THE QUESTIONS OF NUCLEAR TECHNOLOGY IN JAPAN AND AUSTRALIA: A COMPARATIVE ANALYSIS OF ENERGY POLICIES, MILITARY CAPABILITIES AND POLITICAL ATTITUDES TOWARDS NUCLEAR POWER

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Doi: 10.15170/PSK.2026.SI.01.07
Received: December 15, 2025
Accepted: April 24, 2026
Published: May 8, 2026

Citation:
Csekity Szemesi, Bence and Györgyi, Dávid (2026). The Questions of Nuclear Technology in Japan and Australia: A Comparative Analysis of Energy Policies, Military Capabilities and Political Attitudes towards Nuclear Power. *Polarities,* 7(SI), 120–138.

Acknowledgements:
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Abstract

Australia and Japan share historically unique ties to nuclear technology. From the first British atomic bomb tests conducted on Australian soil to the Nobel Peace Prize awarded to the International Campaign to Abolish Nuclear Weapons (ICAN), large parts of Australian civil society have shown a hardline stance against nuclear weaponry. Echoing this, Japan, as the only country that was bombed twice directly with atomic weapons, shares a complex system of societal pushback, along with a highly politicised nuclear policy. The Japanese attitude regarding nuclear energy is economically pragmatic, though overshadowed by the 2011 Fukushima accident, while in Australia, plans to construct nuclear power plants remain only ideas. This paper aims to examine how Japan and Australia share their attitudes on the issues of pursuing nuclear energy solutions and military technologies while balancing national and economic interests, green policies, non-proliferation commitments and civil society pushback.

Keywords: *Australia, Japan, Nuclear technology, Policy, Geopolitics*

Introduction

Japan and Australia have starkly distinct historical and societal backgrounds, however both states share common experiences with nuclear energy and nuclear weapons. Japan, as the sole country to have suffered from nuclear bombing during wartime, has developed a so-called *Nuclear Allergy*: a stark commitment to nuclear disarmament. Australia, whose soil was utilized after the Second World War as a site for nuclear testing, has similarly developed a strong anti-nuclear stance,

supported by its strong civil society growing sensitive to environmental and human consequences.

Australia and Japan are two of the closest and most prominent allies of the United States within the Indo-Pacific region, navigating the challenges of the increasingly assertive foreign policy of the People's Republic of China, and the Chinese-US competition emerging from this (Vörös & Tarrósy, 2024). The rising pressure is forcing Australia and Japan to reassess how they balance in the international arena, while keeping their moral commitments, security needs, and technological capabilities in check. While Japan constitutes the world's fourth largest economy, at the forefront of global technology development, coupled with a highly developed manufacturing industry, Australia's global economic importance is highlighted by its abundant natural resources and its strategic trade links with the leading economies of Asia, securing its strategic position within global supply chains.

In this paper, we will be comparing these countries due to their unique and complex stances regarding nuclear power use for both civilian and military uses. We will examine how the shifting world order influences the political and societal perceptions towards nuclear technologies within Japan and Australia. Both Japan and Australia are facing the effects of the global power shifts especially prevalent in the Indo-Pacific region. Amidst growing uncertainties regarding global energy supply chains, the strategic and economic feasibility of utilising nuclear power plants may be seen as a solution to fossil fuel dependency by politicians in both countries. Furthermore, growing security concerns due to an increasingly assertive Chinese foreign policy coupled with a reinvigoration of US interest in the Indo-Pacific, the military use of nuclear technologies has become a crucial political issue in both Japan and Australia. At the same time, however, the societies of Japan and Australia show a longstanding disdain for nuclear power use, making any nuclear technology development a divisive issue in both countries.

Starting out from the comparison of these perspectives, the research questions we pose in this paper are the following:

Q1. Can the uncertainty of the energy security environment of the Indo-Pacific incentivise the re-evaluation of civilian nuclear energy use within these countries?
Q2. How are the political attitudes to military nuclear technologies developing?
Q3. Can international security concerns shift societal attitudes towards nuclear technology?

To answer these questions, we will examine nuclear power use from three perspectives, comparing Australian and Japanese examples regarding each one. Firstly, we will examine the history and development of civilian nuclear energy use, considering the context of the Cold War and international tensions, Japan's development of nuclear power plants and British nuclear tests on Australian soil. Secondly, we

will examine the re-evaluation of utilising nuclear technologies for military capabilities in Australia and Japan, including proposals of acquiring nuclear weapons for Japan, and the planned acquiring of nuclear submarine propulsion technology by Australia under the AUKUS deal. Thirdly, we will introduce how the 2011 Fukushima disaster continues to form public opinion regarding civilian nuclear energy use and what are some of the major groups forming public opinion against nuclear weapons, examining their global relevance. During these comparisons, we will examine and utilise relevant information from government sources, international organisations, qualified articles and relevant economic and societal reports while focusing on civilian issues as well, to provide a broad overview of all three research perspectives. Lastly, we will conclude by showcasing our findings regarding each of our research questions, comparing the results between Japan and Australia.

The Questions of Civilian Nuclear Energy Use

The historical background of nuclear power in Japan and Australia

When the Empire of Japan surrendered to the allied forces in 1945 after the atomic bombings of Hiroshima and Nagasaki, Japan and the whole Indo-Pacific region was left devastated after years of warfare. After surrendering unconditionally, Japan came under a United States-led Allied occupation, lasting until the signing and ratification of the San Francisco Treaty in 1951, after which Japan regained its independence in 1952. The first and most prominent Japanese prime minister of the postwar era, Yoshida Shigeru, developed what would become known as the Yoshida Doctrine, in which he began paving the way for a new and democratic Japanese state, postwar economic reconstruction and eventually kickstarting the first phases of the so-called Japanese miracle. For postwar Japan, a resource-poor, import-dependent economy striving for rapid industrial growth, US President Eisenhower's endorsement of nuclear reactor construction became an opportunity that matched national priorities. At the same time however, the idea of constructing nuclear facilities faced an overwhelmingly negative opinion in Japanese society. In 1955 Japan adopted the Atomic Energy Basic Law, defining how the government may use nuclear energy, banning and denouncing the idea of acquiring nuclear weapons and only allowing the utilization of nuclear energy for peaceful and civilian purposes. Shortly after, the Japanese government began construction of its first two civilian nuclear reactors in the Tokai-Mura area. Within 5–6 years the first two Japanese nuclear reactors began their commercial operations. Nuclear power went on to play an outstanding role in the successful economic growth of postwar Japan, and the government decided to construct more reactors, even though this found widespread opposition in civil society (Aldrich, 2012).

After the end of the Cold War, nuclear reactor siting and constructions were slowed down drastically due to growing civil pressure, opposing such facilities due

to health and environmental risk concerns, the lack of long-term storage facilities for nuclear waste and of potential proliferation concerns. The nuclear accident on the 11th of March 2011 at the Fukushima Daiichi nuclear reactor effectively swept away any remaining pro-nuclear energy and weapon voices in Japanese politics, heavily affecting other developed countries as well. The questions of energy dependency and self-reliance, however, have recently regained momentum after Russia's invasion of Ukraine in 2022 and with the changing geopolitical landscape in the Indo-Pacific for Japan (Aldrich, 2012).

Australia became the testing site of the first British nuclear weapons during the first years of the Cold War. The United Kingdom restarted its independent research efforts into nuclear weapons shortly after the end of the Second World War. For testing these new weapons, remote locations in Australian territory were chosen, at which the British conducted several live nuclear weapon tests between 1952 and 1963. After the UK ratified the 1963 Partial Nuclear Test Ban Treaty, testing stopped in Australia, amidst growing civil opposition to nuclear weapons development. Serious political will towards developing nuclear weapons for Australia has remained outside the scope of mainstream politics of the country ever since. At the same time, investigations into the feasibility of constructing civilian nuclear reactors became part of political discourse, at the time of the government of John Gorton during the 1960s. After Gorton's replacement as prime minister in 1971, however, efforts to develop a civilian nuclear program lost popularity and became sidelined from mainstream politics until the 2000s (Tynan, 2016).

Nuclear Energy and its Role within the Japanese Economy

The Atomic Energy Basic Law of 1955 was groundbreaking – even in international terms – since it not only laid out the direction of future government policies in connection with nuclear energy but also stated that the use of it must always be for peaceful purposes, within democratic governance and transparency, a principle that has proven to be difficult to uphold. Most importantly, the law enshrined Japan's commitment to pacifism even within its own nuclear policy. Also in 1955, the Japan Atomic Energy Commission (JAEC) was created along with the Science and Technology Agency, institutions that were designed to guide the research and development of nuclear energy. The country's first research reactor, the JRR-1 was built in Tokai-Mura, and from 1957 it marked the beginning of operational nuclear capability for Japan. Japanese firms such as Toshiba, Hitachi, and Mitsubishi Heavy Industries quickly entered the field, initially relying on American technology but gradually adapting and innovating upon it (Aldrich, 2012).

The 1960s and 1970s marked the crystallization of nuclear power as a cornerstone of Japan's economic strategy. Japan's postwar economic miracle, characterized by annual GDP growth rates often exceeding ten percent, created massive demand for electricity. During this period, nuclear power plant construction accelerated at

an unprecedented rate. Major facilities such as Fukushima Daiichi, which connected its first reactor to the grid in 1971, followed by the Ohi and Takahama plants in 1974 and in 1975, Hamaoka in 1976, and Fukushima Daiichi in 1982. These reactors, among others throughout the late 1970s and 1980s, became essential components of Japan's evolving energy infrastructure. The Kashiwazaki–Kariwa complex in Niigata Prefecture, whose reactors entered operation between 1985 and 1997, eventually became the world's largest nuclear electricity generating site. Due to the aftermath of the Fukushima Daiichi accident in 2011 however, it was shut down in 2012 (Aldrich, 2012). The reactor is planned to return into commercial operation by the 18th of March 2026, after a 14-year hiatus (Inoue, Tomatsu, Ogawa, & Morishita, 2026).

Japan's long-term nuclear strategy also emphasized the goal of achieving fuel-cycle independence. In pursuit of this objective, Japan developed uranium enrichment capabilities, reprocessing technologies, and fast-breeder reactor projects. The burst of the asset bubble in 1991 led to a period of economic stagnation, yet the electric utilities organised as powerful regional monopolies continued to advocate for nuclear expansion. In 2002, Tokyo Electric Power Company (TEPCO) admitted to decades of falsifying safety reports, triggering a major scandal that forced several reactors to shut down temporarily. Similar incidents involving Kansai Electric and Chubu Electric revealed systemic issues within what critics labelled Japan's Nuclear Village: a tightly interconnected network of utilities, bureaucrats, politicians, and researchers who collectively shaped nuclear policy with minimal transparency. Even in periods of rapid economic growth, civil society remained fearful of radiation leaks and stayed worried about possible environmental harm, and society at large was distrustful of the large complex technological systems (Satoko & Higashi, 2025).

The trajectory of Japan's civilian nuclear sector changed irreversibly on 11 March 2011. The Great East Japan Earthquake, followed by a devastating tsunami, crippled the Fukushima Daiichi Nuclear Power Plant. The loss of power and cooling systems led to core meltdowns in Units 1, 2, and 3, hydrogen explosions, and the release of radioactive material. This event was the most serious nuclear accident since Chernobyl in 1986 that was already labelled as "7" (Major accident) on the International Nuclear Event Scale and revealed severe regulatory and institutional failures (Nuclear Energy Agency, 2025). In terms of the economy, the consequences were immediate and profound. Within two years of the accident, all of Japan's 54 nuclear reactors were taken offline and only 14 of them have been reactivated as of 2025. Nuclear power, which had provided around 30% of the country's electricity before the disaster, dropped close to zero by 2014 (Johnson & Russo, 2025). To compensate for lost capacity, Japan sharply increased imports of liquefied natural gas, oil, and coal mainly importing it again from Middle Eastern partners. The additional fuel costs reached several trillion yen annually, placing heavy burdens on households, industry, and the national trade balance. Electricity prices rose significantly, and

energy-intensive industries faced declining competitiveness. The government, led first by Prime Minister Kan Naoto and later by Prime Minister Abe Shinzo, sought to stabilize the situation through short-term fossil fuel reliance while debating the long-term role of nuclear power (Taghizadeh-Hesary, Naoyuki, & Rasoulinezhad, 2017).

In response to the regulatory failures exposed by Fukushima, Japan established the Nuclear Regulation Authority (NRA) in September 2012 as an independent body separate from the ministries and agencies that had previously overseen the sector. The NRA introduced some of the most stringent safety standards in the world, including comprehensive seismic and tsunami assessments, enhanced cooling requirements, filtered venting systems, and strict counterterrorism standards, however with the cost of defence the cost of operating became a heavier burden as well. The Sendai Nuclear Power Plant in Kagoshima Prefecture became the first to resume operation in 2015, followed by reactors at Takahama, Ikata, Ohi, and Genkai. Yet progress remained slow, hindered by court injunctions, local opposition, and the high cost of mandated retrofits (Aldrich, 2012).

The Nuclear Outlook of Australia's Energy Sector

Australia is home to immense quantities of uranium ore deposits, along with a highly developed mining and resource export economy. In 2001, Australia's known uranium stores accounted for approximately 40% of the world's known deposits (McKay & Miezitis, 2001). The next largest uranium-producing countries are Kazakhstan and Canada, both operating domestic nuclear reactors in their power grids. This places Australia in the unique position, despite being home to the largest known supplies of uranium worldwide, it is also the largest economy not making use of uranium domestically, exporting effectively all of it to nuclear reactor operating countries (World Nuclear Association, 2025). Australia is the world's third largest exporter of uranium after Kazakhstan and Canada, and the world's thirteenth largest economy as of 2025 by GDP. It is also only the third largest not using any nuclear power plants after Germany and Italy, and the only one never to have had a nuclear reactor. Only one functioning nuclear reactor exists in Australia, OPAL, the use of which is restrained to scientific research and nuclear medicine purposes (World Nuclear Association, 2025).

Mining uranium in Australia is thus necessarily a heavily regulated industry, on the one hand due to the country's strict adherence to international nuclear non-proliferation policies, and on the other due to stringent domestic regulations in place regarding mining operations. Australia has only three operational uranium mines as of 2025: Ranger, Olympic Dam and Beverley-Four Mile mines, with plans to resume production in the Honeymoon mine as well (World Nuclear Association, 2024). One of the largest recipients of Australia's uranium exports is Japan – coming in immediately after the US and the EU in terms of trade volume – with trade formerly

reaching 2500 tonnes of uranium per year, though the crash of the nuclear energy market in Japan post 2011 has reduced this. Nevertheless, as of 2015, Japan was cited as having one-third of its uranium imports supplied from Australia, valued at around $250 million (World Nuclear Association; 2021, Zavattiero, 2015)
Australian laws also heavily regulate possibilities for nuclear energy projects, with an outright ban in place regarding the construction of nuclear reactors since 1998, when Australia adopted the Australian Radiation Protection and Nuclear Safety Act. This means any serious efforts to introduce nuclear reactors to the Australian power grid will have to overcome in-place regulations (as well as civil society resistance and economic burdens) (Owen, 2010; Falk, Green, & Mudd, 2006; Matysek & Fisher, 2008).

With the issue of the global climate crisis becoming a mainstream political issue, in 2006 John Howard's Coalition government suggested nuclear power as a possible alternative to fossil fuels for Australia's electricity production necessities. This has also been brought up during Tony Abbott's term in government, and most recently during the 2024 federal election when Peter Dutton's campaign embraced the idea again. Dutton's campaign outlined a plan to start construction on seven new nuclear reactors in Australia in order to meet the country's goals of carbon emission decreases set out in the Net-Zero plan (Readfearn, 2025). After the 2024 elections concluded, Prime Minister Anthony Albanese has achieved a second term to lead the government of Australia, meaning the nuclear power project has again become sidelined for the foreseeable future.

The long-term financial viability of constructing nuclear reactors may be cited as one of the main reasons as to why Australia has never committed to building one. This is further hindered by how difficult it would be to introduce nuclear power into Australia's National Electricity Market logistically due to its inflexibility, the prevalence of inexpensive coal alternatives, a lack of suitable water-side locations, serious legal obstacles and negative public opinion (Owen, 2010). Anthony D. Owen's 2010 study outlining these barriers has been reinforced by the 2016 Royal Commission review and by a CSIRO review in 2024, both concluding that introducing nuclear power plants to Australia's power grid is not economically feasible (Nuclear Fuel Cycle Royal Commission, 2016; Graham, Hayward, & Foster, 2025).

Military Use of Nuclear Technologies

The Changing Narrative of Nuclear Means in Japan

Japan, as the only country ever bombed with nuclear weapons during warfare, developed a firm stance on the abolition of nuclear weapons early in the postwar period. This position later became institutionalized under the Eisaku Sato's administration, which established the Four Pillars of Nuclear Policy, defining the following ideas:

- Adherence to the Three Non-Nuclear Principles: Japan is committed to not possessing, not manufacturing, and not permitting the introduction of nuclear weapons into its territory.
- Global Nuclear Disarmament Efforts: Japan would actively work towards the long-term goal of bringing about a world free of nuclear weapons.
- Reliance on the U.S. Nuclear Deterrent: Japan's national security would be guaranteed by the United States' extended deterrence (the so-called Nuclear Umbrella), based on the US-Japan Security Treaty.
- Promotion of the Peaceful Use of Nuclear Energy: Japan would develop nuclear technology strictly for peaceful and solely civilian purposes (Akiyama, 2024).

The Northeast Asian region, due to its complex and seemingly unmendable security environment – with the rise of an assertive Chinese foreign policy – shows that risks and dangers posed by the nuclear capabilities are real and even more concerning than they were during the Cold War. Concerns regarding China's military buildup, including its nuclear capabilities, have been perceived as a threat to Japan since the early 1960s, when China developed its nuclear weapons with aid and technology transfer from the Soviet nuclear weapons program, after which it successfully detonated its first nuclear device in 1964 (Gill, 2025).

Today, emphasizing the effects of the changing world order, concerns have been mounting in the region more than ever before (Vörös & Tarrósy, 2024). This may be attributed to China's further expansion of its military capabilities, the tense geopolitical competition between China and the United States, and also Russia's 2022 invasion of Ukraine, concerning which Russia has repeatedly threatened to use nuclear weapons. Although the war is not taking place near Japan, they hold deep concerns and envision various scenarios with the actual use of nuclear weapons becoming reality (AFP, 2024). The possibility of an extensive and long-term blockade or an armed conflict over the Taiwan Strait has also become a subject of extensive discourse in recent years, with persistent apprehensions regarding the possibility of Japan becoming entangled in the situation (Kamikawa, 2024).

Further complicating the region's security environment, the Democratic People's Republic of Korea (DPRK) has been vocal about expanding its missile program since the early 1990s, hand in hand with the internationally suspected development of nuclear weapons. The DPRK recently has overseen serious growth regarding its missile capabilities, especially concerning intercontinental ballistic missiles. The DPRK's missiles are now capable of reaching the main islands of Japan, even being able to fly over them. Furthermore, the DPRK has been making significant progress in miniaturizing its nuclear weapons, to the degree that the regime has developed the technological capability to launch them using ballistic missiles – posing an existential threat to Japan (U.S. Naval Institute, 2025).

Collaborations among Russia, China and the DPRK are causing an even greater security threat. Regarding the relations between Russia and China, Russia has consistently supported the One-China policy, stating that Taiwan is an inalienable part of China and that it could never become independent. The question of Taiwan and the PRC's intentions regarding it have consistently fuelled debates in Japanese politics, with even Abe Shinzo and Sanae Takaichi, former and current prime ministers of Japan declaring, that a security threat to Taiwan is seen as a security threat to Japan. Sanae Takaichi's remarks on a possible involvement of the Japanese Self Defense Forces in case of a blockade or armed conflict – commonly referred to as an emergency (Vörös & Györgyi, 2025) – occurring concerning Taiwan reignited the flame of anti-Japanese sentiments in China, sentiments which the PRC has been consciously making use of (Komurata, Nishimura, & Tajima, 2025). After the APEC summit in 2025, South Korea received the permission of the United States to build and to operate nuclear-powered submarines citing the reasons for South Korea to be able to better protect themselves and to shift the power balance of the region (The Korea Times, 2025). At the same time however, Japan does not have the option to acquire its own nuclear weapons or to operate any nuclear-powered military vessels, however much of a threat it perceives to its national security, due to Article 9 of its constitution, as well as the rules laid out in the Atomic Energy Basic Law. The response of the Japanese government to this was a statement by the Minister of Defense Shinjiro Koizumi concerning that Japan, considering the security situation of the region, may also need to acquire nuclear submarines of its own (Sato & Kiyomiya, 2025). This public declaration happened on the same day when Sanae Takaichi brought up the aforementioned Taiwan issue.

Japan admits that the US nuclear umbrella is an inevitable part of the country's security policy, holding that nuclear deterrence plays an unequivocal role in the region's stability from a Japanese perspective. Both at the first meeting between President Donald Trump and Prime Minister Shigeru Ishiba in February 2025, at the first meeting between Japan's new Prime Minister Sanae Takaichi and Donald Trump in October 2025, the US President firmly upheld continuation of the US-Japan alliance, and the necessary security guarantees ensuring the defence of Japan and its territorial integrity (NHK World Japan, 2025; Johnson J., 2025).

The United States' position in the Indo-Pacific, including its nuclear umbrella and its relevance, were again reaffirmed in November 2025 by the country's new National Security strategy. The strategy defines the securitization of the First Island Chain as a term including the Japanese mainland, meaning Japan has retained its key position within US National Security (The White House, 2025).

From Maralinga to AUKUS

Military use of nuclear technology in Australia also shares a complicated history. At the start of the Cold War, the United Kingdom began to develop its own nuclear

weapons program. Political differences with the United States, namely being left out of its nuclear program meant that the United Kingdom couldn't conduct live nuclear testing at one of the already extant US testing ranges, as it would have seemed logical. Instead, it looked to its former colonies for appropriate testing grounds, first surveying remote Canadian territories for 12 live bomb tests. When the Canadian government learnt of the plans, however, it swiftly declined to host the British tests. Thus, the choice fell on Australia, whose government under the Menzies administration was keen to make use of Australia's large uranium deposits, and to keep as close as possible to the UK government in terms of security assurances against the perceived threat of communism spreading throughout the Indo-Pacific (Tynan, 2016).

The first British atomic bombs were tested at the Monte Bello islands in Western Australia, in 1952. From 1953 testing briefly moved to Emu Field, then to Maralinga, South Australia, in 1956. A total of four large-scale testing projects, including the live explosion of the Blue Danube atomic bomb were conducted at Maralinga, as well as around hundreds of smaller scale tests. The effects of the latter have been more devastating long-term, including dire health consequences for the nearby, mostly native Aboriginal Australian populations, unknowingly exposed to radioactive waste from the testing. With the signing of the Partial Test Ban Treaty (PTBT) in 1963 by the UK, testing ceased within Australia, though further live explosions were conducted by Britain in its Pacific Island territories. After testing was over at Maralinga, a cleanup effort concerning radioactive waste left by tests at the site went underway in 1967, after which the issue was sidelined for more than a decade. In the mid-1980s, a royal commission investigation into the contamination of the site of Maralinga determined radiation hazards were still present near the sites. Another cleanup effort went underway in 2000, though radioactive contamination has still been detected at the site even as recently as 2021 (Tynan, 2016; Aeria & Leckie, 2021).

The idea for Australia to acquire its own nuclear weapons was considered by officials in the 1960s, during the Gorton administration. Plans to construct Jarvis Bay Nuclear Power Plant were also created at this time, but with public opinion opposing the project and later the fall of the Gorton government, the project was abandoned without advancing out of the planning phase. Under the next governments, Australia then signed and ratified the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) in the 1970s. Though some politicians and media personalities have occasionally floated the idea, Australian officials have refrained from ever seriously trying to acquire nuclear weapons since then (Cawte, 1992).

The Australian Defence Force, most notably the Royal Australian Navy has also historically refrained from acquiring nuclear propulsion technology as well, Australia has never had any nuclear-powered naval craft, only traditionally powered ones. During the 2010s, when the Royal Australian Navy began to look for

replacements to its aging Collins-class conventionally powered submarines. In 2016 Prime Minister Malcolm Turnbull announced that the choice was made to acquire French-built Suffren-class submarines. These submarines were to be built as variants of the original French design, as the original Suffren-class was nuclear powered, meaning the new design was specifically tailored for Australian requirements and redesigned to accommodate for conventional diesel-electric power, creating the new Shortfin Barracuda variant (Panda, 2016). In 2021 however Australia announced its intention to acquire nuclear powered submarines through its newly shared AUKUS deal signed between Australia, the United Kingdom and the United States. The already troubled, late-running contract with the French Naval Group was suddenly deemed cancelled because of this, causing diplomatic upheaval between France and members of AUKUS, with France even recalling its ambassadors to Australia and the US (Corbet, 2021). Against a background of NGOs and civil organizations arguing against this, Australia maintains its obtaining of nuclear propulsion submarine technology adheres to its obligations under non-proliferation treaties (Australian Submarine Agency, 2025). In 2024, Japan has been named as a potential partner to the technological, information sharing areas of the AUKUS treaty, as of 2025 however, no significant steps had been taken to advance this proposition (Capaccio, 2025).

Civil Society and Nuclear Power

The Societal Effects of the 2011 Fukushima Disaster

For many, the Fukushima disaster was not merely a breakdown of technology but a systemic institutional collapse, exposing the long-term effects of weak oversight, entrenched complacency, and enduring ties between regulators, utility companies, and political leadership (nippon.com, 2025). The civilian reaction was immediate and far-reaching. Mothers' groups became the leading figures organised demonstrations, demanding that children must be protected from radiation exposure (Kakuchi, 2011). By September 2011, six months after the disaster, roughly forty thousand people gathered in Tokyo's Meiji Park for the Sayonara Nuclear Power rally, in which many prominent Japanese artists like Kenzaburo Oe participated to highlight the possible dangers of such facilities (Gopalakrishnan, 2011).

Investigations soon validated public anger that claimed the disaster was mainly because of the lack of institutional checkups. The 2012 parliamentary report of the Fukushima Nuclear Accident Independent Investigation Commission concluded that the disaster was manmade. The commission found systemic negligence, insufficient emergency planning, and a regulatory structure that prioritized industry promotion over safety. In response, nearly all of Japan's nuclear reactors were taken offline for comprehensive safety inspections or for permanent decommissioning. At the same time, the government announced institutional reforms aimed at separating

the promotion of nuclear energy from its regulation to prevent future failures. Parallel to these developments, civil society movements became more structured and increasingly influential (Suzuki, 2015).

From 2015 onward, a small number of reactors resumed operations after meeting the NRA's new safety standards. The restart of reactors revealed profound societal divisions: on the one hand, restarting nuclear electricity production was accepted as a necessary measure to secure reliable electricity in the face of environmental and economic challenges, but on the other hand, for those affected directly by the disaster it felt like a betrayal of the transformative energy of the Fukushima protests and a stark reminder that influential bureaucratic and industrial interests continued to prioritize nuclear power (The Fukushima Nuclear Accident Independent Investigation Commission, 2012).

The most notable post-Fukushima controversy arose in August 2023, when Japan began releasing treated wastewater from the Fukushima Daiichi plant into the Pacific Ocean. Although the International Atomic Energy Agency confirmed that the discharge met international safety standards, public opposition within Japan was intense. Notably, the fishermen's unions in Fukushima voiced concerns that the release would further harm the reputation of their products, while activists organized demonstrations in Tokyo, condemning the decision as premature and disrespectful to affected communities (Bateman, Obayashi, & Mallard, 2023). International reactions were similarly strong: China, Hong Kong and South Korea imposed a complete ban on Japanese seafood, and protests occurred in neighboring states as well, demanding that Japan halt polluting the waters (Mao, 2023). For Fukushima residents, many of whom had already experienced displacement, social stigma, and economic hardship, the wastewater release represented a new chapter in a decade-long struggle for recognition and justice. Within the broader population, generational differences became increasingly evident, with the younger generation, influenced by global debates on climate and energy security, faced the challenge of reconciling skepticism toward nuclear institutions with concerns over sustainable energy and climate change (AP, 2023).

Non-Proliferation Efforts – ICAN and Nihon Hidankyo

After having signed and ratified the NPT in the 1970s, Australia became one of the most prominent international advocates of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in 1996, under which any further test explosions of nuclear weapons would be banned internationally. Japan signed the NPT in February 1970 and ratified it in June 1976, formally committing to remain a non-nuclear-weapon state under international safeguards. Japan later strengthened its normative stance by signing CTBT when it opened for signature in 1996, completing its ratification in the late 1990s and reinforcing the global norm against nuclear testing. The treaty, however, could not enter into force despite an overwhelming majority of countries

voting in favor of it, as key nuclear powers, such as the US, Russia and China have not ratified it (Department of Foreign Affairs and Trade, 2025; Ministry of Foreign Affairs of Japan, 2025).

In a large part due to the frustration caused by the failure of the CTBT entering into effect, members of the 1985 Nobel Peace Prize laureate organization, International Physicians for the Prevention of Nuclear War decided to launch a new campaign aimed at the prohibition of nuclear weapons in general. As a result, the International Campaign for the Abolition of Nuclear Weapons (ICAN) was founded in Melbourne, Australia in 2007. During the first ten years of its existence, the organization became the most significant international civil effort to ban nuclear weapons, directing its work towards what would become known as the Treaty on the Prohibition of Nuclear Weapons (TPNW), accepted by the United Nations General Assembly in 2017. For these efforts, mobilizing 95 signatory countries to the treaty – 74 of which have ratified it as of 2025 – ICAN was awarded the Nobel Peace Prize in 2017 (ICAN, 2025; Nobel Prize Outreach, 2025).

Despite this strong pro-disarmament identity, Japan has consistently declined to join the TPNW. Tokyo justified its decision by arguing that the treaty's absolute prohibition is ineffective without the participation of nuclear-armed states and incompatible with Japan's security dependence on US extended deterrence, especially given its strategic environment. Japan has repeatedly emphasized that it remains fully aware of the risks posed by nuclear weapons, particularly because Northeast Asia constitutes one of the most complex and volatile nuclear regions in the world (Mukai, 2025). Similarly, Australia, sharing the idea of close cooperation with the US under its Nuclear Umbrella, refused to join the TPNW (ICAN, 2025).

The unprecedented mobilization following the Fukushima disaster produced and brought into the spotlight many civil organizations such as Gensuikyo, Gensuikin and most famously Nihon Hidankyo. These organizations stayed prominent in Japanese society well past the aftermath of Fukushima, advocating for abolishment of nuclear energy, and nuclear disarmament (Aldrich, 2012). Nihon Hidankyo, founded in 1956 in Nagasaki, became the most prominent of many grassroots organizations for the survivors of the 1945 nuclear bombings in Japan. After the effects of the Fukushima disaster became clear, Nihon Hidankyo rose to prominence in Japan as an organization with the goal of never letting anyone suffer the fate of their original founders ever again. For its efforts to achieve a world free from nuclear weapons it was awarded the Nobel Peace Prize in 2024 (Nobel Prize Outreach, 2025).

Conclusion

The conclusion seeks to address the research questions introduced at the outset. The first of these (Q1) asked whether uncertainty in the Indo-Pacific energy security

environment can incentivize countries in the region to re-evaluate their use of civilian nuclear energy.

In Australia, political debate regarding the introduction of nuclear power to the civilian energy grid of the country became one of the main campaign promises of the Australian Liberal Party running up to the 2025 elections. After the Liberal Party's decisive defeat at the elections, the idea of constructing civilian nuclear reactors has been sidelined. At first sight, this could contrast with the abundance of uranium deposits in Australia, providing the country with its own potential fuel deposits as an invaluable strategic asset for its energy security. Further examined however, the main reasons as to why Australia hasn't constructed any reactors are twofold: on the one hand, Australian society has been historically opposed to the use of nuclear technology ever since the atomic energy boom of the 1960s concluded without any reactors being built – and the negative health effects of British nuclear testing became widely known – and on the other hand Australia has an abundance of naturally available fossil fuels supplying a historically consistent low-cost energy source. This meant that nuclear energy would remain politically sidelined throughout Australian history, until environmental concerns related to traditional fossil fuel power plants became a mainstream political issue in by the 21st century, creating the modern political idea of nuclear energy as zero carbon emission alternative to fossil fuels. Due to its consistently low popularity among voters in Australia and its extremely high entry costs, we may conclude that complete paradigm shift is needed for Australian society to adopt the idea of investing in civilian nuclear power plants.

In contrast to Australia, Japan has never fully backed away from the future use of nuclear energy; possible supply-chain disruptions, such as the Israel-US intervention in Iran, can be seen as an example of why. The election of Sanae Takaichi as the first female prime minister of Japan, changed the LDP's stance on nuclear energy facilities and their re-introduction into the civilian sphere. After the Komeito, the LDP's coalition partner until 2025, had been the main force that halted the nuclear buildup after Fukushima; however, after the election win of Sanae Takaichi and with the Komeito leaving the coalition, the political power and coalition partner was found to re-open other power plants in accordance with the "Japan is Back" agenda, a promise of Takaichi's to make Japan stand up for itself. Nuclear energy thus for a civilian use can be considered a tool to reduce dependence on other sources such as on the Middle Eastern countries in terms of gaining a "strategic autonomy" over such fields, and the Takaichi Cabinet's decision to re-introduce the world's biggest power plant in Niigata is an example of that.

The second research question (Q2) examined how political attitudes toward military nuclear technologies are evolving. The political attitude of Australia towards the military use of nuclear energy has seen a decisive shift from decisively refusing to acquire nuclear powered naval technology before 2021, to – with the signing of the AUKUS Treaty in 2021 – officially committing to jointly developing and operating

a completely new class of nuclear propulsion fitted submarines. As the AUKUS deal continues to be endorsed by successive Australian, British and US governments, Australia stands to gain access to nuclear submarine propulsion technology, contrasting with its longstanding denial to acquire such technologies before the 2020s. This paradigm shift may be considered a part of the larger context of Australia's geostrategic environment being reevaluated as the Indo-Pacific region, reacting to the increasing foreign policy activity by China, and the perceived need by the government of Australia to reaffirm its deep commitment to alliance with the United States.

This parallels Japanese defense policy and possible constitutional re-evaluations, which are also developing dynamically in the light of ever-increasing Chinese foreign policy activity throughout the Indo-Pacific. However, the military usage of such capabilities is not only a Taboo in Japan but cannot be done without rewriting or rethinking of the Japanese Constitution's 9th Article that prevents war as a tool and prohibits the state to keep an army and such potential attacking capabilities. Nevertheless, discussions are underway of re-defining the constitution in a way it would fit the modern, and changing world's needs, and on nuclear capabilities such as nuclear-powered submarines or having the capacity of constructing nuclear warheads and bombs if needed. In February the 8th 2025 Sanae Takaichi won the snap elections securing record mandates and gaining the super majority in the lower house of the Japanese diet, with the election win the Takaichi Cabinet has the upper hand when it comes to legislations and if the international disruptions of supply chains in terms of goods and energy chains wise the government has the stepping-stone capabilities and the legitimacy to make steps in order to possess nuclear capabilities to an extent, however considering the stiff relations between China and Japan and the United States occupied with its own interventions and foreign policy goals it is highly unlikely that the Japanese government would make such decisions.

Lastly, the third research question (Q3) explored whether international security concerns can shift societal attitudes toward nuclear technology. With the decisive defeat of the Australian Liberal Party in 2025 after running a campaign in favor of constructing nuclear reactors, it may be concluded that the civilian use of nuclear power will likely remain unpopular within the Australian electorate for the coming years. Due to Australia's naturally occurring fossil fuel deposits and its developed extraction industry, it is significantly less dependent on the international energy grid compared to Japan, making the high-cost, long-term investment into nuclear energy inefficient, and ensuring the idea meets significant societal pushback. Environmental concerns further warrant that Australian civil society will remain opposed to civilian nuclear power unless a significant paradigm shift occurs. At the same time, due to the endorsement of the AUKUS treaty by successive Australian governments, societal opposition to the adoption of nuclear submarine propulsion technology has not received any political credit. To conclude, Australian society and in turn the

Australian electorate has retained a decisively negative stance towards nuclear technology use, save for the special case of AUKUS, which calls for further analysis as Australia faces the long-term treaty stipulations.

The Japanese civil society is active and participating when it comes to nuclear policy and decisions that might be interpreted as forced upon the population, however we have to take it into consideration the current international environment and how the Japanese economy can suffer from disruptions in supply chains and disruption within the energetic sector can cause more damage in comparison to imported goods. Nuclear policy was always a difficult question within the Japanese population, and the Fukushima daiichi accident worsened public opinion, which is still against the fast-tracked reopening of nuclear power plants and the economic stagnation, the financial difficulties, the question of foreign nationals and migration bothers society at large more than nuclear power plants and the government is aware of the issues surrounding the question of nuclear energy, however, as part of the incumbent government's promise to achieve less dependence on global markets, society, as the February 8th election described it, supports the change and with that the careful and well-thought steps towards the aim can be tolerated, one example is the planned re-operation of the Kashiwazaki–Kariwa complex.

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