Scotland passes turbine test to harness tidal power

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Image: Andritz Hydro Hammerfest

(Phys.org) -- An underwater turbine being used for harnessing tidal power to generate electricity for homes and businesses has successfully completed its testing period in the island of Eday, one of Orkney's northern isles. The machine marks the first to be used in Scotland's ambitious tidal power project, with more turbines at more sites planned. Scottish Power Renewables (SPR) says that the completion of the test period is an encouraging step up in Scotland's tidal power initiative. The

turbine was lowered into position during winter storms as a test device to prove that the technology can operate efficiently in Scotland's fast-flowing tides.

The 100 foot-high, one-megawatt Hammerfest Strom HS1000 is described as a "pre-commercial demonstrator." The heavily instrumented turbine will continue to serve as an R&D platform and is already powering homes and businesses on Eday. The turbine can be monitored from the European Marine Energy Center base there; engineers can also operate and inspect the device from Glasgow using mobile connections and on-board camera.

The HS1000 was developed by Andritz Hydro Hammerfest, as a "tidal power" turbine. As a version of a wind turbine positioned on the seabed, its blades spin in the flow of tides for generating power. A tidal turbine has shorter blades that rotate slower. The energy is converted in current directions by pitching the blades. The structure is designed as a tripod, which has a minimal footprint on the seabed and is held in place by gravity and additional ballast.

Scotland, in the context of providing leadership in renewable energy, is eagerly exploring the concept of generating electricity from the natural movement of the tide. Scotland engineers consider it well placed to lead in turbine projects for clean, green electricity. Scotland is said to have superior tidal power resources, with a massive amount of power in its seas. Keith Anderson, CEO of Scottish Power Renewables, said the test gives them confidence to implement larger-scale projects. A 10MW tidal power array in the Sound of Islay is planned over the next few years

While other renewable energy sources such as wind and solar power are in the news, proponents of tidal power say that it can be a significant part of the renewable energy mix as it carries an advantage over other alternatives. Namely, it is predictable. With its links to the lunar cycle,

tidal currents can be predicted years in advance.

A new Scottish Government report confirms Scotland's commitment to generate 100 percent of its electricity needs from renewables and to "decarbonize" the electricity-generation sector by 2030.