

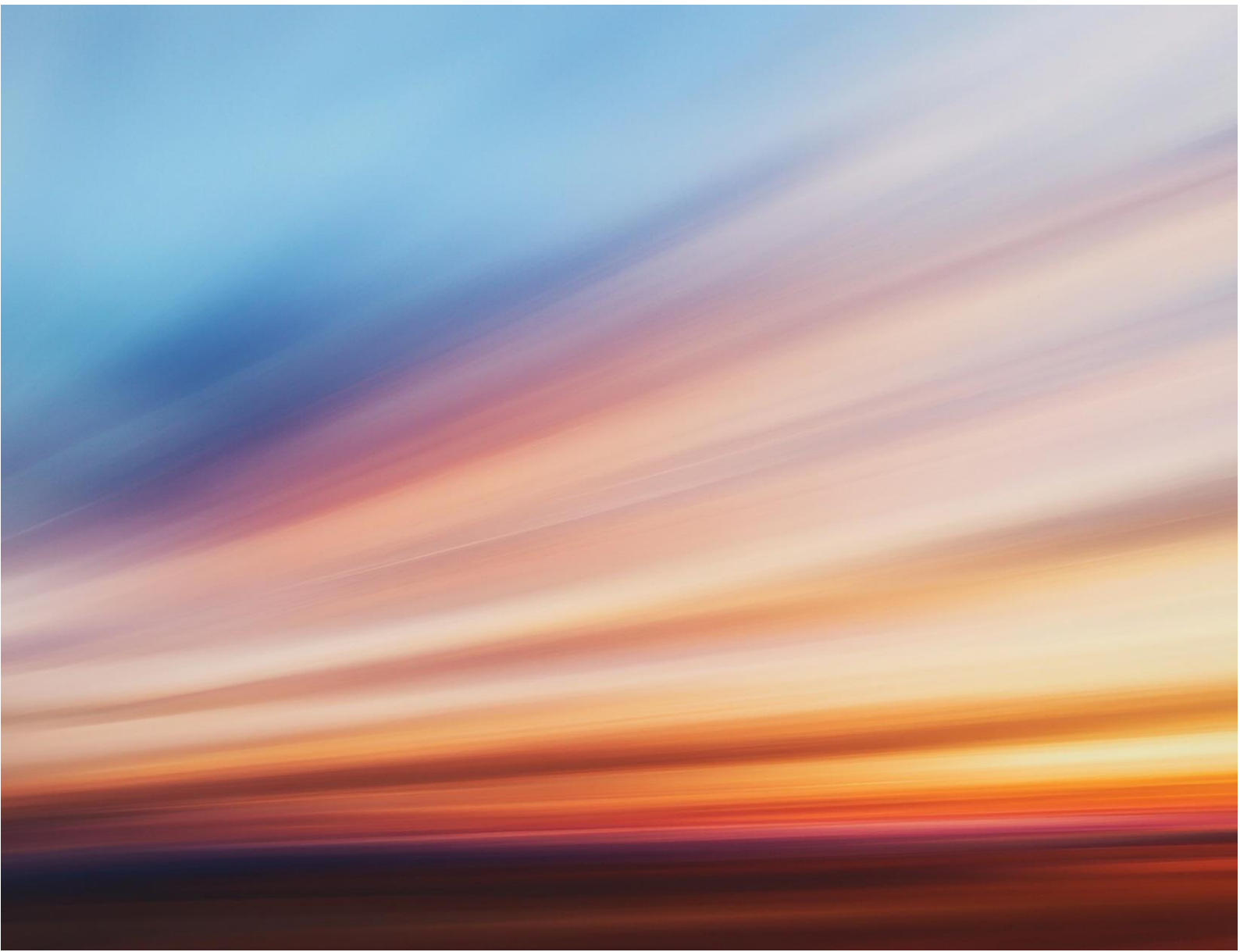
Mylen Leah Solar Farm

Preliminary Environmental Information Report (PEIR)

Volume 3

Appendix 8.1: Climate Data Sources and Assumptions

April 2026



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1. Introduction

- 1.1.1 This technical appendix to the **Chapter 8: Climate** in **Volume 1** presents the raw data and emissions factors used to carry out the greenhouse gas (GHG) assessment. This appendix is intended to be read in conjunction with the **Chapter 8: Climate** in **Volume 1**, which includes the methodology and assumptions used within the assessment.
- 1.1.2 Emissions calculations apply the following format:
- Activity data x emissions factor = emissions in mass of CO₂e (carbon dioxide equivalent)
- 1.1.3 Units referred to in this appendix include kilograms (kg) of CO₂e per material. CO₂e is a standard measure of the total impact of all greenhouse gases by converting them into an equivalent amount of carbon dioxide.
- ### 1.2 Construction of the Mylen Leah Solar Farm
- 1.2.1 A large number of data sources have been supplied by the Applicant to estimate emissions from construction. These are summarised at a high-level below (**Table 1.1**), alongside assumptions that have been applied in the assessment.
- 1.2.2 It has been confirmed by the Applicant that the construction period will last for a maximum of 36 months.

Table 1.1: Construction stage assumptions and data sources

Component	Quantity across the entire site	Assumption methodology	Distance travelled by sea (km)	Distance travelled by Heavy Good Vehicle (km)
Solar photovoltaic (PV) modules	997,596 No.	Weight of 38kg per module provided by the Applicant	10,000 ¹	500
String inverters	1738 No.	116kg per unit provided by the Applicant	10,000	500
Solar PV module framework	13,344,000kg total weight assumed	Weight of 24 metric-tonnes per MW assumed by the Applicant	1,500	100
Solar PV module foundation	2,716,900kg total assumed, steel piles	Weight assumed from comparable project using MW metric	10,000	500
Switchgear	11 individual units	896.2kg/unit from closest matching Environmental Product Declaration, using Mass per Verified Area metric ²	10,000	500
On-Site Substations	Two substation compounds, approximately 115 x 130m gravelled area surrounded by a steel picket fence, containing various pieces of	Assumed constructed in the United Kingdom (UK). Modelled using One Click Life Cycle Assessment software from 'Other Materials' provided ³	N/A	Default material delivery distances supplied by One Click Life Cycle Assessment software

Mylen Leah Solar Farm

Component	Quantity across the entire site	Assumption methodology	Distance travelled by sea (km)	Distance travelled by Heavy Good Vehicle (km)
	high/medium voltage equipment.			
Main Transformers	62 No.	24,000kg per transformer provided by the Applicant	10,000	500

1.3 Operation of Mylen Leah Solar Farm

1.3.1 Mylen Leah Solar Farm is anticipated to generate 689,000MWh in the first year and is expected to produce around 0.4% less electricity each year as the solar panels lose efficiency over time. The operational energy generation is displayed below (Table 1.2).

Table 1.2: Operational energy generation per year

Year of operation	Year	Energy generation (MWh)
1	2033	689,000.00
2	2034	686,244.00
3	2035	683,499.02
4	2036	680,765.03
5	2037	678,041.97
6	2038	675,329.80
7	2039	672,628.48
8	2040	669,937.97
9	2041	667,258.21
10	2042	664,589.18
11	2043	661,930.83
12	2044	659,283.10
13	2045	656,645.97
14	2046	654,019.39
15	2047	651,403.31
16	2048	648,797.69
17	2049	646,202.50
18	2050	643,617.69
19	2051	641,043.22
20	2052	638,479.05
21	2053	635,925.13
22	2054	633,381.43
23	2055	630,847.91
24	2056	628,324.52
25	2057	625,811.22
26	2058	623,307.97
27	2059	620,814.74
28	2060	618,331.48
29	2061	615,858.16
30	2062	613,394.72
31	2063	610,941.15
32	2064	608,497.38
33	2065	606,063.39
34	2066	603,639.14
35	2067	601,224.58
36	2068	598,819.68
37	2069	596,424.40
38	2070	594,038.71
39	2071	591,662.55

Year of operation	Year	Energy generation (MWh)
40	2072	589,295.90
41	2073	586,938.72
42	2074	584,590.96
43	2075	582,252.60
44	2076	579,923.59
45	2077	577,603.89
46	2078	575,293.48
47	2079	572,992.30
48	2080	570,700.34
49	2081	568,417.53
50	2082	566,143.86
Total lifecycle generation (MWh)		31,280,178.00

1.4 Emissions Factors

1.4.1 The emission factors used in the assessment are summarised below (Table 1.3).

Table 1.3 – Emission factors used in the assessment

Description	Emissions Factors	Unit	Source	Notes	
Materials	Steel - cold rolled	2.73	kgCO _{2e} /kg	The Inventory of Carbon and Energy 2019 ⁴	World average
	Steel - plate	2.46	kgCO _{2e} /kg	The Inventory of Carbon and Energy 2019 ⁴	World average
	Copper	3.42	kgCO _{2e} /kg	Dong <i>et al.</i> , 2020 ⁵	Produced in China, assumes primary material production (produced from raw natural resources)
	Mineral Oil	1401	kgCO _{2e} /t(metric tonnes)	Department for Energy Security	Primary material production

Description		Emissions Factors	Unit	Source	Notes
				and Net Zero 2025 ⁶	
	Insulating paper	1.76	kgCO ₂ e/kg	Guo <i>et al.</i> , 2022 ⁷	World average
Transport	All rigids	0.20	kgCO ₂ e/tkm (tonne kilometre)	Department for Energy Security and Net Zero 2025 ⁶	Average laden (The average percentage laden for a freighting vehicle in the UK)
	Average container ship	0.02	kgCO ₂ e/tkm	Department for Energy Security and Net Zero 2025 ⁶	Average
	All rigids	0.23	kgCO ₂ e/tkm	Department for Energy Security and Net Zero 2025 ⁶	50% laden
	Diesel van	0.26	kgCO ₂ e/km	Department for Energy Security and Net Zero 2025 ⁶	Average size
	Petrol car	0.16	kgCO ₂ e/km	Department for Energy Security and Net Zero 2025 ⁶	Average size
Electricity	China	International Energy Agency 2024 (Unable to share due to contractual obligations)	kgCO ₂ e/kWh	International Energy Agency 2024 ⁸	Location based factor

Description		Emissions Factors	Unit	Source	Notes
Electricity T&D	China	International Energy Agency 2024 (Unable to share due to contractual obligations)	kgCO ₂ e/kWh	International Energy Agency 2024 ⁸	
Disposal	Mineral Oil - recycling	4.69	kgCO ₂ e/t	Department for Energy Security and Net Zero 2025 ⁶	
	Other metals recycling	One Click 2025	kgCO ₂ e/kg	One Click 2025 ³	e.g., Aluminium recycling
	Inert materials landfill	One Click 2025	kgCO ₂ e/kg	One Click 2025 ³	
Water	Consumption	0.19	kgCO ₂ e/m ³	Department for Energy Security and Net Zero 2025 ⁶	
	Treatment	0.17	kgCO ₂ e/m ³	Department for Energy Security and Net Zero 2025 ⁶	
Fuels	Diesel	2.57	kgCO ₂ e/l	Department for Energy Security and Net Zero 2025 ⁶	Biofuel blend

1.5 Environmental Product Declarations

- 1.5.1 The Environmental Product Declarations used in the assessment are outlined below (**Table 1.4**). For further detail regarding emission categories, please refer to **Chapter 8: Climate** in **Volume 1**.

Table 1.4: Environmental Product Declarations

Asset	Emission category	Emissions Factors	Unit	Source
Solar PV modules	A1-3 Product Stage	221	kgCO ₂ e/m ²	Average of various Environmental Product Declaration's sourced from One Click Life Cycle Assessment ³
Solar PV modules	C1-4 End of Life	11	kgCO ₂ e/m ²	Average of various Environmental Product Declaration's sourced from One Click Life Cycle Assessment ³
Main Transformers	A1-3 Product Stage	402,469	kgCO ₂ e/unit	Guo et al., 2022 ⁷
Main Transformers	C1-4 End of Life	8,321	kgCO ₂ e/unit	Guo et al., 2022 ⁷
String Inverters	A1-3 Product Stage	3990	kgCO ₂ e/unit	Environmental Product Declaration Italy, 2023 ⁹
String Inverters	C3-4 End of Life	30	kgCO ₂ e/unit	Environmental Product Declaration Italy, 2023 ⁹
Switchgear	A1-3 Product Stage	7	kgCO ₂ e/unit	Environmental Product Declaration Norge, 2024 ²
Switchgear	C3-4 End of Life	0.13	kgCO ₂ e/unit	Environmental Product Declaration Norge, 2024 ²

1.6 General Assumptions

1.6.1 The general assumptions used within the assessment are included in (Table 1.5) below.

Table 1.5: Environmental Product Declarations

Category	Assumption	Source
Construction worker water use	60 litres/worker/day	British Standard 8551 2015 ¹⁰
PV cleaning water use	76 litres/MWh	Solar Energy Industries Association 2025 ¹¹
HGVs - deliveries	43% empty running factor	Royal Institution of Chartered Surveyors 2023 ¹
Repair	10% of A1-3 for Mechanical, Electrical, and Plumbing or 25% maintenance	Royal Institution of Chartered Surveyors 2023 ¹
Landfill disposal distance	22.1km	RSK assumption based on distance to specialist disposal facilities
Recycling disposal distance	22.1km	RSK assumption based on distance to specialist disposal facilities
Service life	50 years	Provided by the Applicant
Steel foundation assumption	4,887kg/MW	Weight assumed from comparable project using MW metric
Maintenance	1% of A1-5	Royal Institution of Chartered Surveyors 2023 ¹
Mechanical, Electrical, and Plumbing Repair	10% of A1-3	Royal Institution of Chartered Surveyors 2023 ¹
Transformer	0.88 Mineral Oil kg/litre	CBS 2025 ¹²
Solar PV- frame weight	24 tonnes/MW	Provided by the Applicant
Transformer	0.555 litres of mineral oil per kg of transformer dry weight	Litres assumed from comparable project using dry weight metric

¹ Royal Institution of Chartered Surveyors (2023) Whole Life Carbon assessment for the built environment. Available online: [Whole life carbon assessment \(WLCA\) for the built environment](#)

² EPD Norge (2024) Environmental Product Declaration, Medium-voltage gas-insulated switchgear ZX2 Feeder-36.12.31, EDP Norge. Available online: [EPD ZX2 Feeder-36.12.31](#)

³ One Click LIFE CYCLE ASSESSMENT Software. Available online: [LCA & EPDs for construction & manufacturing | One Click LCA](#)

⁴ University of Bath (2019). Embodied Carbon, the Inventory of Carbon and Energy. Available online: [Embodied Carbon Footprint Database - Circular Ecology](#)

⁵ Dong, D., van Oers, L., Tukker, A. and van der Voet, E., 2020. Assessing the future environmental impacts of copper production in China: Implications of the energy transition. *Journal of cleaner production*, 274, p.122825 Available online: [Assessing the future environmental impacts of copper production in China: Implications of the energy transition - ScienceDirect](#)

⁶ Department for Energy Security and Net Zero. (2025) Greenhouse gas reporting: conversion factors 2025. Available online: [Greenhouse gas reporting: conversion factors 2025 - GOV.UK](#)

⁷ Guo, H. et al. (2022) 'The greenhouse gas emissions of power transformers based on life cycle analysis', *Energy Reports*, 8 (Supplement 15), pp. 413–419. doi: 10.1016/j.egy.2022.10.078. Available online: [The greenhouse gas emissions of power transformers based on life cycle analysis - ScienceDirect](#)

⁸ International Energy Agency. (2024) Emissions Factors 2024. Available online: [Emissions Factors 2024 - Data product - IEA](#)

⁹ EPD Italy (2023) Available online: [SUN2000-330KTL-H1 – EPD Italy](#)

¹⁰ British Standards Institution (2015) BS 8551:2015 – Provision of temporary water supplies and distribution networks. London: BSI.

¹¹ Solar Energy Industries Association. (2025.). Water Use Management. Available online: [Home – SEIA](#)

¹² CBS (2025) Weight units energy. Available online: [Weight units energy | CBS](#)