Oxford turbines to harvest energy from tides

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A prototype turbine, above, has already performed well in tests. The full-scale device would measure up to 10m in diameter.

Oxford researchers have developed a new tidal turbine which has the potential to harness tidal energy more efficiently and cheaply, using a device which is simpler and more robust and scaleable than current designs.

The team includes Prof Guy Houlsby, Professor of Civil Engineering at Oxford, Dr Malcolm McCulloch of the electrical power group, and Prof Martin Oldfield from mechanical engineering. They have designed, built and tested the device, a horizontal axis water turbine, to intersect the largest possible area of current. The rotor is cylindrical and rolls around its axis, catching the current.

A prototype 0.5m-diameter turbine has already performed well in tests, proving the benefits of the blade design. A full-scale device would

measure up to 10m in diameter, and a series of turbines can be chained together across a tidal channel.

The team has calculated that a tidal site 1km in width could produce 60 Megawatts of energy.

The turbine is mechanically far less complicated than anything available today, and requires fewer generators and foundations, meaning it will cost less to build and maintain. The manufacturing costs are about 60% lower and the maintenance costs are 40% lower than current tidal devices.

By 2009 the team plans to conduct sea trials in open water, leading to a full commercial scale up by 2013.

The UK is estimated to have 10% of the global extractable tidal resource. Tidal currents are sub-surface, so tidal turbines have minimum visual impact, unlike wind farms or estuary barrage schemes.

Isis Innovation, the University's technology transfer company, has patented the turbine device, and is looking out for potential investors and development partners.

Provided by Oxford University