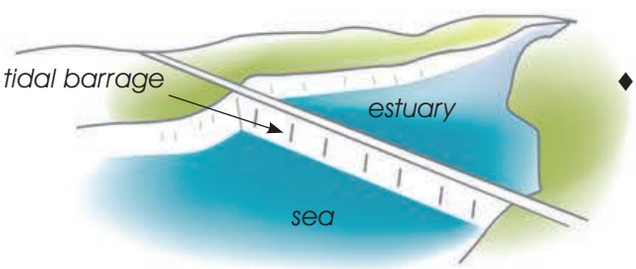
Tidal Energy - Fact Sheet 9 SIDE A

Tidal energy is energy from the pull of the moon on the sea, which creates tides.

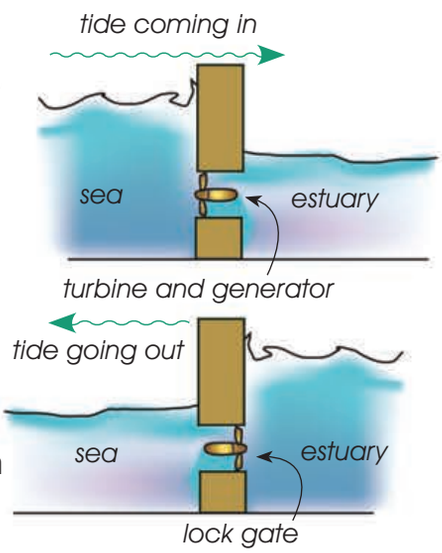
Around the coast of Britain the tide flows in and out, twice each day. A huge amount of water is moved with each tidal flow. Tidal energy is powerful and very reliable but it is difficult to capture. Tidal energy is captured using a barrage or free-standing tidal stream turbines.

Tidal barrage

A tidal barrage is a giant dam that is built across a river estuary or a bay on the coast.



- As the tide comes in, the barrage holds back the sea, making a difference in the **levels** of water on each side
- The **lock gates** are opened and the water rushes through, turning the turbines as it passes
- As the tide goes **out**, water flows the **other way** to turn the turbines again



Tidal energy facts

The number of hours per day that tidal energy can be captured?	For about 10 hours when the tide is flowing either in or out
Are all estuaries suitable for tidal barrages?	No, only places where the tide rises by 5 metres or more are suitable
Where is the World's largest tidal power station ?	In the Rance estuary in Northern France
Are there any tidal barrages in the UK?	No, the one in the Rance is the only one in Europe at the moment
Are there sites in the UK where tidal stream turbines are being piloted?	Yes, for example: Orkney and Northern Ireland
Which parts of the UK are most suitable for tidal energy projects?	The west coast of the UK, and the north of Scotland in particular

Illustration courtesy of Marine Current Turbines Ltd

Tidal stream Turbines

Tidal streams are fast sea currents that flow as tides move in and out.

- The turbines work like **submerged windmills**, turned by water currents rather than air currents
- As the turbine turns, electricity is generated and taken to shore **by cables**

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diagrams adapted from http://www.berr.gov.uk/energy/sources/renewables/schools/index.html

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A SeaGen tidal current turbine raised for servicing in Strangford Narrows, Northern Ireland.

photo courtesy of Dr I J Stevenson

photo courtesy of Marine Current Turbines Ltd

A SeaGen tidal current turbine feeling the flow of the current.

photo HIE

The OpenHydro tidal current turbine at the European Marine Energy Centre, Island of Eday, Orkney.

Advantages of Tidal Energy

- Tidal energy is renewable, it will never run out.
- Tidal energy produces no pollution or greenhouse gases.
- Tidal energy is completely predictable, it does not depend on the weather.
- There is a lot of tidal energy around the UK's coast which could be harvested.
- A tidal barrage produces cheap electricity, once it is built.
- A tidal stream turbine has little environmental impact.

Disadvantages of Tidal Energy

- A tidal barrage has a huge effect on the wildlife in the estuary and the river.
- A tidal barrage has a huge effect on ships and boats using the estuary and river.
- Tidal energy is only produced for about 10 hours per day.
- Tidal stream turbine technology is still under development.