Allt na Moine Hydro: Ready and waiting to deliver urgently needed renewable electricity

Summary

- Allt na Moine (AnM) is a recently completed and fully operational **2-megawatt** storage hydro scheme, located to the north of Applecross in Wester Ross.
- Fully Feed in Tariff accredited, AnM is **fully Grid connected** and has the capacity to generate more than 10,000,000 kilowatt hours of renewable electricity each year – equivalent to the annual consumption of more than 2,500 homes.
- Due to protracted delays in upgrading the Transmission network between Fort Augustus and Broadford, AnM is only permitted to export **50 kilowatts** of electricity until such time as these works are completed. As things stand, with no planning or formal regulatory consent for this upgrade, this restriction will apply until the end of 2026 at least.
- The UK urgently needs to get additional renewable electricity on to the grid to address short-term energy security issues and to get back on track to achieve the declared ambition of Net Zero by 2035.
- Storage hydro (10 - 20 days in this case) represents the ideal technology to complement other renewables, most notably onshore and offshore wind.
- The opportunity exists for all parties to achieve a **quick win** by enabling Allt na Moine hydro to make use of the considerable 'dynamic headroom' that is understood to exist, but this will require a shift in approach from the policies and procedures of the past to a much more flexible approach that utilises the latest grid management technology.

Background

Allt na Moine is a 2-megawatt storage hydro scheme, 6 miles north of Applecross. The scheme completed construction in summer 2022 and has now been energised and G99 certified in conjunction with SSEN but is unable to export more than 50 kW due to a grid constraint that was originally due to be removed in 2021 but is now scheduled for late 2026….at the earliest.

Developments such as Allt na Moine have for many years been actively encouraged by UK and Scottish Governments in the critical drive to reduce carbon emissions. The introduction of Feed in Tariffs by the UK Government in 2010 was specifically intended to stimulate the construction and commissioning of renewable electricity generating schemes such as this. To qualify for Feed in Tariffs, applicants required to have full planning consent, a CAR licence from SEPA, and a grid connection offer from the relevant DNO. All three of these items placed demanding obligations on the developer, however in the case of the grid connection offer, the arrangement was very one-sided, with no obligation on the DNO or Transmission counterparts to adhere to quoted timescales or costs, as so clearly demonstrated in the case of Allt na Moine.

The table below details the extent to which the cost of connection and the projected connection dates have moved in the past 5 years. It should be noted that the costs shown in the table do not include any amounts for attributable transmission works (c. [redacted]) or wider cancellation charges.

Offer date	Connection costs (Distribution) exc. VAT	Connection date (Distribution)	Connection date (transmission)
April 2017	[redacted]	[redacted]	[redacted]
September 2019	[redacted]	[redacted]	[redacted]
March 2022	[redacted]	[redacted]	[redacted]
September 2022 Additional substation costs of [redacted]	[redacted]		[redacted]

Since the original grid connection offer was made to [redacted] in April 2017, the overall costs, excluding transmission related payments, have trebled from [redacted]. And there is no guarantee that the costs will not increase further.

At a time of national and international energy crisis, when plans are being made for power cuts and old coal plants are being readied for use, there must be a way of bringing the full generating potential of this renewable generation asset on to the national grid. The situation during week commencing 12 December 2022 confirmed the madness of the situation facing Allt na Moine. A prolonged spell of very cold, still weather resulted in power shortages, as neither wind nor solar was able to deliver any meaningful volumes of electricity. During this period, Allt na Moine hydro could have been running at full capacity, taking advantage of the 150 MWh+ storage capability of the scheme.

At such times when other sources of renewable generation are subdued, there will be capacity available on the grid to accommodate not just Allt na Moine, but other generators and storage assets waiting for the Broadford Transmission upgrade, which forever seems destined to be at least three years away, or more.

A Derogation has been in place, covering the Broadford GSP, since 2010. When it was introduced, it was a positive initiative that enabled the early access to the grid for many renewable generators who would otherwise have had to wait for upgrades to the Transmission network. But over time, the same Derogation has become an obstacle to new development. With this Derogation in place, there would appear to have been less onus on completion of the otherwise required upgrades to the Transmission network.

It is evident that the Derogation achieved its original aim of getting more renewable generation on to the grid, but for the reasons stated above it has failed to optimise utilisation of available grid capacity. Because of the related obligation to make constraint payments to generators in circumstances when combined output exceeded physical capacity, it was wholly understandable that the Derogation only allowed for a fixed % of 'overselling', but the circumstances in 2023 are quite different, therefore the challenge is to find a way of getting more generation on to the grid, 365 days of the year, without increasing the financial exposure to constraint payments.

The solution proposed is for future beneficiaries of the Derogation not to be eligible for constraint payments, and to be a non-firm connection instead. They will be the first generators to be temporarily excluded from grid access and will receive no compensation in return. For generators with storage assets, such as Allt na Moine Hydro, this will impact the timing of output, but with little or no impact on overall generation.

Each scheme that operates under the G99 regime can be directly managed from the SSEN Control Centre in Perth, as was demonstrated during the G99 witness testing at Allt na Moine [redacted].

There is a golden opportunity here for SSEN Transmission and National Grid to demonstrate that they are ready to make use of technology and innovation in optimising the UK's energy security while facilitating the fastest possible progression towards net zero.

A brief history of Allt na Moine hydro

Allt na Moine hydro was originally conceived by [redacted], who first applied for a grid connection in [redacted]. [redacted] held off constructing the scheme until closer to the transmission connection date, to ensure that they did not waste a significant portion of the 20-year Feed in Tariff period running at only 50 kW.

[redacted]

[redacted]

The scheme was acquired by Allt na Moine Hydro Limited in late 2019, and construction commenced in early 2020.

[redacted]

Since 2017, the Transmission connection date has moved by fully four years, from October 2022 to October 2026. Based on experience, it seems highly likely that the Transmission connection date will continue to shift into the future, if it happens at all. Until the planning and regulatory approvals are in place for the Fort Augustus to Skye re-enforcement works our capital is at risk.

Obstacles to connection

As noted previously, the primary obstacle to Allt na Moine being fully connected to the grid before the Broadford Transmission upgrade works are completed is the Derogation covering the Broadford GSP that has been applied by SSEN Transmission. This states that no new connections of more than 50 kW can be added until further Transmission upgrades are completed.

There are two connected schemes in the vicinity currently restricted to 50kW which contracted prior to Allt Na Moine. They will increase their export to 90kW and 100kW (+90kW total) respectively upon completion of the Transmission reinforcements. Allt Na Moine is next in queue followed by an already connected scheme restricted to 50KW who will increase to 100kW, and a contracted scheme of 137kW.

In summary, the total extent of 'the queue' is less than 2.5 MW.

Positive PR for all concerned.

Getting the full 2 MW potential of Allt na Moine Hydro on to the grid represents an excellent PR opportunity for SSEN Transmission as well as for National Grid and Ofgem. The fact that Allt na Moine is a storage hydro scheme means it is better placed than any other renewable technology to provide power when there is a shortfall, such as was seen in mid-December 2022.