



## Ocean Energy



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- ❑ Vast store of kinetic energy created by oceans' water movements.
- ❑ Can be harnessed to generate electricity.

### Types of Ocean Energy

- ❑ **Tidal:** By tidal water which is held back and released on river estuaries.
- ❑ **Wave:** By the movements of devices, floating on the ocean's surface or moored to the seabed).
- ❑ **Current:** By underwater turbines which are run by the ocean currents.
- ❑ **Ocean thermal:** By temperature difference between the warm surface water and deeper cold layers.
  - OTEC has high capacity factor; best possible source with infinite supply of solar energy and no harmful air polluting emissions.
- ❑ **Osmotic:** By water movement across a membrane between a saltwater reservoir and fresh water reservoir; Salinity Gradient Energy.

### Features

- ❑ Predictable, reliable and endless.
- ❑ Global presence - oceans are available almost everywhere.
- ❑ Energy rich.
- ❑ Unlimited usage areas as surface, ocean beds, on shore, offshore locations.

### Objectives

- ❑ To accelerate and enhance support for resource assessment and deployment.
- ❑ To overcome energy deficiency.
- ❑ To include public & private sectors for more projects on it.
- ❑ To invite Industry led research and development proposals for problem solving.

### Limitations

- ❑ Limited deployment of technology and under utilised.
- ❑ Very less research; most at the initial stages of R&D.
- ❑ Uncertainty of marine environment - tsunamis, hurricanes etc.
- ❑ Commercial scale risks - corrosion of machinery, impact on marine ecosystem.

### Potential

- ❑ Tidal energy – 12,455 MW, potential locations - Khambhat & Kutch regions.
- ❑ Wave energy – 40,000 MW.
- ❑ OTEC – 1,80,000 MW.
- ❑ Boost economic growth, reduce carbon footprint and provide employment.

### Suggestions

- ❑ Long coastline of India (with estuaries & gulfs) should be fully used.
- ❑ Small environmental interactions for large scale electricity generation.
- ❑ More research inputs are needed.

### Conclusion

- ❑ Can enable India to stimulate innovations, provide more jobs, grow economically.
- ❑ Can help attain self sufficiency in energy and help support neighbouring nations for growth and development in the energy sector.



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