



# CLEVE HILL SOLAR PARK

**OTHER DEADLINE 2 SUBMISSIONS  
RESPONSE TO ADDITIONAL SUBMISSION BY GREAT DATED 16 APRIL  
2019 (ANSWERING THE STATEMENT OF NEED FOR CLEVE HILL SOLAR  
PARK) (AS-012)**

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**CLEVE HILL**  
SOLAR PARK

## **1 INTRODUCTION**

1. This document provides a response by Cleve Hill Solar Park Ltd (the Applicant) to a letter from Graveney Rural Environment Action Team (GREAT) to the Planning Inspectorate dated 16 April 2019 titled Answering the Statement of Need for Cleve Hill Solar Park ([AS-012](#)).
2. Table 1 lists the points raised in the letter and provides the Applicant's responses.
3. References to the Application documentation are provided where necessary according to the reference system set out in the [Cleve Hill Solar Park Examination Library](#).
4. This response is supported by five appendices:
  - Appendix 1 - Net Zero - The UKs contribution to stopping global warming;
  - Appendix 2 - SSE Announces Proposed Closure of Fiddler's Ferry Coal-Fired Power Station;
  - Appendix 3 - Cottam power station to cease generation;
  - Appendix 4 - Network Options Assessment 2017-18; and
  - Appendix 5 - Network Options Assessment 2018-19.

**Table 1: GREAT Representation and the Applicant's responses**

<b>Representation</b>	<b>Applicant's Response</b>
<p>This letter is written in anticipation of the Inspectorate setting a timetable for evidence, hearings and the determination of the application ("the Application") by Cleve Hill Solar Park Limited for a Development Consent Order in relation to Cleve Hill Solar Park ("the Proposed Development").</p>	<p>Noted.</p>
<p>I am writing on behalf of GREAT, who represent a diverse group of local people, voluntary groups, community interests and others who have registered as Interested Parties and made our Relevant Representations to the Proposed Development.</p>	<p>Noted.</p>
<p>It is clear that, at its heart, the Inspector's decision on the Application will be a balancing act between the unacceptable adverse impacts of the Proposed Development and the Inspector's view on the Applicant's statement that the development is needed.</p>	<p>The Application is for a type of renewable energy generating station for which there is a relevant NPS in the form of EN-1 and EN-3. However, because solar PV and energy storage technologies are not specifically covered in either NPS, the Applicant has taken the precautionary approach of inviting the Secretary of State to determine the Application pursuant to S.105 Planning Act 2008 (the "Act"). S.105 (2) states that "in deciding the application the Secretary of State must have regard to—</p> <p>(a) any local impact report (within the meaning given by section 60(3) ) submitted to the [Secretary of State] 3 before the deadline specified in a notice under section 60(2),</p> <p>(b) any matters prescribed in relation to development of the description to which the application relates, and</p> <p>(c) any other matters which the Secretary of State thinks are both important and relevant to the Secretary of State's decision"[emphasis added].</p> <p>Unquestionably, the urgent national need for energy generating stations set out in both EN-1 and EN-3 is a matter that is "both important and relevant" to the determination of the Application. This national case has been updated in the Applicant's Statement of Need [APP-253] and its Addendum [AS-008] with specific regard to solar PV and energy storage technologies. That update is also "both important and relevant" to the determination of the Application. The Applicant accepts that the need for the authorised development will</p>

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	<p>need to be balanced against its local impacts, as described in the LIRs and other evidence submitted to the Examination. The Applicant's view is that no adverse impact of the proposed development would outweigh its benefits in terms of meeting the national need for energy.</p>
<p>The Applicant articulates its position on need in a 59 page Statement of Need ("SoN") document and a 14 page Addendum. The SoN is, by its nature, fundamentally an argument in favour of the Proposed Development. It does not claim to be independent, nor does it include, anticipate or address any counter-arguments. It does not include evidence of, or demonstrate, that the Applicant has held any discussions with or submissions from third parties relevant to the proposal. Such third parties might include National Grid ("NG"), district network operators, regulators, local authorities and industry bodies.</p>	<p>The Statement of Need and its Addendum have been prepared by an independent and credible expert, Simon Gillett of New Stream Renewables, whose credentials are set out in the documents. Whilst preparing the Application the Applicant has been in regular dialogue with National Grid, which has covered topics including: (a) the Grid Connection Application process - where National Grid have an opportunity to comment on the suitability of the proposed generator at the proposed location; and (b) the potential utility of batteries in support of the system operation and system stability challenging local transmission areas. The authorised development will not connect to the Distribution Network. Nonetheless, the Applicant has consulted UKPN. Both National Grid and UKPN are supportive of the Application, the location of the authorised development, and both technologies it comprises. The Applicant has also consulted with Ofgem and obtained a Generation Licence, and other local authorities and industry bodies. The comments of all consultees and how those have been addressed in the Application are set out in the Consultation Report [APP-022].</p>
<p>The Inspector will, of course, need to consider the SoN and challenge the arguments made. We expect that we will, to the best of our abilities, also challenge these arguments. We are not experts in the issues that have been discussed in the SoN, nor do we have significant resources with which to finance our own representation or expert evidence in order to rebut it. However, the subject matter covered in the SoN involves some of the most complex economic, regulatory, technical and legal issues that arise in the UK and in the wider European and global context. The energy sector has always been an area requiring participants to have profound expertise; and it has become more challenging in recent years with the emergence of</p> <ul style="list-style-type: none"> <li>- new business models,</li> <li>- new regulations at the European and national levels,</li> <li>- new technologies,</li> </ul>	<p>Noted.</p>

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- new operational concepts in particular in grid balancing, and - new planning laws.	
The Inspector will need expert assistance on all of these matters.	The ExA is required to make its recommendation based on the evidence before the Examination. It may test the Applicant's evidence through written questions and oral questions in hearings. In respect of need, an ISH has been scheduled for 17 July 2019 (ISH1).
In our submission, the SoN is deficient in the following aspects:	The Applicant submits that its evidence on need is not deficient for the reasons that follow.
1. It does not properly explore the wider context of the Application. The Proposed Development is apparently going to address some of the UK's needs in decarbonisation and system adequacy (among other things). But how material can its contribution to meeting these demands be?	The Statement of Need describes the wider context of the authorised development in Chapters 2 and 3. The wider context is one of (a) a legal requirement to decarbonise; (b) a policy objective to ensure sufficient electricity is available to consumers at all times; and (c) cost efficiency. The authorised development is not presented as a single solution to all problems, but has the potential to play a significant part in solving all three problems. Figure 5.3 of the Statement of Need shows the contribution solar power will make to decarbonisation. National Grid's 2018 FES (Fig. 5.2, 5.3) (Reference [02] of the Statement of Need) shows their forecast of the estimated contribution of solar generation to national demand. Many other independent organisations are now reporting on the cost benefits of solar generation versus alternate generation technologies, for example, the Committee on Climate Change's May 2019 report: Net Zero. The UK's contribution to stopping global warming (the "CCC Report 2019"), Table 7.2, p223 (Ref [01] to this submission) (a copy of which will be submitted at DL2).
2. What is happening elsewhere in the UK energy market to address the needs that the Proposed Development is seeking to meet? This requires evidence of activity and then qualitative analysis of that activity to determine whether other agents in the market can meet the need without the Proposed Development going ahead.	Table 3.1 of the Statement of Need describes the landscape of investment in GB power generation assets. The Addendum provides an update in terms of the nuclear sector, following the high-profile withdrawal of two nuclear projects in late 2018/early 2019. Since writing the Addendum the closure of 3.5GW of coal generation assets has been reported. On 13 June 2019, SSE announced the proposed closure of the 1.5 GW Fiddlers Ferry ( <a href="https://sse.com/newsandviews/allarticles/2019/06/sse-announces-proposed-closure-of-fiddlers-ferry-coal-fired-power-station/">https://sse.com/newsandviews/allarticles/2019/06/sse-announces-proposed-closure-of-fiddlers-ferry-coal-fired-power-station/</a> ) by March 2020 (Appendix 2). This followed an announcement made earlier this year, regarding the closure of Unit 1 of this Coal fired power station. On 7 February 2019, EDF Energy announced the closure, by October 2019, of the 2.0 GW Cottam Power Station ( <a href="https://www.edfenergy.com/media-centre/news-releases/cottam-power-station-cease-generation">https://www.edfenergy.com/media-centre/news-releases/cottam-power-station-cease-generation</a> ) (Appendix 3). The

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	Statement of Need describes the mature forward plans for renewable generation, at the time of writing. National Grid's 2018 FES (Reference [02] to the Statement of Need) provides an independent view of future generation plans (see also response above).
3. How efficient is the Proposed Development as a solution in dealing with the needs identified in the SoN? The SoN fails to acknowledge an accepted fact that solar power is highly inefficient when compared with other technologies, and requires huge amounts of scarce land resource. In simple terms, is it not the case that the benefits of the Proposed Development could be achieved with one 40MW plant delivering baseload electricity and using a small fraction of the land area required by the Proposed Development?	Solar PV is an efficient generation technology, particularly when co-located with energy storage. This point is addressed in the Statement of Need, Paras. 5.22 - 5.27 in particular. One 40 MW plant, delivering baseload power, would deliver broadly the same energy as the authorised development over a year, but critically it would likely be (a) significantly higher in carbon emissions, and (b) generate at a higher cost per MWh than the authorised development, both now and in the future. In Northern Europe, solar costs range from \$70 to \$298 / MWh and gas peaker plant from \$189 to \$244 / MWh (see Table 7.2, p223 of the CCC Report 2019 (Appendix 1) and Paras 6.11 - 6.21 and Reference [06] of the Statement of Need, Lazard, p8).
4. Solar power is at its most effective as a source of power generation during summer months and daytime. It can be enhanced by co-location with storage batteries; but the SoN does not provide a model, demonstrate any real understanding on the part of the Applicant, or even make a case, as to what this benefit will be.	The efficiency and effectiveness of solar PV can be enhanced through design and co-location with energy storage. The Application proposes an east-west layout design of the solar PV panels in order to maximise irradiation capture and efficiency (see Chapters 4 [APP-034] and 5 [APP-035] of the Environmental Statement). The benefits a battery storage system can bring to an electricity transmission system are described in the Statement of Need, Paras 5.55 through 5.59, including Table 5.5. The Applicant continues to engage with industry bodies and technical experts to further explore and define the services energy storage could provide to the System Operator in light of the local specificity issues described in Statement of Need paras 5.60 - 5.70.
5. There is no evidence that there has been any specific discussion with NG as to the need for the Proposed Development. The SoN quotes from NG's "future energy scenarios" in order to make very general claims about the utility of the Proposed Development. It raises certain engineering concepts around power system operation but fails to show, with engineering support, why the Proposed Development is suitable for purpose.	National Grid has been consulted and is supportive of the Application (see response above and the Consultation Report [APP-022]). The Statement of Need articulates in Chapter 2 the legal obligation the UK has to decarbonise (this has been strengthened by the recent CCC Report 2019). Chapter 5 (iv) of the Statement of Need demonstrates the role solar PV can play in decarbonisation and system adequacy, and the economic leg of the energy trilemma is discussed in Chapter 6 (iii) with respect to solar generally. In these three regards the authorised development is demonstrated as suitable for the purpose of providing low-carbon, cheap and reasonably predictable energy for GB consumption.
6. "Need" has been assessed in relation to many previous applications and the Inspector will require reference examples to guide its decision. The SoN avoids discussion on a matter which will be at the heart of the decision-making	It is a matter for the discretion of the Secretary of State, whether or not, based on the evidence before him, the need for the authorised development outweighs any adverse impacts. NPS EN-1 and EN3 set out the national need for energy and specifically renewable energy generation, and the Statement of Need describes the contribution the

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<p>process. What level of need is sufficient to outweigh the environmental and other damage schemes such as the Proposed Development will cause?</p>	<p>authorised development would make towards the UK's legal decarbonisation goals, and adequacy and affordability of energy generation and supply.</p>
<p>This letter is intended to "surface" the issues now that we say will need to be explored in detail during the hearing and determination process. There may be further deficiencies in the SoN that we have not yet identified. We invite the Inspector to require the Applicant to fund the production, in good time, of a truly independent expert report, which may include findings from independent communications with the relevant third parties (such as NG, other electricity market participants, economists and regulators). This expert report should, if the Inspector so deems it, challenge the SoN and also explore the core points that we have listed above.</p>	<p>A purpose of this document is to respond to the issues raised by GREAT in advance of ISH1 - Need. The Applicant and its experts will be available at that hearing to help respond to questions raised by the ExA and interested parties.</p>
<p>In order to guide the Inspector in defining the scope of this report, we have included as an Appendix to this letter, commentary that develops each of our 6 core points. We have also included some high-level comments on the content of the SoN.</p>	<p>Noted. Please see responses below.</p>
<p>It is our firmly held view is that the Application cannot be properly determined without the expert input and evidence that we have outlined in this letter. We do not consider it equitable to have to fund the production of the same ourselves although we reserve the right to do so, should we consider it necessary. We remain available at all times to meet in order to assist with this process, including, if required, to discuss the scope of the proposed report.</p>	<p>The Applicant has commissioned a credible and independent expert to author the Statement of Need and its Addendum. It is satisfied that those documents and the national case for need in EN-1 and EN-3 provide sufficient evidence of the need for the authorised development.</p>
<p>Appendix 1</p>	<p>Noted. Please see responses below.</p>
<p><u>1. The SoN does not properly explore the wider context</u></p>	<p>Noted. Please see responses below.</p>
<p>What are current forecasts regarding the required <b>output (as opposed to installed capacity)</b> from low carbon</p>	<p>Extracts from National Grid's 2018 Future Energy Scenarios document, included as Figures 5.2, 5.3 and Figure 5.3 of the Statement of Need demonstrate clearly the contribution made by additional solar generation capacity to the UK's legal decarbonisation targets.</p>

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generators over the relevant periods (to 2030, to 2050 etc) in order to meet national and international targets?	
What will the contribution of solar generators be within these targets?	See comments above.
How will the solar contribution compare to other technologies in particular, wind <sup>1</sup> ; and emerging industries such as waste-to-energy, wave and tidal and demand-side response?	See comments above.
What is the contribution (in terms of output) of the Proposed Development when compared to the low carbon nuclear generators about which the Applicant is concerned in its Addendum?	The authorised development will produce enough power for approximately 100,000 homes each year. This is not as much as - for example - Hinkley Point C, which is expected to generate enough power for around 6 million homes each year ( <a href="https://www.edfenergy.com/energy/nuclear-new-build-projects/hinkley-point-c/about">https://www.edfenergy.com/energy/nuclear-new-build-projects/hinkley-point-c/about</a> ). However, it is infinitely more power than will be provided by Wylfa and Moorside Nuclear Power Plants, which, as described in the Addendum, are not being built and therefore will generate nothing.
Within the context of an expected wave of unsubsidised solar deployment in coming years, what can be achieved using installations with lower environmental impact (in domestic, commercial and industrial, and smaller scale greenfield settings)? Would the Proposed Development displace or otherwise negatively impact on the prospect of other installations being completed?	The CCC Report 2019 (Ref [01]) clearly sets out a recommendation for the UK to be net-zero in greenhouse gas emissions by 2050, concluding that it is "necessary, feasible and cost effective" (p8) and on 12 June 2019 the Prime Minister confirmed the Government's commitment to meeting that target ( <a href="https://www.bbc.co.uk/news/science-environment-48596775">https://www.bbc.co.uk/news/science-environment-48596775</a> ). The CCC conclude that this ambition is not credible unless decarbonisation progresses with far greater urgency than currently exists. Within the range of scenarios described in the report is the theme of increased electrification (discussed in the Statement of Need at Chapter 4). Page 23 of the CCC Report 2019 describes one scenario (not inconsistent with National Grid's Future Energy Scenarios): that of " <i>Extensive electrification, particularly of transport and heating, supported by a major expansion of renewable and other low-carbon power generation.</i> " The report goes on to describe that " <i>The scenarios involve around a doubling of electricity demand, with all power produced from low-carbon sources (compared to 50% today)</i> ". This, coupled with National Grid's own forecasts of the deployment of solar (and other generation technologies) in the UK, leads to the conclusion that not only is there sufficient space for both large-scale and small-scale solar within the GB energy mix, but there is a requirement for both. The critical point in this is to ensure that all possible use is made from the resources and infrastructure available for development.



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<p>What is the opportunity for re-powering of old sites installed with inefficient technology?</p>	<p>Repowering old sites would deliver increased capacity from existing locations. The useful life of solar panels far exceeds the current average age of facilities in GB. As a consequence, developers choosing to "repower" existing sites would be writing off capital not yet depreciated which may make repowering uneconomic at the present time. Further, incentive regimes which have hitherto facilitated the deployment of small scale solar in GB (and which the Applicant will not be accessing for its development) may be tied to initial installed capacities and infrastructure, meaning that re-powering may significantly reduce or cancel the subsidised revenue streams currently received by many sites. For this reason, although repowering is technically feasible, repowering existing solar assets would not make economic sense over the coming 5 - 10 years.</p>
<p>Will interconnectors ultimately fill the "need" in the system? And to the extent that the real issue in the UK energy system is "margin" (between available capacity and demand), how will large solar farms such as the Proposed Development contribute?</p>	<p>At a recent industry event (Aurora Energy conference, March 20, 2019) Simone Rossi, CEO of utility, EDF Energy, talked about interconnectors: <i>"Each year, before winter in France there is a ritual security of supply assessment – all countries do the same – and in France we are given a presentation by the people who look at the system and they say, "Great news, it looks like this winter, we are better off than the previous winter... we have additional interconnector capacity to Britain. So in case of need, we can import." The next day we come to Britain and they say "We've got additional interconnection with France." So who of the two is wrong or right? For 99 per cent of the time, the interconnectors will do great things and deliver huge benefits but I have a nagging doubt about those few moments when the system is in tension. We tend to ascribe to interconnectors metaphysical powers to bring us electricity when we need it but actually everybody is shutting down their coal stations, everybody is shutting down their despatchable power and today we take for granted that there is limitless capacity on the other side of the interconnector. Interconnectors are good but they might not be enough in terms of security of supply..."</i> Interconnectors are a part of the solution for GB and other countries, but they are not the whole solution. There is no substitute for a diverse energy mix as described in the Statement of Need at Para. 5.39.</p>
<p>How great is the risk that large scale solar deployments such as the Proposed Development will be "stranded assets"?</p>	<p>Chapter 6 Sections (i) and (ii) of the Statement of Need describe the mechanics of the GB power market, and solar's particular commercial characteristics. Solar assets generate power at virtually zero "marginal cost". Therefore, as long as there is sufficient irradiation, solar assets will provide cheap power to consumers. In this regard, the asset cannot ever become a stranded asset (i.e. the economic case for it closing will always (in any rational "electricity costs money" world) be worse for the asset owner than carrying on operating).</p>

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<p>Is the actual need in the UK energy mix not, in fact, for flexible assets such as gas-peaking engines or stand-alone storage battery systems?</p>	<p>Chapter 5, section (vi) of the Statement of Need describes the need for integration technologies in the GB market (such as batteries and gas peaking plant). Integrators work hand-in-hand with bulk power delivery mechanisms, such as solar, wind, nuclear, and tidal to manage the system. Integrators on their own will not provide both capacity and cost reduction while delivering the UK's low-carbon targets. Chapter 5 Section (iv) and (v) of the Statement of Need describe the role solar plays in delivering bulk power. Through the co-location of batteries with solar, the Application is for generating assets, which provide both bulk power, and integration services, efficiently from the same grid connection point.</p>
<p>Is it not the case the "system adequacy" issues (if they exist) are not traditionally addressed with technologies such as solar; but instead require capital investment and other measures on the part of network operators</p>	<p>Paragraph 5.5 of the Statement of Need defines adequacy, also referred to as system adequacy later in the report: "Governments define policy to ensure that there is sufficient generating capacity available to meet maximum expected demand. This is called adequacy." This is different the system network planning activities which ensure that there is sufficient transmission and distribution network capability in the country to transmit power from its source to its destination (which is the role of National Grid, see, for example, Reference [05] to the Statement of Need: National Grid's Electricity Ten Year Statement, 2017).</p>
<p>2. <u>What is happening elsewhere in the UK energy market to address the needs that the Proposed Development is seeking to deal with?</u></p>	<p>Table 3.1 of the Statement of Need, and the Addendum, describe what is happening, and what is not happening, in the GB energy market, to address the needs of security of supply, adequacy, and cost.</p>
<p>What "pipelines" are being developed using solar panels and other renewable technologies, what is their prospect of being installed and in what timeframe<sup>2</sup>?</p>	<p>Table 6.3 of the Statement of Need illustrates the cost savings achieved in solar installations in the 8 years to 2017. This has been driven by a volume increase in solar development (globally) and a resulting competitive market place. The Applicant has negotiated with a number of solar panel and energy storage producers. It remains confident of its ability to procure, deliver and install the authorised development within the timeframes referred to in the ES.</p>
<p>Are any political interventions expected that will accelerate other deployment in order to meet need?</p>	<p>The Applicant has submitted an Application for a renewable energy development, which is subsidy free. This demonstrates that for the right project, at the right location, significant advancements in low-cost decarbonisation of the GB electricity generation sector can be made, without further political intervention. Full decarbonisation may require political interventions, especially if nuclear power is to be a part of the mix. But this does not</p>

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	come without its challenges, as discussed in the Chapter 4 of the Statement of Need, and the Addendum.
<u>3. How efficient is the Proposed Development as a solution in dealing with the needs identified in the SoN?</u>	Please see responses below.
<p>Aurora Energy Research consider that current installed solar fleet in the UK has a load factor of just under 10% across the year; whereas the onshore wind fleet has 28% and offshore wind fleet has 43%<sup>3</sup> load factors. Is solar not an inefficient way of delivering output (KWh units of electricity) from capacity (installed KWp capital assets)?</p>	<p>Paragraph 5.25 of the Statement of Need describes the relationship between installed capacity and load factor. It is a global trend, that grid load factors reduce as Renewable Energy Systems ("RES") penetration increases. Wind is able to deliver in some places; but not in others. The same is true of solar power. Figure 5.3 of the Statement of Need illustrates the important role solar has to play in meeting the UK's legally binding carbon targets; and Figure 5.4 shows how a mix of RES technologies can support generation dependability. Figure 6.2 shows that solar is broadly comparable in Levelised Cost of Energy ("LCoE") with wind generation. Solar is not inefficient in terms of value for money, but importantly the Applicant is not trying to make the case for solar on its own, but it is making the case that solar at Cleve Hill is positive in the general interest to GB.</p>
<p>How does the output of the Proposed Development compare to other technologies that deliver base load? Is it not the case that, in simple terms, 350MW of solar x 10% load factor delivers the equivalent of 35MW from a base load generator operating with 100% load factor? Hinkley Point C will be a 3,260MW base load generator: does this not mean that Hinkley Point C will therefore deliver nearly 100 x the power output of the Proposed Development? And is the contribution of the Proposed Development to meeting national need not, therefore, negligible?</p>	<p>The UK consumes c. 350 TWh of electricity each year. Hinkley Point C is expected to deliver 26 TWh of electricity each year. So building 14 Hinkley Point C reactors would in fact provide the adequacy required (until energy demand grows through electrification). Para. 4.14 of the Addendum explains that the last nuclear reactor to be commissioned in the UK was in 1995, and Para 3.3 describes a potential commissioning date for Hinkley Point C, of 2026. The conclusion drawn from this is that the contribution made by the authorised development to meeting national need is significant, and importantly once built (ref. response to "stranded asset" comment above), will endure.</p>
<p>What land area would be required in order to deliver the proposed output of the Proposed Development using other technologies? Analysis should be produced to compare, at minimum, onshore wind, open cycle gas turbines, reciprocating gas engines and waste-to-energy plant.</p>	<p>The Applicant has considered how to maximise energy generation per hectare from the Cleve Hill site. Its optimal solution is that for which a DCO has been sought. We do not believe that any other low-carbon generation technologies are viable at Cleve Hill. Offshore wind (London Array Phase II) was cancelled (<a href="https://www.londonarray.com/the-project-3/phase-2/">https://www.londonarray.com/the-project-3/phase-2/</a>); the site has not been selected under NPS-6 for potential nuclear development; and (for integration technologies) there is no economically viable large-scale supply of gas to the location. Therefore, the Applicant believes that solar and electricity storage are the only feasible technologies for electricity generation at the site, and</p>

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	the only way of maximising the benefit ascribed to spare connection capacity (Para 6.40 of the Statement of Need).
<p>How likely is it, and when will, the Proposed Development be operated to discharge electricity directly to the grid, rather than use the electricity to charge batteries for time-shifting? What is the additional value of the battery storage component of the scheme?</p>	<p>The value associated with time shifting is highly dependent on energy market characteristics at the time of decision making, rather than a formulaic approach to "uplift". Dispatch to grid, rather than diverting energy to storage, will be a market-led activity. Generally, the Applicant might expect to store energy through the middle of the day, and export it at night when the power is needed. Table 5.5 of the Statement of Need describes non-energy market applications for the battery element of the authorised development.</p>
<p>4. <u>Solar power is at its most effective as a source of power generation during summer months and daytime.</u></p>	<p>Please see responses below.</p>
<p>Aurora Energy Research GB Wholesale Market Summary, January 2019<sup>4</sup> indicates that load factor for the existing solar fleet in the UK in January 2019, a period of peak demand, was less than 3%.</p>	<p>In Jan 2018, the existing UK solar fleet delivered 1.2% of national power demand from a load factor of 3%. In the period May to July 2018, the load factor increased to 18%, delivering 9.1% of UK's power needs. From March 2018 to September 2018 inclusive the load factor was 14%, delivering 6.5% of UK's power needs. All with zero carbon emissions. The data to underpin these statistics was sourced from industry metered data provided by National Grid on a regular basis and made available at <a href="https://demandforecast.nationalgrid.com/efs_demand_forecast/faces/DataExplorer">https://demandforecast.nationalgrid.com/efs_demand_forecast/faces/DataExplorer</a></p>
<p>Is it not the case, as a general proposition, that solar (even if enhanced with storage capacity for time-shifting) does not make a material difference in delivering electricity at times of high demand? And that it only performs at times when demand across the national system is lower and can (and will) be met from other generation sources?</p>	<p>The electricity market is changing because of electrification of transport and home heating. These trends are set to change the nature of electricity demand in GB and other countries, and large amounts of low-carbon generation are required to meet demand while meeting the UK's legal climate change goals. More information can be found in Chapter 4 of the Statement of Need. Cost is also important, and the analysis in Figure 6.2 of the Statement of Need demonstrates that electricity from solar is cost-competitive against many other forms of generation. Low carbon generation at any time of the year, and any time of the day, helps pave the way to take carbon emitting plant off the grid. Chapter 5, Section (v) describes the capability of solar generation to contribute in a meaningful way to the decarbonisation of the electricity generation sector.</p>
<p>Should the Applicant model the expected performance of the Proposed Development in this context and compare the output against projected national demand?</p>	<p>The authorised development will generate enough electricity to power nearly 100,000 homes each year (Statement of Need. Para 7.2). National Grid's FES (supplemental tables), ED.5 (<a href="http://fes.nationalgrid.com/media/1366/2018-fes-charts-v2_as-">http://fes.nationalgrid.com/media/1366/2018-fes-charts-v2_as-</a></p>

<b>Representation</b>	<b>Applicant's Response</b>
	published.xlsx) show that during both the Winter evening peak, and Summer morning, demand is predicted to rise in many scenarios, into the 2030s and beyond, due to the changing nature of electricity demand in GB. No modelling is required to substantiate these points - the evidence already exists in this regard.
<p>As the installed solar fleet in the UK (and in Europe via interconnectors) increases in size with new build, what is the risk that the power price may be "cannibalized" (ie there will be an over-supply of solar power, meaning low or even negative pricing)? Given that many commentators consider this risk is highly likely, is the Proposed Development well-conceived?</p>	<p>Para 5.2 of the Statement of Need describes the generation assets proposed at Cleve Hill. The authorised development includes an east-west panel configuration, which is designed to minimise exposure to the risk described in this point, by capturing relatively more power from the sun away from the midday peak. Further, Table 5.5 describes the services a storage asset can provide to the market, including trading (i.e. shifting power generation to when it is needed). This demonstrates that the project has been well conceived and is resilient to the potential risk described in this point.</p>
<p>As operator of the Capacity Market, NG has previously analysed the contribution of solar schemes to system adequacy and their "equivalent firm capacity" and has set a de-rating factor of 1.17% to 1.76% to reflect solar's negligible utility value. The storage battery de-rating factor (depending on design) is in the region of 36% for a one hour duration plant. By way of comparison, offshore wind has a de-rating factor of 14.6%<sup>5</sup>. Is this not a relevant factor and why does the SoN not make mention of it when it is clearly contrary to the Applicant's case?</p>	<p>National Grid published proposed de-rating factors for renewable technologies in the Capacity Market in January 2019 (2 months after the Statement of Need was submitted with the Application). At the launch, National Grid stated that "<i>solar's contribution to stress events, which predominantly occur outside of daylight hours, is negligible</i>" (<a href="https://www.current-news.co.uk/news/national-grid-unveils-proposed-terms-de-rating-factors-for-renewables-in-the-capacity-market">https://www.current-news.co.uk/news/national-grid-unveils-proposed-terms-de-rating-factors-for-renewables-in-the-capacity-market</a>), but this does not mean that solar's contribution to the electricity system is negligible. For example: solar contributes "<i>to enabling battery storage units to reserve their output until a stress event requires it</i>" (same source) - a valuable example of the presence of different generation technologies for a resilient electricity system.</p>
<p>5. <u>There is no evidence of any specific discussion with NG as to the need for the Proposed Development.</u></p>	<p>Please see responses above - National Grid has been consulted.</p>
<p>Has the Applicant had correspondence with NG in order to understand the specific and local impact of the Proposed Development on the transmission network? To what extent are the Applicant's statements in Chapter 5 based on conjecture?</p>	<p>Please see responses above - National Grid has been consulted. Also, Chapter 5 of the Statement of Need has been fully referenced to source material. Chapter 5, Section (viii) draws on National Grid's System Operability Framework (<a href="https://www.nationalgrideso.com/insights/system-operability-framework-sof">https://www.nationalgrideso.com/insights/system-operability-framework-sof</a>) and Network Options Assessment (2017/18 and 2018/19) (Appendices 4 and 5), without conjecture.</p>
<p>NG's "future energy scenarios" change on a regular basis. What weight do they really have as encouragement for this</p>	<p>National Grid publish Future Energy Scenarios ("FES") annually at: <a href="http://fes.nationalgrid.com">http://fes.nationalgrid.com</a>. On their website they state: "<i>All our scenarios consider energy demand and supply on a whole system basis, incorporating gas and electricity</i></p>

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<p>particular scheme, in the context of the questions raised in our section 1 (above)?</p>	<p><i>across the transmission and distribution networks. We continually develop all aspects of our Future Energy Scenarios process ensuring that the outputs are as rich and robust as possible to provide a sound reference point for a range of modelling activities. This includes extensive stakeholder consultation and detailed network analysis, which enables National Grid to identify strategic gas and electricity network investment requirements for the future.</i>" (<a href="http://fes.nationalgrid.com/">http://fes.nationalgrid.com/</a>). National Grid have published their FES each year since at least 2012 (see <a href="http://fes.nationalgrid.com/fes-document/fes-archives/">http://fes.nationalgrid.com/fes-document/fes-archives/</a>), and each year without fail, their scenarios describe greater capacities of solar generation connecting to the national transmission system: 2012: &lt;10GW (incl. marine, hydro, biomass); 2013: 14GW (incl. marine, hydro, biomass); 2014: 20GW solar; 2015: 20GW solar by 2030; 2016: 35GW solar by 2040; 2017: 35GW solar by 2040; 2018: 40GW solar by 2040. These trends, coupled with similar trends in thermal generation capacity reductions, lend significant weight to both the need and the route(s) to decarbonisation.</p>
<p>Simply because a wind farm extension that had intended to connect to the national transmission network at the Cleve Hill substation was not granted planning permission, does that mean that other more suitable generation or transmission plant (including interconnectors) will not come forward? Will such alternative schemes not ultimately prove a far more efficient and worthwhile use of any capacity within NG's assets in the area?</p>	<p>The Applicant has submitted the Application to develop a c.700 MW, subsidy-free, solar and storage generation project at Cleve Hill. The evidence submitted with the Application demonstrates the value these assets will bring to the GB energy and climate mix. Alternatives to the authorised development have been addressed in Chapter 4 of the ES (Site Selection, Development Design and Consideration of Alternatives Chapter) [APP-034].</p>
<p>There have been a number of recent changes in the regulatory provisions governing network charging and network income, most importantly in OFGEM's Targeted Network Charging Review <sup>6</sup>. These changes follow extended periods of consultation and policy-making. A key focus of OFGEM has been to encourage de-centralised generation, as opposed to centralized (ie transmission-connected generators, such as Cleve Hill). One outcome is the withdrawal of the "transmission-connected generation residual", which is an income stream that historically favoured plants such as the Proposed Development; but which OFGEM now considers is inappropriate. Why does the</p>	<p>Ofgem state that their Targeted Network Charging Review ("TCR") was launched in 2017, <i>"to address our concern that the current framework for residual network charges could lead to inefficient use of the network, leading to adverse impacts on consumers"</i> (<a href="https://www.ofgem.gov.uk/electricity/transmission-networks/charging/targeted-charging-review-significant-code-review">https://www.ofgem.gov.uk/electricity/transmission-networks/charging/targeted-charging-review-significant-code-review</a>). Critically the review is about removing perverse incentives to build generation in specific locations for reasons other than directly for consumer benefit. The "minded to" removal of TCR was published in late November 2018 (after the Statement of Need was written and submitted with the Application) and a consultation ran until 4 February 2019, the decision remains to be awaited. Critically, the TCR is also addressing how charges and credits are applied to distribution connected assets. In the Statement of Need, it is demonstrated (as summarised in Chapter 7) that 300 - 400 MW of solar generation with similar capacities of energy storage would provide</p>

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SoN make no mention of this aspect of the policy background? Expert input is required in order to explain.	significant energy security, decarbonisation and cost benefits to the GB power network, regardless of the network charging regime applied to it during operation.
<p>The SoN makes high-level statements regarding "adequacy", the benefits of "diversification", the value of "ancillary services" available from storage systems (such as frequency and voltage services). These must be quantified and explained in the context of other possible and existing schemes; and also in the context of changes to the way that NG procures these services (it is clear that NG has massively downgraded its estimates of the amount of battery capacity required in the UK to meet its need for frequency services. A 29MW storage scheme was connected to the distribution network at Aylesford, some 25 miles from the Proposed Development, in 2018. What can be learnt from this experience and other comparable developments in the region and beyond? Anecdotally, the Aylesford scheme is bankrupt.</p>	<p>Table 5.5 of the Statement of Need describes the potential services which can be provided by a battery anywhere, including at Cleve Hill and Aylesbury. The Applicant is also currently investigating the additional potential utility of the battery asset in support of system operation and system stability in the local transmission area. Learnings from international and national experience are that: (a) batteries show significant potential with regard to being part of the decarbonisation solution; (b) tailor-made, single-service contracts do not deliver value to the consumer; (c) battery deployment must include flexible operations and multiple revenue streams.</p>
<p>What are the "operability" benefits for NG? Is it not the case that the most effective way of achieving "operability" for network operators is for them to install their own plant to deal with issues and can we anticipate a change in the market or regulations so that is what happens? If it does, will the storage component of the Proposed Development become a stranded asset?</p>	<p>National Grid are not currently permitted (under their Operating Licence) to own any assets which can be dispatched into commercial markets. This is a key principle of the EU's third energy package, and remains a fundamental characteristic of competitive markets where vertical integration can drive anti-competitive behaviour.</p>
<p>6. "Need" has been assessed in relation to many previous applications and the Inspector will require reference examples to guide its decision.</p>	<p>Please see responses below.</p>
<p>What are the precedents?</p>	<p>The Application is for the first 50+ MW transmission-connected solar and energy storage NSIP to be examined by the ExA and determined by the Secretary of State. However, other similar large-scale solar and energy storage NSIPs are expected to follow. For example, according to the Planning Inspectorate's website: an application for Little Crow Solar Park is expected to be submitted to the Planning Inspectorate Q3 2019, and another in respect of the Sunnica Energy Farm is expected to be submitted to the Planning Inspectorate Q2/Q3 2020. The Applicant is aware of other similar projects that are not yet</p>

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	<p>in the public domain. The Applicant and its advisors are also aware that potential sponsors of those projects wish to see how this Application is determined before incurring significant expenditure on DCO applications. Accordingly, the grant of a DCO in respect of the Application is critical to investor confidence in the UK's large-scale solar and energy storage market.</p>
<p>The Secretary of State has previously been required to determine in relation to far smaller solar schemes. The Proposed Development is of a different order and scale to the precedents: the absence of any discussion on comparable decisions (other than large nuclear developments) suggests that the Applicant is unable to support its case with examples.</p>	<p>The Applicant accepts that the authorised development is of a larger scale than solar projects previously considered by the Secretary of State on appeal (note: previous schemes below 50MW would have been determined by local planning authorities ("LPA") under the Town and Country Planning Act 1990, or by the Secretary of State following submission of a planning appeal in respect of the LPA's decision). However, the benefits and impacts associated with the authorised development are no different to those considered in respect of smaller scale solar and energy storage projects.</p>
<p>Where "need" has been a factor in other decisions using other technologies (such as wind or nuclear), how was it balanced against adverse impact?</p>	<p>The Planning Inspectorate's website shows that there have been 49 DCO applications for energy projects determined by the Secretary of State. Of those only 5 have been refused consent (two Carbon Capture Storage Plants, one Underground Gas Storage Facility, one onshore wind farm and one offshore wind farm) and the decision in respect of one of those (the Underground Gas Storage Facility) was quashed following judicial review, and redetermined with the grant of a DCO. All of those applications (whether determined under S.104 or 105 of the Act) relied on the need case set out in NPS EN-1, 3 and 5, in respect of which the Secretary of State found that local impacts did not outweigh the national need for energy and other benefits of the projects in 45 of 49 decisions, i.e. in 92% of energy related decisions, the national need prevailed. That said, that each DCO application is determined on its own merits, having regard to benefits and local impacts on a case by case basis. Ultimately, the planning balance to be struck is a matter for the discretion of the Secretary of State. The Applicant accepts that the need for the authorised development will need to be balanced against its local impacts, as described in the LIRs and other evidence submitted to the Examination. The Applicant's view is that no adverse impact of the proposed development would outweigh its benefits in terms of meeting the national need for energy.</p>
<p>High-level comments on the content of the SoN (and the Addendum)</p>	<p>Please see responses below.</p>



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In relation to the specific arguments advanced in the SoN, we would invite an expert to comment on the following points:	Please see responses below.
1. Explanation of the National Policy	The Applicant refers to Paras 1.1, 1.2 of the Statement of Need, the Planning Statement [APP-254], the ES Chapter 6 (Legislative and Planning Policy Context) [APP-036], and the Written Representation on Policy submitted at DL2, which explain the National policy framework for energy developments.
Need and urgency: how does the Proposed Development contribute to need, and how immediate is the "urgency", in light of the other initiatives taking place in the wider energy market?	Table 3.1 of the Statement of Need shows that other initiatives taking place in the wider energy market are either falling off pace or have stopped; and Figure 5.3, shows the impact on carbon emissions of building gas generation instead of projected solar generation. In this analysis, the gap between the two carbon intensity trajectories widens in the mid 2020s, and critically misses the legally binding target for 2050.
2. Discussion on Decarbonisation	Addressed in the comments above, the Statement of Need and Addendum.
No specific comment at this stage	Noted.
3. Factual summary of the progress of decarbonisation in the UK to date	Addressed in the comments above, the Statement of Need and Addendum.
An expert will be better placed to assess the factual statements that the Applicant makes in this section.	The Applicant has appointed a credible expert to opine and give evidence on this topic.
4. Discussion of future demand and related uncertainties	Addressed in the comments above, the Statement of Need and Addendum.
The SoN is pitched at a very "high level" and fails to go into the important issues around time of day/time of year that would be expected in a "needs" argument.	The Statement of Need and its Addendum constitute a comprehensive assessment of the need for the authorised development. The electricity market is changing because of electrification of transport and home heating. These trends are set to change the nature of electricity demand in GB and other countries, and large amounts of low-carbon generation are required to meet demand while meeting the UK's legal climate change goals. More information can be found in Chapter 4 of the Statement of Need. Cost is also important, and the analysis in Figure 6.2 demonstrates that electricity from solar is cost-competitive against many other forms of generation. Low carbon generation at any time of the year, and any time of the day, helps pave the way to take carbon emitting plant off the grid. Chapter 5, Section (v) describes the capability of solar generation to contribute in a meaningful way to the decarbonisation of the electricity generation sector.

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<p>5. Explanation of security of supply issues within the UK electricity system and how the Proposed Development will contribute to the same</p>	<p>The Applicant refers to Chapter 5, Section (v) of the Statement of Need.</p>
<p>It appears that the Applicant does not have a detailed or functioning financial model and is therefore unable to provide actual scenarios to demonstrate the contribution that the Proposed Development could (or could not) make in achieving the various benefits claimed.</p>	<p>A financial analysis of the proposed development has been included in the Chapter 6 of the Statement of Need (see Section (iv), Sub-sections (b) and (c)). This analysis, alongside Figure 6.3 demonstrates that solar generation is cost effective versus other forms of electricity generation, critically with zero carbon emissions.</p>
<p>6. Discussion of the economic viability of the Proposed Development.</p>	<p>Please see responses below.</p>
<p>At the core of the Applicant's thesis are the claims that (a) the scheme is financially viable; and (b) that larger schemes produce electricity at a lower cost of energy than smaller schemes and therefore the Proposed Development will have a downward impact on energy prices into the future.</p>	<p>Para 6.39 of the Statement of Need describes how scale impacts the total cost of generation of the development. Chapter 6, Section (ii) also describes how, with more solar power coming to market, the wholesale power price is reduced.</p>
<p>Claim (a) depends very much on a funder's view on the future energy price<sup>7</sup>; and on the cost of capital to finance the scheme. It may be that investors consider that the scheme is not financially viable, due to the concentration risk of proceeding with such a large scheme when compared with alternative investments (for example in a portfolio of smaller schemes).</p>	<p>Para 6.13 - 6.16 of the Statement of Need describes the general trend of increasing solar scale and decreasing cost. This is driven by international confidence in solar technology and solar generation revenue mechanisms, which both work to reduce the risk of any investment. As demonstrated in Table 6.2, the capital cost - therefore investment and debt requirements - associated with multiple smaller solar installations is higher than that associated with a single larger investment, while the same markets will be accessible by both assets. Therefore, it is concluded that risk is in fact greater for multiple smaller assets than for single larger assets.</p>
<p>Claim (b) is a very simplistic and ignores two obvious facts. First, solar generators have no input costs and will always export; they are expected to be price takers, not price makers (even with co-located storage schemes in the ratio proposed for this development). Second, the power price in the UK is dependent upon numerous additional factors, not least the carbon price, gas price, wind conditions, time of day and year, and price of power available from international sources via interconnectors.</p>	<p>Chapter 6, Section (ii) of the Statement of Need describes how more solar power coming to market, reduces wholesale costs for the same demand level (through the merit order supply curve). By lowering the project cost of generation at the development, the margin attainable for the project increases, thus reducing the financial risk of the development for the investors. This increases the chances of the asset coming to market, moving price setting plant above the estimated demand requirement more frequently (and having a reducing effect on the wholesale price of power for those periods).</p>

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<p>The Applicant's argument on viability is a distraction. Unsubsidised solar schemes and "solar plus battery" schemes will come forward<sup>8</sup> and be installed; in all cases, they can be expected to be far smaller than the Proposed Development.</p>	<p>Chapter 6, Section (iv) describes the economic case for large scale solar in GB. Para 6.40 describes Ofgem's view that the use of grid connections should be maximised to manage the cost to consumers of meeting their future power needs. The Statement of Need concludes that a larger development at Cleve Hill overall reduces costs for consumers when compared to (potentially multiple) smaller developments. It is an unsubstantiated and unrealistic assertion to say all future subsidy free solar projects will be far smaller than the authorised development, as demonstrated by the two solar and energy storage NSIPs registered on the Planning Inspectorate's website (and there are at least three others not in the public domain). The Applicant's expectation is that additional large scale solar and energy storage projects will come forward, subject to investor confidence, which will be significantly influenced by the Secretary of State's decision in respect of this Application.</p>
<p>In relation to the Addendum</p>	<p>Please see responses below.</p>
<p>1. Security of supply, affordability and low-carbon needs</p>	<p>Addressed in the comments above, the Statement of Need and Addendum.</p>
<p>No specific comments at this stage</p>	<p>Noted.</p>
<p>2. Timeframes for projected deployment of nuclear plant</p>	<p>Please see responses below.</p>
<p>A report should explain the possible contribution that the Proposed Development could make to electricity targets when compared against possible delays or shortfalls resulting from the concerns raised in the Addendum.</p>	<p>Figure 5.3 of the Statement of Need shows the contribution solar generation is already expected to make to decarbonisation targets. The authorised development will produce enough power for approximately 100,000 homes each year. This is not as much as - for example - Hinkley Point C, which is expected to generate enough power for about 6 million homes each year. However, it is infinitely more power than will be provided by Wylfa and Moorside Nuclear Power Plants, which, as described in the Addendum, are not being built and therefore will generate nothing.</p>
<p>3. Specific information in relation to the EDF Hinkley Point C scheme</p>	<p>Please see responses above.</p>
<p>See comment on 2 above</p>	<p>Please see responses above.</p>
<p>4. Analysis of the progress of other nuclear schemes</p>	<p>Please see responses above.</p>
<p>See comment on 2 above</p>	<p>Please see responses above.</p>
<p>5. A synthesis of projections for nuclear capacity</p>	<p>Please see responses above.</p>

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See comment on 2 above.	Please see responses above.



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