

North coast tides could power half of Scotland, say scientists

Pentland Firth is pinpointed as prime spot for ambitious scheme

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RENEWABLE energy to power around half of Scotland could be harnessed from the tides in a single stretch of water off the north coast of the country, according to new research.

Some 1.9 gigawatts (GW) of clean energy could be generated by turbines placed in the Pentland Firth between mainland Scotland and Orkney, engineers from Edinburgh and Oxford Universities estimate.

The research underlines that the Pentland Firth with some of the fastest tidal currents in the British Isles, is a prime candidate for developing marine power schemes.

Four years ago Alex Salmond said the waterway had "the potential to become the Saudi Arabia of marine power".

While the engineers say their study narrowed down earlier estimates that the firth could produce anywhere between 1GW and 18GW, they underline the enormous power potential.

They have calculated as much as 4.2GW could be harnessed, but because tidal turbines are not 100% efficient the estimate of 1.9GW was a more realistic target.

To fully exploit the potential of the tidal stream in the firth, turbines would need to be located across the entire width of the channel, the researchers said.

They have outlined locations where turbines should be positioned to boost the area's energy producing potential.

Sites which minimise the impacts on sea life and shipping have been identified by the UK Crown Estate, which will lease them to tidal energy firms.

Professor Alistair Borthwick, of the school of engineering at Edinburgh University, said: "Our research builds on earlier studies

by analysing the interactions between turbines and the tides more closely.

"This is a more accurate approach than was used in the early days of tidal stream power assessment, and should be useful in calculating how much power might realistically be recoverable from the Pentland Firth."

Professor Guy Houlsby, of the Department of Engineering Science at Oxford University, who led the study, said: "The UK enjoys potentially some of the best tidal resources worldwide, and if we exploit them wisely they could make an important contribution to our energy supply.

"These studies should move us closer towards the successful exploitation of the tides."

The research was commissioned and funded as part of the Energy Technologies Institute's Performance Assessment of Wave and Tidal Array Systems project (PerAWAT).

In September the Scottish Government approved plans by MeyGen to install the tidal array in stages in the Pentland Firth, which will be largest tidal turbine energy project in Europe.

Work is now underway on the scheme which will use underwater propellers anchored to the sea bed.

The developers are MeyGen, a joint venture between Morgan Stanley and International Power. It will start with 9MW demonstration project of up to six turbines, with a phased construction programme scheduled until 2020.

When fully operational, the 86MW array could generate enough electricity to power the equivalent of 42,000 homes.

This does not include the energy potential from wave action, currently being developed particularly at the European Marine Energy Centre in Orkney.

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LOCATION



THE FUTURE: An impression of how the turbines would look in the firth.





HARNESSING POWER: Researchers from Edinburgh and Oxford universities say the Pentland Firth has the potential to generate 1.9 gigawatts of energy.

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