Summary of 'Tentative Findings' of SA Nuclear Fuel Cycle Royal Commission

Summary by Jim Green, national nuclear campaigner, Friends of the Earth

The 'Tentative Findings' report is posted at: http://nuclearrc.sa.gov.au/tentative-findings/
The deadline for written submissions responding to the report is March 18 (see the above website for details).
The final report will be published in May 2016.

What does the report say?

In a nutshell, the Royal Commission is negative about almost all of the proposals it is asked to consider – but positive about the proposal to import high-level nuclear waste from nuclear power plants for disposal in South Australia.

Uranium mining

The report states: "An expansion of uranium mining has the potential to be economically beneficial. However, it is not the most significant opportunity."

The report notes there are "significant barriers to the viability of new uranium mine developments in South Australia" including the "current low price of uranium and uncertainty about the timing of any price increases", "the costs of identifying new deposits", etc.

The report praises Australia's "active involvement in strengthening the international safeguards system". However, Australia is actively weakening the nuclear safeguards system. The most recent example is the proposal to sell uranium to India – a country which is actively expanding its weapons arsenal and refuses to sign the Comprehensive Test Ban Treaty. That proposal has been endorsed by the federal government despite strong criticisms from a *who's who* of nuclear arms control diplomats and experts including John Carlson (former long serving Director-General of the Australian Safeguards and Non-Proliferation Office from 1989 to 2010), Ron Walker (former chair of the International Atomic Energy Agency), and Prof Lawrence Scheinman (former assistant director of the U.S. Arms Control and Disarmament Agency). These are veteran players in global nuclear diplomatic and regulatory regimes, not anti-nuclear activists.

Uranium processing stages of the nuclear fuel cycle

The Royal Commission report says: "In an already oversupplied and uncertain market, there would be no opportunity for the commercial development of further uranium processing capabilities in South Australia in the next decade."

It further states: "At present, the market for uranium conversion and enrichment services is oversupplied."

It further states: "However, fuel leasing, which links uranium processing with its eventual return for disposal, is more likely to be commercially attractive, creating additional employment and technology-transfer opportunities."

That finding is contradictory – fuel leasing would involve entry into several markets, such as uranium conversion and enrichment, which are oversupplied and not commercially viable as the Royal Commission itself notes.

On nuclear fuel reprocessing, the report states: "Without nuclear power generation, a used fuel reprocessing facility would not be needed in South Australia, nor would it be commercially viable."

Nuclear power

The Royal Commission's findings regarding nuclear power are very sceptical. The report states: "Taking account of future demand and anticipated costs of nuclear power under the existing electricity market structure, it would not be commercially viable to generate electricity from a nuclear power plant in South Australia in the foreseeable future."

Similarly the report states that "on the present estimate of costs and under current market arrangements, nuclear power would not be commercially viable to supply baseload electricity to the South Australian subregion of the NEM from 2030 (being the earliest date for its possible introduction)". And more bluntly: "it would not be viable".

The report further states: "In Australia, the ability for nuclear power to contribute to emissions reductions before 2030 is affected significantly by the long lead time to make new capacity operational."

The report then throws a small bone to the nuclear power lobby: "However, Australia's electricity system will require low-carbon generation sources to meet future global emissions reduction targets. Nuclear power may be necessary, along with other low-carbon generation technologies. It would be wise to plan now to ensure that nuclear power would be available should it be required."

Similarly the report states: "The politics concerning global efforts to reduce emissions are fluid. It would be wise to plan now for a contingency in which external pressure is applied to Australia to more rapidly decarbonise. Action taken now to settle policy for the delivery and operation of nuclear power would enable it to potentially contribute to a reduction in carbon emissions. While it is not clear whether nuclear power would be the best choice for Australia beyond 2030, it is important that it not be precluded as an option. ...

There is a major push for a waste-to-fuel plan which would involve importing high level nuclear waste and to converting it into fuel for (non-existent) 'integral fast reactors' (one of a variety of non-existent Generation IV reactors). The push comes from Senator Sean Edwards, nuclear industry consultant Ben Heard and others. The illogical nature of the waste-to-fuel plan is neatly debunked in an important recent report by The Australia Institute, commissioned by Conservation SA.

The Royal Commission could not be clearer on the topic of fast reactors. It states: "Fast reactors or reactors with other innovative designs are unlikely to be feasible or viable in South Australia in the foreseeable future. No licensed and commercially proven design is currently operating. Development to that point would require substantial capital investment. Moreover, the electricity generated has not been demonstrated to be cost-competitive with current light water reactor designs."

So the waste-to-fuel fantasies of Senator Edwards and Ben Heard are dead and buried.

The Royal Commission is also sceptical about proposals for 'small modular reactors' or small off-grid reactors. It states: "Off-grid nuclear power also is unlikely to be viable in South Australia in the foreseeable future because of low demand, even assuming optimistic growth of mining activities, and the likely location of that demand."

Nuclear waste

According to the Jacobs MCM report commissioned by the Royal Commission, revenue from the importation of spent fuel (high level nuclear waste) and intermediate level waste would exceed the costs of managing the waste; i.e. it would be profitable.

However the revenue estimates have no basis in reality. There is no comparable overseas model of commercial trade of nuclear waste for disposal. No real idea how many countries might avail themselves of the opportunity to send nuclear waste to Australia for disposal, or how much they might send, or how much they might pay. So there's no way of knowing whether revenue would exceed costs.

The estimated construction costs for a deep underground repository for high level waste are in the tens of billions of dollars. For example the construction cost estimate in France is A$39 billion while in Japan the estimate is A$43 billion.

Of course, there are significant additional costs associated with operating and monitoring repositories. The US governments estimates that to build a repository and operate it for 150 years would cost A$135 billion.

The Jacobs report commissioned by the Royal Commission provides a similar figure. The Jacobs paper estimates costs of $145 billion over 120 years for construction, operation and decommissioning.

But the above timeframes – 150 years in the U.S. report and 120 years in the Royal Commission study – are nothing compared to the lifespan of nuclear waste. It takes 300,000 years for high level waste to decay to the level of the original uranium ore. The Royal Commission report notes that spent nuclear fuel (high level nuclear waste) "requires isolation from the environment for many hundreds of thousands of years."

In the US, the Energy Department's plan aims to safeguard nuclear material for the next 10,000 years. Presumably the argument is that residual radioactivity after 10,000 years is so low that active monitoring is no longer required.

So what might the costs of monitoring waste for a period of 10,000 years be? The Royal Commission is silent on that important question. Thus the Royal Commission's conclusion that importing waste could be profitable has no rational basis given that the cost of managing waste for millennia is not considered.

Finally it should be noted that there is only one deep underground repository for nuclear waste anywhere in the world – the Waste Isolation Pilot Plant (WIPP) in the U.S. state of New Mexico.

WIPP was closed in 2014 because of a chemical explosion which ruptured a nuclear waste barrel and resulted in 23 workers being exposed to radiation. Before WIPP opened, the government estimated one radiation release accident every 200,000 years. But there has been one radiation release accident in the first 15 years of operation of WIPP.

The Royal Commission's report is silent about WIPP. It is silent about the Asse repository in Germany, where massive water infiltration has led to the decision to exhume 126,000 barrels of radioactive waste. The report is silent about the fire at a radioactive waste repository in the U.S. state of Nevada last year. And the report is silent about many other problems with the nuclear industry that it should have squarely addressed.

Some expert responses

Prof. Ian Lowe, Emeritus Professor of Science, Technology and Society at Griffith University, and a member of the Royal Commission's Expert Advisory Committee:

"The crucial finding of the Royal Commission is that community consent would be essential to the successful development of any nuclear fuel cycle activities. It says "Long-term political decision-making, with bipartisan support at both state and federal government levels, would be a prerequisite". It is difficult to see how bipartisan support at both levels would be achieved for South Australia being more deeply involved in the nuclear industry.

"It notes that uranium mining currently contributes relatively little to South Australia. Despite Roxby Downs being one of the largest uranium producers in the world, its royalties are about $4 a year for each South Australian. The Commission sees little prospect of local processing of uranium and correctly observes that nuclear power is not economically feasible. The Switkowski report in 2007 found that significant public subsidies would be needed to make nuclear power economic in Australia.

"The most serious proposal in the Commission's tentative findings is that SA should consider setting up shop as a destination for radioactive waste from countries like Japan, Taiwan and South Korea. The Commission believes that this could be a profitable operation, but that belief is based on generous assumptions about the willingness of those countries to pay for the removal of their waste. Independent analysis by The Australia Institute questions those assumptions and concludes the operation would probably not be profitable. The Commission also notes "there are no operating models for the commercial transfer of used fuel for disposal. Any proposal to store and dispose of used fuel in South Australia would require agreements between customer countries and both the federal and state governments". That is a big hurdle, as is the acknowledgement that "any development would require sophisticated planning and consent-based decision-making, acknowledging the particular interests and experiences of regional, remote and Aboriginal communities.

"So the report gives a red light for nuclear power, a tentative amber light for expanding uranium mining, a red light for further processing of uranium for export, then a very tentative and heavily qualified amber light for the SA State government's concept of setting up as the destination for east Asia's radioactive waste."

Associate Professor Mark Diesendorf, Associate Professor in Interdisciplinary Environmental Studies at the University of New South Wales:

"The Royal Commission's report acknowledges that nuclear electricity is not commercially viable in South Australia. However, it expresses great enthusiasm for the management and disposal of overseas-produced high-level and intermediate level nuclear wastes in South Australia. It supports a combination of above-ground interim storage of dry casks together with underground 'permanent' storage. The rationale for this economically risky scheme is slender, being based on the quantities of wastes held in temporary storage by countries with nuclear power stations. The report is not troubled by the fact that no country, not even the USA, has so far succeeded in building and operating an underground waste dump.

"It fails to address the points raised by the Australia Institute, questioning, for example, why nuclear countries would pay to export their wastes when it may be cheaper to manage them at home. The economic analysis justifying this scheme is a single 2016 study, most of whose assumptions are not stated in the Commission's report. The Commission discusses the alleged benefits of this scheme, while failing to acknowledge the economic risks of Australia managing high-level wastes for hundreds of thousands of years by means of unproven technologies and social institutions."

Professor Jim Falk, Professorial Fellow at the Melbourne Sustainable Society Institute, University of Melbourne and an Emeritus Professor at the University of Wollongong:

"This report should not provide much cause for optimism amongst thoughtful members of Australia's pro-nuclear lobby. As with the previous Switowski report a decade ago, this report makes clear that nuclear energy generation and further fuel processing including enrichment and spent fuel reprocessing will be uneconomic in Australia without major changes in the Australian and world market."

"Oddly, the report settles on high-level nuclear waste storage as the opportunity for South Australia. This is odd given the decades long process (from as early as 1984) for the Commonwealth in trying to find an acceptable location to store Australia's existing low- and intermediate-level nuclear waste. This couples with the Commission's insistence that any extension of nuclear activities should have both bipartisan political support and the consent of the community.

"Prior experience, especially in Australia, and also in many other parts of the world including the USA, reflects long standing and widespread concerns about the safety of storing nuclear wastes completely isolated from the environment for the many centuries required. Given this, it would be fair to characterise any government which sought to open the way to waste storage and disposal in Australia as at best "courageous" and perhaps less politely, as "very politically foolish.""