



**Energy Policy**  
INSTITUTE OF AUSTRALIA

**NUCLEAR FUEL CYCLE ROYAL COMMISSION:  
RESPONSE TO ISSUES PAPER THREE – ELECTRICITY  
GENERATION FROM NUCLEAR FUELS**

**27 JULY 2015**

This is a response by the Energy Policy Institute of Australia to Issues Paper Number Three (Electricity Generation from Nuclear Fuels) released by South Australia's Royal Commission into the Nuclear Fuel Cycle.

The Institute is an independent, apolitical and technology-neutral policy body. It postulates that the world should move progressively towards a decarbonised society as fast as it can afford to do so.

The Institute commends the Government of South Australia for its decision to establish the Commission.

The Institute is pleased to respond to the undermentioned specific questions posed by the Commission:

### **Question 3.1: Suitability of Areas for Nuclear Electricity Generation**

The Commonwealth's April 2015 Energy White Paper reported that Australia currently has an overcapacity in electricity generation. Notwithstanding that this may be so, the Institute believes that there is potential in South Australia for the decentralised deployment of high-safety, small modular reactors (SMRs) in regional cities and in major mining and industrial locations.

The suitability of particular sites will need to be assessed on a case-by-case basis against economic, technical, public health and safety and environmental considerations

Whether decentralised nuclear generation will be economic in any particular case will mainly depend on future load at the particular location. Another main factor will be the extent to which decentralised development can avoid costly upgrades to transmission grids.

The economic viability of particular projects is highly project-specific, technology-specific and site-specific.

### **Questions 3.2 and 3.3: Availability of Commercial Reactor Technologies**

SMRs, with their natural safety systems, have been designed and are under construction in several countries and are expected to be commercially available in Australia soon.

The principal feature of all nuclear technologies is that they provide base-load power, whilst not producing greenhouse gas emissions.

They may be developed either with a grid connection or in an off-grid setting. They can also produce heat for desalination and other processes. Project-specific issues vary widely.

### **Question 3.4: Viability of Electricity Generation in General**

Reference should be made inter alia to the published reports of the Australian Energy Market Operator.

### **Question 3.5: Viability of Nuclear Electricity Generation**

Nuclear electricity generation is a source of base-load power. Economic viability is however highly project-specific and site-specific and requires detailed study on a case-by-case basis.

### **Question 3.6: Models and Case Studies**

The Institute's response to this question is to emphasise that nuclear electricity generation needs to be preceded by project-specific, technology-specific and site-specific studies by project proponents. Such case studies are very costly and time-consuming and cannot be carried out until the Australian legislative prohibition on nuclear electricity generation is removed. Until then, there will be a continuing stalemate on nuclear development in Australia.

### **Question 3.7: The Future Place for Nuclear Electricity Generation**

The Institute considers that South Australia should have the option of generating electricity from nuclear fuel for two main reasons: first, to increase its energy security (through diversity of supply sources) and, second, to reduce its level of greenhouse gas emissions.

Technology diversity and neutrality is considered by the Institute to be the paramount and fundamental principle of modern energy policy. The Institute believes that there should be no exceptions to this principle - it is imperative for a secure, resilient and affordable energy supply system.

This requires keeping all energy sources and technology options open, encouraging competition amongst all of them and fostering innovation in each of them, based on their economic, technical, environmental and social merits. None should be banned. They all have their place and South Australia cannot afford to randomly jettison any of them.

The adoption of technology diversity and neutrality as a policy principle does not imply that South Australia should be constrained in the exercise of its essential regulatory functions of protecting public health and safety and the physical environment, including the protection of water supplies and limiting the discharge of greenhouse gas emissions, or joining in schemes for that purpose, so long as its regulatory approach is non-discriminatory across technologies.

The energy policy issue of the most longstanding contention in Australia has been the discriminatory legislative prohibition against nuclear power. In the view of the Institute, this prohibition is based at least in part on yesterday's understanding of nuclear technology.

Energy policy is likely to remain adversely affected by contentious technology issues until technology neutrality is accepted by all stakeholders as a fundamental policy principle and this is accompanied by modernised, transparent and trusted regulatory regimes to protect public health, safety and the environment.

The Institute believes that nuclear electricity generation, as a source of base-load power, should be available as a future option for the two main reasons specified above.

The Institute further submits to the Commission that the Australian energy industry has suffered from excessive politicisation amongst rival technology proponents and opponents. The Institute considers it essential that politicisation be reduced.<sup>1</sup> The need to do so has been acknowledged by some leading political figures.<sup>2</sup>

### **Question 3.8: Technological Advantages and Disadvantages**

Simply put, the advantages of nuclear electricity generation over other technologies are that it provides reliable, base-load, emissions-free supply that, at least in the case of SMRs, is likely to be economically competitive against other technologies. Supply from nuclear sources has relatively low operating costs and is not constrained by the intermittency concerns that affect wind and solar power. Diversity of supply by itself enhances security of supply.

A disadvantage of nuclear generation may be its relatively high capital cost.

Nuclear generation also carries the very well-known risk to public health and safety of potential exposure to ionising radiation. Effective safety regulation under the auspices of the International Atomic Energy Agency (IAEA) is essential to manage this risk, for which Australia has a highly-regarded regulatory regime administered by the Australian Radiation Protection and Nuclear Safety Authority (ARPANSA).

### **Question 3.9: Lessons from Accidents such as Fukushima**

Guidance should be sought from the IAEA on the risk issues that should be taken into account in South Australia and elsewhere in Australia when it comes to nuclear electricity generation. The lessons from all past accidents in the nuclear field are reflected in evolving international best practice under the auspices of the IAEA and the Convention on Nuclear Safety. They are taken into account by ARPANSA in its work.

The Institute submits that the legislative prohibition against nuclear generation in Australia is unnecessary as a regulatory measure – through ARPANSA, Australia has a first-class

---

<sup>1</sup> As we explained in our February 2014 submission to the Commonwealth's EWP process:

*“In the view of the Institute, the politicisation of climate change and environmental issues spilled over to the energy industry, causing an excessive and unnecessary politicisation of energy issues. This excessive politicisation has created uncertainty for investors; it has resulted in discriminatory policy treatment towards competing energy technologies, with governments picking winners and losers; it has created an uneven playing field with unpredictable rules; it has induced the energy industry to fracture into rival interests, forcing them to compete for subsidies or for favourable policy treatment; and it has provoked disquiet and mistrust in the community. There is also a lack of appreciation in the community about the central role of fossil fuels in energy supply and their continuing long-term importance to global economies.*

*This has led to high electricity and gas prices for consumers and a high level of political risk for investors. Providers of finance for investors find it hard to assess and price political risk. Some will not accept it at all and, when they do, they tend to write it into their financing arrangements as a ‘material adverse risk’ for which borrowers are responsible, with the possible consequence of triggering early repayment.”*

<sup>2</sup> *“Never has it been more important to take the politics out of our national energy policy and use a scientifically based and economically sound approach to creating long term solutions.”* Hon Gary Gray MP, Speech to Energy Users Association of Australia, 14 October 2014.

nuclear regulatory regime that upholds international best practice, including ‘defence-in-depth’ principles.

The Institute sees no reason why regulatory approval for all future nuclear power development throughout Australia cannot be entrusted to ARPANSA subject to the proviso that ARPANSA’s approval process be supplemented by provision for effective stakeholder participation.

The Institute therefore submits that the Commission should recommend to the State Government that it should make representations to the Australian Government for the removal of the current legislative prohibition, subject to provision being made in ARPANSA’s constituent legislation for effective stakeholder representation.

### **Question 3.10: Safety Regulation**

Future development projects in South Australia should be required to obtain requisite planning approvals from South Australian authorities in accordance with state law, with ARPANSA being responsible for all nuclear-specific approvals on an Australia-wide basis under Commonwealth law.

The Australian Government should remain responsible to ensure that there is a trustworthy regulatory framework in which nuclear power development proposals can be evaluated on their economic, technical, safety, environmental and social merits. Guidance should continue to be sought from the IAEA.

The availability of an Australia-wide regulatory framework would provide future investors with an avenue to seek regulatory approval of the latest nuclear power technology. It would enable them to undertake the requisite technical research and economic and technical feasibility studies of individual projects with the necessary degree of confidence that future investment could be made in accordance with the applicable regulatory regime.

### **Questions 3.11 to 3.17**

The Institute makes no submission on the remaining questions in Issues Paper Three.

---

Respectfully submitted

**Robert Pritchard**  
Executive Director