DESIGN AND ACCESS STATEMENT

Battery Energy Storage Site

This document serves as an information pack in support of planning applications. It outlines the basic justifications, site selection process and design approach of land to be used for a battery energy storage site .

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LAND AT CAMSISCAN FARM, CRAIGIE, KILMAROOCK SOUTH Battery Energy Storage System (BESS)

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Acronyms and Abbreviations

Acronym	Meaning
MW	Megawatt
kV	Kilovolt
BESS	Battery Energy Storage System
CCTV	Closed Circuit Television
SSSI	Sites of Special Scientific Interest
km	Kilometre
EIA	Environmental Impact Assessment

1 Introduction

This report is submitted on behalf of (the applicant) Scot Stability Ltd and provides information to support a proposed development of a 350MW Battery Energy Storage System to be located at Camsiscan Farm, Criagie, Kilmarnock, KA1 5JT. The 350MW BESS is to be connected with import/export cables to the existing Kilmarnock South 400 kV substation.

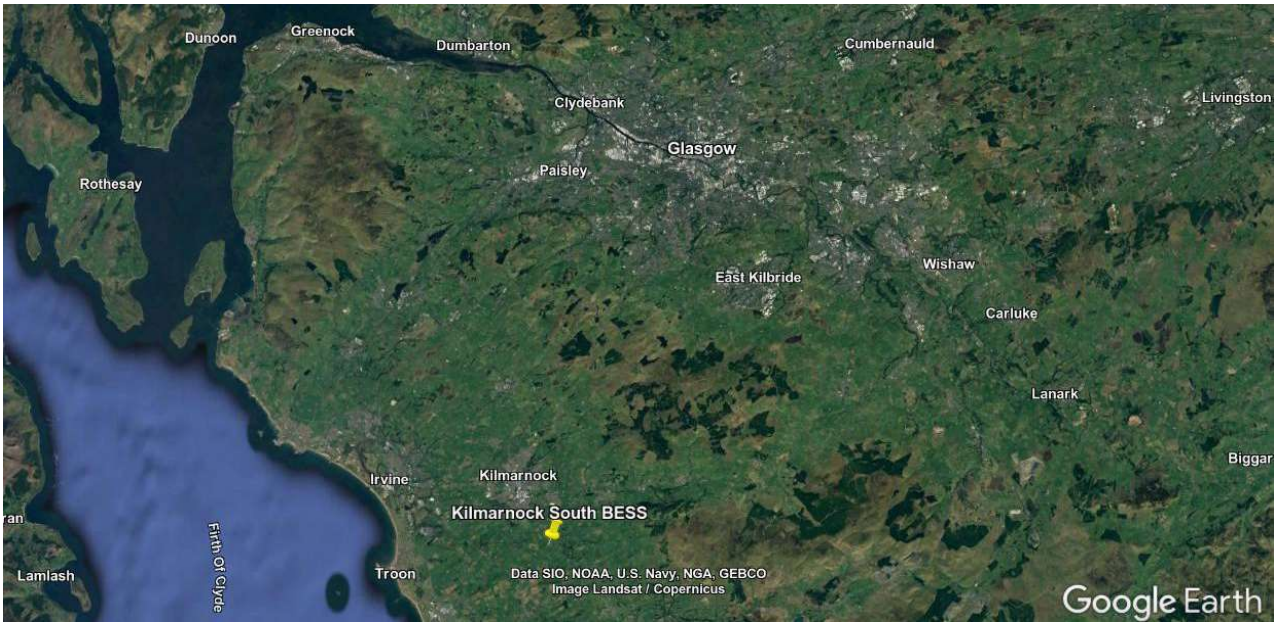


Figure 1 BESS Location

The BESS charges with electricity from the grid during periods of low demand and then discharges that electricity during periods of high demand. Energy is taken from existing and proposed sources, including renewables from wind farm, solar and hydro schemes in the wider area. The existing Kilmarnock South sub-station then distributes nationally and to smaller sub-stations regionally to meet demand requirements.

In addition, the BESS will contribute to grid stability by offering services to the National Grid, such as frequency control and inertia. Energy storage is a key enabler that will allow significant increases in intermittent renewable generation from wind and solar onto the UK electricity system by allowing rapid rebalancing of supply and demand, and critical stabilisation functions.
Without these services, it is not possible to connect additional wind or solar to the electricity network.

The proposed BESS project provides benefit by supporting the Scottish Government's transition to a low carbon electricity system by increasing the capacity of intermittent generation on the Scottish electricity network. It will be future-proofed to store energy created from future renewable sources, for example from any off-shore wind turbines which may be constructed in the future in the Irish sea.

Scotland's long-term climate change targets will require the near-complete decarbonisation of the energy system by 2050, with renewable energy meeting a significant share of the needs.

The Scottish energy strategy published in December 2017 sets a 2030 target for the equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption to be supplied by renewable sources. This is taken forward in the recently issued National Planning Framework 4: revised draft (8 November 2022) which identifies, as a National Development, Strategic Renewable Electricity Generation and Transmission Infrastructure to 'support electricity generation and associated grid infrastructure throughout Scotland, providing employment and opportunities for community benefit, helping to reduce emissions and improve security of supply' (https://www.gov.scot/publications/national-planning-framework-4-revised-draft/pages/2/). This proposal helps secure this significant requirement to some extent.

The primary factors include:

1. Managing imbalance caused by short term discrepancies between intermittent renewable generation, and time variable demand, and thereby facilitating improved decarbonisation of the electricity supply system.
2. Providing services to increase power flow capacity on the grid that increases grid headroom.
3. Increasing security of supply and grid stability.
4. Operational cost savings and financial/commercial opportunities
5. Setting the proposed BESS into the landscape, to reduce visual impact
6. Siting the infrastructure in area free from national, regional and local environmental, landscape, cultural heritage and ecological designation
7. Siting the BESS away from adjacent residential properties, as far as possible to minimize visual and noise impacts.

This Design and Access Statement has been prepared by Scot Stability Ltd, following an iterative design process. It is a document to support the application for consent, and should be read in conjunction with other application documents.

1.1 Proposed Development

The proposed development would comprise the following elements of external construction, which are fully detailed in the application drawings;

- Laying out of containerised battery units along with associated inverters, switchgear, closed loop cooling units, control units and associated electrical infrastructure mounted on concrete pads.
- An extra high voltage compound with associated switchgear and transformers, and containerised substation units and associated electrical infrastructure mounted on concrete pads.
- Transformers within bunded compounds.
- Standby power supply.
- Security welded mesh fence around the BESS substation and battery compound with access gate to the compound entrance from the road network.
- Erection of CCTV cameras.
- Laying out of a hard surfaced site access into to the BESS substation and battery compound from the internal road network. Car parking bays. Uncompacted gravel as a surface cover between the containerised units and equipment. Construction laydown area.
- Landscaping.

Figure 1 Example of BESS Site at Byers Brae, Scotland

1.2 Cables

In addition to the proposed development, Scottish Power will be responsible for the installation of the underground cable connections between the BESS substation and the existing Kilmarnock South 400 kV substation; potentially along the public highway. Electricity would be imported and exported between the BESS substation and the existing 400 kV substation.

Figure 2 Substation and BESS Sites

The cables will be installed underground and are not visible after installation. Depending on the ground conditions, they will be laid at an approximate depth of 1000mm (3ft 3”) to ensure the land retains its full use for agricultural purposes.

2 Land Requirements

2.1 Development Site and setting

Kilmarnock Flexpower Ltd, a subsidiary of Scot Stability Ltd and part of the Noriker Power group, is planning to construct a Battery Energy Storage System on land to the south of the electrical sub-station, see *Figure 3*.

Figure 3
Site Location

Latitude: 55.561889**, Longitude:** -4.458269

BLUE SHADED AREA: Proposed Battery Park
GREEN SHADED AREA: Enhanced ecological Habitat

2.2 Site Selection Process

The proposed development, including the construction laydown area, would be located on greenfield, arable farmland in South Ayrshire.

This site has been identified following an extensive site search within the region which considered environmental designations, local electricity network access and capacity, the physical characteristics of the site, and a supportive landowner.

The main factors in considering a location include, but not limited to, the following criteria:

- Connection capacity to the national transmission grid and associated connection offer
- Land availability close to the substation
- Agreed leases, easements and wayleaves
- Local population considerations
- Visual impact
- Nearest noise receptors
- Ecological considerations
- Topography
- Traffic Impact
- Geotechnicals
- Drainage and flooding
- Local heritage/archaeology
- National heritage designations
- Special Protection Areas
- National Scenic Areas
- Historic Environment
- Scheduled Monuments
- Sites of Special Scientific Interest (SSSI)

2.3 Preferred Site Justification

The following section outlines our decision process for the ‘why here’ justification of our preferred location.

2.3.1 National Grid Connection Offer

Confirmed grid connection offer received from National Grid

- Ref: *A/SPTL/KILM/21/KILM-EN(0)*
  - 21/03/2022
- Grid Supply Point/Connection Site: Kilmarnock BESS 400kV Substation
  - Connection Entry Capacity: 350MW
  - Transmission Entry Capacity: 350MW
  - Demand Limit: 350MW
- Connection Date: 31st July 2025

2.3.2 Land Availability

We use desktop tools, local contacts, land agents and database registers to search for suitable land close to substations. When suitable land is found, we reach out to land owners to investigate if they are open to dialogue for land lease and purchase options.

The land around Kilmarnock South 400kV substation has seen a large rise in applications and exclusivity agreements by renewable energy companies seeking to establish electrical connections to the grid has led to a shortage of land availability. In addition, any development needs to avoid the overhead lines emanating from the substation, underground cables and other utility infrastructure.

Justification

We have determined that the land that we have secured, approximately 1300 metres from the existing substation, offers the best combination of availability, avoidance of utility servitudes, access and importantly, lowest impact to the surrounding population and environment. It is worth noting that a major connection node such as Kilmarnock South would be expected to have several such projects connected to it as we transition to a renewable grid, and providing some separation between them lessens their cumulative impact in the landscape.

2.3.3 Proximity to existing energy infrastructure and landscape

As it is desirable to locate close to an existing substation or energy source and as land-take is relatively high, it is difficult to avoid using countryside locations for BESS facilities. However, the avoidance of developing a pristine high-quality landscape of special national, regional or local designation is also desirable, but at the same time, since the transition to net zero will require substantial integration of infrastructure into rural spaces, the avoidance of detrimental accumulation, where possible, is also advantageous. The existing Kilmarnock South substation is a low level structure, and visual impact tends to be dominated in the landscape by overhead line lattice pylons and wind turbines.

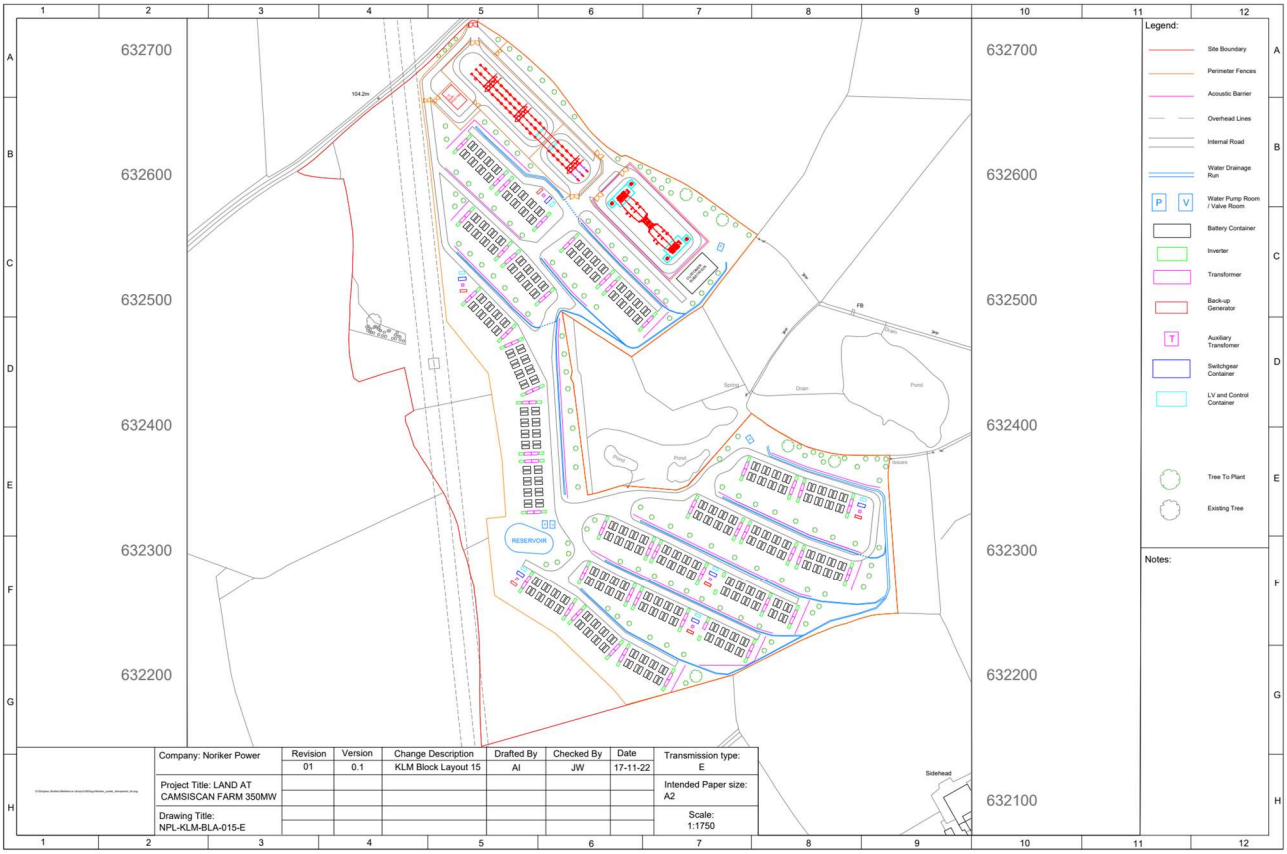
Justification

We have secured land that lies adjacent to a line of lattice pylons, and in the same visual space as two wind turbines, but is not constrained by special landscape designation, which land ought to be protected if possible. It is obscured from long distance views from three sides by the topography. The landscape therefore has elements of existing energy infrastructure, while avoiding an overbearing accumulation with this development. Further information is provided in the LVIA. It is proximate to the Kilmarnock South substation, which is sited in a more open landscape and developments nearer to it risk a greater visual impact to a larger number of people.

2.3.4 Local Impact

How the site impacts the local community plays a key part of the site selection process. Whilst the introduction of BESS sites to the national grid stabilises the power as increasing amounts of renewable energy is generated, how the site is perceived by the local population after switch on is also a key factor. When selecting a site, factors such as noise, ecology and environment are important criteria but so is the potential impact on people who live and work in the immediate area. Selecting land away from population clusters, holding open dialogue about the project with those who represent local people, and minimising impact by using smart construction techniques and management, helps to build confidence with the local population. Creating new habitats and enhancing existing ecological areas brings benefits to the local ecology, and compensates for perceived harm.

Justification



A landscape-led design approach to the site follows the principle of blending into the existing landscape with low terracing, utilising the natural topography of the land and ensuring that additional tree planting matches the existing landscape. This is to ensure that the visual impact is strongly mitigated and the area enhanced ecologically. The preferred site also allows the designers to take advantage of the natural topography of the land, enhance an existing biodiversity habitat, and the potential to construct a 1.5 million litre lake and catchment ponds for cooling batteries in an emergency. By using the naturally sloping hillside, water will return through drainage channels to interceptor ponds before being returned to the lake. The interceptor ponds serve to protect the environment in the event of an emergency by stopping water flowing into the biodiversity area and wider environment.

2.3.5 Noise Receptors

When planning large scale BESS sites, noise is one of the primary concerns of the local population during construction and when operational. When searching for suitable land, close to substations, sensitive noise receptors are a major factor of site choice and site selection / deselection. There are a number of ways to mitigate against noise, including constructing or specifying acoustic control equipment and these are typically deployed if required.

Justification

The land close to the existing sub station contains a number of residential buildings (sensitive noise receptors). Our preferred land offers the best compromise of low population density, natural topography of the land and proximity to the existing substation. The nearest noise receptor to the proposed BESS is the current landowner, who fully supports the proposal. We have designed the layout to ensure that noise from the BESS site will not impact quality of life for those living locally. Noise impact on visitors to the area is not a significant issue as there are no known attractor facilities (for example, tourist areas, natural beauty locations or core / cycle paths in close proximity to the site).

Reference should be made to the noise report which accompanies the application.

2.3.6 Site Surveys

Extensive site surveys are carried out by third party consultants to ensure that the land is suitable for a BESS site to be constructed. One of the primary studies is the impact on the ecology of the land in and around the proposed site. Carrying out such surveys, and by investing in the enhancement of existing habitats and creating new ones where appropriate, we ensure the BESS site will have a minimum detrimental impact on the local environment. Whilst not all sites require an EIA report, it is still important to demonstrate our commitment to biodiversity. Other factors such as flood and drainage reports, pre and post construction, site investigations for archaeological remains or areas designated as National heritage designation, Special Protection Areas, National Scenic Areas, Scheduled Monuments and Sites of Special Scientific Interest (SSSI) need to be considered.

Justification

Special consideration was made for this site to ensure there were not any significant areas of natural or archaeological interest, or other restrictions to develop the land. The (Confidential) Ecology Report identifies the relatively low-ecological value of the site. The site was designed with the landowner to ensure that other areas of the farm are not impacted and that an existing habitat is enhanced and offering greater biodiversity contribution to the area. A specialist landscape team will be contracted to ensure that the long term wellbeing of the site is maintained and that features such as the lake are inspected frequently.

3 Design Approach

Key:

- Site Boundary
- Existing vegetation
- Proposed battery containers
- Proposed hardstanding / internal roads
- Proposed trees
- Proposed mixed species hedgerow
- Proposed mixed species scrub and trees
- Proposed species rich grassland / meadow
- Proposed embankments
- Proposed reservoir
- Proposed water drainage runs / water catchment ponds

Ecological Enhancement Notes:

H - Mixed species hedgerow & trees including:

Hedge Mix:

- 60% *Crataegus monogyna*
- 10% *Acer campestre*
- 10% *Corylus avellana*
- 10% *Prunus spinosa*
- 5% *Prunus padus*
- 5% *Rosa canina*

Tree Mix:

- *Quercus robur*
- *Carpinus betulus*
- *Acer campestre*
- *Sorbus aucuparia*

M - Species rich grassland / meadow

BESS facilities are relatively standard facilities, with limited scope on size of battery unit and associated infrastructure. The design approach to this site was to accommodate a BESS facility to store 350MW energy whilst limiting impact on the landscape and residential amenity. The site selection above demonstrates the appropriateness of the site in relation to proximity to the Kilmarnock South sub-station, the already degraded landscape due to the OH pylons, and the sparsity of landscape, residential and ecological features.

Considerations for the site relate to layout, height, colour and landscaping.

Layout

Predominately the proposed BESS would be at a height of 3m (single storey) although the associated infrastructure will rise to a maximum height of 15m (within the high voltage compound) to meet Scottish Power's requirements. A number of different layout options were considered, and went through fifteen design reiterations. Three solutions were introduced to ensure the design has least impact on the landscape :

- higher infrastructure at the lowest part of the site
- battery units sited utilizing the existing land form, in a tiered layout

Height

Both double temp and single storey units were considered to assess the appropriate design. It was determinaed that a larger site to allow single storey units only should be proposed, rather than reducing site area and increasing height. This allows the proposed development to be screened from view behind existing landform.

Colour

To assimilate the units into the landscape, it is proposed that the units are finished in green colour, specification to be agreed.

Landscape

Landscaping is proposed on the site boundaries and between the terraces of battery units to soften the effect of the development over the longer term.

4 . Conclusions

After an extensive due diligence process, it was determined that this area of land offered the best compromise of availability, landowner engagement, impact mitigation, and, importantly, strong scope to enhance local biodiversity. The philosophy behind the land choice is not to hide the battery park behind large fences and screens, or by creating long rows of unnaturally planted trees. Instead the focus was to find land where the battery park can more softly blend in, without sharp lines or contrasting colours, and by enhancing the local ecology. A large amount of battery storage is required on the national transmission system to support net zero. It is desirable that this is developed with sympathy, when the necessary connection locations are situated within rural landscapes.

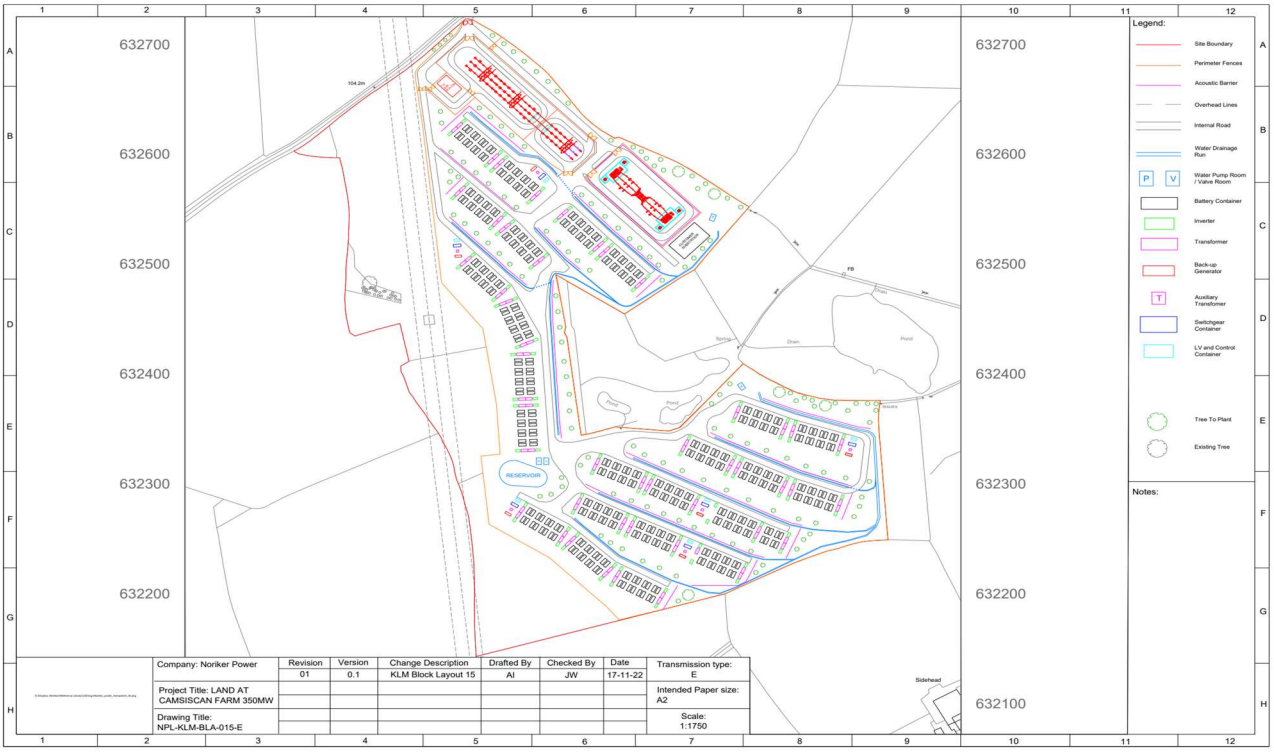


Figure 4 Site Block Layout fifteen