By email to:
beaconfen@planninginspectorate.gov.uk

[redacted]
Infrastructure Manager
Planning Services
Lincolnshire County Council
County Offices
Newland
Lincoln LN1 1YL
Email: nsips@lincolnshire.gov.uk

Date: 29 December 2025

Dear Sir/Madam

**Application by Beacon Fen Energy Park Limited for an Order Granting Development Consent for the Beacon Fen Energy Park Project**

This letter sets out Lincolnshire County Council's (LCC) comments on the additional information and submissions received at Deadline 4, while noting the applicant's intention to provide further updated documents and information by Deadline 5 to respond to action points from Issue Specific Hearing (ISH) 2 and ISH3.

**Applicant's Response to Other Parties' Deadline 3 Submissions (REP4-025), Applicant's Written Summary of Oral Submissions from ISH2 and Responses to Action Points (REP4-026) and Applicant's Written Summary of Oral Submissions from ISH3 and Responses to Action Points (REP4-027)**

**Ecology**

The Council met with the Applicant on 1st December 2025 to discuss outstanding areas of concern in relation to ecological mitigation and enhancement and the delivery of Biodiversity Net Gain raised at Deadline 3. The Council welcomes the Applicant's ongoing work to address the concerns raised and notes that the Applicant will provide an update on progress at Deadline 5. The Council will review any updated documents when they are available.

**Waste**

The Council has reviewed REP4-025 and REP4-027 in respect of waste and has the following comments:

- Waste arisings forecasts (REP4-025, p59-60) – The Council disagree with the statement that *"it is not feasible to complete this calculation at this phase"*. Whilst we are aware that a number of unknown factors will affect the final quantities, other solar NSIPs have provided forecasts based on a stated list of assumptions, and this allows for an assessment of the impacts of those quantities, particularly of PV panels.
- Construction waste (REP4-025, p60) – The applicant states that "*The construction phase… is not anticipated to generate large amounts of waste"* but actual quantities should still be forecasted including, as other solar NSIPs have done, an assumed percentage of PV panels which fail on installation.

- Operational waste (REP4-025, p60) – The applicant has not responded to our comment on the absence of an Operational Environmental Management Plan (OEMP) to provide details on the management of operational waste.
- Cumulative waste arisings (REP4-025, p61) – In terms of our request for forecasts, the applicant states that it *"does not consider that such a requirement would be necessary or reasonable"* and that *"this tonnage is likely to be managed in a staggered manner at the decommissioning phase and will be treated at emergent solar panel recycling facilities in the UK, and abroad where capacity currently exists."* This is unsatisfactory on both points as they should provide forecasts (as other solar NSIPs have done) and they cannot simply assume that suitable recycling capacity, particularly for PV panels will emerge when it doesn't exist at present.
- Operational waste (REP4-027, p11) – The Council welcome Action Point 5, and the applicant's commitment (p34) to consider, for Deadline 5, providing more information on the quantity and control of operational waste.

The Council will review any additional information when available and update its position accordingly.

**Battery Energy Storage System (BESS)**

As indicated at ISH2 and in our written summary of oral submissions submitted at deadline 4 [REP4-030] the Council would seek technical assistance regarding the points raised by the applicant in relation to the connection between MW capacity and physical scale of the BESS proposed and we committed to providing an update on our position following receipt of technical guidance on this matter.

The Council has also reviewed the applicant's summary of its oral submissions at ISH2 [REP4-026] and acknowledges and agrees with many aspects of the applicant's response. It accepts, in principle, that a 600MW BESS would allow for greater flexibility in the system which would have energy efficiency benefits, and therefore could be seen as making a more effective contribution to the electricity network in support of the Government's net zero objectives. However, the Council do not consider that the applicant's summary clearly addresses the size (footprint) of the BESS itself.

The applicant states that it "*maintains that the physical dimensions of the battery as proposed is proportionate to the size of the solar scheme and its megawatt (power) capacity. Further, there are no significant physical effects which are different between a BESS which can export at only up to 400MW versus a BESS which can export at up to 600MW."* (p.3 of REP4-026]

Referring to physical infrastructures required to connect the BESS to the grid, the applicant states *"that these physical characteristics would not vary between a 400MW BESS and a 600MW BESS the significance of their correlative"* (p.3 of REP4-026], in terms of the cable to the point of connection and the POC itself, the Council do not disagree with this.

At p.5 of REP4-026 the applicant states *"The layout of a BESS of a lower megawatt rating would not be smaller than that of the BESS as proposed in terms of sizing/configuration."* However, no justification/evidence is provided to support this statement.

Following receipt of technical guidance and review of the information submitted to date, the Council has the following comments which are considered to be relevant to the sizing/scale discussion of a BESS facility.

In understanding the trade-off between a 600MW and 400MW BESS a key aspect is understanding the duration the output can be sustained, BESS have been typically designed for a 2hr duration, but extended durations are feasible. This will directly impact the footprint of the proposal. The following comments are based on the proposed BESS being of a typical 2hr duration but **this should be confirmed by the applicant as other durations will have an impact on scale**.

Energy capacity (MWh), rather than simply installed power capacity (MW), is the critical factor in defining the battery's role and value. While maximum capacity provides a headline figure, it does not by itself indicate footprint, economics, or operational usefulness. Instead, both installed capacity and discharge duration together shape the physical scale and performance of the system.

A typical energy comparison is provided below:

Solar Farm Output

- Capacity: 400 MW
- Typical summer day generation: 1,440–2,400 MWh
- Annual generation (capacity factor 15–20%): 525,600–700,800 MWh

Battery Energy Storage System (BESS)

- Capacity: 600 MW
- Duration: 2 hours
- Energy capacity: 1,200 MWh
- Deliverable energy (after 85–92% efficiency): 1,020–1,104 MWh

For comparison a 400MW /2hr BESS would have any energy capacity of 800MWh.

In terms of achieving an optimum BESS energy capacity a 600MW/2hr BESS is not considered to be unreasonable as it would allow for more of the solar farm maximum output to be stored and be released when its most useful such as during the evening when demand is high, or when the grid needs extra support.

However, BESS are increasingly deployed to support grid stability, renewable integration, and peak shaving. While capacity (MW) and duration (hours) are the primary performance metrics, the physical footprint of such systems is an important consideration for land use planning, permitting, and cost estimation.

The physical footprint of a BESS installation is influenced by several factors:

- Total energy capacity (MWh)
- Number and size of battery containers or cubes
- Fire safety separation distances.
- Access and maintenance lanes
- Inverters, transformers, and PCS equipment
- Perimeter security, drainage, and ecological buffers

Although modern BESS systems are highly energy dense, site layout and safety spacing typically determine the overall land requirement.

Typical containerised BESS systems fall within the following ranges:

- 20 ft container: 250 kWh to 1 MWh
- 40 ft container: 1 MWh to 3.5 MWh
- High density systems: up to ~6 MWh per 20 ft unit

This results in a practical planning assumption of 4000 – 6000 $m^2$ per 100MWhr.

Sources: https://www.acebattery.com/blogs/bess-container-sizes-how-to-choose-the-right-capacity & https://cambridgerenewables.co.uk/megawatt-hour-container-bess/

Indicative footprints for four representative configurations are provided below:

| Project Size | Storage duration (hr) | Total storage (MWh) | Footprint ($m^2$) | Footprint (hectares) | Increase vs 400MW 2h |
|---|---|---|---|---|---|
| **400MW** | 2 | 800 | 80,000–162,000 | 8–16 ha | 0[1] |
| **400MW** | 3 | 1200 | 120,000–245,000 | 32–49 ha | +50% |
| **400MW** | 4 | 1600 | 160,000–325,000 | 45–65 ha | +100% |
| **600MW** | 2 | 1200 | 120,000–245,000 | 32–49 ha | +50% |

For each project size:

1. Total storage (MWh) is calculated as: Power (MW) x Duration (hours)
2. The footprint range is derived using Storage (MWhr) x High- Density Volume

Which gives a BESS estimated footprint requirements shown in table above.

The analysis above would indicate that footprint is directly proportional to the BESS capacity, however, footprint savings (of around 10-20%) maybe achievable when going from a 400 MW 2 h BESS to a 600 MW 2 h BESS due to the following factors:

- Other infrastructure such as substation, control building, security, main access roads, and some fire infrastructure do not grow in direct proportion to MWh, so a 600 MW/2 h system reuses more “fixed” land take than a 400 MW/2 h system, and
- Denser block/layout optimisation at larger scale: With more containers you can pack rows and blocks more efficiently (fewer edge effects, better use of corners and circulation space), which slightly reduces the average $m^2$ per MWh.

A 400 MW 2h BESS is likely to be optimal if the developers aim is to firm solar output and keep costs aligned with PV capacity. A 600MW 2h BESS would be optimal if the developers strategy emphasises ancillary services, merchant volatility capture, or firming obligations larger than PV output, provided the interconnection and market conditions support it.

[1] *Percentage increases are calculated using the mid-point of each footprint range, compared against the mid-point of the 400 MW / 2-hour (800 MWh) baseline footprint.*

In conclusion, there would be benefits associated with the proposed 600MW BESS in terms of flexibility and energy efficiency, compared to a 400MW system, and in terms of achieving an optimum BESS energy capacity a 600MW/2hr BESS is not considered to be unreasonable. However, a 600MW system would in our opinion require a larger footprint, thereby taking more land out of agricultural use and the potential for negative environmental impacts to occur over a wider area. This will be a matter for the SoS to weigh in the planning balance.

The applicant has set out its justification as to why the proposed 600MW BESS constitutes associated development under the Planning Act 2008 in REP1-030. Notwithstanding the points made above regarding footprint size, LCC has no further comments to make in this respect. The ExA, when making its recommendation, must be satisfied that the BESS is subordinate and proportionate to the solar development, in line with guidance on associated development.

**Draft Development Consent Order (REP4-003)**

Article 46

The Council notes the amendment to ten weeks (46(4)) in relation to approvals under this article which is welcomed.

Requirement 8

The Council welcomes the addition of Requirement 8 (2) which makes a commitment to the delivery of minimum Biodiversity Net Gain (BNG) percentages of 30% biodiversity net gain in area-based habitat units, a minimum of 10% biodiversity net gain in hedgerow units, and 10% biodiversity net gain in watercourse units. This approach to securing the delivery of BNG is consistent with the wording of Requirements relating to BNG in other recent solar DCOs in Lincolnshire.

The issues outlined at ISH3 and detailed in our written summary of oral submissions [REP4-030], specifically regarding limits on the percentage of panels that may be replaced, a commitment to annual reporting, the submission of an Operational Environmental Management Plan, and matters concerning Article 44 (Trees), remain unresolved.

**Draft Construction Traffic Management Plan (CTMP) (REP4-013)**

The inclusion of Section 4.5 regarding the Delivery of Road Modifications is noted. The Council is satisfied with the wording of this section as drafted and addresses our concerns raised at ISH3 and summarised in our written summary of oral submissions [REP4-030].

Yours faithfully,

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**Head of Planning**