Compact tidal generator could reduce the cost of producing electricity from flowing water

June 13 2006

What happens if you run an electric motor backwards? That is exactly what researchers Dr Steve Turnock and Dr Suleiman Abu-Sharkh from the University of Southampton asked themselves after they had successfully built an electric motor for tethered underwater vehicles, using funding from the Engineering and Physical Sciences Research Council.

The well-known answer to this question is that it stops being a motor and becomes a generator. Instead of using electricity to turn a propeller and drive the vehicle along, the flow of water turns the propeller, generating electricity. What's new about the Southampton design is its simplicity. "This is a compact design that does away with many of the moving parts found in current marine turbines. It's a new take on tidal energy generation," says Turnock.

Most current tidal stream generators are essentially wind turbines turned upside down and made to work underwater. They often include complex gearboxes and move the entire assembly to face the flow of the water. For example, they turn a half a circle as the tidal current reverses direction. Gears and moving parts require expensive maintenance, especially when they are used underwater. This pushes up the cost of running the turbines, a cost that is passed on to the consumers of the generated electricity. The Southampton design does not need to turn around because the design of its turbine blades means that they turn

equally well, regardless of which way the water flows past them. The blades are also placed in a specially shaped housing that helps channel the water smoothly through the turbine.

Another beauty of the Southampton design is that everything is wrapped in a single package that can be prefabricated so there will be few on-site construction costs. "Just drop it into flowing water and it will start generating electricity. It will work best in fast flowing, shallow water," says Turnock, who foresees rows of these devices secured to sea floors and riverbeds.

The present prototype is just twenty-five centimetres across and the research team now plan to design a larger model with improved propeller blades that will further increase the efficiency of generating electricity. All being well, the team envisage the generator becoming commercially available within five years.

Source: Engineering and Physical Sciences Research Council

Citation: Compact tidal generator could reduce the cost of producing electricity from flowing water (2006, June 13) retrieved 1 May 2024 from https://phys.org/news/2006-06-compact-tidal-electricity.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.