

Planning Factsheet – Battery Storage

Reading Gate Retail Park, Reading, RG2 0QG

This statement outlines the national stance on renewable energy and low carbon energy development which includes battery storage.

National Infrastructure Commission – Smart Power (March 2016)

The NIC prepared a report outlining how the UK market can better respond to its energy supply and demand. It concluded the need for 'smart power' providing interconnectivity, storage and demand flexibility to meet carbon targets and secure the supply of energy. The report states:

"The benefits of storage could be substantial. It can help reduce the impact of peak demand, provide an outlet for power stations at other times of day, and ease constraints on our grids. Network owners are only just starting to make use of storage technologies. There is now enormous potential to make storage technologies an integral part of our networks. Network owners should be encouraged to see storage as a central tool to improve the capacity and resilience of their networks as part of a more actively managed system." (p35).

Page 38 of the NIC goes on to state:

"A key role for storage technology will be to provide some of the grid stability services needed to keep the electricity system resilient to unexpected events, such as a power station failing... Batteries and other storage technologies are also ideally suited to play this role as they can dispatch power extremely quickly, precisely matching the needs of the system. Battery technologies are already more effective than using existing power stations for some of these services, demand for which will grow as the electricity generation mix develops and an increasing share of generation comes from intermittent renewables such as wind and solar power".

This outlines the importance of battery storage to support the renewable energy mix in the UK.

Energy White Paper 'Powering our Net Zero Future' (Dec 2020)

The Energy White Paper recognises the movement towards renewable forms of energy however, it outlines that:

"to ensure that the system is also reliable, renewables need to be complemented by technologies which provide power, or reduce demand when the wind is not blowing, or the sun does not shine"

Further, it recognises the need to move away from gas-fired power stations that have previously provided flexibility to the grid to meet high demands and towards cleaner forms of energy storage such as batteries. It notes that this could help reduce consumer costs by preventing the need for expensive network reinforcement or additional electricity generation.

The White Paper goes on to state that it will support such forms of cleaner technologies required to support the renewable energy transition. Smart Systems and Flexibility Plan 2021

The plan sets out a vision, analysis and work programme targeting the delivery of flexible electricity systems to assist the transition to net zero by 2050 and provide energy security.

Page 37 of the White Paper states that battery storage is targeted to provide "significant flexibility to the system...and helping to address many of the challenges presented by a low carbon system, including maintaining energy security" by 2030. It continues:

"It [electricity storage] is essential to a net zero system as it can store electricity when it is abundant (e.g., when it is windy or sunny) for periods when it is scarce (e.g., when demand is higher)."

Page 5 of the plan notes that BEIS and Ofgem analysis shows around 30GW of carbon flexible capacity

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could be needed as early as 2030, and 60GW by 2050. There is a clear need for increased electricity storage to achieve these targets given that as of 2021 a total of 4GW of electricity storage was operational in Great Britain, of which just 1GW was made up of lithium-ion battery storage.

National Grid ESO 'Future Energy Scenarios' (2023)

This report outlines the investment required in new energy infrastructure to meet net zero by 2050 along with policy implications and how we consume our energy. It predicts a number of scenarios based on our societal change. The report states that:

"electricity storage will need to increase significantly to support the decarbonisation of the electricity system".

Across all scenarios outlined, battery storage is expected to make up the largest share of storage capacity by 2050. In the future it is anticipated that a much greater share of dispatchable sources of supply will come from other sources, such as electricity storage.

By 2030 we will need to increase from the 2022 baseline position of 3.5GW of storage capacity to between 17GW and 31GW. This drastic increase in estimations in such a short period of time demonstrates the need to adopt a greater number of renewable energy storage technologies and associated development, at a much quicker rate. The 2023 FES Report also provides a 'Fall Short' scenario in which we do not achieve net-zero by 2050, and even this scenario requires 13GW of storage capacity, a four-fold increase on the current baseline position. Furthermore, by 2050 energy storage will likely need to increase to between 37.5GW and 68.5GW to achieve net zero.

The UK Government has estimated that technologies like battery storage systems could save the UK energy system up to £40 billion by 2050. There is clearly an important and established need for battery storage which needs to be supported and expanded over the coming years/decades.

Regarding availability of sites, National Grid have a network of 298 Super Grid Transformer Substations, just over half of these currently have capacity to accommodate battery storage of the proposed site's scale. This identifies a clear shortage and the importance of the delivery of new battery storage sites.

NESO Clean Power 2030 (Oct 2024)

This report sets out the advice of the National Energy System Operator's to achieving clean power by 2030. As part of this a number of key priorities have been set out, one being 'Unlock flexibility of demand and supply' emphasising the importance of flexibility in a system of renewable power generation.

The clean power pathway sets a target of four-to-fivefold increase in demand flexibility including over 22GW of grid connected battery storage. It further sets out that:

"Key supply-side technologies (e.g. offshore wind, onshore wind, solar, batteries) will all need to deploy more on average each year to 2030 than they have ever done in a single year before."

There is also an emphasis on planning and consenting timescales to allow construction within the next 6-24 months.

With regard to battery storage the report states at p23:

"Our pathways see battery capacity increase from around 5 GW in 2023 to between 23 and 27 GW in 2030. This represents a major scale-up in build rates, but there are many more projects in the



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pipeline. Batteries currently have a one-to-two-year deployment lead time and annual levels of deployment have increased every year since 2020. The principal role of batteries today is to provide within-day flexibility by cycling regularly to help match supply and demand. Additionally, they provide vital system services, such as frequency response, for which their role is likely to grow to 2030 as use of gas generation falls."

Clean Power 2030 Action Plan (Dec 2024)

The Clean Power Action Plan for 2030 builds on the recommendations made by NESO and has been adopted by Government and includes key targets to achieve a clean power system by 2030. With regard to battery storage it outlines a requirement for 23 – 27GW of battery capacity by 2030 which is approximately 5 times the current installed capacity (Approx. 4.5GW).

This shows a significant demand for new battery storage systems to come online along with the importance of having a grid connection before 2030 to achieve this target.

The plan also sets out that the world is facing twin climate and nature crises which threaten global health, wealth and security. These are inextricably linked. Not only is the UK government committed to reaching net zero by 2050 and clean power by 2030, it is also committed to restoring nature, as demonstrated, for example, with the Environment Act targets in England to halt the decline in species abundance by 2030.

National Planning Policy Framework (Dec 2024)

Paragraph 8 outlines the three overarching objectives to deliver sustainable development being economic, social and environmental.

Paragraph 11 confirms that:

"For decision-taking this means: c) approving development proposals that accord with an up-to-date development plan without delay".

Paragraph 168 states:

"When determining planning applications for all forms of renewable and low carbon energy developments and their associated infrastructure, local planning authorities should: a) not require applicants to demonstrate the overall need for renewable or low carbon energy, and give significant weight to the benefits associated with renewable and low carbon energy generation and the proposal's contribution to a net zero future"

Planning Practice Guidance

In addition to the NPPF, PPG provides further guidance on Battery Energy Storage Systems within PPG 'Renewable and Low Carbon Energy' paragraphs 32 – 36.

Paragraph 32 confirms the need for this type of development where it states:

"Electricity storage can enable us to use energy more flexibly and de-carbonise our energy system cost-effectively – for example, by helping to balance the system at lower cost, maximising the usable output from intermittent low carbon generation (e.g. solar and wind), and deferring or avoiding the need for costly network upgrades and new generation capacity."



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National Policy Statement for Energy EN-1 (Jan 2024)

Paragraph 5 of the NPPF outlines that National Policy Statements form part of the overall framework of national planning policy, and may be a material consideration in determining planning applications. It is important to consider their context and material when assessing the proposed planning application.

In January 2024 the updated NPS (EN-1) was adopted which recognised the importance of storage where it states:

“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... 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. Storage can provide various services, locally and at the national level. These include maximising the usable output from intermittent low carbon generation (e.g. solar and wind), reducing the total amount of generation capacity needed on the system; providing a range of balancing services to the NETSO and Distribution Network Operators (DNOs) to help operate the system; and reducing constraints on the networks, helping to defer or avoid the need for costly network upgrades as demand increases.”

NPS EN1 paragraphs 4.2.4 and 4.2.5 have introduced a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure. Low carbon infrastructure for the purposes of this policy means for other energy infrastructure, fuels, pipelines and storage infrastructure, which fits within the normal definition of “low carbon”.

The provisions of the NPS are a material consideration in s78 TCPA planning applications and weigh heavily in favour of new renewable and low carbon development.

NPS EN1 sets Criteria for Good Design for Energy Infrastructure, which must be read alongside NPPF policy on design (Para 135) and local plan policies guiding place, character and appearance (our emphasis):

“4.7 Criteria for good design for Energy Infrastructure

*4.7.1 The visual appearance of a building, structure, or piece of infrastructure, and how it relates to the landscape it sits within, is **sometimes considered to be the most important factor in good design.** But high quality and inclusive design goes far beyond aesthetic considerations. The functionality of an object – be it a building or other type of infrastructure – including fitness for purpose and sustainability, is equally important.*

4.7.2 Applying good design to energy projects should produce sustainable infrastructure sensitive to place, including impacts on heritage, efficient in the use of natural resources, including land-use, and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible. It is acknowledged, however that the nature of energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area.

4.7.3 Good design is also a means by which many policy objectives in the NPSs can be met, for example the impact sections show how good design, in terms of siting and use of appropriate technologies, can help mitigate adverse impacts such as noise. Projects should look to use modern methods of construction and sustainable design practices such as use of sustainable timber and low carbon concrete. Where possible, projects should include the reuse of material’.