Energy Policy
INSTITUTE OF AUSTRALIA

**Policy Research Note:**

# *The Likely Viability of Nuclear Power in Australia*

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Modern nuclear power is versatile, unique and likely to be beneficial for Australia's economic development.[1]

It would take around 10 years for nuclear power to become operational in Australia. This policy research note by the Energy Policy Institute of Australia indicates its likely viability and outlines how its utilisation in Australia could have a significant economic and environmental effect on the nation.

## Whole-of-System Benefits

Preliminary studies by EPIA indicate that, on becoming operational in around 10 years, modern, advanced nuclear power technology could be providing Australian power systems with ten 'whole-of-system' benefits:

- near-zero emissions
- 24/7 availability, not weather-dependent
- high supply security and reliability levels
- high safety levels
- long plant operating life (up to 80 years)
- strategic siting away from coasts on existing transmission networks, minimising investment in system enhancements
- a hub for regional micro-grids which involve a mix of technologies
- provision of both heat and electricity for mining, minerals-processing, steel, aluminium, cement, chemicals and plastics-making, desalination and fast rail
- the ability to work flexibly with variable renewable energies (VRE) and
- with small modular reactors (SMRs), the ability to expand reactor capacity with increases in system demand.

### Inferences from EPIA's Preliminary Studies

**The strong inferences arising from EPIA's preliminary studies are:**

1. **Nuclear power is likely to be viable in Australia and could become Australia's lowest-cost, emissions-free generation source.**

2. **The economic flow-on benefits to the national and regional economies could be substantial, including enabling Australia's energy-intensive industries to compete strongly in world markets.**

## Whole-of-System Costs

System Levelised Cost of Energy (SLCOE) calculations are essential for meaningful cost comparisons amongst competing generation technologies. Cost comparisons of individual generation technologies are meaningless unless full system support for each generation source is factored in to ensure equivalent system reliability and customer electricity supply continuity.

Nuclear power is considered likely to help contain Australia's whole-of-system costs at a competitive level as it requires no additional 'firming costs' and will minimise transmission system enhancements.

Long-term whole-of-system costs for any generation mix including nuclear could be less than that of VRE alone, depending on the firming technology employed by the VRE generators.

## Global and Regional Developments[2]

451 reactors are presently operating in 30 countries, generating 11% of the world's electricity. Another 50 reactors are presently under construction.

Countries in the Asian region with new reactors under construction are:

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|---|---|---|---|
| Bangladesh: | 2 | Pakistan: | 2 |
| China: | 15 | South Korea: | 4 |
| India: | 6 | UAE: | 4 |
| Japan: | 2 | | |

The number of countries utilising nuclear power and the number of reactors in operation around the world are both anticipated to double by 2050. This points strongly to the cost-competitiveness of nuclear power.

China is well in the lead of new developments and is accelerating ahead of all other countries, with 290 new reactors envisaged by 2050.[3]

## Enabling Policy Reforms – Starting with the Lifting of the Legislative Prohibition

The first reform step for Australia is to lift its 20-year old legislative prohibition on commercial nuclear power generation. This would enable detailed studies to be carried out. Lifting the prohibition would not cost taxpayers anything and would increase competitive tension with other generation technologies.

The 2016 Nuclear Fuel Cycle Royal Commission in South Australia recommended removing the legislative prohibition. Australia remains the only G20 country to have such a prohibition, despite being the world's third largest supplier of uranium to the international reactor market.

Lifting the legislative prohibition would not mean approving any specific project but it would allow preparatory economic, technical and environmental studies to be made in order to seek planning and environmental approvals.

Some additional reforms of energy policy, energy law, energy regulations and energy market rules may also be needed. They should be developed with fully informed community support.

## Conclusion

Nuclear power is likely to be viable in Australia but it will take around a decade to develop; good reason now for Australia to take the first step of lifting its legislative prohibition. This would ideally be done with bipartisan political support.

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[1] '*Nuclear power can make an important contribution to reducing greenhouse gas emissions while delivering energy in the increasingly large quantities needed for global economic development,'* Foreword, *Climate Change and Nuclear Power 2018,* International Atomic Energy Agency, Vienna, 2018.

[2] The data in this section is from *Plans for New Reactors Worldwide,* World Nuclear Association, London, October 2018.

[3] Xiao Xin-Jian and Jiang Ke -Jun, *China's Nuclear Power under the Global 1.5ºC Target: Preliminary Feasibility Study and Prospects,* Advances in Climate Change Research 9 (2018) 138-143.