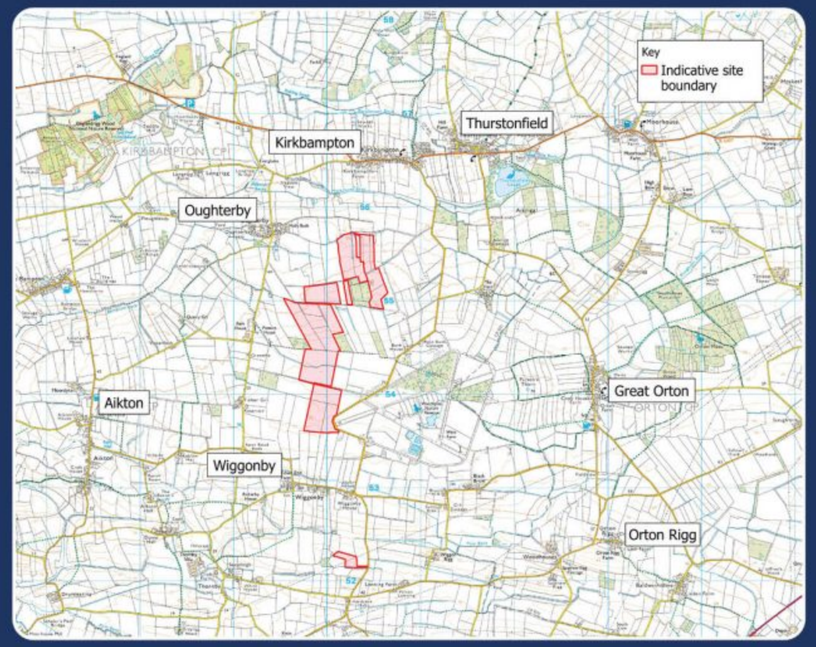
Great Oaks Renewable Energy Park

Key Facts

- The scheme would generate as much electricity each year as is used by approximately 16,900 homes.
- Site area of approximately 31 ha/77 acres (consisting of wind turbines, solar panels, battery storage, access tracks and associated infrastructure).
- Solar capacity of approximately 24 MW and wind capacity of 16.8 MW.
- Battery storage capacity of up to 20 MW.
- 35 year operational period.
- Approximately 6-9 month construction period.
- Fully decommissioned after operational period.
- Funding will be made available to support existing community projects and help new ideas become a reality.
- Renewable electricity generation from the proposed development would support the UK's legally binding net zero commitment and help secure domestic energy supply.



Great Oaks Renewable Energy Park Site Location

Indicative Timeline

Survey Start 2020

July 2022
Public Consultation Begins

Autumn 2022
Planning Application Submitted

Spring 2023
Planning Application Determined

2025
Potential Start of Operation (Dependent on Grid Connection)

Public consultation period

Detailed environmental assessments

Construction

Great Oaks Renewable Energy Park

Proposed Site Design

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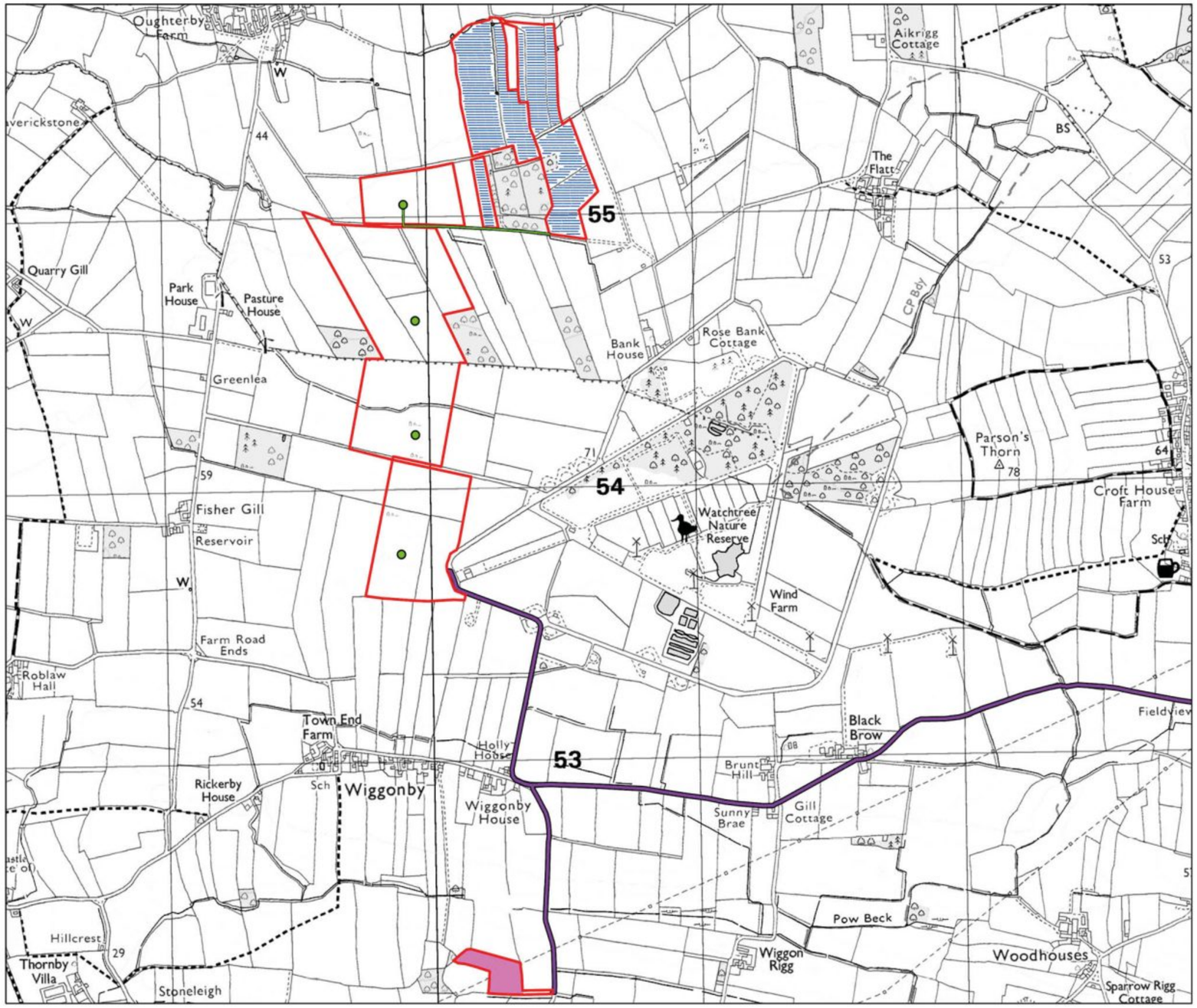

Legend

- Indicative Site Boundary
- Indicative Solar PV Modules
- Indicative Wind Turbine Location
- Indicative Cabling
- Indicative Battery and Substation Area
- Indicative Access Route

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Great Oaks Renewable Energy Park

Indicative Site Layout August 2022

Great Oaks Renewable Energy Park

Community Benefit Fund

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Contribution to Annual Energy Bills

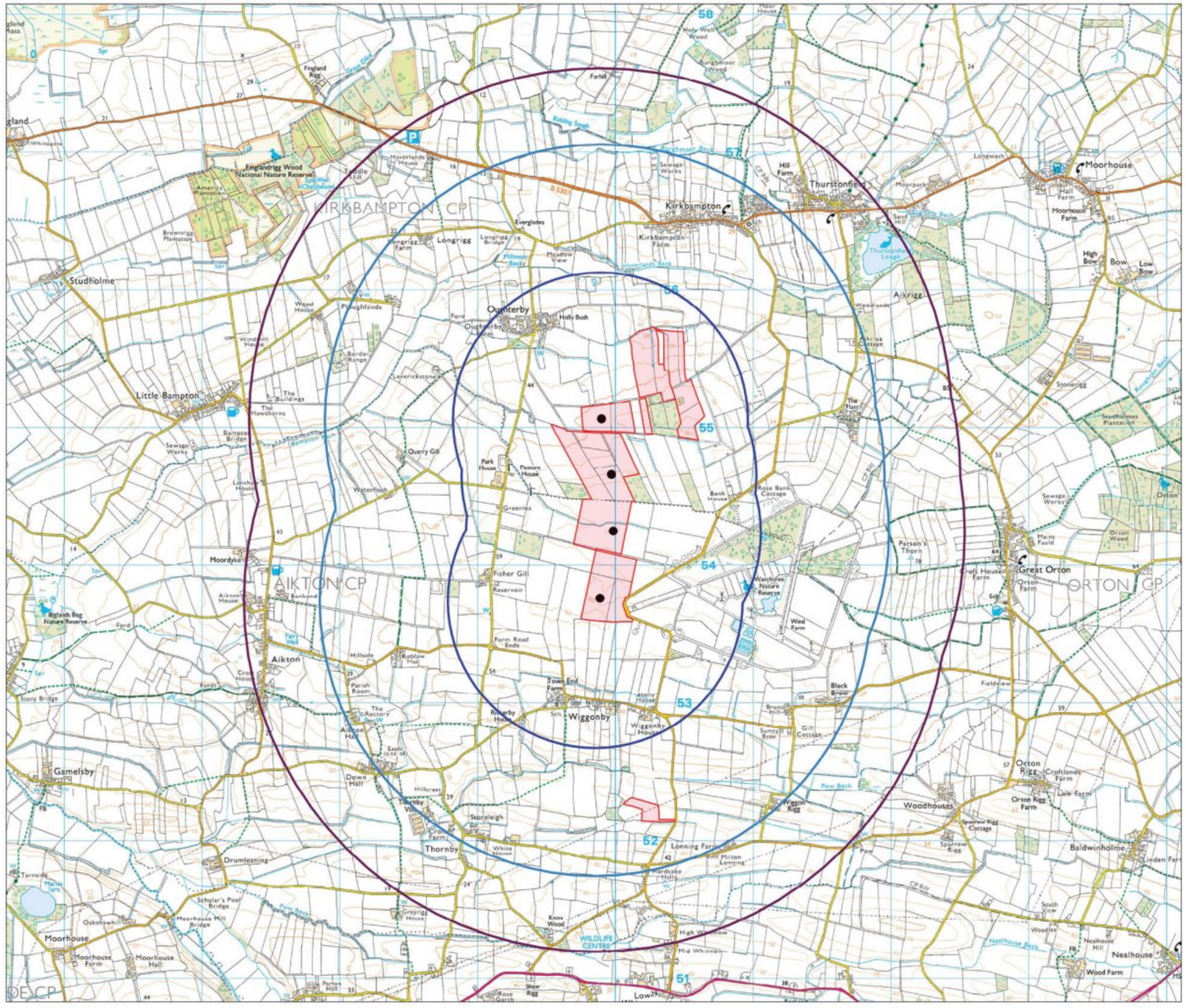
The community benefit fund would include an annual contribution towards energy bills to all homes within 2.5km from the wind turbines.

This would include homes in Kirkbampton, Thurstonfield, Oughterby, Aikton, Thornby and Wiggonby.

Proposed tiers of contribution:

- 0 - 1 km - £500 per year
- 1 - 2 km - £250 per year
- 2 - 2.5 km - £100 per year

The boundary of the three contribution tiers has been outlined on the adjacent map.



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0 0.75 1.5 2.25 km

Legend

- Indicative Site Boundary
- Indicative Wind Turbine Location
- 1km (0.62 mi) from the indicative turbine locations
- 2 km (1.24 mi) from the indicative turbine locations
- 2.5 km (1.55 mi) from the indicative turbine locations

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Great Oaks Renewable Energy Park

Distance from Indicative Wind Turbine Locations

Great Oaks Renewable Energy Park

Community Engagement

Community benefits

Great Oaks Renewable Energy Park will generate a community benefit fund over the lifetime of the project.

The community benefit fund would be available to directly support the needs of local people and could be used for creating a community hub, cycle paths and rural transport, providing EV charging facilities or other community priorities associated with environmental benefits. The community benefit would include an annual contribution towards energy bills to all homes within 2.5km from the wind turbines.

Along with your suggestions and thoughts, we will continue to engage with Parish Councils and community groups to identify the main areas of need and then focus on growing a positive asset for all living in the vicinity of the project.

Ridge Clean Energy work in partnership with communities – including landowners, residents, councils, and community groups – to engage at an early stage and answer local needs at the earliest opportunity. Specifically, we are keen to identify local initiatives for which our expertise and finance may be useful.

Supply chain opportunities

If the proposal is successful, Ridge Clean Energy would encourage local suppliers and contractors to get in touch to outline what services could be provided by local businesses in order to help support the local economy.

Feedback, comments & questions

Thank you for your interest in our public exhibition for the proposed Great Oaks Renewable Energy Park. Please take the time to fill out a feedback form and Local Community Survey provided by the project team. We would be very grateful to receive your feedback, comments and any questions.

We are pleased to support Castlegate Coffee Shop in Carlisle from whom we purchased refreshments for today's public exhibition.

Contact us

Email: greatoaks@theridgegroup.com

Post: Ridge Clean Energy, Noah's Ark, Market Street, Charlbury, OX7 3PL

Website: https://ridgecleanenergy.com/greatoaks-contact-us/

Great Oaks Renewable Energy Park

Wind Energy

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Wind Turbine Components

1. The nacelle contains the generator, cooling systems, part of the electrical control system and the yaw drive. The yaw drive rotates the whole nacelle to ensure the rotor is always pointing directly into the wind.
2. The 57.2m blades (each a single piece made of epoxy resin) angle into and out of the wind in response to variations in wind speed to optimise energy capture.
3. The tower is constructed from sections of welded rolled steel. The height from the bottom of the tower to the middle of the rotor is called the hub height. For the chosen Vestas V117 - 4.2 MW turbine this is 91m.
4. Electrical and telecommunication cables pass down the centre of the tower to an internal transformer housed either within the tower of the turbine or externally at the base.
5. Access would be required to the base of each wind turbine for component delivery and operational maintenance. A hard-standing (35X40m) is located at the base to provide a suitable crane foundation during construction.

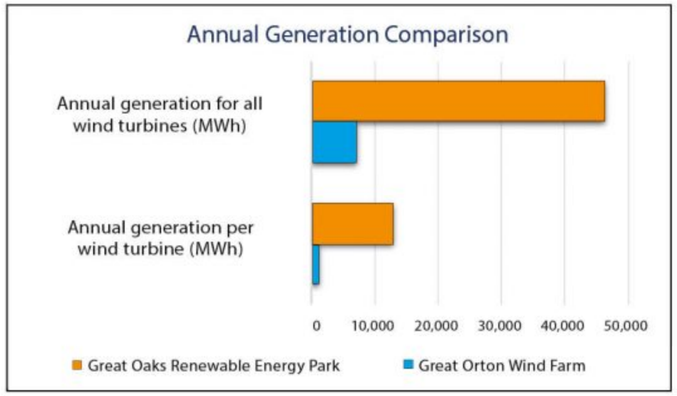
Where does the electricity go?

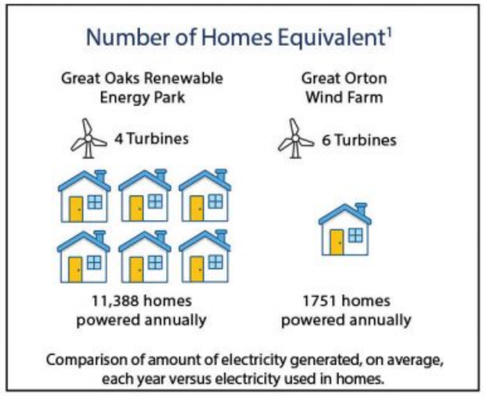
Electricity is exported from each wind turbine via an underground cable to the switchgear and substation kiosk, adjacent to the battery units, before being transformed up to 132kV for connection into the distribution network's 132kV line.

1. based on average domestic consumption per household of 4,070 KWh – DBEIS, 2021

How do turbines today compare to existing turbines near the site?

Since the Great Orton Wind Farm became operational in January 2000, technology has advanced beyond recognition. Wind turbines today are approximately 10 times more productive and the energy generated from a single wind turbine can provide enough electricity for at least 2,500 homes annually.





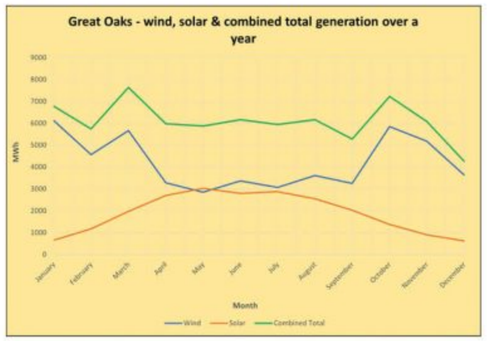
Comparison of amount of electricity generated, on average, each year versus electricity used in homes.

How do wind turbines compare to solar PV panels?

A 4.2 MW wind turbine (as is proposed here) would generate, on average, approximately three times more electricity as the equivalent 4.2 MW of solar. A single 4.2 MW wind turbine requires approximately 0.6 hectares of land (foundation, crane, hardstanding and site track), whereas 4.2MW of solar would require more than 4 hectares of land. However, the ideal solution is to combine both to maximise annual electricity production levels.

Do wind turbines and solar PV panels complement each other?

Wind and solar energy work well together, and co-located developments are likely to become ever more commonplace across the UK and beyond. Weather forecasting has improved drastically in recent years, so much so that National Grid are able to accurately forecast how much renewable energy is going to be produced and can therefore tailor 'dispatchable' generation accordingly.



During winter months, windy weather is more frequent when the power from the sun is lower. During summer months, the sun's power is stronger and we often find calmer days with lower wind speed. Together, these generation technologies complement each other really well, as shown in the chart above.

There may be occasions when generation across the network exceeds demand. Rather than curtailing (limiting) the amount of generation, the electricity can be stored in the battery units on site.

Great Oaks Renewable Energy Park

Infrastructure: Solar Power and Battery Storage

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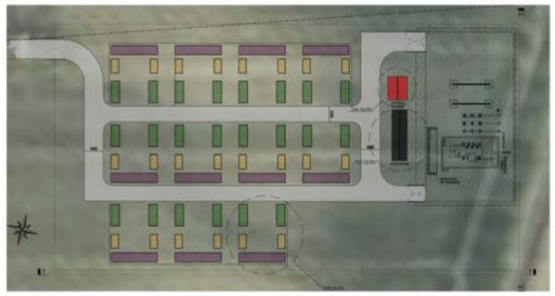


Example layout of the battery energy storage system (BESS)

The battery energy storage system (BESS) and substation would be located on a landholding 600m south of Wiggonby, where the renewable energy park would then connect to the local electricity distribution network. The compound would be surrounded by a climb proof fence and house infrared cameras for security.

General representation of battery storage and solar panels

1. Access Track
New, upgraded or widened access track (grassed over in time) would be 4 metres wide and laid over a stone sub-surface constructed upon a geotextile membrane.

2. Frame
Frames to support the solar panels would be push driven into the ground or supported on concrete plinths if sensitive areas are identified.

3. Inverters
Inverters can be situated either beneath the solar panels, or in centralised units within the site. These are used to convert the direct current (DC) generated by the solar PV to alternating current (AC) for distribution to the grid.

4. Transformer
Underground cables connect to a transformer that steps up the voltage to 33kV. From here, underground cables take the electricity to the substation compound on the landholding south of Wiggonby, where the electricity is transformed up to 132kV and connected to the distribution network.

5. Solar Power Station
The inverter and transformer can be housed in solar power stations that would be distributed at regular intervals amongst the solar panels. Each solar power station would be no more than 3 metres in height.

6. Batteries
The batteries can store electricity generated from the solar farm or wind turbines when there is excess generation, or from the grid during times of low demand, for use when the electricity is required.

7. Security Fencing
Security fencing (such as deer fencing) would surround the solar arrays. Small gaps at the base can allow small animals to cross the site.

Great Oaks Renewable Energy Park

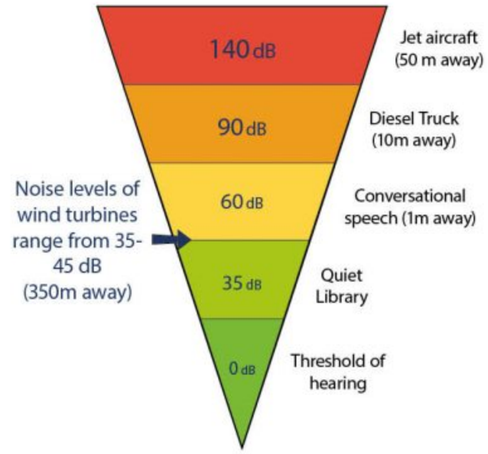
Noise and Construction

Noise

Noise during the construction phase could result from the Heavy Goods Vehicle (HGV) construction traffic. This would be managed by restricting working hours – for example from 7am to 7pm during the week and 7am to 1pm on Saturdays. In addition, standard noise reduction techniques such as silencers on plant/machinery and not allowing idling of engines could be implemented.

During the operational phase, both the heating ventilation and air conditioning (HVAC) for the batteries and the cooling fans for the power conversion system (PCS) would generate sound from the grid compound in the south of the site. Within the solar arrays, inverters used to convert the direct current (DC) to alternating current (AC) would also generate sound.

Wind turbines emit aerodynamic sound levels depending on the wind speed. If the predictive noise levels at properties is above 35 dB(A), a background noise survey would be conducted. This would involve monitoring the background noise at agreed locations, whilst concurrently monitoring the wind speed at the site. Noise limits would then be derived from these background noise levels. In addition, it is possible that a cumulative noise assessment will be required, which would include the noise levels from other wind turbines adjacent to the site.



Noise is not expected to impact residential properties due to the distance between the infrastructure and the properties. A full noise assessment will accompany the planning application to assess any potential impacts at sensitive receptors.

Construction

The proposed Great Oaks Renewable Energy Park would take approximately 6 - 9 months to construct. Initial works would consist of the site tracks, compounds and wind turbine hardstandings for the cranes. This would be followed by installation of the frames, electrical equipment and solar PV panels brought onto site by HGV's including flatbed trailers. It is expected that the frames would be driven into the ground to provide a secure foundation.

The wind turbine foundations would consist of concrete poured over reinforced steel. The tower sections, nacelle and wind turbine blades would be brought to site on oversize overmass (OSOM) vehicles. Finally, the battery energy storage system and transformer equipment would be brought on to site, for connection to the local electricity distribution network at the 132kV pylon.

The indicative access route would be from the M6 motorway onto the A689 then towards the site on the local road network. Approximately 1010 HGV deliveries (2,020 vehicle movements) would be required and, assuming a 6 month construction period, would result in an average of seven deliveries (14 vehicle movements) per day. In addition, approximately 36 OSOM deliveries (72 OSOM vehicle movements) would be required to transport the wind turbines to the site.

Operation and Decommissioning

During the operational phase, there would be regular site visits to clean the panels, inspect the equipment and the wind turbines. In addition, there would be an environmental management plan in place, which describes the environmental enhancements and their ongoing maintenance. The performance of the renewable energy park would be monitored remotely.

At the end of the 35-year operational lifetime, the site would be decommissioned and returned to agricultural use. All material would be recycled where possible.

Great Oaks Renewable Energy Park

Ecology and Environmental Enhancement

Ecology

Ridge Clean Energy commissioned an ecologist to undertake a Preliminary Ecological Appraisal (PEA) to determine ecological interests on the proposed site to assess predicted impacts. Ecological surveys began in 2020 and will continue through 2022.

A suite of ecological surveys have been conducted on the site, including: a Phase 1 habitat survey, a protected fauna survey, breeding bird surveys and wintering bird surveys.

Bird species identified are typical of farmland species in the area.

Enhancement measures will be included for site-wide habitat improvement, such as a lower fencing line gap of 150mm to facilitate the passage of small mammals. Habitat connectivity will be improved with additional planting. It is proposed an overarching Landscape and Ecological Management Plan will be agreed with Allerdale Borough Council.

How can the project contribute to a net gain in biodiversity?

Great Oaks Renewable Energy Park would result in a net gain for biodiversity through new ecological and enhanced planting measures, including beehives.

The Renewable Energy Park would contribute to the improvement of soils as the ground is left fallow for the lifetime of the project, capturing carbon rather than releasing it through common agricultural methods of continuous cultivation.

Beehive

Bees are pollinators that support plant reproduction. They can gather nectar and pollen from miles around, spreading diversity and enhancing the sustainability of local flora.

Tree Planting

Tree planting of native deciduous trees would occur to assist with screening of infrastructure over time.

Wildlife Boxes

Wildlife boxes would be provided to offer additional locations for birds to nest or for bats to roost in.

Hedgerow Restoration

Hedgerow planting or restoration with native species would occur to encourage wildlife in the area.

Great Oaks Renewable Energy Park

Viewpoint Locations

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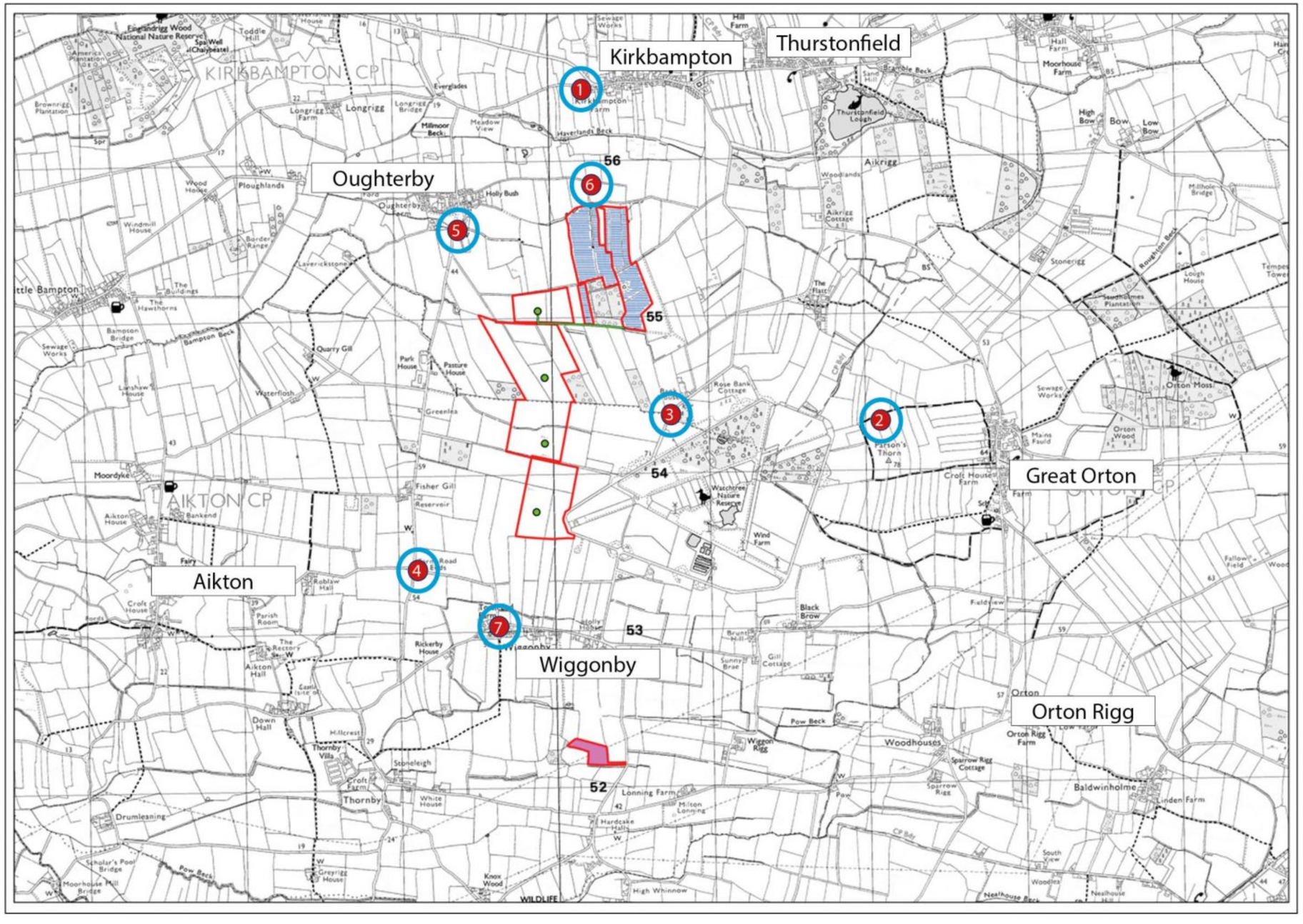
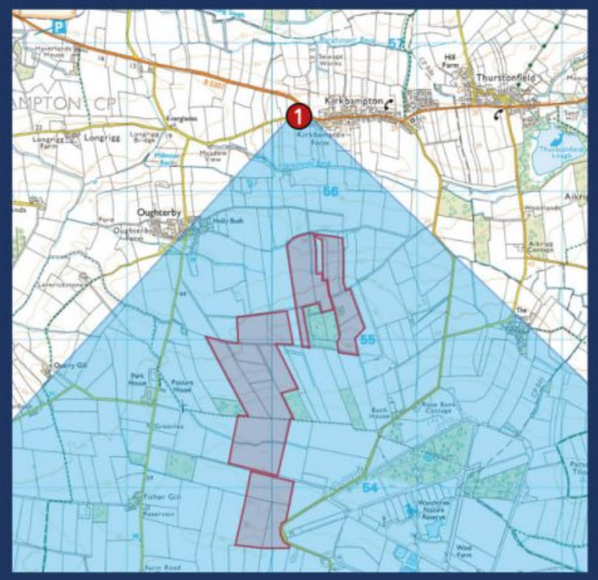


Viewpoint 1

Looking south from back road off B5307 outside Kirkbampton

The photomontage has been created using Lidar 2m data to superimpose the proposed renewable energy park on the existing view to illustrate the appearance from this location.

The photomontages, alongside onsite analysis, are used in the Landscape and Visual Impact Assessment to assess the potential impacts of the proposal to views.



RIDGE CLEAN ENERGY

Existing view looking south from back road off B5307 outside Kirkbampton

3D Model of Great Oaks Renewable Energy Park

Predicted view looking south from back road off B5307 outside Kirkbampton

Viewpoint 2

Looking west from bridleway near Great Orton

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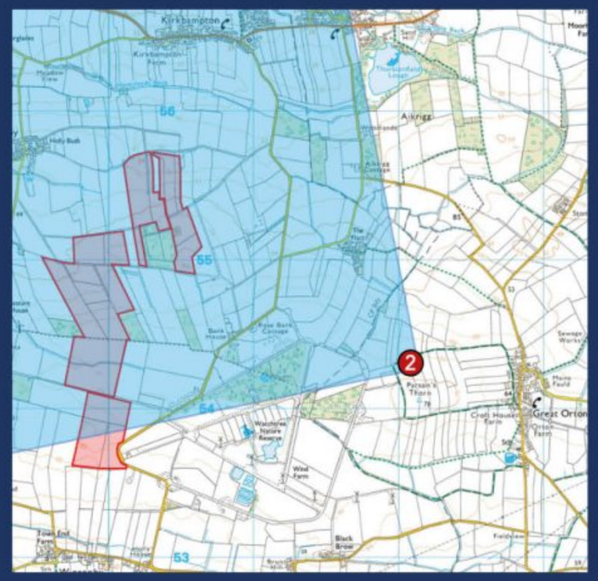
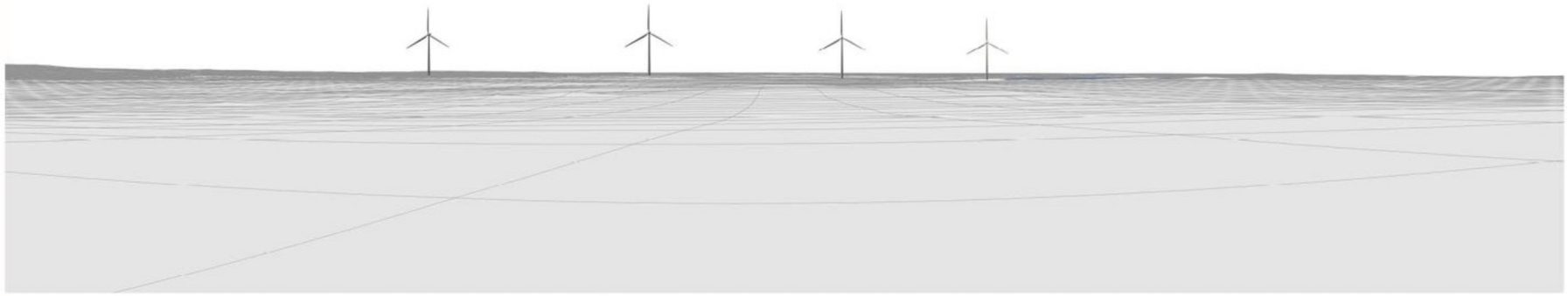


RIDGE CLEAN ENERGY

Existing view looking west from bridleway near Great Orton

3D Model of Great Oaks Renewable Energy Park



Predicted view looking west from bridleway near Great Orton

Viewpoint 3

Looking west from road from Wiggonby to Kirkbampton

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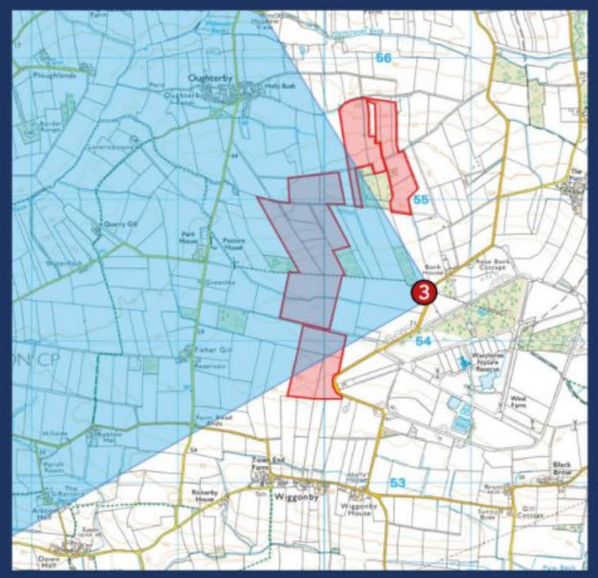
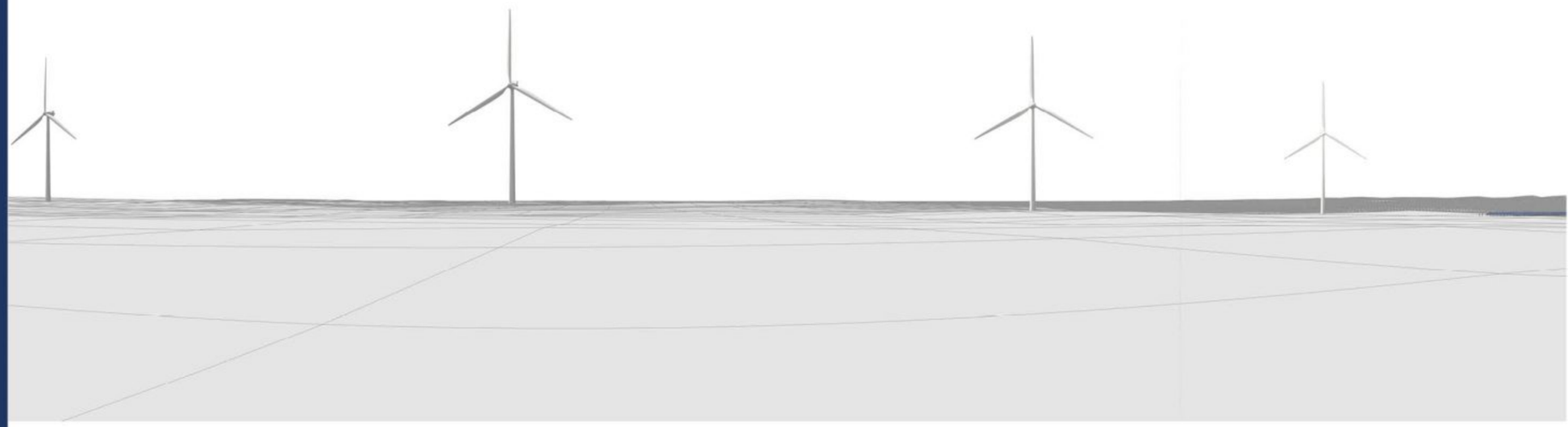


RIDGE CLEAN ENERGY

Existing view looking west from road from Wiggonby to Kirkbampton

3D Model of Great Oaks Renewable Energy Park



Predicted view looking west from road from Wiggonby to Kirkbampton

Viewpoint 4

Looking north east from the crossroads at Four Roads End

The photomontage has been created using Lidar 2m data to superimpose the proposed renewable energy park on the existing view to illustrate the appearance from this location.

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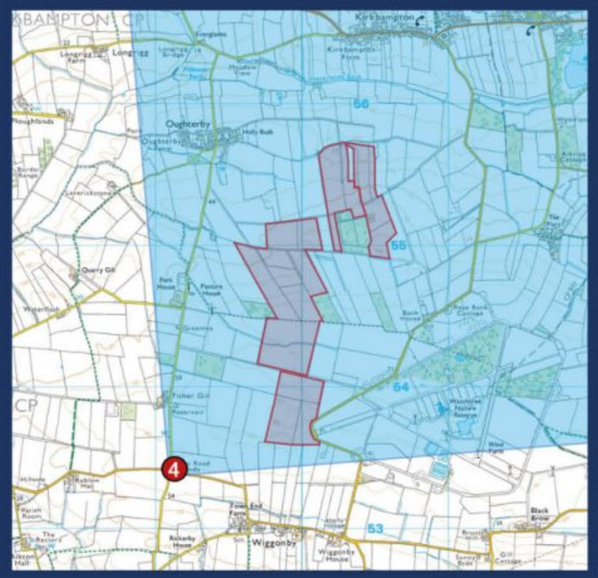

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Existing view looking north east from the crossroads at Four Roads End

3D Model of Great Oaks Renewable Energy Park

Predicted view looking north east from the crossroads at Four Roads End

Viewpoint 5

Looking south east from Oughterby Village

The photomontage has been created using Lidar 2m data to superimpose the proposed renewable energy park on the existing view to illustrate the appearance from this location.

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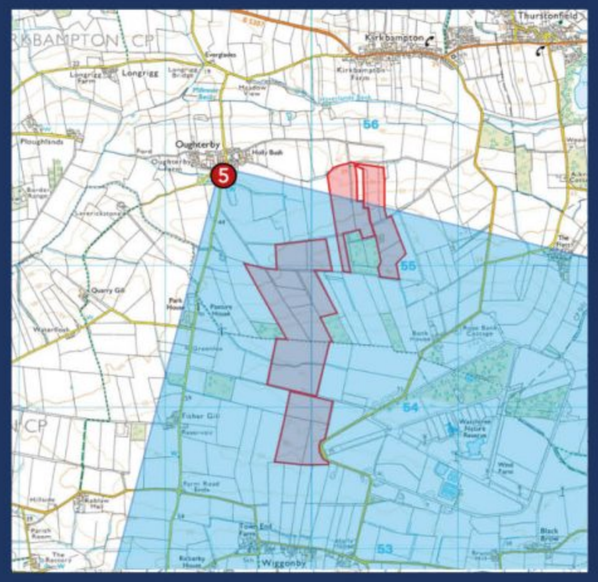

Existing view looking south east from Oughterby Village

Predicted view looking south east from Oughterby Village

RIDGE CLEAN ENERGY

Viewpoint 6

Looking south from back road east of Oughterby

The photomontage has been created using Lidar 2m data to superimpose the proposed renewable energy park on the existing view to illustrate the appearance from this location.

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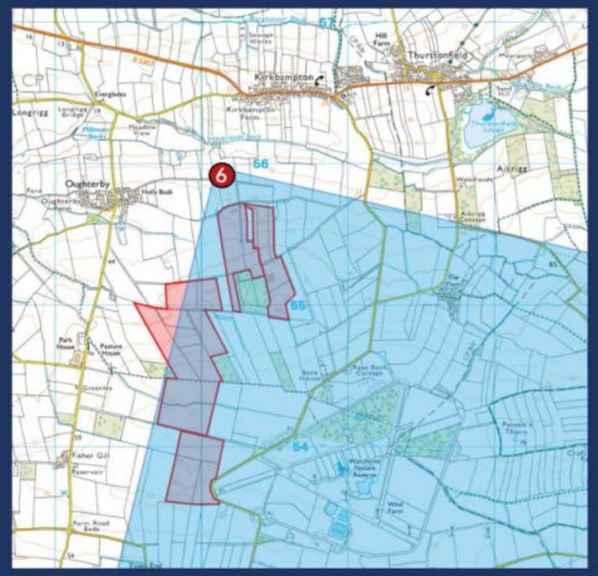
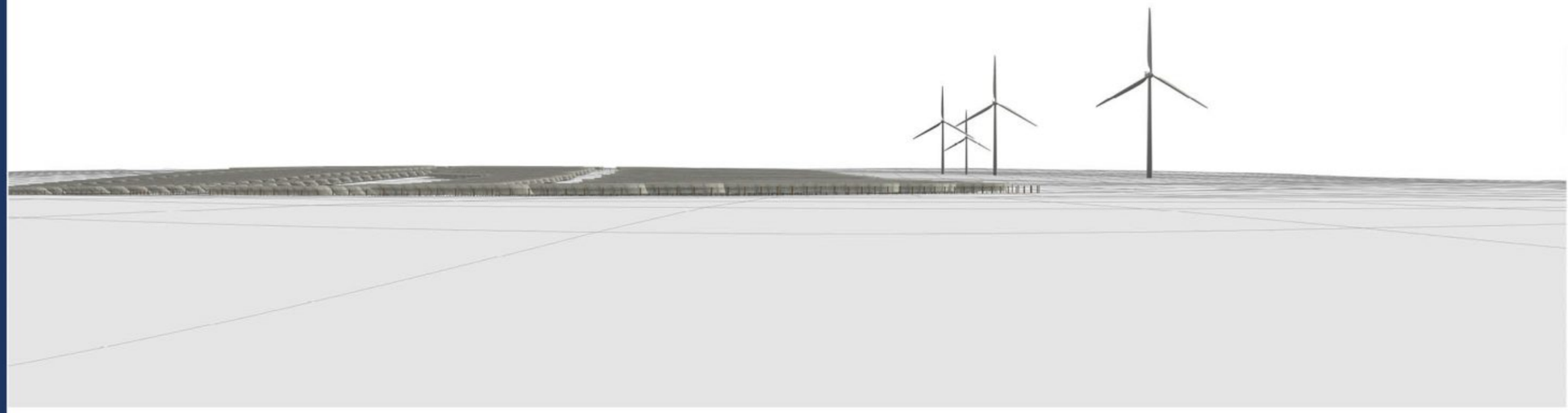


RIDGE CLEAN ENERGY

Existing view looking south from back road east of Oughterby

3D Model of Great Oaks Renewable Energy Park



Predicted view looking south from back road east of Oughterby

Viewpoint 7

Looking north from Wiggonby

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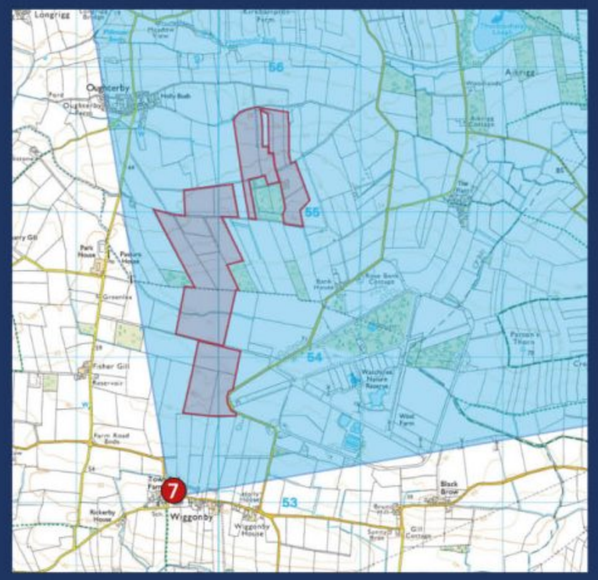

RIDGE CLEAN ENERGY

Existing view looking north from Wiggonby

Predicted view looking north from Wiggonby