OCEAN RENEWABLE ENERGIES AND THEIR POTENTIAL IMPACTS ON MARINE BIODIVERSITY

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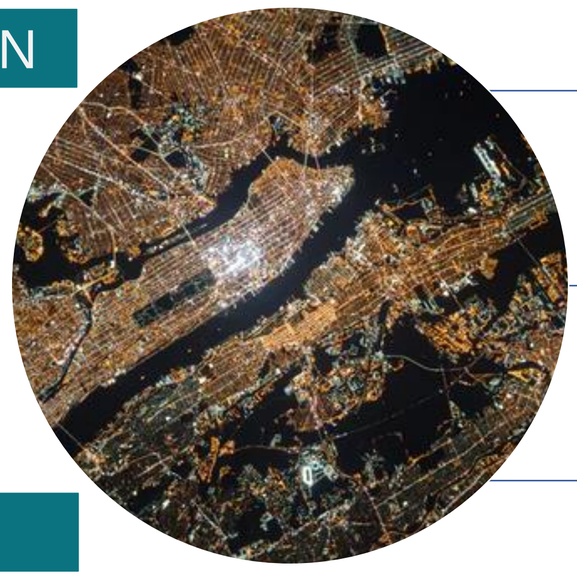
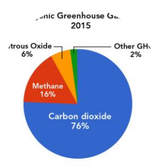
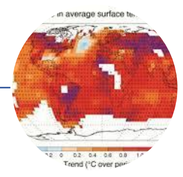
1 INTRODUCTION



Emissions



Greenhouse gases

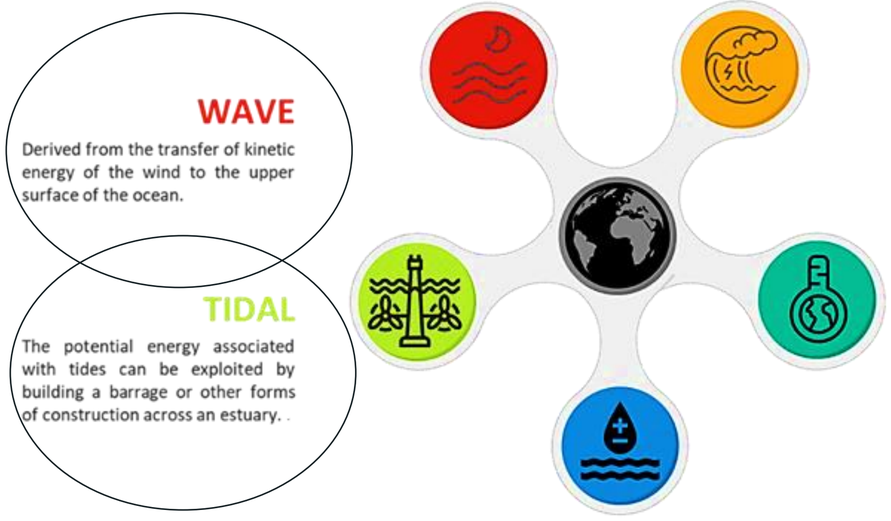


Climate Change

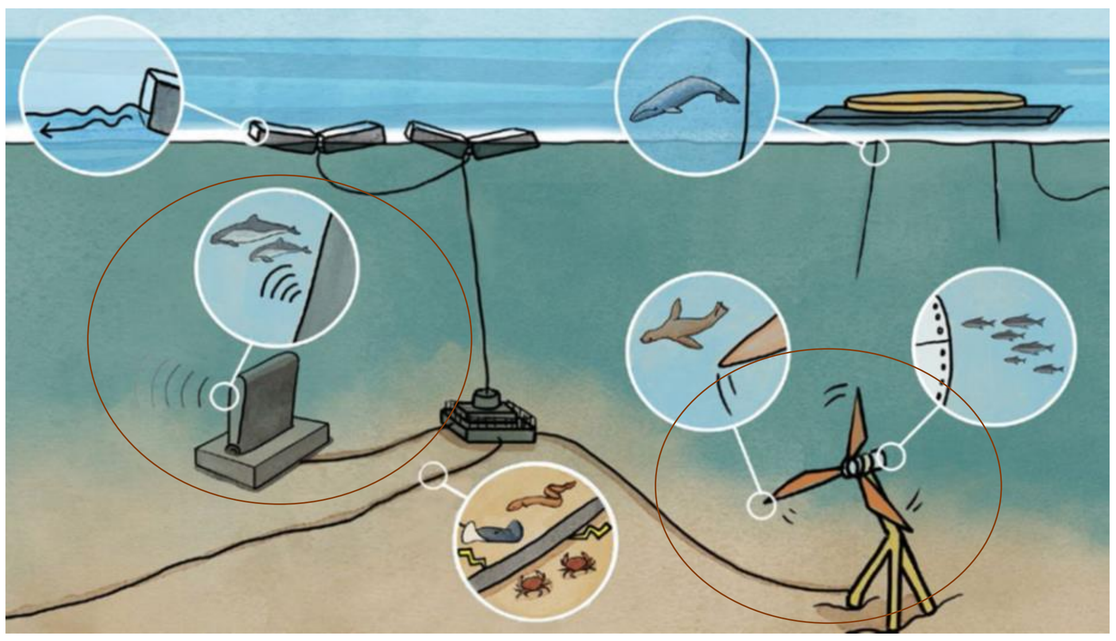
- Climate change concerns have promoted nations worldwide seek for research and development of renewable energy sources.
- SDG 7 focused on ensuring access to affordable, reliable, sustainable and modern energy for all acknowledged the necessity to transition towards the adoption of clean energy technologies and infrastructure (UN, 2015).
- IPCC recognizes seven types of renewable energy: bioenergy, solar, geothermal, hydropower, wind, and ocean (Moomaw et al., 2011).
- Globally, ocean energy resources have the theoretical potential to generate between 20,000 and 80,000 terawatt-hours (TWh) (IRENA, 2014).
- LCA can aid to quantify marine biodiversity impacts and provide a framework for such assessment.

2 METHODS

Types of ocean energy technologies



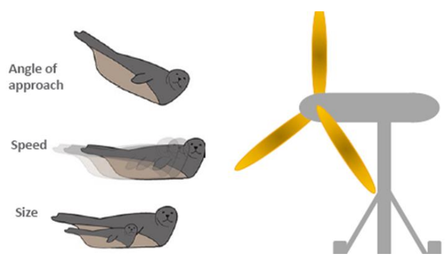
Main impacts caused by ocean energy



Stressor-receptor interactions. From top left to bottom right: changes in oceanographic systems, **underwater noise**, electromagnetic fields, mooring entanglement, **collision risk**, and changes in habitats. (Illustration by Rose Perry

3 RESULTS

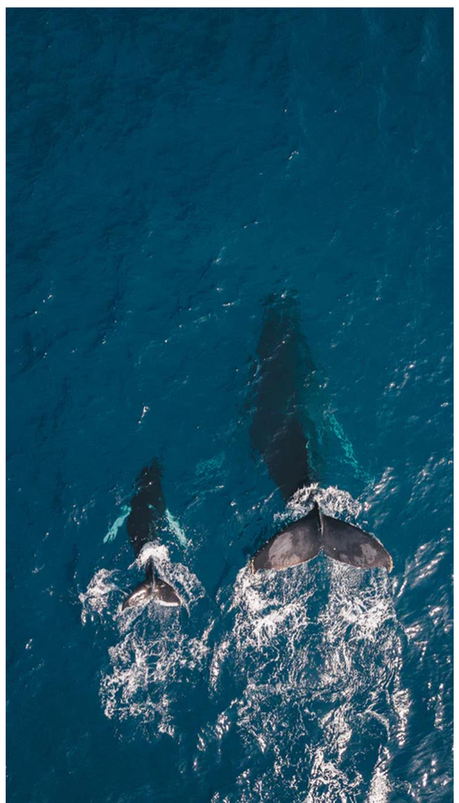
- Several LCA studies have been developed to evaluate the potential impacts of ocean technologies (Paredes et al., 2019).
- However, the potential effect over the marine environment has been left out.
- Models for specific environmental effects over marine biodiversity (fish, marine mammals, birds) have been developed (collision, underwater noise).
- LCA model can be adapted to cover main stressors (Middel, 2017).
- Also, land use impact models may be adapted to the marine environment (Langlois, 2014).
- Marine litter impacts and their analysis can provide a support information to tackle marine affectation usting LCA (Woods, 2021).



Horne et al. 2021

4 CONCLUSIONS

The integration of biodiversity into LCA models to evaluate present and future ORE developments will provide a better understanding of ocean technologies, delivering information to decide where to install the devices and how to avoid trade-offs.



5 REFERENCES

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