



Fosse Green Energy

EN010154

6.3 Environmental Statement Appendices

Appendix 6-B: Climate Change Risk Assessment

Planning Act 2008 (as amended)

Regulation 5(2)(a)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

18 July 2025

VOLUME

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulation 2009 (as amended)

Fosse Green Energy

Development Consent Order 202[]

6.3 Environmental Statement Appendices

Appendix 6-B: Climate Change Risk Assessment

Regulation Reference	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	EN010154
Application Document Reference	EN010154/APP/6.3
Author	Fosse Green Energy Limited

Version	Date	Issue Purpose
Rev 1	18 July 2025	DCO Submission

1. Climate Change Baseline & Projection Data

Climate Variable	Baseline (1981-2010) Waddington	Climate change projection			Projected Trend	Source
		Extreme scenario RCP8.5 (2020 - 2049)	Extreme scenario RCP8.5 (2040 - 2069)	Extreme scenario RCP8.5 (2070 - 2099)		
Temperature						
Mean annual maximum daily temperature (°C)	13.5	+1.1 (+0.5 to +1.7)	+1.9 (+1.0 to +2.8)	+3.8 (+2.2 to +5.6)	↑	UKCP18
		+1.3 (+0.44 to +2.13)	+2.3 (+1.0 to +3.6)	+5.2 (+2.3 to +8.2)	↑	
Mean winter minimum daily temp (°C)	1.4	+0.9 (+0.2 to +1.7)	+1.6 (+0.5 to +6.0)	+3.1 (+1.0 to +5.5)	↑	UKCP18
		21.3 July				
Warmest month and average temperature for baseline period (°C)	21.3 July					Met Office
Coldest month and average temperature for baseline period (°C)	1.2 February					Met Office
Rainfall						
Mean annual rainfall levels (mm)	614.5	+0.1% (-6.7% to +6.7%)	-2.9% (-11.7% to +6.0%)	-2.1% (-13.1% to +9.0%)	↓	UKCP18
		-4.1% (-22.0% to +13.3%)	-15.9% (-38.9% to +7.6%)	-30.1% (-57.9% to +0.8%)	↓	
Mean winter rainfall (mm)	58.9	+3.7% (-4.2% to +12.4%)	+7.0% (-4.3% to +19.5%)	+17.4% (-0.6% to +39.0%)	↑	UKCP18
		45.5				
Wettest month on average (mm)	55 November					Met Office
Driest month on average (mm)	38.3 February					Met Office
Other						
Sea level rise (m) *		0.12	0.27	0.43	↑	IPCC AR6 Sea Level Projection Tool SSP8.5
Mean wind speed (knot)	7.3	The Met Office has projected an increase in near surface wind speeds over the UK for the second half of the 21st century for the winter season when more significant impacts of wind are experienced. However, the increase in wind speeds is modest compared to natural variability from month to month and season to season, so confidence is low.			-	UKCP18
Storm surges		The UKCP18 model suggests a small contribution from storm surges, however it is unclear if the frequency and severity of future storm surges is going to change. Although, rising sea levels due to climate change are expected to worsen the impacts of storm surges.			↑	
Heatwaves		Under a high emissions scenario, it is estimated that by the end of the 21st Century, all areas of the UK are projected to be warmer with hotter, drier summers and heatwaves likely to become more common and intense.			↑	UKCP18
Wildfires		ThinkHazard has classified the wildfire hazard in Lincolnshire as High, according to currently available information.			↑	ThinkHazard
Drought		The Met Office has projected a trend towards drier summers on average, with the trend being stronger under a high GHG emission scenario compared to a low one. However, it is the distribution of rainfall			↑	UKCP18

References

1	UK CP18 https://www.metoffice.gov.uk/research/approach/collaboration/ukcp
2	Met Office historic averages https://www.metoffice.gov.uk/research/climate/maps-and-data/location-specific-long-term-av
3	IPCC Sea Level Projection Tool https://sealevel.nasa.gov/data_tools/17/
4	ThinkHazard https://thinkhazard.org/en/
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Definitions

Summer dry days	
Snowfall	
Heatwaves	
Wet Days (>20mm)	
Very Wet Days (>30mm)	
Frost days per annum	
Wind speed	
* Sea level rise	

2. Risk framework

Source: EU Technical guidance on the climate proofing

		CONSEQUENCE						
		Impact can be absorbed through normal activity	An adverse event that can be absorbed by taking business continuity actions	A serious event that requires additional emergency business continuity actions	A critical event that requires extraordinary / emergency business continuity actions	Disaster with the potential to lead to shut down or collapse or loss of the asset / network		
Asset damage / Engineering / Operational		First aid case	Minor injury, medical treatment	Serious injury or lost work	Major or multiple injuries, permanent injury or disability	Single or multiple fatalities		
Safety and Health		No impact on baseline environment. Localised in the source area. No recovery required	Localised within site boundaries. Recovery measurable within one month of impact	Moderate harm with possible wider effect. Recovery in one year	Significant harm with local effect. Recovery longer than one year. Failure to comply with environmental regulations / consent	Significant harm with widespread effect. Recovery longer than one year. Limited prospect of full recovery		
Environment		No negative social impact	Localised, temporary social impacts	Localised, long-term social impacts	Failure to protect poor or vulnerable groups (1). National, long-term social impacts	Loss of social licence to operate. Community protests		
Financial (for single extreme event or annual average impact) (**)		x % IRR (**) < 2 % of turnover	x % IRR 2-10 % of turnover	x % IRR 10-25 % of turnover	x % IRR 25-50 % of turnover	x % IRR > 50 % of turnover		
Reputation		Localised, temporary impact on public opinion	Localised, short-term impact on public opinion	Local, long-term impact on public opinion with adverse local media coverage	National, short- term impact on public opinion; negative national media coverage	National, long-term impact with potential to affect the stability of the government		
Cultural Heritage and cultural premises		Insignificant impact	Short term impact. Possible recovery or repair.	Serious damage with wider impact to tourism industry	Significant damage with national and international impact	Permanent loss with resulting impact on society		
In-combination		The climate change parameter in-combination with the effect of the Proposed Development does not impact the significance of the impact of the Proposed Development on the resource/ receptor, as defined by the topic.	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/ receptor, as defined by the topic, to increase from minor to moderate.	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/ receptor, as defined by the topic, to increase from minor to moderate.	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/ receptor, as defined by the topic, to increase from moderate to major.	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/ receptor, as defined by the topic, to increase from major to catastrophic.		
LIKELIHOOD		Qualitative	Quantitative	Insignificant	Minor	Moderate	Major	Catastrophic
Highly unlikely to occur	5%	Rare		Low	Low	Medium	High	Extreme
Unlikely to occur	20%	Unlikely		Low	Low	Medium	High	Extreme
As likely to occur as not	50%	Moderate		Low	Medium	High	Extreme	Extreme
Likely to occur	80%	Likely		Medium	High	High	Extreme	Extreme
Very likely to occur	95%	Almost certain		High	High	Extreme	Extreme	Extreme

3. Climate change risk assessment (Construction)

Risk ID	Climate variable	Risk statement	Direct or Indirect, In-combination	RISK IDENTIFICATION								RISK ASSESSMENT				ADAPTATION MEASURES					
				Physical structures	Workforce	Materials	Utilities	Plant	Machinery	Access	Impact type	Planned Controls	Initial risk rating RCP4.5 (2020 - 2039)	Justification	Adaptation Measures	Responsibility	Residual risk rating RCP4.5 (2020 - 2039)				
		Description of impacts									e.g. Asset damage / engineering / operational, Health and safety, Environmental, Social, Financial, Reputation, Cultural	e.g. controls planned within the current design that mitigate the identified risk	Likelihood	Consequence	Risk Rating	Rationale for likelihood and consequences and any changes between climate scenarios	e.g. additional design or operational measures that can be implemented to further reduce the climate risk		Likelihood		
CONSTRUCTION																					
1	Extreme rainfall events	Surface water flooding and standing water	Direct	•							Asset Damage, Financial	Temporary drainage systems (SuDS) will be developed to prevent runoff increasing existing flood risk to the Proposed Development and existing structures / assets. Weather forecasts are monitored so any expected periods of heavy rainfall are prepared for in advance, and measures can be in place to minimise disruption to the DCO Site. Identified land drains that are damaged during construction will be repaired. Infrastructure flood resilience detailed in Chapter 9: Water Environment of this ES [EN010154/APP/6.1]. Critical infrastructure to be above PMF (Probable maximum flood) level. Make sure that there is suitable storage for loose materials, such as soil, to protect from high rainfall events during construction.	Rare	Minor	Low	Projection data suggests that extreme rainfall events to be unlikely.	Consideration will be given to installing a water pump for the areas with critical infrastructure and a key part of construction operations. This will help increase the DOC Sites surface drainage capacity.	Contractor	Rare	Insufficient	Low
2	Extreme rainfall events	Working on-site in dangerous conditions	Direct	•							Safety and health	Contractors will monitor weather forecasts and receive Environment Agency's flood alerts and plan works accordingly with internal methodologies to manage resources in extreme weather conditions such as storms, flooding. Construction phase adaptation / resilience measures to be presented in the Framework Construction Environmental Management Plan (FCEMP) [EN010154/APP/7.1].	Rare	Insignificant	Low	Projection data suggests short-term increases in extreme rainfall events are unlikely, and planned controls mitigate risks to construction workforce.	No further adaptation measures required.	Contractor	Rare	Insignificant	Low
3	Decrease in annual rainfall	Increased drought risk	Indirect	• • • • •							All impact types	Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Establish a 'Heat Stress Prevention Guidelines' procedure during construction. Construction phase adaptation / resilience measures to be presented in the the Framework Construction Environmental Management Plan (FCEMP) [EN010154/APP/7.7]. Ensure construction workers access appropriate personal protective equipment (PPE) for extreme heat conditions. There will be shaded and indoor cool facilities for staff to get out of the heat, and water provided to help rehydrate. Hydration kits will be provided to those suffering from heat exposure. Ensure correct medical facilities are on site so construction workers can access medical care during periods of extreme heat.	Rare	Insignificant	Low	Projection data suggests that drought events are unlikely to occur for this time period, and planned controls mitigate risks to assets and the workforce.	No further adaptation measures required.	Contractor	Rare	Insignificant	Low
4	Increase in summer temperature	Risk of overheating to workers	Direct	•							Health and safety, Financial	Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. If temperatures exceed safe working limits, work will be suspended until it is appropriate to return to site. Construction phase adaptation / resilience measures to be presented in the the Framework Construction Environmental Management Plan (FCEMP) [EN010154/APP/7.8].	Unlikely	Minor	Low	Projection data suggests that summer temperatures exceeding safe levels are unlikely (Mean max summer daily temperature at RCP 8.5 90th percentile projected to be 22.5°C). Financial impacts from tools-down days unlikely to be realised in the short-term.	No further adaptation measures required.	Contractor	Unlikely	Minor	Low
5	Increase in summer temperature	Increase damage to infrastructure	Direct	•	• • • •						Asset damage	BESS units and other infrastructure with cooling properties to be selected as per the Framework Operational Environmental Management Plan (FOEMP) [EN010154/APP/7.8].	Unlikely	Insignificant	Low	Projection data suggests that extreme heat is unlikely (Mean max summer daily temperature at RCP 8.5 90th percentile projected to be 22.5°C). Solar infrastructure designed to withstand warm temperatures.	No further adaptation measures required.	Contractor	Unlikely	Insignificant	Low

Risk ID	Climate variable	Risk statement	Direct or Indirect, In-combination	Components impacted			Impact type	Planned Controls	Initial risk rating RCP4.5 (2020 - 2039)			Justification	Adaptation Measures	Responsibility	Residual risk rating RCP4.5 (2020 - 2039)				
6	Increase in annual temperature/extreme heat event	Risk of overheating to workers	Direct		●		Safety and health	Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Expected periods of high temperatures should have minimal work that's exposed to the sun e.g., schedule outdoor work to times during the day when the temperature is at its lowest.		Rare	Minor	Low	Projection data suggests that exceedingly warm temperatures are unlikely in the short-term (RCP8.5 scenario 90th percentile for mean annual maximum daily temperature projected to be 15.2°C).	No further adaptation measures required.	Contractor		Rare	Minor	Low
7	Decrease in summer rainfall	Increase drought risk	Indirect	●	●	●	All impact types	None required.		Rare	Insignificant	Low	Projection data and ThinkHazard suggests that drought risk in the short-term is low.	No further adaptation measures required.	Contractor		Rare	Insignificant	Low
8	Increase to winter rainfall	Viability of land access to sites (such as heavy rain resulting in surface water flooding of local roads, sources of power supply, or inundation of sites)	Direct	●	●	●	Safety and health	Contractors will monitor weather forecasts and receive Environment Agency's flood alerts and plan works accordingly with internal methodologies to manage resources in extreme weather conditions such as storms, flooding.		Unlikely	Minor	Low	Projection data suggests that increases to seasonal rainfall will be low in the short-term. Workforce to be protected by planned controls and risks to assets mitigated by appropriate planning e.g. drainage and pumping systems.	Consideration will be given to installing a water pump for the areas with critical infrastructure and a key part of construction operations. This will help increase the DCO sites surface drainage capacity.	Contractor		Unlikely	Insignificant	Low
9	Increase in heatwaves	Increased heat stress/heat exhaustion for workers	Direct		●		Safety and health	Weather forecasts will be monitored so any extreme temperatures are prepared for in advance and contingency measures can be in place to minimise disruption to operations. Work schedules should be reflective of weather conditions. Expected periods of high temperatures should have minimal work that's exposed to the sun. E.g., schedule outdoor work to times during the day when the temperature is at its lowest.		Rare	Minor	Low	Projection data suggests that heatwaves are unlikely to occur during the construction phase. Planned controls mitigate risks to workforce.	No further adaptation measures required.	Contractor		Rare	Minor	Low
10	Wildfire risk	Risk to workers over dry periods	Direct		●		Safety and health	Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather.		Unlikely	Minor	Low	Projection data and data from ThinkHazard suggested that the wildfires risk is high however, planned controls mitigate the risks to the construction workforce.	No further adaptation measures required.	Contractor		Unlikely	Minor	Low
11	Sea level rise	Surface water flooding and standing water	Direct		●		Asset damage	Keep stored materials away from areas of the Proposed Development with potential flood risk. If areas located within Flood Zone 2 (or 3) are to be utilised for the storage of construction materials, this would be done in accordance with the applicable flood risk activity regulations, with details to be confirmed in detailed CEMPs (presented in the Framework Construction Environmental Management Plan [EN010154/APP/7.7]).		Rare	Insignificant	Low	Sea level rise projections for the Proposed Development area sit at +0.12m in the short term. Planned controls mitigate any risks to assets.	No further adaptation measures required.	Contractor		Rare	Insignificant	Low

Risk ID	Climate variable	Risk statement	Direct or Indirect, In-combination	Components impacted							Impact type	Planned Controls	Initial risk rating RCP4.5 (2020 - 2039)			Justification	Adaptation Measures	Responsibility	Residual risk rating RCP4.5 (2020- 2039)		
12	Changing wind pattern	Health and safety risks to the construction workforce and risk of delay in construction due to compromised site access, damaged building equipment and unsafe working conditions during severe weather events.	Direct								Safety and health	Contractors will monitor weather forecasts and plan works accordingly in response to any extreme weather. Construction phase adaptation / resilience measures to be presented in the Construction Environmental Management Plan (CEMP). A Framework Construction Environmental Management Plan is submitted with the DCO application [EN010154/APP7.7].	Rare	Minor	Low	Research undertaken by Palova et al. (2022) indicates that in the RCP 8.5 Scenario, there could be a gradual but not significant increase in storm activity. This implies that storm events are unlikely during the construction period, with an unlikely (but not impossible) risk of heavy and rain storms during the construction period. Wind pattern changes may align with this increase in stormy weather.	If applicable undertake regular monitoring of trees and large bushes, pruning as necessary to avoid damage to the construction site in the event of a storm with high wind speed.	Contractor	Rare	Insignificant	Low

3. Climate change risk assessment (Operation)

Risk ID	Climate variable	Risk statement	Direct or Indirect, In combination	RISK IDENTIFICATION						RISK ASSESSMENT								ADAPTATION MEASURES											
				Physical structures	Workforce	Materials	Utilities	Plant	Machinery	Access	Impact type	Planned Controls	Initial risk rating RCP4.5 (2020 - 2039)	Initial risk rating RCP8.5 (2040 - 2069)	Initial risk rating RCP8.5 (2070-2099)	Justification	Adaptation Measures	Responsibility	Residual risk rating RCP4.5 (2020 - 2039)	Residual risk rating RCP8.5 (2040 - 2069)									
OPERATION																													
1	Extreme rainfall events	All types of flooding can result in dangerous working conditions on the DCO Site which exacerbates health and safety risk. E.g., workers can trip on debris that was moved during a site flooding event.	Direct	●	●					●	Asset damage, health and safety	Drainage arrangements to attenuate surface water runoff and ensure no increase in flood risk to the Proposed Development location and surrounding areas is discussed along with supporting outline drainage strategy. Infrastructure flood resilience is detailed in Chapter 9: Water Environment of the ES [EN010154/APP6.1]. Weather forecasts will be monitored so any expected periods of heavy rainfall are prepared for in advance, and measures can be in place to minimise disruption to the DCO Site.	Unlikely	Consequence	Low	Risk Rating	Likelihood	Consequence	Medium	Risk Rating	Likelihood	Consequence	Rationale for likelihood and consequences and any changes between climate scenarios	e.g., additional design or operational measures that can be implemented to further reduce the climate risk	Operator	Likelihood	Consequence	Risk Rating	
2	Extreme rainfall events	Deterioration of structures or foundations due to soil moisture levels	Direct	●							Asset damage	Rainwater harvesting is to be implemented on site to capture potential run off - detailed in Chapter 9: Water Environment of the ES [EN010154/APP6.1]. Make sure that there is suitable storage for loose materials, such as soil, to protect from high rainfall events during operation. Raise critical infrastructure to be above high flood risk areas. Operational adaptation measures to be included in the Framework Operational Environmental Management Plan (FOEMP) [EN010154/APP7.8].	Unlikely	Minor	Low	Moderate	Moderate	Minor	Medium	Moderate	Minor	Medium	Projection data suggests increases in seasonal rainfall are possible, but planned controls mitigate risks to workforce and assets.	An Early Warning System will be developed to help provide workers sufficient time to retreat from high risk flood areas. An Emergency Response Plan will be developed for extreme rainfall events.	Operator	Operator	Low	Moderate	Medium
3	Decrease in annual rainfall	Drought risk	Direct	●							Safety and Health	During periods of maintenance works, contractors will monitor weather forecasts and sign up to receive the Environment Agency's flood alerts and plan works accordingly with internal methodologies to manage workers and resources in extreme weather conditions such as storms, flooding. Operational adaptation measures to be included in the FOEMP [EN010154/APP7.8].	Rare	Minor	Low	Rare	Rare	Minor	Low	Rare	Minor	Low	Projection data suggests that drought risk is fairly low in the region, and planned controls mitigate risks to workforce.	There will be an emergency stock supply of potable water stored on the DCO Site. Rainwater harvesting and storage will be incorporated into the design, to allow rain to be collected and used during periods of water shortages.	Operator	Unlikely	Insignificant	Low	
4	Decrease in annual rainfall	Drought risk potentially impacting landscape	Indirect	●	●						Asset damage	The Proposed Development is designed with components that can withstand dry periods, and the landscape will be managed by controls listed in Chapter 10: Landscape and Visual Amenity of this ES [EN010154/APP6.1].	Rare	Minor	Low	Rare	Moderate	Minor	Low	Unlikely	Minor	Low	Projection data suggests that drought risk is fairly low in the region.	No further adaptation measures required.	Operator	Unlikely	Low	Medium	
5	Increase in summer temperature	Extreme heat events can lead to the damage of electricity infrastructure, namely the overheating of electrical cables and/or substation components. This could cause electrical shorts, failures leading to possible further asset damage (i.e., fire) and site down time.	Direct		●	●	●	●	●		Asset damage	Regular maintenance activities carried out by a contractor will provide the opportunity to monitor asset performance and condition. Key sections of electrical equipment will be monitored for signs of damage from exposure to extreme heat. BESS Units with adequate cooling systems installed to control the temperature and continue to operate efficiently in warmer conditions selection, as secured in the Framework Operational Environmental Management Plan [EN010154/APP7.8].	Unlikely	Minor	Low	Moderate	Moderate	Minor	Medium	High	High	High	Projection data suggests that average summer temperatures are likely to increase in the medium- and long-term; however, electrical equipment and solar components are designed to withstand high temperatures.	Conduct fire risk assessments. Regularly conduct assessments to identify potential fire hazards and address them promptly Heat Monitoring: Use temperature monitoring systems to detect high heat levels that could lead to fires Emergency Response Plan: Develop and communicate a clear emergency response plan for fires during heat waves	Operator	Low	Low	Moderate	Medium
6	Increase in summer temperature	Working in high temperatures presents risks to the workforce such as dehydration, fatigue, and damage from prolonged sun exposure. During periods of extreme weather, operational staff may have to be suspended from site - potentially leading to shut downs.	Direct		●						Health and Safety, Financial	During periods of maintenance works, contractors will monitor weather forecasts and plan works accordingly to manage any extreme weather conditions. Operational adaptation measures to be included in the Framework Operational Environmental Management Plan [EN010154/APP7.8].	Unlikely	Minor	Low	Moderate	Moderate	Minor	Medium	High	High	High	Projection data suggests that average summer temperatures are likely to increase in the medium- and long-term. Lincolnshire already holds the UK's highest recorded temperature from July 2022.	Emergency Response Plan: Develop and communicate a clear emergency response plan for fires during heat waves	Operator	Unlikely	Unlikely	Low	
7	Increase in winter temperature	Operational efficiency	Direct	●							Asset use	Operational staff will monitor weather forecasts and plan works accordingly in response to extreme weather conditions. Infrastructure is designed to tolerate hot conditions so will not be impacted. Operational adaptation measures to be included in the Framework Operational Environmental Management Plan [EN010154/APP7.8].	Unlikely	Minor	Low	Moderate	Moderate	Minor	Medium	High	High	High	Projection data suggests that warm winter temperatures are unlikely in short term; moderate in medium-term and likely in the long-term.	No further adaptation measures required.	Operator	Unlikely	Insignificant	Low	