Declaration of ocean energy as Renewable Energy

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Our previous article on same topic

***Source**: Press Information Bureau*

Recently the Union Minister of State for Power and New & Renewable Energy has approved a proposal to declare ocean energy as Renewable Energy.

Accordingly, the Ministry of New and Renewable Energy has clarified to all the stakeholders that **energy produced using various forms of ocean energy such as tidal, wave, ocean thermal energy conversion, etc. shall be considered as Renewable Energy and shall be eligible for meeting the non-solar Renewable Purchase Obligations (RPO)**

Key highlights about Ocean Energy

Potential of Ocean Energy

- The total identified potential of Tidal Energy is about 12455 MW, with potential locations identified at **Khambat & Kutch regions,** and large backwaters, where barrage technology could be used.
- The total theoretical potential of wave energy in India along the country's coast is estimated to be about 40,000 MW – these are preliminary estimates. This energy is however less intensive than what is available in more northern and southern latitudes.
- OTEC has a theoretical potential of 180,000 MW in India subject to suitable technological evolution.

Technology

Although currently under-utilized, Ocean energy is mostly

exploited by just a few technologies: Wave, Tidal, Current Energy and Ocean Thermal Energy.

a) Tidal Energy

The tidal cycle occurs every 12 hours due to the gravitational force of the moon. The difference in water height from low tide and high tide is potential energy. Similar to traditional hydropower generated from dams, tidal water can be captured in a barrage across an estuary during high tide and forced through a hydro-turbine during low tide. The capital cost for tidal energy power plants is very high due to high civil construction and high power purchase tariff. **The Gulf of Cambay and the Gulf of Kutch in Gujarat on the west coast have the locations in the country where the potential exists.**

b) Wave Energy

Wave energy is generated by the movement of a device either floating on the surface of the ocean or moored to the ocean floor. **Wave conversion devices that float** on the surface have joints hinged together that bend with the waves. This **kinetic energy** pumps fluid through turbines and creates electric power. **Stationary wave energy** conversion devices use pressure fluctuations produced in long tubes from the waves swelling up and down. This bobbing motion drives a turbine when critical pressure is reached. Other stationary platforms capture water from waves on their platforms. This water is allowed to runoff through narrow pipes that flow through a typical hydraulic turbine.

c) Current Energy

Ocean Current Energy. Ocean current energy can be harnessed using underwater turbines, also known as tidal turbines, to generate power. Similar to wind turbines, the movement of the marine current moves the rotor blades to generate electric power.

d) Ocean Thermal Energy Conversion (OTEC)

Ocean thermal energy conversion, or OTEC, **uses ocean temperature differences from the surface to depths lower than 1,000 meters,** to extract energy. A temperature difference of only 20°C can yield usable energy. Research focuses on two types of OTEC technologies to extract thermal energy and convert it to electric power: **closed cycle and open cycle**. In the closed cycle method, a working fluid, such as ammonia, is pumped through a heat exchanger and vaporized. This vaporized steam runs a turbine. The cold water found at the depths of the ocean condenses the vapor back to a fluid where it returns to the heat exchanger. In the open cycle system, the warm surface water is pressurized in a vacuum chamber and converted to steam to run the turbine. The steam is then condensed using cold ocean water from lower depths.