Jabiluka shortly.

We sell our products to power utilities in Japan, South Korea, Europe and North America under strict international safeguards. Initially the Ranger plant was designed to produce 3,000t U₃O₈/yr, with expansion of the plant in the early 90's to a 5,700t U₃O₈/yr capacity.

Geoscience Australia Figures

Turning to our focus today on uranium resources and production, our primary source is Geoscience Australia's latest report; Australia's Identified Mineral Resources.

Geoscience Australia monitors whether resources are being discovered and developed for production at rates sufficient to maintain Australia's position as a major supplier.

The latest figures, as yet unpublished, show that Australia continues to have the world's largest reserves of uranium recoverable at costs of less than US\$40 kg. These resources add up to 689,000 tonnes, about 40,000 tonnes above the previous year's estimate. The increase is due to increases in proved and probable reserves at Western Mining's Olympic Dam operations.

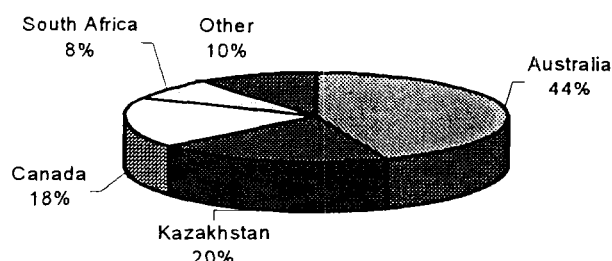


Fig. 2 U: Reasonably assured resources recoverable at costs of less than \$US40/kg

Australia's total resources amount to 44 percent of world resources in this category (Fig.2).

Australia also leads the world at the higher figure of reserves recoverable at costs of less than US\$80 a kilogram. Resources recoverable in this category are now estimated at 702,000 tonnes in Australia.

These figures tell us that Australia has tremendous uranium resources, in fact the lion's share in world terms. But the figures do not tell us the whole story.

Large resources do not always translate into primary production.

The first reality check is in recognising the gap between resources and mineral reserves. For any mine to go ahead, there must be a financial attraction for investors, which means a profit from efficiently mining and extracting the U₃O₈ from the host rock. Once this financial "filter" is applied to Ranger's stated resources, for example, the available U₃O₈ to the power industry decreases by more than 50%.

So for the industry to be reviewing available resources on the basis of costs of US\$40/kg, when the current price is a little over half of that number, is quite misleading. To quote available resources at costs of US\$80/kg, when prices that high were only achieved once over a 30-year period, denies the reality of this very open market.

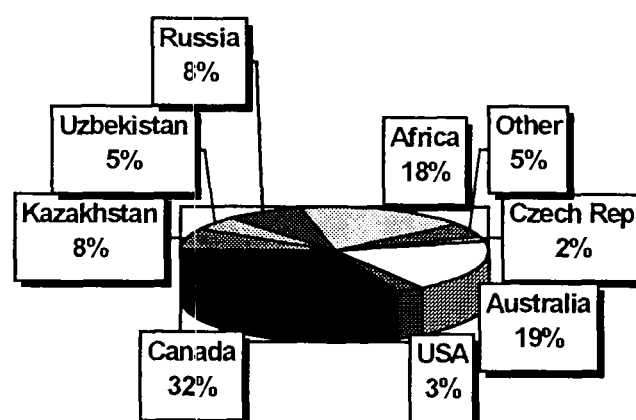


Fig. 3 World Uranium Primary Production by Region 2003

On the last available figures, Canada has 32 percent of primary production, followed by Australia at about 19 percent, followed by African nations which jointly have about 18 percent (Fig.3).

So for Australia the story is: 44 percent of the world's resources, and yet only 19 percent of primary production.

Why is this so?

Australian Uranium Development

In Australia nowadays it typically takes around seven years from the successful delineation of a resource (that is after exploration) to initial production for *most* types of mining commodity. The Environmental Impact Statement, regulatory approvals and a raft of community obligations not only consume resources, but also consume long periods of time.

When uranium is the commodity, there are countless extra political hurdles based on concerns within some political parties and some parts of the community about the nuclear fuel cycle, particularly waste management, and unfounded fears about the possible diversion of nuclear reactor fuel for use in weapons. With no nuclear power generation in Australia to create flow-on personal impacts locally from interrupting, complicating or attempting to stop the nuclear fuel cycle, the opposition to uranium mining is much more strident.

At ERA's minesites at Ranger and Jabiluka there are environmental perceptions stemming from the simple fact that the minesites border a World Heritage National Park. Equally importantly, the leases are on Aboriginal Land proclaimed under the Aboriginal Land Rights Act of 1976, with its many regulatory and legal structures.

ERA has always taken its health, environmental and community obligations seriously: in such a highly-regulated industry we are bound to do so; it simply makes good business sense. This requirement of environmental excellence has also been seen by groups opposed to the nuclear power industry as fertile ground for raising community concerns, and hence building significant delays into approval processes. Hence 15 years or more is the expectation in Australia for taking an economic uranium discovery into production.

It is also important to note that ERA has been 68 per cent owned by Rio Tinto since August 2000. Rio Tinto was an early champion of sustainable development and building sustainable communities.

The Rio Tinto philosophy is that in order to ensure a long-term future in a region, we must build a partnership with the communities in which we operate, and have those communities supportive of our proposed operations. They need to be convinced that their lives will be enhanced, not diminished, by our adjacent mining operations.

ERA's Sustainable Future

ERA agrees with this philosophy, and we have been pro-active in these areas. We need to demonstrate the Company's values in what we do, rather than simply state our values and what we are committed to doing. Hence, we have for example recently brought forward by 12 months our plans to be certified under the highest international environmental management standard, ISO 14001.

We are also working on a Jabiru Region Sustainability Project in partnership with local stakeholders to identify possibilities for the future of the town and the region.

We have also begun to change our approach to building stronger links with the Mirrar people, who are the Aboriginal Traditional Owners of the area covering our Ranger and Jabiluka mines.

The Jabiluka ore has not been sent to the Ranger mill, our preferred option for development, because the local people have exercised a veto over milling the ore at Ranger. Also the Commonwealth Government has made a commitment to the World Heritage Committee of the U.N. that Jabiluka would not be mined until Ranger had commenced winding down.

The Mirrar Traditional Owners have told us that right now they want the Jabiluka decline backfilled, as part of a broader discussion on the future of the site. In August we reached an agreement with them on the backfill, which also makes good economic, social and environmental sense.

We are now working towards a formal Agreement on Jabiluka's long term care and maintenance. The Agreement will halt current company payments in respect of Jabiluka, as well as confirming that ERA will not develop Jabiluka without the support of the Mirrar.

I am telling you this story about Jabiluka to illustrate the fact that developing a uranium mine can be a long, slow business. It can demand significant time and energy of the Company's management, and can be very costly.

Our strategy in filling the Jabiluka decline is to put ourselves on firmer footing to do better business for ERA in the region in future.

The Jabiluka deposit was discovered more than 30 years ago. This long and drawn out process in Australia brings with it significant risk for those prepared to believe in and invest in the future of nuclear power. This is because even though a project may be well equipped to run the gauntlet of approvals, the uncertainty of timing means it may well emerge from the process at a time that the market is unfavourable, the politics may block it, or the attitude of the community towards it may have changed.

This experience shows that for new entrants, the uranium industry has been a relatively high-risk proposition. This could go a long way towards explaining why Australia's contribution to nuclear fuel supply lags what our share of world resources would suggest.

For some years, in the primary production uranium supply industry, the strongest market forces have been the entry of new competitors (e.g. eastern bloc production), entry of substitutes (e.g. inventory and downblended material) and hence the decline in the bargaining power of producers (due to excess supply).

We could also put forward another force, a 6th force to add to Porter's usual five forces, a political and environmental force. The point was made recently in the Australian Government's *Mays Report on Corporate Sustainability* that this force might actually benefit a company in the long-term. I quote the report: "The management of sustainability issues through corporate sustainability can bring about embedded and innovative advantages which deliver: better risk management; cost savings; management of intangible assets; extended corporate governance; performance culture; innovation; recognition and management of key stakeholders."

Historical western uranium production vs reactor requirements

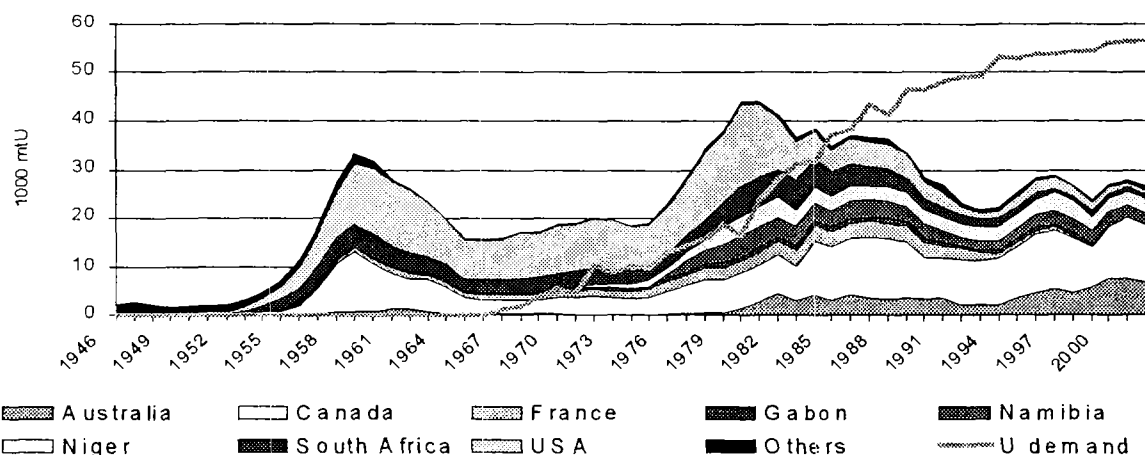
Figure 4 shows the first peak in production aimed at weapons manufacture in the fifties and sixties.

The second peak in the early 80s showed the world gearing up for greater nuclear power production. The demand, due to several international incidents, turned out to build more slowly than expected. The net result of all of this was oversupply – oversupply of a commodity that could be effectively stored in significant quantities for many years. And that is exactly what many power utilities around the world did.

The result of this oversupply has been that the higher cost and generally smaller uranium producers have shut down or have been consolidated. The secondary uranium material, such as down blended nuclear weapons material, is now mostly part of main stream production.

In regard to primary production, there is a spread of regional players in this market, with a number of mines or extraction centres in most regions. However, over 70% of primary supply comes from just three locations, Australia, Canada and Africa.

Let's look at where the majority of the western resources lie. While the huge Olympic Dam deposit represents the major portion of Australia's uranium resources, those of Ranger and Jabiluka are by all measures a significant part of the picture. Of the estimated total tonnes of in-situ uranium oxide in world resources, **over half** resides in just six major deposits.



Reproduced with permission of WNA

5

Fig. 4 Historical Western Uranium Production vs Reactor Requirements

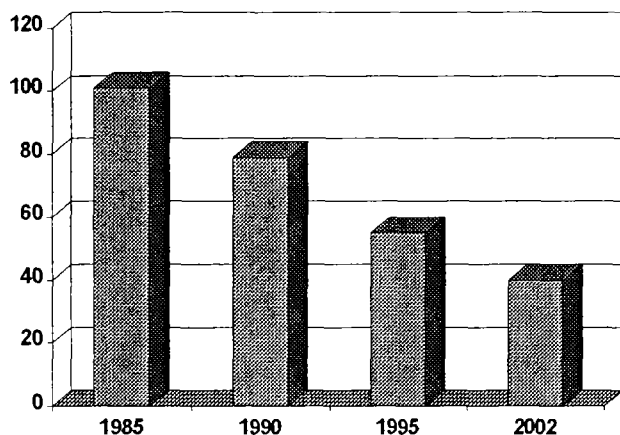


Fig. 5 Estimated number of active global Uranium Production Centres

There are a number of ways that the primary uranium supply industry has been consolidating. The number of mines actively producing has reduced, individual mines have become larger, the number of companies owning these mines has reduced, and interestingly the methods of mining used are consolidating.

It is often insightful to review overarching trends in an industry.

In 1999 - 44% of primary uranium production was sourced from underground methods, including 11% of this as by-product production. I include by-product with underground because virtually all uranium by-product production is in fact from underground mines, be they primarily copper, gold, etc.

Last year underground mining rose to 49 percent, with open pit mining declining.

It is likely that, by 2015, the percentage of uranium produced by underground means will increase to around two-thirds of global primary supply, even with increased ISL production.

What does this indicate for primary supply and the nuclear fuel industry? It indicates that there will be higher investment costs, longer time needed to construct, extreme diligence in radiation and underground environmental controls, requirement for competent management of normal underground mining parameters, and the ongoing costs of ensuring best practicable operation.

These all mean that the returns to sustain a level of required profitability in the business have to be available. And these returns have to be reasonably locked in, at least for some forward period of time, at the commitment phase of a project.

The extraordinary delays experienced for uranium projects in Australia makes forecasting the timing of first production extremely difficult; in virtually all areas of business, high risk is expected to be accompanied by high rewards, but some early investors may have missed out on these.

I mentioned previously that many mining operations have been closed over time. These were often smaller, higher-cost operations, or those where the economic ore reserves was depleted. The approximate number of operating mines around the world has reduced during the last 20 years from more than 100 mines in 1980 to around 40 currently. Of these, only 25 or so market their production onto the world markets through 13 companies.

This industry consolidation has been driven by the need for improved operating costs to compete with the increased sources and variety of uranium equivalent supply. If the pricing levels for uranium were to continue at existing low levels there would be further consolidation, as mines that are depleted and shut down will not be replaced by new production centres.

Conclusion:

Although Australia is particularly well endowed with uranium resources, with an estimated 44% of global reasonably assured resources by traditionally assessed standards, our producers face a number of obstacles that overseas counterparts or competitors do not.

The most significant of these additional obstacles is the uncertainty of time to production, which adds significant risk both to the potential investor in the mine and extraction plant, as well as for the power company customer, who cannot fully rely on the U_3O_8 fuel being available when needed.

All international producers deal with market risk when producing a commodity. Being able to time the bringing on of a new project with the commodity price cycle is the best strategy for that risk.

When we look at the international scene, there are alternative approaches and models for the handling of political and indigenous issues that could be instructive for Australian Governments, companies and indigenous organisations.

As I have said, we at ERA are looking at several sustainable development initiatives that are showing promise in this regard.

When we look at issues like the establishment of national parks, we have an obligation to consider all the consequences fully. We want cultural and natural heritage protected and conserved, and we want sustainable economic growth as well. The Kakadu region has a lot of cultural and conservation values, important to indigenous and non-indigenous peoples alike. We believe that we are showing that these values can co-exist successfully.

Australia has an important role to play in helping meet the energy needs for a growing world population with aspirations for the sort of living standard that access to affordable energy has given Australians. We have the uranium resources to create clean power, an important part of the world's energy mix.

The industry needs to continue to push new initiatives such as those discussed in this paper, so that there develops the political and community will to have Australia prosper from fulfilling this vital supply role.

Acknowledgement

With thanks to Geoscience Australia's Ian Lambert and Aden McKay for unpublished material.

References

Mays, S. 2003. Corporate Sustainability – an Investor Perspective. The Mays Report p. 15

OECD Nuclear Energy Agency. Uranium 2001: Resources, Production and Demand.

Geoscience Australia - Australia's Identified Mineral Resources 2002.

Energy Resources of Australia Ltd – 2002 Annual Report.

Rio Tinto – Annual Report and Financial Statements 2002.