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## DIVERSITY INDISPENSABLE FOR NET ZERO

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## *Key Points*

- Until recently in Australia, there had been little public concern about our national defence, our energy security, and the strength of our export earnings from resources such as coal, natural gas and uranium. However, these issues are being impacted by the global crusade to achieve 'net zero emissions' by 2050.
- Impacts in Australia include the substitution of weather-dependent renewables for fossil fuels, the electrification of transport, the promotion of hydrogen as an alternative energy carrier, and the possible impairment of our defence and space industry capabilities.
- These impacts pose a systemic challenge that cannot be addressed by a narrow policy response – nor by a range of narrow responses, nor especially by politically contrived solutions.
- To achieve net zero, diversity is more than ever indispensable – a change agent is required and communities need to be involved.

## History

Energy security has always been an important aspect of Australia's national security – and even more important to our major export customers.

Australia has always been a 'lucky country' with its energy resources. As early as 1797, coal was discovered at Newcastle, NSW. This triggered our sustained energy development and underwrote our economic and social development for over two centuries. Other 'lucky countries' profited in their own way from the discovery and export of petroleum.

In the 1970s, energy security risk leapt to the top of international attention with the confiscation of BP's petroleum interests in Libya, triggering decades of geopolitical upheaval over oil supply from the Middle East. In his 1980 State of the Union Address, US President Jimmy Carter stated that the US would if necessary use military force to defend its 'national interests' (the right to extract oil from its overseas petroleum concessions).

Without needing to resort to military force, the US successfully countered the global oil threat by discovering and developing its own resources and expanding its domestic production capacity. Australia, for its part, became a major developer and exporter of coal, LNG and uranium, supplying key customers in Japan, Korea, China and Taiwan.

### 'The Climate Threat'

By 1994, however, the 'climate threat' was being claimed by many as a greater global threat than the oil threat. The UNFCCC entered into force in 1994 and a total of 197 countries have now ratified it.

By 2015, the Paris Agreement was negotiated with the aim of limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C. The Paris Agreement also established *Mission Innovation*, a global initiative to accelerate clean energy innovation. The theory was that the power of innovation – driven by sustained public investment and business leadership – would make clean energy widely affordable and bring fledgling ideas into the mainstream.

Many of the historical assumptions about our energy industry are now being shaken by increased political and social agitation over the goal of achieving 'net zero emissions' by 2050.

## ‘The Energy Transition’

Many countries are responding by investing in a broad range of lower emissions technologies and storage systems. These include renewable energy, hydropower, natural gas with CCS, nuclear energy and, most recently, hydrogen.

Energy systems everywhere are undergoing transformation. At their June 2019 Summit in Osaka, G20 Leaders recognised energy security as a guiding principle for the transformation of their energy systems:

‘...the importance of [transforming] our energy systems into affordable, reliable, sustainable and low GHG emissions systems as soon as possible

... the role of all energy sources and technologies

... different possible national paths to achieve cleaner energy systems

... global energy security as one of the guiding principles for the transformation of energy systems, including resilience, safety and development of infrastructure and uninterrupted flow of energy from various sources, suppliers, and routes.’


Nonetheless, the energy transformation is more difficult than meets the eye. In January 2021, for example, the Australian Energy Security Board reported there had been an ‘*exponential increase in system instability in recent years*’, which it attributed to rising levels of intermittent, weather-dependent generation.

## Pathways to Our Energy Future

What policy pathways should Australia now take to underwrite its energy security and preserve its energy exports, at the same time as transforming its energy system to achieve net zero? The Australian Government has initiated a Technology Investment Roadmap to encourage innovative solutions.<sup>1</sup>

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<sup>1</sup> Department of Industry, Science, Energy and Resources, ‘*Technology Investment Roadmap: First Low Emissions Technology Statement – 2020*’, Canberra, 2020.



One possible pathway is nuclear power but this has been arbitrarily prohibited by legislation since 1998. The prohibition arose from Parliamentary ‘horse trading’ over the centralisation of environmental regulation. At the time, other forms of energy were abundant and few believed there would ever be a need for nuclear power, whether for power generation, maritime propulsion or space industry applications.<sup>2</sup>

Now hydrogen has become the ‘vogue pathway’. According to Australia’s National Hydrogen Strategy of 2019:

*‘Technological developments that support energy affordability, improve energy system reliability and contribute to long-term emissions reductions will be vital as global energy markets continue to evolve. Hydrogen is one of the many tools that can help us on this evolution and Australia is in a unique position to maximise on this opportunity.’*

*The development of our hydrogen resources could enhance Australia's energy security, create Australian jobs and build an export industry valued in the billions. We have all the pieces needed to create this new industry and supply clean hydrogen to the world: the energy resources, expertise, and infrastructure.’*


Unfortunately, there are no ‘hydrogen resources,’ just as there are no ‘electricity resources.’ The carbon emissions-free production of hydrogen at the industrial scale needed for wholesale replacement of domestic (and export) energy resources—whether ‘blue’ hydrogen from natural gas with no release of CO<sub>2</sub>, ‘green’ hydrogen from wind and solar, or ‘pink’ hydrogen from nuclear energy—will take considerable time and entail considerable cost. Significant high-risk research and development will be required to achieve the hoped-for cost reductions. Do we have the time, the sustained commitment, the Australian and international commercial and academic research partnerships and all the capital we need?

### **What Have We Learned About Our National Security and Energy Security Needs?**

What have we learned about our national security and our energy security needs from the history of oil and gas and coal development? What have we learned from the expropriation of oil concessions in the Middle East and the threats of oil producers to use the ‘oil weapon’? What have we learned from Russia’s push to establish the Gas Exporting Countries Forum and its threats to curtail gas supply to Western Europe? What have we learned from Iran’s threats to disrupt tanker traffic in the Straits of Hormuz?

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<sup>2</sup> Frame, Tom (ed), ‘An Australian Nuclear Industry. Starting with Submarines?’ UNSW Canberra, Connor Court Publishing, 2020.



What have we learned from short-term, piecemeal solutions to electricity market reform in Australia? What have we learned from the push to invest in weather-dependent renewables as a substitute for fossil fuels in electricity generation?

### **No Single Pathway**

We have learned, or should have learned, that there is no single pathway on which we can rely. We have learned, or should have learned, that there is significant value in diversity, and in a portfolio of real options.

Over the last 30 years, Australian companies successfully developed their coal, LNG and uranium resources for supply to Asian markets. This successful strategy prompted many politicians to claim that Australia was an *'energy super-power'*. However, super-power status has little value if global demand drops and export prices fall.

### **Facing the Future: Diversity and Optionality**

Our indispensable response must be to pursue diversity and genuine optionality, avoiding unnecessary politicisation of the issues. Our energy security will always be enhanced by the availability of a diversity of options and the flexibility to switch quickly from one to the other.

Australia should continue exporting *'energy security'* to its main customers, who will be alarmed if their energy supply is threatened by political or market disruptions.

At the same time, Australia needs to ensure that its own increasingly high level of dependence on imported oil does not compromise the nation's energy security, while not exposing its power system to the vagaries of the weather.

The pursuit of diversity requires collaboration but collaboration will not happen by itself. It requires orchestration. For this, a change agent is required and communities and affected stakeholders need to be involved.



## About the Author

**Robert Pritchard** is a lawyer and consultant on energy policy and strategy. He serves as executive director of the Energy Policy Institute of Australia and is a director of several companies involved in energy technologies and energy industry start-ups, including a nuclear technology company.

Robert served for 9 years on the Finance Committee of the World Energy Council and chaired the 2001 WEC Study on Electricity Market Design and Creation in Asia-Pacific.

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