

SHORT SUMMARY

3.20.007 Offshore Wind Potential for Australia

KEY POINTS

- △ Offshore wind energy is growing rapidly globally, and over 10 offshore wind projects of over 25 GW in size are now proposed for Australia.
- △ Australia has very high quality and abundant offshore wind resources, but new floating offshore wind technologies will be necessary to access many of the best locations.
- △ Offshore wind has the potential to contribute to the energy system through higher capacity factors and diversity of energy supply. This is particularly important under 'energy superpower' scenarios including mass electrification and hydrogen production.
- △ Offshore wind energy could play a significant role in a 'just transition' for oil, gas and coal workers and current energy generation regions.

THE CHALLENGE

Offshore wind is booming globally. Globally, 2030 targets for offshore wind total around 200 Gigawatts. The rapid development of the offshore wind industry around the world merits a more serious re-consideration of the opportunity for Australia.

The conventional wisdom in Australia is that offshore wind energy would not have a role to play in our electricity system. Australia has more sites with good-quality on-shore wind and solar resources without the tighter land space constraints of some other nations. Across many parts of the coastline, the shelf falls away quickly meaning there are less locations in which fixed bottom offshore wind turbines are viable. In the 2020 Integrated System Plan developed by the Australian Energy Market Operator, offshore wind was not included in the assessment of resources used to allocate Renewable Energy Zones, and was poorly represented in future scenarios for the development of the National Electricity Market (NEM).

Despite there being no regulatory framework in place, there are more than 10 offshore wind projects proposed for development in Australia, exceeding 16 GW installed capacity. The potential contribution of offshore wind as part of an Australian energy transition is clear.

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THE OPPORTUNITY

Australia has a coastline of almost 60,000 km with very high wind resources. As global development of offshore wind has increased turbine sizes and reduced costs, there are a range of benefits that could arise from Australian development of offshore wind, including:

- △ the potential to diversify Australia's clean energy generation stock with high capacity factors that complement the generation profile of onshore renewable energy;
- △ delivery of high capacity factor renewable energy in regions close to existing coal-fired power stations that are scheduled for closure, in turn ensuring optimal use of existing electricity infrastructure, and avoiding stranded or underutilised assets;
- △ easing land-use conflicts that could intensify with the large-scale development of onshore solar and wind through some very large capacity offshore projects, especially if there is large-scale electrification and the development of export opportunities such as green hydrogen;
- △ utilising and redeveloping port infrastructure in locations such as the Port of Newcastle and ports on the Victorian and Tasmanian coasts of Bass Strait;
- △ providing alternative employment, especially to support a 'just transition' for fossil-fuel workers in the coal, oil and gas sectors.

OUR RESEARCH

The aim of this study is to stimulate discussion of the Australian opportunity for offshore wind energy by:

- △ undertaking high-level mapping of the national Australian wind resource;
- △ analysing and comparing the generation profile at hourly interval with the load profiles of states within Australia's Electricity Markets;
- △ profiling the workforce required to develop, construct and manage an offshore wind farm and the scope for the industry to provide employment for the coal, oil and gas workforce;
- △ developing recommendations for next steps based on international experience and the review of the Australian potential for offshore wind.

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OUTCOMES

Key findings of the report include:

- △ Australia has very high quality and abundant offshore wind resources in a range of locations;
- △ Floating offshore wind technologies will be necessary to access many of the best Australian offshore wind resources;
- △ The capacity factors for offshore wind are usually higher than onshore wind;
- △ Offshore wind can provide diversity of energy supply due to its availability at times when solar power and onshore wind are not available;
- △ Under 'energy superpower' scenarios including mass electrification and hydrogen production, offshore wind could become a key source of electricity supply;
- △ Offshore wind energy could play a significant role in a 'just transition' for oil, gas and coal workers.

NEXT STEPS

Recommendations are issued across 5 themes:

1. Establishing a regulatory regime for offshore renewable energy;
2. Offshore wind should be incorporated into national and state energy planning;
3. Offshore wind should be recognised as a strategic resource for innovation and commercialisation funding;
4. The permitting process should support the development of local supply chain capacity to maximise investment and jobs and community benefit;
5. Detailed research is required to assess cost-benefits of offshore wind to energy, environmental and social systems.

PROJECT TEAM

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PROJECT REPORTS/PUBLICATIONS

Briggs, C., M. Hemer, P. Howard, R. Langdon, P. Marsh, S. Teske and D. Carrascosa (2021). Offshore Wind Energy in Australia, P3.20.007 – Final Project Report. Hobart, TAS: Blue Economy Cooperative Research Centre

PROJECT PARTICIPANTS

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