AUSTRALIAN ENERGY COUNCIL

Committee Secretary

House Select Committee on Nuclear Energy

Parliament House

Canberra ACT 2600

Submitted online: Nuclear.reps@aph.gov.au

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Inquiry into nuclear power generation in Australia

The Australian Energy Council ('AEC') welcomes the opportunity to make a submission to the Inquiry into nuclear power generation in Australia.

The AEC is the peak industry body for electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. AEC members generate and sell energy to over 10 million homes and businesses and are major investors in renewable energy generation. The AEC supports reaching net-zero by 2050 as well as a 55 per cent emissions reduction target by 2035 and is committed to delivering the energy transition for the benefit of consumers.

The AEC has an active interest in public policy debate about energy and Australia's future energy mix. The introduction of nuclear energy would likely have significant implications for the affordability, reliability and emissions profile of Australia's energy system in the 2040s and beyond that requires careful consideration.

The AEC does not believe that the debate around nuclear energy should distract from the fact that investment in new sources of generation is required now to ensure a least cost low-emissions pathway can be realised as thermal generation (such as coal fired generation) exits the system.

While the AEC takes a technology neutral approach to generation types participating in Australia's energy system, there are significant challenges that nuclear generation would need to overcome to participate in a low emissions energy system that could also successfully deliver energy in an affordable, reliable and timely manner. These challenges include:

- Timeliness – while nuclear could play a part in a low-emissions energy system in the longer term, it is highly unlikely that it will be able to play a role in Australia's energy mix before 2040. Factors limiting the timely development of nuclear include:
    - the need to overcome existing State / Federal prohibitions;
    - the absence of a nuclear generation industry in Australia;
    - recent international experience demonstrating that nuclear projects commonly experience significant delays; and
    - small modular reactors (SMRs) are yet to be proven at scale internationally.
- Affordability – large scale nuclear is characterised by very large upfront capital costs and does not easily support or 'firm' renewables, particularly in the Australian context where there is a high volume of both small and large-scale solar energy. International experience indicates nuclear project costs can escalate significantly, especially when building for the first time. [1] Significant government investment would be required to build and sustain even small modular reactors in the current environment.

The merits of nuclear generation should be assessed through the lens of both economic and deployment factors such as commissioning lead times and stage of technological advancement. Apart from a small research reactor in Lucas Heights NSW, Australia has no experience in building or operating nuclear power plants

[1] https://www.energycouncil.com.au/analysis/large-scale-nuclear-costs-has-the-csiro-hit-the-mark/

Level 13, 575 Bourke Street
Melbourne 3000
GPO Box 1823 Melbourne Victoria 3001

P +61 3 9205 3100
E info@energycouncil.com.au
W energycouncil.com.au

ABN 92 608 495 307

Given the time and capability required to assess, design and construct nuclear power plants and the delay risks playing out alongside an energy market which is changing rapidly, it is unlikely any investor would commit to the upfront capital costs without Government assurance. We note that nuclear power stations in free market economies have all been subsidised in one way or another through various mechanisms including:

- government underwriting the risk of a serious accident;
- responsibility for decommissioning and rehabilitating the site;
- long term storage of nuclear waste;
- out-of-the money long term power purchase agreements;
- concessional finance;
- direct cash funding; and
- bearing commissioning delay risk.

In the Australian context, if Government ownership is the preferred model, the AEC notes that there is already a mixture of private and Government ownership in the NEM, and the energy transition will require both private and public investment. Observing the principle of competitive neutrality is key to ensuring these ownership arrangements can co-exist in a market. Government ownership does not obviate the need to assess nuclear on its merits, as to do otherwise would be to the detriment of both energy consumers and taxpayers.

The need for flexible sources of generation

Taking into account the level of rooftop solar penetration and given the amount of variable renewable energy required to fully decarbonise Australia's electricity sector, there is a need for more flexible, less weather-dependent sources of generation and long duration storage to operate when renewable sources like wind and solar cannot.

The challenge with nuclear energy, like coal, is that it is typically a type of firm synchronous generation that is operated at a constant level. Conventional designs used overseas are inflexible and difficult to turn on and off, which could result in other, cheaper forms of low-emissions sources (like wind and solar) being curtailed. What is ultimately needed in a high renewables energy system like Australia, are more flexible sources of generation and long duration storage that can complement the existing and future generation profile of wind and solar energy in a cost-effective manner.

The role for nuclear energy in the longer term requires careful consideration

The AEC generally advocates for a technology neutral approach to energy sources and for any new or emerging low-emissions technology advancements being applied in the Australian context to be robustly assessed through both cost and capability lenses before significant policy or investment decisions are made.

Ultimately, Australia will need a diverse mix of low-emissions generation sources and technologies to decarbonise and a reliance on singular sources of generation is unlikely to result in the lowest-cost pathway to net zero. For nuclear energy to be considered an economically viable, reliable and affordable part of the Australian energy mix, the following activities should be undertaken and the outcomes made publicly available:

- the capital and levelised costs of nuclear energy should be compared with the entire delivered cost for renewables with other complementary sources of generation and long duration storage. The costs should be expressed both for each generation type, but perhaps more importantly, as total system costs and comparing scenarios with and without nuclear energy;
- an assessment of the nature and quantum of system wide costs that could be avoided if nuclear energy becomes part of the energy mix, as well as the direct costs incurred in adopting nuclear;
- the time and cost to develop a conducive regulatory and safety framework for nuclear generation if a robust economic and capability analysis demonstrates that it is a viable option;
- the environmental and cost implications of sourcing the required input materials as well as waste management and decommissioning costs;
- a capability assessment focused on Australia's ability (and competitiveness) to assess, design and construct nuclear reactors and the associated timeframes and costs to deliver; and
- total emissions with and without nuclear energy in the mix.

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W energycouncil.com.au

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Thank you for the opportunity to provide a submission to this inquiry. Questions about this submission should be addressed to David Feeney by email at david.feeney@energycouncil.com.au.

Yours sincerely,

David Feeney

David Feeney
General Manager, Wholesale and Environment

Level 13, 575 Bourke Street
Melbourne 3000
GPO Box 1823 Melbourne Victoria 3001

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E info@energycouncil.com.au
W energycouncil.com.au