BAILLIE GREENER GRID PARK

LAND WITHIN BAILLIE WIND FARM, WEST OF THURSO

APPENDIX 1: DESIGN AND ACCESS STATEMENT

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1 INTRODUCTION

1.1 Background

This Design and Access Statement ('the DAS') has been prepared by Arcus Consultancy Services Ltd ('Arcus'), on behalf of Statkraft UK LTD ('the Applicant'), to accompany the planning application ('the Application') submitted to the Highland Council ('the Council') for the development of a Greener Grid Park ('the Development'), to support the flexible operation of National Grid and decarbonisation of electricity supply by balancing electricity supply and demand at land within Baillie Wind Farm, west of Thurso ('the Site'). The Planning Application boundary is made up of an area of approximately 1.99 hectares ('ha').

Figure 1: Site Location Plan

The Development will have a construction period of up to approximately 12 months and the Applicant is seeking a permanent planning permission**.**

1.2 The Applicant

The Applicant is Statkraft UK LTD. Statkraft is 100% owned by the Norwegian state and is Europe's largest generator of renewable energy. In the UK Statkraft develop, own and operate wind, solar, hydro and Greener Grid Park projects. Since 2006 Statkraft has invested over £1.4 billion in the UK's renewable energy infrastructure and is a leading provider of Power Purchase Agreements (PPAs), having facilitated over 6 GW of new-build renewable energy generation through PPAs. Statkraft is contracted to deliver grid stability services to National Grid ESO, supporting their target to deliver a zero-carbon electricity system by 2025. The first two projects in Moray and Liverpool are currently in construction.

1.3 Role and Purpose

This DAS has been prepared in accordance with Regulation 13 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013[1] ('the DMP

[1] Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013 (Online) Available at: http://www.legislation.gov.uk/ssi/2013/155/regulation/13/made (Accessed 05/11/2021)

Regulations') which sets out the detailed requirements of the content of a DAS in relation to planning permission.

Regulation 2(1) of the Town and County Planning (Hierarchy of Developments) (Scotland) Regulations 2009 ('the HOD Regulations') states that development will be classed as a "*major development*" where the applicable threshold in Schedule 1 of the HOD Regulations is met or exceeded. In this instance, the proposal would be classified as 'Other Development', with the threshold for being considered a 'Major' development as where:

(a) The gross floor space of any building, structure or erection constructed as a result of such development is or exceeds 5,000 square metres;

or

(b) The area of the site is or exceed 2 hectares.

The Development does not meet any of the cited thresholds, as defined within Schedule 1 of the HOD Regulations, and is considered 'local development' as per the Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009[2]. As such, there is no statutory requirement to provide a DAS in support of the Application. However, at the direct request of the Council, a DAS has been prepared in order to provide as comprehensive a suite of documents in support of the Application.

The requirements under Regulation 13 of the DMP Regulations cover both design and access, allowing applicants to demonstrate an integrated approach that will deliver inclusive design, and address a full range of access requirements throughout the design process.

The DAS forms part of the Application submission, which also comprises a Planning Statement and supporting technical appendices; planning drawings; planning application form/ownership certificate details; and the requisite planning fee.

The role and purpose of the DAS, in accordance with Regulation 13 of the DMP Regulations, is to:

- Explain the design principles and rationale that have been applied to the Development;
- Demonstrate the steps taken to appraise the context of the Development, and how the design of the Development takes that context into account;
- Explain the policy adopted as to access, and how policies relating to access in relevant local development documents have been taken into account;
- State what, if any, consultation has been undertaken on issues relating to access to the Development and what account has been taken of the outcome of any such consultation; and
- Explain how any specific issues which might affect access to the Development have been addressed.

This DAS has also been prepared in accordance with guidance included within the Planning Circular 3/2013: Development Management Procedures ('the Circular') Part 3, 'Preparation of Statements', Paragraphs 3.23-3.30. This section sets out the requirements for what must be included within the contents of a DAS.

Paragraph 3.24 of the Circular states that:

"A design statement is a written statement about the design principles and concepts that have been applied to the development and which –

Explains the policy or approach adopted as to design and how any policies relating to design in the development plan have been taken into account.

[2] Town and Country Planning (Hierarchy of Developments) (Scotland) Regulations 2009 [Online] Available at: https://www.legislation.gov.uk/ssi/2009/51/contents/made (Accessed 05/11/2021)

Describes the steps taken to appraise the context of the development and demonstrates how the design of the development takes that context into account in relation to its proposed use.

States what, if any, consultation has been undertaken on issues relating to the design principles and concepts that have been applied to the development; and what account has been taken of the outcome of any such consultation".

Paragraph 3.26 of the Circular states: A design and access statement must: 'Explain the policy or approach adopted as to access and how:

(i) policies relating to such access in the development plan have been taken into account; and

(ii) any specific issues which might affect access to the development for disabled people have been addressed'. This should explain how the applicant's policy / approach adopted in relation to access fits into the design process and how this has been informed by any development plan policies relating to access issues.

This DAS is structured as follows:

- Section 2 – The Development;
- Section 3 – The Policy Context;
- Section 4 – The Design Statement;
- Section 5 – The Access Statement; and
- Section 6 – Conclusion.

2 THE DEVELOPMENT

2.1 Overview

The Applicant is seeking planning permission for the construction and operation of a Greener Grid Park.

The Development is designed to support the flexible operation of the National Grid and decarbonisation of electricity supply. The Development will store, import and export electricity but will not generate any additional electricity nor have any direct on-site emissions of CO_2.

2.2 Development Infrastructure

The Development will consist of the following components, as shown on the Site Layout Plan (Planning Drawing 2):

- 60 no. battery units (each 12.9m x 2.44m x 2.59m)
- 2 no. Synchronous Compensator building (each 38.6m x 20.7m x 10.0m envelope)
- 2 no. water cooler pump skid (each 6.35m x 2.05m x 2.6m)
- 6 no. switchgear containers (each 12.2m x 2.44m x 3.0m)
- 6 no. inverter units (each 6.1m x 2.44m x 2.59m)
- 1 no. welfare facility (12.9m x 3.45m x 2.59m)
- 1 no. SHETL Distribution Container (12.19m x 3.45m x 2.59m)
- 1 no. Statkraft Distribution Container (12.19m x 3.45m x 2.59m)
- 2 no. Synchronous compensator HV control and protection (12.19m x 3.45m x 2.59m)
- 2 no. LV electrical house (each 12.19m x 3.45m x 2.59m)
- 1 no. Synchronous Compensator Comms House (12.19m x 2.44m x 2.59m)
- 1 no. BESS Comms House (12.19m x 2.44m x 2.59m)
- 1 no. 275kV AIS & Transformer (36.8m x 18.6m x 7.05m)
- 2 no. 2500kVA 690V Transformers (each 4.0m x 4.0m x 2.9m)
- 6 no. 1000kVA 400V BoP Auxiliary Transformers (each 3.0m x 3.0m x 2.14m)
- 2 no. lube oil pump skid (each 2.15m x 1.1m x 1.1m)
- 6 no. air blast coolers (each 9.6m x 2.4m x 2.5m)
- 1 no. emergency diesel generator (5.1m x 2.07m x 1.6m)
- 5 no. security columns of 6 m in height with CCTV cameras located at various points around the site boundary;
- Internal roads;
- 4.0 m high noise attenuation fencing; and
- 3.4 m high palisade gate and electric security palisade fencing.

Most components of the development will be housed in steel container-style units, while the palisade fencing and electric fence provide security. The approach to design included ensuring that the aesthetic of the units was as low-impact on the receiving landscape as possible.

3 THE POLICY CONTEXT

3.1 Planning Policy Context

3.1.1 National Planning Framework 3

The National Planning Framework 3 ('NPF 3'), published in June 2014, provides a statutory framework for Scotland's long term spatial development. NPF 3 sets out the Scottish Government's spatial development priorities for the next 20 to 30 years and represents a clear vision of what is expected of the planning system and outcomes that it must deliver for the people of Scotland. Whilst it is not prescriptive, NPF 3 will form a material consideration when determining the applications for new energy developments.

Although NPF3 does not specifically address Greener Grid Parks, the Scottish Government *"aims to ensure that all parts of Scotland make best use of their assets to build a sustainable future",* as stated in paragraph 2.6, while paragraph 2.7 supports *"emerging technologies for renewable energy"*. NPF3 establishes Scotland as a leader for renewable energy development and advises that onshore wind will continue to make a significant contribution to the diversification of the energy mix.

It is important to recognise that energy management and storage plays an invaluable role in the success of renewable energy. Being able to store and distribute energy as efficiently as possible is a key component to the ongoing success of the renewable energy industry.

3.1.2 Scottish Planning Policy

Scottish Planning Policy ('SPP') was published in June 2014; its purpose is to set out national planning policies that reflect priorities of the Scottish Ministers for operation of the planning system and the development and use of land through sustainable economic growth. SPP aims to promote a planning process that is consistent across Scotland but flexible enough to accommodate local circumstances. SPP demonstrates a commitment to sustainable growth through a balance of promoting development in the appropriate places.

SPP strongly promotes good quality design of development, from initial concept through to delivery. Specifically, for energy developments in sensitive areas, SPP recognises the need for significant protection through detailed and efficient design. Consideration to demonstrate that any significant effects on the qualities of sensitive areas can be substantially overcome by siting, good quality design and mitigation is required.

Scottish Government Policy is to generate the equivalent of 100% of Scotland's gross annual electricity consumption and the equivalent of 11% of Scotland's heat demand met from renewable sources and a further 500 MW of community and locally-owned renewable energy by 2020. Scottish Planning Policy supports the installation of a wide range of renewable energy technologies to achieve these targets.

3.1.3 Policy Description

3.1.3.1 Highland-wide Local Development Plan (2014)

Formally adopted in April 2012, the Highland-wide Local Development Plan[3] ('HwLDP') aims to represent the view of the Council, setting out policies and proposals that aim to guide development and investment in the area over the next twenty years.

The HwLDP reflects the Scottish Government's core principles and objectives as expressed in the National Planning Framework 3 (NPF3) and Scottish Planning Policy (SPP) including:

[3] Highland Council (2012) *Highland-wide Local Development Plan* [online] Available at: https://www.highland.gov.uk/info/178/local_and_statutory_development_plans/199/highland-wide_local_development_plan (Accessed 05/11/2021)

- Enabling sustainable Highland communities;
- Safeguarding the environment;
- Supporting a competitive, sustainable and adaptable economy;
- Achieving a healthier Highlands; and
- Providing opportunities for all.

The following policies outlined within the HwLDP are considered to be of relevance to the Development with regards to design and access:

Policy 28 – Sustainable Design: This policy states that the Council will support developments which promote and enhance social, economic and environmental wellbeing, and will assess them on the extent to which they:

- are compatible with public service provision (water and sewerage, drainage, roads, schools, electricity);
- are accessible by public transport, cycling and walking as well as car;
- maximise energy efficiency in terms of location, layout and design, including the utilisation of renewable sources of energy and heat;
- are affected by physical constraints described in Physical Constraints on Development: Supplementary Guidance;
- make use of brownfield sites, existing buildings and recycled materials;
- demonstrate that they have sought to minimise the generation of waste during the construction and operational phases. (This can be submitted through a Site Waste Management Plan);
- impact on individual and community residential amenity;
- impact on non-renewable resources such as mineral deposits of potential commercial value, prime quality agricultural land, or approved routes for road and rail links;
- impact on the following resources, including pollution and discharges, particularly within designated areas:
    - habitats
    - freshwater systems
    - species
    - marine systems
    - landscape
    - cultural heritage
    - scenery
    - air quality;
- demonstrate sensitive siting and high quality design in keeping with local character and historic and natural environment and in making use of appropriate materials;
- promote varied, lively and well-used environments which will enhance community safety and security and reduce any fear of crime;
- accommodate the needs of all sectors of the community, including people with disabilities or other special needs and disadvantaged groups; and
- contribute to the economic and social development of the community.

Renewable and low carbon energy developments will be supported in principle where they are appropriate in terms of location, siting and design having regard to any individual or cumulative significant effects on:

Policy 29 – Design Quality and Place-Making: This policy states that:

"New development should be designed to make a positive contribution to the architectural and visual quality of the place in which it is located, where appropriate, and should consider the incorporation of public art as a means of creating a distinct sense of place and identity in line with the Council's Public Art Strategy for the Highlands. Applicants should demonstrate sensitivity and respect towards the local distinctiveness of the landscape, architecture, design and layouts in their proposals.

The design and layout of new residential development proposals should focus on the quality of places and living environments for pedestrians rather than movement of vehicles, and should incorporate all of the six qualities of successful places. Further guidance on this policy topic will be provided in the Council's Residential Layout: Supplementary Guidance.

Where relevant, the Council will judge proposals in terms of their contribution to place-making. Proposals should have regard to the historic pattern of development and landscape in the locality and should, where relevant, be an integral part of the settlement. The Council will examine proposals to ensure that people of all abilities can move safely and conveniently within the development and, where appropriate, to facilities in other parts of the settlement."

Policy 67 – Renewable Energy Developments: This policy states that renewable energy developments should be well related to the resources required for their operation.

This policy requires developments to be located, sited and designed such that they will not be significantly detrimental, having regards to the following:

- natural, built and cultural heritage features;
- species and habitats;
- visual impact and impact on the landscape character of the surrounding area (the design and location of the proposal should reflect the scale and character of the landscape and seek to minimise landscape and visual impact, subject to any other considerations);
- amenity at sensitive locations, including residential properties, work places and recognised visitor sites (in or outwith a settlement boundary);
- the safety and amenity of any regularly occupied buildings and the grounds that they occupy- having regard to visual intrusion or the likely effect of noise generation and, in the case of wind energy proposals, ice throw in winter conditions, shadow flicker or shadow throw;
- ground water, surface water (including water supply), aquatic ecosystems and fisheries;
- the safe use of airport, defence or emergency service operations, including flight activity, navigation and surveillance systems and associated infrastructure, or on aircraft flight paths or MoD low-flying areas;
- other communications installations or the quality of radio or TV reception;
- the amenity of users of any Core Path or other established public access for walking, cycling or horse riding;
- tourism and recreation interests;
- land and water based traffic and transport interests.

Any developments will be required to comply with the criteria in the Sustainable Design Supplementary Guidance.

The Sustainable Design Supplementary Guidance provides additional context to HwLDP Policies 28 and 29.

3.1.4 Policy Assessment

It is considered that many of the factors under Policy 67 are intended to relate more to the development of onshore wind turbines and are therefore not a consideration for the development for a relatively low-grade Greener Grid Park.

The role and purpose of the DAS is not to provide an assessment of the Development's compliance with HwLDP policies. This can be found in the accompanying Planning Statement. However, the policies listed here are done so to demonstrate the factors that have been considered as part of the design process for the Development.

As can be seen from the Council's pre-application and screening advise, visual impacts on amenity should be mitigated through appropriate screening and considered in the design of the Proposed Development. Following a landscape and visual site survey and assessment, a landscape planting plan has been produced and is submitted with this Application. This ensures that visual impacts are mitigated as far as reasonably practicable.

4 THE DESIGN STATEMENT

4.1 Site Selection

The Development is located within the existing Baillie Wind Farm, which allows for a harmonious relationship between a site of energy generation, energy stabilisation, energy storage and redistribution. The close proximity will allow for the placement of appropriate infrastructure close by, to work together in balancing the supply and demand of renewable electricity.

The other key criteria which have led to the Site being selected for energy management development include:

- The Site is one of the locations targeted by National Grid Electricity System Operator (ESO);
- There is a 275kV connection option at an existing tower on the 275kV double circuit overhead line;
- The Site is located in the most northern part of the GB transmission network;
- The site is within an area of high wind generation and export;
- Synergies with the existing Baillie Wind Farm;
- The character of the Site and surrounding area;
- Separation from residential properties;
- Topography;
- Ease of access to the site for construction; and
- Lack of environmental constraints (e.g., ecological/landscape designations, flood risk, etc.).

Following consideration of the above factors and the existing infrastructure within the wider area, the selected site was identified as having excellent potential for development with minimal environmental impacts.

4.2 Rationale for the Development

Renewable technologies are intermittent as the amount of energy generated is dependent on weather conditions. It is therefore necessary to balance demand and supply in order to prevent shortages and blackouts, as experienced in the South East of England in August 2019.

In September 2021, the National Grid released clarifications[4] on the role that interconnectors and stabilising technology plays in the wider renewable energy industry, acknowledging that they would:

- Play a vital role in helping us to reach Net Zero;
- Help to reduce energy costs;
- Play a critical role in sharing clean energy between the UK and the EU; and
- Help the UK to reduce our carbon emissions.

Renewable energy and the ability to successfully manage its supply is critical to stabilising fluctuating fuel prices[5]. As fossil fuel generating stations are constrained by resources there is an inevitable price fluctuation. Whereas a system that prioritised well-balanced, renewably sourced electricity would not be affected by the same market-related volatility.

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[4] National Grid (2021) *Interconnectors – separating the myths from the facts* [Online] Available at: https://www.nationalgrid.com/stories/engineering-innovation-stories/interconnectors-separating-myths-facts (Accessed 05/11/2021)

[5] The Guardian (2021) *Government should have moved earlier to low-carbon, say industry experts* [Online] Available at: https://www.theguardian.com/business/2021/sep/21/government-should-have-moved-earlier-to-low-carbon-say-industry-experts (Accessed 05/11/2021)

As such, there is a growing demand by network operators for a broad range of services such as stabilisation, storage and management. The Development is designed to support the flexible operation of the National Grid and the decarbonisation of the electricity supply. More information regarding this can be found in Section 1.3 of the Planning Statement.

The use of the Development is intended to support commitments to reduce emissions of greenhouse gas emissions to combat the effects of climate change.

The Atkins Report – Engineering Net Zero – The Race to Net Zero 2020[6] dispels the myth that the UK can achieve Net Zero without further concerted action in relation to how we generate and distribute electricity.

This Report quantifies the minimum requirement for new generation of energy to meet Net Zero by 2050 at 250 GW, with the UK system needing between 15 and 30 GW of new storage, during this time.

To put this into perspective, "the UK currently has 3.1GW of capacity in pumped storage plus about 1GW in batteries. We may need up to ten times this to achieve net zero."

The European Council 2030 Climate and Energy Framework[7] has set a further target of at least a 40% reduction in greenhouse gas emissions by 2030. The target is binding and all Member States are required to participate in this effort to further combat climate change.

The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019[8] sets a national target for net-zero emissions of 2045. Setting a 'carbon neutral', Net Zero target of 2045 is ambitious and ahead of the rest of the United Kingdom's target of 2050.The Government has set ambitious targets for reduction of carbon emissions. Projects, such as the Development play a key role in aiding the decarbonisation of the energy sector.

Further information on the need for the Development can be found in the accompanying Planning Statement.

4.3 The Site Context

The Site comprises land associated with the existing Baillie Wind Farm. The land is open field within the consented wind farm red line application area, with some rough grazing for livestock. Following a review of the Scotland's Soils: Soils Map[9] which details the national scale land capability for agriculture, the Site is located within land classified as Class 4.2 (land capable of producing a wide range of crops, primarily on grassland with short arable breaks of forage crops).

The Site is located at approximately 101 m to 108 m above ordnance datum (AOD) with a gentle incline from the east to the west of the Site.

The Site is bound on all sites by land associated with the Baillie Wind Farm and the established wind farm tracks adjoin the entrance on the eastern boundary.

The Site Layout is shown in Planning Drawing 2 accompanying the planning application.

[6] Atkins & SNC Lavalin (2020) *Engineering Net Zero: The Race to Net Zero* [Online] Available at: https://www.snclavalin.com/~/media/Files/S/SNC-Lavalin/download-centre/en/report/the-race-to-net-zero.pdf (Accessed 05/11/2021)

[7] European Commission (2014) The European Council 2030 Climate and Energy Framework [Online] Available at: https://ec.europa.eu/clima/policies/strategies/2030_en#tab-0-1 (Accessed 05/11/2021)

[8] Scottish Government (2019) Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 [Online] Available at: http://www.legislation.gov.uk/asp/2019/15/contents/enacted (Accessed 05/11/2021)

[9] Scotland's Soils (2017) Land Capability for Agriculture in Scotland [Online] Available at: (Accessed 05/11/2021)

4.4 Surrounding Land Use

The characteristic of the immediate surrounding land use is defined by the existing wind farm. Whilst the Site is currently open in character, the surrounding landscape is influenced by the presence of wind turbines.

A more detailed description of the Site and its surroundings is included in the Landscape and Visual Appraisal at Appendix 1.

4.5 Site Design

An explanation of each design component is set out briefly below.

4.5.1 Use

The design rationale for the use relates to statutory requirements and the Applicant's aspirations to combat climate change and reduce carbon emissions. The use of the site will be for the development of a Greener Grid Park to support the flexible operation of National Grid and decarbonisation of electricity supply by balancing electricity supply and demand.

Under HwLDP Policy 67, the type of development has in-principle support, subject to environmental consideration. Therefore, the Development is considered an appropriate use of the land.

Due to the nature of energy storage technology, it is important to have robust prevention, protection and mitigation systems to minimise the risk of overcharging, overheating or mechanical damage that could result in an incident such as a fire. As such, a Fire Safety management document is included at Annex A to demonstrate the measures in place for the Development.

4.5.2 Amount

The Development will consist of infrastructure to support the stabilisation and storage of electricity and the balancing of the grid network. The amount of infrastructure present on site directly links to the capacity to achieve this purpose. In proposing the Development, and with account to its proximity to the Baillie Wind Farm, the amount of infrastructure present on Site is reflective of a fit for purpose approach to design, whereby the Applicant has determined the amount of infrastructure that can be included on the Site to best achieve and maximise its desired purpose.

The full list of infrastructure components is included at Section 2.2 of this Statement. This amount of infrastructure has been incorporated into the Site with regards to appropriate safety measures, separation distances and the ability to operate and maintain the Development.

The amount of infrastructure present on the Site has been determined through the following principles:

- Maximising the potential for electricity storage, balancing the grid network, and contributing to decarbonisation;
- Ensuring safe and fit for purpose operations; and
- Ensuring that it does not unduly impact on environmental factors.

4.5.3 Layout

The layout has been informed by a number of factors through the site selection and iterative design process. These include:

- Suitable access to the site;
- The avoidance of environmentally sensitive areas to reduce potential effects on ecological assets, flood risk, landscape and visual amenity;

- Potential to incorporate biodiversity and landscape mitigation;
- The appropriate location for drainage infrastructure; and
- Achievement of optimum equipment efficiency and energy outputs through effective orientation and positioning.

4.5.4 Scale

The dimensions of the development infrastructure are included at Section 2.2 of this Statement. Most of the infrastructure will be at or below the equivalent of one story and where the height exceeds this, it is necessitated by the technologies contained within.

The visual impact, with regards to the scale of the Development, is considered in the Landscape and Visual Appraisal accompanying the planning application.

4.5.5 Appearance

Most components of the development will be housed in steel container-style units; however, the Applicant is open to input from the Council in terms of the final appearance in terms of colour and boundary screening.

The amount, layout, scale and appearance of the Development are considered to be design factors which determine the suitability of the Development. All of these have been considered and proposed with regards to HwLDP policies determining the appropriateness of the design and the value of using design to mitigate against unacceptable environmental effects.

4.5.6 Landscaping

The landscape planting and mitigation measures include native species hedgerow planting across the boundary of the Site. Further details with regards to Landscaping are available in Appendix 1: Landscape and Visual Appraisal and the accompanying Landscape Planting Plan.

4.5.7 Hydrology

As per the accompanying Outline Sustainable Drainage Strategy, on-site containerised units will be raised via plinths so as best to achieve the drainage strategy.

Figure 2: Example Raised Container Units

4.5.8 Ecology

Given the low ecological value of the Site, as determined by the accompanying Preliminary Ecological Appraisal, no ecological mitigation measures have been incorporated into the design.

4.5.9 Archaeology and Cultural Heritage

There are no listed buildings or other archaeological designations either on-site or impacted by the design of the Development. The final design iteration has taken account of all the Archaeological Assessment to ensure that no design mitigation is required.

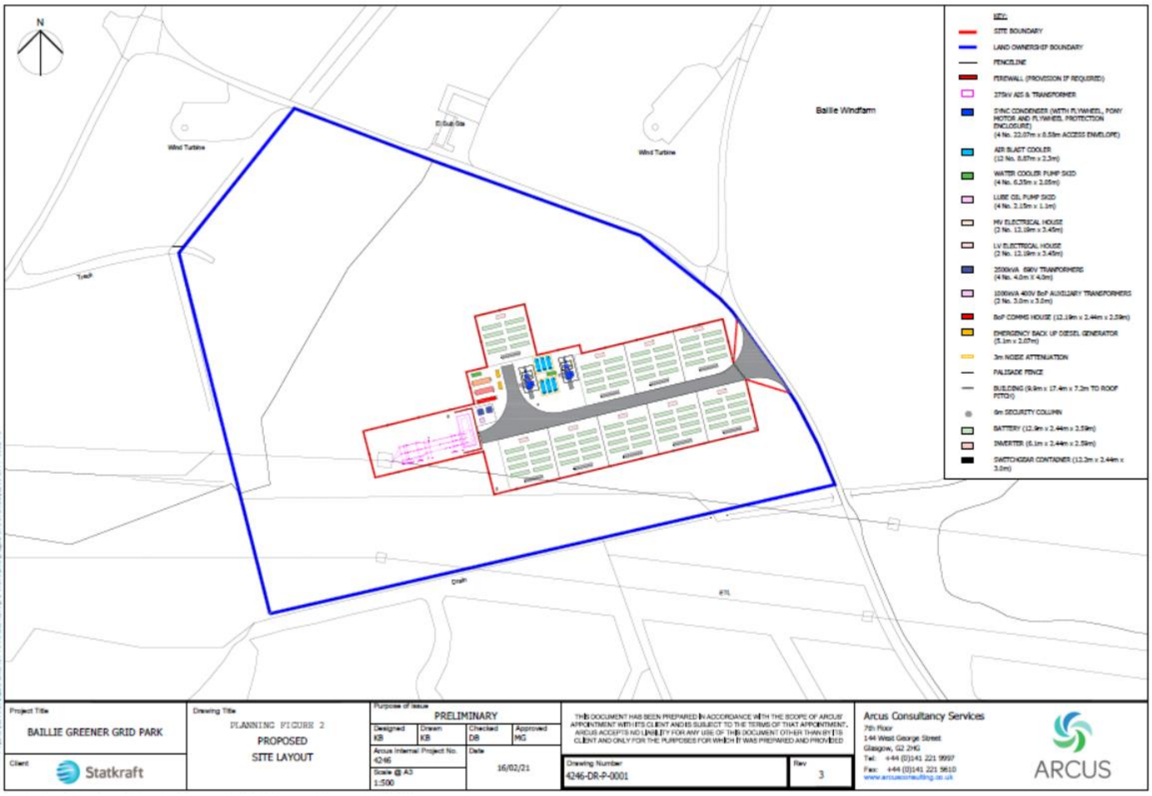
Under HwLDP Policy 67, renewable energy developments should take account of, amongst others, visual impact and impact on natural, built and cultural heritage features. The principles demonstrated in Section 4.5.6 – 4.5.9 of this DAS demonstrate that ensuring appropriate levels of impact on these environmental features has been at the forefront of the design process.

4.6 Design Principles and Evolution

The following section highlights the design evolution with regards to how the Development achieved the final design iteration.

In March 2021, a Screening Request and Pre-Application Request was submitted to the Council for a development on the Site.

Figure 3: Pre-application Layout

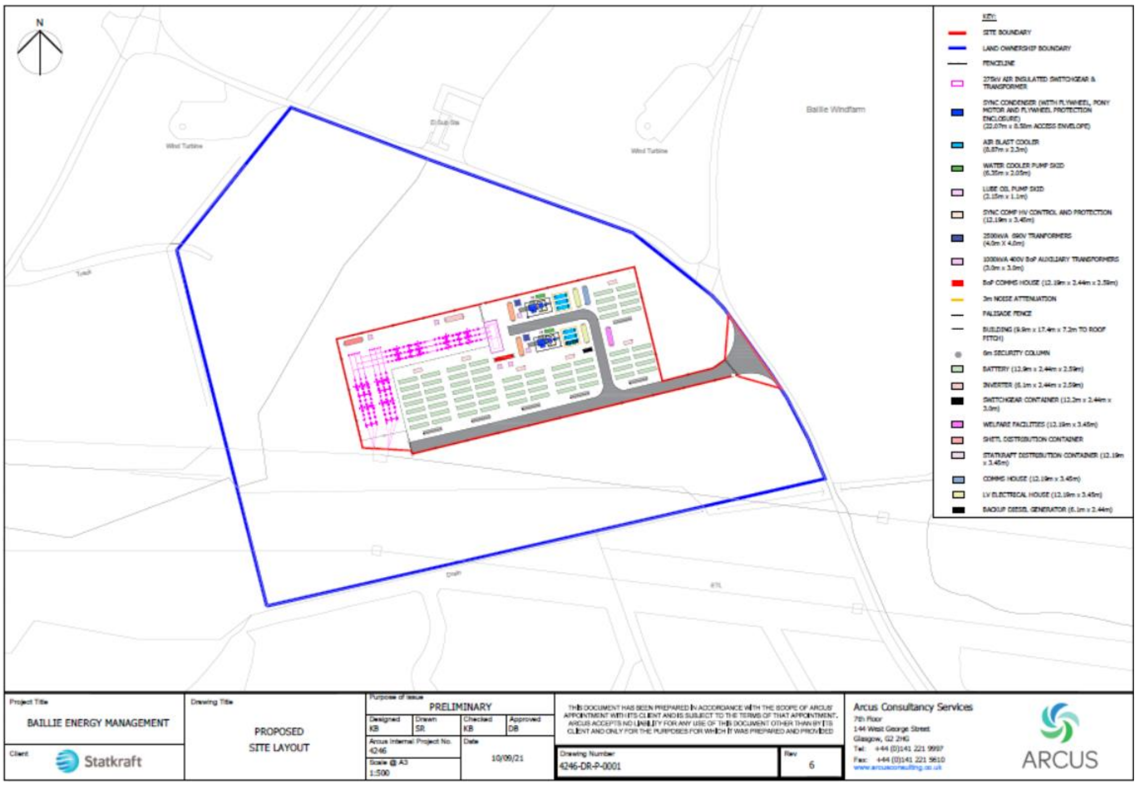


The size and orientation of individual component infrastructure was not required to be amended by any of the advice contained within the pre-application response.

The Site was determined to be non-EIA development; therefore, an EIA was not required and did not impact the design of the Development. However, a suite of surveys were undertaken and technical documents produced in support of this Application, to assess the acceptability of the Site based upon the layout.

Based on the advice provided the submitted layout contains alterations to boundary planting and drainage components.

Figure 4: Proposed Site Layout



The finalised layout has to be viewed in concurrence with the submitted Landscape Planting Plan in order to consider the full screening measures and design mitigation. This layout provides the following components:

- Accessibility to all infrastructure during construction and operation;
- Avoidance of placing tracks under overhead lines;
- Suitable separation of infrastructure for safety and deliverability purposes;
- Optimised site access point;
- Containerised infrastructure;
- Suitable landscape screening to minimise environmental effects; and
- Site size with the greatest potential to provide greatest stability for electrical grid.

The reorientation of the application boundary was determined throughout the pre-application process specifically in response to the following:

- Avoidance of siting plant and machinery, during construction and operation, under the Scottish Hydro Electric Transmission (SHET) 275 kV overhead lines in accordance with Guidelines of Good Practice; and
- To reduce the corners on the fenceline to improve the safety and security of the site.

5 THE ACCESS STATEMENT

5.1 Route to Site

All construction vehicles approaching the Site will be directed to use the approved approach route to Site. It is assumed that the majority of vehicles will approach the Site from the east via the A836, however a proportion may approach from the east by the B874. The proposed route is indicated on Figure 5 and listed below:

- Exit A9 onto the A836 westbound;
- Continue along the A836 westbound for approximately 15 km until its junction with the C1001 Shebster to Westfield Road;
- Turn left onto the C1001 Road eastbound and continue for approximately 6 km towards the Baillie Wind Farm access junction;
- Turn left into the existing wind farm and continue northbound until the on-site junction;
- Turn left and continue for approximately 0.5 km and turn left onto the internal access road towards the Site.

All construction vehicles departing the Site are expected to use the same route as on approach in reverse. It is acknowledged that further investigations are required for the delivery of the AILs, though it is noted this route was used by construction traffic (including the delivery of turbine components) during the construction of the Baillie Wind Farm.

Figure 5: Route to Site

Construction traffic is expected to arrive via the A9. Construction traffic will exit the A9 onto the A836. As this road is a major transport link, it is expected that any increase in traffic numbers due to construction of the Development will be negligible.

The A836 is a major single carriageway road within the Highlands which runs from Ross and Cromarty to Caithness. The junction connecting the A836 to the C1001 Shebster to Westfield Road, which will be used by construction traffic, is a crossroads junction. It is expected that any increase in traffic numbers on the A836 due to construction of the Site will be negligible.

The C1001 Road is a rural, single carriageway road, which provides a connection between the A836 and Thurso via Shebster, Westfied and the B874. It serves a number of residential properties and farms and access to the existing Baillie Wind Farm is via this road. The road was reasonably used by HGVs during the construction of the Baillie Wind Farm and other neighbouring wind farms.

Further details about the delivery route to site can be found in the accompanying Transport Statement.

5.2 Site Entrance

Access to the Site will be via an existing access junction into the Baillie Wind Farm site. This priority junction is well formed with good visibility and was used during construction and maintenance of the Ballie Wind Farm and therefore would not require improvement works to allow access to the proposed Development.

Warning signage will principally be located within the vicinity of the Site entrance to warn members of the public of the possibility of HGVs.

5.3 Access Track and Hardstanding

The proposed access track will take up an approximate area of 3,087 m^2 proposed hardstanding areas make up an area of approximately 15,757 m^2.

In total, approximately 8,480 m^3 of aggregate will be imported to the Site via a 20T tipper lorry with an assumed volumetric capacity of 9 m^3 which will result in 943 vehicle loads over approximately 2 months.

5.4 Construction Traffic Management Plan

Prior to the commencement of construction works on Site, a CTMP will be prepared and submitted to the Council for approval. It is assumed the requirement for the CTMP would be secured by an appropriately worded planning condition. This CTMP will provide specific timings of construction phases and will consider the specific details of how construction will be managed alongside the potential construction of the nearby proposed Limekiln Wind Farm if it is consented and if the construction timescales of the two projects overlap.

A Framework Traffic Management Plan is provided with this Application.

5.5 Construction Programme

The Development is expected to be constructed over a 12-month period.

Table 4.2 of the accompanying Transport Statement shows an anticipated construction programme.

6 CONCLUSION

This DAS has been prepared in accordance with requirements of Regulation 13 of the DMP and the relevant LDP policies.

The DAS has established:

- The design principles and rationale that have been applied to the Development, including the various relevant environmental and technical criteria;
- The steps taken to appraise the context of the Site, and how the design of the Development takes that context into account, in respect of design iteration, the various relevant environmental and technical criteria, and each design component;
- The relevant considerations in forming the site access; and
- That all relevant issues which might affect access to the Development have been addressed.

The DAS has thus established that the Applicant can ably demonstrate an integrated approach that will deliver inclusive design, and address the full range of access requirements throughout the design process.

ANNEX A – STATKRAFT FIRE SAFETY

Statkraft Fire Safety

The intention of this report is to provide information on how Statkraft manage fire safety across our Greener Grid Parks, with particular reference to Battery Energy Storage Systems (BESS).

1. Greener Grid Park Safety Overview

1.1. Introduction

Greener Grid Parks include synchronous compensator technologies as well as Battery Energy Storage Systems (BESS). Deploying energy storage at scale is essential to facilitate increasing levels of renewable energy on the electricity system, as wind and solar are variable in their output, not always generating electricity when it is needed. Energy storage technologies are a key part of a decarbonised electricity system and their deployment supports Government policy on climate change and energy security.

Renewable energy generation and energy storage are highly complementary technologies, combining to address the issues arising out of intermittency, especially at very high wind penetration levels.

Most grid-scale battery-based energy storage systems use rechargeable lithium ion battery technology. This is similar to that used in smartphones and electric cars but aggregated at scale to deliver electricity storage capability.

As energy storage systems become more common and are an increasingly important part of our global energy transition, it is only natural that communities being introduced to a new technology will have questions. Most important is to address any concerns people may have from a health and safety perspective. Safety is fundamental to the development of energy storage systems. Each energy storage unit has multiple layers of prevention, protection and mitigation systems. These minimise the risk of overcharge, overheating or mechanical damage that could result in an incident such as a fire. A global approach to hazard management in the development of energy storage projects has made the lithium ion battery one of the safest types of energy storage system.

2. Safety Measures

Safety management is a fundamental feature of all lithium-ion energy storage systems. Everything is done to prevent, mitigate and protect against potential hazards. Safety incidents are, on the whole, extremely rare.

2.1. Prevention

The safety systems for a battery storage project operate on multiple layers from the individual battery cell right up to the whole storage system.

The first layer is **monitoring**. Every individual cell is being constantly monitored by automated systems that track current, voltage, temperature and other critical information. These systems are generally known as Battery Management Systems (BMS) and are designed to ensure that the batteries are continually monitored and protected to prevent hazards occurring and to maintain the reliability of the batteries, so they are ready to deliver power to the grid when needed.

As soon as the BMS detects that a specific battery cell, or group of cells, is acting in a way that it should not, it can reduce the flow of electricity through the cell, switch it off or disconnect it completely from the power supply. The BMS also works to identify problems before they occur. It allows the operators to know the state of health of the individual battery cells so that any deterioration or fault can be detected, and appropriate maintenance carried out.

It is important that batteries are kept cool. This is to ensure they are operating safely, and it also improves the performance and operating life of the battery. Energy storage systems contain cooling and ventilation systems. These maintain the batteries at a stable operating temperature and remove excess heat in the event of potential overheating. These systems may use ventilation, air conditioning or liquid cooling to help prevent batteries from overheating.

It must also be noted that grid-scale energy storage systems must apply for planning permission and meet the relevant Authority planning requirements, including any appropriate fire safety assessments.

2.2. Mitigation

In the unlikely event of a problem occurring and the BMS failing to prevent it, energy storage systems have additional design measures such as alarms, fire detection and suppression systems. These suppression systems use techniques such as inert gas, foam suppression, fire sprinklers or water mist etc. to control fires. Battery energy storage project developers also work in advance of the construction of the project with the local Council, first responders and fire services to ensure they understand the kinds of technologies used in a storage facility and how best to work together to deal with any problem that might arise. As battery fires can release flammable gases, it is important that first responders and fire services in an area where a battery energy system is operational are aware of these risks and have plans in place on how to deal with any potential hazards.

The European Advanced Rechargeable and Lithium Batteries Association (RECHARGE) provides technical and legislative expertise on lithium batteries and works to ensure best practices and standards for the use of this technology. They carry out work on lithium ion battery safety and have published a rescue and training manual for first responders and fire services regarding lithium batteries in storage facilities. This guidance is incorporated into the design mitigation strategies for the BESS units.

2.3. Protection

To provide an additional layer of protection, batteries for energy storage systems are also generally housed in separate containers. This reduces the risk of a problem in one container spreading to the rest of the facility.

3. Safety Standards

Our Teams develop and operate BESS units to very high international safety standards. The safety of people working on BESS sites and those living nearby is our highest priority. Lithium-ion batteries are used safely and securely in countries and on countless sites across the world. Properly designed lithium-ion batteries can and are operated safely every day. A key part of ensuring any technology is used safely is to identify any potential risk, no matter how small and ensure it is guarded against. Potential hazards are mitigated to safe levels with careful and thoughtful management and design.

A concern raised by some communities living close to sites identified for battery energy storage units centres around fire safety. In the absence of proper prevention and protection measures a battery cell can become overheated due to a fault or short-circuit. Either one of these could cause what is known as a ‘cell failure’. When multiple cells are present there is a risk of a ‘thermal runaway’ where adjacent cells overheat and fail in a cascading reaction. This can lead to a fire and the release of toxic or flammable gases such as carbon dioxide or hydrogen fluoride.

A short circuit can also happen if a lithium-ion battery is damaged, penetrated or crushed mechanically. This risk is typically highest during shipment and installation. Once up and running the batteries are installed inside flame resistant containers. The interior layout of the container also helps prevent the risk of thermal runaway as batteries are placed in separate racks with spaces in between to prevent any potential fire spreading. This is in addition to housing the battery system in separate containers as outlined in the previous section.

Most importantly, safety is incorporated in the design, manufacture and transportation of the batteries in order to minimise the occurrence of defects which could result in a potential hazard. Lithium-ion batteries are subject to strict testing requirements set out in the United Nations regulations on the Transport of Dangerous Goods (UN/DOT 38.3) prior to transportation. These provide for the safe packaging and shipment of lithium-ion batteries and require a variety of testing under different altitude, vibration, impact and thermal conditions before transportation. Manufacturers of lithium batteries and products using lithium batteries must account for these testing requirements in the design, manufacture and distribution of their products.

There are also many established international standards which lithium ion battery manufacturers systems must comply with to ensure products are designed, manufactured and tested for safety, quality and reliability. Testing to these standards is conducted by the Original Equipment Manufacturer (OEM) of the batteries. International codes and standards are regularly updated using real world experience and tests to ensure advancement in overall industry efficacy and safety.

Installation of the battery storage system at the site is finalised via site acceptance testing. The purpose of this testing is to ensure that the system is installed properly, and that battery management and protection systems are working properly. This testing is carried out in cooperation between the battery system operator and the supplier.

Lithium-ion battery designers are constantly working to find new ways to ensure the safe use of this essential technology. Further technological advances, such as continued improvements in the safety characteristics of the LIB's as well as development of solid-state lithium ion batteries (which eliminates the liquid electrolyte and will improve design safety further) are also on the horizon.

The international energy consultancy, DNV GL, have also created global best practice guidelines for the safety, operation and performance of grid connected energy storage systems. These guidelines were created in conjunction with numerous industry bodies, associations, universities and technical experts and contain a wide ranging set of recommendations in areas such as storage system design and safety, risk management, testing and coordination with planning authorities which is adopted as best practice within the industry.

4. Statkraft Safety Systems

In addition to the measures set out in Sections 2 and 3, the Statkraft project team develop the following safety documents during the design phase to ensure fire safety risks are considered and mitigated as best as reasonably practicable. The following documents capture the safety requirements of a Greener Grid Park.

1. Fire Strategy Report
2. Fire Risk Assessment
3. Evacuation strategy
4. Fire Safety Drawings
5. A Fire Safety Manual is produced containing design information and operational records. In addition, it will provide a full description of the fire safety design, in regard to the management of the buildings, housekeeping and other functions. Thus, providing a continuously updated record of all aspects of the buildings and the buildings users that affect its fire safety.

5. Specific measures for a Greener Grid Park

As well as the specific fire safety techniques used for a battery energy storage system, safety of the Greener Grid Park as a whole is to be factored into the design. Some of the safety features Statkraft include are:

- The outdoor oil-insulated transformers will be separated from adjacent structures and from each other by Fire Resistance Barriers (Fire Wall), spatial separation, and provided with an enclosure that confines the oil of a ruptured transformer tank for the purpose of limiting the damage and potential spread of fire from a transformer failure. The containment area will be designed to accommodate the maximum spill from a ruptured transformer tank;

- Spatial separation between the transformer and the synchronous compensator building or the facing elevation wall of the building;

- Direct consultation with the fire department prior to construction;

- Automatic fire, gas and smoke detection (beam based);

- Automatic fire suppression (e.g. sprinklers – water and/or gas based);

- Use of fire-resistant non-combustible materials/enclosures;

- Air ventilation and temperature control in battery containers to prevent overheating;

- Regular maintenance and testing of BESS and synchronous compensators;

6. Conclusion

The use of lithium-ion in rechargeable batteries is well established globally. Over the last 50 years it has reached widespread adoption in consumer electronics and in the last decade with electric vehicles and grid-scale energy storage systems. However, the sector is far from static, continually applying new best practices and learning from experience to design energy storage systems that operate as safely as possible.

There are over 8.7 million fully Electric and Plug-in Hybrid cars in use around the world, and over 12 GWh of stationary battery storage in operation (equivalent to approximately 1.2 billion iPhones), yet battery fires are a rare occurrence due to the multiple levels of prevention, protection and mitigation measures that go into their design, manufacture, distribution and operation.

Safety is fundamental to the development and design of energy storage systems. Each energy storage unit has multiple layers of prevention, protection and mitigation systems that minimise the risk of overcharge, overheating or mechanical damage that could result in an incident such as a fire. There are also international best practice guidelines for industry to aid developers in the design and operation of battery storage systems in a safe and secure manner. A global approach to hazard management in the development of energy storage projects has made the lithium-ion battery one of the safest types of energy storage system.