

Prospects for Nuclear Energy Policy in Australia

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Abstract

During the May 2019 national election campaign, Prime Minister Scott Morrison denied his Liberal-National Party (LNP) government had any intention to pursue nuclear power for Australia. An official ban on nuclear power remains in place, but following the election, a parliamentary inquiry into nuclear energy was announced, and its report delivered in December 2019. This inquiry restarted a long-running debate on nuclear policy in Australia. Under the Liberal-Country Party government in the 1950s, Australia hosted the UK's atomic weapons testing, and considered developing Australia's own nuclear weapons arsenal. However, after the election of a Labor Party government in 1972, Australia ratified the Non-Proliferation Treaty (NPT), and has relied on the extended deterrence protection of its US ally ever since. Australia has nevertheless been a major exporter of uranium, and has maintained a small research reactor. In 2006, the LNP government of John Howard commissioned a report into nuclear power, which found it was uneconomic, given Australia's preponderance of coal-fired energy. A Royal Commission held by the South Australian state Labor government in 2016 found nuclear power would still be uneconomic, compared to renewable energy sources. Nuclear power advocates argue that small modular reactors (SMRs) could deliver baseload energy for Australia, while reducing carbon emissions. The opposition Labor Party remains against nuclear power though, particularly over where to site power plants, and disposal of nuclear waste. Any future Australian nuclear power industry is therefore a very long-term prospect, as renewable energy becomes more widespread, efficient, and affordable.

Keywords: Nuclear Power, Australian Politics, Energy Policy

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Introduction

Since the onset of the atomic age, whether to have nuclear power has been a long-running policy debate in Australian politics. Despite possessing large amounts of uranium, Australia has so far not pursued the option to develop nuclear energy. This has been due to its relative economic disadvantage, compared to the abundance of established coal and gas-fuelled electric power, and public concerns over the safety of nuclear reactors and disposal of radioactive waste. An overall bipartisan political consensus has therefore been maintained among Australia's main political parties, to uphold a moratorium prohibiting nuclear energy, although some politicians from the conservative parties have occasionally advocated its adoption.

Promoters of the nuclear option, including representatives of the mining industry, have therefore attempted to keep the issue on the public agenda. Debate over policy addressing climate change has given these nuclear power advocates renewed opportunity to argue that it will enable Australia to secure baseload electric power, while reducing carbon emissions. The most recent parliamentary inquiry into the issue, following the 2019 federal election, has argued that new nuclear technologies may be a future option to supplement Australia's energy sources. However, rather than bringing a resolution, this recommendation has only perpetuated the political dispute over this highly controversial issue.

The Background of Australian Nuclear Policy

Australian involvement in the nuclear power cycle has its origins in the discovery of radium, first extracted in Australia in 1906. Further exploration confirmed that Australia possessed up to 40% of the world's uranium ore deposits. The Australian government first mined uranium in 1944, to help supply the USA's Manhattan Project to develop the atomic bomb. Commercial mining of uranium began in 1954, at the Rum Jungle mine in the Northern Territory (NT), and the Radium Hill mine in South Australia (SA). Uranium exports would go on to supply markets in the USA, Europe, Japan and South Korea, and eventually China and India. (Ian Lambert, Jaireth, McKay & Mieztis, 2005).

Australia was also directly involved in the development of nuclear weapons during the Cold War. The Liberal-Country Party (LCP) Coalition government of Prime Minister Robert Menzies demonstrated its ongoing loyalty to the declining post-war British Empire, by offering to host the United Kingdom's atomic weapons testing program. The first atmospheric test took place at the Monte Bello Islands off the coast of Western Australia (WA) in 1952, and further open-air tests were conducted in WA and at Maralinga in SA, until October 1957. These test sites were left highly contaminated, particularly Maralinga. Thousands of Australian Defence Force personnel who assisted in the tests later suffered adverse health effects as a result. These personnel, and the traditional indigenous owners of the lands subject to the test had to endure a long legal battle against both the UK and Australian governments. They did not receive any kind of recognition or compensation, until a Royal Commission was held in 1985 (Firth, 1999, pp.120-122).

Australia also took its first minor, but significant steps towards developing nuclear science during the Menzies government. The Atomic Energy Act of 1953 established

the Australian Atomic Energy Commission (AAEC), a statutory government authority. The AAEC supervised the construction of the small 10MW High Flux Australian Reactor (HIFAR) at Lucas Heights, in the southern suburbs of Sydney, which became operational from 1958. Another small graphite research reactor (MOATA) was operated from 1958 to 1995. The AAEC was renamed the Australian Nuclear Science and Technology Organisation (ANSTO) in 1987. Used for nuclear science research, and production of materials for nuclear medicine, HIFAR was replaced by the Open Pool Australian light-water (OPAL) reactor in 2007 (ANSTO, 2020).

Australia Considers Nuclear Weapons and Nuclear Power

The Cold War experience of hosting British nuclear testing prompted a push within various members of the Menzies government, and the Australian military, for Australia to acquire its own nuclear weapons capability. In 1956, Minister for Air Athol Townley, proposed the Royal Australian Air Force (RAAF) acquire free-fall nuclear bombs. The Defence Committee of Cabinet then recommended the Australian Defence Forces acquire tactical nuclear weapons from the UK. However, Menzies was not enthusiastic, and by 1958, had confirmed his preference to continue to rely on the extended deterrence protection of the USA. The RAAF nevertheless from 1963 still acquired American F-111 strike aircraft, which could carry nuclear weapons. John Gorton, who became Liberal Prime Minister in 1968, was more keen for Australia to domestically produce its own nuclear weapons, particularly since Communist China tested its own weapons from 1964. However, by then Australia was under diplomatic and political pressure to sign the Nuclear Non-Proliferation Treaty (NPT); Gorton's government reluctantly did so in February 1970 (Walsh, 1997, pp.3-12).

Boosted by persistent lobbying from AAEC chairman Phillip Baxter, Gorton still proceeded to authorize the development of a British-designed nuclear power plant at Jervis Bay, the section of the Australian Capital Territory on the south coast of New South Wales (NSW). As well as generating electricity, the project was overtly designed towards providing Australia with its own potential nuclear weapons production capability, should its strategic position in the region deteriorate, as was feared during the later stages of the Vietnam War. However, Gorton's successor as Liberal Prime Minister in 1971, William McMahon, was less amenable to the proposal, and halted preliminary construction (McLaren, 2019).

The Three Mines Policy & the Nuclear Power Moratorium

The LCP government meanwhile delayed Australia's ratification of the NPT, which had to wait until after the election of the Australian Labor Party (ALP) government of Gough Whitlam in December 1972. The Whitlam government also suspended all contracts for uranium ore exports, pending a number of official inquiries into uranium mining. Allowing the export of uranium had become a hotly contested policy issue within Labor. The ALP's Left faction opposed it, a position energetically supported by the environmental and nuclear disarmament movements, which had emerged by the 1970s to conduct vigorous anti-uranium campaigns, including mass public rallies, instigating strikes, and direct protest action (Branagan, 2014, pp.1-2). Uranium mining was supported by the Right faction of the ALP, and its various affiliated unions in the mining sector. By 1975, Labor declared its 'Three Named Uranium

Mines Policy', which only allowed three uranium mines to be in operation at any one time. However, a moratorium against nuclear power was effectively in place in Australia, a prohibition that has endured to the present (Vestergaard, 2015, pp.24-25).

Even before signing the NPT, Australian governments have maintained Australia's role in the nuclear warfighting network of its US military ally. This has been principally done through hosting an American Signals Intelligence base at Pine Gap in central Australia. The highly-classified defence satellite and communications 'Joint Defence Space Research Facility', has been in operation since 1969 (Ball, 1980, pp.58-59). Australia also recently refused to sign the Treaty on the Prohibition of Nuclear Weapons at the United Nations in 2017 (as did mutual US ally Japan), citing the necessity of remaining under the protection of the USA's extended nuclear deterrence (IHRC, 2018).

After the dismissal of the Whitlam Labor government in November 1975, the Liberal-National Party (LNP) government under Prime Minister Malcom Fraser allowed new mining of uranium ore to export for use in nuclear power plants, which commenced in 1976, at the Mary Kathleen mine in Queensland (Lambert et al, 2005). After more rancorous debate at ALP policy conferences, the next Labor government of Bob Hawke continued the three mines policy from 1983. The LNP Coalition led by John Howard overturned the policy after it won government from 1996; but, no more than three mines have ever become operational at any one time, which has left the convention of the restriction unofficially still in effect (Firth, 1999, p.122). The long-running political moratorium on nuclear power was given further legal force though, with the passage in the Federal Parliament of the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*; a wide-ranging piece of legislation, its section s140A expressly prohibits nuclear power generation (Commonwealth of Australia, 1999).

The Switkowski and Australia Institute Reports

As a long, lucrative mining boom continued during the fortunate tenure of the Howard government, there was persistent lobbying from the mining industry and other advocates for a nascent Australian nuclear industry. This led in June 2006 to an official inquiry, the Report into Uranium Mining, Processing and Nuclear Energy, chaired by nuclear physicist Dr Ziggy Switkowski (BBC, 2006).¹ After receiving over 230 submissions, the Switkowski Report was released in November 2006. It concluded nuclear power was a possible option for Australia's energy mix, which could potentially deliver electricity to the national grid within 10 to 15 years. 25 reactors could possibly supply up to a third of Australia's electricity by 2050, and reduce carbon emissions by 8 to 17% (DPM&C, p.xii).

However, the Report also concluded that nuclear energy would be 20 to 50 per cent more expensive compared to coal and gas generated power, particularly if there was no price placed on carbon emissions. There would also be considerable obstacles to Australia entering the foreign-dominated market for uranium enrichment (DPM&C, p.45). The Report also neglected to address the rather important issues of feasible

¹ Switkowski had been the CEO of Telstra, Australia's largest telecommunications company; he was later appointed chair of ANTSO, and would go on to chair the National Broadband Network Company.

locations for power plants, and the disposal of nuclear waste. The Howard government used the Switkowski Report to sidestep any commitment to nuclear power. The Labor Party, now led by Kevin Rudd, continued its traditional policy of maintaining the moratorium on nuclear energy, which continued throughout the Labor governments of Rudd (2007-2010, 2013), and then Julia Gillard (2010-13) (Crowe, 2006).

Following the Switkowski Report, the Australia Institute (AI) public policy think tank released its own report in January 2007, examining where nuclear power plants could be realistically located in Australia, should nuclear energy ever proceed. It identified 19 possible locations for nuclear power plants, based on proximity to power grids of major energy markets, and access to large provisions of water. These criteria meant the most likely sites would have to be along the populated east coast of Australia, ranging along the coasts of Queensland, NSW, Victoria and SA. The AI report also referred to opinion polls, where only 35% of Australians supported nuclear power, and only 25% would support a nuclear power plant being built in their local area (Macintosh, 2007, pp.1-4).

The results of both the Switkowski and AI Reports reinforced the general bipartisan opposition to nuclear energy well into the next decade. After coming to office in 2013, the LNP government of Tony Abbott (a climate science sceptic) issued an Energy Green Paper in 2014, which considered there was potential for Australia to pursue Small Modular Reactors (SMRs), or thorium reactors in future, as Australia possesses 8% of the world's thorium deposits. However, the Green Paper also noted both these emerging technologies were still in development stage. Skills shortages, the relative low cost of alternative energy sources, and adverse community sentiment, particularly after the Fukushima disaster in Japan in 2011, were also significant barriers to Australia developing nuclear energy (DoI, 2014, pp.61, 71).

Abbott, and then Foreign Minister Julie Bishop, still favoured allowing nuclear power, if it was economically feasible, and did not require any government subsidies. After being deposed from the Liberal Party leadership by rival Malcolm Turnbull in 2015, Abbott called for the legal prohibitions on nuclear power to be lifted, something he had failed to even attempt while in office (Brown, 2017). Nuclear energy supporters now admit a pricing mechanism for Australia's carbon emissions needs to be reintroduced, to allow a nuclear power industry to ever become feasible (Quiggan, 2019). Such a carbon pricing system had been established by the Gillard Labor government in 2011; but, it was abolished in 2014 under Abbott's government (which incorrectly called it a 'carbon tax'), in favour of a taxpayer-funded 'Direct Action' policy, largely based on a bureaucracy-directed Emissions Reductions Fund (ERF) to subsidise polluting industries. This regulatory policy approach continued under the LNP Coalition governments of Turnbull, and then of Scott Morrison, which renamed the ERF as the 'climate solutions' fund in February 2019 (Holden & Dixon, 2019).²

² Morrison replaced Turnbull as Liberal Party leader and Prime Minister after a party room challenge in August 2018, after Turnbull failed to implement legislation for stronger emissions reduction (Sengupta, 2018).

The Australian Nuclear Association

Supporters in the LNP, some academics and scientists, the Australian Workers Union, and industry lobby groups have still continued to defend nuclear energy in public debate. Since its formation in 1983, the key organization promoting nuclear power in Australia has been the Australian Nuclear Association (ANA). It describes itself as:

an independent incorporated scientific institution which promotes the knowledge and practice of the peaceful, safe and effective use of nuclear science and technology to benefit people, science and the environment....ANA strongly supports the use of nuclear power for Australia as reliable, affordable and low carbon generator of electricity and as a low carbon source of heat for industry...The ANA supports the removal of Federal and State legislative nuclear prohibitions so that nuclear power can be considered on its merits (ANA, 2020a).

The ANA holds public lectures and biannual conferences extolling nuclear power; its 2019 conference in Sydney was opened by Deputy Premier and NSW National Party Leader John Barilaro, with the conference theme of ‘Nuclear for a Low Carbon Future’ (ANA, 2019). It has extensive links with international lobby groups for the nuclear industry, such as the American Nuclear Society and the World Nuclear Association. Significantly, one of the ANA’s members include the very wealthy and influential Minerals Council of Australia (MCA).³ The peak body for the mining industry, within the ANA the MCA represents the interests of uranium miners, principally the large multinational companies BHP Billiton, Rio Tinto, and Paladin Energy (ANA, 2020b).⁴

These connections indicate the considerable interest overseas nuclear energy corporations have in exploiting a potential Australian market. According to the 2015 GenCost Report from Australia’s science agency, the CSIRO, renewable energy was projected to reach similar costs with coal by 2030, and become the cheapest form of energy by 2050. Meanwhile, nuclear power would continue to be the most expensive form of power generation, even with a carbon price. Any future nuclear power industry in Australia would therefore inevitably be heavily reliant on foreign investment, supported by lucrative government subsidies, and an extensive level of bureaucratic supervision and regulation (Graham, 2015).

The SA Royal Commission and SMRs

The ANA was hence one of the interested parties who made over 250 submissions to the Nuclear Fuel Cycle Royal Commission, announced by the South Australian Labor government in March 2015. After nearly 40 public hearings, and testimony from 132 witnesses at Expert Advisory Panels, the final report was delivered in May 2016 (ABC, 2016). As the state most closely tied to uranium mining, the purpose of the Royal Commission was criticized by environmental campaigners as providing justification for further expansion of nuclear related industries (Long, 2016).

These fears from anti-nuclear critics turned out to be well-founded, as the key

³ The MCA donated \$146,730 to political parties in FY2018-2019 (AEC, 2020).

⁴ The three mines currently in operation are: Ranger in the NT, and Olympic Dam and Four Mile in SA. A total of 7798 tonnes of U3O8 ore was produced in 2019. (World Nuclear Association, 2020).

recommendations of the Royal Commission included: further encouragement of uranium mining; local processing of ore; and most controversially, the establishment of a facility for storage and disposal of nuclear waste. While the Royal Commission's report also recommended that federal prohibitions on energy generation by nuclear power be removed, a nuclear power plant would not be economically viable in South Australia (DP&C, 2016, pp.xiv-xv).

The section of the Report which dealt with nuclear energy included an examination of SMRs, the next-generation technology being heavily promoted by enthusiasts such as the ANA. SMRs are compact light water reactors, with a generating capacity of 300 MWe or less; most large-scale reactors in current operation generate around 1GWe. They are designed to be assembled from various components, making SMRs readily transportable. While their development is being promoted by a number of overseas corporations, including from the US, UK, China, South Korea, India and Russia, SMRs are not yet commercially operational (Gothe-Snape, 2019). Since their investment costs, timescales of introduction, and security risks are all still unknown and unproven, the Royal Commission Report concluded that SMRs were not economically viable, having a lower thermal efficiency than traditional larger fixed-location reactors (DP&C, 2016, pp.202-203).

The 2019 Election & Parliamentary Inquiry

Although the LNP remained consistently behind in opinion polls into 2019, on April 10, Prime Minister Scott Morrison announced a general election for May 18, hoping to take advantage of continuing positive growth in the economy, and the relative unpopularity of Labor's Opposition Leader Bill Shorten ("Australian Prime Minister", 2019). In the first week following the start of the campaign, Morrison was forced to backtrack on suggestions he was potentially open to nuclear-sourced energy, which saw the Labor Party swiftly accuse the government of preparing to lift the moratorium. Seeking to suppress this political controversy early in the campaign, Morrison made a clearer statement, that there were no plans by the government to change the laws prohibiting nuclear power (Ferguson, 2019).

Despite these denials during the election, less than three months after the LNP's generally unexpected victory (two seats were gained, for a still-narrow majority of 78 in the 151-seat Lower House of Representatives), Energy Minister Angus Taylor announced on August 2 that the House Standing Committee on Environment and Energy of the Federal Parliament would conduct an inquiry into the feasibility of nuclear energy.⁵ This came at the prompting of nuclear power enthusiasts in the LNP Coalition, who were emboldened by their election win (Macmillan, 2019).

The inquiry took three months, during which 11 public hearings were held, and 309 submissions received. The LNP-majority-dominated committee delivered its Report to Parliament on December 13, 2019. The committee chair, LNP MP Ted O'Brien,

⁵ Australian Electoral Commission data later revealed the fossil fuel industry made \$1,894,024 in political donations the year preceding the election: \$1,147,376 to the Coalition, and \$725,448 to Labor. Gas company Woodside, and coal company Adani were among the largest donors. The United Australian Party, led by Clive Palmer, received \$83.7 million in donations from Mineralogy, Palmer's own mining company. The UAP received 3.4% of the vote, and did not win a single seat (Stayner, 2020).

cited the need to reduce greenhouse gas emissions, in recommending a partial lifting on the restriction on nuclear technology for Australia's energy mix. Only new technology such as SMRs should be considered, and only with public consultation and consent, including for any associated nuclear waste disposal facilities (hence the title of the report) (DHR, 2019).

In their dissenting minority reports, the opposition committee members from Labor and the Independents argued against lifting the current restrictions on nuclear energy. They cited the lack of any clear economic case for nuclear power, including for the as-yet unproven technology of SMRs, amid the overall global decline of the nuclear power industry; the Labor report stated that global gross nuclear power generation had peaked at 17.46% in 1996, and had declined to 10.5% by 2018. The dissenters also raised the potential safety dangers of nuclear power and waste storage (SCEE, 2019, pp.55-73, 75-93). Responding to the report while attending the COP25 summit in Madrid, Energy Minister Taylor said there were "no plans" for the government to end the prohibition of nuclear power, which could not proceed without community and bipartisan political support (Foley, 2019).

Even before the conclusion of the inquiry, movement towards a permanent nuclear waste disposal facility took another step further in November, when the South Australian town of Kimba voted in a referendum held by the Australian Electoral Commission in favour of hosting a 'National Radioactive Waste Management Facility', by 61.58%, to 38.42% opposed. Local indigenous Native Title Holders claimed they had been excluded from the ballot, and planned a challenge in the Federal Court, supported by environmental groups also opposed to any facility (Smith, 2019). In a following ballot in December, the town of Hawker, also in regional SA, voted 52% against hosting a nuclear waste dump ("Residents vote against", 2019).

While neither of these ballots were legally binding on the federal government, in February 2020, the former Resources Minister Matt Canavan announced the federal government's approval for a nuclear waste dump at the rural property of Napandee, near Kimba. It is expected to concentrate the storage of low-level medical-origin radioactive waste, which is presently stored on-site at over 100 locations around Australia. Environmental groups such as the Australian Conservation Foundation (ACF) and local residents opposed to the dump are already planning to continue protests against such a facility going ahead ("South Australian farming property", 2020).

The ACF was also critical of a plan by mining company Boss Resources to re-open the Honeymoon uranium mine in SA; while it is one of only four mines in Australia with a currently valid export licence, it has not been in production since 2013. The company claimed new processing technology would make the mine viable again, once uranium prices recovered from their current slump on international markets. The ACF countered this optimistic assessment, pointing to the major company Rio Tinto's closure in 2012 of one of its main pits at its Ranger mine in the Northern Territory, due to lack of demand (Gooch & Tomevska, 2020).⁶

⁶ As of February 10, 2020, uranium was trading on the New York Mercantile Exchange at US\$24.55/lbs; the market peak was US\$140, on June 1, 2007 (Trading Economics, 2020).

Conclusions – the Climate Crisis Debate and the Fate of Australian Nuclear Policy

The unprecedented bushfire crisis that Australia endured during the summer of 2019-20, which commanded global attention, intensified public calls for stronger action to reduce Australia's carbon emissions. There was widespread awareness, supported by scientific opinion, that the likelihood of such extreme bushfires had been aggravated by drier conditions and higher temperatures caused by global warming (Gramling, 2020). Nuclear power advocates did not shirk this opportunity to re-enter the debate; while bushfires were still burning, the ANA invited a nuclear science professor from the Massachusetts Institute of Technology to spruik nuclear power, urging its necessity in order for Australia to eventually reach zero carbon emissions (Borschmann, 2020).⁷

The nuclear debate thus remains active in federal politics. On the first day of parliamentary sessions for 2020, former National Party leader (and outspoken nuclear power advocate) Barnaby Joyce launched a failed party room challenge to reclaim the leadership of the Nationals from Deputy Prime Minister Michael McCormack. At the first joint LNP party room meeting for 2020 held the same day, in a divisive debate over climate policy, backbench Liberal MPs Trent Zimmerman and Tim Wilson advocated adoption of nuclear power to reduce carbon emissions; National MPs such as Joyce argued for more coal-fired power stations, subsidised by the government if necessary. This demonstrates the ongoing policy tensions within the Coalition between 'moderates' willing to take action on climate change, and sceptics who deny the science altogether (Martin, 2020).

Following a cabinet reshuffle after Joyce's failed leadership bid, Nationals MP Keith Pitt was appointed Resources Minister, replacing Matt Canavan. Pitt was the MP mainly responsible for instigating the parliamentary inquiry into nuclear energy, as an advocate for lifting the moratorium. Amidst this latest political turmoil within the Coalition, Morrison maintained there were still no plans by the government to lift the long-standing ban on nuclear power (Coughlan, 2020).

Despite ongoing overseas investment in SMRs, this technology is still far from commercial realization, not expected until the 2030s at the very least. Even if the legal prohibition was overturned in the near future, a nuclear power industry in Australia would be unlikely to be established and viable until the 2050s, at the earliest. There would be substantial risks of cost blowouts, and requirements for extensive regulation and subsidies of foreign investment and operation, since there is no domestic experience and expertise for operating commercial nuclear power plants. The financial argument against nuclear energy is further reinforced by the latest updated CSIRO-AMEO Gencost 2019-20 study; it reconfirms earlier findings that renewable energy, principally solar and wind, will continue to be cheaper than coal and gas, while nuclear remains the most expensive option (Parkinson, 2020).

Future proposals for nuclear power by any Australian government are certain to be highly contested. Labor's policy remains firmly opposed to nuclear power; the ALP

⁷ The bushfire crisis largely eased in February, due to another extreme weather event – the heaviest rainfall for 30 years along the east coast of Australia, which caused local flooding (BBC, 2020).

would therefore be sure to politically exploit any hint of its proposal towards the next national election, due in 2022. Meanwhile, Scott Morrison's LNP government faces growing internal divisions, and widespread discontent among the electorate over its lacklustre climate policy (Bongiorno, 2020). Decisions over where to site power plants, and disposal of nuclear waste would remain highly controversial issues. Any Australian nuclear power industry is therefore a very long-term prospect, if ever, as less risky renewable energy becomes more widespread, efficient, and affordable.

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