

North of Scotland Wind Farm Repowering

August 2017



Background

The volume of renewable generation connected to the transmission and distribution networks in the north of Scotland in the last decade has grown tremendously with over 4GW now being connected ranging from small community owned schemes to large scale wind generation projects.

A number of these generators have now been connected to the system for some time and, with an asset lifetime assumption of between 20-25 years for wind turbines, the potential for repowering is now starting to be factored into long term planning for the electricity system. Scottish and Southern Electricity Networks (SSEN) is currently in the early stages of preparing for the next transmission price control (RIIO-T2) which will cover the eight-year period between 2021 and 2029. As part of this work, we have been reviewing our own assumptions concerning wind farm repowering and those used within the Future Energy Scenarios developed by the GB System Operator.

This brief paper provides a summary of the potential onshore wind capacity that could be subject to repowering based on connection dates and sets out a number of questions on which we will be seeking feedback from the developer community to better understand future trends in this area.

Repowering Potential

A review of connection dates for onshore wind projects in the north of Scotland has indicated that by the end of the RIIO-T2 period a total of around 700MW of capacity could be nearing the end of its life assuming a 20-year asset lifetime. This value drops to around 120MW if a 25-year asset life is used. The cumulative potential repowering capacity is illustrated in Figure 1 where it can be seen that looking into the three years beyond 2028/29 these figures have the potential to rise significantly. Given the long planning times associated with projects any engineering associated with this further capacity could fall within the latter part of the RIIO-T2 period.

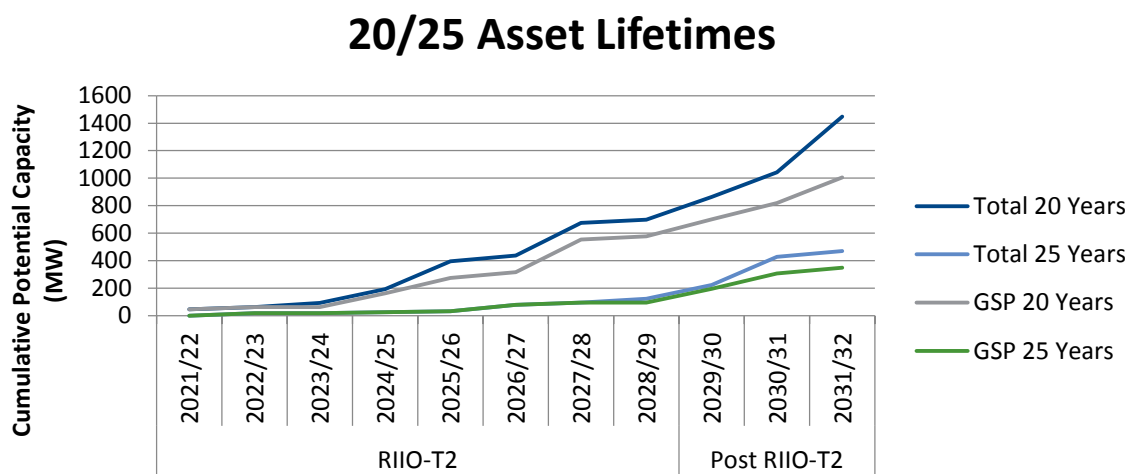
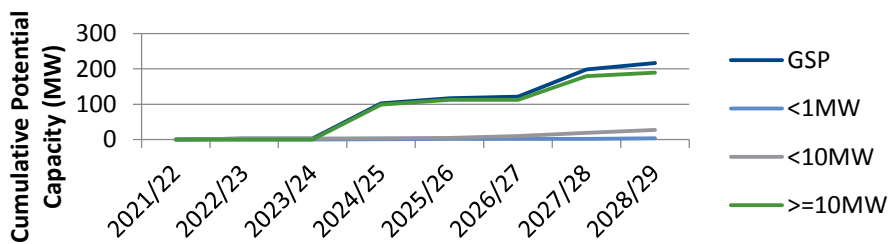


Figure 1: Cumulative potential repowering capacity in the north of Scotland

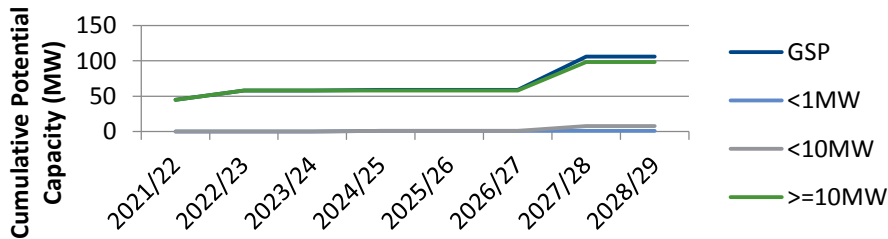
Although the upper limit of 700MW associated with the 20-year asset lifetime assumption for the end of RIIO-T2 is relatively small in terms of the overall installed capacity, the analysis suggests that there are areas within our network where clusters of potential repowering projects may emerge. The trends in Figure 1 indicate that the majority of the repowering capacity is associated with distribution connected wind farms connected via our grid supply points. This factor could give rise to local capacity issues which must be explored. Figure 2 provides examples of the cumulative potential repowering capacities for the Highland and Argyll and the West regions of our network. A summary of the regional total is provided in Figure 3 for the RIIO-T2 period.

20 Year Asset Life



(a)

20 Year Asset Life



(b)

Figure 2: Example regional cumulative potential repowering capacity – (a) Highland and (b) Argyll and the West

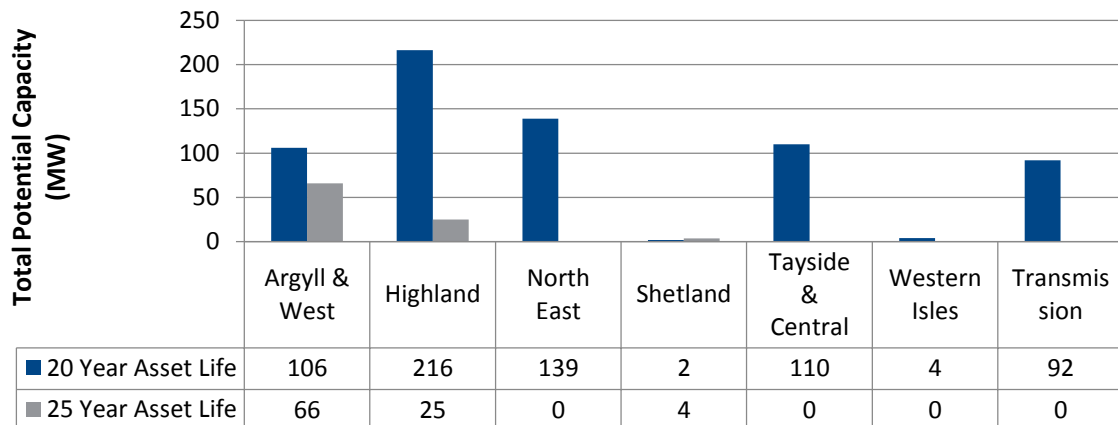


Figure 3: RIIO-T2 regional totals

Repowering Trends

As a network owner, we are seeking to better understand the current thinking within the developer community with regards to onshore wind repowering and the resulting implications for how the network in the north of Scotland could be developed to reflect this. There are a number of questions that our analysis has raised and we are seeking your feedback on the following questions:

- Are our assumptions regarding an asset lifetime range of 20-25 years valid? Should this range be broadened to factor in potential developments in lifetime extensions?
- If repowering is being considered, what would be the implications for the required levels of Transmission Entry Capacity (TEC)?
 - Is it likely that repowering using larger and/or more efficient turbines could lead to requests for higher levels of TEC?
 - Alternatively, would developers adopt an approach of repowering to increase energy yields within the constraints of existing TEC levels?
- Is the development of energy storage being considered as part of repowering strategies or as standalone projects? We are keen to understand the views of the developer community on the technical and commercial maturity of this concept as its deployment could have a significant impact on transmission power flows. This impact could be positive if the System Operator is able to take advantage of this technology via ancillary services to help manage transmission constraints or provide other services to the system.

We recognise that the answers to these questions could be highly site specific due to local consenting restrictions, wind resource or other factors. However any insights you can provide on onshore wind repowering would be extremely useful to us.

Contact Us

If you have any feedback on the potential for onshore wind repowering, please contact us using the details below:

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