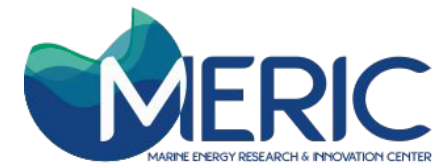




PAMEC 2024

Pan American Marine Energy Conference
Barranquilla, Colombia Jan 22-24, 2024



Regional Perspectives for Marine Energy: Chile

Dr.-Ing. Gonzalo Tampier Brockhaus
Universidad Austral de Chile / MERIC

Wave Resource

Significant wave

Wave resource is abundant and has a low variability*

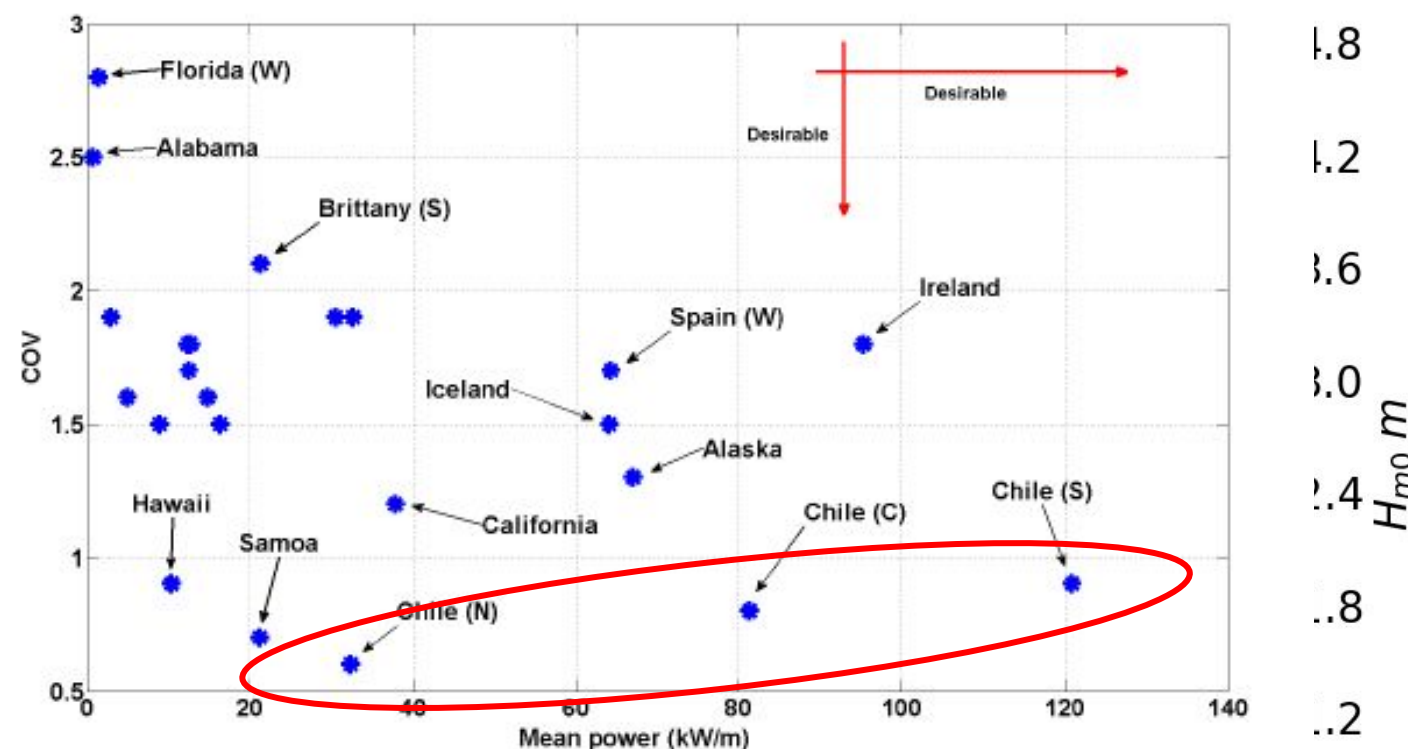
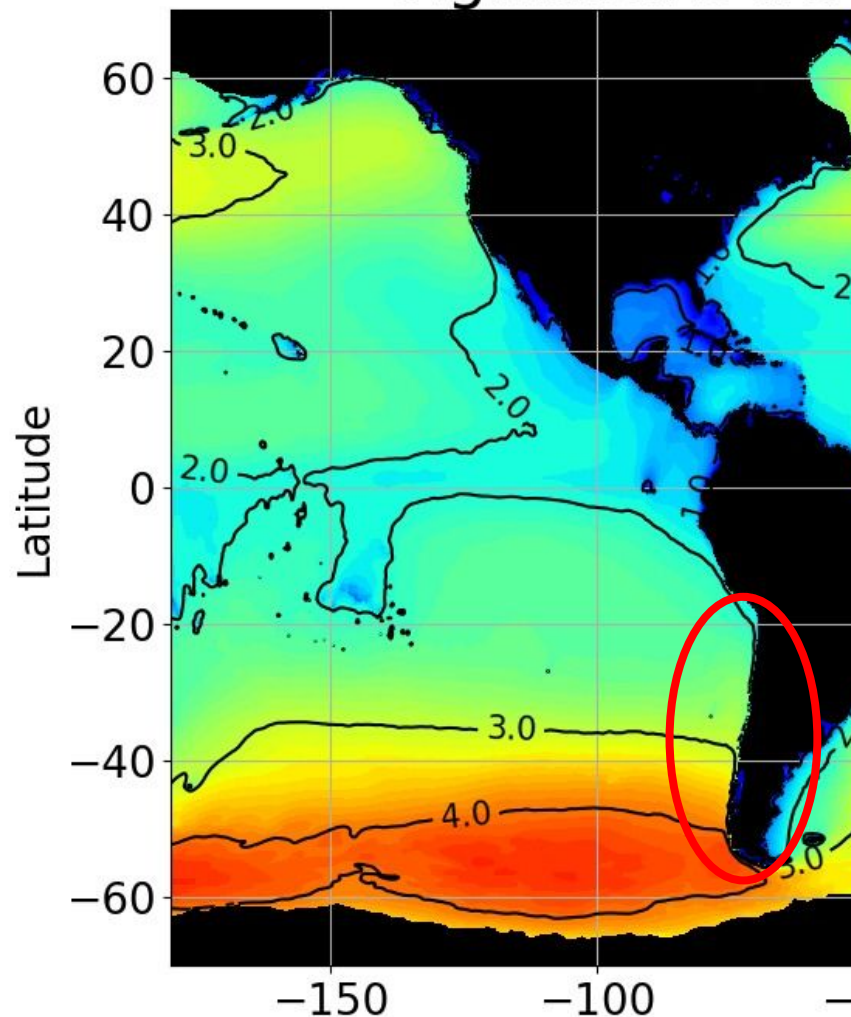


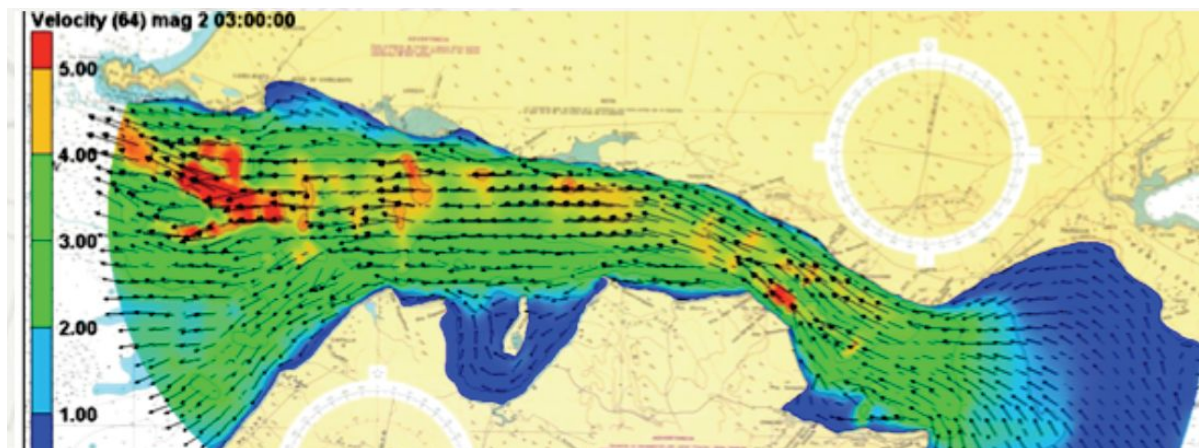
Fig. 5. Mean power and COV for various sites ordered by mean power

*Source: Ringwood, John and Brandle, Gabriel (2015) A new world map for wave power with a focus on variability. Proceedings of the 11th European Wave and Tidal Energy Conference. ISSN 2309-1983

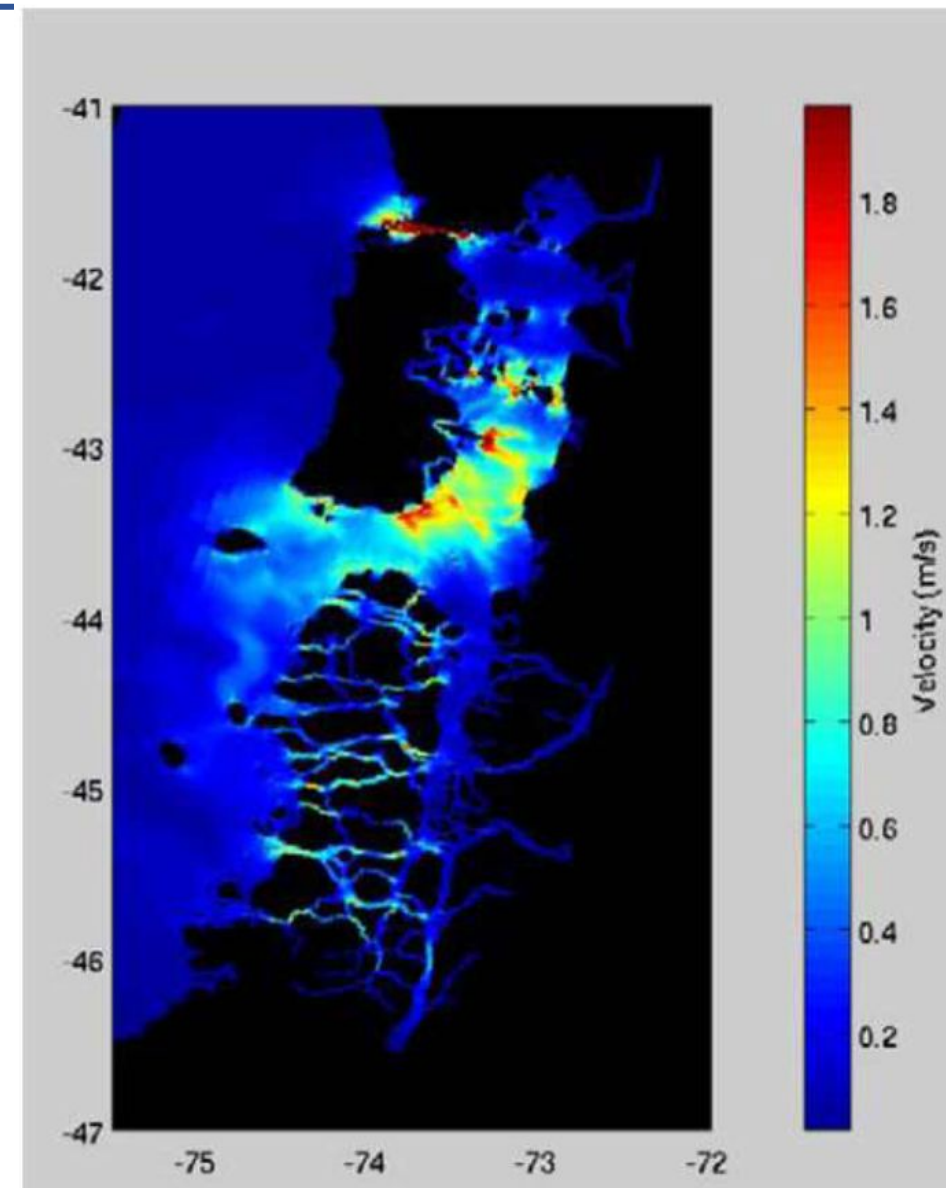


Tidal Resource

- Important tidal streams in Chacao Channel and Magellan strait (~5m/s)
- Integration potential with green hydrogen production in Magallanes Region



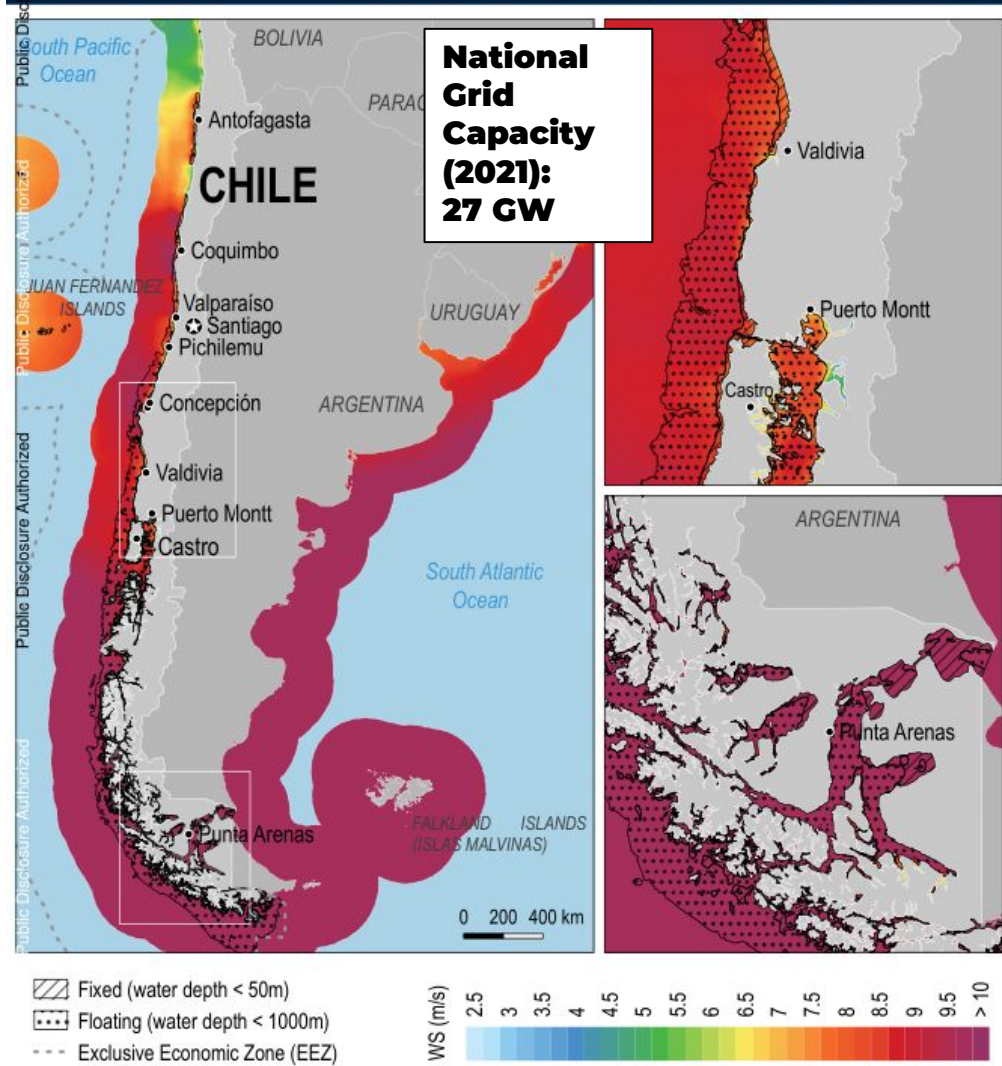
Chacao Channel. Source: Escauriaza, 2012



Chiloe Archipelago. Source: Aiken, 2008

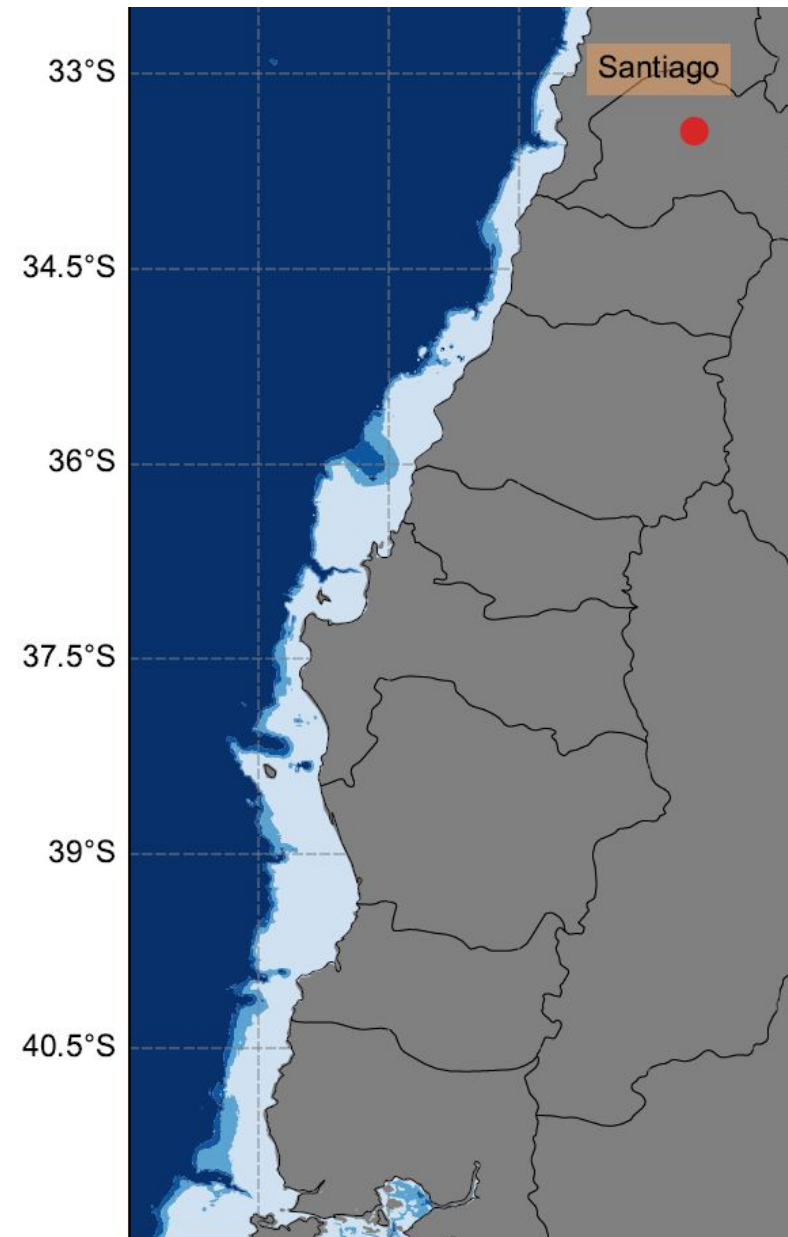
Offshore Wind Technical Potential in Chile

RISE score: 73 Fixed: 131 GW || Floating: 826 GW || Total: 957 GW



Very good resource, but challenging bathymetry

Floating wind technologies can be used from ~33°S to the south



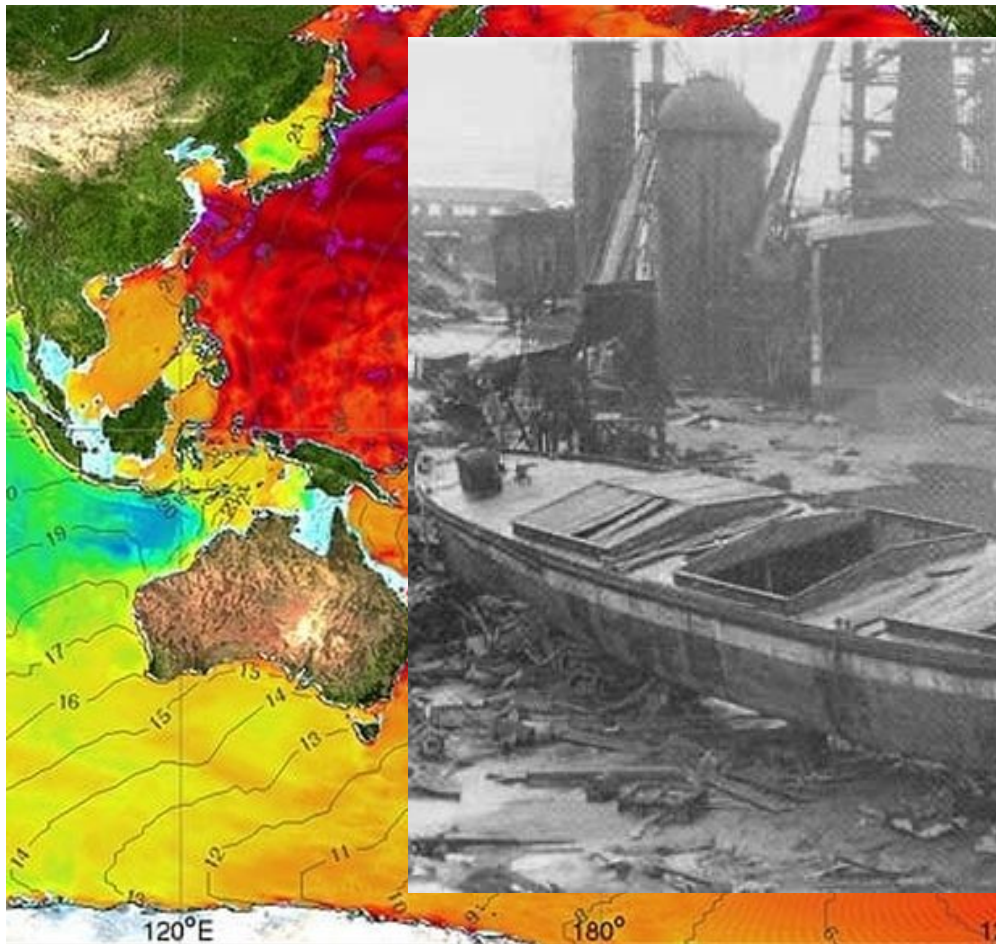
- Storms (marejadas) are part of our history and geography
- Sadly, measurements of these extreme events (and in general, measurements of waves in Chile) are scarce
- Climate change suggests more and stronger storms (marejadas).
- First studies about the effects of extreme events on MRE technologies in Chile have been done



Valparaiso, Temporal



Tsunami Valdivia 1960



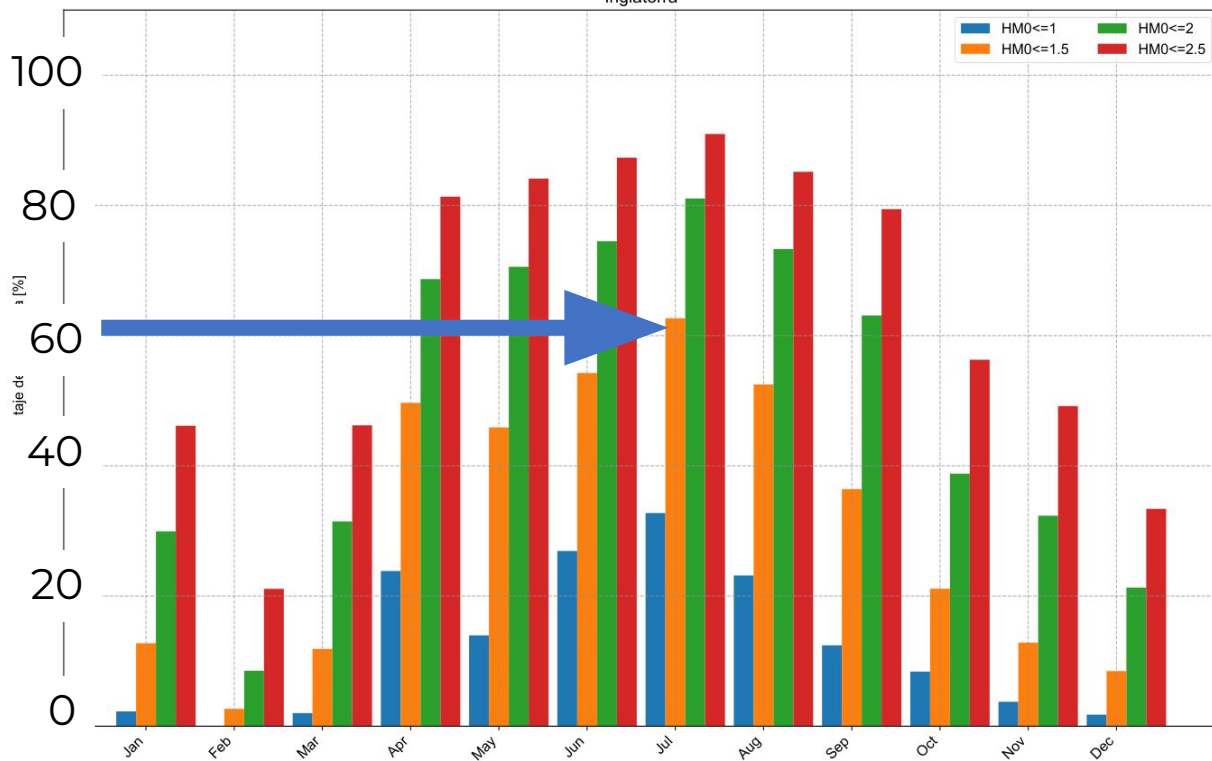
Tsunami Talcahuano 2010



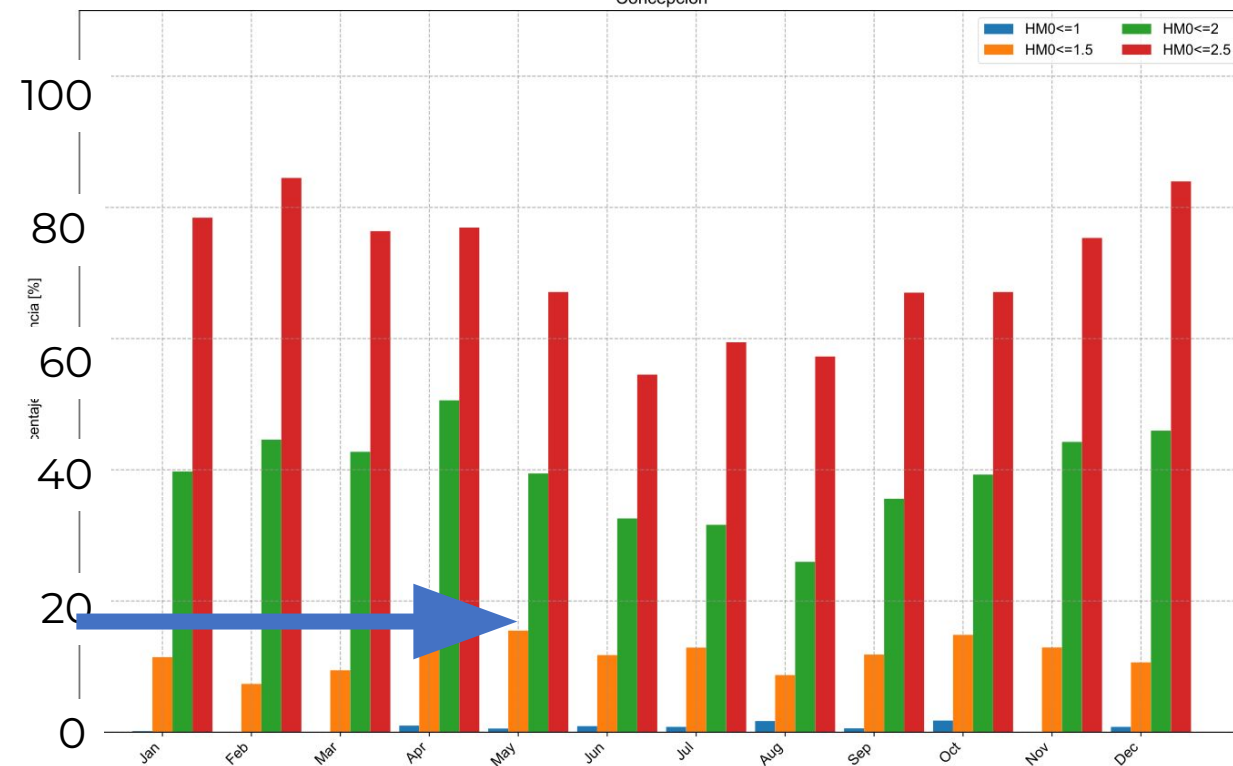
- On average, one tsunami every 14 years
- MRE technologies expected service life: 20-30 years



Inglaterra



Concepción



Abundant and consistent wave and offshore wind energy but:

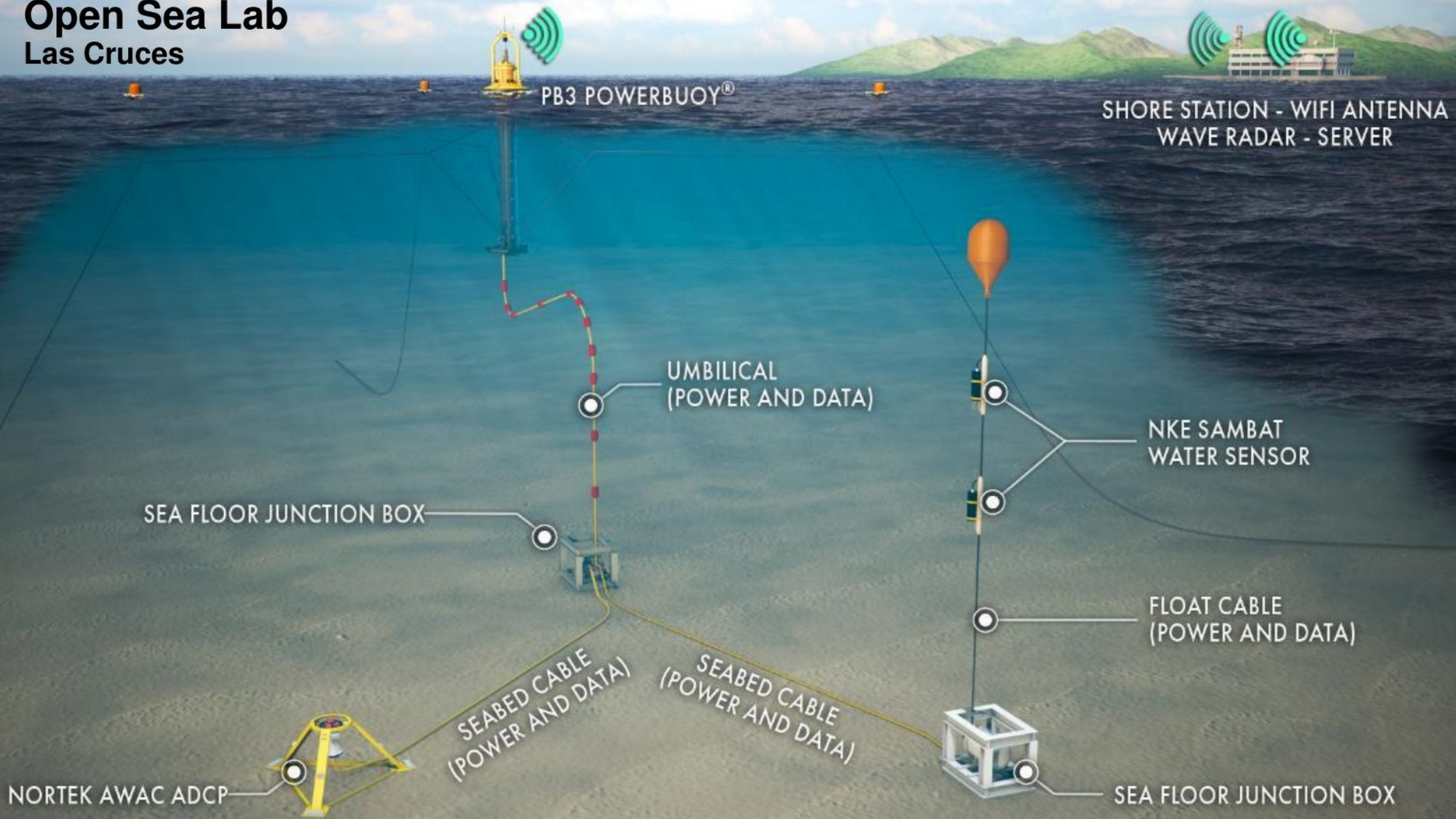
- Uncertainties about storms (marejadas)
- Permanent tsunami risk
- Challenging operational conditions

Local potential for tidal energy

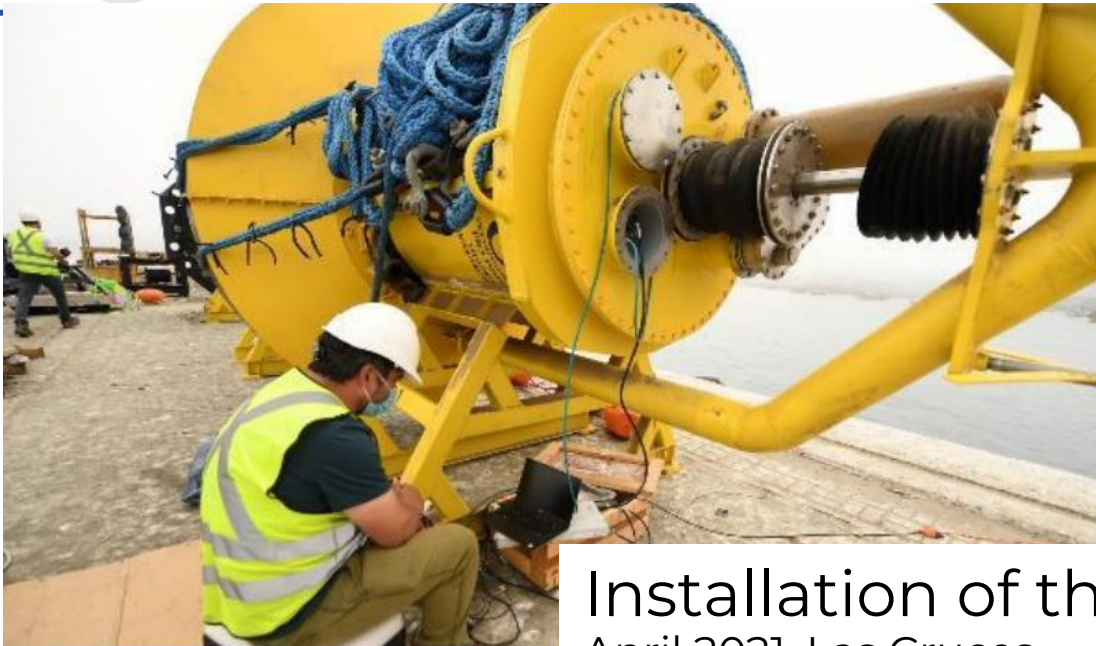


Projects: Open Sea Lab

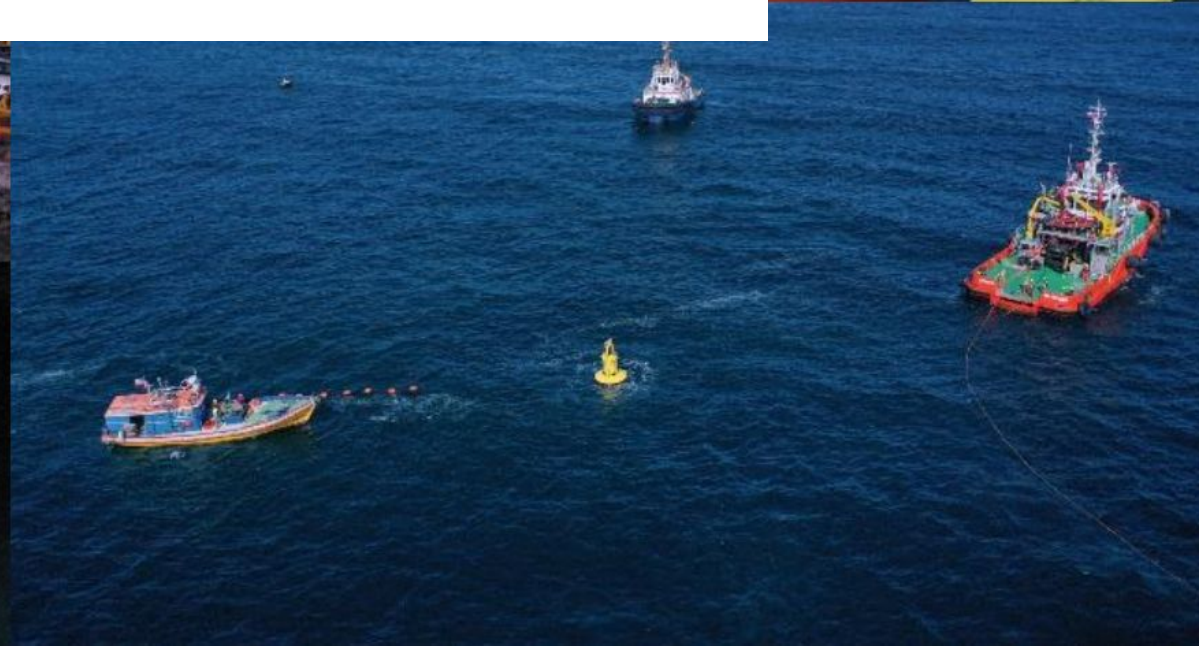
Open Sea Lab Las Cruces



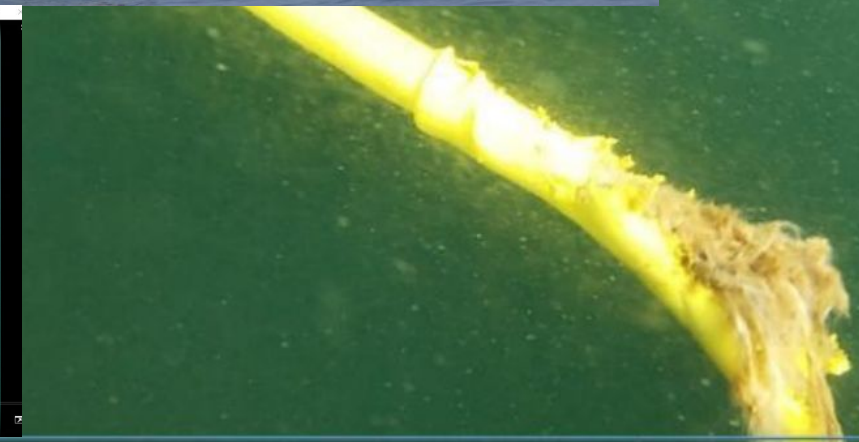
Projects: Open Sea Lab



Installation of the Open Sea Lab
April 2021, Las Cruces



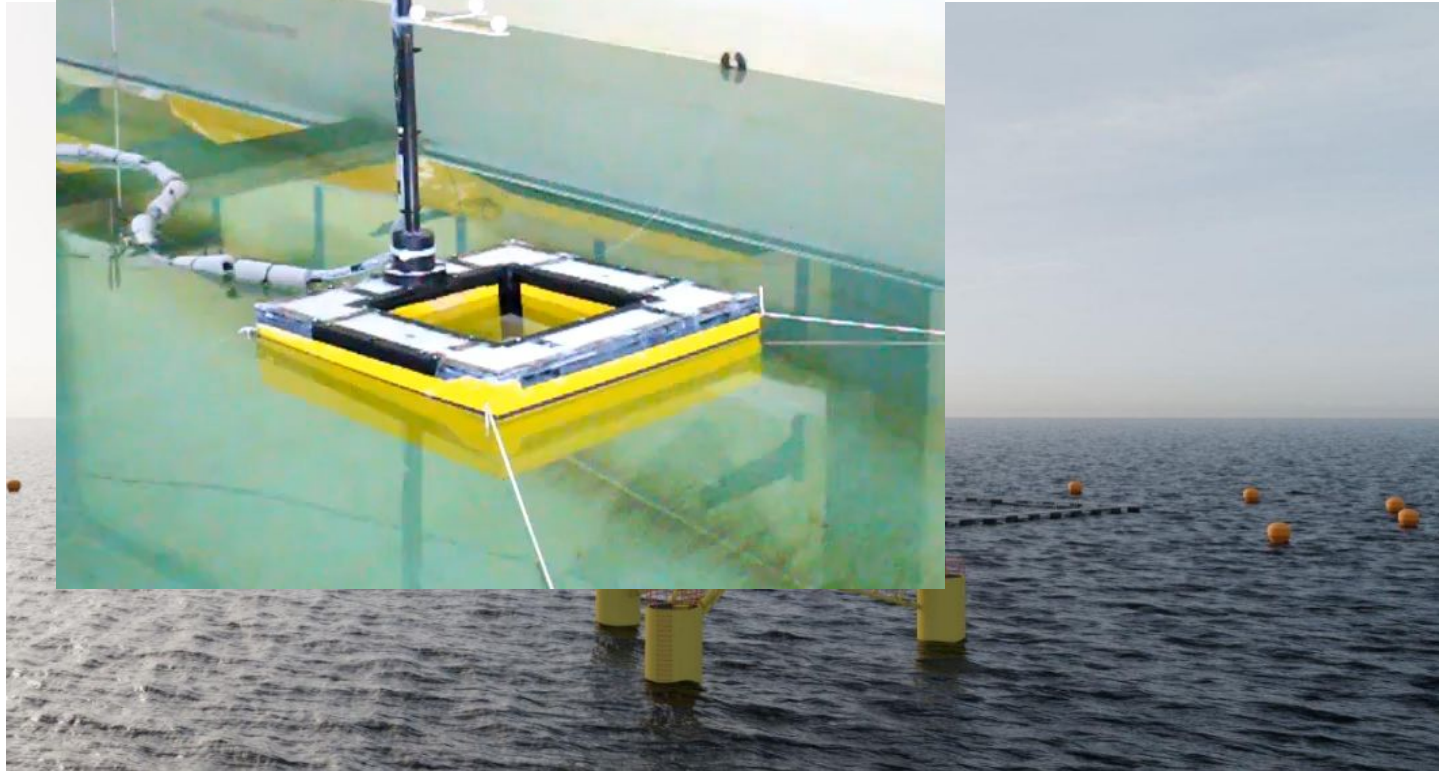
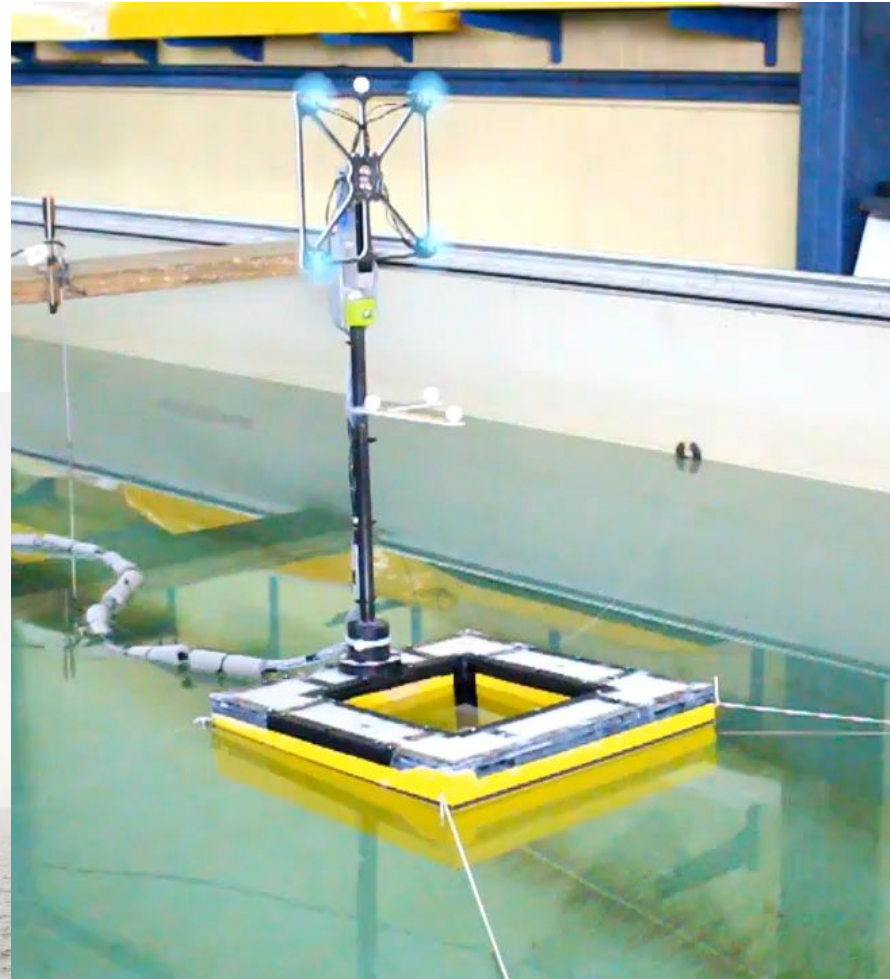
“no plan resists contact with the ~~enemy~~ salt water”

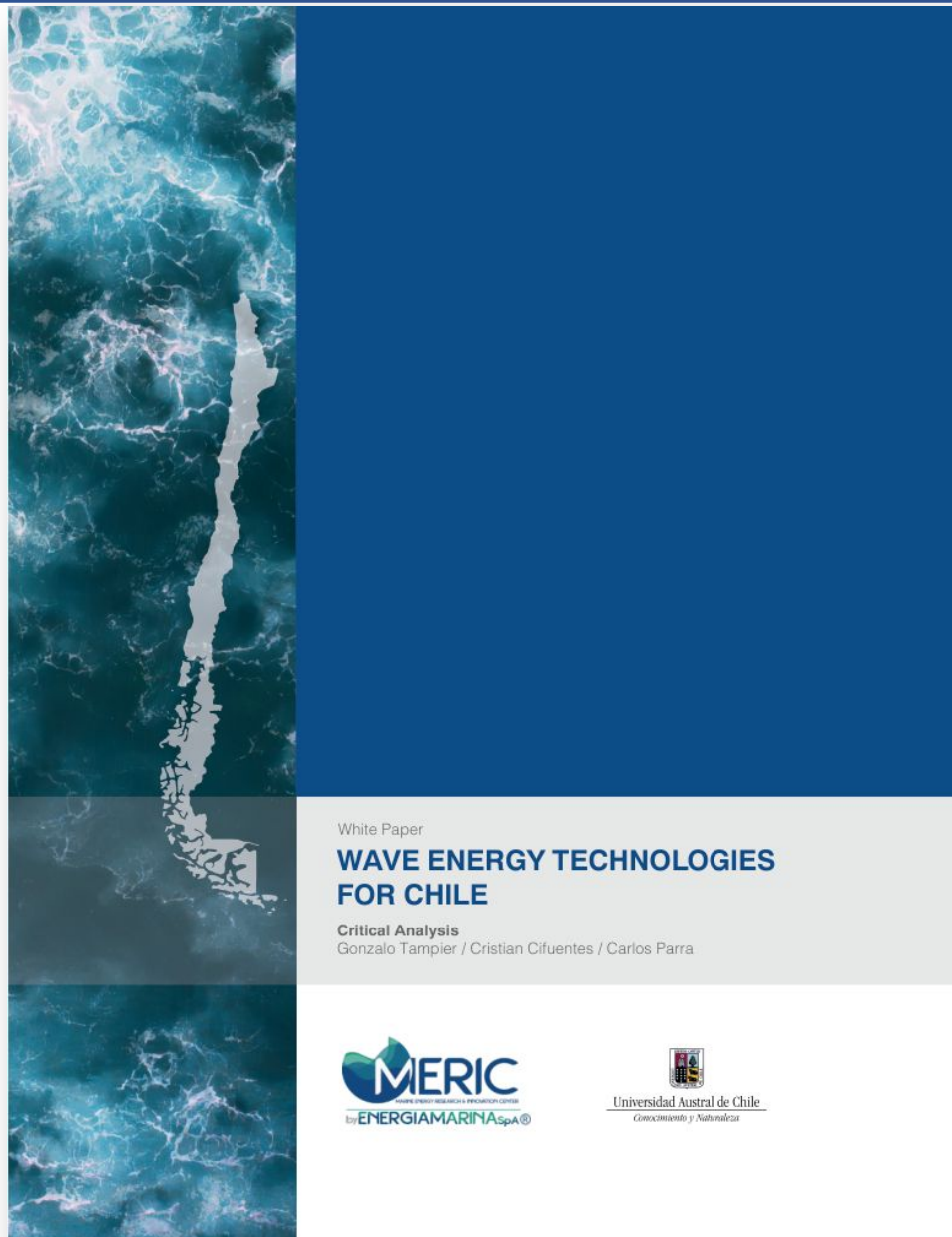


Projects


Local niche applications


Development of small-scale FWT for aquaculture and isolated communities

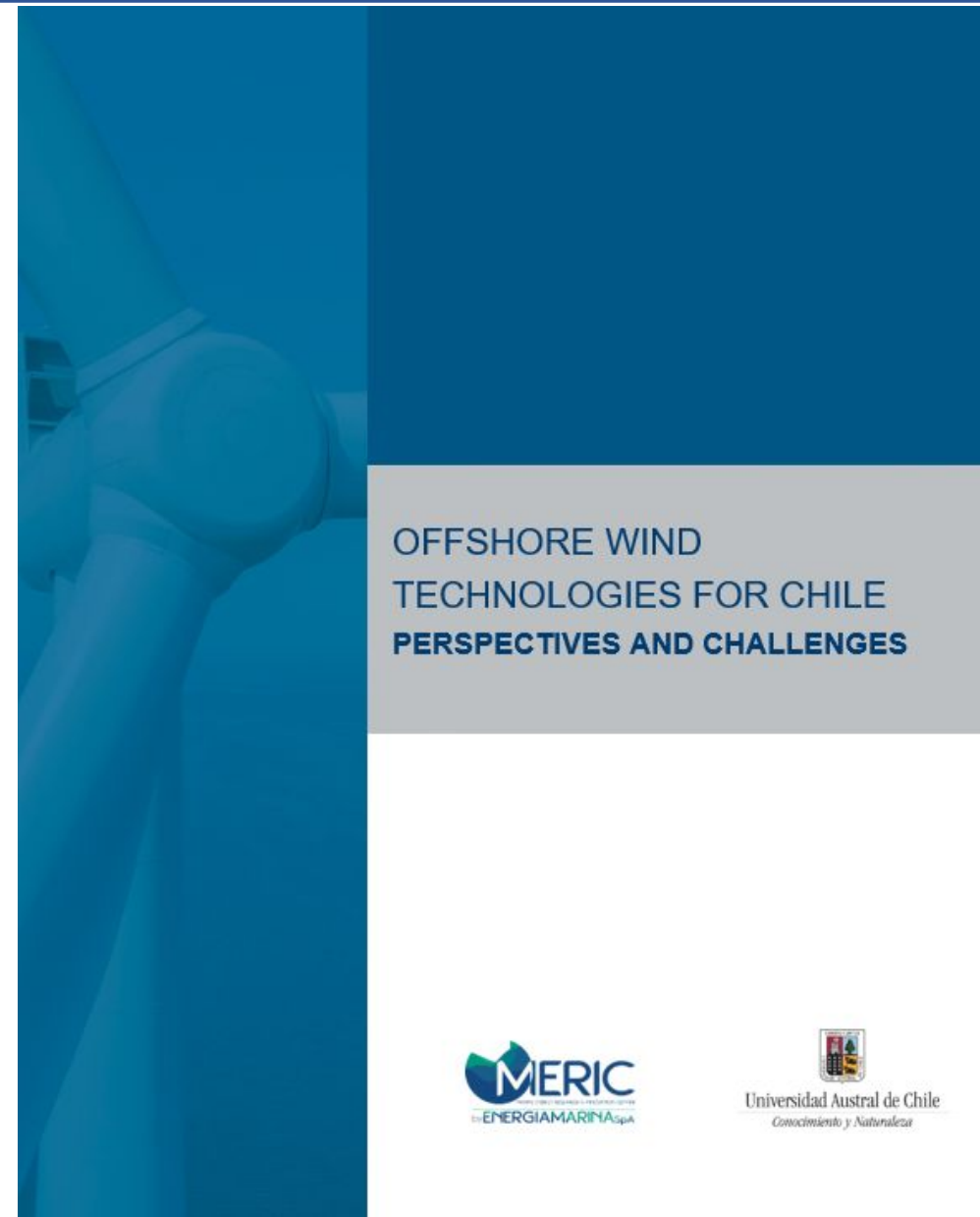





White Paper
WAVE ENERGY TECHNOLOGIES FOR CHILE
Critical Analysis
Gonzalo Tampier / Cristian Cifuentes / Carlos Parra


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Universidad Austral de Chile
Conocimiento y Naturaleza



OFFSHORE WIND TECHNOLOGIES FOR CHILE PERSPECTIVES AND CHALLENGES

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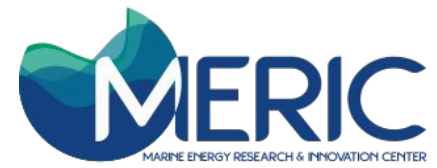
Conclusions

- **Chile has a significant wave, tidal and floating offshore wind potential. It also has some challenging conditions.**
- **Policy-wise, Chile has implemented veryt attractive conditions for on-shore renewables, but is still in a very early level of development in marine renewables.**
- **Pilot projects such as Open Sea Lab and niche applications such as integration with aquaculture are contributing to the development of the sector and its strategies, and a recent interest in floating wind projects is observed.**



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Thank you!

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