East Anglia ONE North Offshore Windfarm

Appendix 7.3

Assessment of Transboundary Effects

Environmental Statement
Volume 3

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7.3.1 Introduction

7.3.1.1 Purpose of this document

1. This report has been produced to assess potential transboundary effects arising from the proposed East Anglia ONE North and East Anglia TWO projects, in the context of physical processes.

7.3.1.2 Transboundary Effects

2. To investigate the potential for transboundary effects, consideration has been given to potential effects on each of the wave, tidal and sediment regimes. The receptors that could potentially be affected by transboundary effects are areas of the sea bed and shoreline in Belgium, France and Germany and part of the sea bed in the central North Sea (***Figure 1***).

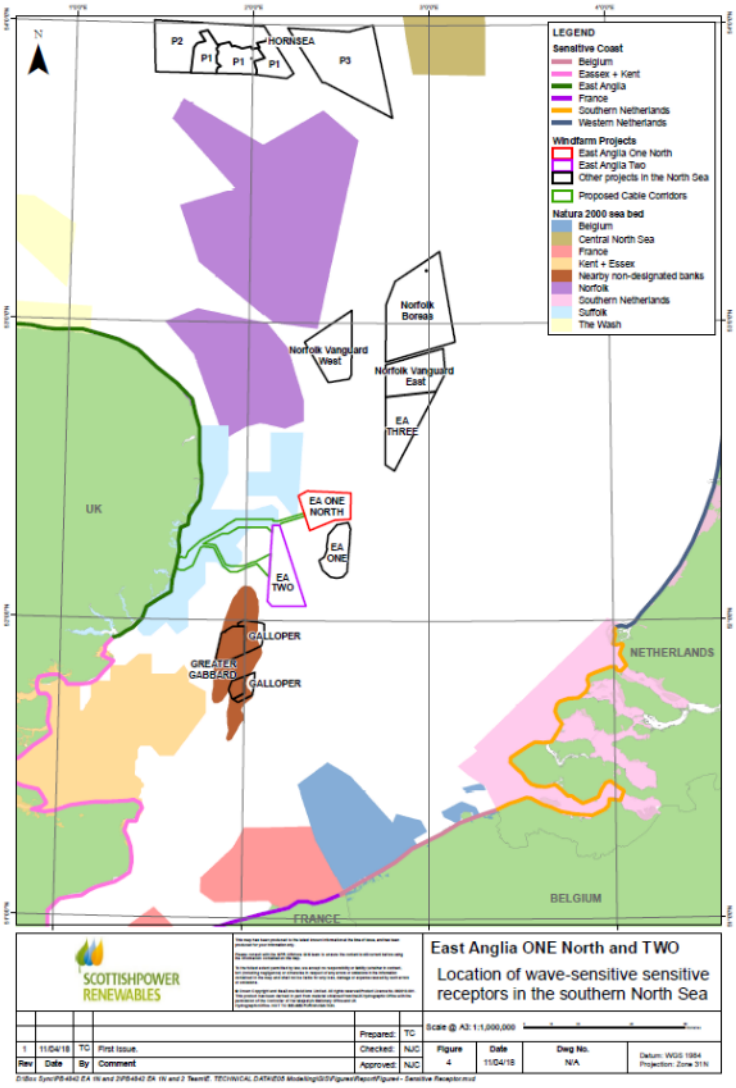

Figure 1: Location of sensitive receptors in the southern North Sea

7.3.2 Wave Regime

3. The greatest potential transboundary effects on the wave regime are associated with the cumulative modelling assessments (rather than the individual project modelling) and with the 1 in 1 year return period event (compared to the 1 in 50 year return period event). Furthermore, the greatest potential cumulative effect on the identified sea bed and shoreline receptors along the mainland European coast was associated with waves from N, due to their alignment with respect to the specific windfarm projects and the Belgian coast in particular.

4. ***Figure 2*** shows the zone of influence map for this worst case condition for transboundary effects. Note that wave effects would extend marginally southward of the southern model boundary, but dissipate to baseline values within a very short distance of this boundary.

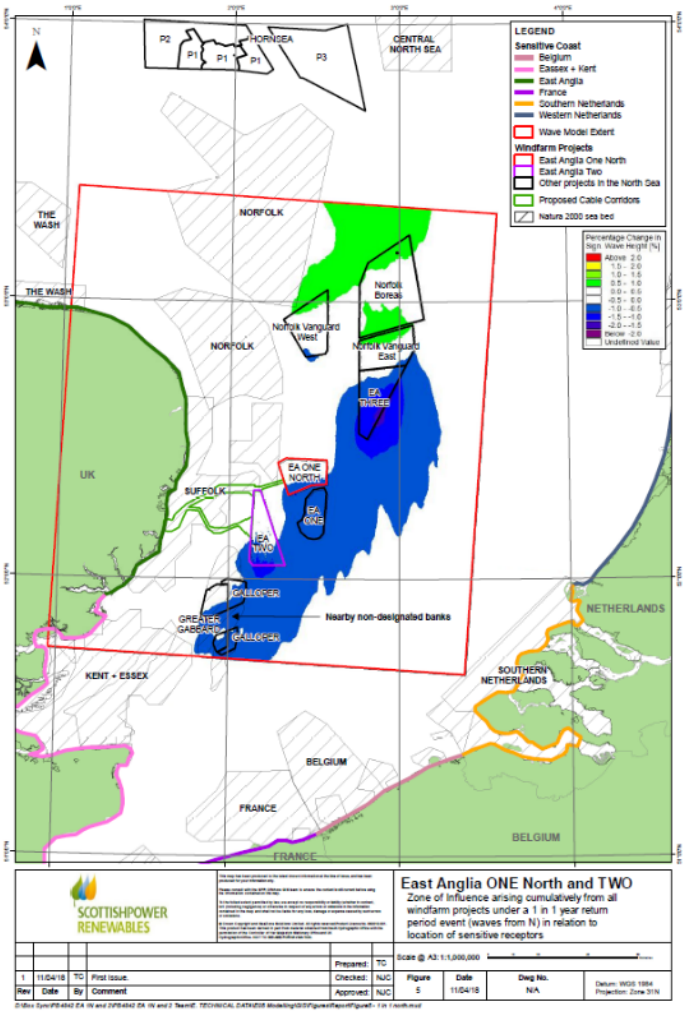

Figure 2: Zone of Influence arising cumulatively from all windfarm projects under a 1 in 1 year return period event (waves from N) in relation to location of sensitive receptors

5. It can be seen that there is no potential for change in baseline wave conditions leading to transboundary effects.

7.3.3 Tidal Regime

6. To assess the potential for transboundary effects to influence the tidal regime, Cefas suggested use of a ‘zone of influence’ approach that had previously been adopted for other windfarm projects in the former East Anglia Zone, such as East Anglia THREE.

7. This zone of influence is based on an understanding of the tidal ellipses in the area and knowledge that effects arising from wind turbine and platform foundations on the tidal regime are relatively small in magnitude and largely confined locally to near field effects. Generally, it is likely that effects on the tidal regime are dissipated within one tidal ellipse of the obstacle to flow on the sea bed.

8. Based on this principle a zone of influence has been derived from all projects within the former East Anglia Zone as well as Galloper and Greater Gabbard (***Figure 3***).

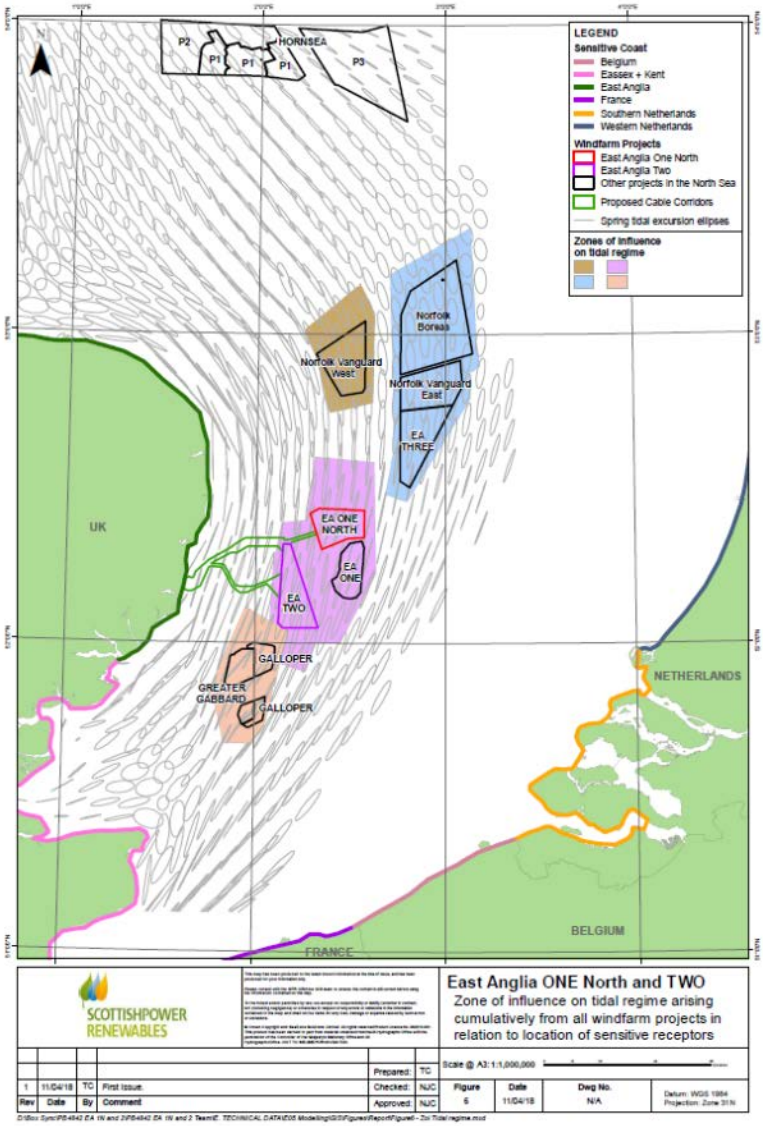

Figure 6: Zone of influence on tidal regime arising cumulatively from all windfarm projects in relation to location of sensitive receptors

9. This shows that the zone of influence from these projects cumulatively can be separated into four distinct locations with no interaction between them, namely:

- Norfolk Vanguard West only;
- Norfolk Boreas, Norfolk Vanguard East and East Anglia THREE cumulatively;
- East Anglia ONE, East Anglia ONE North and East Anglia TWO cumulatively; and
- Galloper and Greater Gabbard cumulatively.

10. Note that whilst there is some overlap between the zone on influence from East Anglia TWO on the flooding tide and the zone on influence from the northern part of Galloper on the ebbing tide within the area of sea bed between these two projects, both of these tidal events cannot occur simultaneously and therefore there will also be a separation of zone of influence between each project grouping.

11. The zone of influence arising from East Anglia ONE, East Anglia ONE North and East Anglia TWO cumulatively does marginally impinge upon the edge of part of the 'Suffolk Natura 2000' receptor and the non-designated sandbanks. However, the magnitude of change at these locations will be at its lowest value since it is the most remote area of the zone of influence from the windfarms.

12. Furthermore, the zone of influence shows that there is no potential for transboundary effects arising from changes to the tidal regime.

7.3.4 Sediment Regime

13. Transboundary effects on the sediment regime could arise during the construction phase, in the form of a sediment plume, or during the operation phase if there are significant changes to the wave and/or tidal regimes.

14. Given that there are no transboundary effects arising from changes to the wave or tidal regimes, consideration focuses on the construction phase effects, which will be temporary. Sediment disturbed from the sea bed during installation of cables of foundations may become entrained in a sediment plume and advected by tidal currents under the sediment re-settles on the sea bed. The distance that any plume will travel, and the concentration of the suspended sediment in the water column will depend on both the direction and magnitude of the tidal currents and the size (and hence settling velocity) of the sediments.

15. Any plume that does arise will move in the direction of the tidal currents, which are governed by the tidal ellipses. These are presented in ***Figure 7*** and it can be seen that there is no potential physical connection, in terms of tidal currents, between the proposed East Anglia TWO and East Anglia ONE North projects and the sensitive shoreline or sea bed receptors in Belgium, France or the Netherlands. Also, these areas are very remote from the proposed developments and it is inconceivable to envisage that sediment entrained within a plume would reside in the water column in sufficient quantities to reach such areas in measurable quantities even if there were a direct physical connection.

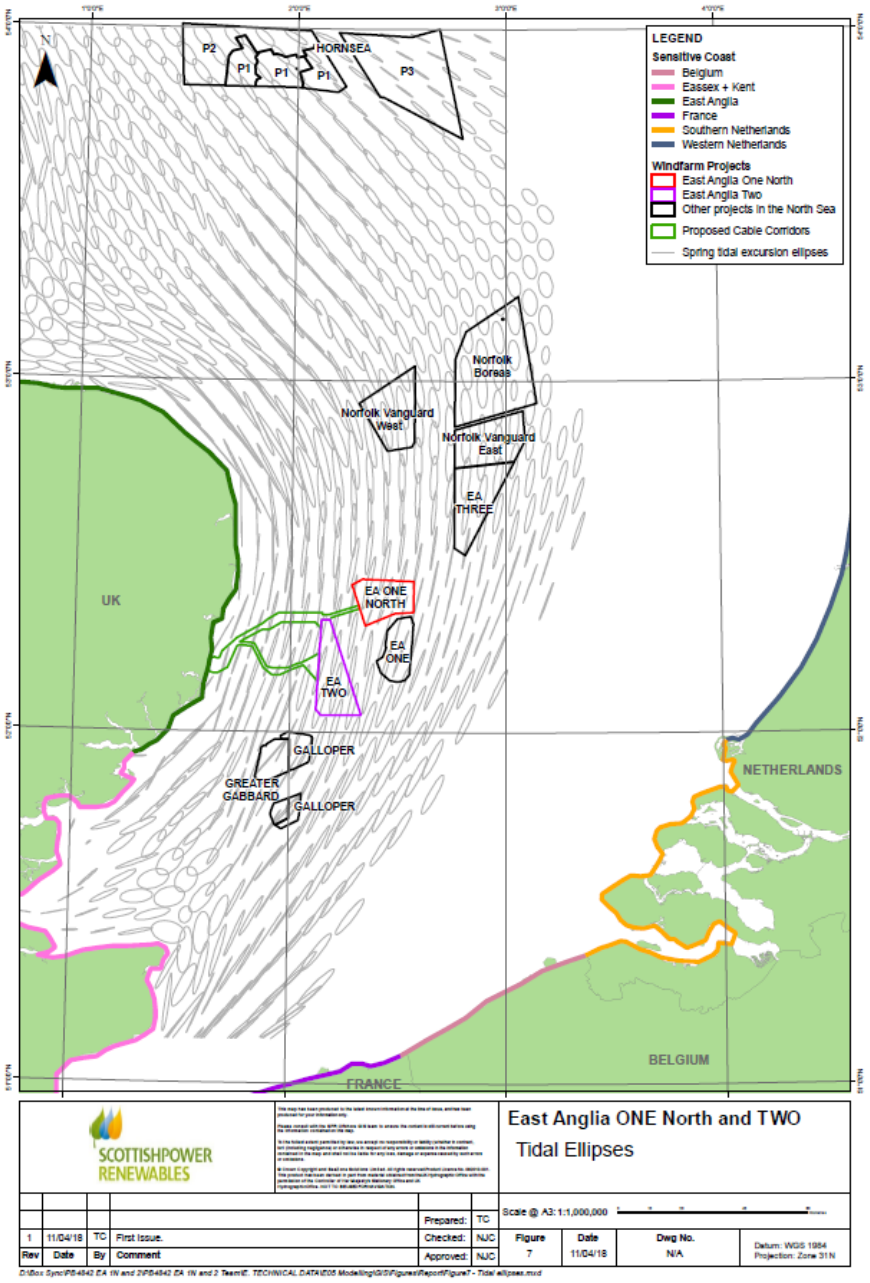

Figure 7: Tidal ellipses

16. Due to the above, there is no potential for transboundary effects arising from changes to the sediment regime.

17. Given that the zone of influence and tidal cycle in the area will not result in transboundary effects for sediment deposition, or that effects on tidal resource will not result in transboundary effects, it is proposed that there is no pathway for transboundary effects on sea bed sediments and benthic habitat. Therefore, this is presented as justification for scoping out transboundary impacts on benthic habitats.

7.3.5 Conclusion

18. Given that there is no potential for transboundary effects arising from changes to the wave, tidal or sediment regimes, consideration of transboundary effects on physical processes and benthic ecology should be scoped out from further assessments.

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