



A Critique of the South Australian Nuclear Fuel Cycle Royal Commission

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1. Origins of the Royal Commission

In March 2015 South Australian Premier Jay Weatherill announced a state based Royal Commission into the nuclear industry. The announcement surprised many. Unlike most Royal Commissions, it was not a response to a salient public issue. It appears rather that it was a calculated political initiative that resulted from non-transparent lobbying by a small number of people with a pro-nuclear agenda.¹ Consequently the Royal Commission has been framed not as an objective risk/benefit analysis but rather as a feasibility study.

The pre-emptive preclusion of any possibility of recommendations to reduce SA's role in uranium mining – both in statements by the Premier and in the wording of the Royal Commission's Terms of Reference – is indicative of a bias that permeates the Royal Commission. That preclusion is objectionable. SA's uranium industry is in great need of a comprehensive risk/benefit inquiry for reasons discussed in detail in the joint submission to the Royal Commission by Conservation SA, the Australian Conservation Foundation and Friends of the Earth, Australia.²

¹ As a sceptical Whyalla resident put it: "It used to be royal commissions were held to investigate things that were done wrong, now they're using them to justify doing the wrong thing."

www.whyllanewsonline.com.au/story/2952866/no-nuclear-in-our-backyard/?cs=1928

² www.foe.org.au/sites/default/files/NFCRC%20submission%20FoEA%20ACF%20CCSA-FINAL_0.pdf

2. Royal Commission processes

2.1 EDO (SA) submission

The submission to the Royal Commission by the Environmental Defenders Office (SA) provides a useful summary of issues, problems and possible solutions regarding the Royal Commission's processes. The EDO(SA) pointed to three issues that cast doubt upon the Commission's ability to fulfil its mandate to "undertake an independent and comprehensive investigation into South Australia's participation in four areas of activity that form part of the nuclear fuel cycle", namely:

- the Commission's failure to minimise the procedural barriers for community members to make submissions.
- the Commission's failure to provide resourcing for community participation in the Royal Commission.
- the Commission's failure to entrench, in its processes, international best practice in regard to meaningful community stakeholder participation.

Consequently, the EDO(SA) recommended a number of initiatives that would place Australia at the forefront of "community stakeholder participation" best practice, namely:

- Simplification of the Royal Commission consultation processes;
- Resourcing of independent information, training and advice services to community stakeholders in the context of both the Royal Commission and ongoing community participation under legislation and regulation; and
- Legislative and regulatory reform in regard to nuclear activity related decisions to provide greater community access to information, greater opportunities for community comment and community appeal and judicial review rights.

2.2 Issues Papers

The Royal Commission prepared four Issues Papers based on the Commission's Terms of Reference. In line with the feasibility study remit set out in the ToR, the four Issues Papers are framed in terms of overcoming obstacles. They are written as if there were no fundamental ethical issues involved or requiring consideration.

The Issues Papers each contain a list of questions, but the format of the questions omits a key component. They jump straight from asking if there are any obstacles to expanding South Australia's role in nuclear fuel cycle activities to how to overcome those obstacles, without adequate or objective consideration of whether it is desirable or appropriate to engage in the activities in the first place.

While the questions in the Issues Papers allow some room for responding in other than narrow scientific and economic terms, the assumptions that underpin the process are not neutral. The thrust is on how to overcome any lack of public confidence, rather than respecting that there might be good reasons for the lack of confidence and that this lack of confidence might of itself be grounds for not proceeding.

Opinions of official organisations such as the International Atomic Energy Agency (IAEA), the Organisation for Economic Cooperation and Development (OECD) and the World Nuclear Association (WNA) are treated as non-controversial, even though these organisations are well-known promoters of nuclear energy. In the case of the IAEA, Article 2 of its Statute explicitly specifies that its mandate is to promote nuclear energy.³

³ *The Statute of the IAEA*: www.iaea.org/about/statute

Critical texts, even highly regarded empirical texts such as the World Nuclear Industry Status Report⁴, are not cited.⁵

It is beyond the scope of this paper to detail all the contested and inaccurate statements in the Royal Commission's Issues Papers. Suffice it to note one important example: the casualties from the Chernobyl nuclear accident in Issues Paper 3 are grossly understated. Issues Paper 3 refers only to deaths of 'operators and emergency service personnel', without referring to the thousands of additional mortalities estimated to arise as a result of radiation exposure. The very lowest of these estimates comes from UN agencies, who estimate up to 4,000 fatal cancers among the higher-exposed Chernobyl populations (emergency workers from 1986–1987, evacuees and residents of the most contaminated areas) and an additional 5,000 deaths among populations exposed to lower doses in Belarus, the Russian Federation and Ukraine.⁶ Other scientific studies – including studies published in peer-reviewed scientific literature – estimate tens of thousands of cancer fatalities.⁷

This one case highlights the Commission's disturbing pattern of not reflecting or acknowledging the contest that exists in relation to many nuclear impacts, operations and policies.

2.3 Overseas Visits and Public Sessions

The Royal Commission can be commended for seeking out not just nuclear proponents but also nuclear critics in some of the countries it visited. However, the overwhelming majority of people interviewed have been nuclear proponents.⁸

Likewise, many more nuclear proponents than opponents have been invited to participate in the public hearings (called Public Sessions) held in Australia. SA and national environment groups contributed a 248-page joint submission⁹ with 793 footnotes yet our request to participate in a Public Session was twice rejected by the Royal Commissioner. The Medical Association for Prevention of War¹⁰ has an extraordinary depth and breadth of knowledge on radiation and health issues yet its request to participate in a Public Session was rejected by the Royal Commissioner.

2.4 Submissions

In order to make a valid submission, the Royal Commission required that an affidavit be signed and witnessed by a JP. This unnecessary burden undoubtedly discouraged many ordinary citizens, particularly those in regional or remote areas, from making submissions. It was also a potential barrier to people from overseas from making submissions.

⁴ www.worldnuclearreport.org/

⁵ We identified only one reference to what could be called a critical text. That was a reference to a report by the International Panel on Fissile Materials (Issues Paper 2, reference 11).

⁶ Chernobyl Forum, 2005, 'Chernobyl's Legacy: Health, Environmental and Socio-Economic Impacts',

www.iaea.org/Publications/Booklets/Chernobyl/chernobyl.pdf

World Health Organization, 2006, www.who.int/mediacentre/news/releases/2006/pr20/en/index.html

www.who.int/ionizing_radiation/chernobyl/background/en/

⁷ A number of these studies are discussed at:

www.theecologist.org/News/news_analysis/2370256/chernobyl_how_many_died.htm

⁸ <http://nuclearrc.sa.gov.au/worldwide-visits/>

⁹ www.foe.org.au/sites/default/files/NFCRC%20submission%20FoEA%20ACF%20CCSA-FINAL_0.pdf

¹⁰ www.mapw.org.au See also MAPW's submission to the Royal Commission.

The Royal Commissioner said that the reason for this requirement was to enable him to treat the information as evidence,¹¹ but this is an unconvincing argument. The nature of this Royal Commission (being a feasibility study, not an inquiry into legal matters such as crime and corruption) is not such that legalistic evidentiary requirements are necessary. It appears that, as the Royal Commissioner himself acknowledged during a press conference on 24 July 2015, the real reason for this requirement was to prevent 'repeat' submissions (i.e. identical submissions from many people).¹² It was an over-reaction to such submissions made in response to the call for public comments on the draft Terms of Reference. In fact, there is no reason why such submissions should not be accepted. They are a legitimate expression of interest and concern about the issues and, as such, should be taken into account.

Witnessed submissions have been published on the Royal Commission's website. Unwitnessed ones have not, even when people submitting them made the required statements of factuality and authorship.

2.5 Commissioned studies: unbalanced and unhelpful

Even a cursory reading of Royal Commission literature regarding the studies it has commissioned¹³ reveals implausible assumptions. We note only two in this report. Numerous other implausible assumptions would be noted if there was any reasonable likelihood that these would be rectified; however we have no such confidence.

Firstly, studies are being conducted on the assumption of a 37% increase in global nuclear power capacity between 2014 and 2030.¹⁴ That is an average of high and low projections from the International Energy Agency (IEA). But the IEA has a track record of overestimating nuclear growth. So does the International Atomic Energy Agency (IAEA). To its credit, the IAEA has published information assessing the accuracy of its past predictions of nuclear growth.¹⁵ Unsurprisingly, the IAEA's 'high' projections are always too high and often absurd. The IAEA's middle/reference projections are also too high, sometimes by a wide margin. The most striking aspect of the IAEA's self-analysis is that even its 'low' projections are usually too high – by 13% on average.

The low projections from the IEA¹⁶ and the IAEA¹⁷ are for a continuation of the past 10-20 years of stagnation.¹⁸ That would be a reasonable assumption to guide the studies commissioned by the Royal Commission. The 37% growth figure is not a reasonable assumption.

The Royal Commission failed to respond to these simple and reasonable questions:

1. *What is the justification for using that [37%] assumption regarding nuclear growth?*
2. *What other predictions (if any) have been considered?*

¹¹ Letters received from the Royal Commissioner dated 11 June 2015 and 5 August 2015.

Statement published on the Royal Commission's web site, 'Response to recent media reports regarding written submission requirements', 26 May 2015:
<http://nuclearrc.sa.gov.au/media-centre/26-may-2015-response-to-recent-media-reports-regarding-written-submission-requirements/>

¹² Press Conference 24 July 2015 (from about 8:30 minutes in the following YouTube recording):

<https://www.youtube.com/watch?v=a6swqTljXeE>

¹³ <http://nuclearrc.sa.gov.au/tenders-2/>

¹⁴ 6 October 2015 Public Session, <http://nuclearrc.sa.gov.au/app/uploads/2015/10/151006-Topic-5-Day-1-Transcript-full.pdf>

¹⁵ IAEA, 2007, Energy, Electricity and Nuclear Power: Developments and Projections – 25 Years Past and Future', tables 33 and 34, p.56, www-pub.iaea.org/mtcd/publications/pdf/pub1304_web.pdf

¹⁶ www.wiseinternational.org/nuclear-monitor/794/international-energy-agencys-world-energy-outlook

¹⁷ www.wiseinternational.org/nuclear-monitor/811/fanciful-growth-projections-world-nuclear-association-and-iaea

¹⁸ <https://www.iaea.org/PRIS/WorldStatistics/WorldTrendNuclearPowerCapacity.aspx>

3. Have you looked at the International Energy Agency's past predictions for nuclear growth and assessed their accuracy / inaccuracy?

A second implausible assumption underpinning commissioned research is for a 60 year operating life for power reactors.¹⁹ It is conceivable that, in time, some reactors will reach that lifespan however it is not a credible basis for an average figure. Of the 162 power reactors that have been permanently shut down, less than one-third (52/162) operated for more than 30 years and less than one in eight (19/162) operated for more than 40 years.²⁰ The average lifespan of all 162 shut-down reactors was about 25 years²¹, less than half the figure being used by the Royal Commission's consultants. The Commission's credibility and impartiality have been undermined by such deficiencies, especially given the contested nature of this policy arena.

3. Composition of the Royal Commission

3.1 A creeping bias

Speaking in November 2014 at Flinders University, Rear Admiral Kevin Scarce said: "I'm not just an advocate for a nuclear industry. I'm an advocate for looking at everything that we do in this state to see what might be a sustainable opportunity for the future."

Two points arise. Firstly, the November 2014 statement sits uncomfortably with the Royal Commissioner's March 2015 statement: "I have not been an advocate and never have been an advocate of the nuclear industry."²²

Secondly, the 2014 statement refers to "everything that we do in this state to see what might be a sustainable opportunity for the future." The Royal Commission's Terms of Reference include consideration of "the relative advantages and disadvantages of generating electricity from nuclear fuels as opposed to other sources." The Royal Commission could be pursued in such a way as to thoroughly investigate opportunities to develop renewable energy sources (and industries) in SA in addition to nuclear opportunities. That would be commensurate with the Royal Commissioner's 2014 statement, and it would be commensurate with the Terms of Reference of the Royal Commission. While the Royal Commission has not ignored renewable energy sources, they run a poor second (or perhaps a distant last) to the focus on matters nuclear. One clear example of this is that none of the research projects put out to tender address renewables.

At regular intervals a creeping bias is evident in statements from the Royal Commission. A few examples are noted here.

The Royal Commissioner said that some objections raised by nuclear critics are "overheated".²³ Why not also note that some of the claims made by nuclear proponents are overheated?

A 30 July 2015 Royal Commission media release, titled 'United Arab Emirates Model Impresses Nuclear Royal Commission', says that the UAE expects to complete building its first nuclear power plants in the

¹⁹ 6 October 2015 Public Session, <http://nuclearrc.sa.gov.au/app/uploads/2015/10/151006-Topic-5-Day-1-Transcript-full.pdf>, p.487

²⁰ www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2015.html#h.2dlolyb

²¹ www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2015.html#h.2dlolyb

²² <https://www.youtube.com/watch?v=CiR6T7YjBDA>

²³ www.afr.com/news/nuclear-inquiry-head-says-objections-to-uranium-overheated-20151030-gkn2mo

space of 10 years.²⁴ Leaving aside the possibility (or likelihood) that the target will not be met, the media release makes no mention of the elephant in the room: undemocratic states can build reactors more quickly than democratic states. Why not balance the UAE media release with another noting that most reactor projects around the world are behind schedule²⁵, that there is a clear global trend towards increasing construction times²⁶, that delays and cost escalations with new reactor projects in democratic countries are commonplace²⁷ and in some cases mind-boggling²⁸, and that only two 'newcomer' countries are actually building reactors while a greater number of countries are phasing out nuclear power²⁹?

According to a report in the *Sydney Morning Herald*, the Royal Commissioner said that Canada is the best role model for Australia, pointing to economic benefits of \$6 billion in annual turnover from its nuclear industry and the 60,000 people employed.³⁰ But there are precious few constraints on uranium mining in Australia – and precious few jobs (987 jobs according to IBISWorld's March 2015 market report³¹, less than 0.01% of all jobs in Australia). There are some jobs in conversion and fuel fabrication in Canada³², but scant possibility of these nuclear fuel cycle industries being economically viable in Australia even if there were no political or legal constraints.³³ Most of the jobs in Canada's nuclear industry are in the nuclear power sector. Megawatt-hour for megawatt-hour, there are comparable jobs in fossil fuel based electricity generation and *more* jobs in renewable electricity generation. So in what sense is Canada's nuclear industry a role model for Australia?

The Advertiser reported that the Royal Commissioner "said it was important to note that, according to World Health Organisation figures, there were 16,000 people killed by the tsunami and seven killed at Fukushima – none due to radiation exposure."³⁴ But in fact, the World Health Organisation report concluded that for people in the most contaminated areas in Fukushima Prefecture, the estimated increased risk for all solid cancers will be around 4% in females exposed as infants; a 6% increased risk of breast cancer for females exposed as infants; a 7% increased risk of leukaemia for males exposed as infants; and for thyroid cancer among females exposed as infants, an increased risk of up to 70% (from a 0.75% lifetime risk up to 1.25%).³⁵

3.2 Generation IV nuclear concepts

On two separate occasions the Royal Commissioner has made inaccurate comments regarding 'Generation IV' nuclear technology, specifically in relation to fusion and small modular reactors. We raise these issues

²⁴ <http://nuclearrc.sa.gov.au/media-centre/30-july-2015-united-arab-emirates-model-impresses-nuclear-royal-commission/>

²⁵ www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2015.html#h.2p2csry

²⁶ www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2015.html#h.147n2zr

²⁷ www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2015.html#h.2dlolyb

²⁸

www.theecologist.org/News/news_analysis/2859924/finland_cancels_olkiluoto_4_nuclear_reactor_is_the_epr_finish_ed.html

²⁹ www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2015.html

³⁰ www.smh.com.au/business/canadas-6b-nuclear-industry-a-role-model-for-aust-says-royal-commissioner-20150724-gijaar.html

³¹ IBISWorld, 'Uranium Mining in Australia: Market Research Report',

www.ibisworld.com.au/industry/default.aspx?indid=1852 A IBISWorld [Accessed 15 July 2015]

³² www.world-nuclear.org/info/Country-Profiles/Countries-A-F/Canada--Nuclear-Power/

³³ See p.90-99 of joint NGO submission:

www.foe.org.au/sites/default/files/NFCRC%20submission%20FoEA%20ACF%20CCSA-FINAL_0.pdf

³⁴ www.adelaidenow.com.au/news/south-australia/nuclear-royal-commissioner-kevin-scarce-says-fukushima-nuclear-disaster-no-major-barrier-to-sa-industry/story-fnpp66pk-1227413485904

³⁵ www.who.int/mediacentre/news/releases/2013/fukushima_report_20130228/en/

not as an exercise in point-scoring, but because of our concern that the report of the Royal Commission will be similarly wide of the mark with respect to Generation IV concepts.

In 2014, before his appointment to the Royal Commission, Rear Admiral Scarce said in a Flinders University guest lecture:³⁶

"Technology is changing so rapidly that we should be actively monitoring progress rather than keeping a closed mind on the subject. For example, in the United States work is well underway on the development of a reactor to harness nuclear fusion, the process that powers the sun. There are reports that the reactor would be small enough to fit in a truck and generate enough energy to light 80,000 homes. It would burn less than 20 kilograms of fuel in a year, producing waste that is "orders of magnitudes less" than the ash and sludge spewed from coal plants. This technology, which may be less than a decade away, could release more energy than current commercial units using nuclear fission, without the risk of Fukushima-style meltdowns."

In fact, claims³⁷ by Lockheed Martin about its proposed 'compact fusion reactor' were met with skepticism and even ridicule by scientists. For example, Matthew Hole, an academic and Australia's representative on the IAEA International Fusion Research Council, said:

"This isn't enough information to substantiate a credible program of research into the development of fusion power, or a credible claim for the delivery of a revolutionary power source in the next decade. ... So far, its [Lockheed Martin's] lack of willingness to engage with the scientific community suggests that it may be more interested in media attention than scientific development."³⁸

Even the World Nuclear Association poured cold water on Lockheed Martin's claims, noting that the 'compact fusion reactor' concept remains "undemonstrated" and that Lockheed Martin has itself acknowledged that it is "searching for partners" to help advance the technology.³⁹ Work is certainly not "well underway" as the Royal Commissioner claimed. Nor is there any credible prospect that such developments "may be less than a decade away" as the Royal Commissioner claimed.

The assertion that nuclear technology "is changing so rapidly" is also wide of the mark. Generation IV reactors appear to be always a generation away. The International Atomic Energy Agency states that (emphasis added): "Experts expect that the *first* Generation IV fast reactor *demonstration plants and prototypes* will be in operation by 2030 to 2040."⁴⁰

According to a report in the *Sydney Morning Herald*, the Royal Commissioner said that there have been rapid advances with small modular reactors (SMR), they are about four to five years away from being commercially available, they are safer than conventional reactors, and the cost is likely to be less than 10% of the cost of large-scale reactors.⁴¹ However:

- Only three SMRs are under construction according to the World Nuclear Association.⁴²

³⁶ <https://www.youtube.com/watch?v=CiR6T7YjBDA>

³⁷ www.lockheedmartin.com/us/news/press-releases/2014/october/141015ae_lockheed-martin-pursuing-compact-nuclear-fusion.html

³⁸ <http://theconversation.com/dont-get-too-excited-no-one-has-cracked-nuclear-fusion-yet-33132>

³⁹ www.world-nuclear-news.org/NN-Big-dreams-for-compact-fusion-reactor-1610147.html

⁴⁰ Peter Rickwood and Peter Kaiser, 1 March 2013, IAEA Division of Public Information, 'Fast Reactors Provide Sustainable Nuclear Power for "Thousands of Years"', www.iaea.org/newscenter/news/2013/fastreactors.html

⁴¹ www.smh.com.au/business/canadas-6b-nuclear-industry-a-role-model-for-aust-says-royal-commissioner-20150724-gijaar.html

⁴² www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Power-Reactors/Small-Nuclear-Power-Reactors/

- Interest in SMRs is on the wane. Thus Thomas W. Overton, associate editor of POWER magazine, wrote in a September 2014 article: "At the graveyard wherein resides the "nuclear renaissance" of the 2000s, a new occupant appears to be moving in: the small modular reactor (SMR). ... The SMR concept disdains ... economies of scale in favor of others: large-scale standardized manufacturing that will churn out dozens, if not hundreds, of identical plants, each of which would ultimately produce cheaper kilowatt-hours than large one-off designs. It's an attractive idea. But it's also one that depends on someone building that massive supply chain, since none of it currently exists. ... That money would presumably come from customer orders – if there were any."⁴³
- No company or country is seriously considering building the massive supply chain that is at the very essence of the concept of SMRs (mass, modular construction).
- Even SMR boosters struggle to put a positive spin on the current situation. Introducing an SMR report by *Nuclear Energy Insider*, lead author Kerr Jefeferies said: "From the outside it will seem that SMR development has hit a brick wall, but to lump the sector's difficulties together with the death of the so-called nuclear renaissance would be missing the point."⁴⁴ The report points to a "pervasive sense of pessimism" resulting from abandoned and scaled-back SMR programs.
- Glenn George from KPMG said: "I think that investors are in a wait-and-see mode regarding development of the SMR market. ... Investors will want to see SMR learning-curve effects, but a chicken-and-egg situation is at work: Decreased cost comes from production of multiple units over time, yet such production requires investment in the first place."⁴⁵
- In the absence of a mass supply chain, costs are likely to be exorbitant. Of the three SMRs under construction, two are esoteric designs (Russia's floating reactor and China's pebble bed prototype), and cost information is difficult to come by. That leaves just one SMR based on conventional reactor technology – Argentina's 25 MWe CAREM, the estimated construction cost of which equates to approximately A\$20 billion / 1000 MWe.
- Steve Kidd, former World Nuclear Industry Association executive, notes: "Even if the costs of construction can be cut with series production, the potential O&M [operating and maintenance] costs are a concern. A substantial part of these are fixed, irrespective of the size of reactor."⁴⁶
- Ron Cameron of UK Trade and Investment recently noted that cost increases for some large reactors have been "disappointing to put it mildly. First of a kind (FOAK) reactors have many difficulties, SMRs will too."⁴⁷
- Dr Mark Cooper, Senior Fellow for Economic Analysis at the Institute for Energy and the Environment, Vermont Law School, points to some economic constraints: "SMR technology will suffer disproportionately from material cost increases because they use more material per MW of capacity. Higher costs will result from: lost economies of scale; higher operating costs; and higher decommissioning costs. Cost estimates that assume quick design approval and deployment are certain to prove to be wildly optimistic."⁴⁸
- There is no reason to believe that SMRs will be safer than conventional reactors. Academics M.V. Ramana and Zia Mian state in their detailed analysis of SMRs: "Proponents of the development and large scale deployment of small modular reactors suggest that this approach to nuclear power technology and fuel cycles can resolve the four key problems facing nuclear power today: costs, safety, waste, and proliferation. Nuclear developers and vendors seek to encode as many if not all of these priorities into the designs of their specific nuclear reactor. The technical reality, however, is that each of these priorities can drive the requirements on the reactor design in different, sometimes opposing, directions. Of the different major SMR designs under development, it seems none meets all four of these challenges simultaneously. In

⁴³ www.powermag.com/what-went-wrong-with-smrs/

⁴⁴ <http://bit.ly/smrscomeback>

⁴⁵ <http://analysis.nuclearenergyinsider.com/small-modular-reactors/smrs-private-investors-call-track-record-and-big-government-orders>

⁴⁶ www.neimagazine.com/opinion/opinionnuclear-myths-is-the-industry-also-guilty-4598343/

⁴⁷ www.nuclearconsult.com/blog/the-new-challenge-for-the-uks-nuclear-debate/

⁴⁸ www.nirs.org/reactorwatch/newreactors/cooper-smrsaretheproblemnotthesolution.pdf

most, if not all designs, it is likely that addressing one of the four problems will involve choices that make one or more of the other problems worse."⁴⁹

In short, the Royal Commissioner's claims regarding SMRs do not withstand scrutiny.

Given the aforementioned experience with fusion and SMRs, it seems likely that the report of the Royal Commission will give a glowing – and inaccurate – assessment of so-called 'integral fast reactors' (IFR) that are heavily promoted in a number of submissions to the Royal Commission. A strident IFR advocate – Barry Brook – was appointed to the Expert Advisory Committee. Brook's promotion of IFRs has more basis in enthusiasm than evidence and includes the unfounded claim that IFRs could not produce weapons-useable material – a claim flatly contradicted by a leading US scientist with direct experience working on an IFR prototype.⁵⁰

The Royal Commission was strongly encouraged to seek input from Dr David Lochbaum from the US-based Union of Concerned Scientists – one of a small number of independent scientists with a deep understanding of IFR technology. The Royal Commission spoke to Dr Lochbaum during an overseas visit – but remarkably did not ask him about IFRs! We note that the Royal Commission has sought some independent advice about IFRs⁵¹ but on the basis of the previous uncritical acceptance of false claims regarding fusion and SMRs, there remains a high probability that inaccurate and exaggerated claims about IFRs may well be included in the Royal Commission's interim and final reports.

3.3 Expert Advisory Committee

Membership of the Royal Commission's five-member Expert Advisory Committee is clearly biased in favour of nuclear proponents. Three members – Barry Brook⁵², Timothy Stone and John Carlson⁵³ – have track records as strong nuclear advocates. Mr Stone has a personal material interest in the wider nuclear debate as a non-executive director of Horizon Nuclear Power, a subsidiary of Hitachi Ltd which plans to build nuclear power plants in the UK. Only one member (Ian Lowe) is a known nuclear critic, while the other member (Leanna Read) has no known track record in the field.

The appointment of nuclear advocates to the Panel is not objectionable per se. Indeed some environmental and anti-nuclear groups recommended the appointment of John Carlson. However the numerical weighting towards nuclear proponents lacks a credible rationale and further undermines community and stakeholder confidence in the integrity and impartiality of the Commission process.

No doubt there are issues where balance is illusory and subjective; one person's balance is another's bias. The membership of the Expert Advisory Committee is not one of those issues. The Royal Commissioner could have appointed a balanced panel; instead he chose to appoint a panel with a clear pro-nuclear bias. The Royal Commissioner has repeatedly said he is seeking to preside over a "balanced" Royal Commission.⁵⁴ While welcome in tone such statements are in contrast to the Commission's practice.

⁴⁹ www.sciencedirect.com/science/article/pii/S2214629614000486

⁵⁰ Dr George Stanford notes that proliferators "could do [with IFRs] what they could do with any other reactor – operate it on a special cycle to produce good quality weapons material." <http://bravenewclimate.com/2010/09/18/ifr-fad-7/>

⁵¹ See for example the transcript of Dr Edwin Lyman's 17 November 2015 discussion with the Royal Commission: <http://nuclearrc.sa.gov.au/videos/transportation-of-nuclear-materials-17112015-7-30am/>

⁵² www.foe.org.au/anti-nuclear/issues/oz/barry-brook-bravenewclimate

⁵³ www.foe.org.au/sites/default/files/asnoes_0.pdf

⁵⁴ www.smh.com.au/business/mining-and-resources/sa-sets-out-agenda-for-nuclear-industry-inquiry-expert-mix-appointed-20150417-1mmq8n.html

The imbalance in the composition of the Expert Advisory Committee needs to be urgently redressed. This would be a positive initiative, especially at this time when the Royal Commission is assessing the very large amount of evidence it has received and is no doubt advancing work on the interim report to be released in February 2016.

3.4 Conflicts of interest

The Royal Commission should be commended for publishing information about the interests of its staff and advisors.⁵⁵ However, the interests listed raise further doubts on the independence of the process. Several people involved in the Royal Commission have shares or other interests in uranium and nuclear companies. The Royal Commissioner has shares in a uranium mining company. Royal Commission staff member Julian Kelly is Chief Technology Officer of Thor Energy, a Norwegian company focusing on experimenting with the use of thorium in nuclear reactors.⁵⁶ Timothy Stone, a member of the Expert Advisory Committee, has numerous interests, e.g. he is a non-executive director of Horizon Nuclear Power, director of Nuclear Risk Insurers, and co-owner of Alpha-n Infrastructure, a company promoting nuclear power.

When this issue was raised the Royal Commissioner stated: "I do not accept that the holding of small parcels of shares in a substantial corporation, such as a diversified mining company like Rio Tinto, could lead to a conclusion that the Commission is partial to one view or another. There is no way in which a finding made by the Commission could lead to any benefit being derived."⁵⁷

Obviously any Royal Commission recommendations to facilitate the expansion of the uranium industry would, if implemented, be likely to benefit the uranium industry and those who hold shares in uranium mining companies. It is odd to assert that any pro-nuclear findings or recommendations from the Commission would not have a benefit for companies active in the sector. This is after all the rationale underpinning the whole Commission's Terms of Reference and process.

4. Aboriginal People and the Royal Commission

SA Premier Jay Weatherill said in March 2015: "We have a specific mandate to consult with Aboriginal communities and there are great sensitivities here. I mean we've had the use and abuse of the lands of the Maralinga Tjarutja people by the British when they tested their atomic weapons."⁵⁸

Yet the SA Government's handling of the early stages of the Royal Commission process systematically disenfranchised Aboriginal people. The truncated timeline for providing feedback on draft Terms of Reference disadvantaged people in remote regions, people with little or no access to email and internet, and people for whom English is a second language. This was compounded when the Commission was formulated as there was no translation of the draft Terms of Reference, and a regional communications and engagement strategy was not developed or implemented.

The Premier's powerful words have not been reflected in the Commission's actual practice.

Aboriginal people have repeatedly expressed frustrations with the Royal Commission process. One example (of many) is the submission of the Anggumathanha Camp Law Mob:

⁵⁵ Nuclear Fuel Cycle Royal Commission web site, 'About the Commission':

<http://nuclearrc.sa.gov.au/about-the-commission/>

⁵⁶ <http://thorenergy.no/about-thor-energy/>

⁵⁷ Letter to Friends of the Earth Adelaide, 11 June 2015.

⁵⁸ www.abc.net.au/worldtoday/content/2015/s4200643.htm

"Why we are not satisfied with the way this Royal Commission has been conducted: Yaiinidha Udneyu ngawarla wanggaanggu, wanhanga Yura Ngawarla wanggaanggu? – always in English, where's the Yura Ngawarla (our first language)?
The issues of engagement are many. To date we have found the process of engagement used by the Royal Commission to be very off putting as it's been run in a real Udneyu (whitefella) way. Timelines are short, information is hard to access, there is no interpreter service available, and the meetings have been very poorly advertised. Engagement opportunities need to be fair and equitable (readily available to all people) and the Native Title interest is no more important than the wider community. A closed and secretive approach makes engagement difficult for the average person on the street, and near impossible for Aboriginal people to participate."

The Royal Commission has made some efforts to overcome its early deficiencies – such as the appointment of a (non-Aboriginal) regional engagement officer and some limited efforts to translate written material. However it would be fair to summarise the attitudes of very many Aboriginal people by saying that the Royal Commission's efforts have been too little, too late.⁵⁹ The following ABC article addresses some of these concerns:

SA nuclear royal commission: Indigenous voices lost because of 'difficult' JP requirement, community leader says

Nicola Gage, ABC, 22 May 2015, www.abc.net.au/news/2015-05-22/sa-nuclear-royal-commission-barrier-indigenous-voices/6490160

Indigenous voices will not be heard in South Australia's royal commission into the nuclear fuel cycle because the process is "too difficult", a prominent Aboriginal woman claims.

The commission is examining the potential for an expansion of SA's role in the nuclear industry, including whether a nuclear power station or nuclear waste dump should be built.

Meetings have been held in Adelaide as well as the state's far north, including in the APY Lands and Coober Pedy.

Karina Lester, whose father Yami was affected by nuclear testing at Maralinga in the 1950s, said residents were told they would need a Justice of the Peace (JP) to sign any submissions before they would be accepted.

She said many communities did not have a JP, making it "very difficult for people".

"For example my father, 27 kilometres west from Marla Bore, (he) doesn't drive, wouldn't have a JP on hand, and would probably need to travel down to Coober Pedy," Ms Lester said.

"But he certainly has a story to tell and certainly would love to have input into the royal commission."

Ms Lester said a number of people at remote meetings did not speak English and she was frustrated because some, including a gathering at the Umoona community, did not include interpreters.

"I think they were a little bit confused," she said.

"They haven't simplified the talk to the community and straight away you will get disengagement when it's a language that's not understood by the general community."

⁵⁹ Relevant submissions to the Royal Commission include the following:

Frank Young (Amata community member); Mike Williams, Mimili Community; Anangu Pitjantjatjara Yankunytjatjara; Bobby Brown; James Brown; Campbell Law; Kurna; Anggumathanha Camp Law Mob; Kokatha Aboriginal Corporation; Frank Young.

Submission from Representatives of Native Title Parties: Antakirinja Matu Yankunytjatjara Aboriginal Corporation; Dieri Aboriginal Corporation RNTBC; Irrwanyere Aboriginal Corporation RNTBC; Narungga Nations Aboriginal Corporation; Nauo Native Title Claimants; Ngadjuri Nation Aboriginal Corporation; Yankunytjatjara Native Title Aboriginal Corporation (YNTAC); Yandruwandha Yawarrarrka Traditional Land Owners Aboriginal Corporation.

Separate Native Title Representative submission dated 10 September 2015.

Ms Lester said many Aboriginal people had become disengaged with the process. She wanted oral submissions to be accepted to stop people walking away.

"They have a story, let them tell their story," Ms Lester said.

"The commission needs to now find ways and means of how they can go and gather those stories." Conservation Council of South Australia chief executive officer Craig Wilkins said there were huge barriers stopping Aboriginal people from participating.

"Requiring a member of the public to travel to a JP and swear an oath in front of them before they can lodge a submission is a highly unusual, unnecessary and a surprising restriction that will stop people getting involved," he said.

"If they are concerned about fake or spam submissions, all they need is for individuals to self declare and sign a coversheet.

"To be forced to swear an oath in front of a JP just to have your say is simply not necessary."

The commission has hired a regional engagement officer to work with Aboriginal communities.

It said it would do everything in its power to ensure indigenous voices were heard.

Commission opening old wounds, community executive says

Yalata chief executive Greg Franks said discussions about the nuclear fuel cycle was opening old wounds for many people affected by the Maralinga nuclear testing.

"Every time issues come up regarding nuclear energy and in particular nuclear bombs, it is still a raw wound with many people in community, particularly the older ones," he said.

Yami, in his 70s, claims to have been blinded from nuclear testing at Maralinga in the 1950s.

"He was out there as a young man or a young boy on country, when the black mist rolled north of where the tests took place," Ms Lester said.

"There was a camp, people started getting very sore in their eyes, people started to get rashes on their skin.

"He lost his sight overtime from those tests so he's now blind and we are reminded everyday on how it's affected the family."

Mr Franks said many Aboriginal people were confused about how to make sure their voices were heard.

"The first language of the community is Pitjantjatjara so the formal structures around having to make submissions, doing things online, formal signoffs by JPs for example, although there is one here in community, they are difficult things to do," he said.

"They're barriers for getting people to provide good feedback."

Further concerns are expressed in the submission to the Royal Commission by West Mallee Protection (WMP), representing Aboriginal and non-Aboriginal people from Ceduna:

"Royal Commission Issues Paper 4.7: What are the processes that would need to be undertaken to build confidence in the community generally, or specific communities, in the design, establishment and operation of such facilities?"

WMP finds this question superficial and offensive. It is a fact that many people have dedicated their time and energy to investigating and thinking about nuclear waste. It is a fact that even elderly women that made up the Kupa Piti Kungka Tjuta – a senior Aboriginal women's council committed years of their lives to stand up to the proposal for a low-level facility at Woomera. They didn't do this because of previously inadequate "processes" to "build confidence" as the question suggests but because:

- A) Individuals held a deep commitment to look after country and protect it from a substance known as 'irati' poison which stemmed from long held cultural knowledge
- B) Nuclear impacts were experienced and continued to be experienced first hand by members and their families predominately from nuclear testing at Emu Fields and Maralinga but also through exploration and mining at Olympic Dam.
- C) They epitomized and lived by the worldview that sustaining life for future generations is of upmost importance and that this is at odds with the dangerous and long lasting dangers of all aspects of the nuclear industry.

The insinuation that the general population or target groups such Kupa Piti Kungka Tjuta or the communities in the Northern Territory that succeeded them and also fought off a nuclear dump for Muckaty were somehow deficient in their understanding of the implications and may have required "confidence building" is highly offensive."

The Royal Commissioner said at a Public Session of the Royal Commission: "I also understand from submissions from many indigenous communities more generally the deep concerns, and in many instances, the opposition of Aboriginal people to the activities being considered by the Commission. If such activities were to go ahead, a fair, full and informed process would need to occur."⁶⁰

Those comments are welcome, although an informed process is no substitute for informed consent.

But what happens when the Royal Commission's recommendations are handed to the SA Government? Presumably a continuation of the disenfranchisement seen during the public comment period for the draft Terms of Reference with scant effort to seek out the views of Aboriginal people and little reason to expect that these would be listened to and respected.

Existing nuclear industry practices in SA illustrate how Aboriginal rights and interests have been subordinated to commercial imperatives. For example the Roxby Downs Indenture Act was amended in 2011 and the amended Act retains extraordinary exemptions from Aboriginal heritage protection laws. When quizzed on this at the time a state government representative told Parliament: "BHP were satisfied with the current arrangements and insisted on the continuation of these arrangements, and the government did not consult further than that."⁶¹

The report of the Royal Commission could draw attention to the retention of those exemptions, and it could comment critically on the failure to consult Traditional Owners. However this seems unlikely. The Royal Commission's Issues Paper #1 incorrectly states that Aboriginal sites of significance are protected by the SA Aboriginal Heritage Act 1988. It fails to note that under the Roxby Downs Indenture Act, BHP Billiton's Olympic Dam mine and some 15, 000 sq km of the surrounding Stuart Shelf are exempt from the Act.⁶² In fact, those areas are not subject to the SA Aboriginal Heritage Act 1988 but BHP Billiton must instead partially comply with an earlier version of the Act – an earlier version that was never proclaimed!

When this highly significant factual error in the Royal Commission's Issues Paper was drawn to the Royal Commissioner's attention, he refused to correct it.⁶³ The Royal Commission repeatedly promotes itself as a fact and evidence-based inquiry however this reluctance to address clear errors of fact is in conflict with this positioning.

5. Conclusions and Recommendations

Rather than being a disinterested forum the Nuclear Fuel Cycle Royal Commission is essentially a feasibility study to consider whether there are opportunities for new business in the nuclear field. As such, it prioritises economic considerations and industry assumptions over other considerations. It is not investigating the merits of the nuclear industry from a neutral and objective position and it has omitted or

⁶⁰ 12 Nov 2015 Public Session

⁶¹ http://hansard.parliament.sa.gov.au/pages/loaddoc.aspx?e=2&eD=2011_11_24&c=26

⁶² www.adelaide.foe.org.au/2015/07/mr-scarcelly-accurate-nuclear-fuel-cycle-royal-commission-issues-paper-inaccurate/

⁶³ www.adelaide.foe.org.au/2015/08/media-release-public-consultations-based-on-misinformation/

See also: www.adelaide.foe.org.au/2015/07/mr-scarcelly-accurate-nuclear-fuel-cycle-royal-commission-issues-paper-inaccurate/

glossed over important problems in its Issues Papers. It has taken the trouble to ensure that it hears critical perspectives, but has given much more time to nuclear proponents. Furthermore, technocratic and economic perspectives have been privileged over other relevant perspectives.

The general public has been given opportunities to contribute, but at the same time unnecessary barriers have actively discouraged community engagement and participation. Although we recognise that the Royal Commission is separate from government, it has failed to meet the standards promoted in *'Better Together: Principles of Engagement'*, the South Australian Government's key policy document on public engagement.⁶⁴

Our organisations are disappointed that this important opportunity to advance a full community discussion around the costs and benefits of Australia's past, current and potential future engagement in the nuclear sector appears instead to be increasing moving to advance a partisan and pre-determined outcome.

It is not too late to partially rectify some of the problems associated with the Royal Commission. For example, the Expert Advisory Committee could be expanded to redress the clear bias in the Committee as it is currently constituted, and to redress the lack of any direct Aboriginal involvement in the Royal Commission at any level (Royal Commissioner, Expert Advisory Committee, or Royal Commission staff). As mentioned (in section 3.3), expanding and balancing the Expert Advisory Committee would be a forward-looking initiative, especially at this time when the Royal Commission is assessing the very large amount of evidence it has received and has begun work on the draft report to be released in February 2016.

The SA Government needs to balance the Nuclear Fuel Cycle Royal Commission with a dedicated review that further explores the states renewable energy opportunities. This could build on reports such as the State Government's Low Carbon Economy Expert Panel report⁶⁵, and the detailed report by energy expert Dr Mark Diesendorf commissioned by the Conservation Council of SA.⁶⁶

As the Low Carbon Economy Expert Panel noted in its November 2015 report:⁶⁷

"Given South Australia's abundance of wind and high solar rating, South Australia has the capacity to move to 100% renewable energy more quickly than other States and has already made significant progress in decarbonising its electricity supply utilising these advantages. Establishing a secure, low carbon energy supply can position South Australia as an attractive location for future industries needing energy in a carbon constrained world."

There are both economic and environmental imperatives to thoroughly assess South Australia's renewable energy potential, and to complement the Nuclear Fuel Cycle Royal Commission with a comparably resourced investigation of the state's renewable energy potential.

The nuclear industry embodies unique, complex and long lasting safety, security, environmental and public health challenges. The sector remains actively contested and lacks a secure social licence. In such a context it is imperative that any consideration of an expansion of the industry is predicated on the highest

⁶⁴ South Australian Government, *Better Together: Principles of Engagement*: <http://yoursay.sa.gov.au/better-together>
In fact, we believe the Royal Commission's performance to date has been inadequate on all six of the principles in this document.

⁶⁵ www.environment.sa.gov.au/files/sharedassets/public/climate-change/sa-low-carbon-economy-experts-panel-report-findings-recommendations.pdf

www.premier.sa.gov.au/images/news_releases/2015/15_11Nov/climateexpertpanel2.pdf

⁶⁶ www.conservation.sa.gov.au/images/100_Renewables_for_SA_Report_-_Dr_Mark_Diesendorf_-_web_version.pdf

⁶⁷ www.environment.sa.gov.au/files/sharedassets/public/climate-change/sa-low-carbon-economy-experts-panel-report-findings-recommendations.pdf

standards of evidence, rigour, transparency and inclusion. Sadly our organisations are not seeing these traits reflected in the tone and approach of the current Royal Commission.

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