# Outer Dowsing Offshore Wind

# Clarification Note: Climate Change, Increased Rainfall & Soil Impacts

## Deadline 3

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# 1 Background

1. This document aims to assess the effects of climate change on the soil condition and stability, in particular the potential for increases in peak rainfall intensity and the effect this may have on soils along the onshore Export Cable Corridor (ECC).

## 1.1 Planning Policy

2. This assessment is in line with the requirements set out in relevant planning policy.
3. Planning policy on offshore renewable energy Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to climate change, is contained in National Policy Statements (NPSs). The NPSs of relevance to this assessment include:
   - Overarching National Policy Statement for Energy (EN-1) ;
   - National Policy Statement for Renewable Energy Infrastructure (EN-3) ; and
   - National Policy Statement for Electricity Networks Infrastructure (EN-5) .
4. The principal guidance for the proposals is that provided by the NPSs, together with National Planning Policy Framework (NPPF), which provides additional relevant context.
5. Guidance in relation to renewable energy projects is provided within NPS EN-3. For offshore windfarms, this document focuses primarily on the offshore elements of the Project. In relation to climate change, NPS EN-3 refers to NPS EN-1, Section 4.10.
6. Guidance specifically relating to onshore grid connections and climate change adaption is provided in NPS EN-5. In relation to consideration of climate change, NPS EN 5 refers to NPS EN-1, Section 4.10.

*Overarching National Policy Statement for Energy (EN-1)*

7. Paragraphs 4.10.10 - 4.10.11 of EN-1 require that applicants should assess the impacts on and from their proposed energy project across a range of climate change scenarios, in line with appropriate expert advice and guidance available at the time.
8. Applicants should be able to demonstrate that proposals have a high level of climate resilience built in from the outset. They should also be able to demonstrate how proposals can be adapted over their predicted lifetimes to remain resilient to a credible maximum climate change scenario.
9. These results should be considered alongside relevant research which is based on the climate change projections.
10. The assessment should consider the potential impacts of climate change using the latest UK Climate Projections and associated research and expert guidance (such as the EA's Climate Change Allowances for Flood Risk Assessments) available at the time of the assessment to ensure appropriate identification of mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure.

*National Policy Statement for Electricity Networks Infrastructure (EN-5)*

11. Section 2.3, paragraph 2.3.2 of EN-5 requires that applicants set out to what extent the proposed development is expected to be vulnerable and show how the Project has been designed to be resilient to potential effects of climate change.

*National Planning Policy Framework (NPPF)*

12. Chapter 14 of the National Planning Policy Framework (NPPF)[1], *Meeting the challenge of climate change, flooding and coastal change*, along with the National Planning Practice Guidance (PPG)[2] which expands on policies contained in the NPPF, recommends a proactive strategy to mitigate and adapt to climate change. NPPF informs Section 5.8 Flood Risk of EN-1 with respect to the climate change allowances appropriate for assessment.

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[1] National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2023, available at: National Planning Policy Framework

[2] Planning Practice Guidance, Ministry of Housing, Communities and Local Government, Published November 2016, Last updated February 2024, available at: Planning practice guidance - GOV.UK

## 2 Climate Change Allowance

13. The NPPF and NPS EN-1 requires that climate change is considered over the lifetime of the onshore elements of Outer Dowsing Offshore Windfarm (ODOW). For the assessment of soils this requires consideration of potential changes to rainfall over time which will affect water within and on the surface of soils.
14. The Flood Risk Assessment prepared for the onshore ECC [AS1-068] includes detail on the potential increases in peak rainfall intensity over the anticipated life of the development. For the assessment a consideration of a life into the 2070s epoch has been considered.
15. From a planning perspective, for peak rainfall intensity PPG states that the Central Allowance for both the 3.3% annual exceedance probability (AEP) storm event and 1% AEP storm event should be used.
16. The length of the onshore ECC falls within both the Welland Management Catchment and Witham Management Catchment. Details of the potential peak rainfall increases due to climate change are set out in Table 2 1.
17. The climate change allowance for peak rainfall intensity equates to a 25% uplift for both the 3.3% AEP and 1% AEP events.

Table 2.1 Peak Rainfall Intensity Climate Change Allowance

| Management Catchment | Annual Exceedance Probability (%) | Allowance Category | 2050s | 2070s |
|---|---|---|---|---|
| Witham Management Catchment | 3.3 | Upper End | 35% | 35% |
| | | Central | 20% | 25% |
| | 1 | Upper End | 40% | 40% |
| | | Central | 20% | 25% |
| Welland Management Catchment | 3.3 | Upper End | 35% | 35% |
| | | Central | 20% | 25% |
| | 1 | Upper End | 40% | 40% |
| | | Central | 20% | 25% |

18. Embedded mitigation measures are included within the application to prevent long term changes to surface water drainage and to control any earthworks activities during the construction phase. These measures are discussed in the Environmental Statement [APP-079 and APP-080] and are secured within the Code of Construction Practice [REP2-029]. Taking these measures into consideration, there are no significant changes to surface water hydrology anticipated for the construction phase of the project and no subsequent significant impacts are assessed in relation to soil or soil loss. Once constructed the land along the onshore ECC will be reinstated and there will be no change to existing surface water hydrology and no potential for a change to the soil environment.

# 3 Soil Stability Assessment

## 3.1 Field Capacity

19. Field capacity refers to the amount of soil moisture or water content held in the soil after excess water has drained away and the rate of downward movement has decreased, typically occurring two to three days after rain or irrigation in soils with uniform structure and texture. It is an important concept in soil science, agriculture, and environmental management as it represents the maximum amount of water that soil can retain for plant use without being saturated.
20. Soil water holding capacity is the maximum amount of water that a soil can retain after excess water has drained, and which is available for plant use, determined by the soil's texture, structure, and organic matter content.
21. When soils reach their full water holding capacity, they can no longer absorb additional water, at which point they are saturated, in which case excess water typically leads to:
    - **Surface Runoff**: Excess water flows over the surface of the soil, leading to runoff. For bare soils, this is likely to cause erosion and the movement of sediment to nearby water courses. Where surface runoff is excessive, this could result in localised flooding.
    - **Ponding**: Water may accumulate on the soils surface, creating temporary ponds or puddles, especially in flat areas or on soils with poor drainage.
    - **Percolation to Groundwater**: Depending on the soil’s permeability and soil profile, water may slowly percolate, recharging groundwater aquifers.

## 3.2 Effects of Climate Change on Soil Stability

22. Assuming peak rainfall increases by 25%, as described within Section 2, the soil will have exceeded its field capacity and water holding capacity limits (as described within Section 3.1 and 3.2) and therefore the soils would be fully saturated and soil structure and stability in itself will not be affected. Once soils reach the water holding capacity limit, this would result in surface runoff run-off, ponding, or percolation to groundwater.
23. The land on which the Project is situated is low lying relatively flat land. Earth movement or subsidence due to flooding is less likely to occur on low-lying, flat, and level land because the gentle gradients reduce the risk of movement. This area of Lincolnshire has extensive water management systems, including drainage channels, and pumping stations. These systems help manage water levels and reduce the risk of prolonged flooding, which can lead to subsidence.