Frodsham Solar

Technical Note on Major Replacement Works

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1.0 INTRODUCTION

1.1.1 At Issue Specific Hearing 1 (ISH1) of the Frodsham Solar Examination, the Applicant made a number of points in relation to the potential impacts of major replacement activities during operation. The Applicant described why it considered the approach adopted to the assessment of likely significant environmental effects from major replacement activities provided within the Environmental Statement (ES), paragraph 2.6.7 of Environmental Statement: Volume 1, Chapter 2 – The Proposed Development (APP-035), repeated below, was robust:

"The replacement of components would be periodic throughout the lifetime of the scheme and would not involve the intensity of construction required at the outset of the project. As such, the magnitude of effect experienced during the replacement and maintenance works would be less than that assessed for the construction phase and relevant measures have been provided for in the outline Operational Environmental Management Plan (oOEMP) [EN010153/DR/7.7] to manage these impacts." (Paragraph 2.6.7 of Environmental Statement: Volume 1, Chapter 2 – The Proposed Development (APP-035)) "

1.1.2 This note builds on the submissions made at ISH1, and reflects on how each topic has considered this matter in the submitted ES.

2.0 BENEFITS OF REPLACEMENT ACTIVITIES

2.1.1 The ExA asked the Applicant to explain the benefits of carrying out replacement activities during the operational period. The Applicant notes that it is common practice to replace solar farm components periodically throughout the operational lifetime of the development. Parts such as PV panels, inverters, transformers and cabling will degrade over time and may also become outdated as technology advances. Periodic replacement will ensure the Proposed Development will continue to operate safely, efficiently,

and in accordance with industry best practice and regulatory requirements, maintaining optimal performance and reliability.

2.1.2 Upgrading components allows the Proposed Development to benefit from technological advances, including higher panel efficiencies, improved inverter performance, and better monitoring and control systems, all of which can increase overall energy output without expanding the development footprint. This approach maximises the renewable energy generated by ensuring that the most amount of electricity is able to be generated for the most amount of time within the 40 years authorised by the DCO, and aligns with national and local policy objectives to deliver efficient, resilient, and low-carbon energy infrastructure throughout the project's lifetime, to meet the long-term challenge that is Net Zero .

3.0 CONTEXT OF REPLACEMENT ACTIVITIES

3.1.1 Table 2-13 of the Environmental Statement: Volume 1, Chapter 2 – The Proposed Development (APP-035) sets out the indicative operational lifespan of the scheme's components and, in doing so, identifies the range of replacement activities expected over the life of the project. In practice, maintenance scheduling means it is highly unlikely that all components requiring periodic replacement would be replaced in one campaign. However, even in the unlikely event that this were to occur, the level of impact would remain lower than that experienced during the construction phase.

3.1.2 One of the main reasons for this, as set out in the Applicant's ISH1 Summary of Oral Submissions, is that there would be no requirement for major earthworks, construction of new tracks, new ground disturbance, or laying of foundations or construction of panel supports as part of the replacement campaign. Furthermore, the mitigation proposed including improved vegetation screening and creation of the NBBMA, would be in place and have matured for circa 15 to 20 years before a major replacement campaign is likely to be required.

3.1.3 During replacement campaigns the operations / spares building and compound would be used to provide a central hub for temporary storage of components, welfare and parking. Replacement panels and cabling would be delivered on a phased basis to meet the requirements of replacement crews working within a specific panel-replacement area. Components would be laid down temporarily on existing stoned access tracks where appropriate or between panel rows. Should ground conditions dictate, then temporary ground protection matting would be deployed along access routes and laydown areas to prevent soil compaction and damage to grassed surfaces. All matting would be removed following completion of the works.

3.1.4 When considering the impact of the anticipated replacement works, and considering that any replacement campaign is most likely to involve a replacement of a proportion of the items identified in Table 2-13, it is also important to recognise the likely duration of these works. Assuming four crews of five operatives each, the Applicant estimates that the campaign that replaced 50% of the panels would last up to six months, substantially less than for the original construction period.

3.1.5 During replacement campaigns, works will be undertaken using a phased and sequential approach. While more than one works crew may be operating at any one time, each crew will progress gradually and systematically through the panel areas rather than working across the entire Site simultaneously as this would be a more efficient work process.

3.1.6 This approach ensures that the area of activity remains localised, with disturbance confined to a limited area at any given time. As crews complete works in one area, they will move on to the next, allowing previously affected areas to be reinstated and reducing the overall extent and duration of disturbance at any one time.

3.1.7 This also allows areas of the Site that may be more sensitive to disturbance at certain times of the year, such as the panel areas closest to the NBBMA, to be scheduled so that work activities avoid the most sensitive periods, e.g.,

avoiding replacement activities closest to the NBBMA during the core non-breeding bird period.

3.1.8 The following sections review the key environmental impacts that could arise from a major replacement campaign, identifying why the impacts during these works are likely to be less than those experienced during construction.

4.0 LANDSCAPE AND VISUAL

4.1.1 By year 15-20 the planting and habitats proposed in the oLEMP (as updated alongside this submission) will be mature and actively maintained, providing more effective visual filtering than during the initial construction phase. The oLEMP sets out the long-term management regime for planting and habitats and the project's design principles which include the retention and enhancement existing vegetation, introduction of new hedgerows and belts of native trees and shrubs, and management these features for the life of the project. The oLEMP also establishes development-free buffers along PRoW, hedgerows and watercourses which would help to mitigate effects from any replacement campaign, not only in relation to landscape and visual effects but also in relation to other environmental topics.

4.1.2 A major replacement campaign would not require new internal tracks or earthworks and the requirement for laydown areas would be less with the main operations / spares building and compound used to provide a central hub for temporary storage of components. As such the magnitude of landscape change is lower. Operational site access would continue to be via Pool Lane, Protos and the Frodsham Wind Farm tracks.

4.1.3 The oLEMP's management of established planting, hedgerows and belts (including inspections and remedial works) and the oOEMP's operational landscape controls will be retained during major replacement campaigns, so that any short-term activity is filtered by established screening.

4.1.4 The ES concludes that during the construction phase, the impact on the landscape character of Frodsham Marshes would be significant and adverse.

For the reasons outlined above, there would be reduced activity, plant, and machinery during a replacement campaign. Furthermore, the character of the landscape within the Site would be defined by an operational solar farm; consequently, the replacement works would be less incongruous than those during the construction phase.

4.1.5 Adverse visual effects have been predicted for users of sections of some of the public rights of way located within or in close proximity to the Site during the construction phase. For the reasons outlined above the visual effects of replacement activities would be less, particularly as the view of users looking towards the Site would include an operational solar farm.

4.1.6 As such, the magnitude of effects is within the envelope of what is assessed at construction, such that no likely significant effects would arise from the replacement activities.

5.0 CLIMATE CHANGE

5.1.1 The embodied carbon and carbon arising from logistics during a panel replacement campaign would be materially lower than during initial construction, because works are limited to removing and refitting modules using the existing site infrastructure.

5.1.2 Furthermore, Environmental Statement: Volume 1 Chapter 5: Climate Change (APP-038) considers the greenhouse gas emissions from the operational phase, including the replacement of components. Paragraph 5.3.4 sets out:

"Both the life expectancy and failure rate of the equipment has been factored into the replacement calculations within the operational stage of the GHG assessment. The emissions associated with replacement include those associated with the manufacture of the equipment, transport to the Proposed Development, and disposal and transport of waste materials (i.e. the swapped equipment). The replacement emissions due to the equipment life expectancy have been allocated to the year that each piece of equipment would be

replaced based on the assumed life expectancy whereas the replacement emissions due to failure have been spread over the operational lifetime of the Proposed Development. The life expectancy of the equipment applied is conservative and is expected to be longer than applied. Therefore, the calculated GHG emissions are conservative."

5.1.3 The climate-related management measures set out in Table 5-1 of the oOEMP, the implementation of the waste hierarchy and the recycling provisions for panels, transformers and BESS components ensure that any carbon arising from replacement is minimised and materials are recovered wherever feasible.

5.1.4 On this basis the climate change impacts from replacement activities are assessed within the ES.

6.0 ECOLOGY AND ORNITHOLOGY

6.1.1 Replacement activities will be limited to the panel rows located in areas of neutral and modified grassland and existing access tracks. The BESS and substation compound is hard surfaces and so would not result in loss of any habitats during replacement works. Similarly, Power Conversion Units (PCUs) would be removed and replaced from access roads and would not involve loss of any habitats. Hedgerows, ditches, trees and wetland habitats are protected from damage via established buffers set out in section 4.4.2 of the oLEMP (as updated alongside this submission). By the time of a replacement campaign, birds will be habituated to the operational solar farm and the NBBMA will be fully functioning.

6.1.2 Table 5-3 of the oOEMP provides specific operational controls for maintenance and periodic replacements: works with potential to disturb wildlife would be timed to avoid sensitive periods where possible, pre work ecological surveys would be undertaken by a suitably qualified ecologist, and task lighting is controlled to avoid spill onto sensitive habitats.

6.1.3 With respect to the Mersey Estuary SPA, the oOEMP places explicit seasonal and spatial controls around the Non breeding Bird Mitigation Area, requiring that any maintenance to arrays or transformers within 180 metres of the NBBMA between November and February only proceeds following agreement with the ECoW, and that no works occur within the NBBMA without agreement from its managing organisation . The oOEMP further requires protected species surveys prior to any major replacement activities, with appropriate mitigation implemented if protected species are found.

6.1.4 Due to the measures outlined above, and on the understanding that the NBBMA will be operational and mature by the time any major replacement works mentioned above are carried out, it is not considered that there will be a significant adverse impact on the NBBMA or other ecologically sensitive habitats from replacement activities.

6.1.5 The ES concluded that there would be no significant beneficial or adverse effects on habitats during the construction phase due to the protection of trees, woodland, hedgerows and watercourses across the Site, and similarly, the mitigation measures proposed would ensure effects on species would not be significant.

6.1.6 Based on the reasoning provided above effects on habitats and species during replacement activities are likely to be less than during construction, it is therefore reasonable to conclude that replacement activities would not cause likely significant effects on ecological receptors.

6.1.7 The Information to Inform Habitats Regulations Assessment concludes that with the mitigation measures proposed, principally the creation of the NBBMA, and the implementation of the mitigation measures set out in the management plans, construction works would not result in an adverse effect on the integrity of the Mersey Estuary SPA or Ramsar site. As effects during replacement activities are likely to be less than during construction, it is reasonable to conclude that replacement works would not result in an adverse effect on the integrity of the Mersey Estuary SPA or Ramsar site.

7.0 FLOOD RISK, DRAINAGE AND SURFACE WATER

7.1.1 A replacement campaign would not impact flood risk as the site layout and quantum of development would not change. Furthermore, there would be no additional earthworks, access tracks or ditch crossings required to facilitate a replacement campaign. The Flood Risk Assessment (AS-019) concluded that there would be no increase in offsite flood risk as a result of the construction, and therefore, the replacement activities would not increase offsite flood risk because no additional development would be added to the Site.

7.1.2 The Flood Warning and Evacuation Plan arrangements for operation, including registering for warnings, suspending maintenance when warnings are in force, and safe refuge design of inverter/transformer substations would apply for major replacement campaigns. The ES also confirms that during operation, the OEMP will integrate pollution prevention measures via the implementation of the Environmental Incident Management and Pollution Prevention Plan that will set out a structured response framework for fuel or chemical spills, unexpected contamination events, and pollution control measures to prevent impacts on watercourses and groundwater, including risks that may arise during replacement activities.

7.1.3 Established vegetated buffers to watercourses and ditches and the maintained SuDS/drainage features remain in place and therefore mitigate any potential pollution entering watercourses.

7.1.4 The ES concluded that the implementation of the measures set out in the oCEMP would ensure that effects during construction would not be significant. On the basis that replacement works would not introduce any greater likelihood of pollution incidents and that necessary management measures and flood warning and evacuation plans are in place, the effects from replacement activities would also not be significant.

8.0 GROUND CONDITIONS AND SOIL QUALITY

8.1.1 No piling, excavation for cable routes or track construction would be required for replacement campaigns. If any intrusive works were required focused ground investigation would be undertaken. The oOEMP includes an Environmental Incident Management and Pollution Prevention Plan and an Unexpected Contamination Protocol to ensure appropriate response if contamination is encountered, this would apply for any major replacement campaign.

8.1.2 As there will be no excavations, it is not expected that there will be any material impact on soil quality. Nevertheless, the outline Soil Management Plan (as updated alongside this submission) includes measures to be adopted during the operational period at Section 5.2 which will be implemented as part of the OEMP (as required by Table 5-5 of the outline OEMP). This includes noting that if the soil structure has been compacted during periodic replacement campaigns, appropriate loosening will be carried out, e.g., using a winged tine subsoiler or deep ripper, and the area reseeded.

8.1.3 The ES concluded that the implementation of the measures set out in the oCEMP would ensure that effects during construction would not be significant. On the basis that there would be significantly less ground disturbance during replacement works than during construction and management measures will be in place, it is concluded that replacement activities would not give rise to likely significant effects in relation to ground conditions and soil quality.

9.0 CULTURAL HERITAGE AND ARCHAEOLOGY

9.1.1 As no ground disturbance is anticipated, archaeological receptors would not be affected. As set out above, the landscape measures set out in the oLEMP will have matured by the time a major replacement campaign is required, and therefore the replacement works would be better screened that during construction. As noted above the intensity of works and duration would be less than during the construction period. As such any potential setting effects

on heritage assets would be restricted to a temporary, small-scale presence of maintenance crews within an already operational site.

9.1.2 The ES concluded that there are unlikely to be significant effects on buried archaeology or the setting of heritage assets. On the basis of the above the magnitude of effects from replacement activities are expected to be less than during construction (with no impacts to archaeology expected) and are therefore unlikely to cause significant impacts on buried archaeology or the setting of heritage assets.

10.0 TOURISM AND RECREATION (INCLUDING PROW)

10.1.1 Temporary management may be required at crossings where access tracks intersect PRoW / permissive paths during a major replacement campaign, the measures adopted would be similar to those described in the outline Public Rights of Way Management Plan (PD-021).

10.1.2 It is also possible that some of the permissive paths, which are proposed on the access tracks used for the construction and maintenance of the Proposed Development, may be required for access. As such there may be a need to close the affected sections for short periods.

10.1.3 Not all sections of footpaths / permissive paths would be affected due to the phased nature of replacement campaigns and so impacts would be less and for a shorter period than in the construction period. Vehicular access will be required along NCN5, RB40 and RB106, but due to the lower levels of traffic required for replacement, the disturbance to these PRoW would be for a much shorter time period.

10.1.4 The ES concluded that there are unlikely to be significant effects on tourism and recreational receptors. The limited and short term effects during replacement activities would be less than during construction and are therefore unlikely to cause significant impacts on tourism and recreation receptors.

11.0 TRAFFIC AND TRANSPORT

11.1.1 Construction traffic included significant HGV movements associated with importing stone for site tracks, concrete for foundations, equipment delivery and workforce logistics. A replacement campaign, by contrast, uses the existing access and tracks and focuses on module transport and handling, with much lower HGV demand.

11.1.2 HGV movements from panel deliveries during the construction phase accounted for approximately 10% of all construction-related vehicle movements. If a replacement campaign were to involve the replacement of approximately 50% of the installed panels, this would equate to around 5% of the HGV movements recorded during construction. When allowance is made for ancillary deliveries (such as fixings, cabling and small plant), the overall level of vehicle movements associated with replacement works would reasonably be expected to be in the order of 5–7.5% of the total construction-phase vehicle movements

11.1.3 Access to the Site would remain as per the construction period and so would not be routed through Frodsham, Elton or Ince.

11.1.4 Given that the construction transport assessment found no material highway operation or safety impacts at full scale; reducing flows by ninety percent supports the conclusion that impacts from replacement traffic would not exceed construction effects.

12.0 NOISE AND VIBRATION

12.1.1 Noise impacts would be less than those from construction, mainly because activities with the highest noise levels would not be necessary, such as piling or excavation works. The high background noise levels of the M56 would continue to dominate, so significant noise impacts are not expected, particularly since the works would be carried out during the daytime. Regarding ornithology, and as set out above, the oOEMP places explicit seasonal and spatial controls around the Non breeding Bird Mitigation Area,

requiring that any maintenance to arrays or transformers within 180 metres of the NBBMA between November and February only proceeds following agreement with the ECoW, and that no works occur within the NBBMA without agreement from its managing organisation to prevent significant effects from occurring. Furthermore, and as set out above it would be possible to phase the works to avoid noisy activities near the NBBMA / SPA during the core wintering bird period.

13.0 AIR QUALITY

13.1.1 There would be potential for fugitive dust and emissions from vehicles. However, vehicle movements are significantly less than for construction (where non-significant effects were concluded, including in respect of deposition to ecological receptors) and no major earthworks or aggregate handling would be required. The oOEMP sets out best practice air quality controls for operational maintenance and periodic replacements, including dust suppression, internal speed limits, highway cleanliness and load securing. Impacts on air quality are therefore expected to be less than that for construction.

14.0 WASTE

14.1.1 The replacement activities would give rise to waste PV modules, packaging and ancillary items. The operational WMP, which would be prepared as part of the OOEMP, would cover maintenance activities and periodic replacement, applying the waste hierarchy and segregation of streams for collection by approved carriers. End of life PV modules would be dismantled and sent to specialist PV recycling facilities.

15.0 BESS FIRE RISK

15.1.1 The outline Battery Safety Management Plan (APP-139) states that upon any large-scale replacement, the safety measures associated with the BESS will be reviewed for their appropriateness based on the prevailing guidance at that time and the installed technology. This review will be conducted in

consultation with the Cheshire Fire and Rescue Service, and the outcomes will be shared with Cheshire West and Chester Council. The production of a final Battery Safety Management Plan, which must be in substantial accordance with the outline, is secured pursuant to Requirement 7 of the draft DCO. This requirement specifically identifies the need for the plan to prescribe measures to facilitate safety during the operational period, which may include replacement and maintenance works.

15.1.2 Furthermore, and as noted in ISH1, the risk of fires occurring during replacement campaigns is significantly reduced because the electricity to the BESS units will be switched off during these works.

16.0 FRODSHAM WIND FARM

16.1.1 The Applicant has been asked to explain how a replacement campaign should be considered in the context of Frodsham Wind Farm potentially needing to either be decommissioned or re-powered in a period when the replacement activities are taking place.

16.1.2 Firstly, it should be noted that there is a side agreement between Frodsham Wind Farm and the Applicant which requires both parties to coordinate activities associated with construction, operation and decommissioning. It would not be in the interest of either party to be undertaking a major replacement campaign at the same time as decommissioning or repowering, either logistically or from a safety perspective.

16.1.3 Irrespective of this, in respect of wind farm decommissioning, the timing and approach to the works would be controlled by virtue of the planning conditions and the requirements of the two consents. Condition 48 of the Frodsham Wind Farm consent requires the operator of the wind farm to submit, for approval by Cheshire West and Chester Council, a scheme for the demolition and removal of the wind farm. In relation to a major replacement campaign of Frodsham Solar, the oOEMP requires the submission of a notification for approval of the works prior to them being undertaken, taking account of the

wind farm demolition and removal scheme. These mechanisms provide the necessary control by the Council to ensure that measures are in place to prevent any unacceptable cumulative effect arising if the two programmes were to overlap.

16.1.4 If Frodsham Wind Farm were to re-power, this would require planning permission, and the planning application for that scheme would have to show how the ongoing maintenance of the Proposed Development had been taken account of in its environmental management measures.

17.0 CONCLUSION

17.1.1 There are several advantages to undertaking period replacement works, some of which are essential for the ongoing operation of the Proposed Development, while others provide efficiency benefits that will maximise the renewable energy that can be generated from the Site. However, it is recognised that replacement works, particularly any major replacement campaigns, have the potential to cause impacts to environmental receptors.

17.1.2 A major replacement campaign would not give rise to impacts greater than those assessed for construction, principally because the magnitude of effects from the works would be less than that for construction. One of the main reasons for this is that there would be no requirement for major earthworks, construction of tracks, new ground disturbance, or laying of foundations or panel supports. Furthermore, the mitigation proposed including improved vegetation screening and creation of the NBBMA, would be in place and have matured for circa 15 to 20 years before a major replacement campaign is likely to be required. Each of the main environmental topics considered within the application have been reviewed, demonstrating that the approach adopted in the ES is proportionate and reasonable. The appraisal provided in this technical note establishes that replacement activities would not give rise to new or greater likely significant effects than those assessed in the ES for the construction phase. Accordingly, a detailed assessment of a major

replacement campaign is not required to determine that significant effects from these works are unlikely.

17.1.3 Furthermore, the Applicant considers that the mitigation measures for the replacement activities are adequately secured via Requirement 13 which requires the operational environmental management plan submitted for approval to be substantially in accordance with the outline Operational Environmental Management Plan (oOEMP) (as updated alongside this submission).

17.1.4 Irrespective of the measures which would be implemented in accordance with the details set out in the oOEMP, the Applicant recognises that a major replacement campaign could occur many years into the future and the environmental baseline, regulations and surrounding development context could evolve in this period. As such the oOEMP includes a commitment that where more than 50% of the panels are to be replaced in a single campaign, a notification must be submitted to Cheshire West and Chester Council for approval with details of the management measures that are proposed to be put in place for those replacement activities. These measures would be consistent with the principles of the CEMP, PROWMP, CTMP and OEMP. This is considered to be a reasonable and proportionate approach to ensure that the OEMP contains the necessary measures to ensure that the effects arising from a major replacement campaign are managed to an acceptable level, consistent with the residual effects set out in the ES.

17.1.5 Based on the above, it is considered that the Applicant has provided sufficient information to understand the likely significant effects of the Proposed Development and that the controls within the DCO, primarily the implementation of the OEMP pursuant to Requirement 13, are adequate to ensure that the residual effects predicted within the ES will not be exceeded and that the conclusions of the HRA remain valid.