

# Wave and Tidal Energy

## What is Wave and Tidal Energy?

## How can we use Wave and Tidal Energy?

**Waves** contain A LOT of energy. Have you ever been knocked over by a wave? Have you ever been surfing or body-boarding and experience the speed you move at when you catch a wave?

Waves are caused by wind, wind is caused by the uneven heating of the Earth's atmosphere and the heat comes from the sun.

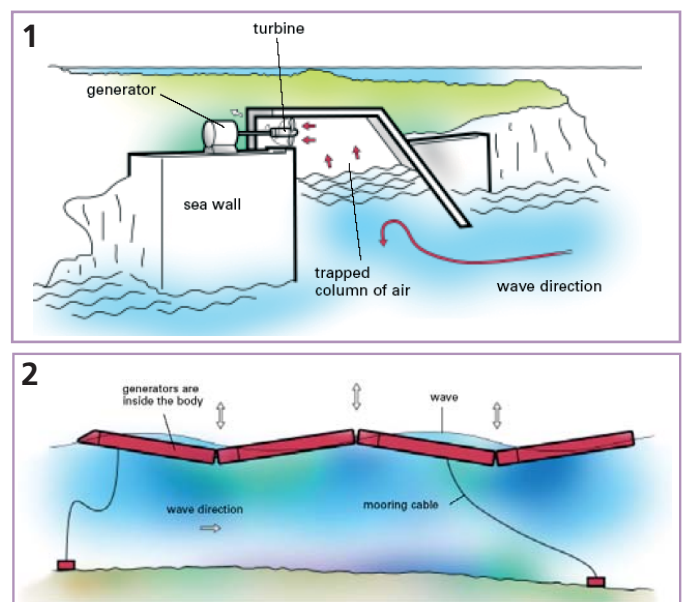


**Portballintrae, Co. Antrim** – the energy from waves is seen in the wearing away (erosion) of sand, stones and other material from the beach and sand dunes.

Wave energy can be used to produce electricity. Ireland's location, on the edge of the Atlantic Ocean has some of the best wave-power sites in the World.

### How does wave energy work?

Specially designed machines are used to harness the power of waves. There are two main types of machines: 1. Fixed 2. Floating.



Source: dti

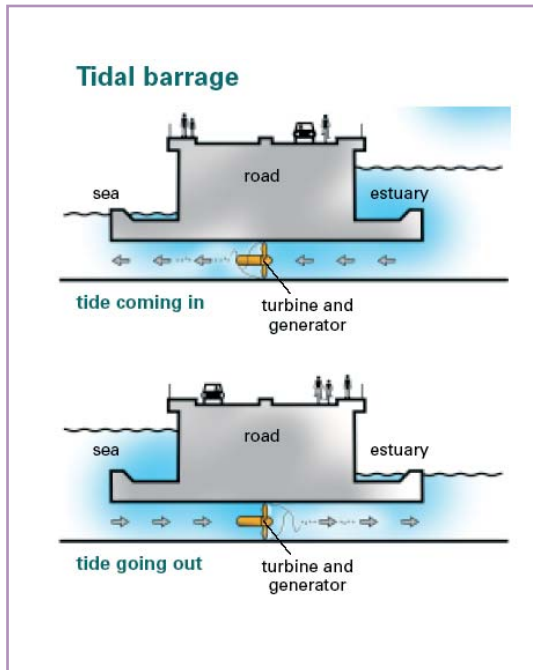
**TIDES** are caused by the pull of the moon. Tides involve the rise and fall of sea levels. Around the coast of Ireland, the sea level rises and falls twice daily.

Tidal energy can be used to generate electricity. The movement in and out of water can be harnessed by **barrages** or **dams**. In the UK, the Severn estuary has the greatest potential for generating electricity in this way. It is believed that by harnessing tidal energy in the Severn estuary, it could supply up to 5% of the UK's electricity needs. BUT, there are no plans to do this yet.

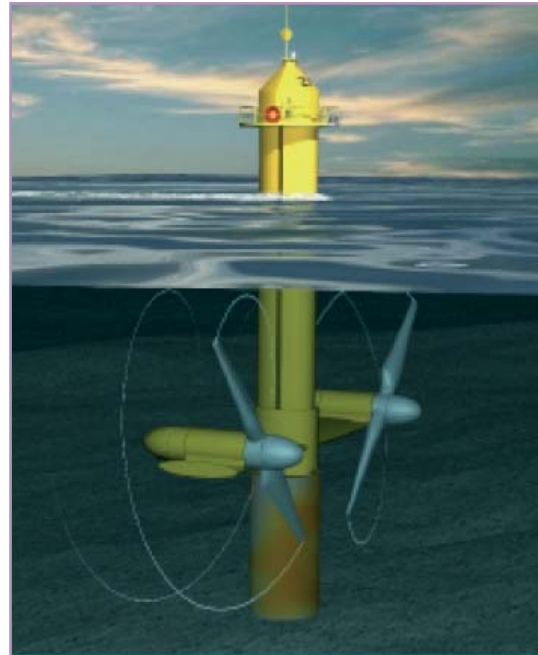


**How does tidal energy work?**

**There are 2 main ways:**



Source: dti



**Tidal Barrage**

- A dam is built across a bay or estuary
- The movement of water drives the turbines
- The turbines, turn the generator, which produces electricity

**Marine Current Turbine (MCT)**

- Works like an underwater wind turbine
- The fast sea currents that are caused by the moving tides, turn turbines, which turn generators to produce electricity
- **Strangford Lough, Co. Down** - is currently testing a MCT



**Advantages****WAVE**

- Once constructed, low running cost
- No waste or pollution created
- Potential for generating large amounts of energy

**TIDAL**

- Running costs very low
- No fuel required
- The amount and time of electricity production is reliable
- No waste or pollution created

**Disadvantages****WAVE**

- Only effective with sites that are exposed to large waves
- Can be noisy
- May cause problems for ships and sailing boats

**TIDAL**

- Few suitable sites for tidal projects
- Technology is still being developed
- The amount and time of electricity production is reliable
- Building dams/barrages can have negative environmental impact on marine life

