SOURCES OF ENERGY
Energy From the Sea

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TIDAL ENERGY:

The rise of ocean water due to attraction of moon is called 'high-tide' whereas the fall of ocean water is called 'low-tide'/ The enormous movement of water between the high tide and low tide provides a very large source of energy in the coastal areas of the world.

During high tide, when the level of water in the sea is high, sea water flows into the reservoir of the barrage and turns the turbines. The turbines then turn the generator to produce electricity. And during the flow tide when the level of sea-water is low, the sea water stored in a barrage reservoir is allowed to flow out into the sea. This following water also turn the turbine and generate electricity.

The tidal energy is not likely to be potential source of energy in future because of following reasons:

(i) There are very few sites around the world, which is suitable for building tidal barrages (or tidal dams).

(ii) The rise & fall of sea water during high and low tides is not enough to generate electricity on a large scale.

SEA WAVES ENERGY:

Due to the blowing of wind on the surface of ocean, very fast sea-waves move on its surface. Due to their high speed, sea waves have a lot of kinetic energy in them. The energy of moving sea-waves can be used to generate electricity. This can be done as follows:

(i) One idea is to set up floating generators in the sea. These would move up and down with the sea-waves. This movement would drive the generators to produce electricity.

(ii) Another idea is to let the sea-waves move up and down inside large tubes. At the waves more up, the air in the tubes is compressed air can then be used to turn a turbine of a generator to produce electricity.

OCEAN THERMAL ENERGY:

The energy available due to the difference in the temperature of water at the surface of the ocean and at a deeper level is called ocean thermal energy. The drives used to harness ocean thermal energy are called ocean thermal energy conversion power plants. A temperature difference of 20^0C between the surface water of ocean and deeper water is needed for operating OTEC power plants. In one type of OTEC power plant, the warm surface water of ocean is used to boil a liquid like ammonia or a chlorofluorocarbon (CFC). the high-pressure vapors of the liquid are then used to run the turbine of a generator and produce electricity. The colder water from the deeper ocean in pumped up to cool the used-up vapors & convert than again into a liquid. This process is repeated again and again.

Advantage of ocean thermal energy:

(i) It can be used continuously 24 hours a day throughout the year.

(ii) It is a renewable source of energy and its use does not cause any pollution.

GEOTHERMAL ENERGY:

Geothermal energy is the heat energy of hot rocks present inside the earth. This heat can be used as a source of energy to produce electricity. Geothermal energy is one of the few sources of energy that do not come directly or indirectly from solar energy. The places where very hot rocks occur at same depth below the surface of earth are called 'hot spots' and are sources of geothermal energy.

The geothermal energy is harnessed as follows:

(i) The extremely hot rocks present blow the surface of earth, heat the underground water and turn in into steam. As more and more steam is formed between the rocks, it gets compressed to high pressures. A hole is drilled into the earth and the hot rocks comes up through the pipe at high pressure. This high-pressure steam rum the turbine of a generator to produce electricity.

(ii) Large rocks are present in the underground rocks, which allow steam and hot water to go up. The steam & hot water gushing out of the ground are a kind of natural geyser. This steam is then used to turn turbines and generated electricity and the hot water is used to cook food.