Stonestreet Green Solar

Written Summary of Oral Submissions from Issue Specific Hearing 4 and Responses to Action Points

PINS Ref: EN010135

Doc Ref. 8.14.2
Version 1
Deadline 4
March 2025

EP Rule 8(1)(b)
Planning Act 2008
The Infrastructure Planning (Examination Procedure) Rules 2010

Table of Contents

Appendices

1 Written summary of the Applicant's oral submissions at Issue Specific Hearing 4

1.1 Introduction

1.1.1 This document summarises the oral submissions made by EPL 001 Limited ('**EPL**' or the '**Applicant**') at Issue Specific Hearing 4 relating to Battery Energy Storage ('**BESS**') ('**ISH4**') which took place in a blended format at the Ashford International Hotel and on Microsoft Teams on 26 February 2025.

1.1.2 In what follows, the Applicant's submissions on the points raised broadly follow the Agenda for the ISH4 set out in the Examining Authority's ('**ExA**') agenda which was published on the Planning Inspectorate's website on 17 February 2025 [EV9-001]. Where the comment is a post-hearing note submitted by the Applicant, this is indicated.

1.1.3 The Applicant, which is promoting the Stonestreet Green Solar Project (the '**Project**'), was represented by Mr Hugh Flanagan of Francis Taylor Building, instructed by Herbert Smith Freehills LLP. He also introduced Mr Matthew Sharpe (Senior Director, Quod Planning Consultancy) and Mr Conor McNally (Director of the Applicant).

1.2 Agenda Item 1: Welcome and Introductions

1.2.1 The ExA welcomed attendees to ISH4 and provided introductory remarks about how the hearing would be conducted.

1.2.2 Against this agenda item, Mr Flanagan explained that the Applicant's appointed BESS expert was unfortunately involved in a car accident the day before ISH4 when travelling down to the hearings. Mr Flanagan confirmed that he is not in a position to appear at ISH4 in person or by video link. Accordingly, Mr Flanagan explained that he would set out the Applicant's position by reference to the Applicant's existing written materials, and that if technical matters are raised which require expert input, the Applicant might need provide an answer in writing after the hearing, once it had the chance to obtain this technical input.

1.2.3 After attendees had introduced themselves, the ExA noted that due to the absence of the Kent Fire and Rescue Service ('**KFRS**'), some questions may need to be deferred to writing.

1.3 Agenda Item 2: Purpose of the Issue Specific Hearing

1.3.1 The ExA summarised the purpose of ISH4, noting that the matters to be discussed included the proposed design approach; and the need for, and the safety of, the BESS included in the Proposed Development. He explained that the Applicant

would also be asked to explain how it has consulted on the BESS element of the Project.

1.3.2 The ExA also asked the Applicant to keep a note of action points arising.

1.4 Agenda Item 3: The Need for Battery Energy Storage System (BESS)

1.4.1 The ExA asked the Applicant to explain the need for BESS as part of the Project and the approach to the design of the BESS, including distribution across the Site.

1.4.2 Introduced by Mr Flanagan, Mr Sharpe provided the following summary on behalf of the Applicant:

1.4.3 Mr Sharpe explained that he would firstly cover the need for BESS, and secondly the design approach to BESS. He also noted that he would be referring to the **Design Principles** [REP3-016], **Works Plans** [REP1-003], the **Planning Statement** [APP-151] and the **Environmental Statement Volume 2: Main Text Chapter 3: Project Description** [REP1-018] during his submissions

Need for BESS

1.4.4 Mr Sharpe explained that the need for BESS is derived from a combination of key government policies to allow it to meet its legally binding obligation to achieve net zero by 2050, and also to improve UK energy security, which is expected to reduce energy costs for consumers. He explained that, excluding nuclear power, all non-fossil fuel generation is intermittent and BESS is therefore an essential component of the 'system services' that will allow energy to be generated and used, as required, and will also help avoid unnecessary and expensive reinforcement of the grid network. He noted that this is because BESS can act as both demand and supply, helping balance electricity demand and supply to create a smoother, more efficient system.

1.4.5 Mr Sharpe then explained that this is important for two main reasons:

- Firstly, balance of supply and demand. He explained that renewable energy sources such as wind and solar are intermittent. BESS can help regulate this situation, making best and most effective use of the renewable energy that is generated and avoid grid curtailment, this being reduced electricity transmission in order to balance supply and demand.
- Secondly, optimisation of available grid capacity. Mr Sharpe explained that it is well known that grid capacity is highly restricted and it is therefore essential to use all existing capacity as efficiently as possible. Therefore, he noted that co-locating BESS with solar generation is a cost-effective and deliverable means of improving the efficiency and resilience of the grid.

1.4.6 Mr Sharpe then explained that the need for BESS is so great that all reasonable and feasible opportunities for delivering capacity need to be explored. As such, there is an urgent need for BESS and other forms of electricity storage to help National Grid

meet its zero carbon by 2035 pledges and help the UK address the climate emergency.

1.4.7 He noted that this need for energy storage is strongly supported in both the *Overarching National Policy Statement for energy* (**'NPS EN-1'**, November 2023) and the *National Policy Statement for renewable energy infrastructure* (**'NPS EN-3'**, November 2023).

1.4.8 Mr Sharpe explained that paragraph 3.3.4 of NPS EN-1 clearly states that there are several different types of electricity infrastructure that are needed to deliver the UK's energy objectives, with electricity storage specifically included. He added that, as such, the need for electricity storage is clearly set out in NPS EN-1. He stated that this goes on to confirm that:

"3.3.5. New generating plants can deliver a low carbon and reliable system, but we need the increased flexibility provided by new storage and interconnectors to reduce costs in support of an affordable supply.

3.3.6. Storage and interconnection can provide flexibility, meaning that less of the output of plant is wasted as it can either be stored or exported when there is excess production. They can also supply electricity when domestic demand is higher than generation, supporting security of supply. This means that the total amount of generating plant capacity required to meet peak demand is reduced, bringing significant system savings alongside demand side response (up to £12bn per year by 2050).40 Storage can also reduce the need for new network infrastructure."

…

"3.3.25 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.

3.3.26 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."

1.4.9 Mr Sharpe then noted that the ExA will be aware that the Infrastructure Planning (Electricity Storage Facilities) Order 2020 removed all forms of electricity storage, other than pumped hydroelectric storage, from the definition of nationally significant energy generating stations within the Planning Act 2008, in order to speed up delivery. He explained that emphasises how urgently new energy storage is needed. This relates to the role it has in relation to delivering net zero. Mr Sharpe explained the role of energy storage in storing electricity when it is abundant so it can be used in periods when it is scarce, as well as providing a range of services to help maintain the resilience and stability of the grid.

1.4.10 He then explained that the need for electricity storage is rising as the volume of variable renewables on the grid increases, and as the peak demand for electricity increases as a result of the electrification of heat and transport. He noted it will be

critical to maintaining energy security as the UK shifts away from gas over the next few years. Mr Sharpe noted that it is also recognised in paragraph 2.10.10 of NPS EN-3 that co-locating solar and BESS maximises the efficiency of land use, and that energy storage is one of the stated examples of the types of associated development anticipated to be included within solar generating projects.

1.4.11 He explained that the policy position for renewable energy is unique, with the Government recognising that the need is critical, and both of national importance and urgent. Mr Sharpe noted that the current Government, and the former Government, have repeatedly made the point that all efforts must be placed on speeding up the delivery of renewable energy.

1.4.12 Mr Sharpe concluded that the need for BESS is therefore clearly outlined in both relevant National Policy Statements; and the co-location of storage with solar generation, as proposed for the Project, is explicitly supported by NPS EN-3.

1.4.13 He then explained that the most recent key Government announcement regarding the energy transition, this being the "Clean Power 2030 Action Plan: a new era of clean electricity", published in December 2024, identified that a 6 times increase in BESS will be required from current levels of 4.5GW to a range of between 23-27GW needed by 2030, further noting that "*large amounts of distribution-connected renewable generation and storage will need to be accelerated to meet the 2030 target*". He noted that, to meet the Clean Power 2030 targets, it is critical that projects that can connect to the grid and contribute prior to 2030, as is the case with the Project, are able to do so.

1.4.14 In summary, Mr Sharpe confirmed that there should be no doubt that the need for BESS is strongly supported, both in terms of planning policy (where co-location as proposed for this Project is explicitly supported) and also in the Government's energy policy and ambitions to achieve Clean Power by 2030.

Associated development

1.4.15 Mr Sharpe then explained that the **Planning Statement** [APP-151] (in particular Table 4) provides the Applicant's assessment of how the supporting development meets the definition of associated development.

1.4.16 He explained that the components of the Project considered to be associated development (this being Work Nos. 2-8 and the Site Wide Works, as defined in the **Draft DCO (Doc Ref. 3.1(E))**) provide for two functions. Mr Sharpe explained that the first function is to provide the infrastructure to enable the connection of the electricity generating station (this being the PV panels (Work No. 1), which is the nationally significant infrastructure project ('**NSIP**') component of the Project) to the national grid. He explained that the second function is to provide the mitigation which is likely to be required.

1.4.17 Mr Sharpe clarified that the BESS forms part of Work No. 2 and is necessary to store energy generated by the PV arrays (Work No. 1) until it is needed for onward distribution to the grid. He noted that the primary purpose of the BESS included

within the Project is to store energy generated by the solar PV panels to allow it to be exported when required.

1.4.18 He then explained that the grid connection would also allow the import of electricity from the national grid typically during periods of high supply (low demand), with discharge typically during periods of high demand (low supply). Mr Sharpe confirmed this is a secondary purpose of the BESS.

1.4.19 Mr Sharpe noted that the BESS allows the Project to load-shift electricity, both generated within the Site and imported from the national grid, which helps to balance the electricity network. He explained that the inclusion of BESS within the Project is a demonstrable planning benefit, as it will help balance supply and demand for the wider grid.

1.4.20 He explained that the BESS included within the Project employs a distributed, direct current ('**DC**') coupled approach with the BESS distributed throughout the Site and directly connected to an area of solar panels, as opposed to the approach where all BESS is located in a single area with connection to the solar panels only indirectly via other infrastructure.

1.4.21 Mr Sharpe noted that the fact that the Project employs a distributed DC-coupled BESS is further evidence that the BESS included within the Project has a direct relationship with the 'Principal Development'. He explained that it would be technically and commercially impossible to separate the BESS on this Project from the generating station for which a development consent order ('**DCO**') is required given the distributed nature of the co-location of the BESS and solar PV.

Proportionality of BESS in the context of the Principal Development

1.4.22 Mr Sharpe explained that the BESS is considered to be proportionate to the Principal Development (being the NSIP solar PV generating station). He further explained that the Rochdale Envelope secured by the **Design Principles** [REP3-016] and the **Works Plans** [REP1-003] would allow up to 128 BESS units, this being 32 inverter station locations and up to 4 BESS units per inverter station. He referred the ExA to the Applicant's **Responses to First Written Questions (ExQ1)** [REP3-047], Question 1.1.1. He explained that the Project is designed to allow flexibility and to ensure that detailed design is not constrained by caps imposed at this stage that are not required to make the Project acceptable. Mr Sharpe noted that the environmental impact assessment has considered the **Illustrative Project Drawings – Not for Approval** [REP3-004] as a reasonable worst case scenario and the Applicant anticipates that, under current market conditions, a maximum of 99.9MWe of BESS capacity will be required.

1.4.23 He clarified that there is no planning or environmental necessity or justification for a cap to be imposed on the capacity of the BESS.

1.4.24 Mr Sharpe explained that BESS is directly linked to operational generation and efficiency, and it will help deliver a secure and reliable energy supply. He confirmed that the Rochdale Envelope for the BESS has been clearly defined. He explained

that these parameters have been defined to ensure that the location and scale of the BESS is proportionate to the overall scale of the Project. Mr Sharpe noted that the BESS will support the operation of the Project by storing and exporting electricity generated. In this regard there would be a direct relationship between the principal development and this associated development.

1.4.25 He concluded by explaining that, overall, it is clear that the BESS would serve a legitimate and beneficial energy storage purpose that is supported by Government, and directly referred to in NPS EN-1 and NPS EN-3.

1.4.26 Mr Sharpe also noted that the Secretary of State for Energy Security and Net Zero ('**SoS**') has also confirmed that BESS meets the definition of associated development in all decisions made to date where BESS has been included within solar NSIPs, most recently in the decision on the West Burton Solar Project Order 2025, where in his decision letter the SoS agreed with the Examining Authority for that project that BESS was associated development.

1.4.27 ***Post-hearing note****: please see paragraphs 4.4 and 4.5 of the SoS's decision for the West Burton Solar Project Order 2025 letter dated 24 January 2025.*

1.4.28 He concluded that the Applicant therefore considers that the BESS can appropriately be regarded as associated development.

Design – distributed BESS approach

1.4.29 Mr Sharpe explained that paragraph 4.3.15 of NPS EN-1 notes that '*Applicants are obliged to include in their ES, information about the reasonable alternatives they have studied.'* He noted that the Site is not located within a designated landscape, and does not trigger any specific requirement to consider specific alternatives to the BESS approach.

1.4.30 He further explained that, as set out in Table 5.4 of **ES Volume 2, Chapter 5: Alternatives and Design Evolution** [AS-010], the design for the Project employs a distributed approach, as opposed to locating all BESS units in a single centralised compound area.

1.4.31 Mr Sharpe then explained that **ES Volume 2, Chapter 5: Alternatives and Design Evolution** [AS-010] sets out a number of benefits to this approach. He noted there are two principal factors, these being lower energy loses and greater flexibility for integration within the landscape given the smaller footprint of those smaller inverter and BESS units, which also reduces the potential for substantial earthworks and vegetation removal. He explained that locating the BESS as part of inverter stations, which are typically located away from field boundaries, limits the impact to offsite receptors relative to a single compound alternating current ('**AC**') coupled system made up of over 100 BESS units.

1.4.32 He confirmed that there is no evidence to suggest that clustering the inverters and BESS units in a single location would reduce the agreed landscape and visual

effects. Mr Sharpe also confirmed that there are a number of locations within the Site where clustering the BESS units could worsen the identified effects.

1.4.33 Mr Sharpe then explained that, for these reasons, a centralised BESS was not considered further to the extent set out in Table 5.4 of **ES Volume 2, Chapter 5: Alternatives and Design Evolution** [AS-010].

1.4.34 He explained that following submission of the DCO Application, a number of parties have suggested a centralised BESS may have benefits over the distributed approach proposed for the Project. Mr Sharpe explained that no specific details have been provided by any of these parties setting out where within the Order Limits a centralised BESS would be located, or any other evidence to support this position.

1.4.35 Mr Sharpe then noted that, as set out in paragraph 4.3.28 of NPS EN-1:

"Alternative proposals which are vague or immature can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision."

1.4.36 He confirmed that it is the Applicant's position that the proposed approach to energy storage is wholly consistent with both NPS EN-1 and NPS EN-3 and that there is no necessity or justification for considering a centralised BESS option further.

1.4.37 Mr Sharpe noted that the Project has been carefully considered and proposes embedded mitigation which has minimised landscape visual effects. He explained that there has been a strong commitment to mitigating effects of the Project and effects have been reduced as far as reasonably practicable. He then explained that, as noted in the evidence of Mr Markwell, the Environmental Statement identifies a limited number of residual significant adverse effects. These are limited to moderate adverse effects, following establishment of proposed planting measures. He also noted that the majority are in relation to Public Rights of Way ('**PRoWs**') that cross the Site.

1.4.38 He then explained that, in terms of planning balance, NPS EN-1 states at paragraph 5.10.5 that "*Virtually all nationally significant energy infrastructure projects will have adverse effects on the landscape, but there may also be beneficial landscape character impacts arising from mitigation*".

1.4.39 Mr Sharpe concluded that in the context of this policy, the Project has limited and localised landscape effects and the benefits are considered to demonstrably outweigh the adverse effects, and is therefore compliant with NPS EN-1.

1.4.40 The ExA noted submissions from Aldington and Bonnington Parish Council ('**ABPC**') and other Interested Parties ('**IPs**') relating to the visual impacts of BESS. In light of this, he asked whether the structures could be designed to look more like agricultural buildings and what other mitigation measures could be implemented.

1.4.41 In response, Mr Sharpe explained that the **Design Principles** [REP3-016] secure that each BESS unit will be surrounded by 4m wooden acoustic fences, which hopefully creates this effect.

1.4.42 The ExA noted that the illustrative drawings submitted at Deadline 3 [REP3-004] show that no BESS is to be located in Fields 20-22. He asked the Applicant to remind the Examination why these fields have been ruled out.

1.4.43 In response, Mr Sharpe explained that the **Outline Battery Safety Management Plan** [APP-161] ('**OBSMP**') commits to there being two access points for all BESS locations. That is not possible in these fields, which explains the rationale for BESS not being included in these fields on the Illustrative Plans.

1.4.44 The ExA then heard submissions from the following IPs:

- Dr Patricia Bromley, relating to a suggested discrepancy in the number of BESS sites and units quoted by the Applicant;
- Mr Jeremy Bromley, in respect of the potential visual and noise impacts arising from the BESS units, including that the noise from the BESS units at Handen Farm would exceed 60dB, above the safe limit set out in World Health Organisation guidance;
- Mr Simon Lunn (on behalf of Aldington and Mersham Support Group ('**AMSG**')), requesting information on hours of battery energy storage and the operation of the solar generating station without the BESS; the amount of BESS capacity in the National Energy System Operator ('**NESO**') grid connections queue; the visual impacts of the BESS units; the connection date of the Project; the distributed nature of the BESS units; the design of the roadways to facilitate the BESS and how these would facilitate access for services in an emergency; security risks;
- Mr Padraig Herlihy (on behalf of the Village Alliance), who noted local concerns relating to the distributed nature of the BESS units and in respect of visual and noise impacts, water supply, access, fire safety, pollution risk and the Applicant's approach to consultation;
- Mr Paul Barlett (ward member for Mersham, Ashford Borough Council ('**ABC**')), who compared the proposals to the single site BESS at the Cleve Hill Solar Park and raised concerns relating to water supply (referring to pending upgrade works being undertaken in Ashford by South East Water);
- Sir David Melville (on behalf of AMSG), relating to the importance of BESS capacity and technological improvements enabling more dense situating of BESS units, and requesting information about the capacity of the BESS in MW hours; and
- Mr Brian Collins, relating to the proximity of his boarding kennels to the proposed BESS units and the potential impacts on animal welfare.

1.4.45 The ExA then requested a response from the Applicant.

1.4.46 On behalf of the Applicant, Mr Sharpe responded as follows:

- In relation to Dr Bromley's statement that there has been a change in the **Design Principles** [REP3-016] relating to the number of BESS units, he clarified that this was incorrect. He explained that each Inverter Station can

include up to 4 BESS units. He noted that the next sentence states that two Inverter Stations can be located together, meaning a total of 8 BESS units can be located together.

- In respect of the concerns raised regarding noise generation, Mr Sharpe explained that the inverter compounds will be surrounded by 4m acoustic fencing. He confirmed that the noise assessment in **Environmental Statement Chapter 14: Noise** [APP-038] does not identify any significant adverse effects to sensitive receptors. He also noted that Requirement 13 in the **Draft DCO (Doc Ref. 3.1(E))** secures the mitigation measures set out in the noise assessment. As such, he confirmed that the Applicant considers these matters to be dealt with.
- In relation to the comments made regarding BESS capacity, Mr Sharpe confirmed that the Applicant's assumption has been that the BESS units will provide up to 4 hours of capacity. He confirmed that the Applicant has not proposed a cap on the BESS capacity as part of the Application, as there is no requirement or planning justification for doing so. In response to comments relating to compliance with the Rochdale Envelope approach, he confirmed that major accidents and disasters was scoped out of the Environmental Impact Assessment process, referring the ExA to the summary of effects in **Environmental Statement Chapter 18: Summary of Significant Effects** [APP-042]. Mr Sharpe confirmed that the Rochdale Envelope relates to the physical extent of the Project, whilst the safety of the BESS is secured through the **Outline Battery Safety Management Plan** [APP-161]. He noted that, as secured through Requirement 5 in the **Draft DCO (Doc Ref. 3.1(E))**, final approval of the detailed Battery Safety Management Plan by ABC must be undertaken in consultation with KFRS.
- In respect of the comments made relating to the Project's grid connection date, Mr Sharpe confirmed that the Project's grid connection date is secured, and that the Applicant would provide a detailed response in writing.
- ***Post-hearing note**: Please refer to the Applicant's response to Action Point 1 in Section 2 below.*
- In relation to the queries raised relating to the disadvantages of a distributed BESS layout compared to a single site BESS and the capacity of the BESS in MW hours, Mr Sharpe confirmed that a detailed response would be provided in writing.
- ***Post-hearing note**: Please refer to the Applicant's response to Action Point 2 in Section 2 below.*
- In response to the concerns raised relating to fire water runoff, Mr Sharpe noted that the **Outline Operational Surface Water Drainage Strategy** [REP3-024] ('**OSWDS**') has a section on this which confirmed that all Inverter compounds will be constructed with an impermeable lining and bunded to provide sufficient storage that would contain any firewater (see section 4.8 of the **Outline OSWDS** [REP3-024]. This secures appropriate measures to prevent leakage and tanking to ensure there is no impact on the wider environment. He confirmed that this approach has been discussed with the Environment Agency ('**EA**') and Kent County Council ('**KCC**') as the

Lead Local Flood Authority ('**LLFA**'), and both parties are satisfied these measures are satisfactory.

- Finally, Mr Sharpe confirmed that the Applicant has engaged with KFRS on general fire safety matters and they have raised no issues.

1.5 Agenda Item 4: BESS Consultation

1.5.1 The ExA asked the Applicant to set out how it has engaged and consulted on BESS matters, including the mechanisms and media that have been used.

1.5.2 In response, Mr Sharpe provided a summary of the Applicant's approach to consultation, noting he would primarily be referring to the **Consultation Report** [APP-126] and **Consultation Report Appendix F: 2022 Statutory Consultation Materials and Consultation Responses Appendix F-1: Consultation Information Pack** [APP-134], **Consultation Report Appendix G: 2023 Statutory Consultation Materials and Consultation Responses Appendices G-2 to G-5** [APP-138] and **Consultation Report Appendix M: Regard had to Consultation Responses Received Outside of Statutory Consultation** [APP-144].

1.5.3 Mr Sharpe explained that the BESS component of the Project has been subject to two rounds of statutory consultation, both of which included details that described the emerging proposals, including the energy storage proposals. He added that additional engagement was also undertaken with the relevant statutory consultees before the Application was submitted in relation to the preparation of the **Outline Battery Safety Management Plan** [APP-161].

1.5.4 Mr Sharpe then explained that this consultation process raised several matters which the Applicant has taken appropriate regard of. He confirmed that the feedback received in relation to the energy storage component of the Project is set out within the **Consultation Report** [APP-126]. He summarised the consultation process, as follows:

1.5.5 He referred to Appendix F-5 in **Consultation Report Appendix F: 2022 Statutory Consultation Materials and Consultation Responses Appendix F-1: Consultation Information Pack** [APP-134] and the responses set out within '*Theme 10 Health and Safety'*. Mr Sharpe explained that this section contains:

- A detailed consultation response from KFRS and how the Applicant has responded to this (PDF page 204);
- A detailed consultation response from the Health and Safety Executive ('**HSE**') and the Applicant's response relating to preparation of the **Outline Battery Safety Management Plan** [APP-161] (PDF page 205);
- A consultation response from the UK Health and Security Agency ('**UK HSA**') and the Applicant's response; and
- A number of consultation responses from members of the public who raised matters in respect of the energy storage component of the Project. These have been dealt with on a thematic basis and how the Applicant has responded is made clear.

1.5.6 He confirmed that these references show how the BESS element was consulted on during summer 2022.

1.5.7 Mr Sharpe then referred to the summer 2023 consultation and Appendix G-4 within **Consultation Report Appendix G: 2023 Statutory Consultation Materials and Consultation Responses Appendices G-2 to G-5** [APP-138]. He explained that the responses set out within 'Theme 10 Health and Safety' are as follows:

- A consultation response from KFRS and the Applicant's response (PDF page 86);
- A consultation response from HSE and the Applicant's response; and
- A number of consultation responses from members of the public who raised matters in respect of the energy storage component (Theme 11, PDF page 109).

1.5.8 Mr Sharpe explained that to ensure those matters have been had regard to, engagement with KFRS has continued, given they are the key stakeholder. He noted that this engagement informed the application submission version of the **Outline Battery Safety Management Plan** [APP-161]. Mr Sharpe explained that prior to submission, KFRS confirmed in writing that they had no objection to the Project provided that the National Fire Chiefs' Council ('**NFCC**') Guidance was followed in the design and management of the Project. He confirmed that the Applicant expects to work closely with KFRS post DCO consent to ensure the final Battery Safety Management Plan and Emergency Response Plan is robust and reduces the risk of any fire incident to the extent possible. He added that this will allow for the delivery of a high quality and safe co-located project, consistent with policy and as required to facilitate the energy transition.

1.5.9 Mr Sharpe then explained that the consultation process has also continued with other parties. As an example, he noted that the **Statement of Common Ground with the Environment Agency (Doc Ref. 8.4.2(C))** specifically states the following: '*the pollution prevention measures outlined in the Outline Battery Safety Management Plan (BSMP) and the Outline Construction Environment Management Plan (CEMP) are satisfactory and appear to meet high standards'*. He then referred the ExA to row 5.1, on page 38 of the **Statement of Common Ground with the Environment Agency (Doc Ref. 8.4.2(C))**.

1.5.10 Mr Sharpe also explained that the LLFA has also confirmed it has reviewed the **Outline Operational Surface Water Drainage Strategy** [REP3-024] and it has confirmed in writing that it includes the required measures. He added that ABC has also confirmed in its **Local Impact Report** [REP1-078] that the Project has a neutral effect in relation to major accidents and disasters.

1.5.11 He then explained that no concerns have been raised by KFRS, HSE or UK HSA. Mr Sharpe also explained that none of these parties have registered as IPs for the Examination, indicating that they do not have any substantive comments on the proposals.

1.5.12 The ExA then heard submissions from the following IPs:

- Cllr Linda Harman (ABC councillor for Saxon Shore Ward), who made representations relating to the adequacy of consultation and the information presented by the Applicant during consultation; and the noise and visual effects of the BESS;
- Lord Aldington, relating to the local highway network, clarity during the pre-application consultation relating to the distribution and size of the BESS (including referring to a plan shown during consultation showing indicative BESS); and compliance with the Local Plan;
- Dr Bromley, who made representations relating to photographs used by the Applicant during consultation, water towers and the capacity of the BESS;
- Mr Lunn (on behalf of AMSG), relating to the effectiveness of community consultation and how the BESS element of the Project was referred to in consultation documentation;
- Sir David Melville (on behalf of AMSG), who made representations relating the proposed capacity of the BESS, stating that the BESS capacity was 400 MWh, which makes it one of the largest in the world, and querying the characterisation of BESS as "associated development" to the solar generating station; and
- Mr Derek Burles (representing Sir Christopher Edwards (Chairman of Heat Vault Company Limited)), relating to the effectiveness of community consultation, and the operation of the BESS as part of the electricity market.

1.5.13 The ExA then invited the Applicant to respond.

1.5.14 On behalf of the Applicant, Mr Flanagan responded as follows:

- He noted that, as a general point on consultation, the Project has been accepted for Examination, and in being accepted the consultation undertaken was considered adequate by the Planning Inspectorate, a conclusion which is endorsed by the Applicant.
- Mr Flanagan then explained, more specifically, that it is not correct to say that the consultation or application materials do not include details of the BESS units. He confirmed that the **Illustrative Project Drawings – Not for Approval** [REP3-004] show locations for inverter stations. There are also scale drawings illustrating the form and dimensions of the BESS Units within the same set of Project Drawings. He reiterated that it is simply not correct to say this information is not before the ExA.
- He then explained that information on BESS was also included in the consultation materials, referring to **Consultation Report Appendix F: 2022 Statutory Consultation Materials and Consultation Responses Appendix F-1: Consultation Information Pack** [APP-134], the Preliminary Environmental Information Report and the consultation booklets provided. Mr Flanagan noted, by way of example, that the October 2022 Consultation Booklet in Appendix F-1 contains half a page on energy storage (see e-page 22), describing the DC-coupled approach, containerised units and the indicative energy storage system, which is described in the legend as a battery unit. Mr Flanagan confirmed that this is what has been explained in

writing and orally at consultation meetings, adding that the information has been out there and that the Applicant has gone to significant lengths to provide it.

- Mr Flanagan noted that the Applicant rejects the suggestion from some IPs that the effects of noise have been downplayed. He explained that the Environmental Statement contains a Statement of Competency (see **Environmental Statement Volume 4: Appendices Chapter 1: Introduction Appendix 1.5: Statement on Expertise and Qualifications of Competent Experts** [APP-065]. He explained that the professional experts are under an obligation to undertake competent assessments. Mr Flanagan also noted that no contrary expert evidence has been presented and that the Applicant's evidence has been agreed with by statutory bodies.
- Finally, he confirmed that anything further could be put in writing.

1.5.15 ***Post-hearing note**: Please refer to the Applicant's response to Action Point 3 in Section 2 below.*

1.6 Agenda Item 5: BESS Safety

1.6.1 The ExA asked the Applicant to explain its approach to addressing perceived safety concerns with BESS, and the mitigation proposed; including proposed water storage on site and how this relates to flood management. The ExA also noted that he would invite feedback from KFRS on its current position in regard to BESS and emergency access to the Site.

1.6.2 On behalf of the Applicant, Mr Flanagan responded to confirm that he would deal with this agenda item in general terms. He explained that, as noted at the beginning of the hearing, given the Applicant's expert is not available, the Applicant may need to take technical questions away to respond to in writing.

1.6.3 Mr Flanagan then provided the following submissions:

1.6.4 In relation to battery safety, he noted that prior to the application submission the Applicant consulted on the Project with a range of statutory consultees including KFRS and the HSE. Mr Flanagan confirmed that these bodies have responded to the consultation and neither raised concerns regarding the proposals.

1.6.5 Mr Flanagan explained that the Applicant has also consulted with the EA and KCC (in its role as LLFA) in relation to the approach to firewater impacts in the unlikely event of a fire occurring. He confirmed that the position had been agreed with both parties via their respective Statements of Common Ground (please refer to the **Statement of Common Ground with Kent County Council (Doc Ref. 8.3.4(C))** and the **Statement of Common Ground with the Environment Agency (Doc Ref. 8.4.2(C)**). He added that ABC, the local authority, has confirmed in its **Local Impact Report** [REP1-078] that the Project will have a neutral impact in relation to major accidents and disasters. As such, Mr Flanagan confirmed that the Applicant is not aware of any disagreement regarding the proposals with any statutory consultee, these being the bodies that have the particular expertise on these matters.

1.6.6 He explained that, as is expected for this type of project, the Applicant has submitted an **Outline Battery Safety Management Plan** [APP-161]. This commits the Project to ensuring the final scheme design is in accordance with the NFCC Guidance for battery installations of this type. Mr Flanagan explained that the Applicant's key commitments in the **Outline Battery Safety Management Plan** [APP-161] were shared with KFRS prior to submission and that they confirmed in writing that they had no objection to the Project provided the NFCC Guidance would be followed in the design and management of the Project. He confirmed that the Applicant is happy to commit to this. He also confirmed that Table 2.1 of the **Outline Battery Safety Management Plan** [APP-161] provides details of the design and fire prevention measures proposed, and confirms that it complies with the NFCC Guidance, including in relation to access and water supply.

1.6.7 Mr Flanagan then explained that the **Outline Battery Safety Management Plan** [APP-161] secures a number of key items including:

- ensuring the BESS units will comply with modern industry standards in terms of specification, control systems and fire suppression;
- that spacing between BESS units will be at least 6m;
- that spacing buffers to the Site boundaries are appropriate;
- that BESS unit containers are not stacked;
- that in the unlikely event of an incident access is available for fire service vehicles from two locations; and
- that the water volume required to meet the NFCC Guidance is available on Site.

1.6.8 He then explained that the **Outline Battery Safety Management Plan** [APP-161] also secures the approach that the Applicant will be required to adopt in terms of procurement, transportation, pre-construction information requirements, installation, operation, maintenance and decommissioning of the BESS infrastructure.

1.6.9 Mr Flanagan explained that the **Outline Battery Safety Management Plan** [APP-161] also requires the development of an Emergency Response Plan, to be developed in consultation with KFRS post-consent. He noted that, again, this will be produced in accordance with NFCC Guidance and will ensure that, in the unlikely event of an emergency, there is adequate provision of firefighting equipment on Site and that fire, smoke and any emissions will not significantly affect Site operatives, first responders and the local community.

1.6.10 He noted that the Applicant was aware that several members of the community have raised perceived concerns regarding battery safety risks. He explained that these representations largely include concerns regarding risk of a fire incident occurring and the potential effects on the local area and community in the event of such an incident. Leaving aside any particularly technical matters, Mr Flanagan made a number of more general points in response:

- In respect of the risk of an incident occurring, the Applicant considers that to be very unlikely, noting that as set out on page 163 of the **Responses to**

Deadline 1 Submissions [REP2-034], there are over 120 operational BESS projects in the UK, with the first installation occurring in 2006. He explained there has been a single significant operational failure to date, in Liverpool, but for one further event at East Tilbury that occurred during pre-operation around a week before ISH4, noting that there are limited other details available at this time. He added that, in both the Liverpool and East Tilbury cases the Applicant understands that the fire incident was contained by the local fire and rescue service and that there was no injury to local residents and there was no impact to nearby residential properties. He confirmed that the Applicant would confirm this in writing in respect of both the Liverpool and East Tilbury incidents.

- ***Post-hearing note**: Please refer to the Applicant's response to Action Point 4 in Section 2 below.*

1.6.11 Mr Flanagan confirmed that the Applicant is fully aligned with the local community in seeking to ensure the risk of any incident is minimised to the extent possible. He added that, prior to submitting its application, the Applicant consulted with a number of technical experts to ensure its proposals were appropriate and conformed with relevant standards and guidance and also engaged with KFRS. He confirmed that, post-submission, the Applicant has continued to engage technical advisers to ensure the Project continues to comply with revised standards such that its approach to this area of the Project is as robust as possible.

1.6.12 Mr Flanagan explained that the **Outline Battery Safety Management Plan** [APP-161] submitted in June 2024 conformed with all aspects of the NFCC Guidance at that time. He noted that the Applicant is aware that the NFCC consulted on new technical guidance in late summer 2024 and had expected updated Guidance to be published by this point. He further noted that the Applicant therefore anticipates that it may be desirable to make updates to the **Outline Battery Safety Management Plan** [APP-161] prior to the end of the Examination, to ensure continued compliance with any published or draft form of the updated NFCC Guidance. He concluded that in any case, as secured in the **Outline Battery Safety Management Plan** [APP-161], the Project commits to following the best practice guidance available at the point of installation to ensure that any risk of an incident is minimised to the extent possible.

Water Supply

1.6.13 Mr Flanagan explained that, in relation to water supply, it has been claimed that there will not be sufficient water to allow KFRS to respond to a fire incident adequately, noting the references made to the recent fire incident at Handen Farm. In respect of this Project, he noted that the **Outline Battery Safety Management Plan** [APP-161] secures that the Project will follow NFCC Guidance in this regard, meaning there will be provision of sufficient water volumes on Site such that concerns raised regarding the ability of the local water network to supply the required water are not relevant. He reiterated that the water required to deal with an incident will be on Site as part of the Project.

Gas emissions and fire water runoff

1.6.14 Mr Flangan noted that concerns have been raised regarding the impacts of gas emissions in the event of a fire, and the potential for firewater to impact local watercourses. He explained that the Applicant recognises that those who have raised this may wish to have further reassurance, and that therefore the Applicant intends to provide written evidence to demonstrate that in the unlikely event of an incident no unacceptable impacts would arise in respect of gas emissions.

1.6.15 ***Post-hearing note:*** *Please refer to the Applicant's response to Action Point 5 in Section 2 below.*

1.6.16 In relation to firewater runoff, Mr Flanagan noted that Section 4 of the **Outline Operational Surface Water Drainage Strategy** [REP3-024] confirms the process to managing firewater, in the event that this is required, to ensure there is no contamination of the local environment. He confirmed that this was anticipated to be agreed with both KCC and the EA shortly in the Statements of Common Ground submitted at Deadline 4.

1.6.17 ***Post-hearing note:*** *The Applicant confirms that these matters have now been agreed with both KCC and the EA. Please refer to Section 2.4 in the* ***Statement of Common Ground with Kent County Council (Doc Ref. 8.3.4(C))*** *and Section 2.5 in the* ***Statement of Common Ground with the Environment Agency (Doc Ref. 8.4.2(C)****.*

1.6.18 Mr Flanagan then explained that, more generally, the Applicant notes that some caution should be exercised in considering some of the claims made in written representations relating to BESS safety. As an example, he noted that it has been claimed that this is one of the largest installations globally. Mr Flanagan clarified that on page 162 of the Applicant's **Responses to Deadline 1 Submissions** [REP2-034] evidence has been provided, by reference to Government data, that there are over 50 BESS facilities in the UK that that are either operational, under construction or have received planning permission that are larger than proposed by the Project. He then noted that there have been references made by IPs to serious failures, citing the Liverpool incident. In response he explained that the Applicant notes, and as stated on page 163 of the **Responses to Deadline 1 Submissions** [REP2-034], that the Liverpool BESS was located in a much denser, urban setting and there was no injury to local residents and no impact to nearby residential properties.

1.6.19 Mr Flanagan acknowledged that the concerns raised largely repeat similar general concerns raised on other solar and BESS DCO schemes that have previously been considered by multiple Examining Authorities. In relation to this, he referred the ExA to the conclusions of the Examining Authority and the SoS in relation to the Cleve Hill Solar Park Order 2020 ('**Cleve Hill**'). He noted that the conclusions from that project have been restated in the decisions for multiple other solar and battery storage DCO projects that have been consented, where similar general battery storage concerns have been raised by objectors.

1.6.20 He then explained that the SoS's Decision Letter for Cleve Hill provides guidance on this matter.

1.6.21 Mr Flanagan explained that at section 4.175, the SoS's Decision Letter states "*The ExA's overall conclusions on safety and security were that there were a large number of representations about this issue which flowed from the scale of the proposed battery storage facility, the fact that it was a new technology, the risk of major fires and the proximity of the battery storage facility to local populations. The ExA acknowledged those concerns. However, it took comfort from the legislation and guidance and the Battery Safety Management Plan which would be subject to consultation with relevant bodies and the ExA was, therefore, confident that the risks could be managed or mitigated appropriately. As far as site safety was concerned, the ExA noted that the measures proposed by the Applicant might be viewed as minimal but there was no evidence before it that anything else was needed – there was a sound basis for managing and mitigating site safety risks. The ExA's overall conclusion on this matter, therefore, was that there was nothing of weight to carry into the overall planning balance*." He confirmed that the SoS did not disagree with the ExA's position.

1.6.22 Finally, and in summary, Mr Flanagan explained that the **Outline Battery Safety Management Plan** [APP-161] will conform to the latest NFCC Guidance and will contain sufficient measures to secure and control battery safety. This will ensure provision is made for key fire safety matters, with the final Battery Safety Management Plan being secured through the **Draft DCO (Doc Ref. 3.1(E))**, to be prepared in consultation with KFRS and the EA.

1.6.23 He further concluded that, given no objection has been raised by any statutory consultees on this Project, noting that KFRS has confirmed it has no objection provided the Project complies with the NFCC Guidance, the Applicant does not see any reason for the ExA to depart from this clear precedent of other solar and BESS DCOs.

1.6.24 As such, Mr Flanagan explained that the ExA should consider BESS safety matters to have neutral weight in the planning balance.

1.6.25 The ExA noted that some IPs have suggested that incorrect installation of BESS units could lead to safety issues with the batteries, causing them to overheat, for instance if ventilation is not properly installed and maintained. He asked what safety precautions are to be taken to minimise these risks.

1.6.26 In response, Mr Flanagan explained that the outline answer is that the **Outline Battery Safety Management Plan** [APP-161] covers that point. He confirmed that the BESS will be designed, selected and installed in line with appropriate guidance, adding that compliance with the **Outline Battery Safety Management Plan** [APP-161] is secured through a requirement in the **Draft DCO (Doc Ref. 3.1(E))**.

1.6.27 The ExA asked the Applicant whether maintenance of the BESS would be done on a cyclical basis.

1.6.28 In response, Mr Flanagan confirmed that BESS maintenance would be done following KFRS instructions and the manufacturer's guidance. On the point as to the

regularity of maintenance, he confirmed the Applicant would respond in full in writing.

1.6.29 ***Post-hearing note:*** *Please refer to the Applicant's response to Action Point 6 in Section 2 below.*

1.6.30 The ExA asked if the BESS systems, post installation, would be inspected by a certified agency.

1.6.31 In response, Mr Flanagan confirmed that the **Outline Battery Safety Management Plan** [APP-161] includes requirements for inspection. He confirmed that the Applicant would confirm in writing who would undertake this.

1.6.32 ***Post-hearing note:*** *Please refer to the Applicant's response to Action Point 7 in Section 2 below.*

1.6.33 The ExA asked the Applicant whether there were any alternative forms of BESS, other than lithium-ion, that could be used for the Project.

1.6.34 In response, Mr Flanagan confirmed that lithium-ion technology has been assumed as it is used on other UK BESS sites. However, he confirmed that the design is not confined to that and noted that the Applicant would respond in writing.

1.6.35 ***Post-hearing note:*** *Please refer to the Applicant's response to Action Point 8 in Section 2 below.*

1.6.36 The ExA noted that the Applicant's submissions had anticipated a question he had on recently recorded incidents of BESS fires. He requested that more information be provided relating to the East Tilbury fire.

1.6.37 ***Post-hearing note****: Please refer to the Applicant's response to Action Point 4 in Section 2 below.*

1.6.38 The ExA asked how often the BESS units would need replacing over the operational lifetime of the Project, and asked how they would be disposed of.

1.6.39 In response, Mr Flanagan confirmed that the **Outline Battery Safety Management Plan** [APP-161] anticipates that units and modules may need replacing. As to regularity and disposal, he confirmed the Applicant would provide this detail in writing.

1.6.40 ***Post-hearing note****: Please refer to the Applicant's response to Action Point 9 in Section 2 below.*

1.6.41 The ExA referred to the BESS positioning shown on the **Illustrative Project Drawings** [REP3-004]. He asked whether there was the potential for units to be situated as far away as possible from residential buildings, at the opposite end of fields for instance.

1.6.42 In response, Mr Flanagan noted that commitment to the minimum distance that BESS can be sited from residential priorities is incorporated into the **Outline Battery Safety Management Plan** [APP-161], secured by the **Draft DCO (Doc Ref. 3.1(E))**. He explained that the BESS units will be at least 150m from the nearest residential receptor and that each BESS compound will be at least 25m from the next nearest compound, to ensure separation. He also noted that the minimum separation distance stated in the current NFCC Guidance between BESS and occupied buildings is 25m. As such, the Applicant is securing a separation distance that is 6 times larger.

1.6.43 The ExA then heard submissions from the following IPs:

- Cllr Harman, relating to BESS fire incidents, and impacts to local residents;
- Dr Bromley, relating to consultation on BESS unit locations; the effects of the recent fire at Handen Farm; and the Applicant's noise assessment of the effects of noise emissions from the BESS in proximity to Handen Farm;
- The ExA requested that the noise data referred to by Dr Bromley be provided to the Examination in writing – see Action Point 10 in Section 2 below;
- Professor Melville (on behalf of AMSG), relating to the consultation responses of HSE and KFRS, safety procedures at other BESS locations, global BESS incidents, the Applicant's use of the Rochdale Envelope, including re-iterating the assertion that the BESS component of this Project would be one of the largest in the world. He also summarised his professional qualifications.
- The ExA requested that Sir David Melville's submissions be provided to the Examination in writing – see Action Point 11 in Section 2 below;
- Mr Steve Loader, relating to choice of hearing venue, the safety risks relating to lithium-ion technology, BESS unit distances to residential property, water supply, and UK BESS production;
- Mr Jonathan Tennant (on behalf of AMSG), relating to the Applicant's consideration of alternatives;
- Ms Alison Eardley (on behalf of ABPC) provided the following comments relating to the relating to the **Outline Battery Safety Management Plan** [APP-161]:
    - Paragraph 5.14, which states that "*the operator and fire service will be unable to confirm the state of charge of the batteries and the potential residual risk from any energised batteries within the container*";
    - Paragraph 5.3.8, which states that an executive stakeholder steering group would be established within 24 hours of the incident, noting that this seems like too long an amount of time to put a plan together as to what might happen next; and
    - Referring to alternatives to lithium-ion batteries and

noting the speed of technological change, she asked if a commitment could be included in the Project that the batteries must be upgraded as technology advances to future proof the development so that the village is not left with an obsolete scheme in the longer term;

- Mr Bromley, relating to local water supply in the event of a BESS fire; and
- Mr Derek Burles (on behalf of Sir Christopher Edwards of Heat Vault Company Limited) relating to issues regarding the durability of lithium-ion batteries and the global supply chains of lithium, as compared to heat vault technology.

1.6.44 In response, Mr Flanagan on behalf of the Applicant stated the following:

- In response to submissions made by Sir David Melville and Cllr Harman relating to toxic emissions, he confirmed that the Applicant would provide further details of mitigation measures in writing.
- ***Post-hearing note:*** *Please refer to the Applicant's response to Action Point 5 in Section 2 below.*
- In response to comments criticising the design approach of dispersion of BESS units across the Site, he confirmed that there is no evidence that this approach creates any additional or unacceptable risks. He noted that there are good reasons for adopting that approach, given it creates efficiencies and reduces loss of energy. In response to Sir David Melville's comments that KFRS has not approved the proposals, Mr Flanagan noted that KFRS have had the opportunity to respond and object to the proposed design and they have not done so. In the context of planning, non-objection indicates they are content with what is proposed.
- Mr Flanagan also noted that in his submissions Sir David Melville has contended that as a society we do not have the ability to make BESS safe. Mr Flanagan explained that this was suggested to the Examining Authority during the Examination of Cleve Hill and during other solar/BESS examinations (by Sir David Melville himself in the instance of Cleve Hill) but these suggestions have not been accepted or considered as credible matters of concern in any decision made by the SoS on a solar/BESS DCO.
- Mr Flanagan then referred the ExA to the Applicant's **Responses to Deadline 2 Submissions** [REP3-046]. He noted that AMSG's submission refers to the Northern Ireland HSE report. Mr Flanagan noted that the report cited was prepared in 2019. He explained that this pre-dates the NFCC Guidance, as well as HSE's response to this Project. Mr Flanagan noted that this report was also cited by the Faversham Society during the Examination for Cleve Hill, which is now consented, so has been considered more than once.
- In response to comments raised relating to local water supply, Mr Flanagan explained that **Outline Battery Safety Management Plan** [APP-161], in Table 2.1, commits that a water supply capable of delivering no less than 1,900 litres per minute for at least 2 hours must be delivered from an onsite water tank, in accordance with NFCC Guidance. He confirmed that the total

volume of water to be retained within sealed bunds as part of the Project would be confirmed in writing.

- ***Post-hearing note:*** *Please refer to the Applicant's response to Action Point 12 in Section 2 below.*
- In respect of detailed comments made by Dr Bromley relating to noise, Mr Flanagan confirmed these would be taken away and dealt with in writing.
- ***Post-hearing note:*** *Please refer to the Applicant's response to Action Point 13 in Section 2 below.*
- In response to Ms Eardley's submissions on behalf of ABPC, Mr Flanagan noted that the Applicant had not been informed in writing before now of these detailed points, which would have assisted in providing a full response. Nonetheless, he confirmed the Applicant would consider them and provide a response in writing.
- ***Post-hearing note:*** *Please refer to the Applicant's response to Action Point 14 in Section 2 below.*
- In response to the submissions made by Mr Burles relating to Heat Vault Company Limited, Mr Flanagan noted that the company has not registered as an IP and is proposing a radically different alternative to storage for this Project. He noted that, as Mr Sharpe explained earlier in the hearing, there is a strong national policy on how alternatives should be considered in the context of a project, and in light of that policy context, the inchoate and separate alternative suggested by Mr Burles should not attract any significant weight.

1.7 Agenda Item 6: Next steps

1.7.1 Mr Flanagan read out the list of Action Points from the hearing.

1.8 Agenda Item 7: Closing

1.8.1 The ExA thanked participants and closed ISH4 at 13:05.

2 Action Points

2.1 List of action points arising and the Applicant's responses

Action Point	Applicant's response
Action Point 1: The Applicant to provide a written response to query raised relating to the grid connection date for the Project, that will meet Clean Power 2030 targets.	As confirmed in the **Grid Connection Statement (Doc Ref. 7.3)** [APP-148] the Applicant has accepted a grid connection offer from UK Power Networks Limited ('**UKPN**'), the distribution network operator for the south east and east of England. UKPN has confirmed to the Applicant that there are no Transmission Network related reinforcements required to allow the Project to connect to the distribution grid at Sellindge. The grid connection offer allows the Project to connect to the grid as soon as the Project has been constructed. This means the Project will be able to contribute to the UK meeting the Government's Clean Power 2030 targets.
Action Point 2: The Applicant to provide information about the distributed approach to BESS, rather than single location, in the design of the Project, including responding to Sir Melville's request to confirm the capacity of the BESS.	NPS EN-1 notes that "Applicants are obliged to include in their ES, information about the reasonable alternatives they have studied" (para 4.3.15). The Site is not located within a designated landscape, and, save in respect of the sequential and exception test, it does not trigger any specific requirement to consider alternatives. As set out in Table 5.4 of **ES Volume 2, Chapter 5: Alternatives and Design Evolution (Doc Ref. 5.2(A))** [AS-010], '*the design for the Project employs a distributed approach… as opposed to locating all BESS Units in a single centralised compound area*'. **Table 5.4 of ES Volume 2, Chapter 5: Alternatives and Design Evolution (Doc Ref. 5.2(A))** [AS-010] sets out a number of benefits to this approach, such as lower energy losses and greater flexibility for integration within the landscape given the smaller footprint which also reduces the potential for substantial earthworks and vegetation removal. Locating the BESS as part of Inverter Stations, which are typically located away from field boundaries, limits the impact to offsite receptors relative to a single compound AC-coupled system made up of 100+ BESS Units.

Action Point	Applicant's response
	There is no evidence to suggest that clustering the inverters and BESS Units in a single location would reduce the agreed landscape and visual effects and there are a number of locations where clustering the BESS Units could worsen the effects. A centralised BESS was therefore not considered further to the extent set out in Table 5.4 of **ES Volume 2, Chapter 5: Alternatives and Design Evolution (Doc Ref. 5.2(A))** [AS-010]. Post submission of the Application a number of parties have suggested a centralised BESS may have benefits over the distributed approach proposed here. No specific details have been set out as to where within the Order limits a centralised BESS would be located or any other evidence to support this position. As set out in NPS EN-1: *4.3.28 Alternative proposals which are vague or immature can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision.* It is the Applicant's position that the proposed approach to energy storage is wholly consistent with both NPS EN-1 and EN-3 and there is no necessity to consider a centralised BESS option further. In relation to capacity, BESS systems can be defined in terms of (i) power (measured in megawatts, or MW) being the maximum rate at which it can charge/discharge and (ii) energy capacity (measured in megawatt hours, or MWh) being the maximum amount of useable energy it can store/release. The ratio of power/capacity developed rapidly in the past 18 months as BESS technology has advanced and the main purpose of the BESS has changed from providing short timeframe grid services (which do not require high capacity due to their short term nature) to allowing energy to be transferred (or "load-shifted") between different times of the day (which requires higher capacity) so that it can be supplied to the network as required by consumers. The current UK BESS fleet is typically 1MW power/1MWh capacity, but existing owners are seeking to augment to 1MW power/2MWh capacity, and new BESS are now typically 1MW power/4MWh capacity,

Action Point	Applicant's response
	meaning that the BESS can charge/discharge at a power rating of 1MW for up to 4 hours. As confirmed at ISH4 by Mr Sharpe each 1MW BESS unit for the Project is assumed to provide approximately 4 hours of capacity which means that a 99.9MW BESS, as currently anticipated by the Applicant, would provide circa 400MWh of energy capacity. This is consistent with other current proposals for BESS in the UK market. The Applicant notes that Professor Melville, appearing for the Aldington and Mersham Support Group, claimed at ISH4 that the proposal would be one of the largest globally and larger than the Cleve Hill Solar Project. Neither of these claims is accurate. The Applicant has previously confirmed in Table 4-2 (Aldington and Mersham Support Group responses) of **Responses to Deadline 1 Submissions (Doc Ref. 8.8)** [REP2-034] that there are over 50 BESS facilities in the UK that are either operational, under construction or have received planning permission that are larger in size than the Project BESS. This statement was by reference to the power (in MW) of the project as this is the information that is publicly available (https://www.gov.uk/government/publications/renewable-energy-planning-database-monthly-extract). Public information regarding capacity (in MWh) is generally not recorded but these projects are larger in power terms and it would be irrational to assume these developers would install an obsolete BESS system with lower energy capacity than is now available, especially given higher energy capacity is required to ensure project's can best provide the "load-shifting" service required by the market. In relation to Professor Melville's claims regarding the size of the Project in a global context by reference to energy capacity, the Applicant notes there are a number of projects that are already operational with higher capacity than proposed for the Project, with the largest global project being 3,280MWh (circa 8x the capacity proposed for the Project). In relation to Professor Melville's claim that the Project would be larger than the Cleve Hill Solar Project the Applicant notes that Professor Melville (in that case acting on behalf of the Faversham Society, a key objector group to that project) publicly claimed that the energy capacity of that project was 700MWh (circa

Action Point	Applicant's response
	1.75x the capacity proposed for the Project) so this claim is also not accurate.
Action Point 3: The Applicant to respond in detail to submissions made at Agenda Item 4 relating to adequacy of consultation in respect of BESS proposals.	The Applicant carried out comprehensive pre-application consultation on its proposals prior to submitting the DCO Application, including a five-week non-statutory consultation, two five-week statutory consultations and two four-week targeted consultations. The pre-application statutory consultation accorded with the requirements of the Planning Act 2008 ('PA 2008'), the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 and the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and had regard to guidance issued under section 50(3) of the PA 2008. In addition, the Applicant undertook non-statutory engagement throughout the pre-application stage. The Applicant consulted in a variety of ways to maximise consultee participation. The methods of consultation were themselves the subject of consultation with the host authorities, and set out within the Statement of Community Consultation ('**SoCC**'). The SoCC was revised three times during the pre-application stage, with the host authorities reviewing the SoCC at each stage. The SoCC specified that the consultation would be in the form of: ▪ 12 local information events: to view informative materials about the Project, discuss the proposals with members of the team and provide their feedback on the proposals. All the materials available at those local information events are available to view on the Project website. ▪ Pre-application consultation material was continuously hosted on the Project website. ▪ Leaflets and newsletters have been regularly distributed throughout the pre-application stage, including a Project email address which has allowed local stakeholders to ask questions directly to the Applicant team. ▪ The PEIR and PEIR Addendum were made available on the Project website and hard copies were available throughout the two rounds of consultation during 2022 and 2023. ▪ A Freephone number, staffed by our community relations team, was available to assist people who find it difficult to submit written comments and the

Action Point	Applicant's response
	Applicant offered a telephone surgery to discuss the proposals. Large print and braille versions of consultation documents were also available on request. A Freepost service was available for people who preferred to send feedback by post rather than respond online or by email. ▪ 6 Community Liaison Panels were also held across the pre-application stage to provide local residents with further opportunities to ask the Applicant questions about the emerging proposals, and for the Applicant team to update the community on progress. The energy storage proposals were set out extensively throughout the consultation stages, with key extracts set out in **Appendix 1: Energy Storage / BESS Consultation Extracts**. A large number of consultees provided specific feedback in respect of the energy storage / BESS aspect of the Project, including the HSE, Kent Fire and Rescue and a number of comments from members of the public . The Applicant had careful regard to the consultation responses received as it finalised the Application for the Project, as explained in detail in the **Consultation Report (Doc Ref. 6.1)** [APP-126], and **Consultation Report Appendices F, G and M (Doc Ref. 6.2)** [APP-134], [APP-138] **and** [APP-144], with comments and the Applicants responses set out under the theme 'Health and Safety' and 'Consultation on the BESS'. In accepting the DCO Application, the Planning Inspectorate have confirmed the Applicant's pre-application consultation has complied with the requirements of the PA 2008. Please refer to section 1.5 of **Written Summary of Oral Submissions at Issue Specific Hearing 4 and Response to Action Points (Doc Ref. 8.14.2)**, which provides a summary of the feedback Mr Sharpe provided. Further details of the responses to the pre-application consultation, and how the Applicant had regard to that feedback is set out within **Consultation Report Appendices F, G and M (Doc Ref. 6.2)** [APP-134].
Action Point 4: The Applicant to provide more details relating to the Liverpool BESS fire and the more recent Tilbury fire, and to confirm that	The Liverpool fire occurred on 15 September 2020 and was limited to one of the BESS storage units. There was a blast event as the Liverpool BESS design did not integrate a gas exhaust system or deflagration panels and integrated a clean agent suppression system which

Action Point	Applicant's response
there were no injuries to the public.	significantly increases explosion risks in BESS failure scenarios. At the hearing Professor Melville stated that there was an "explosion and that fire service personnel were injured". This is not accurate, as the blast event occurred before any fire service personnel were on site and no fire service personnel were injured in attending the incident. The East Tilbury fire occurred during installation of the project on 19 February 2025. There is limited information available at this time but the Fire and Rescue Service has indicated that the fire was limited to a single unit, noting that appropriate spacing between the battery units helped to limit any fire spread. In both cases the incident was contained by the local Fire and Rescue Service, there was no injury to local residents and there was no impact to nearby residential properties.
Action Point 5: The Applicant to provide written evidence to demonstrate that in the unlikely event of an incident no unacceptable impacts would arise in respect of gas emissions.	Please see **Appendix 2: Battery Fire Plume Assessment** that has been produced by Hoare Lea, a specialist engineering consultancy firm. Hoare Lea provided the Cleve Hill Solar Park analysis which is relevant given this was accepted by the Secretary of State and Kent Fire and Rescue. The analysis incorporates worst-case assumptions for lithium-ion BESS battery systems which significantly exceed toxic emission levels from full scale BESS burn tests and real-world events. It confirms that a single BESS failure fire will not lead to significant off site impacts for receptors i.e. the local community. As confirmed at ISH4 the Applicant is aware that the National Fire Chiefs' Council ('NFCC') has consulted on draft technical guidance post submission of the application and that the Applicant anticipates submitting updates to Outline Battery Safety Management Plan [APP-161] prior to the end of the examination. The updates will include a new requirement at the detailed design stage a specific BESS system and site study will be conducted based on the final design specification to assess the environmental impact of an incident to sensitive receptors within a 1 km radius. Toxic gas emissions to sensitive receptors must be below Public Health England (PHE) guidelines when the battery system of a BESS is fully consumed (burnt out).

Action Point	Applicant's response
	These commitments will be secured by the **Outline BSMP (Doc Ref. 7.16)** [APP-161].
Action Point 6: The Applicant to confirm the regularity of BESS maintenance.	Automated or visual daily/weekly inspection will be undertaken to identify and rectify noncritical defects. Routine maintenance will be typically undertaken on the BESS equipment every 6-12 months depending on the risk profile of equipment. Updates will be made to the **Outline Battery Safety Management Plan** [APP-161] to explicitly secure these time period requirements.
Action Point 7: The Applicant to confirm the procedure for inspection of BESS installations, and to confirm if this will be done by a certified agency.	The installation process will conform to the National Fire Protection Association (NFPA) 855 Standard for the Installation of Stationary Energy Storage Systems. The BESS enclosure will be UL 9540 and / or BS EN IEC 62933-5-2 certificated. IEC Factory Acceptance Testing (FAT) or an independent manufacturing audit will be carried out prior to transportation of the BESS to Site. Site Acceptance Tests (SAT) will follow IEC 62933-5-2 and IEEE 2962 (in development) standards and protocols. The BESS system will be installed by certified individuals to comply with insurance requirements. The BSMP, secured through Requirement 5 in the **Draft DCO (Doc Ref. 3.1(E))**, would then specify and secure adherence to these measures.
Action Point 8: The Applicant to confirm alternative BESS technologies that may be installed, rather than lithium-ion.	The **Outline BSMP (Doc Ref. 7.16)** [APP-161] assumes that the BESS system will be a lithium-ion system battery technology as is commonly used on other sites being developed in the UK, including at the Cleve Hill Solar Park project in Kent. This technology is considered to be a reasonable worst case for the purposes of the assessment in terms of BESS toxic gas emission potential (Hydrogen Fluoride production) and explosion risk (significant levels of hydrogen produced during thermal runaway) and is therefore considered to be a reasonable worst case for the purposes of the assessment in terms of safety.
Action Point 9: The Applicant to provide further information relating to how frequently the BESS units/modules will need	The Applicant anticipates that an average of 1.5 replacement of battery cells will be required (this assumes all batteries being replaced once during the lifetime of the Project with an additional 50% of batteries replaced twice) as set out in paragraph 15.4.16 of **ES**

Action Point	Applicant's response
to be replaced, and how spent units will be disposed of.	**Volume 2, Chapter 15: Climate Change (Doc Ref. 5.2)** [APP-039]. The **Outline OMP (Doc Ref. 7.11(A))** [REP1-050] secures that any waste will be managed in line with the waste hierarchy (see Table 3.11) and in accordance with the relevant regulations at the time. It specifically states that "Infrastructure that needs to be replaced during the operational phase will be removed and recycled as far as practical and in accordance with legislation and guidance applicable at the time, or if more suitable at the time, sold for refurbishment and reuse."
Action Point 10: Dr Bromley to submit noise calculations referred to during the hearing relating to effects at Handen Farm.	
Action Point 11: Sir Melville to submit his oral submissions in writing.	
Action Point 12: The Applicant to confirm the volume of water to be retained within sealed bunds as part of the Project.	The Applicant had significant engagement with the current owners (Mr and Dr Bromley) of Handen Farm prior to the purchase of the property in November 2022. The Applicant shared illustrative designs for the Project and agreed an approach to mitigation near to the property. The owners of Handen Farm first raised concerns regarding noise with the Applicant during a call on 20 September 2024, based on their personal experience with solar and battery storage projects. The Applicant verbally confirmed that a noise assessment had been undertaken by qualified specialists and that no significant effects had been identified, (see Table 14.6 of **ES Volume 2, Chapter 14: Noise (Doc Ref. 5.2)** [APP-038]). The owners of Handen Farm provided further detail of their specific concerns to the Applicant regarding the noise assessment, including concerns that topography had not been considered, wind direction, that the assessment assumptions regarding running capacity were incorrect, that the acoustic fencing did not provide appropriate mitigation and that cumulative noise impacts from multiple Inverter Stations had not been considered. The Applicant consulted with its noise technical specialist and responded to the concerns raised, noting

Action Point	Applicant's response
	that assessment modelling was undertaken in accordance with ISO 9613-2, the international standard for noise modelling and includes guidance and calculations for distance attenuation, ground effects, atmospheric absorption, reflection from surfaces and screening from obstacles and calculates a worse-case scenario when considering wind, the propagation is corrected to assume downwind propagation in all directions. The assessment is undertaken at 1.5 m/4m from the topography at each location, i.e. receivers are considered relative to the topography. The effectiveness of the fencing is a function of the proposed height and the relative distances to the source from the receiver and has been included as part of the overall mitigation package for the site. The resultant sound level at any location is mitigated through plant selection, natural screening and reductions secured with the fencing. The response also confirmed the approach regarding running capacity and noted that the assessment considered noise produced by all infrastructure across the Site area, as shown at Figure 14.3 and Figure 14.4 **Chapter 14: Noise Figures (Doc Ref. 5.3)** [APP-057], each of which clearly show overlaps of noise from more than one noise generator. No specialist technical evidence has been provided that takes issue with the noise assessment completed. The noise assessment and residual effects have been agreed with ABC, as set out within the **Statement of Common Ground with Ashford Borough Council (Doc Ref. 8.3.1)** [REP1-062].
Action Point 13: The Applicant to respond in writing to comments raised relating to noise effects of BESS around Handen Farm.	The Applicant's responses to the points raised by Aldington and Bonnington Parish Council ('ABCP') are provided below: 1. ABPC expressed concern regarding Paragraph 5.14, which states that "the operator and fire service will be unable to confirm the state of charge of the batteries and the potential residual risk from any energised batteries within the container". The Applicant notes that this language is included in a section titled "Fire Service Guidance" and similar language has been used in outline battery safety management plans for a number of consented DCOs. The Applicant therefore does not consider any amendment is required to this paragraph.

Action Point	Applicant's response
	2. ABPC expressed concern regarding Paragraph 5.3.8, which states that an executive stakeholder steering group would be established within 24 hours of the incident, noting that this seems like too long an amount of time. The purpose of this group is to review the response in the unlikely event of an incident, not to determine how to respond. The Emergency Response Plan will document how an incident should be responded to, and will be developed with Kent Fire and Rescue Service. The Applicant therefore does not consider any amendment is required to this paragraph. 3. Referring to alternatives to lithium-ion batteries and noting the speed of technological change, ABPC suggested that a commitment could be included in the Project that the batteries must be upgraded as they are replaced to future proof the development so that the village is not left with an obsolete scheme in the longer term. The Applicant notes that the DCO, in particular the **Design Principles (Doc Ref. 7.5(B))** [REP3-016], **Works Plans (Doc Ref. 2.3(B))** [REP1-003] and **Outline BSMP (Doc Ref. 7.16)** [APP-161] already provide controls regarding the installation of the BESS. As technology improves over time it is likely to be in the Applicant's commercial interest to ensure any future BESS replacements incorporate the latest technology but the Applicant does not agree a further requirement is appropriate and is not aware of any other solar DCO that has imposed such a requirement. As such the ABPC proposal would not meet the policy test within NPS EN-1 paragraph 4.1.16 that requirements should only be imposed that are, inter alia, necessary and reasonable.
Action Point 14: The Applicant to respond in writing to detailed points raised by Aldington and Bonnington Parish Council relating to the OBSMP wording.	The National Fire Chiefs' ('NFCC') Guidance 2023 requires hydrant supplies that are capable of delivering no less than 1,900 litres per minute for at least 2 hours, equivalent to 228,000 litres. The **Outline BSMP (Doc Ref. 7.16)** [APP-161] confirms that this will be provided. The Inverter Stations are surrounded by bunds that will be 0.7m in height. The bunded area will typically be an area of circa 25m x 35m (875 square metres) but reducing to circa 600 square metres once allowance is made for infrastructure within the bunded areas as this will reduce potential storage area.

Action Point	Applicant's response
	Therefore the available volume within each bunded area is expected to be circa 600 square metres x 0.7m = 420 cubic metres. 420 cubic metres is equivalent to 420,000 litres which is c. 1.8x the NFFC Guidance volume of 228,000 litres. The **Statement of Common Ground with the Environment Agency (Doc Ref. 8.3.2(C))** and **Statement of Common Ground with Kent County Council (Doc Ref. 8.3.4(C))** (in their role as Lead Local Flood Authority) confirm that all relevant matters in relation to water effects of the Project, including in relation to management of firewater, are agreed.

Appendix 1: Energy Storage / BESS Consultation Extracts

Statement of Community Consultation (March 2022) [(Doc Ref 6.2) Appendix B-3 SoCC, PDF Page 28 and 31] [APP-128]

The energy storage will be provided by batteries installed on the site – these will either be located in a large single compound or distributed throughout the site, depending on the technical approach in relation to charging. This will be determined prior to the DCO application being submitted. [p.31]

Non Statutory Consultation (published in March 2022) [APP-127]

Community Leaflet [**(Doc Ref 6.2) Appendix A-2 Community Information Leaflet**, PDF Page 11]

Evolution Power is intending to develop a renewable energy generating project, together with on-site energy storage, associated infrastructure and an underground cable connection, on land at Aldington near Ashford in Kent

The energy storage facility will be able to store electricity to maximise the output of the solar project and allow it to export at times of peak energy demand to ensure the solar output provides a stable and reliable addition to the UK energy supply

Non Stat Exhibition Boards – March 2022 [(Doc Ref 6.2) **Appendix A-2 Exhibition Boards**, PDF Page 31 and 33] [APP-127]

The Proposed Development will include solar PV arrays and on-site energy storage, together with *associated infrastructure and an underground cable connection via the existing National Grid Substation at Sellindge [p.31]*

Energy Storage Infrastructure; The energy storage provided on the site will enable the maximum benefit to be obtained from the renewable energy produced and provide vital 'grid balancing' services to the electricity grid. It is expected that the energy storage facility will typically be charged using electricity generated by the solar PV modules but it will also be possible to import electricity from the grid for storage on-site. The stored electricity can then be exported back to the grid at times of high demand which is often in the evening. The energy storage will either be located in a single compound or distributed throughout the site, adjacent to the inverter stations. This will be finalised prior to the submission of the DCO application. [p.33]

Community Newsletter June 2022 [**Consultation Report, Appendix I-2: June 2022 (Doc Ref. 6.2))** [APP-140]

Fire Risk from energy storage facilities

Respondents raised the potential issue of fire from the energy storage facilities. What are we doing: An Outline Battery Safety Management Plan is being prepared which will set out the measures to be implemented to mitigate any potential fire risk. This will be submitted with the DCO application.

Scheme Design

Evolution Power is continuing to develop the design of the scheme, taking into consideration feedback received from the first round of consultation. The DCO application will show where the solar arrays are proposed to be sited, along with inverters and the energy storage facilities, and will also show proposed changes and enhancements to Public Rights of Way on the site. The preliminary proposals for the design will be included in the consultation material for the forthcoming statutory consultation

2022 Statutory Consultation (Published in October 2022)

Community Information Leaflet, Consultation Report Appendix F: 2022 Statutory Consultation materials and consultation responses, Appendix F-1: 2022 Statutory Consultation Information Pack [APP-134]

Introduction

Evolution Power is intending to develop a renewable energy generating project, together with on-site energy storage, associated infrastructure and an underground cable connection, on land at Aldington, near Ashford in Kent. K

What has changed since our non-statutory consultation?

Energy storage siting: It is proposed that these would be distributed throughout the site as opposed to a single energy storage compound. In addition, where possible, these structures are to be located further from the site boundaries to reduce impact;

Consultation Booklet [APP-134]

5. Questions regarding energy storage. Battery storage will be distributed across the site adjacent to other electrical infrastructure. Where possible this will be located away from the site boundaries to reduce any potential noise impact;

Energy storage The energy storage will be provided within the site to allow the project to load-shift generation from periods of low demand to high demand (to enable the maximum benefit to be obtained from the renewable energy produced) and to also provide grid balancing services to the electricity grid. It is expected that it will typically be charged using electricity generated by the solar PV modules but it will also be possible to import electricity to charge the storage facilities using grid supplied power when the solar PV modules are not generating sufficient power (for example, during the night). The energy storage element of the project will be DC-coupled (charged using direct current) and accommodated in containerised units (approximately 13.75m (length) x 2.9m (height) x 3.8m (width)) distributed throughout the site, adjacent to the inverter stations. A heating, ventilation, and cooling ('HVAC') system will be integrated into the containers to ensure efficiency and safe performance and the system will also include an integrated fire safety management system. Electricity from the panels will directly charge the batteries via the DC-DC convertors (approximately 1m (length) x 2.1m (height) x 0.85m (width))

located beside the energy storage units and inverter stations. The DC-DC convertors also enable the storage units and the inverters to interact.

Consultation questions

3. Do you have any comments on the proposed siting or layout for the solar generation and energy storage scheme?

Exhibition Boards [APP-134]

Energy storage The energy storage will be provided within the site to allow the project to load-shift generation from periods of low demand to high demand (to enable the maximum benefit to be obtained from the renewable energy produced) and to also provide grid balancing services to the electricity grid. It is expected that it will typically be charged using electricity generated by the solar PV modules but it will also be possible to import electricity to charge the storage facilities using grid supplied power when the solar PV modules are not generating sufficient power (for example, during the night). The energy storage element of the project will be DC-coupled (charged using direct current) and accommodated in containerised units (approximately 13.75m (length) x 2.9m (height) x 3.8m (width)) distributed throughout the site, adjacent to the inverter stations. A heating, ventilation, and cooling ('HVAC') system will be integrated into the containers to ensure efficiency and safe performance and the system will also include an integrated fire safety management system. Electricity from the panels will directly charge the batteries via the DC-DC convertors (approximately 1m (length) x 2.1m (height) x 0.85m (width)) located beside the energy storage units and inverter stations. The DC-DC convertors also enable the storage units and the inverters to interact.

2023 Statutory Consultation Material (published in June 2023)

Consultation Booklet, **Consultation Report Appendix G: 2023 Statutory Consultation materials and consultation responses, Appendix G-1: 2023 Statutory Consultation information pack, Part 2 (Doc Ref. 6.2)** [APP-136]

Key technical components of the Project include:

• Energy storage units – to provide grid balancing services and able to be charged directly by the PV panels;

Questions

2) Do you have any comments on our proposals for the energy storage element of the scheme?

Exhibition Boards

Indicative Proposed Layout - showing Siting Zones for Energy Storage Units

Feedback form

2. Do you have any comments on our proposals for the energy storage element of the scheme?

You said; We did

Question 3 – Do you have any comments on the proposed siting or layout for the solar generation and energy storage scheme?

The most frequent responses were:

• that the proposal is too large;

• concern about visual impact, particularly in to the AONB;

• concerns about the loss of valuable agricultural land / food production;

• concerns about the proposals' proximity to property; and

• that alternative sites are available.

Other responses included support for the scheme, energy storage is necessary, the Project is located on an appropriate site and there a few residential properties affected.

An assessment of every property affected by noise should be undertaken

Further noise assessment work has been undertaken which has informed the location of infrastructure that can generate noise (typically heating, ventilation and air conditioning elements of inverters/energy storage). Acoustic fencing is also proposed in certain locations to minimise potential noise impacts to nearby receptors

Preliminary Environmental Information Report, Volume 3, Appendix 3.4[1]

Skeleton Draft of the Outline Battery Safety Management Plan

- Set out the structure and purpose of the Outline Battery Safety Management Plan

[1] http://www.stonestreetgreensolar.co.uk/

Stonestreet Green Solar

Appendix 2 - Battery Fire Plume Assessment

HOARE LEA

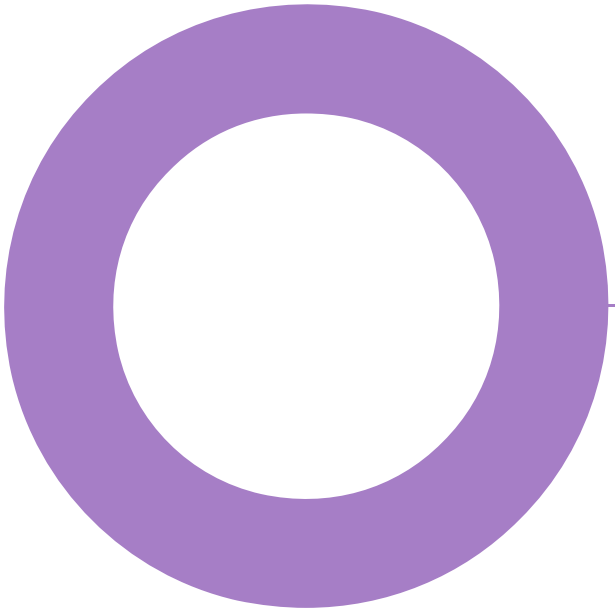
Stonestreet Green Solar. Ashford.

EPL 001 Limited.

AIR QUALITY

BATTERY FIRE PLUME ASSESSMENT

REVISION 01 – 06 MARCH 2025



Audit sheet

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
00	18/02/2025	First Draft	SB	JJ	CE
01	06/03/2025	First Issue	SB	JJ	CR

Project number: 34/22432
Document reference: 3422688-HLE-RP-AQ-BESS Stonestreet Green Battery Failure Plume Assessment-Rev01.docx

Contents

Executive summary

Hoare Lea have been appointed by EPL 001 Limited (the 'Applicant') to assess the potential air quality impacts on the local area in the event of battery failure and potential risk of fire, resulting in the plume dispersion of hazardous gas emissions at the proposed Battery Energy Storage System (BESS) at Stonestreet Green Solar.

The aim of the study is to provide preliminary information by identifying the impact and dispersion of the gas plume and to quantify air quality impacts on the local area in the event of a battery failure at the BESS. For the assessment approach, robust and reasonable worst-case assumptions have been made.

The risk of fire during a battery failure event could potentially result in the plume dispersion of hazardous gas emissions, including the highly toxic hydrogen fluoride (HF). As such, the plume dispersion of a potential toxic gas plume emitted during the rare event of a battery fire scenario must be studied in order to consider the potential impact on sensitive receptors in the vicinity of the Site.

Due to the high toxicity of HF and because its emission rates, although limited, are available in the literature, the emissions of HF alone have been assessed to represent the worst-case impact of a battery fire scenario.

The results of the battery fire assessment indicate that the relevant Acute Exposure Guideline Levels (AEGLs) Level 2 and 3 for HF were not exceeded at any location outside the Order Limits for any of the five exposure periods considered. There is a higher risk of adverse health impacts for AEGL Level 2 and Level 3 exceedances, including irreversible or other serious long-lasting health impacts at nearby receptors. As such, a battery fire is unlikely to lead to serious or long- term health impacts on receptors at any distance from the Site.

The Applicant has confirmed to Hoare Lea that no BESS will be located within 200m of a residential receptor. Assuming this is complied with, then exceedances of AEGL Level 1 for HF (one part per million HF) at nearby residential receptors are only predicted for the short term 10-minute and 30-minute exposure periods.

Furthermore, these results are based on other worst-case assumptions including that the fire will occur on worst-case meteorological conditions for that wind direction. The in-combination possibility of a fire event taking place during the worst-case meteorological conditions is considered to be extremely low.

It is important to note that health impacts associated with AEGL Level 1 values are transient and reversible upon cessation of exposure. In the unlikely event of a battery fire occurring at the site, as a precautionary measure, the areas within the AEGL Level 1 maximum area of exceedance should be avoided by the general public where possible.

In summary, the key findings of this assessment include that it is unlikely that there will be serious/permanent health impacts predicted at any distance under worst-case battery fire conditions. The AEGL Level 1 maximum area of exceedance of 251 m for the 10-minute exposure period only reaches a small number of receptors under a reasonable worst-case fire (in the unlikely event) and worst-case meteorological conditions. In this scenario the predicted impacts are transient and reversible.

1. Introduction

Hoare Lea have been commissioned by EPL 001 Limited (the 'Applicant') to assess the potential air quality impacts on the local area in the event of battery failure and potential risk of fire, resulting in the plume dispersion of hazardous gas emissions at the proposed Battery Energy Storage System (BESS) at Stonestreet Green Solar (the 'Proposed Facility'), within the administrative boundary of Ashford Borough Council (ABC). The Proposed Facility is part of a wider development comprising solar panels and other infrastructure at Stonestreet Green (the 'Site').

The aim of the study is to provide preliminary information by identifying the impact and dispersion of the gas plume and to quantify air quality concentrations within the local area in the event of a battery failure at the BESS. For the assessment approach, robust and reasonable worst-case assumptions have been made.

In reality, the direction of the plume will depend on the wind direction, while the dispersion will also depend on wind speed and atmospheric turbulence at the time of battery failure. To ensure a robust approach, the impacts presented within this report are independent of specific wind direction.

1.1 Location context

The location of the Proposed Facility is presented in Figure 1 for context. The Site area that will include BESS is located to the northeast of the village of Aldington.

Figure 1: Location of the Approximate Application Site Boundary. Contains Google Satellite data © Crown copyright and database rights (2025).

1.2 Proposed facility

The Applicant has confirmed that the Project Design Principles restrict the total number of BESS on the site to 128 battery containers, being a maximum of four batteries for each of the inverters, with the number of

inverters limited to thirty-two. The Applicant has provided an Illustrative Scheme Layout shown below in Figure 2 and Figure 3, but this is subject to detailed design post any grant of a Development Consent Order.

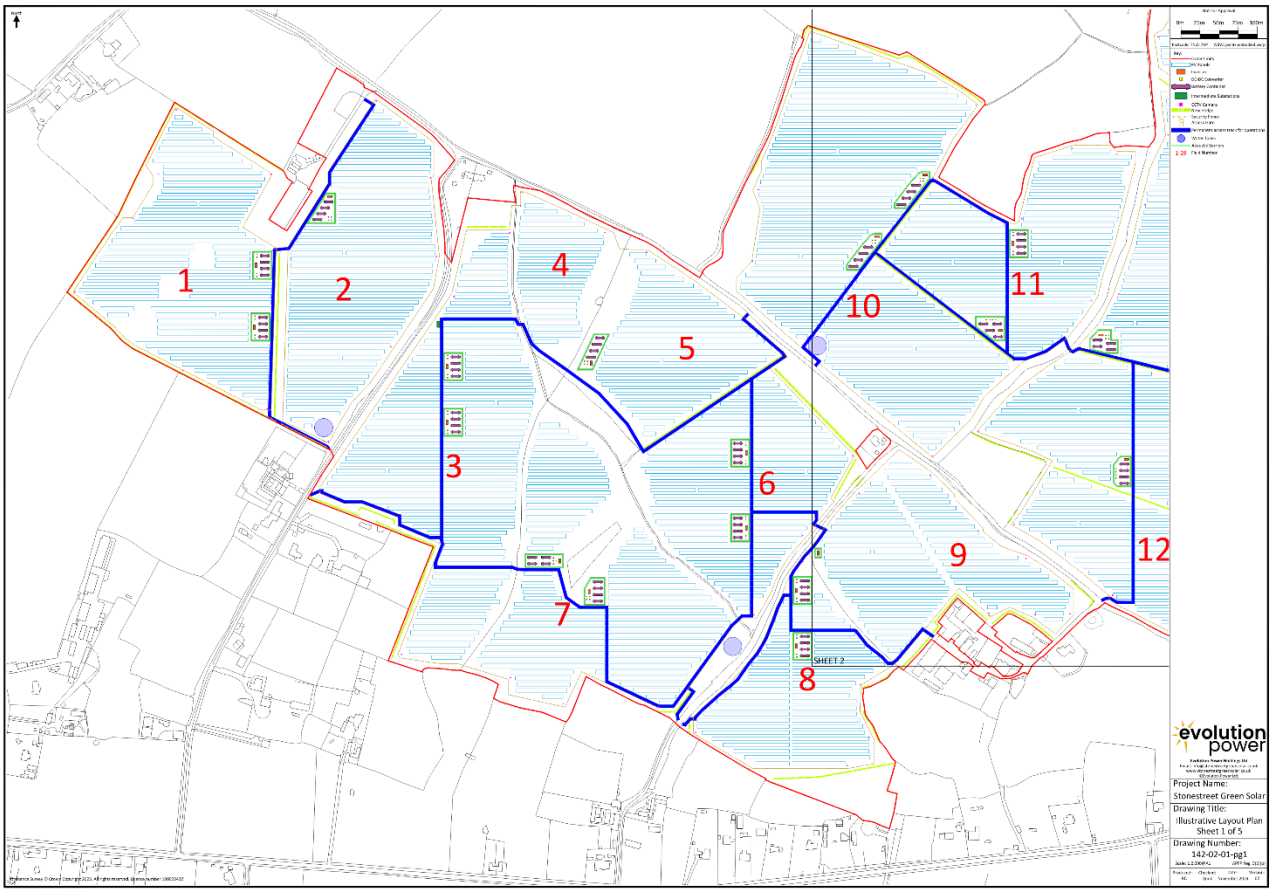


Figure 2: Layout of the Proposed Facility (Fields 1-12). Drawing provided by EPL 001 Limited (Drawing number: 142-02-01-pg1).

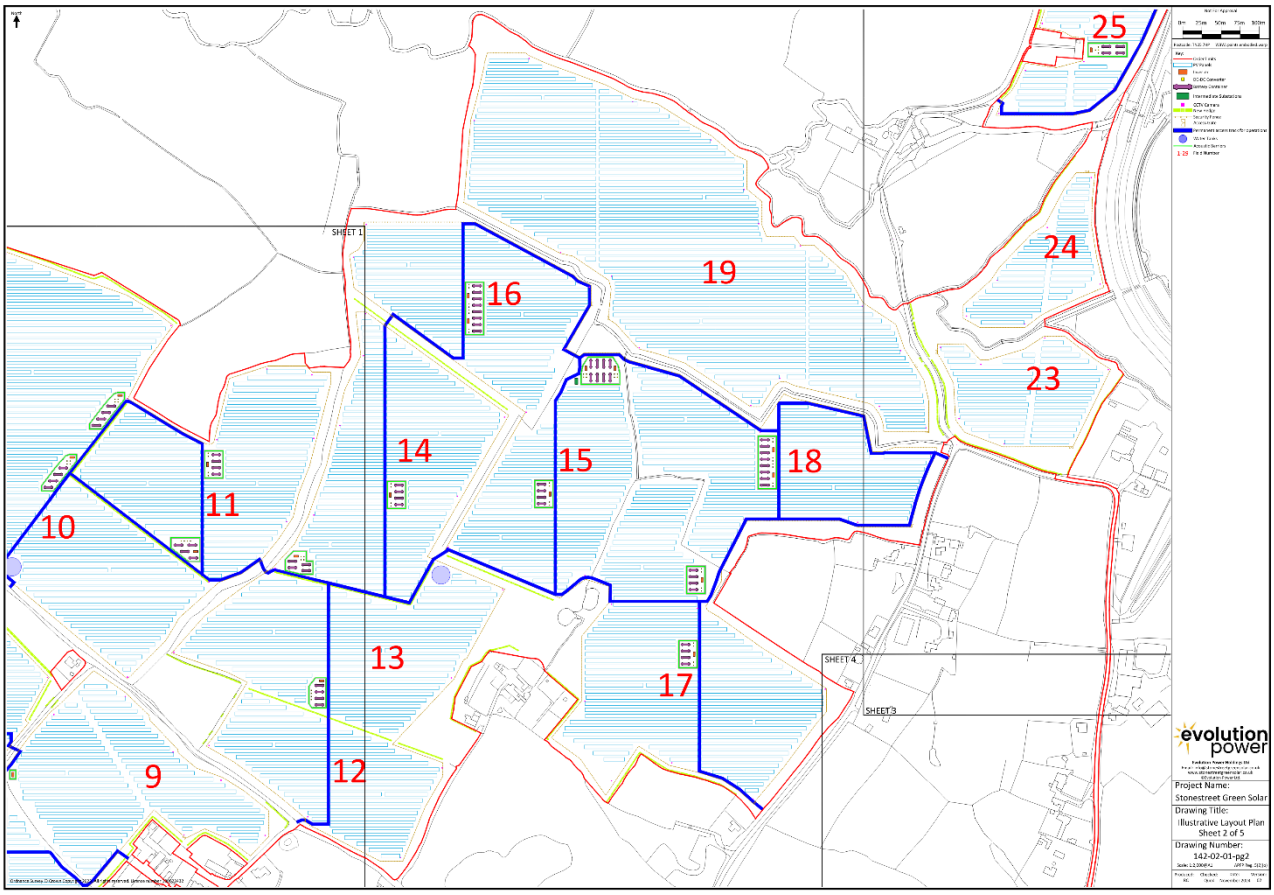


Figure 3: Layout of the Proposed Facility (Fields 12-25). Drawing provided by EPL 001 Limited (Drawing number: 142-02-01-pg2).

At this stage the battery manufacturer has not been specified. However, the Applicant has confirmed that the BESS will utilise Lithium Iron Phosphate (LFP) batteries, which forms the basis of this assessment.

It is important to note that battery failure is an unlikely event, and the BESS will include safety systems to mitigate, control and avoid hazardous outcomes. To ensure a robust approach, this assessment considers the burn out of an entire container. The Applicant has confirmed that the BESS containers on site are located at a distance of at least 6m apart, and as a result, the fire is extremely unlikely to propagate from one to the other.

1.3 Scope of the assessment

It is understood that a battery failure at the Proposed Facility has the potential to result in thermal runaway. Thermal runaway occurs when the battery cells enter an uncontrolled self-heating state, resulting in high temperature and the emission of potentially hazardous gases. In the worst-case event that ignition occurs during thermal runaway, this assessment involves the quantitative analysis of the dispersion of the gases emitted from the Proposed Facility during a fire scenario.

A dispersion modelling assessment has been undertaken to consider the dispersion of HF gases emitted from one container at the Proposed Facility in a fire scenario. The thermal runaway event itself has not been modelled as typically only traces of HF gases are observed during the thermal runaway event and the impact of gas emissions during the thermal runaway event are anticipated to be within close distance to the batteries and unlikely to impact sensitive receptors in the area. The dispersion modelling of HF during a fire scenario is considered the worst-case scenario in the event of battery failure and this has been modelled using emission rates sourced from existing literature.

The Applicant have provided technical documentation in relation to BESS containers. These technical documents provide useful information to determine some of the parameters for a fire scenario that have been included within the assessment. However, the technical documents do not provide comprehensive information required to calculate the emissions for modelling the fire scenario. Therefore, only emissions of HF have been considered and were sourced from existing literature. HF is considered highly toxic and because emission rates, although limited, are available in literature.

It is acknowledged that there will be levels of Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Particulate Matter (PM), Hydrogen Chloride (HCl) and Hydrogen Cyanide (HCN) emitted as a result of a fire event. However, NO_x levels are expected to not have a significant effect, with HCl and HCN emissions expected to be lower than HF emissions. Additionally, there is limited availability of PM emissions from representative battery fires available in the literature. As such, these pollutants will not be considered further within the assessment, with HF being assessed as the worst pollutant, due to the criteria stated above. This is considered to be a robust approach.

The dispersion of the HF emissions associated with the fire scenario has been modelled to predict the spread of the gas plume, predict HF concentrations and to determine the maximum areas of exceedance and exclusion zones (if required) around the battery containers in comparison to the relevant assessment criteria.

2. Methodology

A modelling assessment has been undertaken to consider the dispersion of HF gases emitted from the Proposed Facility during a fire scenario.

2.1 Model inputs, emissions and scenario

2.1.1 Model parameters

Research of LFP battery fire events indicated that during a fire event, traces of HF gases can be found. HF emissions have been sourced from the following reports:

- Larsson et al. (2016) report '*Gas emissions from Lithium-ion battery cells undergoing abuse from external fire*'[1];
- Larsson et al. (2017) report '*Toxic fluoride gas emissions from lithium-ion battery fires*'[2];

These reports provide HF emission rates (mg/Wh) for LFP batteries with varying geometries at specified state of charge (SOC) during test conditions. An average of the HF emissions reported for cylindrical LFP batteries at 50-100% SOC, has been utilised for the dispersion modelling. There is limited availability of emissions data for prismatic LFP cells in the literature, as such, these could not be included in the average HF emission rate calculation. Emissions data for pouch cells have not been included as the Applicant has confirmed that they will not be used as part of the chosen technology for the BESS systems. This approach is considered to provide the most comprehensive data on HF emissions for the battery storage used on Site based on available data at the time of writing, and in the absence of specific emissions for the battery storage used at the Site.

The fire scenario has considered one entire container flaming during a battery failure event. To calculate the HF emission rates representative for the fire, information on the battery capacity and dimensions, as provided by the Applicant, was used. This information and the emission rates from the publications outlined above were used to calculate the hourly HF emission rate. To ensure a robust assessment, the emission rate is assumed constant throughout the fire scenario.

Due to the limited available data, in the existing literature, on the velocity of the gas release to the atmosphere during the fire event, a low velocity of 0.1 m/s has been utilised in order to account for thermal buoyancy effects in the model. This is considered a robust approach as the velocity of HF emissions to air is likely to be quicker, particularly during the peak release.

Given the distributed nature of the proposed BESS, an illustrative container was assessed, with the area of exceedances calculated to be applied to all BESS containers within the Proposed Facility.

The container has been modelled as an area source to represent the emissions distributing equally across the top of the container at the peak flame height. In line with information detailed within the technical documents provided by the Applicant, an average flame height (i.e. emissions release) of 2.1 m above the container top has been utilised in the model. This is considered a robust assumption for the modelled fire scenario.

Fire temperature has been sourced utilising information detailed within the technical documents provided by the project team, with an external fire temperature of 822.5°C used in the assessment which has been assumed constant throughout the entire fire scenario.

Further information on the fire scenario emissions is detailed in Appendix 1.

[1] Larsson et al (2016) Gas emissions from Lithium-ion battery cells undergoing abuse from external fire – [online], (Last accessed: 11/02/2025), Available at www.research.chalmers.se/en/publication/243272

[2] Larsson et al (2017) Toxic fluoride gas emissions from lithium-ion battery fires – [online], (Last accessed: 11/02/2025), Available at: www.nature.com/articles/s41598-017-09784-z/

2.1.2 Scenario

The model has been run considering one full container being on fire, on the basis that the Outline Battery Safety Management Plan (OBSMP) commits to a separation distance of 6 m minimum as recommended by the National Fire Chiefs' Council Guidance.

In order to ensure a robust approach has been undertaken, the model was run for a full calendar year at the 100th percentile for HF at all exposure periods considered. The 100th percentile represents the worst-case period average of the year when concentrations are predicted to be at their greatest. This approach results in predicting concentrations for the worst-case meteorological conditions and subsequently, predicted HF concentrations can be considered conservative.

The likelihood of a fire event occurring during the worst-case meteorological conditions is very low. Meteorological data from Herstmonceux West End meteorological station has been used for the purpose of dispersion modelling. This meteorological station was selected as the most representative of the meteorological conditions anticipated at the Site, due to having similar elevation (15 m difference) as the Site and also being set back at a similar distance from the coast, at approximately 10 km and 7.5 km, respectively.

Data for 2021, 2022 and 2023 has been utilised and the results presented within the report outline the predicted concentrations associated with the worst-case meteorological year for the relevant exposure period.

A fire duration of 8 hours has been utilised and considered a reasonable fire duration. As the model has been ran for a full calendar year of data, this covers any type of length a full container could be on fire.

Further information on the fire scenario modelling parameters is detailed in Appendix 1.

2.2 Assessment criteria and model

Acute Exposure Guideline Levels (AEGLs) are used as guidance to support the handling of rare, usually accidental, releases of chemicals into the air. AEGLs are used worldwide by emergency planners and responders to support guidance and responses during an emergency event. Due to the unlikely event of a thermal runaway and subsequently of a fire at the Proposed Facility, the use of AEGLs as the assessment criteria is considered to be the most representative.

AEGLs are calculated for five short exposure periods:

- 10-minutes;
- 30-minutes;
- 1-hour;
- 4-hours; and
- 8-hours.

They are expressed as specific concentrations at which health effects may occur. AEGLs for a specific pollutant can be categorised to Level 1, 2 or 3, with Level 1 being the least and Level 3 being the most severe. The levels are summarised below:

- Level 1: Notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure;
- Level 2: Irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape; and
- Level 3: Life-threatening health effects or death.

Levels 1, 2 and 3 AEGL values for HF have been used to represent the assessment criteria for comparison against the modelled HF concentrations. The AEGLs for HF are provided in Table 1.

Table 1: Acute Exposure Guideline Levels for Hydrogen Fluoride.

Exposure Period	AEGL level 1 (ppm)	AEGL level 2 (ppm)	AEGL level 3 (ppm)
10-minute	1	95	170
30-minute	1	34	62
1-hour	1	24	44
4-hour	1	12	22
8-hour	1	12	22

For the purpose of the assessment maximum areas of exceedance will be discussed for AEGL Level 1 given the transient nature of the effects, whereas zones of exclusion are discussed for AEGL Levels 2 and 3 due to the higher risk of adverse health impacts.

Impacts have been modelled using the ADMS 6 (v.6.0.0.1) dispersion modelling software. ADMS 6 is an extensively validated Gaussian plume air dispersion model, and is used by regulators, government departments, consultancies, and industry. The model is able to simulate the entrainment of the plume in the wake of buildings.

2.3 Receptors

HF emissions from fire event could have an impact on the health and wellbeing of sensitive receptors.

Concentrations of HF emissions from the modelled scenarios have been predicted within a 1 km by 1 km grid at a 10 m resolution in order to predict the spread of the fire plume, predict pollutant concentrations and to determine the required maximum areas of exceedance and exclusion zones (if required) around the battery container for the modelled scenario in comparison to the relevant AEGL values. The size of the grid will ensure that all nearby existing receptors have been captured.

2.4 Assumptions and limitations of the study

Modelling the impact of air emissions during a potential battery failure is complex because each event is different. It depends on many factors including the number and type of battery modules failing, their SOC, whether/how they are damaged, and the weather at the time of the event. Therefore, a number of assumptions have been made to represent a robust and worst-case assessment in a reasonable manner.

Any dispersion modelling study involves a range of uncertainties, including the model inputs, assumptions, the model and post-processing of model results. The dispersion model used in the assessment is dependent upon emission rates, flow rates, exhaust temperatures and other parameters for each source, all of which are variable in reality. There are then additional uncertainties, as models are required to simplify real-world conditions into a series of algorithms. The model used for this assessment has been validated for this type of modelling studies.

Assumptions and considerations made to ensure a robust approach are listed below:

- HF emissions are assessed to represent the worst-case impact of a battery failure scenario, due to its high toxicity and because its emission rates, although limited, are available in the literature;
- Emission rates for HF are based on average of the HF emissions in mg/Wh reported from the literature[1,2] for cylindrical LFP batteries at 50-100% SOC –an average of 33.88 mg/Wh has been used for this assessment. The mass emitted is spread uniformly across the total length of time that the flaming event was observed. The entire flaming has been assumed to be flaming within the eight-hour fire duration. Further detail on the HF emission rate calculation is provided in Appendix 1.
- It is assumed the entire container will be flaming, taking into consideration slow propagation of the fire from cell to cell. Due to the unknown length of flaming for the entire container, a full year of meteorological data has been used, covering any possible length.

- Due to limited available data on the velocity of the gas release to the atmosphere during the fire event, a low velocity of 0.1 m/s has been utilised in order to account for thermal buoyancy effects in the model. This is considered a robust approach as the velocity of HF emissions to air is likely to be quicker, particularly during the peak release;
- A flame temperature of 822.5°C representative of the temperature for a fire of this kind was used.
- For the modelling process, a full calendar year of meteorological data has been used to predict the peak concentration for each gas assessed per hour. The worst-case meteorological year out of three years of 2021-2023 for each exposure period has been used;
- The model has assumed that the 4-hour and 8-hour exposure periods are considering continuous and consistent emission release during these periods. This takes account of the possibility of continuous fire propagation between modules within a single container; and
- As the resolution of the ADMS pollutant grids was 10 m in X and Y directions, an additional 10 m has been added on to the area of exceedances to account for the uncertainty due to the grid resolution of the model used to predict areas of exceedance.

3. Results

The potential for air quality impacts from the fire scenario in the Proposed Facility are assessed in this section.

As previously mentioned in Section 2, the model has been run for a full calendar year at the 100th percentile for the exposure periods considered. The 100th percentile represents the worst-case averaging period of the year when concentrations are predicted to be at their greatest. In the unlikely event that a fire scenario occurs, it is considered very low risk that this would coincide with the worst-case meteorological conditions. Subsequently, the results provided below are considered conservative.

The maximum concentration of pollutants in each scenario has been provided for the 10-minute, 30-minute, 1-hour, 4-hour and 8-hour exposure periods. Where the limit concentrations, provided in Table 1 have been exceeded; the maximum distance from the source where these exceedances occur have been provided. These can be used to determine the maximum areas of exceedance and exclusion zones (if required) surrounding the battery container during the relevant exposure period.

Table 2 shows the HF results for the fire scenario. The results of the assessment indicate that AEGL Levels 2 and 3 for HF were not exceeded at any location outside the Order Limits for any of the five exposure periods considered. There is a higher risk of adverse health impacts for AEGL Level 2 and Level 3 exceedances, including irreversible or other serious long-lasting health impacts at nearby receptors.

Hoare Lea understand that the Applicant will commit under the OBSMP that no BESS will be located within 200 m of a sensitive receptor. Assuming this is complied with, then exceedances of AEGL Level 1 for HF at sensitive receptors are only predicted for the short term 10-minute and 30-minute exposure periods.

AEGL Level 1 refers to notable discomfort, irritation, or certain asymptomatic non-sensory effects. It is important to note that health impacts associated with AEGL Level 1 values are transient and reversible upon cessation of exposure.

Further, these results are based on other worst-case assumptions including that the fire will occur on worst-case meteorological conditions for that wind direction. The in-combination possibility of a fire event taking place during the worst-case meteorological conditions is considered to be extremely low.

These areas of exceedance are expected to occur downwind of any battery container, however the maximum area of exceedance (AEGL Level 1) has been stated to account for all possible wind conditions.

There is no requirement for exclusion zones surrounding the Proposed Facility, as no exceedances of the AEGL Levels 2 and 3 were predicted for any exposure period.

Table 2: Fire Scenario Results

AEGL level	AEGL		Maximum Distance of Exceedance (m)
	Exposure Period	Value (ppm)	
1	10-min	1	251
	30-min	1	207
	1-hour	1	166
	4-hour	1	141
	8-hour	1	139
Notes: Maximum Distance of Exceedance (m) values were rounded to the nearest whole number.			

In the unlikely event of a battery fire occurring at the site, as a precautionary measure, the areas within the AEGL Level 1 maximum area of exceedance should be avoided by the general public where possible.

4. Conclusion

Hoare Lea have been commissioned by EPL 001 Limited to assess the potential air quality impacts on the local area in the event of a battery failure, resulting in the plume dispersion of hazardous gas emissions at the proposed BESS at Stonestreet Green Solar.

This assessment has considered air pollutant emissions dispersion in a fire scenario to assess the impact on existing receptors in the vicinity of the Site. It is important to note that battery failure is an unlikely event, however, should this occur, there will be adequate safety systems in place to control the situation and avoid further failure. However, for the assessment approach, robust and worst-case assumptions have been made in a reasonable manner.

The results of the assessment indicate that AEGL Levels 2 and 3 for HF were not exceeded for any of the five exposure periods considered at any location outside the Order Limits. These are levels where irreversible or other serious long-lasting health impacts could be experienced.

Hoare Lea understand that the Applicant will commit under the OBSMP that no BESS will be located within 200m of a sensitive receptor. Assuming this is complied with then exceedances of AEGL Level 1 for HF at sensitive receptors are exceeded only for the short term 10-minute and 30-minute exposure periods.

Further, these results are based on other worst-case assumptions including that the fire will occur on worst-case meteorological conditions for that wind direction. The in-combination possibility of a fire event taking place during the worst-case meteorological conditions is considered to be extremely low.

It is important to note that health impacts associated with AEGL Level 1 values are transient and reversible upon cessation of exposure. As such, a worst-case battery fire is unlikely to lead to serious or long- term health impacts on receptors at any distance from the Site.

In the unlikely event of a battery fire occurring at the site, as a precautionary measure, the areas within the AEGL Level 1 maximum area of exceedance should be avoided by the general public where possible.

In summary, the key findings of this assessment include that it is unlikely that there will be serious/permanent health impacts predicted at any distance under worst-case battery fire conditions. The AEGL Level 1 maximum area of exceedance of 251 m for the 10-minute exposure period only reaches a small number of receptors under a reasonable worst-case fire (in the unlikely event) and worst-case meteorological conditions. In this scenario the predicted impacts are transient and reversible.

5. Glossary of terms

ABC	Ashford Borough Council
AEGL	Acute Exposure Guideline Levels
BESS	Battery Energy Storage System
BSMP	Battery Safety Management Plan
CO	Carbon Monoxide
HCl	Hydrogen Chloride
HCN	Hydrogen Cyanide
HF	Hydrogen Fluoride
LFP	Lithium Iron Phosphate
NO_x	Nitrogen Oxides
PM	Particulate Matter
SOC	State of Charge

Appendix 1 – Model input parameters

An assessment has been undertaken using ADMS 6 to consider the gases emitted from the Proposed Facility in a fire scenario.

Model input and emissions parameters

Fire scenario

Section 2.1 within the report details the methodology and calculations behind the emissions used within the dispersion model for the fire scenario. As a robust and reasonable worst-case assumption, the fire scenario was considered for one entire container flaming during a battery failure event.

The data inputted into the model is shown in Table 3.

Table 3: Model Input Parameters used in ADMS 6

Parameter	Value
Container dimensions (width, depth, height) (m)	6.058, 2.438, 2.896
Container area (top) (m^2)	14.77
Battery container energy capacity (MWh)	4.292
Fire temperature (°C)	822.5
Velocity of gas release from fire (m/s)	0.1
HF emission (per cell at 50-100% SOC) (mg/Wh)	33.88*
HF emission rate (g/s)	5.05
HF emission rate (g/m^2/s)	0.342
Modelled flame height (m)	5.0
Note: * indicates HF emission per cell associated with the literature[1,2]	

HF Emission rate

The calculation of the HF emission rate per container area (14.77 m^2) for the area source of HF emissions used in the ADMS 6 model is demonstrated below, with the respective model inputs summarised in Table 3.

The 33.88 mg/Wh battery HF emission rate taken as an average from the various literature reports[1,2] (per cell at 50-100% state of charge) was used to calculate the mass of HF gas emitted by the battery container. To ensure a robust assessment the emission rate was assumed constant throughout the fire event.

The model has been run for every hour of a year with an hourly emission rate of 0.342 g/s/m^2 to cover any potential flaming length. As a worst-case assumption, utilising relevant information provided by the project team, the fire duration has been assumed to be 8 hours for the emissions calculation, with the entire container assumed to burn out within this duration.

Exposure periods

Two out of the five AEGL exposure periods are below 1-hour: 10-minute and 30-minute, respectively. The model used for the purpose of the dispersion modelling exercise has allowed for the calculation of peak 1-hour concentrations (100% percentile) to align with the modelling process and input parameters such as the meteorological data, which is based on hourly data.

Subsequently, two separate factors have been applied to peak 1-hour concentrations (100% percentile) to determine the concentrations for a 10-minute and 30-minute average, which are provided below:

- 1.65 to convert into a 10-minute average; and
- 1.3 to convert into a 30-minute average.

The calculation for the factor to convert to a 10-minute average has been derived from the equation specified within Section 17 of Ontario Regulation 419/05 'Air Pollution – Local Air Quality'[3]. The factor to convert into a 30-minute average has been obtained from the Environment Agency (EA) document 'Air emissions risk assessment for your environmental permit'[4].

Background

The HF background concentration used for the purpose of the assessment is detailed within Table 4.

Table 4: Predicted Background Concentrations.

Pollutant	Daily Background Concentration (µg/m^3)	Source
HF	0.5*	EPAQS (February 2006), Guidelines for Halogen and Hydrogen Halides in Ambient Air for Protecting Human Health Against Acute Irritancy Effects
*A range of 0.5 – 2 µg/m^3 is outlined in the EPAQS Guidelines, with heavily polluted areas at the upper end of this range, however, according to the UK Pollutant Release and Transfer Register (PPTR)[5], no industrial sites within 3 km vicinity of the Site have reported hydrogen fluoride pollutant release to air in any of the years 2019-2024. As such, a background HF concentration of 0.5 µg/m^3 has been used.		

Topography

Topography data can also be added as an input to ADMS-6 model where required. Topography data can have an effect on the flow of the emissions and should be considered when a slope gradient of 1:10 is observed in the terrain surrounding the site. As the topography surrounding the site is less than a gradient of 1:10, topography data was not included in this assessment.

Meteorological Data

The dispersion model includes a meteorological pre-processor developed by the UK Met Office to calculate values of meteorological parameters in the boundary-layer. The pre-processor requires a set of meteorological parameters on an hour-by-hour basis: wind speed, wind direction, temperature, and cloud cover.

It is important to use meteorological data which is representative of the conditions within the Proposed Facility to simulate local weather conditions in the model. This station is located approximately 50 km southwest of the Proposed Facility. There is an approximate 15 m difference in elevation between the Herstmonceux West End meteorological station and the Proposed Facility, with similar relative flat terrain in their surroundings, set back at similar distance from the coastline (approximately 7.5 km and 10 km respectively). As such, Herstmonceux West End meteorological station has been used as it is considered representative of conditions surrounding the Proposed Facility. Meteorological analysis was conducted to assess the worst-case year of meteorological conditions, upon which 2022 was determined to be the worst-case year for the 10-minute, 30-minute and 1-hour exposure periods and 2021 was determined to be the worst-case year for the worst-case year for 4-hour and 8-hour exposure periods. This is based on the highest peak HF concentrations observed in each meteorological year.

Wind roses from 2021, 2022 and 2023 are shown in Figure 4.

[3] Ministry of the Environment, Conservation and Parks (2023) Ontario Regulation 419/05 Air Pollution – Local Air Quality – [online] (Last accessed: 11/02/2025), Available at: www.ontario.ca/laws/regulation/050419

[4] EA (2016) Air emissions risk assessment for your environmental permit – [online] (Last accessed: 11/02/2025), Available at: www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit

[5] Defra (2014) UK Pollutant Release and Transfer Register – [online], (Last accessed: 11/02/2025), Available at: www.gov.uk/guidance/uk-pollutant-release-and-transfer-register-prtr-data-sets

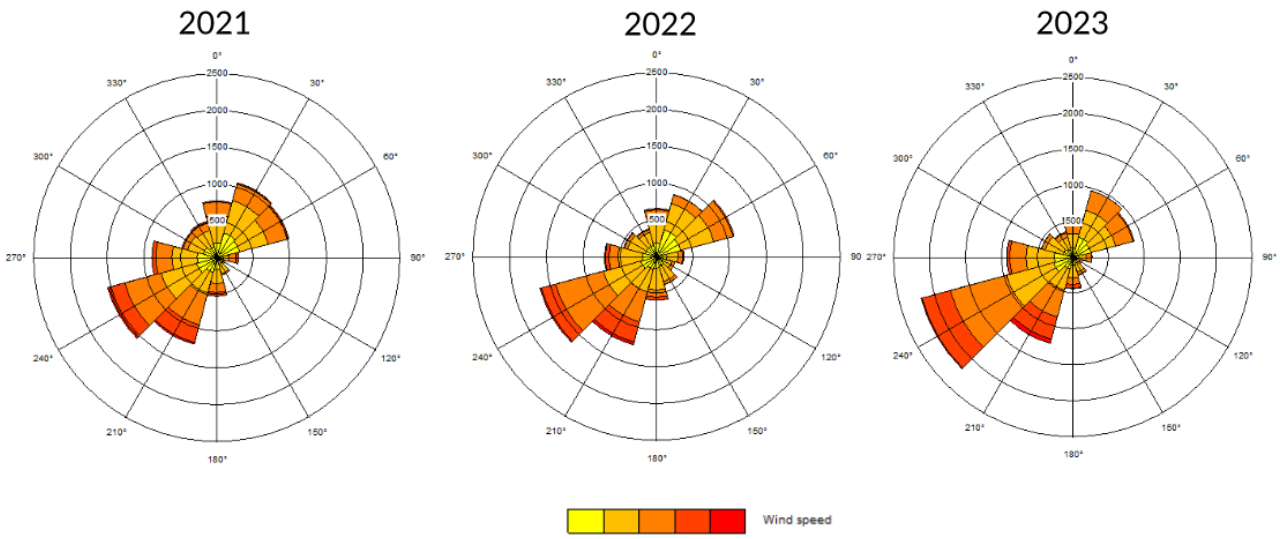


Figure 4: Wind roses from Herstmonceux West End Meteorological Station in 2021, 2022 and 2023.

The wind roses show a south westerly prevailing wind in all three years. Table 5 shows the values for surface roughness and the Monin-Obukhov length inputs used in the model. There same values for surface roughness and Monin-Obukhov Length were utilised around the Proposed Facility and the Hertsmonceux West End meteorological station, due to both being predominantly surrounded by agricultural land and small villages, which has been reflected in the model.

Table 5: Meteorological Data Settings used in ADMS 6

Meteorology		Value
Monin-Obukhov Length (m)	Dispersion Site	10
	Meteorological Measurement Site	10
Surface Roughness (m)	Dispersion Site	0.3
	Meteorological Measurement Site	0.3

HOARE LEA

[redacted]
PROJECT DIRECTOR

+[redacted]
[redacted]@hoarelea.com

HOARELEA.COM

Royal Exchange
Manchester
M2 7FL
England