

Hydro plants play critical role in keeping lights on

'Green batteries' prove vital in helping National Grid tackle system's stability during crisis

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In the Welsh and Scottish mountains, a small number of hydro power stations, some of them more than half a century old, have become a first line of defence in the battle to keep electricity flowing around Britain during the coronavirus crisis.

Britain's four "pumped storage" hydro power stations, often referred to as "green batteries", have played a critical role in helping the utility company, National Grid, address exceptional conditions in the energy system since lockdown.

The closure of businesses has pushed demand for electricity down 20 per cent on average while unusual weather has meant the grid was simultaneously flooded with record solar generation and strong output from wind farms. The combination has threatened the stability of the system, which has to be balanced on a second-by-second basis.

Developers wanting to build pumped storage plants hope the importance of their role in stabilising the system will bring fresh impetus to a campaign for government support, particularly as the chancellor, Rishi Sunak, prepares to plough money into infrastructure projects to kick-start the economy.

"It's big infrastructure projects that are going to be needed to get the economy stimulated again, big, green infrastructure projects," said Mark Wilson, chief executive of the ILI Group, a company based in Hamilton, Scotland, that wants to build three plants with a total capacity of just under two gigawatts.

Pumped storage stations have reservoirs at different heights that can absorb excess electricity by using it to pump water uphill. The water is stored in the upper reservoir and released through turbines to generate electricity when there is stronger demand.

These plants are often a first port of call for National Grid, when it is balancing the electricity system, as they are cheaper than alternative ways of cutting supply.

Pumped hydro plants can also "store" electricity for longer than other technologies such as lithium-ion batteries, although they are not universally popu-



Drax-owned: the Cruachan hydro station is buried inside a mountain in the Scottish Highlands

Chris James/Alamy

lar, given their impact on landscapes.

French utility Engie said since April, its Dinorwig plant in Snowdonia, north Wales, has pumped three times the energy volume during the day than it did for the whole period between April and September last year. Engie also owns the Ffestiniog station in Wales.

"We can absorb [across both stations] about 2,000 megawatts over about a seven-hour period if the system needs us to do that," said Nicola Lovett, Engie chief executive for UK and Ireland.

Ian Kinnaird, head of hydro at Drax, the FTSE 250 energy company that owns the 55-year-old Cruachan station in the Scottish Highlands, said "utilisation of the plant is definitely up on what we would normally see".

He added: "Typically we would see the plant used more over the winter when demand is higher."

Other countries such as Portugal and China have been pushing ahead with new pumped storage plants as governments and energy companies believe the decades-old technology can help keep grids stable as more intermittent renewables are constructed.

In the UK, several proposed projects are awaiting planning decisions. Developers hope they can persuade ministers to introduce a support mechanism that they say will provide the confidence to press ahead with construction.

Pumped storage plants have high construction costs but developers argue they are competitive once running.

ILI's first proposed project, on the banks of Loch Ness, is subject to a public planning inquiry. If the £620m scheme is approved, Mr Wilson wants the Department for Business, Energy and Industrial Strategy to introduce a "cap and floor" mechanism guaranteeing a minimum level of revenue once operational – similar to those used to encourage construction of subsea cables to countries such as Belgium.

FTSE 100 power company SSE is also awaiting a planning decision from the Scottish government for revised plans for Coire Glas, a proposed 1.5GW pumped storage plant in the Scottish Highlands. It already has permission for a smaller scheme at the site.

Previous calls for a support mechanism have come to nothing. But devel-

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opers hope their case has improved because the crisis has provided insight into the challenges of balancing the electricity system as the UK government encourages more renewables to meet its 2050 "net zero" emissions target.

This is because renewables, which produce electricity cheaply and are first to meet demand, have made up a higher proportion than usual of overall generation in the crisis. Renewables' share of generation peaked at 67 per cent in May.

"The cap and floor arrangement has been very successful at incentivising new interconnection to the UK and seems a very appropriate way to encourage new storage," said Dave Holmes, managing director of the Quarry Battery Company, which already has planning permission for a 100MW pumped hydro station in north Wales.

The business department said it recognised the importance of electricity storage "in helping us achieve net zero emissions", adding: "We are currently engaging with industry stakeholders to understand further barriers to its deployment on a large scale."