

## The Potential of Wave Energy in Sur: Resource Assessment and Techno-Economic Feasibility

### Research Idea:

- Oman is working toward clean energy diversification and reducing dependence on fossil fuels.
- Coastal areas require sustainable and reliable clean energy solutions.
- Wave energy remains an underexplored renewable energy resource in Oman, requiring technical and economic assessment before future deployment.

### Objective:

- Assess the technical and economic feasibility of harnessing wave energy in Sur, Oman.
- Study electricity grid connection requirements and potential energy losses.

### Insights:

- North Oman has stable low-to-moderate wave resources, which can provide a reliable and continuous source of wave energy.
- WaveDragon showed strong energy production, while Oscillating Water Column (OWC) systems demonstrated promising economic performance.
- Selecting WEC technologies suitable for Oman's wave climate is essential to improve performance and reduce losses.
- A gradual deployment approach is recommended, starting with small-scale projects and expanding as technologies improve and costs decrease.



Fig.1 WaveDragon



Fig.2 Oscillating Water Column

### Impact:

- Supports Oman Vision 2040 through renewable energy development, reducing dependence on fossil fuels.
- Promotes national energy security, environmental sustainability, and sustainable use of marine and coastal resources.
- Advances research and innovation in ocean-based renewable energy for future coastal and industrial applications.



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