

Greenfields BESS – Energy and Sustainability Statement

This Energy and Sustainability Statement has been prepared by Enso Energy on behalf of the Applicant, Enso Green Holdings X Limited, for the proposed Greenfields Battery Energy Storage System ('BESS') on land at Greenfields Farm, Thorney Edge Road, Bagnall, Stoke-on-Trent.

This statement sets out the planning policy context for sustainable development at both the National and Local level, recognising the critical national priority of delivering large-scale battery storage to meet the UK's ambitious grid decarbonisation target on our way to delivering Net Zero. It also sets out outlines the key sustainability measures that are incorporated into the construction, operation, and decommissioning stages of the Proposed Development.

Greenfields BESS

Please refer to the Planning Statement and Design and Access Statement, for a full description of the Proposed Development.

The Proposed Development will support the flexible operation of the National Grid as it decarbonises, allowing more renewable energy generation to be connected, therefore decarbonising the UK's energy supply. It is obvious that the UK needs more renewable and low-carbon sources of electricity to replace the aging fleet of fossil fuel power stations.

BESS facilities help to 'smooth out' the intermittent generation of renewables by importing, storing, and exporting electricity when required. Typically in the UK, excess energy generated by offshore wind overnight is imported and stored, and then released during the day during peaks such as early morning and late afternoon / early evening.

The Proposed Development will not generate any additional electricity; nor will it have any direct on-site emissions of Carbon Dioxide (CO₂) during its normal operation.

Policy Context

The full set of relevant National and Local policies are outlined in the Planning Statement. The legislation and policies relevant to this statement are:

- Climate Change Act (2008) – set a legally binding target for the UK to reduce CO₂ emissions to 'Net Zero' by 2050.
- Paris Agreement (2016) – global economy needs to be zero-carbon by the second half of the 21st Century.
- Energy White Paper (2020) – sets out a clear position of support for energy storage projects.

- British Energy Security Strategy (2022) – seeks to accelerate the transition away from oil and gas and towards renewables; prioritise flexibility with large-scale, long-duration electricity storage to balance the system.
- National Policy Statement EN-1 (2023)
 - to ensure our supply of energy always remains secure, reliable, affordable, and consistent with meeting our target to cut GHG emissions to net zero by 2050... This will require a step change in the decarbonisation of our energy system.
 - Paragraph 3.3.26 states *“storage is needed to reduce the costs of the electricity system and increase reliability by storing surplus electricity in times of low demand to provide electricity when demand is higher”*.
 - Paragraph 4.7.2 states *“It is acknowledged, however that the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area”*.
- National Planning Policy Framework (2023)
 - Paragraph 7 *“The purpose of the planning system is to contribute to the achievement of sustainable development... at a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs”*.
 - Paragraph 8 sets out the ‘economic, social and environmental’ objectives of sustainable development. So that sustainable development is pursued in a positive way *“at the heart of the framework is a presumption in favour of sustainable development (paragraph 11)”*. For decision-taking this means:
 - c) *approving development proposals that accord with an up-to-date development plan without delay; or*
 - d) *where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:*
 - i. *the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or*
 - ii. *any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.*

The relevant policies to this statement from the Staffordshire Moorlands District Council’s Local Plan (adopted September 2020) are:

- **SD1 ‘Sustainable Use of Resources’** - The Council will require all development to make sustainable use of resources, and adapt to climate change. This will be achieved by:
 1. Having regard to the BMV agricultural classification of the land, with a preference for the use of lower quality over higher quality agricultural land. Development should also aim to minimise soil disturbance and to retain ecological connectivity as far as possible
 2. Supporting or promoting proposals that remediate brownfield sites affected by contamination.

3. Re-use of sites affected by mining activity will be supported, provided that any mining legacy is appropriately addressed and it can be demonstrated that the site is safe and stable for the development proposed.

4. Supporting development that is located and designed to minimise energy needs and to take advantage of maximised orientation (subject to design and landscape policies) to achieve energy savings in line with Policy SD 3.

5. The Council will require applicants for all major-scale planning applications (10 or more residential units or 1,000+ square metres floor area) to demonstrate that they have considered the energy efficiency, water conservation, sourcing of construction materials, and site orientation aspects of the scheme, and where possible the feasibility of integrating micro-renewables. The degree of detail expected will depend on the scale/complexity of the proposal.

6. The Council will encourage developers to investigate the potential for re-using construction or construction waste materials, especially those sourced locally (which can include those minerals available on site, as appropriate) and integrates where possible on-site waste management facilities.

- **SD2 'Renewable/Low Carbon Energy'** - The Council will strive to meet part of the District's future energy demand through renewable or low-carbon energy sources (which could be through a variety of technologies, for example solar energy, biomass etc), in line with current evidence which identifies the feasibility of these forms of energy across the District. The Council will assess wind turbine schemes in line with the Government's specific policy on wind turbines. For all other forms of renewable energy the Council will support small- and large- scale stand alone renewable or low-carbon energy schemes subject to the following considerations:
 - the degree to which the scale and nature of a proposal impacts on the landscape, particularly having regard to relevant Landscape Character evidence and impact on the Peak District National Park (taking into account both individual and cumulative effects of similar proposals);
 - the degree to which the developer has demonstrated any environmental/ economic/ social benefits of a scheme, as well as how any environmental or social impacts have been minimised (e.g. visual, noise or smell);
 - the impact on designated sites of European (or successor), national and local biodiversity and geological importance in accordance with policy NE 1;
 - the impact on the amenity of residents and other interests of acknowledged importance, including the historic environment;
 - the degree to which individual proposals reflect current local evidence regarding the feasibility of different types of renewable or low-carbon energy at different locations across the District;
 - in the case of solar energy proposals that are not affixed to buildings or structures, applicants will be expected to demonstrate that they have examined whether previously developed land is available before greenfield land. Where agricultural land is proposed, poorer quality land should be utilised before higher quality agricultural land.
- **SD3 'Sustainability Measures in Development'** - The Council will support further carbon-saving or water-saving measures in both new and existing developments, in the following ways:

1. Supporting developers who propose exceeding the thermal efficiency or water conservation standards required by law for new buildings or extensions, at the time of the application. In the case of larger developments such as housing estates the Council will support measures such as 'communal' renewables, or District Heating installations.
2. The Council will support measures by landowners/developers designed to contribute to existing or emerging District Heating networks (for example by connecting 'exporters', with receptors, of heat).
3. The Council will support measures designed to improve the sustainability of existing buildings (such as improved thermal insulation, water conservation, or the installation of micro-renewables).

Sustainability and Energy Appraisal

The following topics are explored below:

- Grid services
- Energy and Greenhouse Gas Benefits
- Environmental Considerations

Grid Services

Battery Energy Storage Systems are electrochemical devices that can deliver various services to the electricity grid. They can charge up with electricity at times of excess generation, store that electricity, and then discharge it at times of higher demand.

Regarding sustainability, BESS facilities play a crucial role in reducing overall renewable energy curtailment (i.e. paying renewable energy producers to reduce or 'shut down' generation during times of excess demand to maintain the balance between supply and demand). To achieve Net Zero, it is clearly in the UK's interest to use as much low-cost, renewable and low-carbon energy as possible. By charging BESS facilities with low-cost energy during times of excess generation, and discharging that energy at times of high demand, more low-cost energy will be available to all users. This has the added potential benefit of reducing the cost of electricity, resulting in cheaper bills.

BESS facilities can also provide instantaneous responses to maintain overall system frequency. The batteries can begin to discharge (and charge) electricity within fractions of a second, significantly faster than fossil fuelled power stations, making them excellent at frequency response.

Energy and Greenhouse Gas Benefits

There are no established or defined methods for calculating Greenhouse Gas emissions savings for BESS facilities; values will vary because of the 'carbon intensity' of electricity at any given moment and will not include the additional carbon savings through reducing curtailment. With regards to Greenhouse Gases, it is difficult to estimate these savings over the lifetime of the proposed development because of the anticipated change (increase) of renewable generators operating throughout the UK.

For the purposes of this document, based on similar projects in the UK using two charge/discharge cycles per day, the Greenfields BESS is forecast to provide 992,800 MegaWatt hours (MWh) of electricity each year. Table 1 sets out this forecast calculation.

Parameter	Value
Indicative power capacity	400 MW
Deployment rate	Up to .25 (4 hours)
Energy capacity	1,600 MW
Cycles per day	2
Annual charging capacity	1,168,000 MWh
Typical DC/AC efficiency	85%
Annual discharging capacity	992,800 MWh

Table 1- Greenfields BESS indicative forecast capacity

Based on the average UK home electricity use of 2,700 kWh¹ this equates to meeting the annual electricity demand for approximately 367,704 average UK homes.

It is accepted that the operation of BESS projects reduces the need for fossil fuelled power stations to generate electricity, thereby reducing overall carbon emissions, when BESS facilities are discharging. The overall amount of Greenhouse Gas savings will depend on the specifics of how the Greenfields BESS operates.

Reducing Greenhouse Gas emissions will be considered as part of the construction and decommissioning process. This shall include:

- How construction materials and BESS components are selected and sourced.
- Ensuring compliance with the Construction Environmental Management Plan to ensure both environmental and human protection during the construction phase.
- Effective logistics of construction vehicles.
- Maximising the amount of materials recovered and recycled as part of an overall Site Waste Management Plan, including how the materials within the batteries are recovered.
- Preparation of a Decommissioning Plan, setting out the ways in which the decommissioning process will maximise the recovery and recycling of materials and battery components, particularly metals.

Environmental Considerations

The Greenfields BESS application is supported by a full suite of environmental documents and surveys, that demonstrate why this site is appropriate for a BESS. Local Policies SD1 and SD2 are relevant as they confirm the Council will support applications for renewable and low-carbon if its sustainability can be demonstrated and the impacts of the development have been minimised.

Please refer to the Planning Statement, which provides a topic-by-topic breakdown of the environmental matters considered as part of the application. With regards to policies SD1, SD2 and SD3:

¹ <https://www.ofgem.gov.uk/average-gas-and-electricity-usage> Medium typical annual electricity use (kWh)

- BMV agricultural classification of the land – Grade 3b lower quality agricultural land. The development reduces soil disturbance as much as possible and enhances ecological connectivity through strategic landscape and planting.
- The sourcing of construction materials will be dealt with at the pre-construction procurement stage. Materials (soil, aggregate, etc) that are available on site will be used, or sourced as locally to the Proposed Development where possible. An on-site waste management strategy will be developed as part of a CEMP.
- The Proposed Development has no impact on the Peak District National Park (taking into account both individual and cumulative effects of similar proposals);
- The environmental, economic and social benefits of a scheme, as well as how any environmental or social impacts have been minimised (e.g. visual, noise or smell) are detailed within the Planning Statement and the documents submitted in support of the application.
- There are no impacts on designated sites of European (or successor), national and local biodiversity and geological importance. The site delivers Biodiversity Net Gains in both habitats and hedgerow units.
- Any impacts on the amenity of residents and users of the nearby Public Rights of Way have been mitigated through design.
- The historic environment is demonstrated to be preserved.
- There is a clear need for low-carbon energy storage projects such as the Greenfields BESS. This is demonstrated both at the local level (Policy SD2) and National Policy (and Legislation) relating to carbon reduction and Net Zero.

Conclusion

The NPPF states unequivocally at paragraph 157 that *“the planning system should support the transition to a low carbon future in a changing climate... it should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure”*.

NPS EN-1 states at paragraph 3.3.25 that *“Storage has a key role to play in achieving net zero and providing flexibility to the energy system, so that high volumes of low carbon power, heat and transport can be integrated”*.

The Greenfields BESS will support the UK’s legally binding transition to a Net Zero economy. The Proposed Development is clearly a form of sustainable development that will deliver benefits at a local and national scale. By enhancing renewable energy integration, reducing carbon emissions, and providing vital grid services, this project aligns with UK Government’s energy goals and contributes to a greener, more resilient energy system.