TECHNICAL STATEMENT ON BATTERY ENERGY STORAGE SYSTEMS (BESS)

Author: Grigorios Triantafyllidis

In Respect of: A proposed 44 MW Solar PV Array, and Battery Storage Development, on land near Stratton Audley, Cherwell District, Oxfordshire, England (OX27 9AL).

On behalf of: JBM Solar Projects 8 Ltd.

Date: 11th November 2022 | JBM Ref: TE-08

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1. AUTHOR'S BACKGROUND AND PARTICULARS

1.1. My name is Grigorios (Greg) Triantafyllidis, and I hold a Bachelor and a Master of Science in Electrical and Computer Engineering. I am a Chartered Member of the Technical Chamber of Greece and a Member of the Institution of Engineering and Technology (MIET). I am also a member of the Association for Renewable Energy and Clean Technology's (REA) Solar Steering Group.

1.2. I am the Technical Director of JBM Solar, having joined the company in 2019. I head the technical department, a core function of the business, feeding into every aspect of the project development cycle within JBM. The company employs approximately twenty project development and engineering professionals. Lastly, I represent the company in all relevant trade bodies, electricity industry, and regulatory meetings.

1.3. I have gained over ten years of experience in every aspect of power generation, distribution, and transmission schemes. Prior to JBM Solar, I was a Network Connections Design Manager for Scottish and Southern Electricity Networks, heading up the Thames Valley and Ridgeway connection teams, responsible for large-demand and generation connections. I have considerable experience and involvement in a wide range of renewable development and built projects throughout the UK, from initial conception, through detailed design, construction, and post connection operation and maintenance.

1.4. My work location is in the London office of JBM Solar, where I manage a technical team comprising three design engineers and two GIS specialists.

1.5. This technical statement is based on my professional judgement and supported by publicly available information, the content of which is true to the best of my knowledge and belief and presented irrespective of whom I am employed by.

2. INTRODUCTION AND SCOPE OF TECHNICAL STATEMENT

2.1. I am employed by JBM Solar, thereafter, referred to as the Applicant, and present evidence relating to technical matters in respect of the planning application concerning the construction of a solar farm (also known as Padbury Brook) and battery energy storage system (BESS) together with all associated works, equipment, and necessary infrastructure on land at Stratton Audley in Cherwell District. My technical statement comprises this document and separate appendices. This Statement should be read in conjunction with the Planning, Design and Access Statement (PDAS) prepared by ADAS.

Scope of Technical Statement

2.2. In presenting this technical statement I explain why in technical terms the proposed scheme is considered acceptable, recognising that the overall planning balance is for others to comment upon. From a technical perspective, this technical statement addresses the Battery Energy Storage System (BESS) including safety matters and potential benefits arising from the BESS as well as the CO2 and equivalent homes calculations.

2.3. Accordingly, my technical statement will address the following specific matters;

- The BESS; and
- The Benefits.

3. DESCRIPTION OF THE PROPOSAL

3.1. The application seeks planning permission to construct a 44MW solar farm and battery energy storage system (BESS) on farmland, albeit the actual land take of the parcels would be smaller, as not all the land within the site area would have panels sited on it. The solar farm and battery stations would be a temporary use of the land as the equipment would be removed and the land returned to its former condition when the development is decommissioned following 40 years from the date of the first export of electricity to the electrical grid (with the exception of the on-site sub-station which would remain on-site permanently). To set the scene, the Distribution Network Operator (DNO) is the operator of the power lines and infrastructure that distribute electricity to every consumer. The DNO is the only party that can provide a connection to the existing grid and in this instance, the DNO needs to undertake a significant amount of work to improve the area's electricity network. The works will add new switching points to the network, enabling diverse electricity supply routes for the local area, as well as establish new monitoring stations that greatly enhance the information available to the DNO for running the electricity network. That work relies on the construction of the on-site substation, which will also transform power from the project into higher voltage for export to the grid. To ensure the improvements endure the substation will become a permanent part of the electricity network, and as such, the DNO mandates that the substation remains on site in perpetuity.

3.2. In the Planning, Design and Access Statement (PDAS), it is explained (or will be explained) that the 44MW power proposal would provide electricity equivalent to the average electrical needs of approximately 16,680 typical UK homes annually and assist towards reducing carbon dioxide emissions, saving approximately 32,947 tonnes of CO_2 per annum.

3.3. The BESS would consist of 10 no. battery storage containers evenly distributed throughout the proposed site.

4. THE BESS

Introduction

4.1. This section of the statement goes through the high-level description of Battery Energy Storage Systems (BESS), the assessment of the benefits they present to the electricity system and customer base, and the additional benefits stemming from our solar collocation designs. Lastly, I will elaborate on the BESS safety behaviour, risks, and the available mitigation options.

Purpose of the BESS and how it works

4.2. BESS are utility-scale integrations of the same technology that has been around for decades and is already powering our phones, laptops, EVs, and any device not connected directly to mains electricity. They can be charged and discharged on-demand and benefit from highly advanced monitoring and control systems.

4.3. The power that reaches our homes, offices, and businesses stems from a delicate balancing operation the National Grid Electricity System Operator (NGESO) undertakes. NGESO will contract with generators to meet the anticipated future demand, monitor the energy being used and produced on the network, and intervene further if needed by procuring additional services (like additional generation capacity or turning down of large demand/generation). The major technologies of generators that NGESO has access to are nuclear, gas, coal, biomass, hydro, wind and solar. Traditional generators like nuclear or coal can't turn down without significant notice and this presents another balancing variable which I will expand on later. The electricity consumer behaviour is the one variable that NGESO can't rely on as it varies significantly depending on the season and day of the week (Fig. 1). This means that NGESO will always need to over procure services to satisfy the expected demand and cater for the unpredictability. As a result, electricity pricing has an inverse relationship to consumer behaviour, meaning it's more expensive to use energy during peak/high-demand hours than off-peak/low-demand hours. The Economy 7 electricity tariff is based on the above principle, i.e., customers are incentivised to use energy during the cheaper off-peak hours. Furthermore, this unpredictable behaviour can result in consumption swings that generation can't respond to fast enough, creating excess generation or excess demand periods. These periods represent supply security risks (blackouts) that need managing.

4.4. **Figure 1** is an example of a daily electricity demand curve for the United Kingdom. The curve reduces overnight (on the left) and then starts increasing in the early hours of the morning until the mid-day peak. The curve reduces again until the evening peak (tea-time). Deploying the BESS in all those periods evens the curve out, taking the pressure off the system, while reducing the cost for the consumer. The BESS will fully charge overnight (blue area) and deploy in both peak periods (orange area).

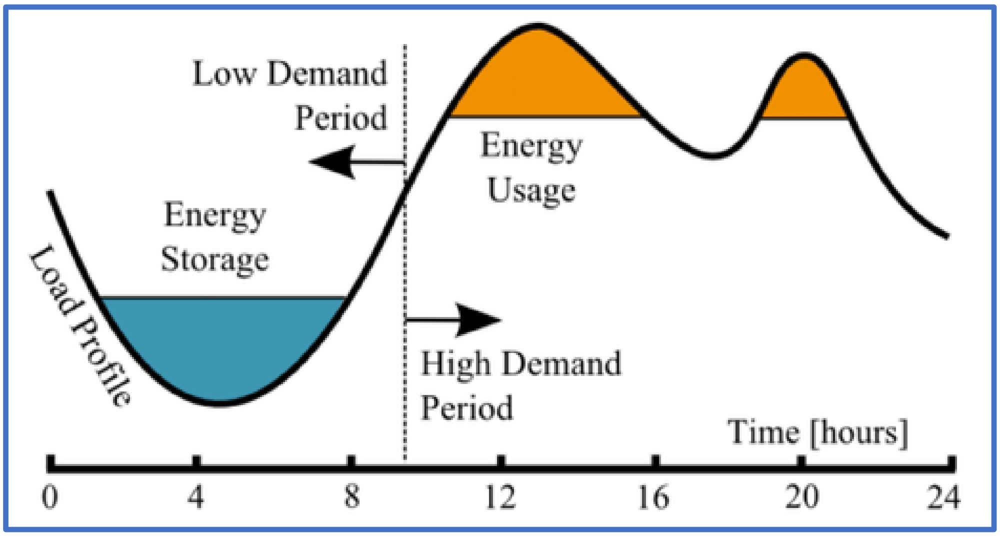

Figure 1 – Electricity Consumption (Demand) Curve example

4.5. The introduction of renewable sources into the energy mix adds another variable to the balancing of the system, as weather patterns and electricity consumption behaviour do not match. To manage, the industry traditionally had to dispatch carbon-heavy generators at 527g of CO2 per kWh produced respectively from fossil fuels[1]. Those generators needed to be on standby, venting their exhaust gases while waiting to be called on by the NGESO to connect and provide support. That is where the introduction of ESS solutions can come in and assist. They negate the need for carbon-heavy generators as excess energy from low demand or high generation periods can be stored for use later. Furthermore, BESS can be deployed significantly faster than any other standby technology and emits no carbon. The almost instantaneous response provides significant security of supply benefits, helping the NGESO balance the network more efficiently and cheaply, helping reduce the cost of electricity for the greater paying public.

4.6. **Figure 2** is a typical example of how the BESS positively affects the supply and demand curve seen above in a high renewable penetration energy system. The light blue line showcases a slightly different electricity consumption curve from Figure 1 above. The consumption curve here has smaller peaks and is smoother (this is because the BESS' operation has smoothed out the curve). There is also a black line depicting a typical solar farm generation curve. The longer arrow indicates the behaviour described under 4.4, whereby the BESS deploys to store cheap off-peak energy overnight (like nuclear or wind) for export during tea-time. As per 4.5, renewable energy production and the demand curve don't always align. There are instances where the generation is more than the current system demand. A generation abundance leads to lower prices, and as such, the BESS deploys to take advantage of cheap renewable energy by storing it during the mid-day over generation peak and deploying it again during tea-time (shown by the shorter arrow). In a system without BESS, the mid-day generation peak (and any peak) would go to waste, and expensive carbon-heavy generators would need to be placed on standby to cater to the teatime peak. Apart from the significant security of

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1064923/2021-provisional-emissions-statistics-report.pdf

supply benefits that BESS produces by helping smooth out the demand curve, it also reduces costs for the consumer in both the fixed costs and the electricity price category.

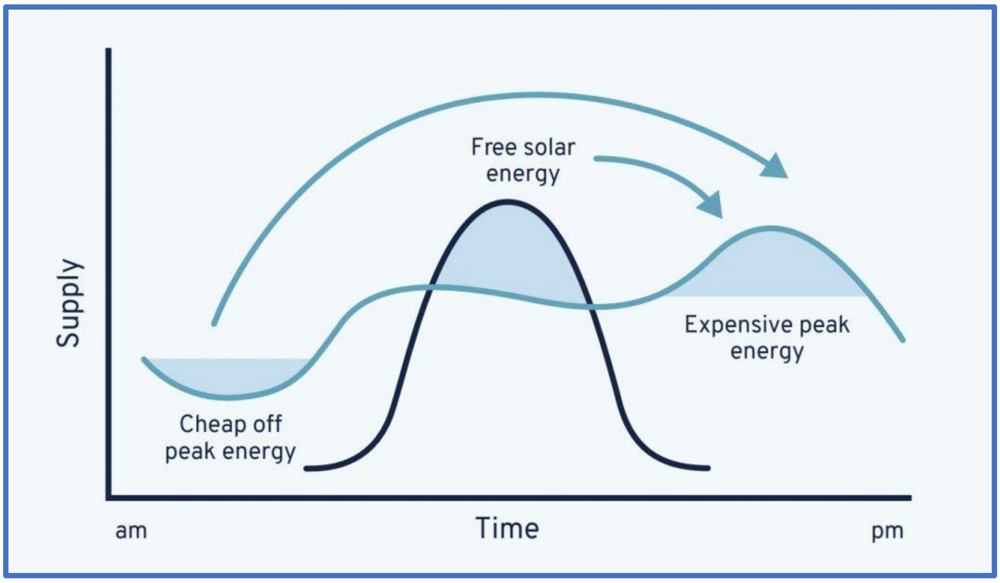

Figure 2 - Load shifting typical example

Connection with the solar energy development

4.7. The BESS directly connects to the solar farm via high voltage equipment and associated AC and DC cables. As a result, the BESS relies on equipment used within the solar farm to operate and, apart from producing savings, this also means that without the solar farm, the BESS can't be built as a standalone project in this location under our proposed design.

Benefits of the BESS and Solar Farm

4.8. BESS are key enablers necessary for our Net Zero future and our security of supply, with their use case enhanced when collocated with renewable energy sources. The key points are below:

- **Renewable Energy Generation and a more balanced grid** – The ability to shift demand and generation boosts the integration of renewable energy into the electricity system significantly, significantly helping the goal of limiting global warming to below 1.5 degrees Celsius
- **Valuable Resource** – Conventional generators can only supply power, whereas energy storage can both charge and discharge power. This means it can provide double the resources and essentially twice the value to NGESO for the same installed capacity.
- **Environment and Health** – BESS displace carbon-heavy generators traditionally used for flexibility services. Displacing CO2 has environmental benefits as well as health benefits, as burning fossil fuels releases a number of pollutants in the air which can lead to health issues in humans (such as respiratory problems).

- **Security of Supply** – BESS' fast response reduces exposure of the electricity system to black-outs and increases security of the supply for the greater public.

- **Cost savings for energy users** - Collocation enhances the use case even more by unlocking further Capital Expenditure, Operational Expenditure, and electricity transmission savings, which are ultimately passed on to the public, resulting in reduced bills.

- **Farm diversification** - With fluctuations in commodity prices such as dairy products and grains and unpredictable yields year on year, a large number of UK farms are undertaking some form of farm diversification providing a more secure long term sustainable source of income.

- The industry has evolved since 2018-19, and as a result of those safety improvements, the safety factor has increased significantly, evidenced by the amount of flexibility in the network today (seen under 4.14).

<u>Collocation Benefits</u>

4.9. With the collocation of the BESS with the solar farm, additional benefits unlock. I have summarised them below:

- Sharing of Grid Infrastructure – This leads to the more efficient usage of the electricity network connection, fewer materials/equipment used, and significant efficiencies during construction and operation.

- Sharing of Generation Infrastructure – This unlocks efficiencies similar to the above point on Grid Infrastructure.

- Load shifting (as per Figure 2) – The BESS can directly interface with the solar farm via their shared infrastructure and tailor the generation curve to the demand curve. Doing this on-site reduces losses on the network, to the ultimate benefit of the greater paying public.

<u>Solar Farm Benefits</u>

<u>Introduction</u>

4.10. The recent IPCC report[2] brought to the forefront the dire need for CO2 emissions to peak by 2025 if we are to maximise our chances of limiting global warming to around 1.5 degrees Celsius. Solar energy will be an essential part of the energy mix, a fact also reflected in the government's energy security strategy[3]. The average solar project saves thousands of tonnes of carbon over its lifetime, with the average payback period for solar panels being 1-4 years[4].

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[2] https://www.ipcc.ch/2022/04/04/ipcc-ar6-wgiii-pressrelease/
[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1069969/british-energy-security-strategy-web-accessible.pdf
[4] https://solarenergyuk.org/resource/everything-under-the-sun-the-facts-about-solar-energy/

As manufacturing processes advance, it is likely that the carbon payback period for solar will decrease further. Below I will go through the CO2 savings and equivalent household power production calculations. Please also refer to the collocation benefits set out at paragraph 4.9 above.

CO2 Savings

4.11. Solar energy generation avoids the need for the use of carbon-heavy fossil fuel generation. As such it directly offsets CO2 emissions as per the below formula:

- [Capacity in MW] x [24 hours] x [365 days] x [Capacity Factor] x [CO2 emissions per MWh from equivalent fossil fuel power production]

- The Capacity Factor is derived from the design of the solar farm. The CO2 emissions figure for conventional fossil fuel generators is taken from the government's 2021 provisional emission statistics report[5]. The filled in formula is below:

- 44 x 24 x 365 x 16.22% x 0.527 = 32,947 tonnes of CO2 will be avoided per year of operation of the solar farm.

Energy Production Households Equivalent Formula

4.12. Solar energy generation avoids the need for the use of carbon-heavy fossil fuel generation. As such it directly offsets CO2 emissions as per the below formula:

- [Capacity in MW] x [24 hours] x [365 days] x [Capacity Factor] / [Annual Average domestic consumption for the UK]

- Similar to 5.2, the capacity factor is derived from the design of the solar farm. The annual average domestic consumption per household is taken from the government's statistics[6].

- 44 x 24 x 365 x 16.22% / 3,748 = 16,680 is the number of households that our solar farm will annually provide equivalent power for.

Permitted JBM Solar and BESS schemes

4.13. You can find JBM's track record below in Table 1. To date, JBM Solar have been successful in securing planning consent for around 1GW of collocated Solar and BESS schemes.

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5 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1064923/2021-provisional-emissions-statistics-report.pdf

6 https://www.gov.uk/government/statistical-data-sets/regional-and-local-authority-electricity-consumption-statistics

Planning Ref:	Project Name	Local Planning Authority	Description
S/19/1097	Corner Copse	Swindon Borough Council	49.9 MW Co-located Solar and Storage Site
19/04321/STPLF	Scurf Dyke	East Riding of Yorkshire	49.9 MW Co-located Solar and Storage Site
TWC/2020/0851	Myttons	Telford & Wrekin / Shropshire	49.9 MW Co-located Solar and Storage Site
21/00552/FUL	Bunker's Hill	Hart District Council	49.9 MW Co-located Solar and Storage Site
21/01363/FUL	Doverdale	Wychavon District Council	49.9 MW Co-located Solar and Storage Site
21/00259/FUL	Claydon	Tewkesbury Borough Council	49.9 MW Co-located Solar and Storage Site
20/06840/FUL	Wick Farm	Wiltshire Council	49.9 MW Co-located Solar and Storage Site
21/02448/FUL	Eastfields	Stratford-on-Avon District Council	25 MW Co-located Solar and Storage Site
20/01242/FULM & APP/B3030/W/21/3279533	Cotmoor	Newark & Sherwood District Council	49.9 MW Co-located Solar and Storage Site
21/0465/FUL	Moreton Lane	Stroud Borough Council	49.9 MW Co-located Solar and Storage Site
20/03528/FUL	Minety	Wiltshire Council	49.9 MW Co-located Solar and Storage Site

Table 1 – Examples of permitted JBM Co-located Solar and BESS schemes

<u>Other examples of BESS schemes being permitted</u>

4.14. I am aware of one known utility-scale BESS fire (Liverpool) in the UK to date, and the capacity of that installation was 20MW. The number of energised, and as a consequence planning approved projects is ~1.5GW, which means that this event represents ~1% of the assets. The numbers stem from Appendix 1. That file is a compilation of the system-wide connection registers that every electricity Network Operator maintains.

<u>Mitigation</u>

4.15. There is a wide variety of BESS technologies available today, with Lithium-Ion systems being the most popular. However, there is no guarantee that this is the chemistry solution that this development will deploy. The alternatives could include Flow, Lead-Acid, Sodium-Sulphur, Lithium-Iron Phosphate to name a few. Even for those systems, as explained under 4.18, there is a low probability of a fire event happening. Any system installed is strenuously tested during the factory and pre-commissioning testing regimes before the final energisation sign-off. They evaluate anything from charging/discharging and electrical properties of the system to Building Management System (BMS) configuration, sensor verification, ventilation, and the simulation of a fault. During this process, if any elements of the systems do not pass, they are replaced or reconfigured.

4.16. As also explained under 4.3, due to the BESS's contribution to the security of supply and its interaction with the NGESO's services, multiple safety measures are involved even after energisation.

4.17. To help explain the various safety measures we are proposing versus older BESS technology I will draw a comparison between two Lithium-Ion BESS fire events (Liverpool[7] and Arizona[8]) and our proposed BESS. Further down this document, I will go through the reasons these two systems developed fire events. In general, the root cause for both events is Thermal Runaway. **Figure *3*** shows the typical thermal runaway cycle for Lithium-Ion based batteries. The figure has a preventative (green) and a containment (red) zone. Once the system enters the red zone of the cycle, a series of cascading events follows that will result in a chemical fire. At that point, it can only extinguish by cooling down the faulty module and flammable gases venting.

4.18. Li-Ion based batteries do not spontaneously combust but have to be subjected to abuse to enter the below cycle. The causes of thermal runaway are either mechanical or electrical abuse, i.e., physical damage (like a puncture to the casing) or overstressing during operation (like overcharging the system with energy). Even when the BESS enters that cycle, it should have enough safety measures to allow sufficient time to act and prevent the cascading event. I will elaborate below on the safety systems that will avert and safely shut down the system before it occurs, i.e., operate in the green section of the Thermal Runaway cycle.

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[7] Merseyside Fire & Rescue Service (MFRS) Significant Incident Report - Incident no. 018965 Orsted BESS, Carnegie Road, Liverpool – see Appendix 2 for full report

[8] https://coaching.typepad.com/files/mcmicken.pdf

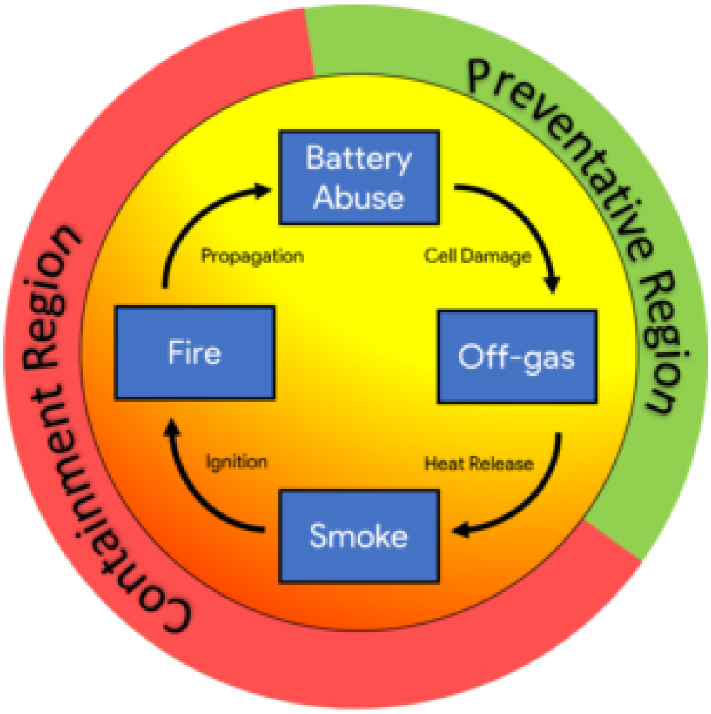

Figure 3 – Thermal Runaway Cycle

Passive measures for fire risk prevention

4.19. Passive protection methods are the first link in fire risk mitigation. These include:

- Adequate system maintenance
- Emergency intervention plans
- Emergency training for onsite and maintenance personnel
- Replacement of out of warranty/faulty/recalled modules
- Establishing an efficient system cooling process i.e., enlarging the space between the battery cell racks and the containers facilitates thermal dissipation and thus contributes in reducing the large-scale fire risk

Monitoring measures

4.20. Monitoring measures help with early detection of events leading to thermal runaway

- Off-Gas monitoring allows for the detection of gases emitted during the early stages of the thermal runaway cycle and can be used to safely power down the system before this occurs. The sensitivity of the relevant sensors is down to 1 part per million.
- Battery management system (BMS) which monitors a whole host of cell health indicators and can automatically make decisions as per manufacturer and integrator specifications.

- Direct connection of the BESS to a 24/7/365 control centre that can dispatch engineers if and when the need arises, as well as notify/coordinate emergency services, in the extremely rare event that their intervention is needed.

- Smoke detection to avoid traditional electrical fires being the cause of thermal runaway.

- Flammable gas detection

- Flame detection

- Heat detection

- Thermal imaging

- Emergency training for onsite and maintenance personnel

Suppression and containment measures

4.21. Suppression and containment measures intervene when thermal runaway is fully developed, and their purpose is to limit the impact on the rest of the system as well as aid the fire response. These include:

- Inert or clean fire suppression agents (most effective for electrical fires)

- Flammable Gas venting that operates in line with the detection system and avoids the build-up that can lead to an explosive environment.

- Battery caused fires require a cool down of the system

Summary of main approaches for fire risk mitigation

4.22. As noted above the three main types of measures for fire risk mitigation for BESS developments include:

- Passive protection measures;

- Monitoring measures; and

- Suppression and containment measures.

Arizona and Liverpool fires

4.23. In the case of the Arizona and Liverpool BESS fires there were several key contributing factors which led to a thermal runaway and fire event in each case. There were also several recommendations outlined in the two reports. Table 2 below summarises the issues and recommendations and demonstrates how the proposed BESS will avoid the same mistakes and will be designed in an appropriate and safe manner.

No	BESS Facility	Issue/Measure	Measure Type	Proposed BESS
1	Arizona	Fire suppression system was incapable of stopping thermal runaway	Suppression and containment	The system will be designed to ensure flammable gases are vented before their concentration reaches the Lower Explosive Limit (LEL) and will not rely solely on the clean agent for suppression. Furthermore, the cooling system will be designed to aid with the fire suppression.
2	Arizona	Lack of thermal barriers between cells led to cascading thermal runaway	Passive protection	This is indicative of early installation designs. The market standard now includes improvements in the space between cells and as such, the system will be designed with adequate thermal barriers.
3	Arizona	Flammable off-gases concentrated without a means to ventilate	Suppression and containment	Similarly to 1, the system will be designed to avoid the build-up of explosive gasses inside the container, in the event of a fault.
4	Arizona	Emergency response plan did not have an extinguishing, ventilation, and entry procedure	Passive protection	Information to be compiled and provided to fire and rescue teams. Any comments will be taken on-board.
5	Liverpool	Improved signage and provision of information/contact details on-site.	Passive protection	This is indicative of earlier installations. All relevant information will be clearly indicated and signposted throughout the site. Fire and rescue comments will also be taken on-board.
6	Liverpool	Fire suppression system did not operate until after the explosion and fire event occurred.	Suppression and containment	The system's location and number of sensors will be specified to design out this scenario.
7	Liverpool	Consider a system that detects the early stage of a cell in thermal runaway and can give early warning while also safely turning off the system and avoid the release of potentially flammable gas.	Monitoring	The system will be designed to operate in the preventative zone of the thermal runaway cycle.
8	Liverpool	Exploring of options that reduce/vent the gas build-up in the event of the BESS operating under abnormal conditions.	Monitoring	Similarly to 1 and 3, the system will be designed to avoid the build-up of explosive gasses inside the container, in the event of a fault.
9	Liverpool	Failing module was on the replacement program but was not being replaced for another 3 months.	Passive protection	Safety first approach will be prevalent throughout the operation of the system. As such, any modules exhibiting signs of stress will be removed until a replacement module is available.
10	Both systems	Signs of stress within the individual battery modules.	Passive protection	See 9.

Table 2 – Issues and Recommendations from Arizona/Liverpool BESS fires and the Proposed BESS

4.24. Both cases indicate early technology installations that did not benefit from lessons learned. The BMS did not appear to be monitoring down to the cell level. There was no system available to detect the off-gases emitted during the early stages of the thermal runaway cycle. Furthermore, there was no thermal/expansion barriers, no venting system and a lack of flammable gas detection and action systems, which is evident by the pictures and the relevant "bulging" of the containers.

4.25. In addition to Table 2 above the proposed BESS development will benefit from many more fire mitigation measures as outlined in sections 4.19-4.21 above. Further details of the exact arrangements and design can be secured through condition and provided prior to construction commencing on site, should the proposals be permitted. Lastly, to put it bluntly, a system of this size is a significant investment for the owner/operator and it's not in anyone's interest to commission an unsafe system. Lessons learned and technology advancements will be a core part of the design so events like the one in Arizona or Liverpool can be avoided.

Summary

4.26. Solar power is at the forefront of the world's and the UK's decarbonisation efforts. The benefits of replacing CO2-heavy generators with solar and the local benefits of providing power for over 16,680 UK homes every year will be crucial if we are to limit global warming to under 1.5 degrees Celsius. BESS are key enablers necessary for our Net Zero future and our security of supply, with their use case enhanced when collocated with renewable energy sources. The key points are below (also refer to 4.8-4.12):

- Demand/Generation shifting
- Environmental and health benefits
- Double value for the grid
- Increased security of supply
- Infrastructure, construction and operation efficiencies and savings
- Increased safety through advancements

5. CLEVE HILL – DCO SOLAR FARM and CO-LOCATED BESS DECISION

5.1. When BESS was a much newer technology, the issue around its safety was explored in detail by the Examining Authority (ExA) and Secretary of State (SoS) in Cleve Hill – a Development Consent Order (DCO) for a solar farm and co-located BESS. The ExA took into account the large number of representations about the proposed system, but "took comfort from the legislation and guidance and the Battery Safety Management Plan which would be subject to consultation with the relevant bodies and the ExA was, therefore, confident that the risks could be managed or mitigated appropriately." The Secretary of State agreed.[9] There is no reason why a different conclusion should follow in this case – if it did, it would cast doubt over the ability of any operator to use what is a crucially important technology in the move towards net zero. As Mr Triantafyllidis explained, it is not possible to achieve net zero, or move towards a low carbon energy system without BESS technology. There is no reason why a different conclusion should follow in this case – if it did, it would cast doubt over the ability of any operator to use what is a crucially important technology in the move towards net zero. As stated in this Technical Statement, it is not possible to achieve net zero, or move towards a low carbon energy system without BESS technology.

5.2. The DCO SI itself at p.31 deals with the risks of battery storage by requiring a battery safety management plan ("BSMP") to be consulted on, submitted to the relevant planning authority, and approved before commencement. The Applicant in this case is willing to agree to a condition(s) for a BSMP which would have the same effect, sufficient to ensure confidence in the BESS' safety.

5.3. Indeed, the end result of Cleve Hill was that the ExA regarded the proposed co-located BESS to be a factor of significant additional positive weight in favour of the proposed development, rather than a negative consideration.[10]

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[9] Cleve Hill Solar Park Decision Letter – See Appendix 3

[10] Cleve Hill Solar Park – Examining Authority's Report of Findings and Conclusions and Recommendation to the Secretary of State for Business, Energy and Industrial Strategy – See Appendix 4

6. PROPOSED CONDITION

6.1. The Applicant would like to propose the following condition in relation to the proposed BESS. The wording of this condition is derived from the *Cleve Hill* co-located Solar and BESS DCO.

"Development of the battery storage compound shall not commence until a Battery Safety Management Plan (BSMP) has been submitted to and approved in writing by the Local Planning Authority.

The BSMP must prescribe for measures to ensure facility safety during the construction, operation and decommissioning of the battery storage facility, including the transport of new, used and replacement battery cells both to and from the authorised development.

The Local Planning Authority must consult with the Health and Safety Executive and the Hereford & Worcester Fire and Rescue Service before approving the BSMP.

The BSMP must be implemented as approved."

Appendices

(1) Combined Capacity Register.xlsx

(2) Merseyside Fire & Rescue Service (MFRS) Significant Incident Report - Incident no. 018965 Orsted BESS, Carnegie Road, Liverpool

(3) Cleve Hill Solar Park Decision Letter

(4) Cleve Hill Solar Park – Examining Authority's Report of Findings and Conclusions and Recommendation to the Secretary of State for Business, Energy and Industrial Strategy