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Energy

Scotland's next Loch Ness monster could power 400,000 homes

A new hydro pump storage facility has been proposed for construction at Loch Ness, and would provide double the capacity of Scotland's current installed offshore wind supply



By **PHOEBE
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The ruins of Urquhart Castle on the banks of Loch Ness, where the plant has been proposed

Credit [DeAgostini/Getty Images](#)

A new 2.4 gigawatt hour hydro pump storage plant in Scotland's Loch Ness will increase the country's ability to deliver renewable energy, after plans for a huge – and discreet – facility in the Highland loch were revealed last week. The plant promises double the capacity of installed offshore wind across Scotland.

The enormous hydro plant is expected to be able to power a million homes for an hour, or 400,000 homes for the six hours it's running, based on estimates from industry regulator [Ofgem](#), during which period it would create 400 megawatts of energy.

The plant bridges the old world of energy and the new: the main challenge in the switch to renewables is integrating this power with a grid that is set up to cope with fossil fuels, and not for renewables sources of energy, which are hard to store and rise and fall with the elements (there's wind when it's windy, etcetera).

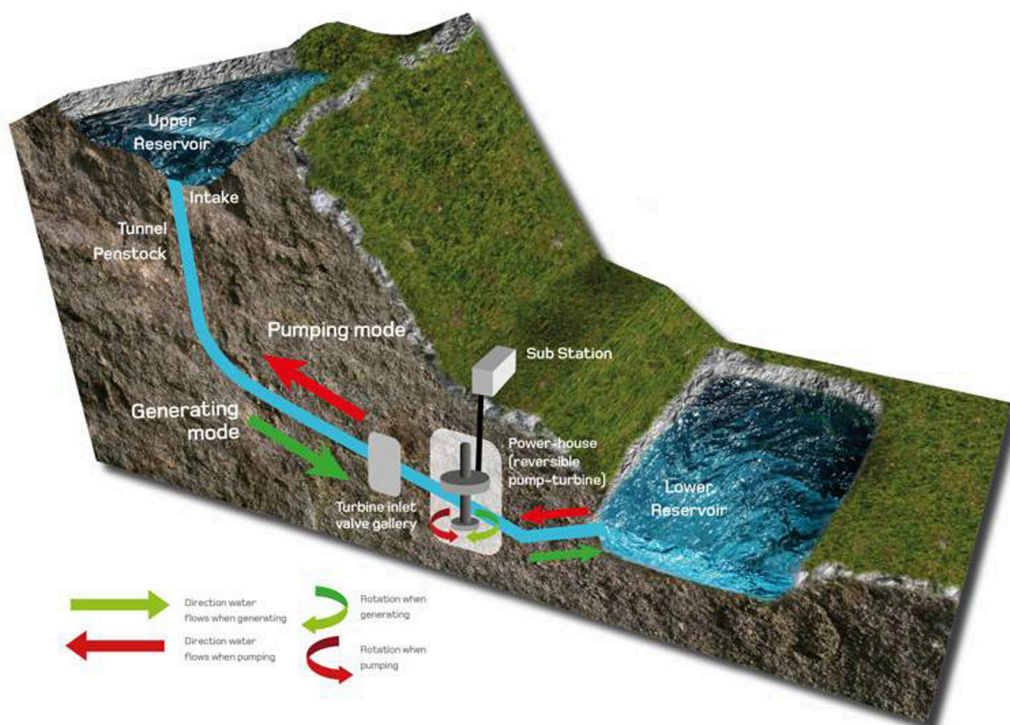
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Red John (as the Loch Ness plant is named for the time being, after Eoin Ruadha, one of the source pools initially proposed) responds to this challenge smartly. Pumped storage hydro uses grid energy at times of low demand to pump water up to the top reservoir, where water is kept in store. When energy is in high demand – information the company has updated day by day – the plant is put into use, ensuring that waste is kept to a minimum as they are always catering to demand.

For instance, if it's very windy at 01:00 on a Tuesday in June, off the coast of Aberdeen where Vattenfall's enormous offshore wind farm is getting underway, the Loch Ness plant can use this surplus – in theory – to send the loch's water up to the top pond, where it can be stored. That water can then be released during peak periods of demand.

"It can generate at those peaks and pump and use energy in the troughs," says Bob Hull, a non-executive director at Intelligent Land Investments (ILI) and former managing director of Ofgem. "It's all calculated on a day-to-day basis, and there's quite a few pump storage plants in the UK that are already doing this," Hull says. The National Grid dispatches generation to balance supply and demand, and this means there's a lot of market information a pump storage plant can rely on to regulate its operation.

While the UK as a whole is looking like it may miss targets for decarbonisation, Scotland has been streaking ahead to meet plans for 100 per cent of electricity to come from renewables by 2020. In 2017, 69 per cent of the Scottish electricity came from renewables in 2017. The majority of this, says professor Gareth Harrison researching energy at the University of Edinburgh, has come from onshore wind, meaning Red John would make a major impact.



An illustration of how the Loch Ness scheme would work



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Technical, practical, ecological and all other plans for Red John will go to the government this September, and it will be a year before ILI, the company behind the plant, hears back. ILI hopes construction would take between three and five years, meaning Red John should be up and running by 2024. So far, funding for the project so far has come from ILI, supported by £3.4 million from green investment crowdfunding company Abundance Investment. Overall project costs could reach £500 million by the time the site is completed, with ILI to seek further funding in 2019 to support the construction phase of the project.

"For the last four years we've been working on pump storage," Wilson says, and ILI has identified roughly 90 pump hydro sites now across Scotland, with one at Loch Tay and another at Loch Oich.

The government, he explains, hands out in excess of £200m million in curtailment costs, paying developers to switch their wind farms off to avoid overloading the grid. "It's so obvious that this has to happen. With onshore and offshore wind – that energy is intermittent," Wilson says. "This allows us to store that energy when it's not needed, and to use energy when it's most needed."

Updated 04.07.18, 10:00 BST: 90 hydroelectric sites have been identified by ILI

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