

IMPROVING DECISION- MAKING IN RELATION TO OFFSHORE WIND

Priority knowledge and decision
support needs for Australia



Improving decision-making in relation to offshore wind: Priority knowledge and decision support needs for Australia

This report by the Australian Marine Conservation Society (AMCS) synthesises technical analysis and expert opinion commissioned by AMCS. It condenses recommendations by experts at the Australian Centre for Offshore Wind Energy and Biodiversity Council.



Australian Marine Conservation Society is the voice for Australia's oceans. AMCS are Australia's leading national charity dedicated solely to protecting our precious ocean wildlife – a community of ocean lovers across the nation working for healthy seas.
marineconservation.org.au



Australian Centre for Offshore Wind Energy (ACOWE) – A national interdisciplinary research and training partnership to enable sustainable offshore wind development in Australia. ACOWE is a collaboration of universities partnering with stakeholders to deliver impact.
eng.unimelb.edu.au/acowe



The **Biodiversity Council Australia** – The Biodiversity Council is an independent expert group founded by 11 Australian universities to promote evidence-based solutions to Australia's biodiversity crisis. The Biodiversity Council is a trusted voice in communicating information on Australia's most pressing biodiversity issues to the community, business and governments to ensure biodiversity and Country prosper.
biodiversitycouncil.org.au

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ACKNOWLEDGEMENT OF COUNTRY: AMCS, ACOWE and the Biodiversity Council acknowledge the Traditional Custodians of this land and sea Country, and pay our respects to their Elders past and present. We acknowledge that this land and sea Country was, and always will be, Aboriginal land and sea.

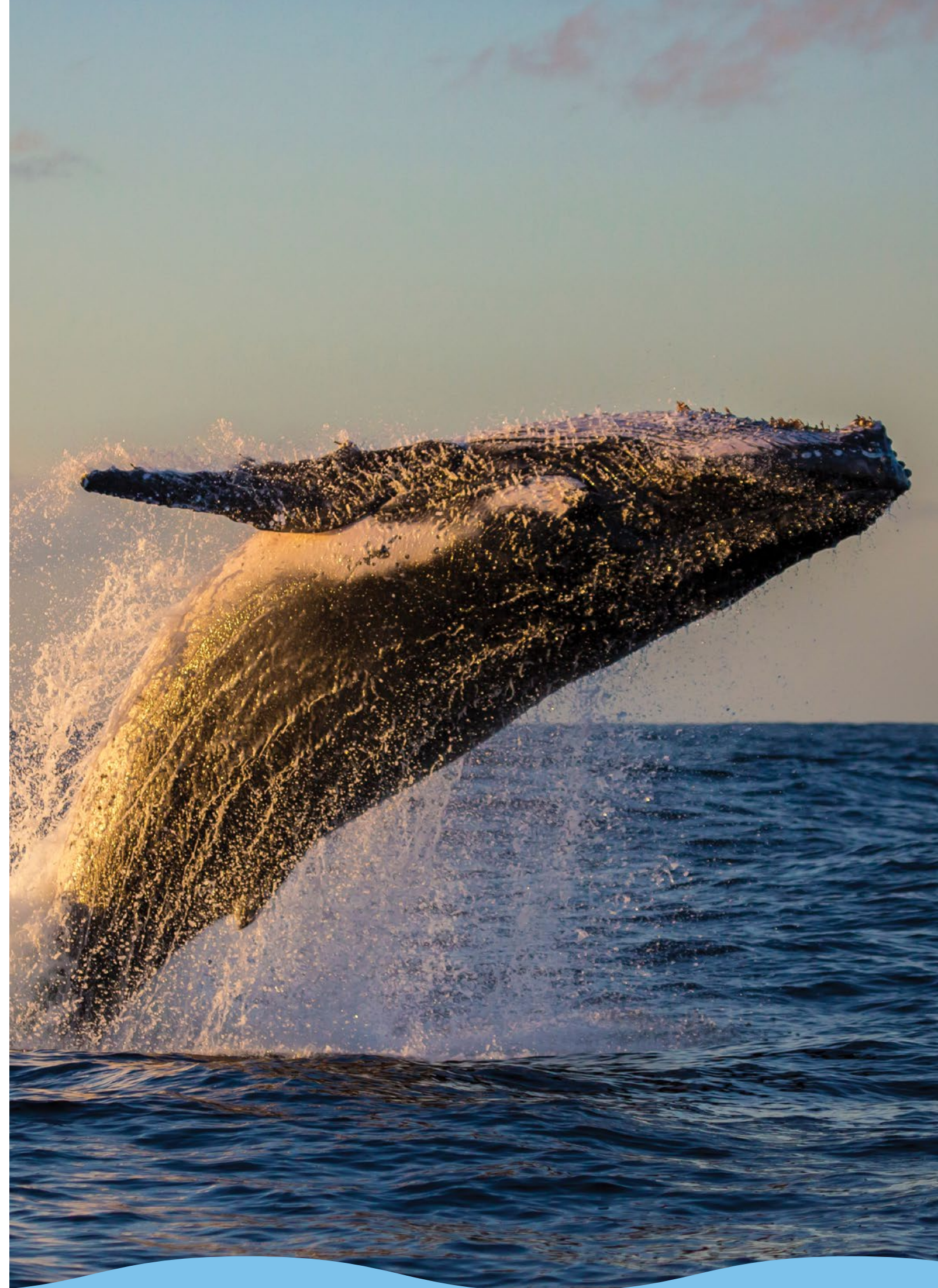
As the oldest continuing culture in the world, Indigenous Australians have a deep, enduring connection to Country – Land, Sea and Sky. This connection encompasses cultural identity, health, and wellbeing. For Indigenous Australians Country refers to more than a physical or geographical area. Rather, it encompasses the interconnectedness of 'all living things on the land and in the seas, and it also includes connected language, knowledge, cultural practice and responsibility'¹.

Each designated zone for offshore wind development is situated on Aboriginal Country, holding deep cultural significance and rich cultural heritage, including submerged cultural landscapes on the continental shelf.

Indigenous Australians maintain a deep connection to Sea Country. It is important that decisions made in relationship to the Offshore Energy Infrastructure Zones, prioritise the rights, and needs of Indigenous Australians, promote Indigenous leadership and ensure the wellbeing of Country.

marineconservation.org.au/offshore-wind-report

¹. Janke, T., Cumpston, Z., Hill, R., Woodward, E., von Gavel, S., Harkness, P., and Morrison, J. (2021) 'Indigenous'. Australia State of the Environment Report. Department of Climate Change, Environment, Energy and Water



About this report

Australia's marine and coastal ecosystems are among the most biodiverse in the world, with deeply interconnected relationships between oceans, coasts and human societies. **Climate change, driven largely by fossil fuels, is having devastating impacts** on ocean and terrestrial ecosystems, as well as human society more broadly. We must significantly reduce greenhouse gas emissions and offshore wind could make a significant contribution to the transition to renewable energy.

This report outlines the key environmental, social, economic, and cultural **knowledge required** to build a strong and independent evidence base, and how knowledge and data should be used to support decision making under the Offshore Electricity Infrastructure (OEI) Act. The report suggests additional policy tools to improve this process and support decision making. The recommendations outlined in this report will help to progress the transition to renewable energy, while minimising environmental impacts (including for areas of high conservation areas and culturally significant species) and increasing the likelihood of support in host communities.

This report condenses technical analysis provided to the Australian Marine Conservation Society with detailed rationale, references and recommendations. **The recommendations support a more 'hands on' role for Governments, independent research institutions, Indigenous Australians, and the broader community in the development of the offshore wind industry in Australia.**

Why are we talking about Offshore Wind?

Climate change is having devastating effects on the world's coasts and oceans, causing sea level rise, ocean acidification, shifts in wave climate and ocean currents, and changes in species abundance and distribution. Marine heatwaves are causing mass coral bleaching and loss of temperate kelp forests. Climate change not only threatens marine ecosystems but also profoundly impacts human communities. **These impacts are happening now and are intensifying.**

Australia has one of the highest per capita emissions and is the second largest exporter of emissions globally from our fossil fuels. Decarbonising Australia's energy systems is essential to addressing the long-term impacts of climate change and fulfilling our global responsibilities. The science is clear: the world must limit global warming to 1.5°C above pre-industrial levels to avoid the most dangerous impacts of climate change. Achieving this will require substantial new, large scale renewable energy generation. Offshore wind holds significant potential as an alternative energy source, as it can tap into stronger, more consistent winds close to energy demand hubs. Its large-scale power generation boosts grid resilience, working alongside other renewables to help Australia meet its rising electricity needs.

Offshore wind is well established globally and expanding fast, with energy production expected to grow more than 25-fold by 2050 across the world. In Australia, where 87% of the population lives within 50 km of the coast, offshore wind offers significant potential to power major industries while supporting our 2050 net-zero emissions targets.

Managing risks and delivering benefits

Like any development in the ocean, offshore wind may affect environmental, socio-economic, and cultural values. Thorough research is essential to fully assess the nature and scale of these risks, especially in the context of existing and future challenges posed by climate change and competing uses of ocean resources. However, international experience demonstrates that many impacts from offshore wind can be mitigated or even avoided. Further research is needed to fully assess and mitigate these risks effectively. At the same time, offshore wind has the potential to deliver ecological, social, and cultural benefits, including contributions to renewable energy targets, job creation, and a range of co-benefits for marine ecosystems. These potential benefits must be carefully weighed alongside the risks to ensure informed, balanced decision-making.

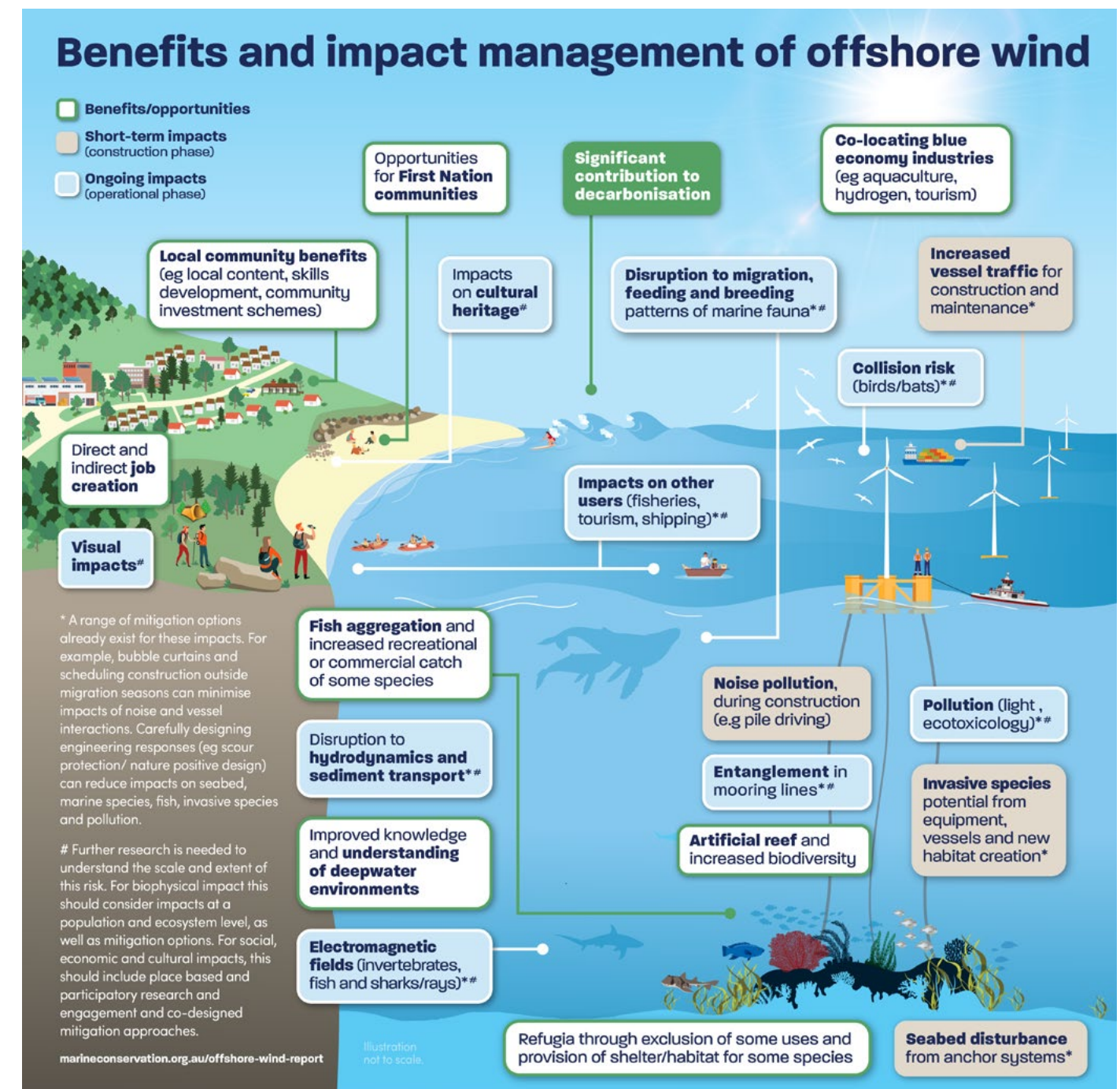


Figure 1: Benefits and impact management of offshore wind.

The laws guiding decision making for offshore wind

The Australian Government has established six Offshore Energy Infrastructure Zones (OEIzs): Gippsland (VIC), Southern Ocean (VIC), Hunter (NSW), Illawarra (NSW), Bunbury (WA), and Bass Strait (TAS). Detailed proposals for offshore wind projects are currently being developed within these zones, with several feasibility licenses already issued. These licenses enable extensive environmental assessments, which are expected to take approximately 5-7 years per zone.

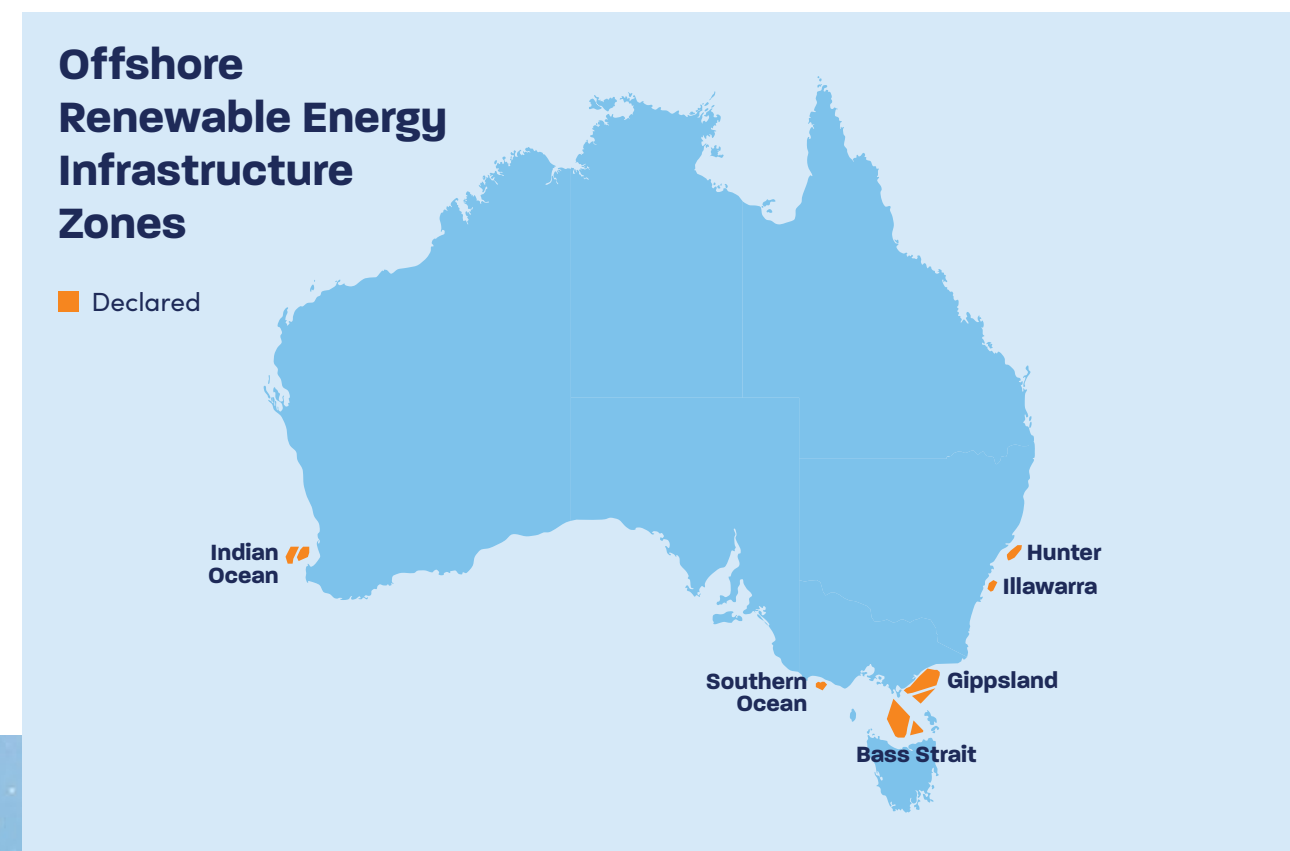


Figure 2: Offshore Energy Infrastructure Zones

Australia's regulatory framework, guided by the *Offshore Electricity Infrastructure Act* and the *Environment Protection and Biodiversity Conservation Act*, outlines the decision-making processes for offshore wind development. These regulations mandate engagement with rights holders, stakeholders, local communities, and the general public at multiple points throughout the 5-7 year assessment period.

For this engagement to be meaningful, everyone needs **access to clear, reliable and trusted information** about the potential risks and benefits of offshore wind – environmentally, socially, economically and culturally. Gathering, analysing, and sharing this knowledge helps ensure decisions are based on solid evidence and reflect community interests. This information must be collected and analysed objectively and at the right scales. Looking only at individual sites won't capture the bigger picture, including broader impacts and benefits. Our deep oceans remain one of the most underexplored parts of the planet. In addition, offshore wind is new to Australia, and most of what we know about its impacts and benefits comes from international research. **While global experiences offer valuable insights, they do not fully account for Australia's unique environmental, regulatory, logistical and cultural conditions.** That's why dedicated research and local knowledge is needed to fill key knowledge gaps and support better decision making.

To support informed decision-making, we need a stronger evidence base that communities, government, and industry can rely on. This goes beyond simply collecting data—how we analyse and use it is just as critical. Data must be analysed to create models that forecast potential impacts and benefits to support rigorous and ongoing assessment processes. Information must also be shared in ways that are accessible and culturally appropriate to enable genuine community participation. The report outlines tools that can be used to bring information together to build a more comprehensive understanding of the outcomes.



Social licence, access to trusted information and structured engagement

Offshore wind has not been welcomed by all sections of the community. Offshore wind developments often face resistance locally, as communities are concerned about negative impacts to the environment and marine life (ecological values) and to the seascape, cultural practices and heritage, identity, recreation activities and work activities (social values). There is often a lack of place specific knowledge to adequately explore these concerns and inform community. Reliance on developer-led engagement and unclear accountability for delivering local benefits has also eroded community confidence in promised economic outcomes in some regions. A more **coordinated, transparent and inclusive approach to community engagement, backed by trusted information, is urgently needed.**

Genuine and effective community engagement requires active negotiation and deliberation, acknowledging and addressing the diversity within and between community groups. Communities need to be provided the opportunity to constructively discuss their concerns and need to be involved in identifying methods of addressing them. Conflict is an inevitable component in decision-making processes. Rather than avoiding conflict, processes of community engagement and decision making should be focused on ways to make conflict respectful and productive, involving negotiation, and genuine deliberation. Lessons can be drawn from other parts of the country and the world which have successfully negotiated difficult periods of transition, including within Gippsland OEIZ. Deliberative processes which engage communities in negotiation and co-design of environmental solutions can elevate environmental and social standards beyond regulatory requirements. For this to be successful, communities also need access to sufficient and **trusted information.**



A roadmap for research and engagement.

A strong evidence base, inclusive decision-making, and rigorous monitoring will be essential to achieving environmentally, socially responsible, and culturally responsive outcomes. Without these, offshore wind risks a loss of social licence and unacceptable environmental impacts. Ensuring that knowledge is collected, shared, and applied effectively will support informed decision-making, foster community trust, and contribute to the long-term sustainability of Australia’s offshore renewable energy sector. The report puts forward a roadmap to achieve these goals (see Figure below).



Immediate investment

- 1. Establish a sustainable, long-term funding mechanism using both industry and government funds to effectively address the highest priority knowledge gaps**
- Australia must make a substantial investment in marine environmental, social, and cultural research. While industry will shoulder much of this responsibility, there is a clear need for government leadership and **strong, independent national oversight** to guide this investment effectively. Future research needs to be part of a coordinated, and **integrated research program** incorporating environmental, social, economic, and cultural assessments. An effective research and monitoring program requires a coordinated approach led by independent bodies, to ensure credibility and public trust. There are a number of international examples of shared funding models which Australia can draw from to establish a public-private research funding mechanism to support long term research and monitoring programs.
- 2. Develop national data-sharing infrastructure to enable open access (where appropriate) to research findings**
- The need to model cumulative impacts on threatened and culturally important species of concern to assess viability and identify priority data gaps is urgent. There is a need for robust data to model and assess cumulative impacts, and to guide long-term ecosystem monitoring. Industry is already collecting data at individual sites, however, without a system to share information it is unclear what is being gathered and where critical gaps remain. Coordination across industry and government is needed to design research to maximise efficiency and avoid duplication.
- In order to support a coordinated knowledge base we also need standardised data collection protocols and methods. A consistent approach to data collection and analysis will help create strong, nationwide monitoring and evaluation of the impacts and benefits of offshore wind projects.

3. Resource Indigenous Australian communities to build internal capacity and support Indigenous leadership in culturally appropriate research co-design

Securing a 'cultural license to operate' requires engaging with a rights based, self-determined process of co-design with Indigenous Australian communities. There is a need to prioritise and support Indigenous leadership and knowledge in the development, planning, implementation and operation of offshore energy. The exact form that this support takes should be co-designed with Traditional Custodians and may include the development of policy instruments such as Sea Country Management Plans. Such plans could enable science collaborations to promote and enhance Aboriginal science, researchers and capacity building.

The report recommends first resourcing Indigenous Australian communities to establish the internal mechanisms to support co-design and engagement. A National Environmental Indigenous research network should also be developed, and an atlas of Culturally Significant Areas scoped. Dedicated resourcing and support are required to enable co-design of Country specific Indigenous Australian protocols for engagement, data sovereignty frameworks and community benefits sharing protocols, cultural heritage management and other self-determined models for managing offshore wind on Sea Country.

4. Establish meaningful community engagement, helping to both support regional communities in co-designing the broader energy transition within their communities, whilst also addressing public concerns about the potential risks and benefits of offshore wind development.

The report highlights a range of strategies to build improved community engagement and support well-informed deliberation and decision making. These include:

- place-based participatory research projects that gather and build on baseline social, economic, and cultural data in all OEIZ host communities
- a move toward more deliberative systems of community engagement
- the creation of local energy hubs, integrated with ocean literacy programs, to provide access to reliable information which can reduce uncertainty, build trust, and counter misinformation
- greater community engagement in priority research areas, including cetacean and bird monitoring and fisheries research, through citizen science activities.

Short to medium term investment

There is an urgent need to undertake **baseline assessment** in all OIEZs alongside appropriate **control sites** (ideally Marine Parks) to measure changes over time and to help design solutions and mitigation strategies. To effectively monitor the ecological impacts of offshore wind, international experience highlights the importance of **collecting 3–5 years of baseline data before construction**.

This work needs to be part of a coordinated, and **integrated research program** incorporating environmental, social, economic and cultural assessments. Data and analysis are needed to model and assess cumulative social, ecological and cultural impacts and to help inform ecosystem monitoring.

Investment should also be dedicated to advancing **experimental research** that supports ecosystem-wide and community-level modelling of offshore wind farm impacts. A further investment is needed to establish effective **decision-support mechanisms**, including Marine Spatial Planning using advanced spatial zoning software in partnership with recognised experts. **Population Viability Analysis on listed and culturally significant species** is also recommended to ensure that the best available knowledge is embedded into regulatory and planning processes.

Ongoing investment

Finally, continuous monitoring, assessment, and adaptive management is needed to ensure that the development, operation and decommissioning of offshore energy is both sustainable and equitable for all Australians.



Leafy sea dragon and weedy sea dragon amongst kelp © Scott Portelli



The Report **Improving decision-making in relation to offshore wind: Priority knowledge and decision support needs for Australia** was commissioned by AMCS and authored by experts at the Australian Centre for Offshore Wind Energy and Biodiversity Council and is available here: marineconservation.org.au/offshore-wind-report

