CONTENTS

TABLES

FIGURES

TECHNICAL APPENDICES

Introduction

3.1 This Chapter describes the components of the Proposed Development, its construction, operation, and decommissioning, which are subject to this EIA Report. It sets out the way in which the Proposed Development would be constructed, including a description of the Site layout, its proposed scale, and the associated infrastructure.

3.2 The layout for the Proposed Development is shown on **Figure 3.1**. Information on construction methods are provided in **Technical Appendix 3.1: Outline Construction and Environmental Management Plan (CEMP)**. The outline CEMP illustrates the construction measures which are inherent in the project development and design, and which are therefore considered present at the outset of the environmental assessment.

Proposed Development

Scheme Overview

3.3 West Scales Windfarm Limited ("the Applicant") is seeking planning permission under the Town and Country Planning (Scotland) Act 1997 (as amended) ("the Planning Act") for the installation and operation of an energy park consisting of up to four wind turbines, solar photovoltaic (PV) arrays, a Battery Energy Storage System (BESS), and associated infrastructure (together, "the Proposed Development") on land at West Scales Farm, approximately 3km west of Gretna in Dumfries and Galloway ("the Site"). The Site location and application boundary are shown in Figure 1.1 and Figure 1.2 respectively.

3.4 The Site is centred on National Grid Reference (NGR) NY 26967 67591, and the Site boundary encompasses an area of approximately 122ha.

3.5 The Proposed Development also includes associated infrastructure including wind turbine crane hardstandings, 5.9km of new internal access tracks, underground cabling, a substation compound (which would likely accommodate 33kV cabling equipment to collect electricity from the Site), a control building and a Battery Energy Storage System (BESS). The Proposed Development also incorporates up to two temporary construction compounds, and a permanent anemometry mast for wind monitoring.

3.6 The Proposed Development has been designed with an operational life of up to 40 years, at the end of which it would be decommissioned, or an application may be submitted to extend the life of the Proposed Development or repower the Site.

3.7 As noted in **Chapter 2**, the Proposed Development has been designed to reflect the topographical, environmental, visual, and technical factors which exist across the Site.

3.8 Each Chapter of the EIA Report takes an appropriate and topic specific approach to assess the Proposed Development. The EIA Report provides a worst-case assessment for each discipline and presents relevant information for consultees and the decision-makers to comment on and determine the application. Each technical Chapter has set out the degree to which the Proposed Development has been assessed, in order to provide a clear and robust assessment that allows for the necessary flexibility in relation to turbine and solar module procurement, post-consent. **Chapter 5: Environmental Impact Assessment**, provides further detail on the approach to assessment.

3.9 The key component parts of the Proposed Development include the following as detailed in **Table 3-1**.

Table 3-1: Proposed Development Key Components

Key Component	Detail
Wind Turbines	Four wind turbines including internal transformers, with blade tip heights of up to 200m.
Wind Turbine Foundations	Foundations supporting each turbine, with adjacent crane hardstandings. Specific dimensions to be confirmed during detailed design.
Access Tracks (including watercourse crossing)	A network of new onsite access tracks (totalling 5.9km in length) with associated drainage. Tracks will connect wind turbines, solar PV arrays, and ancillary infrastructure. One new permanent watercourse crossing is proposed (located at E 326998, N 567196). The crossing will be designed to pass the 1 in 200-year flood event, including an allowance for climate change, and the design / construction details would be agreed with SEPA and D&GC as part of the final CEMP.
Underground Cabling	Power cables linking wind turbines will be laid in trenches underground, this would also be the case for the solar PV arrays. Cables will generally follow access tracks; electrical marker posts used where routed across open ground.
Substation Compound (including battery storage)	One substation compound including a control building and a 12MW battery energy storage system (BESS). One onsite substation which would accommodate 33kV Switchgear to collect electricity from different parts of the Site. The substation compound would have an area of 75m x 100m and would include a control and metering building (approximately 16m x 11m and 5m high) and Battery Energy Storage System (12MW, comprising c. 5 battery storage units each measuring 6.1m x 2.5m x 2.9m).
Solar PV Arrays	Three solar PV arrays covering up to a combined 11.1ha in area. Approximately 14,326 tracking modules reaching 4.5m height at peak tilt and mounted on metal frames. The Solar PV arrays Include inverters, combiner boxes, and transformer stations.
Anemometry Mast	One permanent anemometry mast, 122.5m in height, to monitor wind conditions.
Temporary Construction Compounds	Two temporary construction compounds proposed. Both temporary construction compounds (TCC1 and TCC2) would have a footprint of 45m x 75m.

3.10 Typical details for the proposed wind turbines, solar PV modules, foundations, access tracks, access junction, crane hardstandings, cabling, anemometry mast and temporary construction compounds are shown on **Figures 3.2** to **3.15**.

Access to the Site

3.11 Access to the Site would be taken from the A75 trunk road via a new gated entrance. This access junction would have a left-in, left-out access arrangement during construction in order to avoid right-turn movements across the carriageway (and oncoming vehicles), enhancing road safety (see **Chapter 12: Traffic and Transport** for further detail**)**.

3.12 The delivery of abnormal loads, such as wind turbine components, is expected to be from the King George V dock in Glasgow, via the M8, M74, M6 and A75.

3.13 The proposed abnormal load route was assessed and verified for up to 80m blades, identifying where permanent or temporary road upgrades would be required (see **Technical Appendix 12.1: Turbine Component Delivery Route Feasibility Assessment**.

3.14 Full detail of the assessment of the effects on the road network is provided in **Chapter 12: Traffic and Transport**.

Grid Connection

3.15 The grid connection for the Proposed Development has yet to be determined and is subject to an application to the network operator. Although the grid connection point at Chapelcross substation, approximately 5km north west of the Site, would seem the most appropriate, the grid substation will be confirmed upon determination of the application to the network operator. The precise route of the grid connection cabling (and form that will take, i.e. whether overhead lines, underground cables or a combination of both) has not been determined by the grid operator, meaning that its effects are not identifiable / assessable as it has yet to be designed and a planning application has not yet been made for the grid connection.

3.16 The grid connection will require separate consent under Section 37 of the Electricity Act 1989. The grid connection application would be made by SP Energy Networks (“SPEN”) who are responsible for the transmission and distribution network in the area of the Proposed Development and who would own assets beyond the Site substation. Any cumulative impacts between the grid connection and the Proposed Development would be considered as part of the Section 37 application.

Operational Life

3.17 It is anticipated that the Proposed Development would have an operational life of 40 years. At the end of this period, the Proposed Development would be decommissioned, or an application may be submitted to extend the project life or repower the Site. Details of infrastructure removal and restoration are provided in summary in **Table 3-5**.

Embedded Mitigation

3.18 A key benefit of the EIA process is the opportunity it gives to integrate environmental considerations into the careful, iterative design of a project. Embedded mitigation proposals are those mitigation measures which are inherent to the Proposed Development and are integral to and should be included in consideration of the application.

3.19 Throughout the design evolution, embedding mitigation has been a feature of the process that has led to the final design of the Proposed Development; and this embedded mitigation therefore forms part of the Proposed Development which is assessed.

3.20 During the construction of the Proposed Development, effects can be further mitigated by the adoption of good practice, supported by robust project management and an Environmental Clerk of Works (EnvCoW), as set out in the outline CEMP (**Technical Appendix 3.1**), and by the application of the Pollution Prevention Guidelines (PPGs) and replacement Guidance for Pollution Prevention (GPPs).

3.21 Reference to good practice and standards, guidelines and legislation relied upon in the assessment methodology are referred to within each of the individual specialist topics, in **Chapters 7 to 14**. Such environmental measures are also included in the outline CEMP (**Technical Appendix 3.1**).

Design Principles

3.22 A number of design principles and environmental measures have been implemented and incorporated into the proposed development as standard practice described in **Chapter 2: Site Description and Design Evolution**.

3.23 One of the key approaches to the design has been a desire to maximise the potential energy yield of the Site, whilst respecting environmental (including landscape and visual) constraints. Further details are set out in **Chapter 2** and the Design and Access Statement (DAS) submitted in support of the application.

Micrositing

3.24 Micrositing refers to the process of making small adjustments to the location of infrastructure elements within a defined area to respond to Site-specific conditions encountered during detailed design or construction.

3.25 During the construction process there may be a requirement to microsite elements of the Proposed Development infrastructure. This is an important measure which allows for further minimisation of environmental effects, under the supervision of the EnvCoW, where elements of the Proposed Development can be moved to avoid previously unknown constraints, as more detailed information about Site conditions are acquired. It is proposed that a 50m micrositing tolerance of wind turbines and a 75m micrositing tolerance for all other infrastructure be applied to the Proposed Development (so long as infrastructure does not move within 50m of any identified watercourse, or move closer to a watercourse where it is already within 50m). Within this distance, any change from the consented locations would be subject to approval of the EnvCoW as required, and in consideration of other known constraints. It is anticipated that the agreed micrositing distances may form a planning condition accompanying any consent for the Proposed Development. The assessment of the Proposed Development has assumed the horizontal micrositing allowances detailed above.

Consent Prior to Commencement of Construction

3.26 Prior to commencing construction on the Site, it may be necessary for the applicant to obtain a number of other statutory authorisations and consents to enable the Proposed Development to be implemented. These may include, but are not limited to, permits related to road works, watercourse crossings, protected species licences, and

construction-related environmental controls. Where relevant, these requirements are addressed in the technical chapters of this EIA Report.

Construction Phase

Construction Timetable

3.27 It is anticipated that construction of the Proposed Development would commence in 2028 or 2029 (subject to the length of the planning determination period) and would last approximately 16 months.

3.28 Construction would include the principal activities outlined in the indicative construction programme as provided in **Table 3-2**. The final detailed construction programme would be secured through the detailed Construction Environmental Management Plan (CEMP) and agreed with Dumfries and Galloway Council (and other relevant stakeholders).

Table 3-2: Indicative Construction Programme (Months)

Construction Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Access Road Improvements																
Site Establishment																
Tree Clearance																
Construction of Tracks, Crane Pads and Compounds																
Turbine Foundation Construction																
Substation - Civil & Electrical works																
Turbine Delivery and Erection																
Solar PV Modules Delivery and Erection																
Cable Laying and Cable Bedding																
Site Restoration																

Construction Employment

3.29 It is anticipated that the number of personnel employed during the construction phase of the West Scales Energy Park will vary depending on the stage of construction and the specific activities being undertaken. Workforce numbers are expected to be relatively low during the initial enabling works, such as access track formation and Site establishment, and will increase as construction progresses.

3.30 At peak construction activity - when civil engineering, electrical works, and wind turbine erection are occurring concurrently - it is expected that up to approximately 30 construction staff may be required on Site. This workforce will include a mix of civil engineers, electrical technicians, plant operators, environmental specialists, and support staff. The workforce will gradually reduce as construction activities are completed and the site transitions into the commissioning and operational phases.

3.31 Where possible, local contractors and suppliers will be engaged to maximise economic benefits to the surrounding communities. Opportunities for local employment and supply chain involvement will be promoted through engagement with local business networks and supplier events.

Construction Hours

3.32 The construction working hours for the Proposed Development would be 07:00 to 19:00 Monday to Friday and 07:00 to 16:00 on Saturdays. It should be noted that, where necessary, certain activities - such as abnormal load deliveries, concrete pours for turbine foundations, and lifting of turbine components may need to occur outside of these specified hours (excluding Sundays). Any works beyond these activities and outside the stated working hours would not be undertaken without the prior approval of Dumfries and Galloway Council. The principal contractor would be responsible for keeping local residents informed of the proposed working schedule, including the timing and duration of any particularly noisy or disruptive activities. These measures will be implemented as set out in **Chapter 12: Traffic and Transport**.

Construction Environmental Management Plan

3.33 An outline CEMP is provided as **Technical Appendix 3.1**. In acknowledgement that the CEMP is a live document that would evolve throughout the construction phase of the Proposed Development, only the principles of the CEMP are outlined at this stage. It is anticipated that submission and approval of a more detailed CEMP, following Site investigation works and further detailed design, would be the subject of a condition should consent for the Proposed Development be forthcoming.

Site Preparation and Establishment

3.34 Site preparation works for the Proposed Development would include the following key tasks, some of which would be undertaken concurrently:

- Ground investigation works;
- Tree felling;
- Formation and upgrading of Site entrance and internal access tracks;

- Initial groundworks and earthworks, including vegetation clearance and topsoil stripping in areas designated for infrastructure; and
- Establishment of temporary construction compounds, including the installation of welfare facilities, site offices, parking areas, and secure storage.

Temporary Construction Compounds

3.35 Up to two temporary construction compounds would be established to support the construction of the Proposed Development. The location of the temporary construction compounds are shown on **Figure 3.1**.

3.36 Both temporary construction compounds would have a footprint of 45m x 75m. The temporary construction compounds would contain some or all of the following:

- temporary modular building(s) to be used as a site office;
- welfare facilities;
- parking for construction staff and visitors;
- reception area;
- fuelling point or mobile fuel bowser;
- secure storage areas for tools; and
- waste storage facilities.

3.37 **Figure 3.12** illustrates an indicative temporary construction compound, although the layout may differ depending onsite topography and contractor requirements. Crane hardstanding areas, along with the construction compound, would be used for laydown during construction.

3.38 The buildings (e.g. welfare facilities, storage areas, offices and fuelling point) that form part of the temporary construction compounds would be removed at the end of the construction phase.

Access Tracks

3.39 Approximately 5.9km of new access track would be required to provide access to the wind turbines, solar PV arrays, substation, and temporary construction compounds (**Figure 3.1**). Approximately 2.9km of new track designed to facilitate construction of the proposed wind turbines, and approximately 3km of new track designed to facilitate construction of the proposed solar PV arrays would be created.

3.40 New tracks would be unpaved and constructed of a graded local stone with the tracks designed to facilitate construction of the proposed wind turbines having a typical running width of 6m (wider on bends and at junctions), and the tracks designed to facilitate construction of the proposed solar PV arrays having a typical running width of 4m (wider on bends and at junctions). Where necessary, the tracks have been designed to include up to 1.5m on either side of the track for cabling, and potential ditches and banks. The track designed to facilitate construction of the proposed wind turbines would be wide enough for two vehicles to pass, however should this not be the case (e.g. during abnormal load deliveries), additional passing opportunities would be available using crane hardstandings and temporary construction compounds. Additionally, one turning head would be constructed.

3.41 **Figure 3.6** provides a typical illustration of the design of onsite tracks. the design of tracks would take account of recognised good practice guidance as noted in **Technical Appendix 3.1: Outline CEMP**.

3.42 A new access junction with the A75 is proposed. This access junction is shown on **Figure 3.15** and is designed so as to enforce a left-in left-out rule for all vehicles (other than abnormal loads). The access junction includes an area of proposed hardstanding to the east which is to account for the overrun of abnormal loads vehicles.

3.43 Site visits have confirmed that peat, of variable condition and depth, is confined to the southern and western parts of the Site. Access tracks (as well as other proposed Site infrastructure) have been designed so as to avoid areas of deep peat. In areas where the peat is shallow, i.e. rockhead is less than 0.5m below the surface, then the track formation would be by cut and fill or by a cut operation where there is a slope.

3.44 The tracks would be left in place following construction to provide access for maintenance, repairs, and eventual decommissioning of the Proposed Development. At the end of the construction period, the edges of all new tracks would be restored using materials stripped from excavations.

3.45 There is one new watercourse crossing proposed for an un-named tributary / field drain (in the south of the site) that would be required as part of the Proposed Development. It is noted that this field drain has hydraulic connectivity with the Kyrtle Water (see **Chapter 10: Hydrology, Hydrogeology and Geology**).

3.46 Details of the proposed watercourse crossing are provided in **Table 3-3** and in **Technical Appendix 10.2: Schedule of Watercourse Crossings**.

Table 3-3: Onsite Watercourse Crossings

Watercourse Crossing	Coordinates	New / Existing
WX01	326998, 567196	New

Tree Clearance

3.47 The Proposed Development would require tree felling totalling a combined area of approximately 0.62ha (estimated fewer than 50 trees, spread over multiple areas of the Site). Given the relatively small number of the trees that would require felling, their distribution across the Site (rather than one continuous block of trees), and the National Forest Inventory[1] not categorising the trees to be felled within the Site as woodland, it is considered that this does not meet the definition of 'woodland' and as such the Scottish Government Control of Woodland Removal Policy (Forestry Commission Scotland, 2009) would not apply.

3.48 The trees to be removed (see **Figure 2.3**) would predominantly be native species, of various age and condition, such as beech, hawthorn and birch.

3.49 In order to compensate for the loss of approximately 0.33km of treeline habitat, 0.06km of native hedgerow habitat and 0.62ha of trees at the Site, the Proposed Development includes planting of approximately 1.19ha of new native woodland (see **Figure 2.4**).

[1] https://informatics.sepa.org.uk/NationalForestInventory/

Lighting

3.50 Artificial lighting may be required during the construction phase to ensure safe working conditions, during periods of limited natural light. Examples include vehicle and plant headlights, construction compound lighting, floodlights and mobile lighting units, to be used around specific construction activities. It is intended that the type of lighting used would be non-intrusive (e.g. directed towards works activity and away from the Site boundary), to minimise impact on local properties and any other environmental considerations.

3.51 Artificial lighting is proposed as part of the Substation Compound and the solar PV arrays (to be in place during the operational period of the Proposed Development), in order to ensure safe working conditions, during periods of limited natural light. It is intended that the type of lighting used would be non-intrusive (e.g. directed downwards and of an appropriate lighting intensity), to minimise impact on local properties and any other environmental considerations.

Materials Sourcing and Waste Management

3.52 For construction, the Proposed Development would require a range of materials (e.g. stone for access tracks, the temporary construction compounds and the substation compound). Excavated material from the wind turbine bases and access tracks would be used onsite for restoration/reinstatement.

3.53 A Site Waste Management Plan would be developed for implementation during construction, as discussed in the outline CEMP (**Technical Appendix 3.1**). This outlines the material requirements and waste generation during construction and how the applicant intends to consider the management of these aspects.

3.54 Concrete would be batched onsite at the construction compounds for which water would be required. There may be potential to use water mains, or alternatively a location for a borehole would be required to be found onsite.

3.55 Water would also be required for welfare facilities and to dampen the track during dry weather, although this would be minimal and an abstraction license is not anticipated to be required for the activity.

Wind Turbine Layout

3.56 The Proposed Development includes four, horizontal axis wind turbines. The proposed wind turbine locations are shown on **Figure 3.1** and the coordinates for each are provided in **Table 3-4**.

Table 3-4: Wind Turbine Coordinates

Turbine No.	Easting	Northing	Tip Height (m)	AOD (m)
1	326861	568025	200	26.97
2	326891	567440	200	25.79
3	326544	567467	200	26.8
4	326335	567916	200	29.68

Wind Turbines and Transformers

3.57 The exact model of the wind turbines to be installed at the Proposed Development would be selected through a competitive procurement process and would be dependent upon technology available at that time. This EIA Report has considered the use of an indicative wind turbine type shown on **Figure 3.2**.

3.58 It is anticipated that the wind turbines would be rated at approximately 6.2MW. Based on the four wind turbines proposed, this would give a combined capacity of 24.8MW for the wind energy element of the Proposed Development.

3.59 The wind turbines would each incorporate a tapered tubular tower and three blades attached to a nacelle that would house a turbine generator and other operating equipment e.g. a gear box. The wind turbines would be semi-matt pale grey (in line with RAL 7038) or a finish agreed with Dumfries and Galloway Council.

3.60 For the purposes of the assessment, it is assumed that each wind turbine would be served by an electrical transformer that would be located internally.

3.61 Details of the final turbine model selected would be presented to Dumfries and Galloway Council, as part of the final setting out plans during the discharge of planning conditions, in the event of consent being granted.

Foundations and Crane Hardstandings

3.62 Wind turbine foundations would be designed to accommodate the final choice of wind turbines and to suit Site specific ground conditions. The final design specification for each foundation would depend on the findings of detailed ground investigation of the land on which each wind turbine would be located. An illustration of a typical wind turbine foundation is provided on **Figure 3.3**.

3.63 The wind turbines would have gravity foundations laid using reinforced concrete and would have a diameter of approximately 27m.

3.64 Depth of the excavation would depend on the need to reach suitable ground. Excavations would be, on average, approximately 2.5m deep.

3.65 The sides would be graded back, from the foundation and battered to ensure that they remain stable during construction.

3.66 The wind turbines would be erected using mobile cranes brought to the Site for the construction phase. A crane hardstanding would be built adjacent to each wind turbine and would have an estimated permanent footprint of approximately 99m x 38m and 1m in depth (with additional areas for the boom supports and blade storage trestles). The actual crane pad design and layout would be determined by the wind turbine supplier according to their preferred erection method. An indicative design, considered to be the worst-case in terms of size, has been considered for the purposes of this assessment and is provided on **Figure 3.7**.

3.67 The crane hardstanding would also be utilised as a laydown area. These areas would remain in situ for the duration of the operational phase of the Proposed Development.

3.68 Soils that are excavated during construction would be set aside for backfilling the batter areas around the wind turbine bases and hardstandings and use of small bankings either side of access tracks.

Solar PV Arrays

3.69 The exact solar PV modules to be installed at the Proposed Development would be selected through a competitive procurement process and would be dependent upon technology available at that time. This EIA Report has considered the use of an indicative solar PV module shown on **Figure 3.4**.

3.70 Across the three solar PV arrays that form part of the Proposed Development, there would be approximately 14,326 solar PV modules (set out as 551 modules per 'string' and 25 'strings' in 'series'). The solar PV modules would have a single axis tracking configuration, with a maximum angle of 60°, an east to west orientation, and a maximum height of 4.5m.

3.71 It is estimated that the combined capacity for the solar energy element of the Proposed Development, would be 12MW.

3.72 Security measures are proposed at the Site, including 12 pole mounted CCTV cameras (3m height) and perimeter security fencing around the solar PV arrays (**Figure 3.5**). Fencing would comprise plain wire interior and barbed wire at height, interlinked with wooden batons (75 x 38 x1600mm) and end posts (150 x 150 x 2100mm). Double-leaf vehicle access gates (approximately 4.5m x 1.5m) would allow entry into the solar PV arrays.

Onsite Substation Compound (including Battery Storage) and Electrical Cabling

3.73 The Proposed Development would be connected to the electricity network via an onsite substation control building located within the Substation Compound (approximately 75m x 100m). The Substation Compound would include an area for car parking and High Voltage (HV) equipment, such as transformers and circuit breakers as well as a control building. This indicative onsite Substation Compound is shown on **Figure 3.9**.

3.74 The main control building would be single storey, built on a pre-cast concrete base and would measure approximately 16m x 11m and 5m high (pitched roof which would be 5m high at its tallest point). It is proposed that the buildings would have a rendered finish; the final external finishes would be agreed with Dumfries and Galloway Council, via condition, in the event of consent being granted. A typical control building elevation is shown on **Figure 3.10**.

3.75 The Substation Compound would contain up to 12MW of battery storage. This is anticipated to be formed primarily of an estimated five battery storage units, with each battery storage unit measuring approximately 6.1m (l) x 2.5m (w) x 2.9m (h). The battery storage units would have multiple layers of operational protocol, monitoring, and fire suppression, used to prevent fires, and control/extinguish fires should they begin. It is anticipated that a Fire Safety Plan / Emergency Response Plan would be produced and its content agreed with relevant consultees, prior to any construction work. A Battery Safety Statement has been included as **Technical Appendix 3.2** and is anticipated to form the basis of a detailed Fire Safety Plan / Emergency Response Plan. The Substation Compound, including the indicative number and dimensions of battery storage units, are provided on **Figure 3.11**.

3.76 Underground power cables would run along the side of the access tracks in trenches from each of the wind turbines, and solar PV arrays, to the substation. Indicative cable trench arrangements are provided on **Figure 3.8**.

Anemometry Mast

3.77 One permanent anemometry mast, up to 122.5m in height, is included as part of the Proposed Development. The anemometry mast would be used to monitor wind and weather conditions in order to allow for the safe and efficient operation of the proposed wind turbines (**Figure 3.13 and 3.14**).

Site Signage (Construction)

3.78 During construction, the Site will have suitable signage to ensure that contractors use the correct roads, and also to protect the health and safety of workers, contractors and the general public. Signage will provide the operator's name, the name of the Development and an emergency contact telephone number. The exact final locations and design of the signage will be defined prior to construction commencing.

Site Restoration Post Construction

3.79 Soils would be used for reinstatement works associated with access tracks, cable trenches, wind turbine foundations, solar PV module foundations, crane hardstandings, the Substation Compound, and the temporary construction compounds. The upper vegetated turfs would be used to dress infrastructure edges, and to reinstate the surface of restoration areas. It is anticipated that most of the soil resources within areas directly affected by construction activities would be able to be stored and reinstated as close as possible to where they were excavated, in accordance with best practice; so that the Site would be restored with minimal movement of material from its original location. It is not anticipated that any excavated material would leave the Site.

3.80 Further detail on site restoration would be provided within the CEMP, an outline of which is provided in **Technical Appendix 3.1**.

Operation and Maintenance Phases

Duration

3.81 The Proposed Development would have an operational life of up to 40 years from the first commissioning (export to the electrical grid).

Electricity Generation

3.82 The wind turbines would start to generate electricity at wind speeds of around 2.5m/s (5.6mph). Electricity output would increase as the wind speeds increase up to a maximum of around 13m/s (29.1mph), when the wind turbines would reach their maximum capacity. The wind turbines would continue to operate at maximum capacity up to wind speeds of around 28m/s (62.6mph). Above 28m/s the wind turbines would operate at a reduced output under a storm-control mode up to wind gusts of around 50m/s (112mph). Above 50m/s, the wind turbines would cut-out and automatically stop as a safety precaution.

3.83 The operation of the solar PV arrays would be managed via a Smart Array Controller and Smart Logger. The system has in-built commissioning functionality and would be operated remotely via the preferred network application.

3.84 The Proposed Development would produce an average of approximately 97,300 Mega Watt hours (MWh) of electricity annually (based on a site derived capacity factor of 40% for wind generation and 10% for solar generation). This equates to the equivalent electricity consumed by approximately 29,200 average UK households[2].

3.85 The Battery Energy Storage System (BESS) included in the Proposed Development is for up to 12MW. For BESS, the MWh rating generally refers to the total amount of energy that the system can store e.g. a BESS rated at 12MWh could deliver 1MW of electricity continuously for 12 hours. It is likely that the storage capacity of the proposed BESS would be in the range of two hours, based on current trends in the UK market. While longer-duration systems are starting to emerge, two hour configurations remain the most common and economically viable for projects of this scale in the UK. The specific MWh rating of the BESS included in the Proposed Development would be determined at detailed design stage, post any consent.

Maintenance

3.86 The Proposed Development would largely be controlled and managed remotely, however, there would be technicians on Site regularly and it would be maintained throughout its operational life via servicing at regular intervals. It is anticipated that there would be approximately sixteen annual service visits by a service team of up to three people in relation to the wind turbines, and approximately 12 annual service visits by a service team of two people in relation to the solar PV arrays. Inspections of high-voltage equipment and general site safety are expected to be carried out monthly. Faults would be responded to as required, most likely by a team of two technicians.

3.87 This team would either be employed directly by the developer or in partnership with the wind turbine and solar PV module manufacturers. Management of the energy park would typically include wind turbine maintenance, solar PV module maintenance, health and safety inspections, and annual civil maintenance of tracks, drainage and buildings. Wind turbine and solar PV module maintenance includes the following:

- annual civil maintenance of tracks and drainage;
- scheduled routine maintenance and servicing;
- unplanned maintenance or call outs;
- HV and electrical maintenance;
- Solar PV module inspections; and
- Wind turbine blade inspections.

Habitat Management Plan

3.88 As part of the Proposed Development there are a number of measures proposed, which would enhance, restore, and create onsite habitat for various species. These proposals are set out in **Technical Appendix 8.5: Outline Habitat Management Plan**, and include:

[2] Calculated using the most recent statistics from Department of Energy Security and Net Zero (DESNZ) showing that annual GB average domestic household consumption is 3,323kWh (as of December 2025).

- 19.52ha of wet meadow improvement via an amended animal grazing regime and potentially ditch blocking;
- 1.19ha of native tree planting;
- Provision and maintenance of bat roost and hibernation boxes; and
- Provision and maintenance of reptile hibernacula.

Community Benefit

3.89 Should the Proposed Development gain consent, a Community Benefit Fund would be made available to the communities in proximity to the development. This is offered on the basis of a payment per MW of installed wind capacity at the Scottish Government recommended rate at the time of commissioning the Proposed Development. At present, the recommended rate is £5,000 per MW. It is estimated that, depending on the type of investment selected, the community benefit fund alone would accrue benefits to the local economy of approximately £4.9 million over the 40-year life of the Energy Park.

3.90 The applicant would look to explore potential models for part community shared ownership of the Proposed Development, whereby the local communities would have the opportunity to invest into the project in line with the Scottish Government's Good Practice Principles.

Decommissioning Phase

3.91 At the end of its operational life, which would be defined by condition on the grant of any consent, the Proposed Development would be decommissioned unless an application is submitted to extend the operational period or to repower the Site. The decommissioning period would be expected to take up to 12 months.

3.92 The ultimate decommissioning protocol would be agreed with Dumfries and Galloway Council, and other appropriate regulatory authorities in line with best practice guidance and requirements of the time. This would be done through the preparation and agreement of a Decommissioning and Restoration Plan (DRP). It is anticipated that the DRP would be the subject of a planning condition.

3.93 The final, detailed, DRP would reflect the relevant legislation, and best practice current at the time of decommissioning and restoration.

3.94 As decommissioning effects are, based on current information and guidance, not expected to exceed those at construction phase (for any technical topic), further detailed assessment of decommissioning effects has been scoped out of this EIA. More detail on this is provided in **Chapter 6: Scoping and Consultation** and in each technical topic chapter (**Chapters 7** to **14**).

3.95 **Table 3-5** sets out the potential decommissioning requirements for each element of the Proposed Development. These would be outlined further in the outline DRP and then updated in the detailed DRP.

Table 3-5: Decommissioning Requirements for Infrastructure / Decommissioning Statement

Element	Decommissioning and Requirement
Wind Turbines	Turbines would be dismantled and removed from site. Turbine components would be dismantled onsite using standard engineering techniques similar to those used for

Element	Decommissioning and Requirement
	the original installation. The re-use or recycling of components would be prioritised, this would include exploration of any viable second hand turbine market. Turbine oils or any other oils would be removed from the site and disposed of appropriately.
Turbine Foundations	Top soil material that has revegetated the foundations would be excavated first and temporarily stored for re-use following partial removal of foundations. The top 1m of the turbine foundation would be removed and disposed of appropriately. This is considered preferential to removing all infrastructure, due to the potentially lower environmental impacts associated with excavating, processing and removing concrete from the site. The excavated foundation would be reprofiled with soil and reseeded.
Solar PV Arrays	Components including solar PV array modules, mounting structures, cabling, inverters and transformers would be removed from the Site and recycled or disposed of in accordance with good practice and market conditions at that time.
Crane Hardstandings	Top soil material that has revegetated the crane hardstandings would be excavated first and temporarily stored for reuse following partial removal of crane hardstandings. The top 1m of the crane hardstandings would be removed and disposed of appropriately. This is considered preferential to removing all infrastructure, due to the potentially lower environmental impacts associated with excavating, processing and removing aggregate from the site. The excavated hardstandings would be reprofiled with soil and reseeded. Recovered geogrids and geotextiles would be disposed of appropriately. All granular materials would be excavated and removed from the site, for re-use where practicable.
Access Tracks	Access tracks would be left in-situ, which would reduce potential environmental impacts associated with potential sediment migration into watercourses as a result of removing all tracks.
Watercourse Crossings	These would remain in-situ in association with the access tracks after decommissioning. This would reduce decommissioning activities in the vicinity of watercourses and thus potential for contamination as a result of run-off.
Underground Cabling	These are underground and therefore all cables would be made safe and left in-situ. This is considered preferential to extracting cables from the cable trenches due to the potentially greater environmental impacts associated with excavating, processing and removing the cable from the site.
Substation compound	All equipment from within the substation compound would be removed from site and either reused, recycled or disposed of appropriately. Oils or lubricants from the compound would be removed and disposed of appropriately. The control building, and related infrastructure, would then be demolished and all materials would be reused, recycled or disposed of appropriately.
Battery Storage Units	The full battery energy storage system would be de-energised and then any battery units, transformers or other electrical equipment that is re-usable, carefully dismantled and removed. The decommissioning process would essentially be the construction process but in reverse. Fencing shall be removed to ease access, and then all other above ground structures removed. Concrete plinths and other concrete foundations will be excavated and removed for recycling/disposal. Any contamination from the batteries or transformers would be investigated and the ground remediated where any contamination has occurred. This is likely to be isolated locations (if at all), and therefore removal of contaminated material for onward treatment or disposal is the most likely treatment. Cables and buried services would be removed. The area of the battery energy storage system would then be regraded and blended into the surrounding ground, taking note of any changes to the surrounding land during the lifetime of the facility.

Element	Decommissioning and Requirement
Substation Compound Foundation	The top 1m of the compound foundations would be removed and disposed of appropriately. The excavated hardstandings would be reprofiled with soil and reseeded.

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