

# MRE Regulator Survey: *AUSTRALIA*



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## Introduction

As marine renewable energy (MRE) is still a new industry, there are many unknowns about the potential environmental effects of MRE deployments. These concerns are largely based in the uncertainty of how wave and tidal devices interact with the environment, or how marine animals behave around devices. This uncertainty makes permitting processes for MRE projects difficult, often requiring extensive monitoring and data collection. This cautious approach may limit the implementation of MRE technologies or create financial barriers to development.

To better understand the viewpoint of regulators and advisors involved in permitting MRE devices, a survey was conducted among multiple OES Environmental countries. The survey was intended to understand the familiarity of regulators with MRE technologies, their perceptions of environmental risk, and their recommendations on best approaches to MRE development, including permitting and the potential for data transferability. The survey also included some questions to gather *Tethys* user data. This report summarizes the results from the survey of regulators and advisors in Australia, conducted in 2021.

## Participants

Web links to complete the 2021 Survey on Regulatory Needs for Environmental Effects of Permitting Marine Renewable Energy in Australia were sent to regulators and advisors in Australia identified by the Ocean Energy Systems Australia working group. Out of 6 total responses received, there were 4 mostly complete responses.

3 of the participants represent a federal agency, and one represents a state agency. Participants were also asked to indicate which Act(s) their agency has responsibility for in permitting MRE developments. Out of the 3 regulators who responded to the question, one indicated that they work with agencies responsible for State Acts; one is responsible for the Offshore Electricity Infrastructure bill in Commonwealth waters, the Environmental Protection and Biodiversity Conservation Act assessments, and the Sea Dumping Act assessments; and one is responsible for the Marine and Coastal Act, Environmental Effects Act, and the Planning and Environment Act.

Of those surveyed, all 4 are advisors in some role, while one reviews applications and writes licenses/permits (Figure 1). All 4 survey participants have directly participated in the environmental permitting of an MRE device.

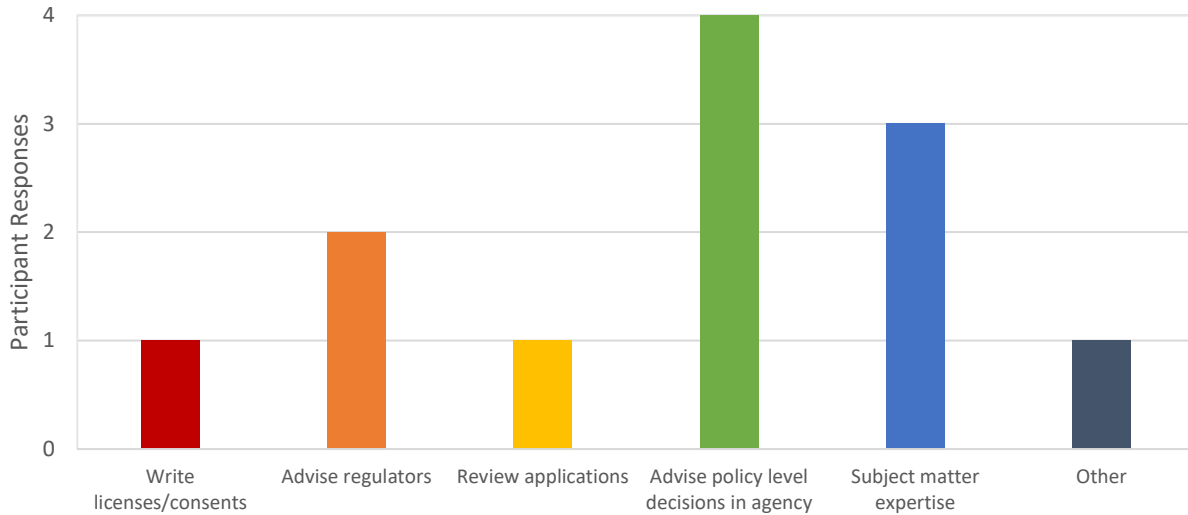


Figure 1. Individual role in marine renewable energy project permitting. 'Other' response is "advise information/research needs to support environmental impact assessment and regulatory decision-making". (n = 4)

## Familiarity with MRE Technologies

Participants were also asked to rate their familiarity with tidal and wave energy technologies and offshore wind on a scale of 1 (not familiar) to 5 (very familiar). The results for tidal energy devices are shown in Figure 2, wave devices in Figure 3, and offshore wind technologies in Figure 4. Regulators and advisors in Australia are slightly more familiar with tidal devices – particularly horizontal axis turbines – than with wave devices, and they are even more familiar with offshore wind technologies. The most familiar devices are fixed wind turbines.

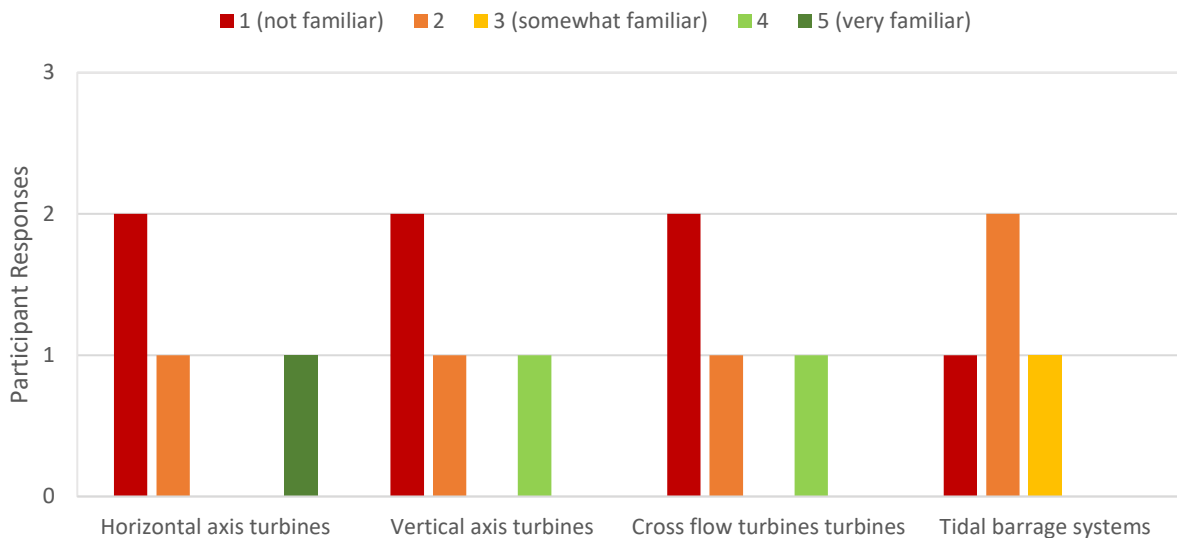


Figure 2. Familiarity with tidal devices. (n = 4)

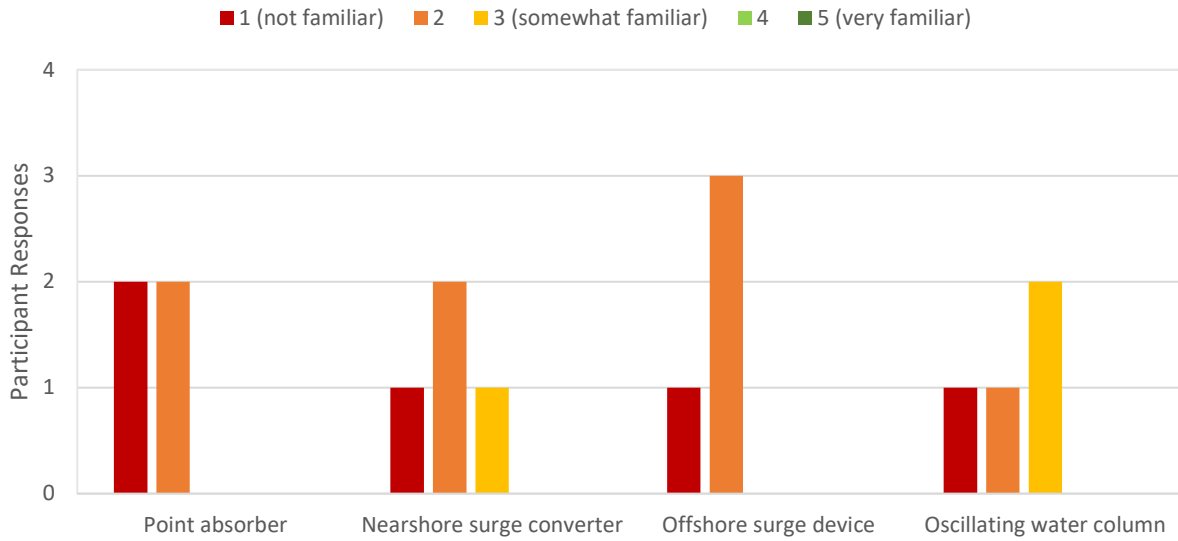


Figure 3. Familiarity with wave devices. (n = 4)

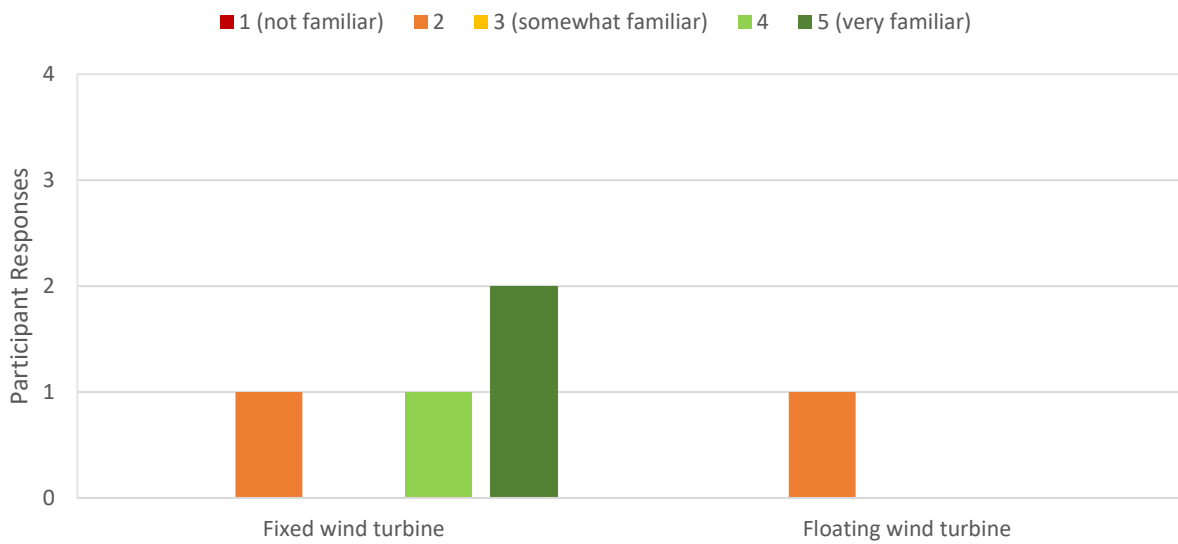


Figure 4. Familiarity with offshore wind turbine technologies. (n = 4)

## Top Challenges and Perceptions

Regulators and advisors were asked to rank the following challenges from 1 (most important) to 7 (least important) for permitting projects with single MRE devices and for arrays.

- Chemical releases and water quality degradation
- Electromagnetic field (EMF) effect on animals
- Benthic/habitat disturbance
- Risk of animals colliding with underwater devices
- Effects of underwater sound emissions from devices on animals
- Avoidance, attraction, and/or displacement of animals
- Energy removal and effects of changes in flow on the ecosystem
- Entanglement of animals with lines and cables
- Displacement of traditional activities

The average ranking of each challenge was calculated by Survey Monkey, such that the answer choice with the largest average ranking is the top challenge.<sup>1</sup>

The results for **single devices** are shown in Figure 5 and the results for **arrays** are shown in Figure 6. The most important challenge identified for single devices was avoidance, attraction, and displacement followed by underwater sound. For arrays the most important challenge was underwater sound followed by avoidance, attraction, and displacement. Benthic/habitat disturbance was also a significant concern for both single devices and arrays.

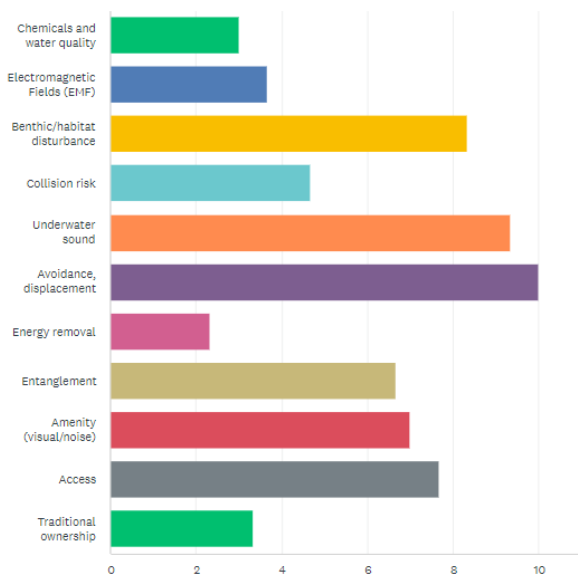


Figure 5. Ranking of challenges for single devices. (n = 3)

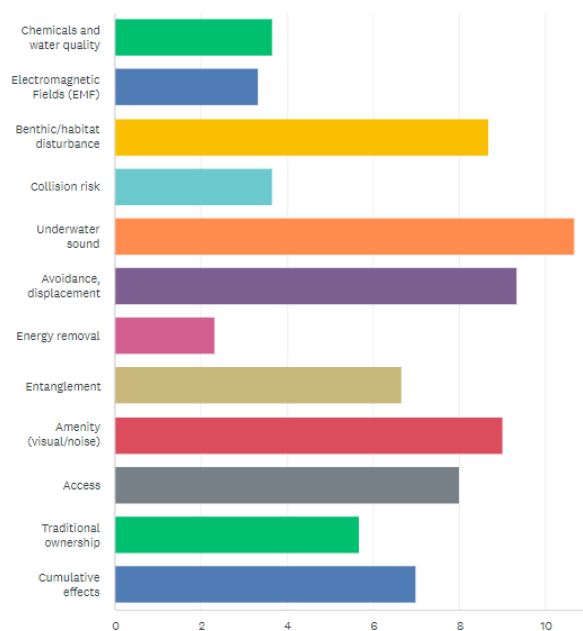


Figure 6. Ranking of challenges for device arrays. Note that cumulative effects was added for arrays. (n = 3)

<sup>1</sup> Method used to calculate average rank uses the equation below, where w is the weight of the ranked position and x is the response count for each answer choice.

$$\frac{x_1w_1 + x_2w_2 + x_3w_3 \dots x_nw_n}{\text{Total Response Count } (n)}$$

The survey also asked participants to respond to several statements about permitting for single devices and arrays with respect to their top ranked challenge:

1. Sufficient field data are needed to determine risks and reduce uncertainty of MRE development.
2. Numerical models play an important role in environmental permitting.
3. Agency/policy guidance are needed to interpret risk and uncertainty.
4. Staff need to be knowledgeable and trained on technologies, interactions, etc.

The results are shown below as heat maps, with responses related to **single devices** shown in Table 1, and responses related to device **arrays** in Table 2. None of the survey participants disagreed with any of these statements. The strongest support for both single devices and arrays was for the need for increasing knowledge and training for staff on technologies and interactions. Moving from single devices to arrays, there appears to be increased support for guidance, numerical models, and field data.

Table 1. Response to statements regarding single devices. (n = 3)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Sufficient field data	0	0	1	1	1
2. Numerical models	0	0	2	0	1
3. Guidance	0	0	0	3	0
4. Training	0	0	0	1	2

Table 2. Response to statements regarding device arrays. (n = 3)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Sufficient field data	0	0	1	0	2
2. Numerical models	0	0	1	1	1
3. Guidance	0	0	0	2	1
4. Training	0	0	0	1	2

## Data Transferability

Regulators and advisors were asked to respond to the question: “Can data collected from other locations be applied towards environmental permitting within your jurisdiction?” Participants were given the option of ‘Never’, ‘Maybe’, and ‘Absolutely’ and were asked to respond based on their top ranked challenge.

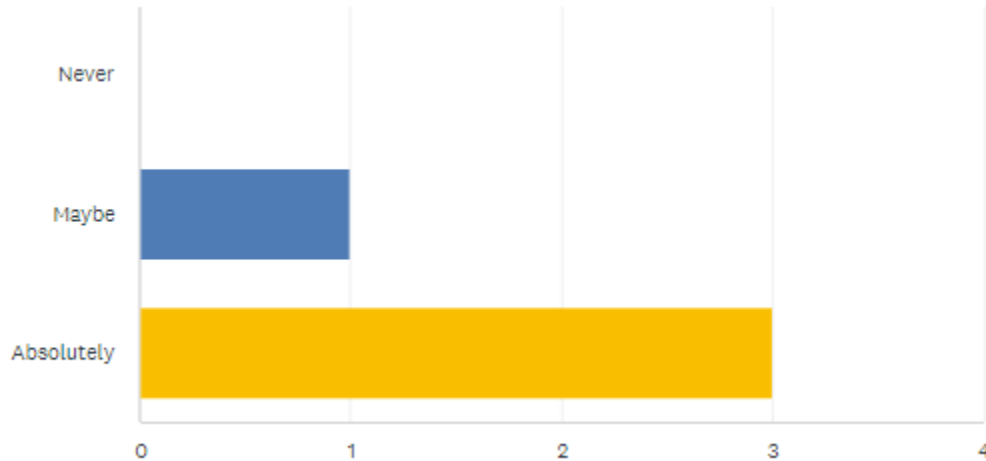


Figure 7. Can data collected from other locations be applied towards environmental permitting within your jurisdiction? (n = 4)

Most participants responded ‘Absolutely’. Additional comments left in response to this question include:

- “New technologies can draw on learnings from other installations – particularly where it has been deployed in large scale such as offshore wind.”
- “There are similarities in how animals interact/react to offshore infrastructure regardless of where in the world they are.”
- “Learning and data from other jurisdictions are important however local context must also be considered.”

These results suggest that Australian regulators and advisors are interested in transferring data and lessons learned if it is deemed relevant.

## Best Approach to MRE Development

Regulators and advisors were asked, “Which of the following approaches best describes your vision of how the MRE industry should develop? (Choose one)”. The options as provided to regulators in the survey are listed below:

- *Precautionary Principle*: There is a high degree of uncertainty and potentially negative outcomes associated with MRE project deployment and operation. Measures should be taken to avoid the negative outcome by proceeding very cautiously or not pursuing projects at all.



- *Mitigation Hierarchy*: Impacts or risks should be systematically limited by taking actions to avoid, minimize, mitigate and/or compensate for risks through siting and/or mitigation measures.
- *Phased Approach*: Single devices should be deployed first, followed by slowly ramping up to array scale after potential risks are better understood and managed.
- *Adaptive Management*: A learning-based management approach should be applied that includes adapting monitoring and mitigation over time to understand risks, decrease uncertainty, and mitigate for impacts.
- *Survey, Deploy, Monitor*: The area of a proposed project should be surveyed before deployment, coupled with monitoring around the device before deployment can proceed.
- *Just do it*: Risks to the marine environment are almost certainly low, so development should be able to move forward.

Results from this question are described in Figure 8. Each participant selected a different preferred approach.

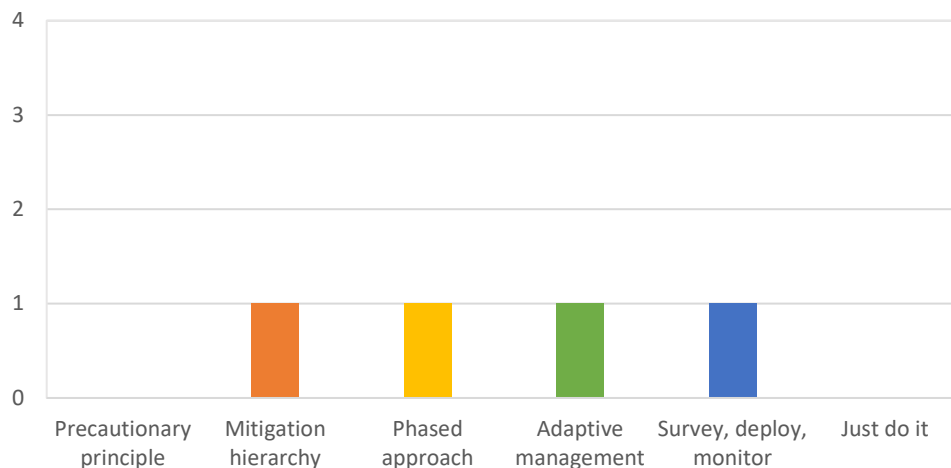


Figure 8. Preferred approaches to the development of the MRE industry. (n = 4)

### Use of *Tethys*

In addition to questions about permitting of MRE devices, regulators and advisors were asked about their awareness of the *Tethys* platform. Out of the 4 Australian regulators and advisors surveyed, no one had heard of *Tethys* and thus were unable to respond to presented questions about how they use the resources available and their usefulness.

## Conclusion

The four Australian regulators and advisors represented in this survey are primarily concerned about effects of MRE on underwater noise, avoidance/displacement, and benthic habitat. Their concerns about socioeconomic impacts and cumulative effects of multiple environmental effects of deployment are expected to grow as the sector transitions from individual deployments to arrays. The participants in the survey are involved at multiple stages in the permitting process, and while they already have experience in permitting MRE (which may also include offshore wind), their experience is limited because this sector is in its infancy in Australia. They are much more familiar with wind energy than MRE, and slightly more familiar with tidal energy technologies than wave energy technologies.

These regulators and advisors are very supportive of data transferability and learning from analogous industries that operate in the ocean, but noted that local context should be considered. Each of the participants surveyed preferred a different approach to development of the MRE industry, though all were interested in moving the industry forward despite some uncertainty.

None of the participants surveyed had ever heard of *Tethys*. This suggests that the work of OES-Environmental and *Tethys* is an unused resource for Australian regulators and advisors, and that increased outreach on available tools and products could support their work.

Therefore, a recommendation arising from this survey is to promote OES-Environmental and *Tethys* among Australian regulators and advisors, because this is likely to improve general knowledge about environmental effects of MRE and offer tools and resources highlighting the current science for environmental concerns. This promotion of resources to assist regulators and advisors is likely to become easier as the networks within the sector grow along with expansion of the sector.