

Statement of Need

Soay Greener Grid Park

Statkraft’s planning application is not only for a Battery Energy Storage System (BESS) but predominately for the installation of Synchronous Compensator(s) to provide Stability to National Grid Energy System Operator (NGESO). This project is called a Greener Grid Park (GGP) to highlight its function of decarbonising the grid system and enabling greater use of the increasingly abundant grid connected sources of renewable energy (from Photovoltaics to Offshore wind).

Soay Greener Grid Park, located in Thornton, is in an area identified by NGESO with a “large growth in stability need” which has led to the Stability Pathfinder as shown in Figure 1. Stability services include the provision of inertia, short-circuit current and reactive power. A grid without sufficient stability is one that is unstable, suffers from issues of power quality and is susceptible to blackouts. In addition to the Stability Pathfinder, NGESO is developing a long term market for Stability¹.

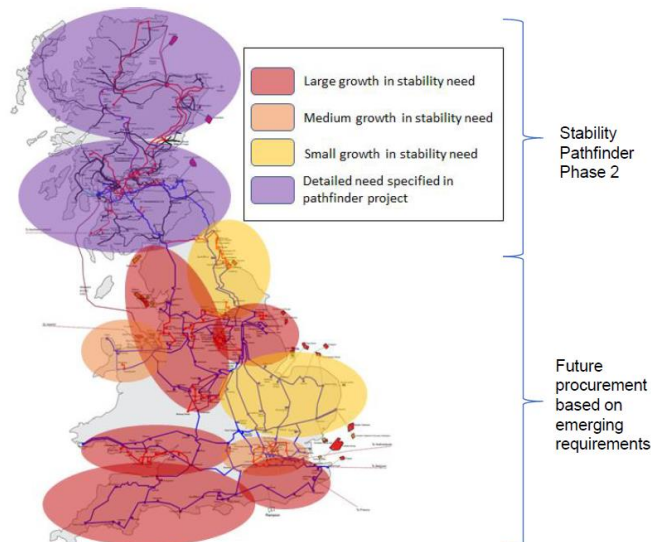


Figure 1. GB areas of stability requirement²

The Thornton area has been selected as it not only is within NGESO’s area of need for Stability but also for its proximity to a critical Transmission Boundary (B7a) as shown in the NGESO Electricity Ten Year Statement (ETYS)³ (refer to Figure 2). The closer this Greener Grid Park is to these transmission boundaries, the more effective it becomes. Greener Grid Parks also operate at their optimum when connected at a 400kV transmission level. After much research, the Thornton substation has been selected because it is able to accommodate our stabilising technology and is close to the transmission boundary. Additionally, the Thornton substation is very “strong” as it is a well inter-connected 400kV substation with 8 x 400kV circuits which optimises the delivery of the service. The site is well screened, has a low risk of flooding and already has infrastructure suitable for access.

¹ Source: https://smarter.energy/networks.org/projects/ni2_ngeso005/

² Source: <https://www.nationalgrideso.com/document/171546/download>

³ Source: <https://www.nationalgrideso.com/research-publications/etys-2020>

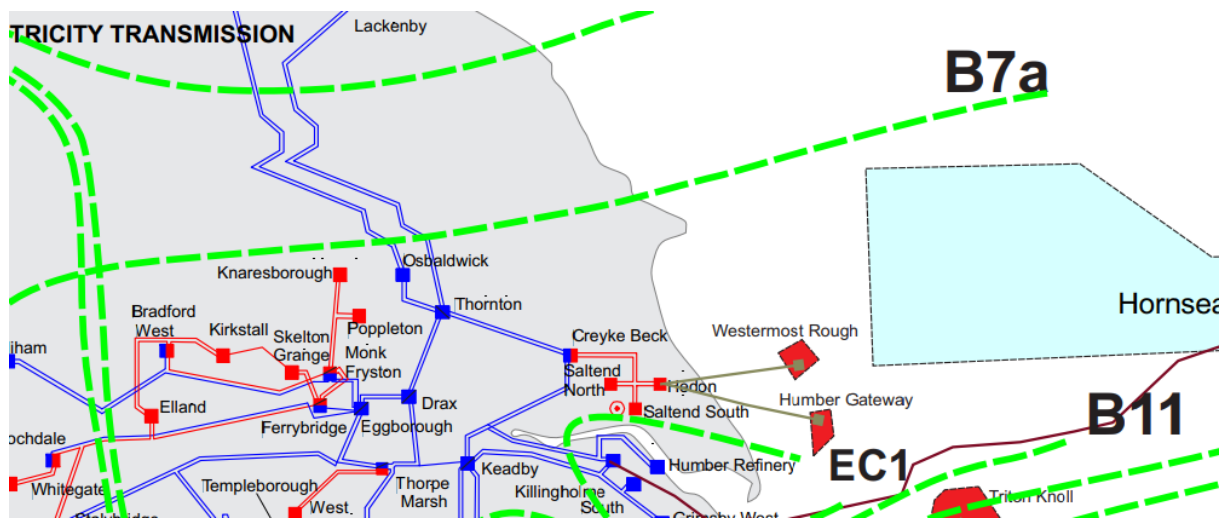


Figure 2. Transmission System Boundaries around Thornton substation⁴

The GGP will provide significant benefits to electricity consumers and to the environment by providing cuts to carbon emissions in the GB grid this decade. Rapid decarbonisation before 2030 is important and valuable in a Climate Emergency. Statkraft’s GGP is contributing to the UK’s pledge to meet the Carbon Budgets (Fourth Carbon Budget 2023-2027) and to deliver the 64% emissions reductions (Figure 3) by 2030, in accordance with the Paris Agreement⁵.

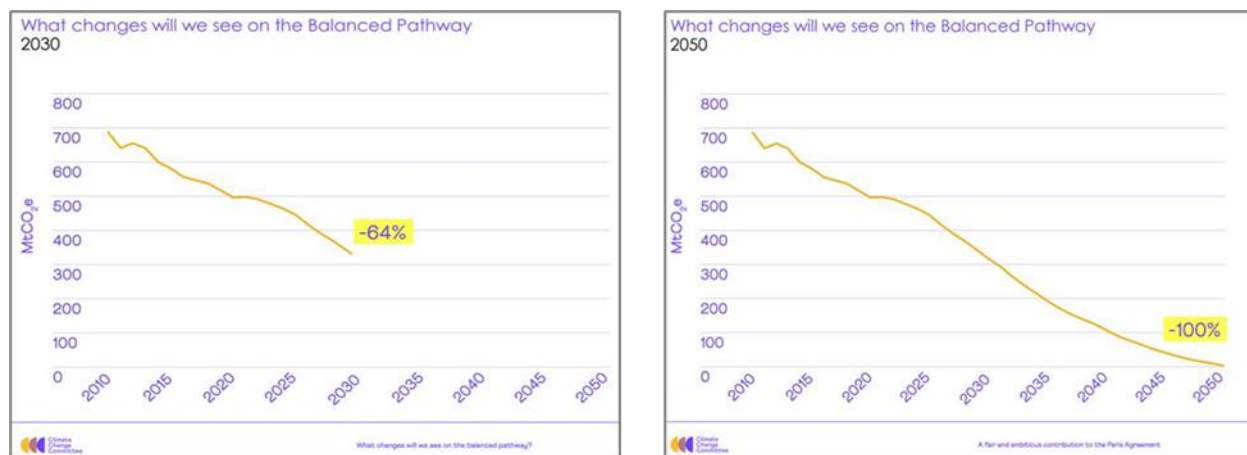


Figure 3. Climate Change Committee - 2030 and 2050 modelled changes on the Balanced Pathway⁶

In January 2020, Statkraft was successful in NGENSO’s Stability Phase 1 Tender⁷. NGENSO stated that this would save consumers up to £128 million in the contract period up to 2025/26. Statkraft is constructing one of these projects at Keith in Moray Scotland as reported in Machinery Magazine⁸. The Keith GGP will host the Stability technology as well as a Battery Energy Storage System (BESS), which is similar to the plans for Soay.

⁴ Source: <https://www.nationalgrideso.com/document/181446/download>

⁵ Source: https://ec.europa.eu/clima/sites/clima/files/long_term_strategy_brochure_en.pdf

⁶ Source: https://www.theccc.org.uk/wp-content/uploads/2021/01/Path-to-Net-Zero-the-role-of-business-slides_FINAL.pdf

⁷ Source: <https://www.nationalgrideso.com/news/national-grid-eso-outline-new-approach-stability-services-significant-step-forwards-towards>

⁸ Source: <https://my.mydigitalpublication.co.uk/publication/?m=65921&i=696681&p=10>

Statkraft is also participating in NGENSO’s tender for Stability Phase 2 which is for sites in Scotland only; Figure 4 shows the type of technologies to deliver the Stability Phase 2 service. Following this, Statkraft intend to tender for Stability Phase 3, which will be focused on England and Wales (see Figure 1 above).

Summary of submissions

The Expression of Interest (EOI) invited potential participants to express an interest in participating in the NOA Stability Pathfinder Phase 2 tender process which is seeking to procure short circuit level, inertia and dynamic voltage services. The EOI closed on 8th January 2021 and we received 29 submissions with 1575 solutions.

All solutions have passed the EOI stage and have qualified to progress to the feasibility study stage.

- 29 Submissions
- 3 Technology categories
- 1575 Solutions
- 67 Substations (different voltage levels/sites)



Figure 4. Summary of Stability Pathfinder Phase 2 Expression of Interest (EOI) submissions⁹

Above it was mentioned that the Soay GGP project will focus on delivering stability but will also include BESS to allow the project to provide energy storage. BESS can be sited at many locations on the transmission or distribution electricity networks within GB, although there are additional locational price signals which encourage projects to locate in areas beneficial to the grid system and electricity market. However, when co-locating stability and BESS technologies, developing anywhere is not possible and Statkraft have to be more selective about the location of the development as described at the beginning of this paper.

Statkraft’s Greener Grid Parks are also designed to minimise environmental and social impacts of the grid connection i.e. minimising any underground cables or overhead lines connecting the Greener Grid Park to the substation. By siting adjacent to the substation, Statkraft’s project does not impact third parties in this regard.

The preservation of biodiversity and wildlife onsite is a top priority for Statkraft, which is why we are committing to provide ecological enhancements in order to obtain a net biodiversity gain from the project.

As a global energy company, strategically focused on scaling renewable energy solutions, Statkraft believes that we can be instrumental in driving progress toward achieving the UN Sustainable Development Goals (SDGs) by 2030. Statkraft have numerous initiatives that can be linked to different SDGs, these positive impacts are naturally concentrated around the goals for Climate Action (SDG 13). Statkraft contribute directly to climate change mitigation by displacing fossil fuels whilst meeting growing energy demand.

⁹ Source: <https://www.nationalgrideso.com/document/187371/download>

We have provided this information to demonstrate the need for the Soay GGP and to differentiate Statkraft's project from other planning applications which are only for BESS. Whilst these technologies are important for the energy transition and decarbonisation, they are not as effective as Statkraft's proposal in decarbonising the GB grid and meeting UKs Climate targets for:

1. 2050 Net Zero¹⁰
2. Fourth Carbon Budget¹¹
3. Paris Agreement¹²
4. NGENSO's target for Zero Carbon Operation in 2025¹³

¹⁰ Source: <https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law>

¹¹ Source: https://www.theccc.org.uk/wp-content/uploads/2010/09/CCC-4th-Budget-Book_with-hypers.pdf

¹² Source: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

¹³ Source: <https://www.nationalgrideso.com/electricity-explained/zero-carbon-explained>