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NUCLEAR POWER AND ITS POTENTIAL ROLE IN ECONOMIC DEVELOPMENT IN AUSTRALIA

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Key Points

- *By its 20-year ban on nuclear power generation, Australia has lost considerable ground. The ban has:*
 - contributed to the destabilisation of Australia's power supply system*
 - disregarded a means of significantly reducing greenhouse gas emissions*
 - failed to enhance Australia's scientific and engineering skills*
 - failed to optimise the development of the Australian economy and*
 - turned a blind eye to Australia's national security.*
- *Over the next decade, Australia could regain some of its lost ground by lifting its nuclear ban and allowing energy innovation to flourish under appropriate regulation.*
- *Australia should capitalise on its small but world-class base that has been built up from 60 years' successful and incident-free experience in operating nuclear research reactors and producing nuclear medicine.*
- *A strategic initiative for any Australian state or territory would be to sponsor the development of a model town, or hub, for energy innovation and economic development, which could be in an inland location. Any such hub should be anchored to safe, complementary, zero-emissions technologies, including modern nuclear technology, and be connected to the transmission grid to enhance system optimisation at least cost. Potential sites should be identified through community engagement and developed with community support.*

1. The Need for Energy Innovation Hubs Anchored to Modern Nuclear Technology

The world is experiencing a wave of innovation in the energy industry, driven by the desire to reduce greenhouse gas emissions.¹ In many countries, this innovative activity has extended to nuclear technology, but not yet in Australia.

The context for this paper is that Australia, through what could not unreasonably be described as a clumsy process to reduce greenhouse gas emissions, has destabilised its power system. According to the Finkel Review, this system destabilisation was caused by the rapid installation of *'poorly integrated variable renewable electricity generators [that] coincided with the unplanned withdrawal of older coal and gas-fired generators.'*²

After the 2016 Nuclear Fuel Cycle Royal Commission in South Australia, there have been some indications of increasing interest in nuclear power amongst various communities³ and by some leading political figures.⁴

The central question raised by this paper is whether, in order to trigger investment in nuclear power research, development and deployment, Australia should review its outdated legislative prohibition on nuclear power generation. It is easy to criticise the prohibition as archaic and call for it to be removed; the more difficult challenge is to outline an innovative energy strategy that the community can embrace and that will underpin the reliability and safety of modern nuclear technology.

Australia should be able to capitalise on its small but world-class base that has been built up from 60 years' successful and incident-free experience in research reactors and nuclear medicine.

A strategic initiative for any Australian state or territory would be to sponsor the development of a model town, or hub, for energy innovation and economic development. Any such hub could be developed in an inland location with the involvement and support of the local community. A hub should be anchored to safe, zero-emissions technologies that complement each other, including modern nuclear technology, and be connected to the transmission grid in order to optimise system operation at least cost. The advantage of modern small modular reactor (SMR) technology is that plants do not require a water supply for cooling and can be sited inland, near points of demand, rather than on the coast.

¹ Chris Greig and Robert Pritchard, *Accelerating Low-Emissions Energy Innovation – An Australian Perspective*, Energy Policy Institute of Australia, EPIA Public Policy Paper 2/2016, March 2017.

² Alan Finkel et al, *Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future* (Finkel or the Finkel Review), June 2017.

³ Evidence for this is to be found in an upsurge in letters to newspapers and the activities of groups such as Students for Nuclear, the Australian Young Generation in Nuclear and Women in Nuclear.

⁴ For instance, in March 2018, the NSW Deputy Premier, John Barilaro, travelled to the United States to participate in an advanced reactor summit.

2 The Global Nuclear Power Renaissance

The World Nuclear Association has set a global target for nuclear power of 25% of global electricity generation by 2050.⁵ Nuclear power presently generates around 11%.⁶ There are 447 nuclear power generators presently in operation in 30 countries, with another 60 under construction.⁷

Several nations are scaling back nuclear power but there are around 28 other countries presently interested in introducing it.⁸ These include some traditional fossil fuel exporters, such as Saudi Arabia and the United Arab Emirates,⁹ who are developing nuclear power as a major new plank in their energy security strategy. They also include countries such as Bangladesh, Egypt, Turkey and Jordan. Other nations, such as China, Russia, and India, are expanding their facilities.

Utilising their experience in the construction and operation of nuclear facilities, Russia, China, and South Korea are expanding overseas exports of their technology, with Russia recently supplying power reactors to Turkey and Bangladesh and negotiating collaborative arrangements with the Philippines and Indonesia.

The US¹⁰ and Canada¹¹ provide precedents for what Australia could aspire to undertake, albeit on a much more modest scale. Australia should be able to capitalise on its small but world-class base that has been built up from 60 years' successful and incident-free experience as an operator of nuclear research reactors and as a producer of nuclear medicine.

⁵ 'The World Nuclear Association's vision for the future of electricity generation, called 'Harmony', envisages a diverse mix of low-carbon generating technologies deployed in such a manner that the benefits of each are maximized while the negative impacts are minimized. The WNA has set a target of 25% of global electricity in 2050 to be provided by nuclear energy, which would require roughly 1000 GW(e) of new nuclear capacity to be constructed, depending on other factors such as reactor retirements and electricity demand growth. To meet this target, the global nuclear sector would need a level playing field, harmonized regulatory processes and an effective safety paradigm.' International Atomic Energy Agency, *International Status and Prospects for Nuclear Power 2017*, Report by the Director General, GOV/INF/2017/12-GC (61)/INF/8, 28 July 2017 (IAEA Nuclear Prospects Report) para 8.

⁶ IAEA Nuclear Prospects Report, para 17.

⁷ IAEA Nuclear Prospects Report, para 1.

⁸ IAEA Nuclear Prospects Report, para 3.

⁹ There are also flow-on effects for industry and jobs. In the case of the UAE, over 1,100 UAE companies are contributing to its current nuclear program.

¹⁰ In testimony to the US Congress in February 2018, US DOE senior nuclear official Ed McGinnis explained: 'The United States pioneered the development and peaceful use of nuclear power to produce around-the-clock, emission-free electricity. As a result of U.S. leadership in nuclear energy, American citizens have benefitted from this truly unique source of electricity for the last 7 decades. Nuclear energy has delivered reliable, predictable, emission-free power from plants that can operate in round-the-clock, rain, sleet, or snow, and in other extreme conditions, 7 days a week at full power for nearly 2 years at a time without stopping. These nuclear power plants have served as bedrocks to communities across the country, providing high-paying, skilled jobs to hundreds of thousands of Americans. Our nuclear energy capabilities have also served to support and reinforce our nation's energy security as well as national security, both in global nuclear nonproliferation goals and supporting our nuclear navy in a way no other energy sector has done. ... The Department is also working to advance our nation's next generation of advanced nuclear reactors, including potentially game-changing advanced Small Modular Reactors (SMRs), through targeted early-stage R&D investments and cost-shared technical partnering on R&D projects to ensure a strong domestic industry now and into the future. The Department has a long history of nuclear power technology development, specifically in innovative technologies that have the potential to improve our economic and energy security. In fiscal year 2018, the Department will actively support nuclear energy innovation through early-stage, cross-cutting research, R&D technical partnering, general advanced reactor design development, to improve the cost and schedule for accelerated development of U.S. advanced reactors.'

¹¹ See Canadian Nuclear Laboratories, *Perspectives on Canada's SMR Opportunity*, 2017.

3 Australia's Prohibition of Nuclear Power

Nuclear power has been prohibited by Australian legislation for the last 20 years.¹² In November 2017, a long-overdue bill to repeal the prohibition was introduced to the Australian Senate by an independent senator.¹³ To be successful, the bill would however require majority support. There was no indication at the time of writing this paper whether the bill would attract this.

The legislative prohibition may be archaic but represents Australia's paramount policy on nuclear power. Unlike policy affecting other energy resources, Australia's policy on nuclear power can only be modified by repeal of the prohibition.

The prohibition was introduced at federal level as part of a political deal to support the passage of federal environmental legislation, but it can also be explained as a response to the 1986 nuclear accident at Chernobyl in the Ukraine, before Australia became a party to the 1996 Convention on Nuclear Safety, an important international treaty that laid down fundamental safety principles for member states.

The prohibition can also be explained by Australia's abundance of other energy resources (we never thought we would ever have a need for nuclear power). The prohibition may also have been aided by poor community appreciation of the potential future implications of climate change and the need to abate greenhouse gas emissions.

Irrespective of the reasons, the legislative prohibition has remained in place for 20 years despite the passage of the 1996 Convention on Nuclear Safety and despite a number of government reports into nuclear resources and nuclear power. These have included:

- the 2006 Report of the Parliamentary Inquiry on Australia's Uranium Resources (the Prosser Report);¹⁴
- the 2006 Uranium Mining, Processing and Nuclear Energy Report (the UMPNER Report);¹⁵
- the 2016 South Australian Nuclear Fuel Cycle Royal Commission Report (the SANFC Report);¹⁶ and
- the 2017 Independent Review of the Security of the National Electricity Market (the Finkel Review or Finkel).¹⁷

¹² The main legislation is the *Environmental Biodiversity and Protection Act 1999 (Commonwealth)* (EPBC Act) section 140A. There is a similar legislative prohibition in the States of Victoria, New South Wales and Queensland.

¹³ *Nuclear Fuel Cycle (Facilitation) Bill 2017 (Commonwealth)*.

¹⁴ In 2006, after an 18-month study, the Prosser Committee published an 800-page report on the strategic importance of Australia's uranium resources for the development of the non-fossil fuel energy industry in Australia. The report emphasised Australia's need for 'a mix of low-emission energy sources and technologies, including nuclear power.' The report's findings were bipartisan and unanimous.

¹⁵ The UMPNER Report was commissioned by the Commonwealth Government. It found that nuclear power was the least-cost low-emission technology that could provide base-load power and play a role in the future generation mix.

¹⁶ The SANFC Report recommended in its summary that: 'There will in coming decades be a need to significantly reduce carbon emissions and as a result to decarbonise Australia's electricity sector. Nuclear power, as a low-carbon energy source comparable with other renewable technologies, may be required as part of a lower-carbon electricity system. While the development of other low-carbon technologies will influence whether nuclear power would be required to meet Australia's future energy needs, it would not be able to play a role unless action is taken now to plan for its potential implementation. The Commission recommends that the South Australian Government pursue removal at the federal level of existing prohibitions on nuclear power generation to allow it to contribute to a low-carbon electricity system, if required.'

¹⁷ Finkel reported at p. 189 that: 'For many countries, nuclear power provides a secure, affordable and zero emissions electricity supply. In Australia, the establishment of nuclear power would require broad community consultation and the development of a social and legal licence. There is a strong awareness of the potential hazards associated with nuclear power plant operation, including the potential for the release of radioactive materials. Any development will require a significant amount of time to overcome social, legal, economic and technical barriers.'

The Finkel Review examined the current state of the security, reliability, and governance of the National Electricity Market (NEM). Finkel recommended a national reform blueprint and recommended that the NEM should consider all available technologies in line with the principle of technology neutrality.¹⁸

The SANFC Report had earlier sagely emphasised the need to analyse the power system as a whole and aim for the lowest possible system cost.¹⁹

To date, nuclear power has been publicly ignored by the newly-established Energy Security Board (ESB). This is despite repeated assertions of political leaders, including the Commonwealth Minister for the Environment and Energy, that the National Energy Guarantee (NEG) scheme proposed by the ESB is a 'truly technology neutral policy'.²⁰

4. Australia's Nuclear Capabilities and Regulatory Arrangements

The Australian Nuclear Science and Technology Organisation (ANSTO)

ANSTO is a highly regarded Commonwealth agency that conducts research and development across a broad spectrum of nuclear science and technology. It produces radioisotopes and nuclear radiation for medicine, science, industry, commerce and agriculture. It is a world leader in nuclear medicine, exporting to nine countries. It also has world-class capabilities in research into materials for advanced nuclear reactors.

ANSTO has 60 years' experience in the construction and incident-free operation of nuclear research reactors, commencing with the commissioning of the HIFAR reactor in 1958.²¹ ANSTO now operates many nationally important scientific facilities, including the 20 MW multi-purpose reactor known as the Open Pool Australian Light-Water (OPAL) reactor at Lucas Heights, outside Sydney, and the Australian Synchrotron facility (an X-ray light source for researchers) at Clayton, outside Melbourne.

The OPAL reactor has been highly successful on all scores. It is recognised as the most modern, reliable and productive multi-purpose research reactor of its type in the world. It has operated over the last few years with over 99% reliability.

ANSTO represents Australia on the Generation IV International Forum, which is engaged in important research into advanced nuclear technologies, and on the ITER (International Fusion Energy Organisation) project in France. ITER is the world's most significant scientific and engineering project, scheduled to begin operations in 2025.

¹⁸ Finkel p. 185.

¹⁹ According to the SANFC Report summary: '*In developing Australia's future electricity system there is a need to analyse the elements and operation of that system as a whole, and not any single element in isolation. This will be significant in determining the role that nuclear and any other technologies should play. The Commission recommends that the South Australian Government promote and collaborate on the development of a comprehensive national energy policy that enables all technologies, including nuclear, to contribute to a reliable, low-carbon electricity network at the lowest possible system cost.*'

²⁰ According to the Minister for the Environment and Energy on 24 November 2017: '*The Turnbull Government welcomes the decision by the COAG Energy Council to undertake further design work on the National Energy Guarantee. The Guarantee was recommended by the independent expert Energy Security Board (ESB) and has received widespread support from industry and consumer groups. Agreement by the Council is a significant and constructive step forward in delivering a more affordable and reliable energy system as we transition to a lower emissions future. As part of the agreement, the ESB will further develop the design details of the National Energy Guarantee and report back to the COAG Energy Council by April 2018 ... As a truly technology neutral policy, the Guarantee will also drive the right investment and reduce emissions without subsidies, taxes or trading schemes.*'

²¹ For 50 years, the 10 MW High Flux Australian Reactor - HIFAR - was Australia's only nuclear research reactor. HIFAR operated safely and effectively over this time. It supplied millions of patient doses of nuclear medicine and provided scientists with neutron beams to enable them to study the structure of materials. It irradiated hundreds of tonnes of silicon for the international semiconductor industry and supplied radioisotopes for industrial use.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)

ARPANSA is Australia's specialist, independent, nuclear regulator, established in 1998.²² It also has a world-class reputation and track record.

In 2006, ARPANSA licensed ANSTO to operate the OPAL research reactor after a rigorous application process in which ARPANSA needed to be satisfied that the OPAL reactor would be constructed and operated in accordance with international best practice.

The Australian Safeguards and Non-Proliferation Office (ASNO)

ASNO is a division within the Department for Foreign Affairs and Trade (DFAT) responsible for ensuring that Australia's international obligations are met, particularly in the area of the physical protection and security of nuclear materials in Australia. ASNO has a very high international reputation and contributes to the development of IAEA safeguards.

The International Atomic Energy Agency (IAEA)

The IAEA is the world's central intergovernmental forum for scientific and technical co-operation in the nuclear field. It works for the safe, secure and peaceful uses of nuclear science and technology, contributing to international peace and security and to the United Nations' Sustainable Development Goals.

Australia is a member of the IAEA, from which it draws guidance and advice on nuclear power development.

5 The Potential Hazards and Risks of Nuclear Power

It has long been acknowledged that public safety is the top priority in nuclear power development:

'As countries weigh up their future energy options for moving towards a low carbon society, the nuclear power option is increasingly in the mix. Protection of public safety remains paramount and must be the top priority in all countries, together with continued strengthening of the international nuclear non-proliferation regime'.²³

The potential hazards of nuclear power generation are real but, with the latest designs and appropriate regulation, should pose no significant cause for concern by Australians. They were reviewed both in the SANFC Report and in the Finkel Review. The nuclear industry is the most highly regulated in the world and Australia has a proven track record of safely dealing with the risks involved.

Australia has also safely dealt with used fuel that has been produced from the operation of ANSTO's nuclear reactors, by reprocessing of this fuel to make the waste safer to manage and by secure storage. The management of nuclear waste is governed by the National Radioactive Waste Management Act 2012 (Cth).

²² Australian Radiation Protection and Nuclear Safety Act 1998 (Commonwealth) (ARPANS Act).

²³ Robert Pritchard and Helen Cook, *Contemplating Nuclear Power Generation Today: Managing Energy Security Risk, Reducing GHG Emissions and Prioritising Public Safety*, Oil Gas and Energy Law Intelligence (OGEL) Journal, Special Issue on Nuclear Power, January 2013.

According to the comparative statistics published by the World Nuclear Association, the risks posed by nuclear power are less significant than other sources of electricity generation.²⁴

The UK Tyndall Centre for Climate Change has found that *‘Overall the safety risks associated with nuclear power appear to be more in line with lifecycle impacts from renewable energy technologies, and significantly lower than for coal and natural gas per MWh of supplied energy.’*²⁵

The SANFC Report concluded in 2016 that nuclear safety was not a basis for ruling out nuclear power in Australia.²⁶

6 Technological Innovation: SMRs, Safety, Siting and ‘Load Following’

As earlier stated, nuclear power, like other forms of electricity generation, is in the midst of an era of innovation.²⁷

The most significant innovation has been the further refinement of modern SMRs, which feature built-in safety systems.²⁸ Earlier versions of SMRs have been safely used in submarine operations for over 60 years.

SMRs do not need to be sited near the coast for water supplies; they are air-cooled; they do not require external water or electricity supplies nor pumps for emergency cooling; and they can be installed underground. These features enhance their physical security and allow them to remain safe in the event of accidents or external events.

Apart from their safety features, a compelling feature of modern SMRs is their enhanced ability to ‘load follow’. This makes SMRs compatible with intermittent renewable energy forms in power systems.

7 National Security Benefits

In perpetuating the legislative ban on nuclear power generation, Australia has turned a blind eye to its national security. In recent correspondence with EPIA, the Australian Security Policy Institute (ASPI) outlined the national security benefits of an active nuclear power sector: the first benefit relates to private sector engineering expertise:

²⁴ World Nuclear Association, *Safety of Nuclear Power Reactors (updated May 2016)*, <http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/safety-of-nuclear-power-reactors.aspx>

²⁵ World Nuclear Association, *supra* p. 21.

²⁶ According to the summary of the SANFC Report:

‘The Commission looked closely at reactor safety and the major accidents associated with nuclear power plants. While acknowledging the severe consequences of such accidents, the Commission has found sufficient evidence of safe operation and improvements such that nuclear power should not be discounted as an energy option on the basis of safety.’

²⁷ It has recently been postulated that, in less than a decade, a completely decarbonized, energy-rich and sustainable future could be achieved with a dominant deployment of next-generation nuclear fission and associated technologies: see Barry Brook et al, *Silver Buckshot or Bullet: Is a Future “Energy Mix” Necessary?* Sustainability 2018, 10, 302.

²⁸As Finkel acknowledged at p. 189: *‘Small modular reactors (SMRs) are a more flexible technology, with faster construction and delivery times. SMRs have a smaller generating capacity (up to 300 MW), and are designed to allow for modular construction. SMRs are also expected to have a strong safety case based on their smaller size and factory construction. The reactors are capable of providing dispatchable and synchronous electricity, benefiting system security. Projects underway internationally include in the United States, where the design of modules with the capacity to provide 50 MW of electricity each are undergoing licence review.’*

'To better understand the risks of nuclear proliferation it would be useful to increase local expertise in nuclear energy technologies. The absence of any large scale civil nuclear energy industry as a result of successive governments' policy reservations has constrained opportunities to develop a cadre of nuclear engineering specialists that support government in directly analysing proliferation and weapons technology developments. Only a small number of specialists in the defence and intelligence communities assist government policy thinking in this area.'

The second national security benefit relates to sovereign expertise:

'The decision to consider nuclear power options would at the same time create new pathways for building greater sovereign expertise on nuclear proliferation that could allow Australia to expand its role in supporting non-proliferation developments and would contribute to Australia having better strategic intelligence on emerging nuclear threats across the Indo-Pacific region.'

ASPI also recently reminded EPIA of Australia's vulnerability to future shortages of liquid fuel reserves.²⁹

8 The Case for Removing the Legislative Prohibition

In summary, by prohibiting nuclear power in its electricity generation mix, Australia has:

- i. contributed to the destabilisation of its power system^{30 31 32}
- ii. disregarded a key means of reducing greenhouse gas emissions³³
- iii. failed to enhance its scientific and engineering skills³⁴
- iv. failed to optimise the development of its economy³⁵ and
- v. turned a blind eye to its national security.³⁶

²⁹ As ASPI describes the liquid fuel security risk: *'Australian liquid fuel security is endangered by the combined failure of the private and public sectors to maintain sufficient reserves. Australia's membership of the International Energy Agency (IEA) mandates a requirement of 90 days' supply of petrol, oil and lubricants – Australia has 23 days' reserve for actual consumption. It also has an over-dependence on imported energy that must transit vulnerable maritime supply lines, many of which run close to or throughout the South China Sea. Any disruption of overseas fuel – potentially as a result of conflict in the South China Sea – would cause devastating cascading effects throughout our economy and society. Increasing dependency on electric and hybrid vehicles in coming years reduces liquid fuel dependency, but accentuates other energy security risks, as those vehicles will place greater demand on the national electric grid.'*

³⁰ As concluded by the Finkel Review: see section 1 of this paper and footnote 2.

³¹ *'Reliability of supply is what matters for the electricity industry – not the debate over the cost of renewables versus coal ... In power system planning, the risk of early closure of ageing generation capacity must be countered by the timely procurement and installation of all necessary elements of replacement infrastructure of the required scale. The aim must be to provide whole-of-system optimisation in a timely manner at the least cost.'* Robert Pritchard, *Reliable Electricity Supply in Australia - at Least Cost*, EPIA Public Policy Paper 1/2018, April 2018.

³² *'Although new renewables (which include wind, solar and geothermal power, but not hydropower) have surpassed nuclear power in total installed capacity, their share of actual electricity generation is less than one third of that produced by nuclear power because of their intermittency.'* IAEA Nuclear Prospects Report para 17.

³³ As the Finkel Review acknowledged, nuclear power is a zero-emissions form of electricity supply.

³⁴ Australia is a leading uranium producer. However, no private sector investment has been made in nuclear power development and no private sector jobs have been created either.

³⁵ High energy costs have impeded development; see Jim Snow, *The Economic Impact of High Energy Prices*, EPIA Public Policy Paper 2/2014, February 2014.

³⁶ As elaborated by ASPI in section 7 of this paper.

9 Model Towns, or Hubs, for Energy Innovation and Economic Development

Over the next decade, Australia could regain some of its lost ground by lifting its nuclear ban and allowing innovation in nuclear science and technology to flourish under appropriate regulation.

A strategic initiative would be to develop, at state or territory level, hubs for energy innovation and economic development. Such hubs would require the close involvement and support of local communities, would need to be anchored to safe, zero-emissions technologies that complement each other, including modern nuclear technology, and should be connected to the transmission grid in order to optimise the efficient operation of the entire power system at least cost.

The main potential advantages of a model town or hub for energy innovation and economic development, anchored to modern nuclear technology, might be listed as:

- nuclear power is a reliable, dispatchable energy source
- nuclear power can strengthen grid stability
- nuclear power is a zero-carbon energy source that will assist Australia meet its present and future international obligations to reduce emissions
- SMRs are effective 'load followers' that complement intermittent renewable energy sources
- nuclear power is likely to be competitive as an energy source over the short and long terms
- there will be a range of flow-on economic development benefits in primary, secondary and tertiary industries
- this will bring direct and indirect employment opportunities for both skilled and semi-skilled workers
- nuclear power will develop Australia's skills and capabilities in associated industries and technologies
- Australia has uranium resources that can underwrite long term security of fuel supply
- nuclear power is of increasing interest to Australia's regional neighbours, which may offer future opportunities for Australian exports of skills, services and technology
- there will be national security advantages for Australia as identified by ASPI.

10 Community Engagement

Community engagement is always a key factor in energy development.³⁷ It is crucial in the nuclear field, as emphasised by the IAEA.³⁸

With nuclear power, a process of minimal consultation will not be enough; there should be early and ongoing community involvement in any proposal for development and in the ongoing regulation of the industry.

³⁷ 'With many Australians paying increasing attention to their energy bills and expressing concern about energy affordability, coupled with their continuing concerns over climate change, the time appears right for a greater degree of community engagement, providing communities with the time and space for meaningful participation. Fostering better-informed and more-engaged communities builds community trust. In turn, greater community trust could appreciably enhance the development of a nationally agreed energy vision that transcends politics. A nationally agreed energy vision as propounded by the EPIA would do much towards providing the high degree of long-term policy certainty that highly capital-intensive investments in the energy sector require.' Peta Ashworth, *Community Engagement In Energy Policy In Australia*, EPIA Public Policy Paper 3/2014 April 2014.

³⁸ 'Transparent and participative processes at all stages of a nuclear power programme are crucial for fair and consistent decision-making, as well as for harnessing the full potential of the nuclear sector.' IAEA Nuclear Prospects Report para 65.



The best form of community consultation is 'bottom-up', starting at the level of the local community and extending upwards to state and national levels. The development of model towns or hubs would be compatible with such bottom-up consultation.

11 Independent Regulation

Beyond community consultation, there is a need for completely independent, transparent, technical regulation. By 'independent', I mean specialist, professional regulation that is independent of both government and industry. In Australia this can continue to be reliably provided by ARPANSA, which was created for this purpose 20 years ago.

Australia's nuclear regulatory regime could be improved by a simple amendment providing for greater public participation in the licensing of nuclear power facilities, putting Australia at the leading edge of world's best regulatory practice.

There is a global trend towards strong, independent regulation of the entire energy industry, not just in the nuclear power sector. Given the public concern over nuclear safety in the post-Fukushima era, if nuclear power is to be developed in Australia for commercial power generation, a process to permanently guarantee greater public participation in decisions to issue construction and operating licences would be advantageous and would be appreciated by the public.

12 Ecological Sustainability

There is a need for all development proposals to be approved under applicable state and local government approval processes.

Although ARPANSA has Australia-wide responsibility for administering the licensing system for nuclear power, this does not override state planning laws. The state and territory governments would remain responsible for considering all applications for the development of nuclear facilities in their respective jurisdictions.

The well-established principle of planning law across Australia is that development should be ecologically sustainable.

Intending developers are required to lodge a detailed Environmental Impact Assessment with the applicable Environmental Protection Authority (EPA) in each relevant jurisdiction. The jurisdictional EPA would be expected to impose conditions that would include the requirement for a developer to obtain and maintain in force all licences required under the ARPANS Act.

Any developer of a nuclear power facility in Australia would therefore be required to undertake a 'dual-track' approval process, one for licences required under the ARPANS Act and another for approval under planning law. The author does not see this as excessive.

Any operator of a nuclear facility would also need to obtain permits from ASNO to possess nuclear materials.

13 Conclusion

The Australian community assuredly needs a reliable, affordable, low-emissions and safe power system.

Technology neutrality should be consistently applied as a policy principle and the archaic ban on nuclear power should be lifted.

The ban has caused Australia to lose considerable ground. Nonetheless any state or territory should be able to develop a model town or hub for energy innovation and economic development with reliability, affordability, low-emissions and safety of energy supply as key attributes. This could in time become part of the essential infrastructure of the nation, more valuable in its way than much of the nation's hard infrastructure such as roads, railways, ports or airports.

Australia has a strategic opportunity to recover some of its lost ground in the energy sector.

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About the Author

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Robert has over 40 years' experience as a lawyer and adviser to industry, governments and organisations on energy projects and policies, both in Australia and overseas, and as a director of companies in the energy sector. This includes serving as chairman of the St Baker Energy Innovation Fund and SMR Nuclear Technology Pty Ltd. Robert was the first chairman of the Energy Law Section of the International Bar Association and served for nine years on the Finance Committee of the World Energy Council.