

4. OCEAN THERMAL ENERGY

Ocean Thermal Energy- Oceans are huge heat reservoirs as they cover almost 70% of Earth's surface. The temperature difference between warm surface waters and the cold deeper layers can be used to generate steam and then power.

Large amounts of solar energy are stored in the oceans and seas. On an average, the 60 million

square kilometres of the tropical seas absorb solar radiation equivalent to the heat content of 245 billion barrels of oil.

The process of harnessing this energy is called OTEC (Ocean Thermal Energy Conversion). It uses the temperature differences between the surface of the ocean and the depths of about 1000 to operate a heat engine, which produces electric power.

OCEAN THERMAL ENERGY CONVERSION(OTEC)

The technology which uses ocean temperature differences from the surface to depths lower than 1,000 meters, to extract energy.

Research focuses on two types of OTEC technologies-

In Closed cycle method, a working fluid (ammonia) is pumped through a heat exchanger for evaporation and the steam runs a turbine. The vapour is turned back to fluid (condensation) by the

cold water found at the depths of the ocean where it returns to the heat exchanger.

In Open cycle method, the warm surface water is pressurized in a vacuum chamber and converted to steam which runs the turbine. The steam is then condensed using cold ocean water from lower depths.

It has high (94%) capacity factor which makes it the best power source and although it has a high initial cost, low maintenance and regular power supply makes it an attractive alternative.

OTEC is supplied by an infinite supply of solar energy and the stored energy in it after sundown makes it a 24 hour power supplier.

There are no emissions from the OTEC power plants so air quality will not be degraded.

5.OSMOTIC ENERGY

Osmotic Energy- This technique produces energy from the movement of water across a membrane

between a saltwater reservoir and fresh water reservoir. It is also called Salinity Gradient Energy.

Salient Features

Predictable and Reliable:

Unlike wind, ocean energy sources are more predictable. The endless flows create a reliable supply source for future availability.

Global presence:

Tidal streams and ocean currents are available almost everywhere across the globe.

Energy-rich:

Moving water is more than 800 times denser than moving air, which multiplies the kinetic energy by