Annex EF57 of Dr E J Fordham Interested Party – Unique Reference: 20030698
EN010106 – Sunnica Energy Farm

Exchange of correspondence with Applicant – November–December 2020

(i) Letter to "Sunnica Consultation" 18 November 2020

COMAH compliance is raised explicitly in item 17.

(ii) Reply from Sunnica Ltd 7 December 2020

Reply to Item 17 refers back to Item 11 which does not mention COMAH.

[redacted]

18th November 2020

Sunnica Consultation
FREEPOST REF RTRB-LUUJ-AGBY
c/o Newgate Communications
Sky Light City Tower
50 Basinghall Street
LONDON EC2V 5DE

Dear Sir/Madam

Sunnica Solar Farm Consultation: Battery Energy Storage Systems (BESS)
BESS component under-specified: Information required for meaningful Consultation

I write on behalf of the "Say No to Sunnica" Community Action Group.

Battery Energy Storage Systems (BESS) are proposed by Sunnica for 78 acres of land over 3 compounds[1]. However the Scheme Description is at present wholly under-specified in respect of the BESS proposed.

Land areas are quoted in the Scheme Description (East A, 5.23 ha; East B, 15.6 ha; and West A 10.65 ha) and a storage cabin size (15 m length, 5 m width and 6 m height). These are not sufficient to form any meaningful impression of the nature or scale of the BESS installation(s) proposed. Councillor Andrew Douch (Freckenham Parish Council) reports that at a meeting with the PC on 30 October, similar points were made, with the response "*we should assume that the area specified was fully used for BESS in the worst case*".

This does not begin to address the question, since the density of BESS cabins on the land is not specified, only their individual footprint (75 m^2 approx). The Scheme proposals thus appear to be under-specified in respect of the following broad parameters:

a) Total BESS energy storage capacity in MWh; total BESS power rating in MW
b) Total number of BESS storage cabins on each site
c) Typical cabin density (percentage of land occupied by cabin footprints)
d) Storage "unit" of energy in MWh, per single cabin
e) Electrochemical technology (e.g. Li-ion, Vanadium flow, high temperature NaS etc)
f) Electrochemistry sub-type (e.g. Ni-Mn-Co or NMC, $LiFePO_4$ or LFP etc)
g) Typical Energy/Power ratio for chosen technology
h) Engineering Design Codes and Safety Standards to be applied
i) Hazard and accident planning, addressing prior experience
j) Compliance, *inter alia*, with CoSHH and COMAH regulations.

A meaningful Statutory Consultation can only take place if the above omissions are clarified.

If intending to rely on the legal doctrines of the "Rochdale Envelope"[2] it is necessary at least to present maximum and minimum limits for the quantitative questions.

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[1] Sunnica Preliminary Environmental Information Report, Ch 3: Scheme Description
[2]https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2013/05/Advice-note-9.-Rochdale-envelope-web.pdf

In respect of the battery electrochemical technology proposed, this is a required specific, because chemicals released in the event of accidents will be completely different for different technologies. There is no "range" or even "worst credible accident" scenario that can be considered, without being specific as to battery electrochemical technology. This will determine both the nature and the extent of the hazards involved, to life, property and the environment. We note the Energy Institute Guidance Notes on BESS[3] state:

> *"The specific chemistry of the battery is important for the planning process because the chemicals released in the event of an accident will determine the level and nature of the risk and how it must be mitigated. For example it is not sufficient to simply state "lithium ion" in the planning application, as each type has widely different characteristics, particularly with regard to fire resistance, fire and explosion propagation, performance, efficiency and resilience to ambient conditions"*

To complete the minimum information needed for a meaningful Consultation, please supply answers to the following questions:

1. What is the projected energy storage capacity (in MWh) for (i) East A (ii) East B (iii) West A, and if ranges are given, (iv) the complete Scheme ?
2. What is the projected power rating (in MW) for (i) East A (ii) East B (iii) West A, and if ranges are given, (iv) the complete Scheme ?
3. What is the projected total number of BESS cabins In each compound, for (i) East A (ii) East B (iii) West A, and (iv) the complete Scheme ?
4. What is the projected density of cabins on the stated land area(s) i.e. what percentage of stated land area will be occupied by the stated BESS cabin footprints of 75 m^2 each ? (for each BESS compound individually, and the whole Scheme, as Qu 1-3 above)
5. What land footprint will be allocated to bunding for containment of firewater or other firefighting materials arising from emergencies ? (as an area per single BESS cabin)
6. What is the projected energy storage capacity (in MWh) and power rating (in MW) of a single BESS cabin of the dimensions stated ?
7. Given a BESS cabin height of 6 m, more than double a so-called "hi-cube" shipping container, and taller than a typical double-decker bus, does this imply a "two-storey" layout internally or a single tall enclosure ?
8. What is the broad electrochemical class of BESS technology proposed ? (Li-ion, lead-acid, Vanadium flow, NaS etc)
9. What specific sub-class of electrochemical technology is proposed ? (e.g. if Li-ion, whether NMC, LFP etc)
10. What is a representative stored Energy/Power ratio for the BESS technology proposed (in MWh/MW) ?
11. What engineering design codes and HSE standards will apply in respect of fire or explosion hazard, or release of toxic gases, irrespective of BESS technology ?

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[3] Energy Institute (2019) Battery Storage Guidance Note 1: Battery Storage Planning, Sec 2.3 page 9

12. Specifically, if Li-ion technologies are proposed, what design codes, principles and test protocols for preventing or mitigating the known problem of thermal runaway (cell-to-cell, module-to-module propagation of failure) will be applied ?
13. Will the engineering design and testing codes address the known deficiencies of existing codes in respect of thermal runaway in Li-ion batteries (e.g. UL 1973, UL 9540 and 9540A, NFPA 855) as identified in the July 2020 report[4] for the Arizona Public Service on the McMicken explosion in April 2019 ?
14. What HAZOP studies have been or will be carried out on fire or explosion hazard in the BESS compounds ?
15. Specifically, has any plume dispersal modelling been performed for the release of any toxic gases in BESS accidents, and has a safe distance for habitation, schools, workplaces etc been determined ?
16. How will compliance with the CoSHH regulations be assured in the event of disruptive accidents at any BESS compound ?
17. A very large energy storage projected for the BESS compounds based on information so far may be projected, dependent on answers to Qu 1 and others above. Will the COMAH regulations[5] apply ? If so, how will you ensure compliance ? If not, why not ?
18. Under the *Regulatory Reform (Fire Safety) Order 2005*, operators and owners have responsibility for fire safety and may face prosecution if fire safety is inadequate. The Energy Institute points out[6]: *" This has implications for landlords who have leased space to energy storage operators"*. Have these responsibilities been made clear to landowners who have agreed to long leases of land for Sunnica ?

I look forward to your prompt replies so that we may have the information available to prepare a meaningful response to your Statutory Consultation.

Yours sincerely

[redacted]

Edmund Fordham MA PhD CPhys CEng FInstP EurIng

cc Councillor Mark Goldsack, Cambridgeshire County Council
Councillor Andy Drummond, West Suffolk Council
Sunnica team, Planning Inspectorate
Mrs Lucy Frazer QC MP
Mr Matt Hancock MP

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[4] D. Hill (2020) "McMicken BESS event: Technical Analysis and Recommendations". Report by DNV-GL to Arizona Public Service, 18 July 2020

[5] https://www.hse.gov.uk/comah/

[6] Energy Institute (2019) Battery Storage Guidance Note 1: Battery Storage Planning, Sec 4.6 p 19 para 1

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7 December 2020

Dear Mr Fordham,

RE: Sunnica Solar Farm Consultation: Battery Energy Storage Systems (BESS)
BESS component under-specified: Information required for meaningful Consultation

Thank you for your letter of the 18th November regarding the specifications of the Battery Energy Storage Systems (BESS) component of the proposed Sunnica Energy Farm (the "Scheme").

In preparing our materials for the consultation that commenced on 22 September 2020, we have taken account of the advice in the *Planning Inspectorate's Advice Note 7* with regards to the amount of information that is to be included in a Preliminary Environmental Information Report (PEI Report) and the appropriate stage of when that report should be published.

We consider that we have published the PEI Report at a stage where we are able to publish sufficient environmental information that allows consultees to make an informed consultation response being aware of the preliminary likely significant environmental effects of the Scheme.

We consider through the PEI Report and our consultation materials that we have provided adequate information to facilitate a meaningful Statutory Consultation on our Scheme. It is inevitable that final details, including detailed design, will not be available at this consultation stage given the Scheme, and indeed as with any other project, is still evolving and responding to both the outputs of the environmental assessment work and consultee responses.

While these details may be refined for submission, at which stage there is a further consultation, the final detailed design (which will have to be within the parameters applied for) will only be decided

upon post consent. This is standard and accepted practice. We appreciate that you may take a contrary view on this point.

In terms of the specific parameters that you reference in your letter, we will clarify the following when we submit our application for a Development Consent Order (DCO) to the Secretary of State for Business, Energy and Industrial Strategy:

a) The electrochemical technology (e.g. Li-ion, Vanadium flow, high temperature NaS etc)
b) The engineering Design Codes and Safety Standards to be applied
c) The hazard and accident planning, addressing prior experience
d) Compliance, inter alia, with CoSHH and COMAH regulations

We currently anticipate submitting our application in Spring 2021. The remaining parameters that you identified will be clarified at the final design stage subject to a development consent order being granted.

In terms of the questions that you asked within your letter, please find answers to each in turn set out below.

1. What is the projected energy storage capacity (in MWh) for (i) East A (ii) East B (iii) West A, and if ranges are given, (iv) the complete Scheme?

We will confirm the energy storage capacity for the Scheme as part of the detailed design that we will prepare once the DCO is granted. This will be dependant upon technological advances and therefore it is not appropriate for us to provide this information now and be tied to a capacity that could be higher and thus make the Scheme even more efficient. The constraint on the project is that the Scheme can only be constructed on the "developable" area identified for the batteries and within controlled parameters, such as height. The parameters that have been identified will be controlled through the DCO and therefore you can be certain that the environmental impacts of BESS will have been assessed within these parameters.

2. What is the projected power rating (in MW) for (i) East A (ii) East B (iii) West A, and if ranges are given, (iv) the complete Scheme?

Likewise, we will confirm this at the detailed design stage. The comments made in response to Question 1 above apply equally here.

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3. What is the projected total number of BESS cabins in each compound, for (i) East A (ii) East B (iii) West A, and if ranges are given, (iv) the complete Scheme?

The number of battery storage units will be identified in the detailed design process. We are not therefore able to confirm the total number of battery storage units at this stage. For the purposes of environmental impact assessment, we have assessed a worst-case scenario in terms of potential impacts – that is, developing the entire area identified for the BESS. The parameters set out in the PEI Report are 15 metres by 5 metres in plan and up to a maximum of 6 metres in height for each battery storage unit. This approach means that we will assess a worst case scenario within defined parameters. This approach is entirely appropriate and as set out in the *Planning Inspectorate Advice Note 9*.

4. What is the projected density of cabins on the stated land area(s) i.e. what percentage of stated land area will be occupied by the stated BESS cabin footprints of 75m² each? (for each BESS compound individually, and the whole scheme, as Qu 1-3 above)

As set out above, the design parameters adopted in the PEI Report assume a worst-case scenario from the BESS for the purposes of environmental impact assessment. The number of battery storage units, and therefore their density, will be identified in the detailed design process.

5. What land footprint will be allocated to bunding for containment of firewater or other firefighting materials arising from emergencies? (as an area per single BESS cabin)

We will provide details of this when we submit our Environmental Statement (ES) as part of our DCO application. The ES will draw on information from the Outline Battery Fire Safety Management Plan to identify risks and propose any mitigation required. We are currently undertaking the relevant calculations to finalise our design. It is important to note that this statutory consultation is not your only opportunity to submit your comments on the Scheme. Following submission and subject to the application being accepted for examination, there is another consultation on the Scheme, whereby you will be able to submit a "Relevant Representation" to the Planning Inspectorate and also take part in the Examination.

6. What is the projected energy storage capacity (in MWh) and power rating (in MW) of a single BESS cabin of the dimensions stated?

In line with the energy storage and power rating for the Scheme, this will be confirmed as part of the Scheme detailed design. The comments made in response to Question 1 apply equally here.

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7. Given a BESS cabin height of 6m, more than double a so-called "hi-cube" shipping container, and taller than a typical double-decker bus, does this imply a "two-storey" layout internally or a single tall enclosure?

The PEI Report sets out the parameters for the BESS, which are 15 metres by 5 metres in plan and up to a maximum of 6 metres in height for each battery storage unit in a single storey. This figure includes an allowance for a concrete base or plinth or other suitable foundation. This maximum height also allows for the BESS container to be raised up above the foundation and for heating, ventilation and air conditioning (HVAC) system to be located above (on top of) the container.

8. What is the broad electrochemical class of BESS technology proposed? (Li-ion, lead-acid, Vanadium flow, NaS etc)

We will be in a position to confirm this when we submit our DCO application to the Secretary of State.

9. What specific sub-class of electrochemical technology proposed? (e.g. if Li-ion, whether NMC, LFP etc)

We will be able to confirm this as part of the Scheme detailed design.

10. What is a representative stored Energy/Power ratio for the BESS technology proposed (in MWh/AMW)?

We will confirm details of this at the final design stage of the Scheme. It is also subject to technological advances. The comments made in response to Question 1 apply equally here.

11. What engineering design codes and HSE standards will apply in respect of fire or explosion hazard, or release of toxic gases, irrespective of BESS technology?

We are currently preparing an Outline Battery Fire Safety Management Plan, which will be included as part of our DCO application. This will set out the design codes and standards relevant to the Scheme and how it will meet their requirements.

We have consulted the Health and Safety Executive, Suffolk Fire and Rescue Service, Cambridgeshire Fire and Rescue Service and the relevant local authorities. Their feedback will be important in informing the Outline Battery Fire Safety Management Plan.

We will continue to engage with these bodies as we finalise the Outline Battery Fire Safety Management Plan for inclusion with our DCO application. If we were to receive development

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consent, the Plan would be updated again to account for details in the final design ahead of construction.

12. Specifically, if Li-ion technologies are proposed, what design codes, principles and test protocols for preventing or mitigating the known problem of thermal runaway (cell-to-cell, module-to-module propagation of failure) will be applied.

Details of this will be included in our Outline Battery Fire Safety Management Plan that we will publish as part of our Environmental Statement when we submit our DCO application.

13. Will the engineering design and testing codes address the known deficiencies of existing codes in respect of thermal runaway in Li-ion batteries (e.g. UL 1973, UL 9540 and UL9540A, FPA 855) as identified in the July 2020 report for the Arizona Public Service on the McMicken explosion n April 2019?

Details of this will be included in our Outline Battery Fire Safety Management Plan that we will publish as part of our Environmental Statement when we submit our DCO application.

14. What HAZOP studies have been or will be carried out on fire or explosion hazard in the BESS compounds?

We will prepare a risk register as part of the Outline Battery Fire Safety Management Plan. This will be published when we submit our DCO application.

15. Specifically, has any plume dispersal modelling been performed for the release of any toxic gases in BESS accidents, and has a safe distance for habitation, schools, workplaces etc been determined?

A Major Accidents and Disasters Assessment will be undertaken to inform the Environmental Statement (ES) that we will submit as part of our DCO application. This Assessment will consider the risks identified as part of the Outline Battery Fire Safety Management Plan, assess them and will propose mitigation where appropriate.

16. How will compliance with the CoSHH regulations be assured in the event of disruptive accidents at any BESS compound?

If the Scheme is built, the operator and contractor for the day-to-day management of the site would be required to comply with CoSHH regulations.

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17. A very large energy storage projected for the BESS compounds based on information so far may be projected, dependant on answers to Qu 1 and others above. Will the COMAH regulations apply? If so, how will you ensure compliance? If not, why not?

Please refer to the answer given to Question 11.

18. Under the Regulatory Reform (Fire Safety) Order 2005, operators and owners have responsibility for fire safety and may face prosecution if fire safety is inadequate. The Energy Institute points out: "This has implications for landlords who have leased space to energy storage operators". Have these responsibilities been made clear to landowners who have agreed to long leases of land for Sunnica?

We take fire safety, and safety generally, very seriously and will ensure that the necessary plans are in place for the Scheme as a responsible operator. Our negotiations with landowners are confidential, but we can confirm that they are receiving professional advice that will allow them to assess the implications of their relationship with the Scheme.

Thank you once again for your letter, we encourage you to submit a response to the consultation in writing prior to the deadline of 23:59 on 18th December.

You can contact the project team directly by calling Freephone 0808 168 7925 (9am to 5pm, Monday to Friday), emailing us at info@sunnica.co.uk, or by writing to us at: Sunnica Consultation, FREEPOST reference RTRB-LUUJ-AGBY, c/o Newgate Communications, Sky Light City Tower, 50 Basinghall Street, London, EC2V 5DE.

Yours sincerely,

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