



GENERATING TIDAL STREAM ENERGY



What is tidal stream energy?

Tides are caused by the gravity of the moon and sun which causes the water levels on the earth's surface to rise and fall at predictable times. Underneath the surface of the ocean there are tidal currents which flow in one direction or another depending on whether the tide is coming in or going out. It is this flowing water that is used by tidal stream turbines to generate electricity.

Tidal stream technology can play a huge part in the energy mix that is needed to meet Government renewable energy targets. According to the Carbon Trust, tidal stream energy is ready to become a significant provider of clean energy for the UK and the Globe. Some 15-20%* of the UK's electricity demand could come from marine renewables (*wave and tidal technologies).

What does a tidal stream turbine look like and how does it work?

There are a number of different types of tidal stream turbines, but the most common types being developed, for example DeltaStream, look like a wind turbine. It works in the same way as a wind turbine, but it sits on the seabed and uses the water's currents.

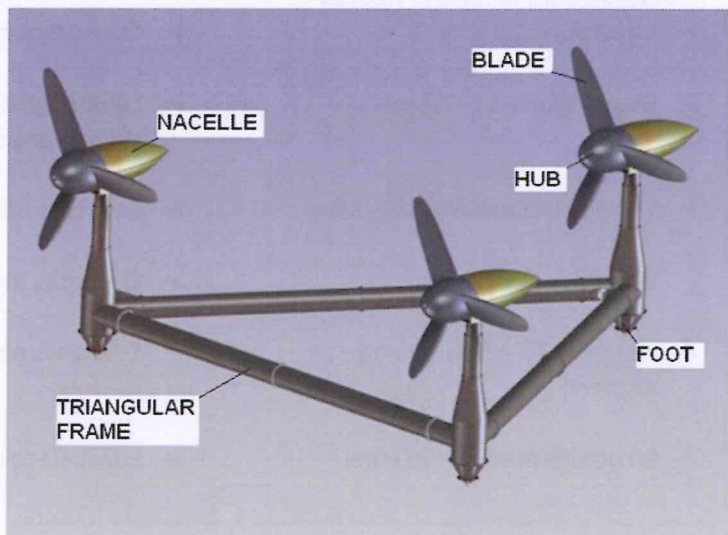
It works by the flow of water turning the rotor blades of the turbine, which in turn turns the generator which is inside the body of the turbine (the nacelle). The generator produces electricity and this power is carried to the shore by an underwater cable.

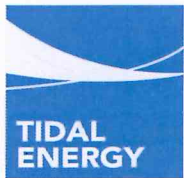
DeltaStream and Ramsey Sound

DeltaStream is the name of the technology being invented by the company Tidal Energy Limited (TEL).

It is a tidal stream turbine which is different to other turbines because it has 3 turbines on one common frame.

TEL was given permission by the Welsh Assembly and the UK Government to install one DeltaStream prototype in Ramsey Sound, Pembrokeshire for 1 year. The location of the project is shown on the attached map.





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The DeltaStream Solution

Each DeltaStream unit will produce 1.2 megawatts of electricity - enough to power 1,000 homes in St Davids. DeltaStream has been designed to be sensitive to the environment, simple to manufacture and easy to transport.



DeltaStream facts and figures

- Capacity – 1.2MW
- Blade diameter – 15m
- Triangular Foundation – 36m
- Weight – 300tonnes
- Height – 20m (when blade at vertical)
- Structure made from steel

DeltaStream benefits

- Ease of manufacture – parts are assembled at shore side
- Lightweight gravity foundation - Does not require drilling or piling into the seabed
- Low cost of manufacture and deployment/maintenance
- Operates in varied water depths and velocities
- Low environmental impact
- Subsurface at all tidal states - Avoids shipping



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