Geothermal and Ocean Energy

RENEWABLE & SUSTAINABLE
ENERGY STUDIES

Other Renewables

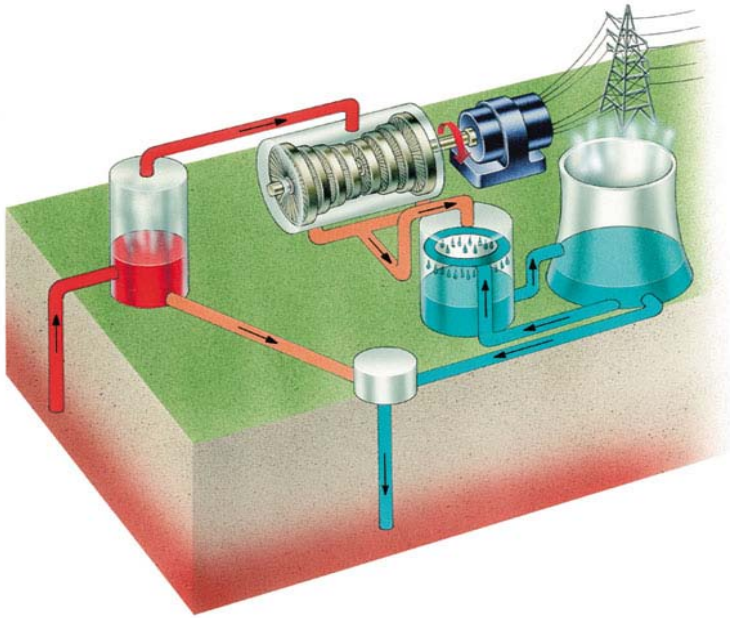
Geothermal

• Beneath the earth's surface lies **hot, molten rock**

• The energy it contains is called **geothermal energy**

• **Geothermal** power plants use the earth's **natural heat** to vaporise water or an organic medium

• **Steam** created powers a **turbine** which produces **electricity**



Geothermal

• **Geothermal** heat plants require lower temperatures and the **heated water** is used directly

• Near the **source** the **heat** can be used directly to **heat homes**, buildings and **hot water** supplies

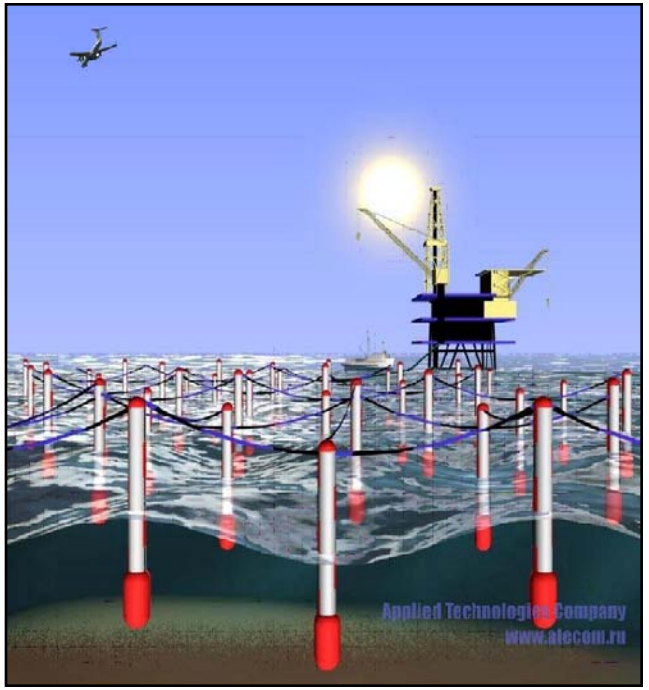
Geothermal

Ocean Energy

- **Wave**, **Tidal** and **Current**

- The **kinetic energy** in **waves** can be used to generate **electricity**

- **Wave power machines** use the **vertical displacement** of the waves to produce electricity

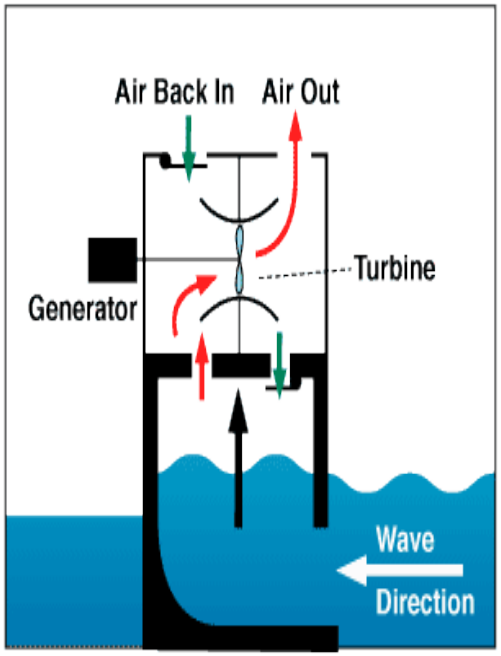


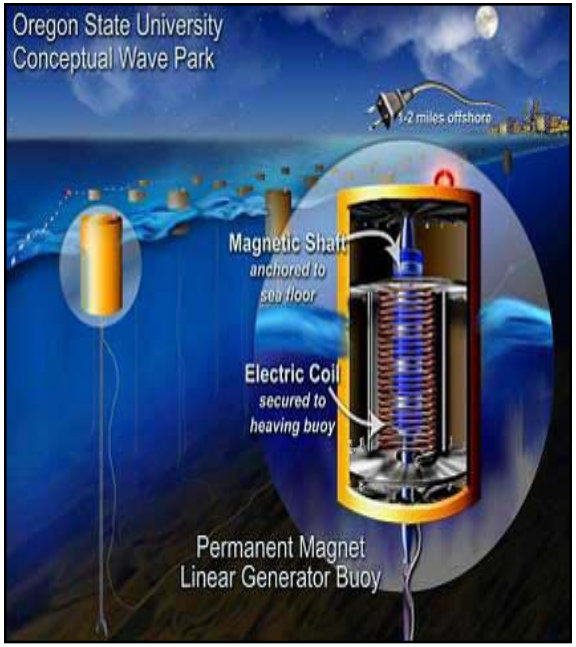
Wave Energy

• Structure interacts with **incoming waves**, converting this energy to **electricity** through a **hydraulic**, **mechanical** or **pneumatic** power take-off system

• Structure is **kept in position** by a mooring system or placed **directly** on seabed/seashore

• **Power** is transmitted to shore by a **sub-sea cable**



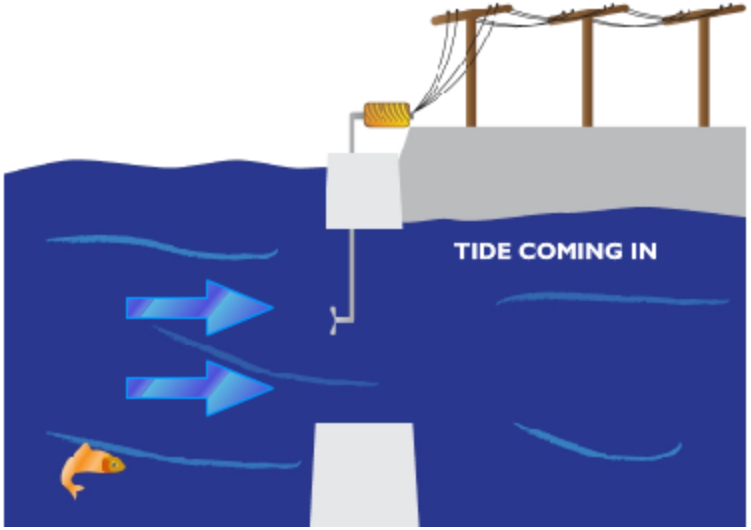


Tidal Energy

• **Tidal power** harnessed by constructing a **dam** or **barrage** across an estuary or bay with a suitable **tidal range**

• **Gates** in barrage allow **incoming tide** to **build up** in **basin** behind it

• Gates then close so that when **tide flows out** the **water** can be **channelled** through **turbines** to generate **electricity**



Tidal Energy

Tidal Energy

- **Tidal barrages** have been built across estuaries in France, Canada and China

- **High cost** and **environmental objections** have **limited** this **technology's** expansion