
EAST YORKSHIRE SOLAR FARM

**East Yorkshire Solar Farm
EN010143**

Environmental Statement

**Appendix 2-1: Grazing Feasibility
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Opinion on the suitability of sheep to graze under solar panels on the proposed East Yorkshire Solar Farm

This feasibility report has been prepared by Kate Phillips (BSc Hons, M. Phil), an independent sheep specialist with almost 40 years' experience in the UK livestock industry.

Introduction

East Yorkshire Solar Farm (hereafter referred to as the Scheme) will comprise the construction, operation (including maintenance and repair) and decommissioning of a solar photovoltaic (PV) electricity generating facility with a total capacity exceeding 50 megawatts (MW) and export connection to the national grid, at National Grid's Drax Substation. Due to its proposed generating capacity being more than 50 MW, the Scheme is classified as a Nationally Significant Infrastructure Project (NSIP) and will therefore require consent via a Development Consent Order (DCO).

The 'Site' comprises all land within the Order limits, approximately 1,276.4 hectares (ha) which is predominantly agricultural in nature. The Site is made up of the Solar PV Site, Ecology Mitigation Area, the Interconnecting Cable Corridor, the Grid Connection Corridor and Site Accesses. The landscape features within the Site consist predominately of agricultural fields mainly under arable production, with some areas of pasture, interspersed with individual trees, hedgerows, tree belts (linear) small woodland blocks and farm access tracks. The field boundaries primarily consist of hedgerows.

The Solar PV Site (totalling 966.4 ha) is made up of 18 Solar PV Areas, which are areas of land within which the Solar PV Panels and associated solar PV infrastructure, including two Grid Connection Substations, are to be located. The Solar PV Areas also incorporate areas of habitat creation/enhancement and landscaping, and the areas beneath the panels and around the associated infrastructure will be sown and maintained as grassland for the duration of the operational period (40 years). The land within the Ecology Mitigation Area (totalling 107.9 ha) will be partially sown to grassland (approximately 18.7 ha) managed for ground nesting birds, with the remaining land staying in arable agricultural production on an amended rotation for the improvement of habitat quality for overwintering bird species. These areas of the Site will remain under the management of the Applicant throughout the operational period and therefore the grassland within them will be available for grazing, which is the Applicant's preferred option for the management of the grassland created within the solar farm.

The agricultural land within the Interconnecting Cable Corridor and Grid Connection Corridor will be reinstated to its pre-development condition and at the end of the construction period returned to the landowner (i.e., the Applicant will have no long-term control over this land). It is therefore assumed that the land will be returned to its pre-development agricultural land use, which is predominantly arable. The Site Accesses do not comprise agricultural land.

Sheep grazing

Sheep are ruminants and are able to thrive on green fodder (grass, legumes, herbs, shrubs etc). They have four stomachs and through microbial activity in the rumen can digest a variety of green fodder crops, high in cellulose and hemi-cellulose, unlike monogastric animals which do not have this capability. They are therefore ideally suited to graze grass.

There are currently about 7.5 million breeding ewes in England and they can be found grazing lowland, upland and high hill areas as shown in Plate 1 (APHA, 2022)¹, with the darker green areas showing the heaviest density of sheep in the North and West of the country. There are approximately 90 breeds of sheep in the UK with slightly differing characteristics, with some more suited to extensive grazing (hill areas and low stocking density) and others more suited to intensive systems in the lowlands.

It is clear from the map that the sheep population in Yorkshire is focused mainly in West and North Yorkshire but South and East Yorkshire also have a good number of agricultural holdings with sheep. This situation has developed since East Yorkshire tends to have suitable, flat or undulating terrain for arable cropping but other than that there is no good reason why sheep and cattle cannot be kept in this area, and indeed many are. The sheep populations across the regions of Yorkshire are shown in Table 1.

Table 1. Sheep holdings and sheep numbers in Yorkshire in December 2021/January 2022

	Sheep Holdings	Sheep Numbers
Humberside (includes the East Riding)	597	55,211
North Yorkshire	3126	858,659
South Yorkshire	314	45,741
West Yorkshire	884	88,128

Source: APHA (2022).

The land is suitable for grass and forage crops, and if managed correctly, by providing good fencing and water supplies and good sheep husbandry, then there is no reason why the land under the panels cannot successfully be grazed by sheep, as is common practice on other operational solar farms both within the UK and internationally.

The current land owners may not have sheep husbandry skills but these can be developed or other sheep keepers in the area may well be keen to rent the land to keep and expand their own sheep enterprises.

Given the proximity to the town of Howden there may be public access issues and concerns over dog worrying but public education and good signage will help to minimise these problems.

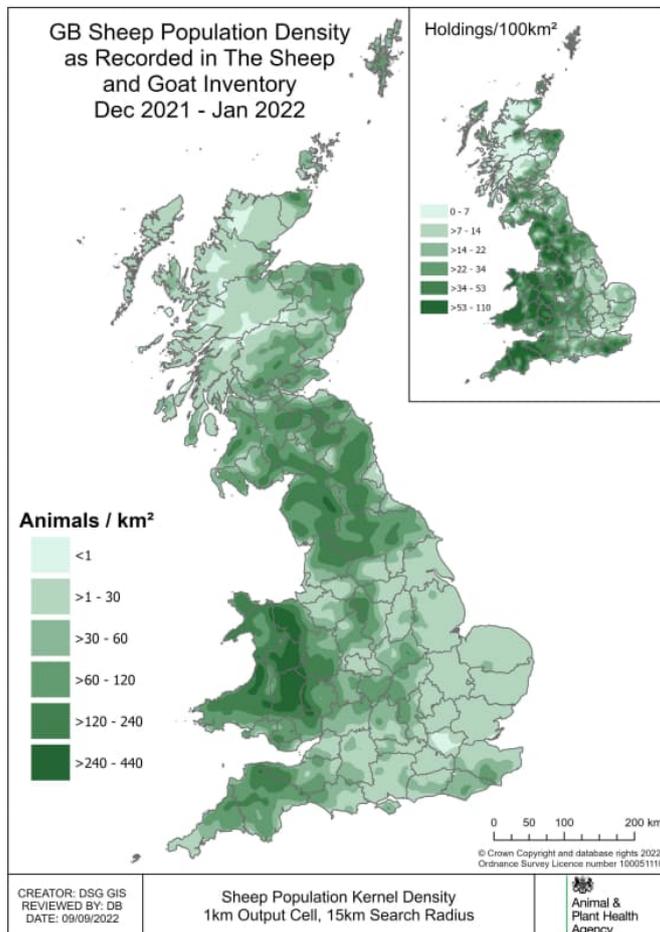
Sheep grazing will need to be managed according to grass availability and soil type – varying stocking density by season and soil conditions which will be learnt over the first years of the system. The choice of stock type – breeding ewes with lambs, dry ewes or store sheep will be dictated by the sheep manager but most sheep – apart from lambing ewes, could be grazed under the panels. It is likely that shepherding at lambing time would be hindered by the panels making it difficult to locate any ewes that are having lambing difficulties. Lambing would therefore happen elsewhere (as is the case for many flocks when ewes are housed over the lambing period) and the sheep brought back to the area once lambs are over six weeks of age. Flocks of dry sheep would be the easiest to manage since there would be no need to be sorting and selecting lambs for slaughter and health issues would be minimal. The primary purpose of sheep being on the land is to graze and manage the grass, not to produce lamb/wool, so a wide range of less agriculturally productive breeds can be considered at much lower stocking densities than might otherwise be considered for a profitable, commercial flock.

Sheep in the UK vary in height and weight very significantly, with small, hill type sheep (e.g. Welsh Mountain) at 50kg and perhaps less than 1 m tall, and some of the larger lowland type breeds (e.g. Oxford Down or Hampshire) may be as heavy as 100kg or more and up to 1.5m tall. Choice of breed

¹ Animal and Plant Health Agency (2022). Livestock Demographic Data Group: Sheep Population Report.

will be important when considering suitable sheep to graze under the panels at their minimum height but it is unlikely that grazing will be limited by the panels themselves for any significant length of time.

Plate 1.



Sheep systems are evolving and the current trend is to farm sheep with minimal purchased feed and to maintain breeding flocks on almost forage alone. This is in line with increasing soil organic matter, reducing use of imported feeds and maintaining flock performance. Indeed, there is a move to introduce sheep into arable rotations to help improve soil structure and fertility, to help control problem weeds like blackgrass and to improve profitability (NSA, 2017)².

Changing the proposed arable area to grassland for sheep should bring benefits to both biodiversity and soil health (BSSS, 2022)³. It will also increase carbon sequestration. Sheep will also benefit from parasite free pastures in the first year or more, will have shade and shelter under the solar panels and if well managed on a rotational grazing system should also perform well. This may require additional (electric) fencing depending on the size of each solar farm. There may be a need to supplement sheep with minerals and trace elements pertinent to the area (as is normal practice on many farms) and this can be defined by testing forage and perhaps blood testing the sheep themselves, but if needed, supplements can be easily administered orally or by injection.

There will be a need for sheep handling facilities – either mobile (which is the preferred method in terms of flexibility and sheep welfare as sheep will not have to move far from their assigned area) or

² National Sheep Association (2017). The Benefits of Sheep in Arable Rotations.

³ British Society of Soil Science (2022). Science Note: Soil Carbon

fixed at key points over the sites. This will enable easy management of the animals should any require management intervention or veterinary treatments.

Some of the benefits of keeping sheep on land that was in arable production previously:

- Sheep have minimal housing and machinery needs.
- Through their manure, sheep can contribute to soil organic matter. This provides vital nutrients for crops and supports soil organisms that keep the soil healthy.
- Sheep benefit the environment by grazing on mixed species swards that increase biodiversity and provide habitat and food for insects.
- Swards that include leguminous species that fix atmospheric nitrogen, increase soil fertility and cut the need for artificial fertilisers.

Conclusion

Grazing sheep in a solar farm is being successfully managed on other sites in the UK and across the world and there is no reason why this cannot be done on the proposed East Yorkshire sites.

Kate Phillips

14 July 2023