

The Infrastructure Road to Recovery— Let's Build Our Way Out of the Depression!

Australia Must Go Nuclear!

by Robert Barwick and Jonathan Tennenbaum

Moving the bill to authorise the construction of the Snowy Mountains Scheme in 1949, the federal Chifley Labor Government's Minister for Works and Housing, Nelson Lemmon, declared to the Parliament: "Now ... the Australian Government desires to proceed with the great Snowy Mountains Scheme, in an endeavor

our to ensure that Australia does not lag in the race to develop atomic power.... Today we are living in the atomic age. It would allow great inland cities ... and decentralised industries to be built."

Today, it is vital for Australia's future that Chifley's and Lemmon's vision for an Australian nuclear power industry be revived. For

Australia to achieve the goal of 50 million people, our energy and water requirements would be most efficiently met through the widespread application of modern, clean and safe nuclear power. One kilogram of nuclear fuel in an atomic reactor generates about as much energy as the combustion of more than 50 tons of petroleum! In that

fact, we begin to grasp the vastly higher economic potential of nuclear energy, compared to fossil fuel technology.

This amazing potential was part of the Chifley Government's vision. The way that vision was virtually snuffed out within 30 years of Lemmon's declaration is a tragedy of Australian history. With it

went many of the other grand plans for Australia Post War Reconstruction (resurrected in this publication), as well as the cultural optimism that allowed our war-time nation builders to expect a future in which Australia would enjoy a prosperous population of nearly 50 million people by the end of the 20th century.

Australia's Nuclear History

From the mid-1950s until the mid-1970s, Australia boasted a world class nuclear research capability, coordinated by the Australian Atomic Energy Commission (AAEC) based at Lucas Heights in Sydney, the site of our only nuclear reactor. Australia's world-class scientists who participated in the AAEC research program in those days insist that, contrary to the anti-nuclear propaganda they have been subjected to, the focus of Australia's research was the peaceful application of nuclear power. The history of the AAEC has been very concisely recorded by its long-time director Keith Alder in a 1996 book, tellingly titled, *Australia's Uranium Opportunities: How Her Scientists and Engineers Tried to bring Her into the Nuclear Age but were Stymied by Politics*.

In its lifetime, the AAEC constructed the Lucas Heights nuclear research facility, and among its many research projects conducted notable research into reactor models, and the uranium enrichment process. In its research into reactor models, the AAEC particularly focussed on high temperature reactors (HTRs), and conducted a significant amount of the very early research into pebble bed reactors. This research was discontinued by the AAEC in the late 1960s, and was seen as unsuccessful, but today pebble bed HTRs are seen as the fourth generation, super-safe reactors whose widespread appli-

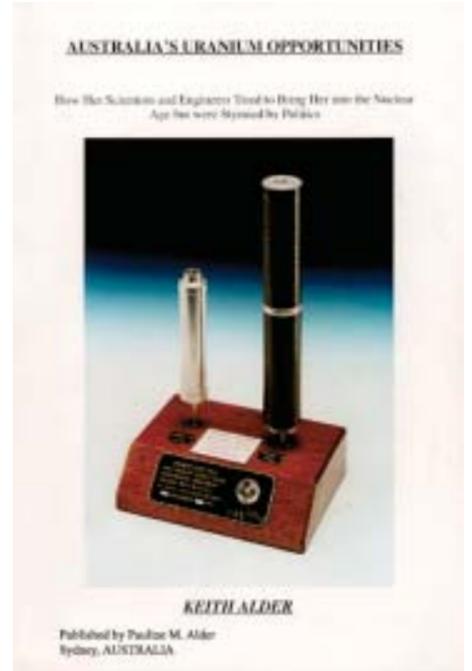
cation is the future of nuclear power generation (see pp. 33 and 34).

In 1971, Australia's nuclear power program was ended when the pro-nuclear Prime Minister John Gorton was replaced by William McMahon, who stopped the construction of Australia's first commercial nuclear power plant at Jervis Bay on the NSW south coast. The Jervis Bay nuclear reactor was a significant project, both nationally and internationally: it would have been the first realisation of a longstanding dream of nuclear power generation in Australia that, for instance, had inspired the Nuclear Research Foundation at the University of Sydney in 1955 to foreshadow a line of nuclear power plants "from Alice Springs to the Arafura Sea"; and it was the world's first genuine competitive tender for a nuclear power station, which triggered advances in enrichment technology worldwide. The decision to build Jervis Bay had been made explicitly "in the national interest". The decision by McMahon to scrap the project, after tenders had closed, the design decided and some foundations laid, was justified purely on financial grounds, and dubious ones at that. In his book, Keith Alder reports PM McMahon said to him, "How can I possibly approve a nuclear power station when I'm faced with the need to cut pre-school education in Canberra?" However, Alder maintains, "In retrospect, the Jervis Bay Nuclear Power Station would

have been a tremendous bargain if it had gone ahead.... I believe that the station would have produced the cheapest electricity in Australia during its operating lifetime." Suspiciously, when the 1971 Cabinet documents were released on January 1, 2002 under the 30-year secrecy rule, documents relating to the Jervis Bay saga were held back as still being "too sensitive" to release, even after 30 years.

Another major wasted opportunity arose from the AAEC's significant research into uranium enrichment, particularly the centrifuge enrichment process, which is necessary to enrich the raw, "yellow cake" form of uranium that is mined from the ground up to the 3-4% purity necessary for most nuclear reactors. (Again, contrary to anti-nuclear propagandists, this is not the process that enriches uranium fuel for nuclear weapons, which requires above 90% purity). This project was given particular encouragement by Labor Prime Minister Gough Whitlam's Minerals and Energy Minister, R.F.X. (Rex) Connor, who had a grand vision of an Australian uranium industry. The potential was enormous: Australia contains 30% of the world's known uranium reserves—more than any other country—and immediately upon beginning research in the field in the 1970s, the AAEC was inundated with expressions of interest from countries keen to develop Australia as an alternative source of enriched uranium.

This book is an excellent personal account of Australia's little known history in nuclear science. Tragically, the author, and many of his contemporaries, are watching their lives' work go to waste.



Tragically, with the sacking of the Whitlam Government in 1975, directly because of Connor's vision for an Australian-owned resource industry, so effectively ended the AAEC's uranium enrichment work, and a major export industry opportunity was lost.

With the advent of the Hawke Labor government in 1983, any remaining serious nuclear aspirations in Australia were effectively killed off, and a strongly irrational, anti-science "environmental"

position took over. Practically, this saw the implementation of the "three uranium mines" policy, which effectively leaves Australia's huge uranium reserves barely touched, while competitor nations like Canada enjoy booming export industries. It also saw the AAEC wound up in 1985, and replaced by the Australian Nuclear Science and Technology Organisation (ANSTO). Thus officially Australia's 30-year commitment to nuclear science.

Australia and the Current Global Reality

Australia's present anti-nuclear policy has serious ramifications. Firstly, we are denying ourselves the most efficient power source in the world, thus thwarting our own development. Secondly, we are potentially placing ourselves at risk from desperate neighbours in our region seeking an energy source which we possess in abundance, but are just sitting on. For instance, in Western Europe

and the United States, the once-mighty nuclear industrial sector is threatened with extinction, thanks to the media-driven anti-nuclear hysteria in the population and institutions. But in Asia, nuclear energy is in the beginning phases of a vast upsurge.

Characteristic of this development is the fact, that nuclear power plants have become an "export champion" of an otherwise de-

pressed Russian machining industry. At present, Russia is building six large nuclear power reactors abroad: two nuclear reactors in China (Tianwan 1 and 2 at Lianyungang, Jiangsu Province); two nuclear units in India, at Kudal; and two reactors in Iran, at Bushehr.

A whole series of further projects is under discussion. Nuclear power is making a comeback in Russia itself: The nuclear energy plant Rostov 1 went on line in 2001; three additional nuclear units are now under construction, and nine others are planned by 2010. Beyond this, the Russian Ministry of Atomic Energy has drawn up a comprehensive plan for the development of nuclear power, according to which the relative share of this energy source in the total energy generation of the nation will increase dramatically over the coming 20 years.

China is also opting for a large-scale expansion of nuclear power. Although that nation possesses enormous reserves of coal, the annual mining, distribution, and burning of over a billion tons of coal per year creates an enormous burden on the transport system and the environment, and drags down the physical productivity of the Chinese economy. For that reason alone, a broad utilisation of nuclear energy is inevitable. There are now eight large nuclear power reactors under construction: Qinshan 2, 3, 4 and 5; Lingao 1 and 2; and Tianwan 1 and 2.

These projects will all be completed by 2005. Additionally

planned are two 1,000 megawatt (MW) reactors at Haiyang, while four additional units for Hui An, Fujian, Sanmen, and Zhejiang are under study.

In South Korea, two nuclear power plants are under construction, and the construction of an additional 12 units is planned by 2015. Japan projects the construction of an additional 20 large nuclear reactors.

India plans 12 additional nuclear energy plants. Even Vietnam is planning the construction of a first nuclear power plant by 2020, in its long-term government program. Indonesia, while a major petroleum-exporting nation, has also been studying the possible domestic applications of nuclear power.

In *Australia's Uranium Opportunities*, Keith Alder spells out the awkward position Australia's current policy is put in by these nuclear developments in Asia. "Looking ahead, all of the Asian countries expanding their nuclear programmes that I outlined earlier will need increasing supplies of uranium. They all know we have it, in large quantities. If we continue to say 'no' to exploration and mining and the world supply becomes scarce or expensive, what do you think their attitude will be. I am not pointing the finger at anyone in particular, just pointing out that if we don't take advantage of our resources someone else may come and do it for us. And who will stop them? None of the administrators of heritage areas, parks and wildlife areas, or aboriginal reserves."

In a discussion with the *New Citizen* on January 4, 2002, former Newcastle Associate Professor of Physics Dr. Colin Keay, the author of two books on nuclear matters, *Nuclear Energy Fallacies*, and *Nuclear Radiation Exposed*, spelled out a solution to this situation.

"What Australia could do, and this would be, in my view a highly moral approach, is to participate in the full fuel cycle. We mine the uranium, and we make the fuel rods for reactors to the specifications of whatever reactor they are needed for. And to replace those fuel rods when the energy has been extracted, we supply more upon return of the old ones, which we then reprocess. For the intractable waste, we've got the world's best opportunity for burying and disposing of it. We reprocess it, we salvage material to put into the new fuel rods, and we keep the cycle going. That way Australia maintains tight control over the whole cycle, because if any material gets out of that cycle, it is subject to the provisions of the Nuclear Non-Proliferation Treaty. And so we are really upholding an international treaty, and we are behaving in a highly ethical way. We could do that."

Further to that commonsense initial step, there is a wealth of exciting potential developments that would open up for Australia, if Australia ditches its current irrational, anti-science, anti-nuclear policy and develops a modern, clean, safe nuclear power industry.

Exposing the Myths

Australia nuclear energy development was thwarted by policies based not on scientific fact, but on anti-nuclear scare stories that are nothing more than superstitions. In two self-published booklets, Dr. Colin Keay, PhD, DSc, a former Associate Professor of Physics for 24 years at the University of Newcastle, who has no past or present connection with the nuclear industry, has emphatically exposed these superstitions, "in the interests of a better future for Australians..." "Nuclear Energy Fallacies: Forty Reasons to Stop and Think", and "Nuclear Radiation Exposed: A Guide to Better Understanding" are mandatory reading for any open-minded Australians who want a scientific understanding of nuclear matters, as opposed to the mass media-propagated superstitions. These concisely-written, 36-page booklets are available from the author for just \$5.00 each, by writing to:

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