

## Submission to the House Select Committee on Nuclear Energy

### Inquiry into nuclear power generation in Australia

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I make this submission as an Australian citizen and an internationally recognised legal adviser on all aspects of the civilian nuclear energy sector.

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#### SUBMISSION

##### Summary

- By maintaining our prohibitions on nuclear energy, Australia is out-of-step with other industrialised nations as well as countries in our region which are embracing nuclear energy for its benefits in decarbonising energy systems and energy security. Australia should overturn the prohibitions and do the work necessary to ensure nuclear energy is available to Australians.
- The Coalition’s timeline of first nuclear energy on the grid between 10-12 years, is achievable. Considering our starting position, Australia is one of the best placed countries in the world to move ahead with an expeditious and responsible nuclear energy programme.
- Australia has existing, world-class nuclear regulatory agencies in the Australian Radiation Protection and Nuclear Safety Agency (“ARPANSA”) and the Australian Safeguards and Non-Proliferation Office (“ASNO”) which implement Australia’s current international obligations in nuclear non-proliferation, nuclear security and nuclear safety. Australia would need to develop and implement a plan to ensure these agencies are ready to oversee a nuclear energy programme.
- Based on ARPANSA’s existing approach to nuclear safety regulation and its experience in licensing and oversight of the OPAL research reactor, ARPANSA could be ready to receive a construction license application for one or more nuclear reactors within three years of a policy decision to implement a civil nuclear energy programme.

##### Discussion

**There is global mobilisation around nuclear energy as countries recognise its importance in achieving Net Zero by 2050 and for energy security.**

- Nuclear energy is well-established in 32 countries operating 415 nuclear power reactors, with 63 additional reactors under construction in 15 countries.<sup>1</sup>

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<sup>1</sup> IAEA PRIS, <https://pris.iaea.org/pris/>

- At COP28, 25 countries, including the US and UK, pledged to triple global nuclear energy generating capacity by 2050.<sup>2</sup> On 13 November 2024 at COP29, six additional countries joined the pledge, taking the total to 31 countries.<sup>3</sup>
- In September 2024, 14 major financial institutions (including Bank of America, Citi, Goldman Sachs, Morgan Stanley and Rothschild & Co) declared support for the pledge to triple global nuclear energy generating capacity by 2050.<sup>4</sup>
- According to the International Atomic Energy Agency (“IAEA”), there are currently some 50 countries that do not have nuclear energy today which are in the process of developing their nuclear energy programmes. Of these, 27 are implementing their national nuclear energy programmes.<sup>5</sup>

### **Industrialised nations already use nuclear energy, have access to it or are moving to nuclear energy.**

- Apart from Australia and Germany, all G20 nations have operating nuclear power plants or have plans to introduce nuclear energy. Germany, following its domestic phase-out ending in 2023, continues to rely on nuclear energy through electricity imports from France, which generates 70% of its power from nuclear and leads Europe in electricity exports.<sup>6</sup> The following G20 nations have plans to introduce nuclear energy:
  - *Turkey* – Turkey is currently building four large reactors and plans to start commercial operations of the first in 2025.<sup>7</sup>
  - *Saudi Arabia* – In 2017, Saudi Arabia approved a National Project for Atomic Energy with plans to use nuclear energy for electricity and water desalination. It has developed its legal and regulatory framework and is currently procuring large nuclear reactors.<sup>8</sup>
  - *Indonesia* – In July 2024, Indonesia included nuclear energy in its national electricity plan, aiming to achieve commercial operation of Small Modular Reactors (SMRs) by the early-to-mid 2030s.<sup>9</sup>

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<sup>2</sup> See <https://www.energy.gov/articles/cop28-countries-launch-declaration-triple-nuclear-energy-capacity-2050-recognizing-key>

<sup>3</sup> See <https://world-nuclear.org/news-and-media/press-statements/six-more-countries-endorse-the-declaration-to-triple-nuclear-energy-by-2050-at-cop29>

<sup>4</sup> See <https://www.reuters.com/business/energy/bank-backing-gives-us-nuclear-new-momentum-2024-10-07/>

<sup>5</sup> See <https://www.iaea.org/sites/default/files/gc/gc68-inf-4.pdf>, page 15

<sup>6</sup> See <https://www.reuters.com/markets/commodities/france-track-smash-clean-electricity-export-record-2024-2024-04-10/>

<sup>7</sup> See <https://world-nuclear.org/information-library/country-profiles/countries-t-z/turkey>

<sup>8</sup> See <https://crsreports.congress.gov/product/pdf/IF/IF10799>

<sup>9</sup> See <https://www.nucnet.org/news/nuclear-included-in-2033-electricity-plan-paving-way-for-first-reactors-7-5-2024>

- *Italy* – Italy is actively exploring its return to nuclear energy and holding discussions with reactor vendors.<sup>10</sup>

**Countries in Australia’s region utilise nuclear energy and many are moving towards the introduction of nuclear energy.**

- *Japan* – Japan is actively restoring its nuclear fleet, with 13 reactors already restarted and a dozen more in the approval process, targeting 20% nuclear energy generation by 2030.<sup>11</sup>
- *China* – China has 56 operating nuclear reactors and is pursuing the world's most ambitious nuclear expansion, with 31 reactors under construction, and 119 planned or proposed, positioning it to overtake the US as the world's largest nuclear fleet.<sup>12</sup>
- *South Korea* – South Korea is re-committing to nuclear energy, with four reactors under construction and plans to obtain 36% of its electricity from nuclear by 2038, having reversed its earlier phase out policy.<sup>13</sup> South Korea is also emerging as a major nuclear exporter, with successful recent builds in the United Arab Emirates and a winning bid for two new reactors in the Czech Republic.<sup>14</sup>
- Several countries are pursuing the introduction of nuclear energy for the first time:
  - *The Philippines* –In September 2024, the Philippines unveiled its Nuclear Energy Roadmap, which includes 1,200 MW of operational nuclear energy capacity by 2032 and 4,800 MW by mid-century.<sup>15</sup> A Bill currently going through the Philippines’ congressional approval processes establishes a state policy to install at least 16,000 MW and up to 32,000 MW of nuclear energy in the country by 2045. A feasibility study is being conducted to start the already constructed, but never commissioned, Bataan nuclear power plant.<sup>16</sup>
  - *Thailand* – Thailand’s Prime Minister announced in May 2024 that the country is exploring SMR technology.<sup>17</sup>
  - *Vietnam* – The national power development plan is being amended to include nuclear energy as an option.<sup>18</sup>
  - *Indonesia* – See above.

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<sup>10</sup> See <https://www.euronews.com/my-europe/2024/09/13/italy-eyes-up-nuclear-energy-with-plans-to-approve-new-plants-by-2025> and <https://www.reuters.com/business/energy/italy-talks-with-westinghouse-edf-nuclear-plants-energy-minister-says-2024-10-17/>

<sup>11</sup> See <https://world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-power>

<sup>12</sup> See <https://world-nuclear.org/information-library/country-profiles/countries-a-f/china-nuclear-power>

<sup>13</sup> See <https://time.com/7020645/south-korea-nuclear-reactors/>

<sup>14</sup> See <https://www.reuters.com/business/energy/south-koreas-winning-bid-czech-nuclear-power-project-2024-07-17/>

<sup>15</sup> See <https://doe.gov.ph/press-releases/philippines-unveils-nuclear-energy-roadmap-largest-annual-gathering-stakeholders>

<sup>16</sup> See <https://world-nuclear-news.org/articles/korea-to-assess-rehabilitation-of-philippine-plant>

<sup>17</sup> See <https://www.reuters.com/business/energy/thailand-exploring-small-modular-nuclear-reactor-technology-says-pm-2024-05-31/>

<sup>18</sup> See <https://www.reuters.com/business/energy/vietnam-amend-national-power-plan-include-nuclear-energy-2024-10-21/>

- *Malaysia* – The Malaysian government announced in November 2024 that nuclear energy will be included in the 13<sup>th</sup> Malaysia Plan 2026-2030.<sup>19</sup>
- *Singapore* – Singapore is advancing its nuclear energy capabilities, having signed a civil nuclear cooperation agreement with the United States in July 2024 and commenced Phase 1 of the IAEA Milestones Approach.<sup>20</sup>

**A country can develop a new nuclear programme and see electrons on the grid in 10-15 years.**

- According to the IAEA, a country can progress from initial consideration of nuclear energy to operating its first reactor in 10-15 years, with timing dependent on available resources and technology choice.<sup>21</sup> Countries utilise the IAEA’s “Milestones Approach” when embarking upon a nuclear energy programme, tailoring it to their own circumstances and needs.<sup>22</sup>
- The United Arab Emirates (the “UAE”), the most recent nuclear newcomer country, demonstrated the above timeline in practice: it announced its nuclear policy in 2008,<sup>23</sup> began construction in 2012, and successfully commissioned its first reactor in 2020.<sup>24</sup> Commercial operations commenced in April 2021.<sup>25</sup> The UAE’s programme was developed from scratch and in accordance with international nuclear non-proliferation, nuclear security and nuclear safety standards.
- Many newcomer countries are planning to have nuclear energy on their grids by 2035. The following newcomer countries have announced public plans to have nuclear energy on the grid by 2035: Estonia, Poland, Kenya, Ghana, Uzbekistan, Indonesia, Kazakhstan and Uganda.

**Australia is one of the best-positioned countries in the world to move ahead with a nuclear energy programme and to do so expeditiously and responsibly. Australia could see an operating nuclear power plant within 10-12 years of a policy decision to implement a nuclear energy programme.**

- Australia is well-positioned to implement the IAEA Milestones Approach – Australia would utilise the IAEA Milestones Approach and would pursue implementation of all aspects of its nuclear energy programme simultaneously. Australia should undertake a brief review to ensure all the infrastructure issues in Phase 1 have been sufficiently addressed and move into Phase 2. It is understood that the Implementing Organisation would be tasked with this function, acting as “NEPIO” under the Milestones Approach.

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<sup>19</sup> See <https://theedgemalaysia.com/node/732987>

<sup>20</sup> See <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/102124-singapore-takes-new-steps-to-build-nuclear-capabilities-upgrade-power-grids>

<sup>21</sup> See [https://www-pub.iaea.org/MTCD/Publications/PDF/PUB2073\\_web.pdf](https://www-pub.iaea.org/MTCD/Publications/PDF/PUB2073_web.pdf), page 2

<sup>22</sup> See <https://www.iaea.org/sites/default/files/18/01/developing-the-national-nuclear-infrastructure-for-nuclear-power.pdf>, page 2

<sup>23</sup> See <https://www.enec.gov.ae/doc/uae-peaceful-nuclear-energy-policy-5722278a2952f.pdf>

<sup>24</sup> See <https://world-nuclear.org/nuclear-reactor-database/details/barakah-1>

<sup>25</sup> See <https://world-nuclear.org/nuclear-reactor-database/details/barakah-1>



- Australia’s nuclear credentials are well-established through decades of experience – Australia has been a nuclear nation since the 1950s, when our first research reactor was commissioned. Australia is one of the original member states of the IAEA. Australia has de facto permanent membership of the IAEA’s Board of Governors as the sole designated representative from the South-East Asia and Pacific Region, reflecting our nuclear leadership position in the region to date.
- Australia has comprehensive international nuclear treaty participation – Australia has in force all the major nuclear safety, security and safeguards instruments that the IAEA recommends for a country with a nuclear energy programme,<sup>26</sup> except in the area of nuclear liability, where Australia is already a signatory to the Convention on Supplementary Compensation for Nuclear Damage. See table in Appendix 1.
- Australia has world-leading nuclear security and non-proliferation credentials – Australia, as a non-nuclear-weapon state party to the Treaty on the Non-Proliferation of Nuclear Weapons has a Comprehensive Safeguards Agreement (“CSA”) in place with the IAEA, and was the first country to sign and ratify an Additional Protocol to its CSA.<sup>27</sup> In safeguards, Australia consistently receives the IAEA’s highest safeguards conclusion.<sup>28</sup> The Nuclear Threat Initiative—an NGO in the US—consistently ranks Australia as numbers 1 and 2 in the world in two different aspects of nuclear security.<sup>29</sup>
- Australia maintains an extensive network of international nuclear partnerships – We have a network of 25 bilateral nuclear cooperation agreements in force covering 43 countries and Taiwan.<sup>30</sup> These agreements facilitate international nuclear trade and commerce. Australia already has nuclear cooperation agreements in force with potential suppliers of nuclear reactors and nuclear fuel, such as the United States, the United Kingdom and Canada.

**Australia would need to develop and implement a plan to ensure ARPANSA and ASNO are ready to oversee a nuclear energy programme. ARPANSA could be ready to receive a construction license application for one or more nuclear reactors within three years of a policy decision to implement a civil nuclear energy programme.**

- Australia implements its international obligations in national law and has existing, world-class Commonwealth regulatory agencies - The Australian Radiation Protection and Nuclear Safety Act 1998 (Cth) and associated regulations such as the Australian Radiation Protection and Nuclear Safety Regulations 2018, establish the mandate of ARPANSA as the Commonwealth Government's primary regulatory authority on radiation protection and nuclear safety with jurisdiction over Commonwealth Government entities. Australia has

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<sup>26</sup> See p13 IAEA Nuclear Energy Series No. NG-T-3.2 (Rev. 1)

[https://www.pub.iaea.org/MTCD/Publications/PDF/PUB1737\\_web.pdf](https://www.pub.iaea.org/MTCD/Publications/PDF/PUB1737_web.pdf)

<sup>27</sup> See <https://www.dfat.gov.au/about-us/publications/Pages/iaea-safeguards-additional-protocol>

<sup>28</sup> See <https://www.dfat.gov.au/publications/international-relations/asno-annual-report-2021-22/asno/section-6-4.html#:~:text=IAEA%20Conclusions%20on%20Australia's%20Compliance&text=On%20this%20basis%2C%20the%20Secretariat,the%20Safeguards%20Statement%20for%202021.>

<sup>29</sup> See <https://www.ntiindex.org/country/australia/>

<sup>30</sup> See <https://www.dfat.gov.au/international-relations/global-security/asno/nuclear-non-proliferation>

hosted IAEA International Regulatory Review Service (“IRRS”) missions in 2007 and again in 2018, with a follow-up mission in October 2023. The IRRS Mission Reports show that Australia implements a legal and regulatory framework that complies with international best practice. The Nuclear Non-Proliferation (Safeguards) Act 1987, gives effect to Australia’s obligations under international instruments related to non-proliferation and nuclear security, the implementation of which is under the purview of ASNO. Both regulatory agencies are internationally respected.

- Australia has recent experience licensing and overseeing the operation of a first-of-a-kind research reactor – ARPANSA received a construction application in May 2001 and issued a facility license for the construction of the OPAL research reactor in April 2002. The operation authorisation was granted in July 2006 and OPAL achieved full power by November 2006. ARPANSA oversees the safe operation of the reactor.
- ARPANSA could be ready to receive a construction license application for a proven nuclear reactor design within 3 years - ARPANSA’s existing, non-prescriptive regulatory regime utilises IAEA Safety Standards and is readily adaptable to licensing and oversight of nuclear power reactors. To meet this timeline, ARPANSA would need to (i) develop and implement a human resources plan, (ii) adopt IAEA Safety Standards for nuclear power reactors, (iii) expand cooperation arrangements with the regulatory bodies of the country-of-origin of the technology and/or the reference plant, and (iv) obtain advisory services of one or more international technical support organisations, as well as those offered by the IAEA. ARPANSA could implement a phased approach to development of its regulatory requirements so that it prioritises those needed in line with project implementation plans.

### Appendix 1

<b>Instrument</b>	<b>Status</b>
Treaty on the Non-Proliferation of Nuclear Weapons	In Force (23 January 1973)
Comprehensive Safeguards Agreement (“CSA”)	In Force (10 July 1974)
Additional Protocol to CSA	In Force (12 December 1997)
Convention on Nuclear Safety	In Force (24 March 1997)
Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	In Force (3 November 2003)
Convention on Early Notification of a Nuclear Accident	In Force (23 October 1987)
Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	In Force (23 October 1987)
Convention on the Physical Protection of Nuclear Material (“CPPNM”)	In Force (22 October 1987)
CPPNM Amendment	In Force (8 May 2016)
Vienna Convention on Civil Liability for Nuclear Damage	Non-Party
Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage	Non-Party
Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention	Non-Party
Convention on Supplementary Compensation for Nuclear Damage	Signature (1 October 1997)

The above international treaties and conventions are listed by the International Atomic Energy Agency in IAEA Nuclear Energy Series No. NG-T-3.2 (Rev. 1) *‘Evaluation of the Status of National Nuclear Infrastructure Development’*.