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**Submission by the Uniting Church in Australia, Synod of Victoria
and Tasmania; Uniting Church in Australia, Synod of Queensland
and U Ethical to the inquiry into nuclear power generation in
Australia
15 November 2024**

The Uniting Church in Australia, Synod of Victoria and Tasmania, Uniting Church in Australia, Synod of Queensland and U Ethical welcome the opportunity to make a submission to the inquiry into nuclear power generation in Australia.

The submitting bodies oppose the development of nuclear power generation facilities in Australia as a means to address climate change due to the fact it would be one of the slowest and most expensive options that could be pursued when alternative technologies and demand management options exist. Further, the waste from nuclear power requires high safety storage for tens of thousands of years, with very high degrees of uncertainty. We view nuclear power is a distraction from what needs to happen for power generation to shift to a low emissions future. There are low emissions alternatives which are ready for deployment, cheaper and do not entail comparable costs and risks. In 2021, investments in non-hydro renewable energy generation totalled a record US\$366 billion, adding a net 250 GW of power generation to the global electricity grids. By contrast, electricity generation from nuclear power reactors declined by a net 0.4 GW with on-going cost blow-outs, possible losses and write-off risks for new reactors. Electricity generated from wind and solar sources exceeded 10% of global electricity generation, more than nuclear power.¹

The development of nuclear power in Australia would undoubtedly see the nuclear power interest groups mount a prolonged rent-seeking campaign with their political allies around subsidies and other concessions or exemptions. The fact that the Coalition has indicated that they would use government revenue to establish nuclear power in Australia is a clear indication that the economics of nuclear power do not stack up.

The Uniting Church is committed to the non-proliferation of nuclear weapons. Any government that acquires the technology for nuclear power has the ability to produce nuclear weapons or risk heightening the risk of proliferation in the Australasian region, particularly in countries that have not signed up to the international nuclear proliferation treaty. There is a danger in the Australian Government adopting nuclear power, it will encourage other governments in the region to also adopt nuclear power and prepare to acquire nuclear weapons if they fear that is also the intention of a future Australian Government. It is also worth noting that, in 1980, Australia became a party to the UN Human Rights Covenant. In

¹ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Angès Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 17; <https://www.wabe.org/30b-georgia-power-nuclear-plant-delayed-up-to-6-more-months/>; and <https://www.powermag.com/southern-company-cuts-its-cost-forecast-for-vogtle-expansion-provides-update-on-project/>

2018, the latter recognised *'the threat or use of nuclear weapons violates the Right to Life'*.² Today, only about 100 nuclear weapons could possibly annihilate the planet.³ The impact of nuclear weapons on climate is also major: even a limited nuclear exchange of less than 1% of global stockpiles would cause a decade long nuclear winter.⁴ At a time of increasing geopolitical polarisation, this is a very concerning ESG risk for ethical and responsible investors.

The Uniting Church in Australia has a long-standing opposition to nuclear power and uranium mining. The relevant resolutions of the Uniting Church National Assemblies and Synod meetings of hundreds of delegates of Uniting Church members outlining this position since 1977 are attached as Appendix A.

We note that Professor Dr Emeritus Aviel Verbruggen has raised to concerns that the WG3 report by the IPCC on nuclear power is deficient:⁵

The nuclear power sections are skipping most of the peer-reviewed literature on nuclear performance, on its degree of sustainability, its compatibility with renewable power from sun and wind. The sections depend on nuclear sector non-peer reviewed literature of the IAEA, the Nuclear Energy Agency (NEA), and similar.

The lopsided treatment of such an important subject means a grave infliction on the "Principles Governing IPCC Work, Section 4.3.3", requesting full assessment of the available literature, and "clearly identify disparate views for which there is significant scientific or technical support, together with the relevant arguments." A balanced assessment of the literature on nuclear power would be a formidable challenge for IAEA's nuclear advocacy. It would help dissolve the juxtaposition "renewables, nuclear, carbon capture and storage" as mitigation options. This deceiving triptych mantra retards the transformation of the global energy system to 100% renewable energy supplies, the substrate for a genuine common future as spelled out in the Brundtland report (1987).

² [https://www.unfoldzero.org/un-human-rights-committee-condemns-the-threat-or-use-of-nuclear-weapons-and-other-wmd/#:~:text=36%20\(2018\)%20on%20article%206,a%20crime%20under%20international%20law.&text=No%20one%20shall%20be%20arbitrarily%20deprived%20of%20his%20life](https://www.unfoldzero.org/un-human-rights-committee-condemns-the-threat-or-use-of-nuclear-weapons-and-other-wmd/#:~:text=36%20(2018)%20on%20article%206,a%20crime%20under%20international%20law.&text=No%20one%20shall%20be%20arbitrarily%20deprived%20of%20his%20life)

³ At present there are about 14,000 weapons most of which in Russia and US arsenals

⁴ <https://www.nature.com/articles/d41586-020-00794-y>

⁵ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki,ANGES Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 15.

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Cost Comparisons

Total costs for nuclear power span across:

- Capital costs - site preparation, construction, manufacturing and financing;
- Plant operating costs - cost of fuel, operation and maintenance, waste handling and storage, decommission funding;
- External costs - such as projected costs of dealing with an accident or emergency; and
- Other costs – such as system costs or technology-specific taxes.

The Levelised Cost of Energy (LCOE) analysis by the US bank Lazard found that between 2009 and 2021, utility-scale solar-generated power costs came down by 90%, and wind-generated power costs decreased by 72%. In contrast, the cost of nuclear-generated power increased by 36%.⁶ Estimates by the International Renewable Energy Agency of the LCOE for wind-generated power have dropped by 15% and for solar-generated power by 13% between 2020 and 2021.⁷

Costing nuclear energy and specifically, SMR nuclear energy is challenging in an Australian context due to the need for estimations, the nature of nuclear costing structure and Australia's liberalised power system.⁸ Outlined in the Parliament of Victoria 2020 Inquiry into Nuclear Prohibition, there was controversy surrounding the costing generated in the CSIRO GenCost's 2018 report. GenCost 2018 gave a figure of \$16,000/kW for SMR nuclear energy between 2020 to 2050 while NuScale Power, a United States company which has received approvals to develop an SMR gave a substantially lower cost of approximately \$5,000/kW - \$6,100/kW for SMR nuclear energy.⁹ In this case, the treatment of 'first of a kind' costs in Australia and the concept of smaller plants leading to higher costs had been treated differently by each party. As per the conclusions of the Parliament of Victoria 2020 inquiry, the example highlights the ambiguities, unreliability and often inaccuracy of costing without a specific business case in Australia.¹⁰ However, additional costing information is projected to become available at the end of 2024, whereby the Australian Nuclear Science and Technology Organisation has joined an International Atomic Energy Agency project to appraise the costs of nuclear SMR.¹¹

Construction delays

Construction of nuclear power plants throughout history have been notoriously slow and delayed.¹² Such delays are of particular concern given cost constraints, energy security and carbon emissions constraints associated with the phasing out of coal fired power. The actual time for nuclear plant construction is not limited to construction but also by the licensing, complex financing negotiations, site preparation and other infrastructure development.¹³ Particularly, in the Australian context, where there is limited infrastructure, these delays are

⁶ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 32.

⁷ Ibid., 32.

⁸ Parliament of Victoria Inquiry into Nuclear Prohibition: Public hearing: Dr Dylan McConnell, Climate and Energy College, University of Melbourne, November 2020

⁹ Parliament of Victoria Inquiry into Nuclear Prohibition, November 2020, 67.

¹⁰ Ibid, 30.

¹¹ Paul Graham, Jenny Hayward, James Fostet and Lisa Havas, 'CSIRO GenCost 2021-22 Final Report', 2022, 17.

¹² Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 54

¹³ Ibid, 52.

even more likely to occur and generate cost blowouts and investor risk, unless government revenue is used to underwrite such otherwise uneconomic development.

Despite improvement in the mean construction time, that is 9.9 years in 2019 to 7.1 years in 2021, over the three years 2019 -2021, only two of seventeen units were started up on time.¹⁴ For the five units connected in the first half of 2022, the construction duration was nine years.¹⁵

Finland started up the first European Pressurised Water Reactor on the continent in March 2022. Construction had begun in 2005 and delivery to be operational was 13 years late.¹⁶ Such an outcome highlights the unreliability of nuclear power as a means to address the urgent needs of greenhouse gas emissions reductions. Of the 53 reactors that were under construction in 2022, 26 had construction delays.¹⁷ Nine of the reactors had been listed as under construction for over a decade.¹⁸ The seven units completed between 2019 and 2021 in China took an average of 6.4 years to build. The four projects finalized in Russia took an average of 11.4 years.¹⁹

In Türkiye, startup of Unit 1 of the Akkuyu nuclear power plant was delayed to 2025.²⁰

It is not only delays but also the likelihood of construction abandonment that is cause for concern and further exemplifies the ‘distracting’ nature of nuclear energy production. Since 1951 until 1 July 2022, at least 93 out of 790 units have been abandoned or suspended, equating to one in eight of nuclear constructions being abandoned.²¹

Although SMR nuclear reactors are supposedly cheaper and faster to build, recent twin reactors Akademik-Lomonosov have show-cased the opposite results. Construction has taken 3.5 times as long as originally projected, starting in 2007 and only going online in 2019.²²

Additionally, with each delay, associated costs increase. In 2017, the V.C. Summer project in South Carolina (two AP1000 reactors) was abandoned after expenditure of US\$9 billion over a five-year period.²³ The project was initially estimated to cost US\$11.5 billion; when it was abandoned, the estimate to completion would have been US\$25 billion.²⁴ The parent company, Toshiba, marginally avoided bankruptcy and has since decided avoid nuclear reactor construction projects.

The US Vogtle project (two AP1000 reactors) has announced delays. In February 2022, Georgia Power Co. announced an additional six-month delay, increasing the total cost to nearly US\$30 billion.²⁵ When the additional reactors were approved for construction in 2012, they were estimated to cost US\$14 billion and be active by 2016.²⁶ The construction time

¹⁴ Ibid, 53.

¹⁵ Ibid, 53.

¹⁶ Ibid., 17.

¹⁷ Ibid., 20.

¹⁸ Ibid., 20.

¹⁹ Ibid., 52.

²⁰ Mycle Schneider, Antony Froggatt *et al.*, ‘The World Nuclear Industry. Status Report 2024’, Sept 2024, 19.

²¹ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki,ANGES Stienne and Friedhelm Meinass, ‘The World Nuclear Industry. Status Report 2022’, 2022, 58.

²² Ibid, 54.

²³ <https://www.worldnuclearreport.org/Toshiba-Westinghouse-The-End-of-New-build-for-the-Largest-Historic-Nuclear.html>

²⁴ <https://www.nytimes.com/2017/07/31/climate/nuclear-power-project-canceled-in-south-carolina.html>

²⁵ Associated Press, WABE, ‘\$30B Georgia Power nuclear plant delayed up to 6 more months’, February 2022.

²⁶ Ibid.

has been delayed upwards of six years and cost more than double what was initially expected. After 11 years of construction, Vogtle-4 was connected to the grid in March 2024 with all-in costs for Vogtle-3 and -4 estimated at US\$36 billion. No more reactors are under construction in the US.²⁷

The State of Nuclear Power Generation Globally

Nuclear power generation globally in 2023 dropped to 9.1%, down from a peak of 17.5% in 1996.²⁸ The number of operational nuclear reactors continues to decline, down to 408 in mid-2024 with 34 in long-term outage, down from 437 reactors in 2021 and 449 in 2018.²⁹ The International Atomic Energy Agency's list of 437 reactors includes 23 that have not generated any power since 2013.³⁰ Only 13 countries, three less than in mid-2023, are hosting 59 reactor construction projects. At least 23 are delayed; of these, at least 10 have reported increased delays. As of mid-2024, China had the most reactors under construction (27) but none abroad. Russia dominated the international market with 26 units under construction, 20 of them in seven other countries. Construction started on six reactors in 2023 — down from 10 in 2022— including five in China and one implemented by Russia (in Egypt). Chinese and Russian government-controlled companies launched all 35 reactor constructions in the world since December 2019 through mid-2024. Besides Russia's Rosatom, only France's EDF is currently building nuclear power plants abroad (two units in the U.K.) as lead-contractor.³¹

Notably, eight of the 33 countries have either nuclear reactor phase-out, no-new-build or no-program-extension policies in place.³² The average age of operating reactors is 31 years.³³ There are 105 reactors that have been operating for more than 40 years.³⁴ Six new reactors were connected to power grids in 2021 and five became operational in the first half of 2022.³⁵ Eight reactors were shut down in 2021, three in Germany, and one in each of Pakistan, Russia, Taiwan, the UK and the US.³⁶

In 2023, five new nuclear reactors (with a generating capacity of 5 GW) started up and five were closed (with a generating capacity of 6 GW), thus a net decline by 1 GW in capacity.³⁷

Global nuclear power generation increased by 2.2% in 2023 but stayed below 2021 and 2019.³⁸

²⁷ Mycle Schneider, Antony Froggatt *et al.*, 'The World Nuclear Industry. Status Report 2024', Sept 2024, 19.

²⁸ Mycle Schneider, Antony Froggatt *et al.*, 'The World Nuclear Industry. Status Report 2024', Sept 2024, 19.

²⁹ Mycle Schneider, Antony Froggatt *et al.*, 'The World Nuclear Industry. Status Report 2024', Sept 2024, 19; and Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 16.

³⁰ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 16.

³¹ Mycle Schneider, Antony Froggatt *et al.*, 'The World Nuclear Industry. Status Report 2024', Sept 2024, 19.

³² Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 37.

³³ *Ibid.*, 21.

³⁴ *Ibid.*, 21.

³⁵ *Ibid.*, 16.

³⁶ *Ibid.*, 19.

³⁷ Mycle Schneider, Antony Froggatt *et al.*, 'The World Nuclear Industry. Status Report 2024', Sept 2024, 19.

³⁸ *Ibid.*, 19.

Between 2004–2023, there were 102 startups and 104 closures worldwide: an increase of 49 units in China and outside China, a net decline of 51 units.³⁹

In China in 2021, wind power generation increased by 40% and solar power generation by 25%. Wind turbines in China generate 71% more electricity than nuclear power reactors.⁴⁰

As of 1 July 2022, there were 53 nuclear reactors under construction with a combined power generation capacity of 53.3 GW.⁴¹ Bangladesh and Türkiye are the two countries that have their first nuclear reactors under construction as of mid-2022.⁴²

In December 2021, there was unexpected detection of stress corrosion cracking in emergency cooling systems in the largest and most recent French nuclear reactor. The fault was detected on other units. The detection led to a massive inspection and repair program on the entire nuclear fleet. As a result, there was a significant decline in electricity generation through 2022.⁴³ The French Government announced the renationalization of operator EDF, which faced potential bankruptcy.⁴⁴

In Japan, at the end of May 2022, The Hokkaido District Court ruled that the three reactors on the island could not be restarted due to concerns about protection levels against tsunamis and spent fuel storage safety.⁴⁵ Two additional reactors were restarted in the second half of 2023 bringing the total to 12 operating units in Japan, while 21 reactors remain in long-term outage. Nuclear power generation surged by 49%, but nuclear's share in total electricity dropped again, from 6.1% to 5.6%.⁴⁶

Italy (in 1987), Kazakhstan (in 1998) and Lithuania (in 2009) have ended their nuclear power generation.⁴⁷ Taiwan plans to shut down its remaining three nuclear reactors by 2025. An attempt by the opposition and the nuclear corporate lobby to overturn the phase-out policy by referendum failed in December 2021.⁴⁸ Germany has also had a program to phase-out the use of nuclear power. Three reactors were closed at the end of 2021, with the remaining three to be closed by the end of 2022. However, with the energy crisis brought on by the Russian invasion of Ukraine, the government has proposed to put two of them into reserve status until the end of winter in mid-April 2023.⁴⁹ The reactor at Neckarwestheim was found to have cracks in pressure generator heating pipes.⁵⁰ Germany has not found a permanent location for its nuclear waste and discussions to do so are expected to last nearly 30 years.⁵¹

³⁹ Ibid., 19.

⁴⁰ Ibid., 17.

⁴¹ Ibid., 20.

⁴² Ibid., 16.

⁴³ Ibid., 17, 22.

⁴⁴ Ibid., 22.

⁴⁵ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 17; and Shako Oda, 'Japan Court Bars Hokkaido Nuclear Reactors from Operating', *Bloomberg*, 31 May 2022.

⁴⁶ Mycle Schneider, Antony Froggatt *et al.*, 'The World Nuclear Industry. Status Report 2024', Sept 2024, 19.

⁴⁷ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 18.

⁴⁸ Ibid., 22.

⁴⁹ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 22; and Joanna Partridge, 'Germany at a crossroads: what nuclear power station tells us about its energy dilemma', *The Guardian*, 9 December 2022.

⁵⁰ Joanna Partridge, 'Germany at a crossroads: what nuclear power station tells us about its energy dilemma', *The Guardian*, 9 December 2022.

⁵¹ Joanna Partridge, 'Germany at a crossroads: what nuclear power station tells us about its energy dilemma', *The Guardian*, 9 December 2022.

In Belgium nuclear power generation dropped by 25 percent in 2023. Three of the remaining five units are to close by 2025, while operation of the two most recent ones is to be extended to up to 2037, subject to European Commission approval.⁵²

In the UK, since June 2021, four reactors were closed. Nuclear power contributed 14.8% of the UK's electricity needs in 2021, down from 26.9% in 1997. Meanwhile, electricity generated from renewable sources has increased from 2.5% in 2001 to 39.6% in 2021. Electricity generated from coal declined over the last decade from 39.2% to 2.6%.⁵³

Small Modular Reactors

Advocates for the nuclear power corporation interests push the option of SMRs, but, to date, the only such reactors that are operational are two in Russia. The idea of small modular reactors for power generation appears to be another way the nuclear corporations are seeking government funding for something that will be expensive and slow to develop. A 2015 report by the International Energy Agency and the OECD Nuclear Energy Agency predicted that electricity costs from SMRs will typically be 50–100% higher than for current large reactors.⁵⁴

Russia operates two small modular reactors on a barge called the Akademik Lomonosov. Both reactors were connected to the grid in December 2019, nine years later than planned.⁵⁵ These reactors took over 12 years to build, longer than the construction of any reactor in Russia over the same period.⁵⁶ A second small modular reactor project was launched in June 2021, involving a lead-cooled fast reactor design.⁵⁷

In Argentina, the CAREM-25 project has been under construction since 2014. Following numerous delays, the latest estimated date for start-up is 2027. The lower end of the final cost estimates per installed kW correspond to approximately twice the cost estimates for the most expensive Generation-III reactors.⁵⁸

In Canada, the federal and provincial governments have provided tens of millions of dollars in grants for the design of SMRs. However, no design has yet been transmitted to the safety authority for review, before moving to certification.⁵⁹

In China, construction on two high-temperature reactor modules started in 2012. The first module was connected to the grid for a few days in December 2021, almost five years behind schedule. Reportedly, neither unit has generated power since. Construction started on a second design, the APC100 or Linglong One, in July 2021, six years later than planned. It is scheduled to be completed by early 2026.⁶⁰

⁵² Mycle Schneider, Antony Froggatt *et al.*, 'The World Nuclear Industry. Status Report 2024', Sept 2024, 19.

⁵³ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki,ANGES Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 22-23.

⁵⁴ Paul Graham, Jenny Hayward, James Fostet and Lisa Havas, 'CSIRO GenCost 2021-22 Final Report', 2022, 15.

⁵⁵ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki,ANGES Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 27.

⁵⁶ *Ibid.*, 52.

⁵⁷ *Ibid.*, 27.

⁵⁸ *Ibid.*, 26.

⁵⁹ *Ibid.*, 26.

⁶⁰ *Ibid.*, 26.

In February 2022, President Macron announced a US\$1.1 billion allocation up to 2030 for the development of the Nuward SMR design.⁶¹

The South Korean System-integrated Modular Advanced Reactor ('SMART') has been under development since 1997. In 2012, the design received approval by the safety authority, but there have been no orders.⁶² Significantly, South Korea has not built any SMART reactors domestically and has no plans to do so⁶³. Such decisions are in line with the World Nuclear Association commentary which explains building SMART reactors in South Korea is "not practical or economic."⁶⁴

Since 2014, Rolls Royce has been developing the "UK SMR", a 470 MW reactor. In November 2021, Rolls Royce announced it had received US\$291 million in government funding and US\$261 million from private sources. The funding is well short of its early calls for US\$2.8 billion to develop the project. In March 2022, the regulator accepted the design for a Generic Design Assessment.⁶⁵

The US Department of Energy has already spent more than US\$1.2 billion on SMRs. It has announced additional funding of up to US\$5.5 billion over the next decade. For all the funds spent, there is no reactor under construction. Only one design, NuScale, received a final safety evaluation report. Since then, Nuscale have announced an increase in the energy capacity of the design, requiring further licensing approvals.⁶⁶ Consequently, NuScale cost estimates have significantly increased, posing increased risks that the project will have to be abandoned due to lack of finance.⁶⁷

In October 2021, eight municipalities withdrew from the only investment project in Utah, leaving the six-module 462 MW project with subscriptions amounting to just 101 MW. Cost estimates for the project have ballooned to US\$5.3 billion.

Waste Management, Safety Concerns and Water Needs

Concerning waste generation and management, nuclear fuel is highly dense and therefore very little waste is made. However, waste is highly radioactive.⁶⁸ There are different types of waste – low, medium and high intensity.⁶⁹ The storage requirements and costings differ depending on their grade:

- Low-level waste (LLW) emits radiation at levels that require minimal protection during handling, transport and storage. Gloves, cloths and filters used at nuclear plants and research facilities fall into this category.
- Intermediate-level waste (ILW) emits higher levels of radiation than LLW and requires more protection during handling, transport and storage. It is generated from certain reactor operations and radiopharmaceutical production.

⁶¹ Ibid., 26.

⁶² Ibid., 27.

⁶³ <https://www.world-nuclear.org/information-library/country-profiles/countries-o-s/south-korea.aspx>

⁶⁴ Ibid.

⁶⁵ Mycle Schneider, Antony Froggatt, Julie Hazemann, Christian von Hirschhausen, M.V. Ramana, Alexander James Wimmers, Michael Sailer, Nina Schneider, Tatsujiro Suzuki, Anges Stienne and Friedhelm Meinass, 'The World Nuclear Industry. Status Report 2022', 2022, 27.

⁶⁶ <https://www.world-nuclear-news.org/Articles/Further-cost-refinements-announced-for-first-US-SM>

⁶⁷ Ibid.

⁶⁸ High-level waste accounts for only 3% of the volume of all nuclear waste, however it is responsible for 95% of the total radioactivity. Source: United States Nuclear Energy Regulatory Commission, *Background on Radioactive Waste*

⁶⁹ <https://www.ansto.gov.au/education/nuclear-facts/managing-waste> accessed 19 November 2019

- High-level waste (HLW) emits radiation at levels requiring significant shielding and isolation from human contact. It also requires cooling due to its heat-generating capacity. HLW is primarily produced from nuclear power generation.

Most radioactive elements decay within the first 500 years. The less radioactive but longer-lived elements of used nuclear fuel require containment and isolation for at least 100,000 years. As a result, high safety storage of spent nuclear fuel needs to account for extremely long periods.

The most feasible way to store waste is underground with Finland and Sweden being the most advanced countries with deep geological repository projects. A project in Finland is the first to use this type of method and was due for completion in 2020.⁷⁰ As of February 2022, the site is set to begin accepting waste from 2045 or 2025 depending on receiving an operating license.⁷¹

The uncertainties inferred from the time scale for nuclear waste handling and storage raise significant questions as to:

- whether we have the capacity to safeguard radioactive waste over thousands of years, and
- whether we have adequate expertise.

Waste management has raised controversies with First Nations communities and will require further consultations and amendments to satisfy public expectations and growing scrutiny. Previous governments failed in their attempts to impose a national radioactive waste repository and store on unwilling communities in South Australia (1998–2004) and the Northern Territory (2005–2014).⁷²

The *National Radioactive Waste Management Act* allows for the rights of First Nations Traditional Owners to be trampled. The selection of a waste site is valid even if the Traditional Owners were not consulted and did not give consent. Specifically, it has sections that nullify the protection of archaeological or heritage values and limits the application of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* and the *Native Title Act 1993*.⁷³

Most worryingly, the management of radioactive waste at past and current uranium mines has been deficient in many respects. Examples include:⁷⁴

- Contamination concerns at former uranium mines, Mary Kathleen (Queensland) and Rum Jungle (NT);
- Contamination at the Port Pirie uranium treatment plant in SA;
- Marathon Resource's illegal dumping of low-level radioactive waste in the Arkaroola Wilderness Sanctuary; and

⁷⁰ Parliament of Victoria Inquiry into Nuclear Prohibition, November 2020, 84.

⁷¹ Sedeer El-Showk, 'Final Resting Place: Finland is set to open the world's first permanent repository for high-level nuclear waste. How did it succeed when other countries stumbled?' Science, February 2022: [Finland built this tomb to store nuclear waste. Can it survive for 100,000 years? | Science | AAAS](#)

⁷² The current push to establish a national radioactive waste repository and store in SA is strongly contested and aspects of the proposal are currently subject to legal challenges and a Human Rights Commission complaint, initiated by Traditional Owners of the targeted sites.

⁷³ <https://nuclear.foe.org.au/NRWMA/>

⁷⁴ Friends of the Earth Australia, Australian Conservation Foundation and Environment Victoria, 'Submission to the Victorian Parliament's Standing Committee on Environment and Planning', *Inquiry into Nuclear Prohibition*, February 2020, 45.

- Deterioration and possible leaking of radioactive waste at Woomera. An Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) report found that the mixture of water and concentrated radioactive material has the potential to produce explosive hydrogen gas.

In the consideration of waste management and environmental impact of the nuclear power industry, the Victorian Legislative Council Environment and Planning Committee came to the finding in their 2020 inquiry that:⁷⁵

Those who propose a policy shift have not presented any argument, data or proof in support of their position that cannot be nullified by those arguing against. Any advantages are speculative in nature, and do not outweigh the identified and proven risks.

Water is a vital for nuclear power stations as a critical resource for cooling their heat-generating radioactive cores. During the nuclear power cooling process, the water becomes contaminated with radionuclides – unstable atoms with excess energy – and must be filtered to remove as many radionuclides as possible.⁷⁶ The water needs add to operational costs. Most nuclear facilities are built on coastlines or, as in the case of Chernobyl, surrounded by huge lakes. That way, filtered water can be discharged into the ocean or lake once it's been assessed and confirmed safe by authorities.⁷⁷ It creates an extra problem that must be addressed in a drought stricken country such as Australia where many sectors and states already compete for access to good quality water.

In its submission to the 2020 Victorian Parliamentary Committee inquiry into the nuclear industry, ANSTO stated that:⁷⁸

Water consumption in conventional large nuclear power plants is high, and second only to that required by the agricultural sector. Water is a requirement for cooling; however, the majority of cooling water used in power reactors around the world is drawn from the sea or rivers, to which the water is returned only a few degrees warmer and with minimal loss due to evaporation.

In their submission to the 2019 Commonwealth Parliamentary Committee inquiry into nuclear technology, the Australian Academy of Science stated that water needs of nuclear power generation is likely to make it unsuitable for Australia.⁷⁹

We note that by contrast, proponents of nuclear power generation told the Commonwealth Parliamentary Committee inquiry into 2019 that there are new nuclear reactor designs that will have lower water usage needs.⁸⁰ However, at the time, these new designs had not been built, making them theoretical.

⁷⁵ Victorian Legislative Council Environment and Planning Committee, 'Inquiry into nuclear prohibition', November 2020, 159.

⁷⁶ Awadhesh Jha, 'Nuclear power: how might radioactive waste water affect the environment?', The Conversation, 30 April 2021, <https://theconversation.com/nuclear-power-how-might-radioactive-waste-water-affect-the-environment-159483#:~:text=Water%20is%20a%20vital%20tool,as%20many%20radionuclides%20as%20possible>.

⁷⁷ Ibid.

⁷⁸ Victorian Legislative Council Environment and Planning Committee, 'Inquiry into nuclear prohibition', November 2020, 173.

⁷⁹ House of Representatives, Standing Committee on the Environment and Energy, 'Not without your approval: a way forward for nuclear technology in Australia', December 2019, 142.

⁸⁰ House of Representatives, Standing Committee on the Environment and Energy, 'Not without your approval: a way forward for nuclear technology in Australia', December 2019, 51.

Government subsidies for Nuclear Power

Removing the prohibition of building a nuclear power plant in Australia will lead to intense rent-seeking by the nuclear power lobbyists and their political allies for massive government hand-outs to make building a plant viable. Looking at the available data, it is highly unlikely that a nuclear power reactor would be built in Australia without substantial backing from government revenue or some form of legislation that crowds in private equity investors, as has already been acknowledged in the pro-nuclear power policy of the Coalition Opposition. Such government intervention could be in the forms of guaranteed prices, tax rebates and other concessionary instruments and risk-sharing.

On 10 January 2023, Mike Hewitt the CEO of nuclear power development corporation IP3 was publicly calling for hundreds of millions of dollars of subsidies from the Commonwealth Government to develop nuclear power generation in Australia.⁸¹

The 2020 Victorian Parliamentary Committee inquiry concluded that: “Without subsidisation a nuclear power industry will remain economically unviable in Australia for now.”⁸²

As pointed out by the International Institute for Sustainable Development, “subsidies have been part of nuclear policy since the beginning of the industry. No project has proceeded anywhere without government limits on liabilities for accidents.”⁸³

In February 2022, the US Administration announced US\$6 billion to implement the Civil Nuclear Credit Program.⁸⁴ The Credit Program is a government subsidy to support the continued operation of US nuclear reactors. To access the Credit Program, a nuclear power corporation must prove their plant will close for economic reasons and demonstrate that the closure would result in a rise in air pollution. In addition, the US Nuclear Regulatory Commission must provide reasonable assurance that the reactor will continue to operate safely.

The nuclear power corporations and their allies in the US have engaged in extensive lobbying to get state governments to pass legislation with the deliberate intention to pass the costs onto consumers.⁸⁵ In New York and Illinois, utility companies must purchase a specific amount of zero-emissions credits from authorised nuclear power stations, all owned and operated by Exelon Corporation. Purchasing contracts in both states will be in effect for 10 to 12 years, and utility companies must pass on the cost to consumer bills. In addition, in New Jersey, “each electric public utility” is required to purchase “Nuclear Diversity Certificates” from nuclear power plants, with consumers paying for these programs through higher utility bills.⁸⁶

The deal that Dominion Energy struck in Connecticut was different, taking the form of a contract that requires the state’s two electric distribution utilities to purchase about 50% of

⁸¹ James Morrow, ‘Expert nukes our policy’, *The Herald Sun*, 10 January 2023, 17.

⁸² Victorian Legislative Council Environment and Planning Committee, ‘Inquiry into nuclear prohibition’, November 2020, 72.

⁸³ Richard Bridle and Clement Attwood, ‘It’s Official: The United Kingdom is to subsidise nuclear power, but at what cost?’, International Institute for Sustainable Development, Global Subsidies Initiative, February 2016, 2.

⁸⁴ US Department of Energy, ‘DOE Establishes \$6 Billion Program to Preserve America’s Clean Nuclear Energy Infrastructure’, 11 February 2022.

⁸⁵ Cassandra Jeffery and MV Ramana, ‘Big money, nuclear subsidies, and systemic corruption’, *Bulletin of the Atomic Scientists*, 12 February 2021, <https://thebulletin.org/2021/02/big-money-nuclear-subsidies-and-systemic-corruption/>

⁸⁶ *Ibid.*

the electricity output of Dominion's Millstone nuclear-generating plant for ten years. Millstone houses two operational nuclear reactors.⁸⁷

The US Nuclear Energy Institute (NEI) managed to get annual fees charged to nuclear-generating plants for hazardous material cleanup scrapped. They stated, "After targeting the House and Senate Appropriations Committees, NEI successfully prevented the implementation of a US\$200 million annual fee placed on the industry."⁸⁸

As an aside, the NEI claimed credit for ensuring the cutting of the budget for the Nuclear Regulatory Commission, which oversees the safety of nuclear reactors in the US. They stated in 2017 that they "worked with the House Appropriations Committee to reduce the NRC's budget again."⁸⁹

In the UK, some proposals for new nuclear power reactors have not progressed because the UK Government has not been willing to provide the level of subsidy the nuclear power corporations are seeking.⁹⁰

Greenpeace analysed capacity mechanism subsidies provided in the EU between 1998 and 2018. The subsidies amounted to €32.6 billion, with a further €25.7 billion committed out to 2040. Identifying the fuel source for just under half of these subsidies was possible. Of those where the fuel source could be identified, 91% were for coal and gas-fired generators. Nuclear power generators received 4%. However, for France and the UK with large nuclear power generation, 31% and 14% of the subsidies went to nuclear power generators. Renewables received approximately 0.5% of the subsidies.⁹¹

The International Energy Agency reported that the corporations running the Swedish nuclear power reactors have stated that their plants are not profitable. In addition, the IEA noted that further building of nuclear power plants in Sweden was unlikely as the government was unwilling to provide direct or indirect subsidies.⁹²

Pursuing subsidies by nuclear power corporations has resulted in recent significant corruption cases.

As examples of recent corruption cases, in July 2020, the Speaker of the House of the state of Ohio, Larry Householder, and four other defendants were arrested for racketeering. The alleged conspiracy was to maintain a US\$1.3 billion bail-out to FirstEnergy Solutions to prop up its unprofitable nuclear power reactors and coal-fired power stations in return for US\$60 million in dark money.⁹³ FirstEnergy is one of Ohio's largest utility corporations. It is alleged that when years of lobbying failed to secure a state government hand-out, the corporation resorted to bribery to gain legislative support for House Bill 6, 2019.⁹⁴ The Bill would force state consumers to pay into "the Ohio Clean Air Fund", which would funnel US\$150 annually to FirstEnergy.

⁸⁷ Ibid.

⁸⁸ Ibid.

⁸⁹ Ibid.

⁹⁰ Emily Haves, 'Nuclear power in the UK', House of Lords Library, 1 December 2021, <https://lordslibrary.parliament.uk/nuclear-power-in-the-uk/>

⁹¹ Greenpeace EU, 'Exposed: €58 billion in hidden subsidies for coal, gas and nuclear', 13 September 2018.

⁹² International Energy Agency, 'Nuclear Power in a Clean Energy System', May 2019, 45-46.

⁹³ Cassandra Jeffery and MV Ramana, 'Big money, nuclear subsidies, and systemic corruption', *Bulletin of the Atomic Scientists*, 12 February 2021, <https://thebulletin.org/2021/02/big-money-nuclear-subsidies-and-systemic-corruption/>

⁹⁴ Ibid.

The US\$60 million from FirstEnergy were to a not-for-profit allegedly secretly controlled by Mr Householder.⁹⁵

FirstEnergy entered into a deferred prosecution agreement over its involvement in bribery. It paid a US\$230 million fine and agreed to assist the law enforcement investigation into the corruption.⁹⁶

In addition, FirstEnergy agreed to pay a US\$3.9 million fine for withholding lobbying and accounting information from the Federal Energy Regulatory Commission's (FERC) enforcement office.⁹⁷ The corporation admitted to violating FERC's Duty of Candor rule in a settlement approved on 30 December 2022.⁹⁸ FirstEnergy failed to disclose nearly US\$94 million in lobbying support of House Bill 6, 2019.⁹⁹ The US\$94 million included nearly US\$71 million to 501(c)(4) nonprofits.¹⁰⁰

FirstEnergy had admitted to paying a US\$4.3 million bribe to Ohio's top utility regulator, Sam Randazzo, through one of his companies just before he took the role as a regulator in exchange for favourable regulatory treatment.¹⁰¹ Mr Randazzo resigned from the Public Utilities Commission of Ohio in November 2020.¹⁰² However, subsequent records allegedly show that FirstEnergy paid US\$22.8 million to Mr Randazzo.¹⁰³

Matt Borges, a lobbyist and former chairman of the Ohio Republican Party, is to be tried alongside Mr Householder. Mr Borges is accused of conspiring in the corrupt activity.¹⁰⁴

Two other lobbyists, Jeff Longstreth and Juan Cespedes, pleaded guilty to their role in the conspiracy.¹⁰⁵ An additional conspirator took his own life after being indicted.¹⁰⁶

⁹⁵ Jake Zuckerman, 'Judge will allow 'pay-to-play' recording at former GOP House Speaker Larry Householder's trial', Cleveland.com, 13 December 2022, <https://www.cleveland.com/open/2022/12/judge-will-allow-pay-to-play-recording-at-former-gop-house-speaker-larry-householders-trial.html>; and David Dewitt, 'Householder defense in racketeering trial previewed in fight over campaign finance expert', *Ohio Capital Journal*, 21 October 2022.

⁹⁶ Jake Zuckerman, 'Judge will allow 'pay-to-play' recording at former GOP House Speaker Larry Householder's trial', Cleveland.com, 13 December 2022, <https://www.cleveland.com/open/2022/12/judge-will-allow-pay-to-play-recording-at-former-gop-house-speaker-larry-householders-trial.html>

⁹⁷ Annemarie Mannion, 'FirstEnergy Fined \$3.9M in Scandal Involving Nuke Plants', *ENR Midwest*, 5 January 2023.

⁹⁸ Annemarie Mannion, 'FirstEnergy Fined \$3.9M in Scandal Involving Nuke Plants', *ENR Midwest*, 5 January 2023.

⁹⁹ Jake Zuckerman, 'FirstEnergy to pay \$3.9m fine for withholding lobbying info from federal regulators', Cleveland.com, 3 January 2023.

¹⁰⁰ Ibid.

¹⁰¹ Jake Zuckerman, 'Judge will allow 'pay-to-play' recording at former GOP House Speaker Larry Householder's trial', Cleveland.com, 13 December 2022, <https://www.cleveland.com/open/2022/12/judge-will-allow-pay-to-play-recording-at-former-gop-house-speaker-larry-householders-trial.html>; Kathiann Kowalski, 'Special Report: Updates on Ohio's ongoing utility corruption scandal', *The Ohio Press Network*, 9 December 2022; and Jake Zuckerman, 'FirstEnergy to pay \$3.9m fine for withholding lobbying info from federal regulators', Cleveland.com, 3 January 2023.

¹⁰² David Dewitt, 'Householder defense in racketeering trial previewed in fight over campaign finance expert', *Ohio Capital Journal*, 21 October 2022.

¹⁰³ Jake Zuckerman, 'FirstEnergy to pay \$3.9m fine for withholding lobbying info from federal regulators', Cleveland.com, 3 January 2023.

¹⁰⁴ Jake Zuckerman, 'Judge will allow 'pay-to-play' recording at former GOP House Speaker Larry Householder's trial', Cleveland.com, 13 December 2022, <https://www.cleveland.com/open/2022/12/judge-will-allow-pay-to-play-recording-at-former-gop-house-speaker-larry-householders-trial.html>

¹⁰⁵ Jake Zuckerman, 'FirstEnergy to pay \$3.9m fine for withholding lobbying info from federal regulators', Cleveland.com, 3 January 2023.

¹⁰⁶ David Dewitt, 'Householder defense in racketeering trial previewed in fight over campaign finance expert', *Ohio Capital Journal*, 21 October 2022.

The not-for-profit Generation Now has been indicted and pleaded guilty. FirstEnergy admitted using Generation Now to “conceal payments for the benefit of public officials and in return for official action.”¹⁰⁷

Former FirstEnergy executives, Chuck Jones and Michael Dowling, were named in a related civil lawsuit by the Ohio Attorney General that aimed to keep Mr Randazzo’s assets frozen.¹⁰⁸

FirstEnergy also admitted to having paid US\$5 million to a dark money group, which appears to have been supporting Donald Trump.¹⁰⁹

In July 2020, Commonwealth Edison (ComEd), a subsidiary of Exelon, was charged with bribery of a public official in Illinois¹¹⁰. The public official was Illinois House Speaker Michael Madigan. Mr Madigan and Michael McClain were accused of causing Commonwealth Edison to make monetary payments to Mr Madigan’s allies to reward their loyalty to Mr Madigan.¹¹¹

ComEd agreed to pay a US\$200 million fine to resolve a federal criminal investigation into a bribery scheme from 2011 to 2019. In a deferred prosecution agreement, ComEd admitted it arranged jobs, vendor subcontracts and monetary payments associated with those jobs and subcontracts. The benefits went to various associates of Mr Madigan to influence and reward Mr Madigan’s efforts to assist ComEd concerning legislation impacting ComEd and its business. ComEd also appointed a person to their Board of Directors at the request of Mr Madigan. ComEd agreed to assist in the investigation into its bribery.¹¹²

In November 2020, four former ComEd executives and lobbyists, including the CEO Anne Pramaggiore, were charged with bribery, bribery conspiracy and falsifying ComEd books and records. The accused allegedly created and caused the creation of false contracts, invoices and other books and records to disguise the true nature of some of the payments. The false documents were also used to circumvent internal controls at ComEd allegedly.¹¹³

The Challenge of Regulating the Nuclear Industry

The submitting bodies note with concern the experience of Gregory Jaczko, who was the US Nuclear Regulatory Commission Commissioner from 2005 to 2009 and then the chairman of the Nuclear Regulatory Commission from 2009 to 2012. In his book *Confessions of a Rogue Nuclear Regulator*, he stated his experience was that the regulator was “overwhelmed by the

¹⁰⁷ Ibid.

¹⁰⁸ Jake Zuckerman, ‘FirstEnergy to pay \$3.9m fine for withholding lobbying info from federal regulators’, *Cleveland.com*, 3 January 2023; and Kathiann Kowalski, ‘Special Report: Updates on Ohio’s ongoing utility corruption scandal’, *The Ohio Press Network*, 9 December 2022.

¹⁰⁹ Kathiann Kowalski, ‘Special Report: Updates on Ohio’s ongoing utility corruption scandal’, *The Ohio Press Network*, 9 December 2022.

¹¹⁰ Cassandra Jeffery and MV Ramana, ‘Big money, nuclear subsidies, and systemic corruption’, *Bulletin of the Atomic Scientists*, 12 February 2021, <https://thebulletin.org/2021/02/big-money-nuclear-subsidies-and-systemic-corruption/>

¹¹¹ US Attorney’s Office, Northern District of Illinois, ‘Superseding Federal Indictment Against Former Illinois Speaker of the House Adds Charge for Alleged Corruption Scheme Related to AT&T Illinois’, 14 October 2022.

¹¹² US Attorney’s Office, Northern District of Illinois, ‘Commonwealth Edison Agrees to Pay \$200 Million to Resolve Federal Criminal Investigation Into Bribery Scheme’, 17 July 2020; and US Attorney’s Office, Northern District of Illinois, ‘Former Illinois Speaker of the House Indicted on Federal Racketeering and Bribery Charges in Connection with Alleged Corruption Schemes’, 2 March 2022.

¹¹³ US Attorney’s Office, Northern District of Illinois, ‘Former Commonwealth Edison Executives and Consultants Charged With Conspiring to Corruptly Influence and Reward State of Illinois Official’, 18 November 2020.

industry it is supposed to regulate and a political system determined to keep it that way.”¹¹⁴ He also stated:¹¹⁵

When I started at the NRC, I gave no thought to the question of whether nuclear power could be contained. By the end, I no longer had that luxury. I know nuclear power is a failed technology.

He reported in his 2019 book that after the Fukushima disaster he had attempted to see license conditions imposed on new nuclear power plants to address the concerns raised by the Fukushima disaster. These efforts were blocked.¹¹⁶ He then attempted to see new plants have a reporting condition that would require them to report to the Nuclear Regulatory Commission well in advance of the start of operations about how their plants would cope with problems identified after Fukushima.¹¹⁷

He concluded that:¹¹⁸

Soon the pressure to bolster the industry will become even more extreme because the economic case for nuclear power is slowly falling apart. That’s because nuclear power is one of the most expensive ways to generate electricity. Over the decades, the cost of operating nuclear power plants has remained stable or even increased, unlike wind and solar and other sources of electricity, which have decreased dramatically in cost.... Nuclear power does, after all, create little to no air pollutants; it does not spew particulate matter, mercury, sulfur dioxide, or any other typical by-product of fossil fuel combustion into the air. More important, nuclear plants emit no carbon dioxide or other greenhouse gases into the atmosphere. Still, it is becoming ever clearer that there are better, cheaper ways to create energy and combat climate change, especially as the marketplace continues to make renewable energy and energy efficiency more affordable.

Today the motivation for continuing to rely on this controversial form of electricity generation stems primarily from the powerful companies that have already made billions of dollars from this technology and the need for a source of power that does not emit significant amounts of greenhouse gases.

The issues raised by Dr Jazko and the experience with other nuclear industry regulators in other jurisdictions means the Synods and U Ethical are concerned about the ability of any government to properly regulate nuclear businesses and not ultimately compromise public safety in the pursuit of profits for those businesses and economic outcomes.

Even if the Australian Government uses valuable government revenue to initially build and operate nuclear power plants in Australia, there is a high risk they will be subsequently privatized. Privatisation often involves a loss to the Australian community, as the assets being privatized are sold at below market value, or the new private operator is given the power to extract payments from consumers at above market rate to make the privatization deal more attractive to the private investors. In either case, the broader Australian community end up as losers in the arrangement.

Nuclear power generation is on the wane globally, so it is not surprising to see the aggressive efforts to assert itself in Australia to try and find a new market.

¹¹⁴ Gregory Jaczko, ‘Confessions of a Rogue Nuclear Regulator’, Simon & Schuster Paperbacks, New York, 2019, viii.

¹¹⁵ Ibid., ix.

¹¹⁶ Ibid., 153-156.

¹¹⁷ Ibid., 156-157.

¹¹⁸ Ibid., 162-163.

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Appendix A: Relevant Uniting Church resolutions on nuclear power and uranium mining

In 1977 the Synod of Victoria meeting resolved:

(a) That the first Synod of the Uniting Church in Victoria does not feel free to be silent about a most important issue which is now before the Australian nation: the matter of the mining and exporting of uranium.

(i) Christ's disciples are called to be "the salt of the earth" and a "city on a mountain" by what they are among themselves and also in their concern for the world. They have heard Christ's commandment to love God and their neighbour and they are called to obey Him in His Lordship over God's creation and his protest against all forces that endanger and damage it. They look forward to a new heaven and a new earth, indeed a new universe that glorifies God's name, a universe where all that is receives God's gracious gifts in harmony, abundance, safety and security.

(ii) In this context the Uniting Church feels constrained to express concern about the policy of the Australian government to mine and export uranium. The Uniting Church wants to speak to its own membership and to the nation, to all men and women, irrespective of their political affiliation.

1. We do not share a popular belief in the inevitability of the use of uranium as a source of energy. Many people argue that the world has entered the nuclear age - that a number of nations are mining and exporting uranium, making handsome profits and also serving the world in its energy needs. They argue that we in Australia cannot put the clock back; that we should not stay behind in the development of the world. We do not share such a belief. We do believe that Australia and the world need a thorough study of the energy problem in its totality in connection with our standards of life; and the glaring differences in the use of energy in the wealthier and poorer parts of the world.

2. We do not share the optimistic belief in man as a being who could overcome all the risks connected with the use of nuclear energy if he only set his mind to it. We have witnessed in our century that man can become a dangerous monster, led by demonic forces to destroy humanity. There are no absolute safeguards against the use of uranium and its waste products for destructive purposes.

3. We share the widely held anxiety in regard to the dangers of waste products - plutonium and others. We feel that present-day generations have no right at all to impose on future ones the enormous cost of human resources to care for the wastes and obsolete installations they leave behind them, to say nothing of the continuous risks this involves.

The 20th century is already, in many respects, bearing the burden of guilty decisions and attitudes of former periods of history. We must not increase that burden.

The life-style of the wealthier parts of the world would only be prolonged for a very small period of time, without helping the under-developed nations to have the bare necessities of life.

(iii) The above mentioned concerns are only a few of the many reasons which make us believe that it is the primary duty of the Australian Government to continue studying the use and possible misuse of uranium as a source of energy.

We plead for the Government to pause again on the decision to mine and export uranium. It should try to involve the whole nation at all levels in the study and discussion of these problems.

The uranium issue is a matter of life and death. It must not become a matter of party-politics; the nation as a whole is responsible.

In this context we believe in the right of every man and woman, young and old, to express an opinion in this matter in public. Endeavours to limit or suppress public demonstrations can only create explosive situations. "Children should obey their parents, but parents should not provoke their children to anger".

(b) That members of the Synod and members of the Uniting Church in Victoria be requested:

(i) to study material produced by the Australian Council of Churches, the Commission for World Mission, and the Northern Synod concerning the ethical and social issues involved; the effect on Aboriginal communities and the future implications of the decision to mine and export uranium.

(ii) to respond by continuing participation in the public debate, and as individuals to take appropriate action according to the request of the Australian Council of Churches, the Commission for World Mission and the Northern Synod.

(iii) to responsibly review our use of personal and church resources and lower our standard of living;

(iv) to convey to the Government that we believe no mining of uranium should take place in Australia for a five-year period from the publication of the second part of the Fox report.

(c) (i) That resolutions (a) to (b) be forwarded to the leaders of all Federal political parties, and to the Premiers of the various States, and their responses be sought in writing;

(ii) that the replies received be published in "Church and Nation" with the consent of the Editor.

In 1978 the Synod of Victoria meeting resolved:

(a) To reaffirm the statement of the 1977 Synod on the mining and export of uranium.

(b) To remind the Federal Government of the recommendations of the first report of the Ranger Uranium Environmental Inquiry, viz.

(i) to take immediate steps to institute full and energetic programs of research and development into alternative energy resources; and

(ii) that there be a national program for energy conservation.

(c) To request the Government to implement these resolutions as a matter of urgency.

In 1980 the Synod of Victoria meeting resolved:

- (a) To call upon the State Government immediately to instruct the S.E.C to pursue policies which will not necessitate the introduction for nuclear power to Victoria.
- (b) To call upon the State Government to amended the S.E.C Act so that nuclear power will not be an option for the future.
- (c) To advise the State Government of its concern with the agreement which the State Government has made with Alcoa in relation to the building of an aluminium smelter at Portland, because the project will take such large quantities of electricity that it may provide a justification for the establishment of a nuclear power plant in Victoria.
- (d) To inform the State Government that it questions the wisdom of the proposal to establish coal liquefaction plants in the Latrobe Valley, because of the environmental problems and the rapid depletion of brown coal reserves, this provided a possible justification for the introduction of nuclear power for electricity production in Victoria.
- (e) To call on the State Government to encourage the development of decentralized energy systems using renewable sources, and to introduce measures by which industries, as well as households, may be encouraged to conserve energy from fossil fuels.
- (f) To request, as a matter of urgency, at all levels of the Church's life, the study and discussion of the use of energy and to encourage participation of members in community discussion and debate, making use of resources available from the Division of Social Justice.

The 1981 Synod of Victoria meeting resolved:

- (a) That the Board of Property and Finance act as follows:
 - (i) By Synod 1982, dispose of any shares, debentures, stock or notes or any other marketable security held by the Board, being an investment of the Common Fund or the specific investment of any other fund held by the Board, which represent an investment in any company whereby any part of the business of that company as at October 1981, is engaged in the actual mining of uranium or a substantial part of the business of that company as at October 1981, is involved in the processing, export, transport, transshipment or handling of uranium or its derivatives.
 - (ii) To report to the Standing Committee by June 1982, the action being taken pursuant to the above resolution including any capital profits or losses which may have resulted from its actions, and whether the board considers that all companies believed to be involved in the uranium industry, and whose marketable securities were held by the Board, are being suitably researched and the necessary action being taken in terms of the above resolution.
 - (iii) To refrain immediately from the purchase of new securities, extensions to present holdings, or option of rights to any marketable security in any company involved in the uranium industry as defined in resolution (i).

- (b) That any company, as defined in resolution (i), whose sole business involvement in the handling of uranium, or its derivatives, is in the area of medical research or for medical purposes, be exempted from action under resolution (a).
- (c) (i) That a Task Group of seven persons be established to carry out an investigation of all companies whose marketable securities are held within the Common Fund or any other fund held by the Board, to ascertain their involvement through financing or secondary investment or otherwise in any way whatsoever in any company which is deemed to be involved with the uranium industry, and to bring a report of such third party involvement in the uranium industry to Synod 1983.
- (ii) That the Task group comprise three members appointed by the Property and Finance, one of whom shall act as Convener, two members appointed by the Division of Resources, and two members appointed by the Division of Social Justice.
- (d) To encourage all members, agencies, institutions of the Uniting Church to study their involvement through financial investment in the uranium and nuclear industries, in the light of the decisions of this Synod, and to act accordingly.
- (e) To urge strongly the Federal Government to review and reconsider its stated intention of transferring the control and operation of the uranium and nuclear industries to individual State Governments of this country.

In 1982 the Synod of Victoria meeting resolved:

To support the concept of declaring Victoria a zone free of the mining of uranium, the processing of fissionable material, the storage, transport and waste disposal of fissionable material, and inform the Victorian and Federal Governments accordingly.

In 1982 the Synod of Victoria meeting resolved:

- (a) To endorse the action of the Task Group in carrying out its work under the minutes of 1981 Synod.

The identification of eight levels of involvement as follows:

- (i) Companies solely engaged in uranium mining;
- (ii) Companies directly engaged in uranium mining as part of their total operations;
- (iii) Companies holding a substantial or controlling interest in a company in categories (i) and (ii);
- (iv) Companies providing services to companies involved in uranium mining e.g. banking, insurance, transport;
- (v) Companies supplying capital equipment to companies involved in uranium mining;
- (vi) Companies having an indirect involvement with the uranium industry not identified in any one of the above categories;
- (vii) Companies providing ancillary services to communities established at uranium centers;
- (viii) Companies with no identifiable involvement in the uranium industry.

The classification of companies within the Synod Portfolio according to the above levels of involvement.

- (b) That the Synod cease to hold shares in companies as described in the first three categories listed above:

- (i) Companies engaged solely in uranium mining;

- (ii) Companies directly engaged in uranium mining as part of their total operations;
- (iii) Companies holding a substantial or controlling interest in a company in categories (i) and (ii).

(c) That the task of reviewing the Uniting Church portfolio be the responsibility of the Investment Review Committee established by the Resources Commission.

(d) That the Task Group be thanked and discharged.

In 1994 the Synod of Victoria meeting resolved:

To reaffirm its opposition to the mining and export of uranium.

To urge the Federal Government to resist attempts to abandon the existing "three mine" policy of the Australian Labor Party so that new mines may be allowed to operate.

In 1996 the Synod of Victoria meeting resolved:

To inform the Federal Government of its disappointment and opposition to their decision to abandon the existing "three mine" policy of the previous Federal Government in order to establish new uranium mines in areas including National Parks, World Heritage Areas and aboriginal owned land.

The 1999 Uniting Church National Assembly meeting resolved:

- The Uniting church policy of a moratorium on uranium mining;
- The Federal Government request to the Uniting Church to research and review our policy concerning uranium;
- The Uniting Church resolutions and efforts to be in solidarity with the people affected by uranium mining;
- The complexities of Australia's and the world's energy needs for the future;
- The Uniting Church's commitment to nuclear non-proliferation; and the Uniting Church's commitment to the rights of nature and the rights of future generations;

And acknowledging:

- Our failure to live up to our commitments; and
- The failure of present procedures to deal justly with Indigenous people;
- Direct Social Responsibility and Justice to draft a new policy for presentation to the November meeting of the Standing Committee concerning the nuclear fuel cycle, its impacts and role in the provision of energy in the future;
- Direct National Social Responsibility and Justice to prepare resources to inform councils and individual members concerning the Church's policy and the implications for action that arise from it.

In 2000 the Uniting Church National Assembly Standing Committee resolved:

Receive the report [on the Uniting Church's policies concerning the nuclear fuel cycle];

Adopt the policy statement as stated in the report;

Adopt the key statement 'The UCA is committed to the development of environmentally benign, renewable energy sources and the cessation of uranium mining. Recognising the complexity of the issues we call on individuals, churches, industry and government to work together to end involvement in the nuclear fuel cycle;

Request the Assembly in 2000 to endorse Standing Committee's action in adopting the Policy Statement;

Encourage individual members, congregations, presbyteries, synods and the Assembly of the Uniting Church to:

- Study and reflect on the Policy Statement;
- Act upon the intent of the Statement by
 - Seeking to reduce energy needs;
 - Investigating and engaging in the use of environmentally benign, renewable sources of energy as quickly as is practicable;
 - Contributing to the 1 per cent fund for Nature and Future Generations;

Request the National Social Responsibility & Justice Agency to:

- Publish the broadsheet on the Nuclear Fuel Cycle making it available to the members of the church, government, industry and other interested parties.
- Set up, promote and administer a 1 per cent fund for Nature and Future Generations. Contribution to the fund shall be voluntary. The purpose of this fund is to:
 - Fund the preparation of educational resources concerning the nuclear fuel cycle and its impacts;
 - Fund congregational initiatives in environmentally benign, renewable energies;
 - Fund advocacy related to the nuclear fuel cycle and its impacts;
 - Fund advocacy related to research and development of the environmentally benign, renewable sources of energy.
 - Support Indigenous participation in negotiations relating to issues of the nuclear fuel cycle;
- Report the Assembly 2003 on progress made toward achievement of the decisions of Assembly arising from the policy;
- Continue in dialogue with the environmental, alternative energy and anti-nuclear organisations, governments, Indigenous Australians, the Australian Mining Industry Council and Mining companies in relation to the reviewed and revised policy on the nuclear fuel cycle, its impacts and role in the provision of energy in the future;
- Seek opportunities for dialogue and common action with agencies of other churches and ecumenical bodies, nationally and internationally, calling for the responsible care and use of God's creation, and seeking a nuclear free world;
- Express our appreciation to the environmental, alternative energy and anti-nuclear organisations, political parties, mining companies and key individuals that have assisted National Social Responsibility and Justice over the past three years in policy review.

Call on the mining industry to:

- Employ higher standards of risk assessment using the precautionary principle as opposed to the utilitarian principle;
- Recognise the need for public accountability and make transparent all decision-making and reporting with regard to all aspects of the nuclear fuel cycle; work toward an internationally-agreed self-funded management plan of all fuel and wastes which guarantees the long term protection of people and the environment.

Call on government to initiate a more active program including:

- Direct government initiatives in developing models of energy use which minimise production of greenhouse gases and increases the use of environmentally benign, renewable resources;
- Tax credits for those working towards development of renewable, environmentally acceptable alternatives, and tax penalties on those who fail to meet targets set by government for reduced pollution; significant increases in the provision of subsidy support for initial research, development and implementation of potentially viable alternative energies, with a view to becoming a leader in research, development and implementation of environmentally benign, renewable alternatives.
- Target government purchases toward enterprises consistent with these policy objectives;
- Do all in its power to accelerate the move in Australia from commitment to uranium mining and involvement in the nuclear fuel cycle towards more acceptable alternatives.

And, urge the government to:

- Apply precautionary principles in their assessment of risk making decisions concerning the nuclear fuel cycle;
- Ensure any sale of uranium is contingent upon an internationally agreed management plan that protects people and the environment; ensure public accountability by requiring industry to make the levels of radiation at and near mine sites and storage facilities a matter for public record;
- Ensure government guidelines do not erode the gains of the Mabo and Wik High Court Decisions.

In 2006 the Uniting Church National Assembly Standing Committee resolved to:

Encourage Uniting Church members to:

- (a) Advocate for government to implement policies that significantly reduce our dependence on fossil fuels and increase our use of non-nuclear renewable energy sources;
- (b) Engage in dialogues, shared learning and action with non –government environment action groups.