15 Pigg Lane
Norwich
NR3 1RS

Telephone: 01603 761660
Email:
michaelr@cprenorfolk.org.uk

www.cprenorfolk.org.uk

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CPRE NORFOLK RESPONSE TO VATTENFALL VANGUARD PEIR CONSULTATION

OVERVIEW

We discuss the following Chapters for the individual content and comment, and cross-over links: Chapter 5 Project Description; Chapter 19 Ground Conditions and Contaminants; Chapter 20 Water Resources and Flood Risk; Chapter 21 Land Use and Agriculture; Chapter 22 Onshore Ecology. For each Chapter we make comment (in italics) on selected points by reference to the text Number, Table or Plate. For each numbered text we indicate what is said and then comment. We make specific points in some detail from the above Chapters. From this we draw the overall general conclusions immediately below.

1. There is an overwhelming case for HVDC to be taken as an embedded mitigation measure for the onshore transmission of electricity from landfall to the national grid. In many ways it has advantages over the use of HVAC, and for differing aspects this is widely recognised by residents, farmers and the interests of nature conservation.

2. The advantages of HVDC transmission are obscured by the misuse and interpretation of the Rochdale Envelope by progressing HVAC and HVDC together within the envelope through the overall planning process and beyond. If the company wishes to pursue both options then it should do so in a way that makes clear the differences between the two systems. It should not conflate the two within an envelope range which encompasses both systems.

3. Not only does this not happen, but it requires some perseverance to read the code used throughout. For a range on minimum to maximum impact on a factor, the first means DC and second means AC. For a worst case scenario in assessing and impact, read AC.

4. This approach needs to be challenged on several grounds. The consultation does not present the data in an open and clear way to those responding. If it is lawful in terms of the Rochdale Envelope, it is certainly not in the spirit of what the public might rightly expect. This fault is most prevalent in Chapters 5, 19 and 20; less so in 21, and clearest in Chapter 22 of those commented on in detail in this submission.

5. *Clearly the use of DC would bring a much greater degree of mitigation to the project,* while inherently AC might well squeeze through the Development Consent Order requirements by using the envelope approach. At present the only major generic mitigation is horizontal directional drilling (HDD) as a better alternative on selected sites than the standard open cut trenching technique for cable laying. In addition, there is a range of different packages according to specific needs, most essentially in the realm of best practice. In all cases the

'no mitigation' impact may be quite high, but after the proposed mitigation measures the impact is assessed as negligible, low, minor or moderate adverse in terms of an Environmental Impact Assessment. As such it will not be considered in the Environmental Statement and public examination; it is only severe adverse, and possibly moderate adverse, *that are taken forward*. Further in the NSIP process the cumulative effect relates just to other major development taking place nearby; specific examples are with the Orsted Hornsea Three Project with Vanguard, or Vanguard with Boreas; or both companies with the dualling of the A47 to the west of Norwich, planned to start in 2021.

6. There are few or no factors it seems after the proposed mitigation measures that are in the moderate or severe impact range. Taken at face value at this PEIR stage there would be little to discuss as regards the EIA and ES other than conditions. In that case the Project could be approved for AC and at a much lower level of environmental protection that could be achieved, and would be selected although being the worst case scenario. That would be a lost opportunity in terms of public goodwill.

7. Transmission by HVDC is much less used at present than HVAC, particularly in the UK, but is proven and reliable. Being more recent in application on a large scale there are few suppliers worldwide than there are for HVAC equipment. The main reason that both Orsted and Vattenfall run with the AC 'solution' as well as the DC 'solution' appears to be that the former will be cheaper at the point where construction is about to start. To most the solutions will not be seen to be equivalent, and clearly they are not, but AC will produce a result which is just inferior than could have been achieved with DC. Furthermore, no DC company is likely to invest in an expansion of their production facilities in the degree of uncertainty of we will decide just before work commences on the choice of AC vs DC. There is also the risk that in the longer term AC continues to dominate by a self-perpetuating process.

8. The only disadvantage of HVAC that is made clear to the public is that AC onshore transmission requires a cable relay station (CRS)/booster station and that HVDC does not. The public were quick to latch on to that, for Orsted as well as Vanguard. What there may be at present is that Boreas follows Vanguard about a year later; that if it is also a 1800 MW project, but from a different wind farm site. As such, with HVAC we would end up with a second CRS for Boreas. While Boreas will be the taken through the NSIP planning process separately, there are elements that are taken up in the Vanguard application, namely the adjacent cabling route; and a site for a second CRS. Further of course, if AC is chosen for both, the disadvantages inherent in AC are that much greater.

9. From the wildlife aspect we recognise that sites with an international designation are avoided entirely, and in general so are county wildlife sites, and sites with protected species. In landscape terms the Broads and AONB are avoided by Vattenfall (it is less clear as to what mitigation in the AONB will be used on the Orsted route). However, and this relates to the NISP process, there is no mention of the 'ordinary' countryside and its part in the ecological network. This only arises in the Ecology Chapter, but in our view the treatment is inadequate, but other than that there is much to be recommended.

10. Finally, in this summary, as noted above, that at least within the Vattenfall documentation there is some information which is sufficient to try and understand the issues surrounding the HVAC vs HVDC situation. We add also that the CPRE members visiting the roadshows for the PEIR found the staff most helpful and open to discussion. This greatly adds to the consultation process. The print Consultation Summary Document is well written and illustrated, and a help in leading into much documentation, and linking across the specialist chapters.

CHAPTER 5 PROJECT DESCRIPTION

ONSHORE: We select and note the numbered points; and comment on most of these.

272. Norfolk Vanguard will seek consent for the following onshore elements of the project. Landfall; onshore cabling corridor including cable route, trenchless crossing technique such as Horizontal Directional Drilling (HDD) zones and primary and Secondary Mobilisation Areas; two HVAC cable relay station options; onshore project substation; and extension to the Necton National Grid substation and overhead line modifications.

Comment: *Norfolk Vanguard and Norfolk Boreas will, if HVAC selected, will each require a CRS.*

273. The applicant will, as part of the planning application of the DCO application, also be seeking to obtain consent to undertake some enabling works for the Norfolk Boreas project. These include the installations of ducts to house the Boreas cables, along the entirety of the onshore cable route from the landward side of the transition pit to the onshore project substation; modifications at the Necton National Grid substation to accommodate the Boreas project; and landscape and planning schemes designed to mitigate the impacts of both projects.

Comment: *We recognise the advantages in this arrangement with two separate wind farm sites; but both should be DC.*

278. The offshore cables would be installed under the Happisburgh South cliff and existing sea defences to be joined to the onshore cables at the transition pits on the landward site of the landfall site. HDD would be used to ensure deep burial of the cable to protect it from wave action and coastal erosion. The depth of burial at the landfall site is expected to between 3m and 10m below sea level.

280/282/284. The works for HDD installation per duct would include either exit on the beach above the level of mean low water spring, classified as 'short HDD', or at an offshore location up to 1000m in drill length, classified as a 'long HDD'. In the case of a long HDD, the installation process for the ducts and cables would not involve any works taking place on the beach. However, in the case of a short HDD there would be beach works at several stages on the process.

Comment: *For DC there would be two ducts, for AC there would be six ducts to carry the cabling. This would be replicated for Boreas coming about one year after Vanguard.*

292. Table 5.30 gives further information on the key parameters for landfall, and does so in a way that masks DC vs AC (neither are mentioned as such). The terms 'maximum' and 'minimum' give the impression of a range between them, when in fact one figure is for DC and one is for AC. Hence, the number of cable ducts are shown as minimum 2 and maximum 6; diameter of drill (mm) is 300 and 750; target depth of drill (m) is 5 vs 25; number of transition pits are 2 vs 6; depth, width and length of pit (m) shown as -, -, -, vs 5.0, 10.0 and 15.0; area of construction compound (sqm) blank vs 3,000; amount of material to be excavated (cubic metres) is – vs 1,178; amount of material to be moved off site is – vs 1,500.

Comment: *We consider this is a misuse in data presentation, the DC and AC elements are not made clear and are wrapped up in the Rochdale envelope.*

295. A CRS would be required for a HVAC connection only. The decision between HVDC and HVAC connection technologies would not be taken until post-consent, therefore for the purposes of this PEIR, the worst case scenario is assumed which would be that the CRS is required.

Comment: *This seems to be a distortion of the term worst case scenario; there is a deliberate and planned clear cut choice being made, rather than coping with something worse than the expected norm.*

296. Note that only the CRS for Norfolk Vanguard is included in this assessment and will be part of the consented project. The CRS for Norfolk Boreas will be considered as part of that project's assessment (likely to be co-located with Vanguard) prior to the completion of the Vanguard DCO application. If selected prior to completion of the DCO application, this will be considered in the cumulative assessment.

Comment: *Map 1 of the Onshore project area shows two potential CRS sites, one labelled Option 5a and the other Option 6a. About 1km from the landing area the cable corridor divides with 5a on the northern leg and 6a on the southern side, and then becomes one corridor again. A verbal description of the location of the two sites is given in this chapter at 319.*

300. A CRS maximum height of the reactor and associated GIS equipment would be 8m. The total CRS fenced area would be a maximum of 73m x 135 m, with a fence height of 2.4m. External to the perimeter fence would be a small control building with associated parking with dimensions of 31m x 18m.

307/308. There would be a commitment for planting with the establishment of woodland belts in strategic locations around the compound to screen the Vanguard CRS and the Boreas CRS. Further details are given in Chapter 29, landscape and visual impact assessment. The planting would comprise a mix of faster growing 'nurse' species and slower growing 'core' species. It is anticipated that 6m growth would take 15 years and at the end of the 25-year consent period the trees will be about 11m high.

310, 313, 317, 318. For construction the site would be stripped and the material reused as part of bunding and shielding as allowed for in the agreed final design. Foundations would be either ground-bearing or pile based. Due to the size and weight of the reactors, specialist delivery methods would be employed. The units would be offloaded at the site with the use of a mobile gantry crane. The full construction for the CRS would be around 18 months; the delivery and installation of electrical plant would take place in phases following the main construction works.

Comment: *The above four paragraphs of course apply only for a HVAC 'solution'. It will be about half way through the consent period before screening is significant; if there is no re-application for continuation at the end of the consent period then decommissioning will take place, and removal of equipment and demolition of the building will also take 18 months, to be followed by landscaping and reinstatement of the site. Further CRS key parameters are shown at Table 5.3.1. The maximum additional temporary operational footprint is 10,413 sqm, and additional temporary construction area is 15,000 sqm to give a total site size of 25,413 sqm. We have further 'maximums', namely tallest structure 8.0m, access road length is 1000m.*

Comment: *Having HVAC and two CRS sites is a retrograde step in landscape terms and large-scale disruption of the site over a one generation period of time. There are also other issues.*

314, 315. The peak noise levels would be produced by the oil immersed reactors with an unmitigated noise level of approximately 102 dB (A) LwA, further detail in chapter 25, Noise and Vibration. Noise mitigation could take the form of a combination of noise barriers, bunds, enclosures, a change in site layout, and a change in plant procurement stage.

Comment: *No doubt residents affected will respond to this issue. For CPRE, while lighting if used will be restricted to movement detecting security lighting, noise is an issue related to tranquillity and is an inevitable major impact in the landscape. This is likely to make it one of relatively few issues to be, after mitigation, significant in EIA terms.*

320. Comment: *There are two mistakes in referring to maps 1-6 (Figure 5.4) when describing the onshore cable corridor. The crossing of the River Wensum is at Map 5, not 4; and entering the refined onshore project substation zone near Necton is at Map 6, not 5.*

321, 322. The onshore cable route (100m) would be located within the onshore cable corridor (200m) and would house all the infrastructure for the Vanguard project as well as ducts installed for the Boreas project. The cable route is called 'the cable easement, which is the area of land for which Vanguard would seek rights over - either permanent or temporary - as part of the DCO. An indicative cable route (100m) has been outlined in figure 5.4.

Comment: *This is very indicative being a dotted central line within the corridor (200m wide), but will be defined at the PEIR stage.*

322. The onshore cable route would contain the main 220kV HVAC or 320kv HVDC onshore export cables within ducts, 400k HVAC 'interface cables' which would connect the onshore project substation to the Necton National Grid substation and ducts for the Boreas project. The onshore cable corridor is 200m wide to allow for the onshore cable route to be located in such a way to minimise potential impacts.

Comment: ***Nowhere is it acknowledged that HVDC would allow for much more flexibility within the corridor than would HVAC. This could be of great benefit in terms of 'wriggle room'. This is something that is 'lost' in using the Rochdale envelope and conflating the two systems and not showing the performance differences between HVDC and HVAC.***

323. The onshore cable route would require trenches (within which ducts would be installed to house the cable circuits); a running track to deliver equipment to the installation site from mobilisation areas; and storage areas for topsoil and subsoil.

324. Plate 5.16 and Plate 5.17 illustrate the working area required to install the ducts and cables for the HVAC and HVDC solutions of the project as well as ducts for Boreas**.**

Comment: *This gives a useful representation but does not give a clear picture of the intrinsic differences between DC and AC in the cabling process, because there are two projects running side by side. However, the print copy of the Vanguard Consultation Summary Document does give the cable easement of Vanguard alone, and the small print is legible in this (page 36, Cable easement, Norfolk Vanguard only). The temporary working strip is 35m for DC and 50m for AC; and for the permanent easement is 13m for DC and 25m for AC. (Orsted provide no data, but using a proportionate factor allowing for a 2400 MW project rather than 1800 MW for Vanguard and Boreas, then we estimate Orsted has a temporary strip of 47m for DC and 67m for AC; and the permanent easement of 17m for DC and 33m for AC).* ***These differences are significant in the land take over 55-60 km of cabling route, and HVDC would also allow for increased wriggle room; for example some separation from farmland ponds, reduced take of hedgerows, more space from a historic building and/or its setting, less impinging on a site of archaeological interest, and avoid impacting on an underground water flow. HVDC offers a much higher level of baseline cumulative mitigation along the cabling from shore to the national grid than can be achieved by HVAC.***

327, 355. Where open cut trenching is likely to be required in constrained areas, such as at hedgerow crossings, the working width could be reduced to the running track and cable trenching areas only (eg 54m for HVAC Vanguard and Boreas) with soil storage areas retained immediately before and after the feature crossing.

Comment: *This is not a helpful example, being an inferior option. It should be viewed in the context of Table 5.33 Summary of onshore route key parameters. For Vanguard and Boreas the permanent strip width for HVAC is given as 38m (trenched feature crossing width up to 54m).* ***This appears to indicate that the HVAC dual project requires 2 x 8m of running track to give the 54m figure, whereas HVDC has one. The number of AC ducts is such that the 'reach' factor requires the retention of two tracks for HVAC. Table 5.33 gives minimum and maximum figures for the number of cable trenches in which the ducts are set is 4 and 12 respectively; likewise for the width of cable trench we have 1.0m and 1.5m. Decoding this, this means a width combination of 4m for HVDC and 18m for HVAC.***

Affecting the depth we have the cable diameter for HVDC is 100mm, and for HDC 150mm. The permanent strip width for HVDC is given as 20m. *Table 5.34 Summary of joint pit key parameters employs the minimum and maximum approach; we speculate that again these represent either HVDC or HVAC, and not some range.* ***The differences in temporary strip widths for HVDC (45m) versus HVAC (100m) for Vanguard and Boreas are particularly important for non-arable land.*** *Removal of vegetation and top soil requires restoration of what was there, and as such will be variable according to habitat type; this can be compounded by the time element, and the degree of compacting on the running tracks. The area affected is more than twice as much by HVAC rather than HVDC. For all types of land HVAC will result in more topsoil and subsoil storage and as such presents a greater risk of water borne soil erosion.*

356. When crossing some features along the onshore cable route, alternatives to open cut trenching is required. These are shown by type of crossing, and primary and secondary method. For the Mid-Norfolk Railway, the Rivers Wensum and Bure, and trunk roads A47, A140 and A149 it has to be some form of HDD. For major roads the primary method is traffic management, which includes B roads and the A1067, with the secondary method being HDD. For hedgerows the primary method is removal and the secondary method is HDD variation.

Comment: *There is scope for avoiding removal of historic hedges, indicated from maps and an average of six or more species in 30m lengths. It is hoped there could be more use of HDD as the primary method to lessen impacts.*

410. Lighting of the Onshore Project Substation would be temporary during working hours only for maintenance activities.

Comment: *Assurances would need to be given about the extent of these 'working hours', ensuring they would not include evenings, night times or week-ends.*

CHAPTER 19. GROUND CONDITIONS AND CONTAMINENTS

7. Table 19. National Planning Statement describes the National Planning Statements for Nationally Significant Projects and quotes two which are relevant to the project. These are the overarching NPS for Energy EN-1 DECC 2011a and Electricity Networks Infrastructure EN-5 DECC, 2011b. EN-1 at section 5.3 states that the applicant clearly sets out any effects on designated sites of ecological or geological importance, protected species and on habitats and other species important to the conservation of biodiversity. The ENS section states that underground lines do not require development consent under the Planning Act 2008.

Comment: *There are in practice constraints on undergrounding, see comments by the Environment Agency at page 6 and tables 19.3 and 19.4 Both EN-1 and EN-5 are superseded on one important issue by the National Planning Policy Framework of March 2012, and this is particularly important for EN-1****. EN-1 does not make any reference to ecological networks, and there is inadequate or no comment by Vattenfall (or Orsted****). Both companies should note and act on what the NPPF says at Chapter 11 Conserving and enhancing the natural environment on this point. Paragraph 109 Minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity,* ***including by establishing coherent ecological networks that are more resilient to current and future pressures****. The North Norfolk District Council Policy EN 9 Biodiversity has a six-page Appendix B on the ecological network and the importance to the Chalk Rivers in the district.*

41. Ground investigations are ongoing at key trenchless (eg HDD) crossing locations listed: Crossing 1 – A47; Crossing 2 –Norfolk Railway east and west sides; Crossing 3 – River Wensum east and west; Crossing 4 - River Bure west and east/Crossing 5 – A140; Crossing 6 – A149/Crossing – Norfolk Railway; Happisburgh South Landfall. We note that in addition there are trenchless crossings to the north west of North Walsham (from the route corridor

maps looks to be the North Walsham and Dilham Canal), and just north of Bacton Wood/Witton Heath, presumably to underground the road running north-south to Horning and the Broads, a major tourism area.

Comment: *We would be supportive of these two additions, but suggest that there are a number of other locations which would benefit from a trenchless approach, and these should be identified in the next stage of work.*

49,50. From Walcott to Happisburgh (encompassing the landfall area at Happisburgh South) sediment transport rates have been estimated at just over 500,000 cubic metres per year between 1979 and 1994. The rate of transport is leaving from the south than is entering from the north-west. Since 1999 the shoreline has eroded up to 10m/year along the landfall site in response to failure of existing defences.

Comment: ***Surely the 'long HDD' and not the 'short HDD' must be used, running deep under the beach at near 10m deep and near 1km inland (chapter 5, 280).***

58. The onshore cable corridor crosses four main catchment river catchments. Some tributaries and wetland areas for each river are listed. For the River Bure the most notable tributary is King's Beck. The downstream reaches of the river have a range of wetland features, including Hoveton Great Broad and Marshes, Woodbastwick Fens and Marshes, Bure Marshes. The River Wensum and several of its tributaries would be crossed, most notably Wendling Beck and the Blackwater Drain. The River Wissey headwaters fall within the area for the Necton National Grid substation extension. The North Walsham and Dilham Canal is crossed at North Walsham (see 41 above; note also a leisure interest).

Comment: ***The tributaries and wetlands listed above and others should be considered for a trenchless crossing to minimise the risk of silt entering the river systems, and not adding to the loading caused by arable run-off, a major problem for all rivers entering the Broads (Bure, Wensum and Ant). Those running into the Wensum have the additional issue is that the whole upper reach of the river is designated SAC.***

59. The baseline hydrology is described in more detail in Chapter 20 Water Resources and Flood Risk, but we note Tables 19.10 and 19.13 which show the status of the Broadland Rivers Chalk and Crag groundwater body and that of the North Norfolk Chalk groundwater body.

114. It is anticipated that surface watercourses are in hydraulic connectivity with groundwater contained within superficial deposits throughout the study area. The River Wensum is a chalk river that is designated as an SAC and SSSI and is therefore considered to have high sensitivity. Tributaries of the Wensum such as Wendling Beck and the Blackwater drain are also considered to have high sensitivity, on the basis of their direct connectivity with the main River Wensum, on their basis of their direct connectivity with the main River Wensum.

Comment: *A team at UEA shows that much of the silt getting into a river system does so in a heavy rain event; and that in a drainage ditch will move on in the next heavy rain event until it reaches the main river. As such ditches only periodically in hydraulic contact with the groundwater also pose a risk.*

116. The overall impact on indirect or contamination of surface watercourse based on the situation which includes the integration of measures adopted in section 19.7.1 is considered to be **minor** adverse which is not significant in EIA terms.

Comment: ***We consider there is a divergence between the theory and what happens on the ground. As a marker consider the persistent and severe problems with agriculture and arable run-off, in spite of good practices ELS, etc. As well as the adverse impact on rivers, it can also result in flooding of property.***

CHAPTER 20. WATER RESOURCES AND FLOOD RISK

42. Table 20.1 The Secretary of State asks that the Flood Risk Assessment should take into account the most up to date climate charge allowances and should cover tidal flood risk as well as fluvial impacts under present and projected sea level scenarios.

Comment: *The consideration of 'short HDD' as an option for the landing at Happisburgh South makes it seem that this advice has yet to be factored in. A tidal surge on the east coast as severe as that of the 5th December 2013 on the north coast could impact on cable relay stations if HVAC transmission were to be used.*

75. Table 20.7. We note the geomorphological overview of the Rivers Bure and Wensum and associated water bodies; and at 76 that the water quality data of the surface water bodies identified predominantly good physicochemical and chemical quality conditions across the main surface water catchments.

Comment: *the exceptions on phosphate level, one from sewage effluent discharges (77), and the other from arable run-off (78) – however these problems are widespread, albeit at a lesser degree than those mentioned here.*

88. Table 20.8, Mitigation measures embedded for water resources and flood risk. We note the ten mitigation factors listed.

Comment: ***The greatest mitigation measure of all for all would be the use of HVDC power transmission rather than HVAC. Apart from not requiring cable relay stations (two with Vanguard and Boreas) the whole cabling would see a much reduced amount of soil to be excavated and stored and back-filled along the 60 km length. In addition, because of that, there will be a greater chance of monitoring the construction work and assess the degree to which the codes of practice and mitigation measures are complied with.*** *We make also make some* ***specific comment****. On the drainage plan it is good to maintain the duration for which trenches remain open by installing ducts in short sections and re-filling on the completion of each section. It is not clear though how the drainage plan to minimise water in the cable trench and ensure ongoing drainage of surrounding land, how the water in general might be got away; nor where water does enter the trenches during installation, how this will be pumped via settling tanks or ponds to remove sediment and then be discharged into local ditches or drains via temporary interceptor drains. For trenched watercourse crossings the dams will be removed; but again it is not clear on how the watercourse will be diverted and where; and what might happen in even a relatively minor rain event, such as dam failure and/or spill-over or failure in the diversion****. Mention is made of the use of existing tracks and roadways for access where needed. However, no mention is made of the running tracks and the soil compaction caused by repeated use by heavy vehicles, far greater than occurs in agriculture, where it is a major factor in arable run-off****. Mobilisation areas will comprise hardstanding to prevent soil erosion and increased surface runoff; will hardstanding really help, it may well depend on the nature of the top soil and underlying subsoil. For surface water drainage systems the SuDS philosophy will be employed to limit runoff, where feasible, and how often will that be? Foul drainage will be collected through a mains connection to existing local authority sewer system if available, and for rural Norfolk again how often will that be? The alternative would be a septic tank located within the onshore project area.*

89.This section establishes the Worst Case Scenario (WCS) for each key impact category and the construction scenario, as well as the particular design parameters (such as the maximum construction footprint at the landfall) that define the Rochdale Envelope.

Comment: We finish where we began. The Worst Case Scenario is the use of HVAC instead of HVDC. However, this is 'lost' and not identified as such by the misuse of the Rochdale Envelope. This applies all along the cabling corridor. In our view this invalidates the process by which impact assessments are made and advantages and disadvantages are assessed as regards residents, farmers and wildlife. Further at Table 20.15, using HVAC and the

WCS, the residual impact identified for water resources and flood risk on the various receptors is shown as 12 negligible and 17 minor, nothing even as moderate adverse. Nothing is significant in EIA terms, and at face value there would be no taking forward to the Environmental Statement. The same methodology brings the same sort of result in other topic areas.

CHAPTER 21. LAND USE AND AGRICULTURE

27. Table21.3 Consultation. The SoS considers that Water Resources and Flood Risk also have the potential to have effects on Land Use.

Comment: ***They do, and we disagree that after mitigation they are all assessed as either negligible or minor. Further, that while the worst case scenario is HVAC rather than HVDC, this is obscured by the use throughout of the Rochdale Envelopment.*** *The potential temporary and permanent loss of Agricultural Land Classification land should be assessed within the ES. At this PEIR stage it is estimated to be 21% of the temporary strip along a 60km route. Again the fact that the worst case scenario is HVAC is 'lost'. Part of the mitigation is to pay farmers for loss of earnings. While compensation is necessary, land (and water) is a fundamental national asset, and as such to include compensation in the mitigation measures is wrong. Natural England make a response on Soil and Agricultural Land Quality: "Impacts from the development should be considered in light of the Government's policy for the protection of the best and most versatile agricultural land as set out in paragraph 112 of the National Planning policy Framework (NPPF). We also recommend that soils should be considered under a more general heading of sustainable use of land and the ecosystem services they provide as a natural resource in line with paragraph 109 of the NPPF.* ***We strongly support this input from NE. We add as a general statement that the NSIP process, and the misuse of the Rochdale Envelope, are particularly weak in recognising the wider benefits of ecosystem services; and minimising impacts on biodiversity and providing net gains in biodiversity, where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures. The impact on ecological networks is not mentioned far less assessed. Continuing on the general scene, this is a major issue for Orsted and the cabling route running through the River Glaven ecological corridor and continuing across the watershed with the Bure; the river systems are key to the county ecological network, they are the lynch-pin.*** *We also draw attention to the first point of paragraph 109, protecting and enhancing valued landscapes, geological conservation interests and soils.* ***Again, we point out that HVAC will result in two cable relay stations at the Happisburgh South landfall, with the Vanguard application including the separate Boreas project being included for the same landfall and cabling route. This is an unacceptable and unnecessary blight on the landscape, and harms the enjoyment of the SSSI cliffs some 300m away.***

28. The focus in this chapter is on land use and tenure, and agriculture. On land use, the potential impacts on human beings, including landowners, occupiers, local communities and other land users.

Comment: ***The only time Orsted and Vattenfall have made clear there is a difference between HVAC and HVDC is that with AC there is a need to have a booster station/cable relay station. This has aroused widespread public protest. Farmers on realising the easement differences between HVAC and HVDC are resistant to HVAC, and strongly prefer HVDC.***

32. Table 21.4 Definitions of sensitivity levels for land use receptors, agriculture and soils. The scale of sensitivity is heavily influenced by the presence of Higher Level Environmental Stewardship Schemes (ESSs), then entry level ESS, followed by capacity to accommodate changes such as loss of land areas, soil degradation.

Comment: *The text goes on so notes the low level of use in ESS, but fails to put in the context of the 2015 CAP Reform which say a change and dramatic fall in payments for agri-environment. No doubt farmers will be aware also of a reduction in compensation payments.*

CHAPTER 22. ECOLOGY

Scoping Opinion, November 2016, pages 14-16.

Comment: *We welcome the input made by Hindolveston Parish Council on ancient woodland, and their plea for due care on all woodland, meadows and areas that are habitats for wildlife, plants and insects even if those sites do not have special designations. This is often overlooked, or as such low value and any impact described as 'negligible'. We have now sterilised arable land to the extent that over decades once common farmland bird species such as yellow hammer, linnet, turtle dove and tree sparrow are a fraction of what they were and on the verge of extinction.*

Natural England make important observations on the hydrological processes and habitats present within the Wensum SAC, which would not be detectable by a desk study, the potential to damage river flow and those meadows which are an integral part of the SAC. Further sites along the route that require consideration are Cawston and Marsham Heaths, Foxley Wood, Honeypoint Wood and Beetley and hoe Meadows SSSIs, all of which are designated as representatives of rare habitats. A key point was made, and has been taken up by the applicant: information for botanical species in sensitive habitats should be taken during the summer survey window – the extended phase 1 Habitat Survey was undertaken outside this window (and see paragraph 76).

Both the Environment Agency and Natural England emphasise the threat posed by invasive non-native species, in particular that where the American signal crayfish are present (such as the Bure and Wensum). NE adds that there is potential to spread invasive species between the rivers and other features. For example, it would be possible to contaminate the sites selected for crayfish selected for crayfish relocations around North Norfolk.

The importance of this must be understood and recognised. The River Glaven is the best river left with a healthy population of the protected species the native white-clawed crayfish; it is from there that translocations are made to other sites where neither the native or the signal crayfish are absent. Orsted and Vanguard are being progressed on the same timescale, and the Orsted route corridor runs north south through the Glaven Catchment and headwaters, which are on the water shed with the Bure. Orsted also crosses the Bure and the Wensum (and the Tud). The cabling cross point between the two projects is north of Reepham. While cumulative impacts are not considered within a project (as near all individually are after mitigation, less than significant in EIA terms), they are considered in the sense of other major projects in the same timescale. To our mind this is the most important cumulative factor of all in the EIA considerations; but it does not get a mention anywhere in this context. We add that there is as yet there is NO mitigation measure that can be used to address this problem.

79. There are a total of 37 statutory designated sites for nature conservation located within the study area of 2km.

Comment: *The Table 22.10 presents a very useful summary of designated sites of relevance to onshore ecology. Note for the River Wensum that the Annex I habitats the primary reason for the selection as an SAC are the water courses of plain to montane levels with aquatic vegetation species characteristic of a chalk river; and for Annex II species a primary reason for the selection of the Wensum is the* ***white-clawed crayfish.*** *There are also three species as a qualifying feature but not primary; they are the brook lamprey and bullhead (both abundant on the Glaven) and Desmoulin's whirl snail. As an SSSI the Wensum has been selected as one of a national series of rivers of special interest as an example of an enriched, calcareous lowland river; the key features are the calcareous river habitat, flora and invertebrate assemblage. The Glaven shares these characteristics but is much smaller. Many of the SSSIs are in the valleys of tributaries of the Wensum, with key features of wet woodland, fen and grassland habitat. Booton*

Common is in a tributary of the Wensum, about 1 mile east of Reepham, and as such water courses might be affected by the Vanguard and Orsted 'cross roads'.

84, 85. There are a total of 9 non-statutory sites (County Wildlife sites) and Roadside Nature Reserves within and up to 2km of the study area as shown in Figure 22.3. All non-statutory sites are considered to be of medium importance.

Comment: *These in our view are under-rated both as individual sites and for their cumulative contribution to the ecological network; and we would extend that too much of the wider countryside. The cable route goes through mainly arable land for some 60km. Arable land is barren territory for wildlife, relieved through the presence of adjacent of hedgerow, woodland and (within) farmland ponds, etc, see 87-119, and 120 Table 22.11 the quantified habitat footprints along the cabling corridor. This is put in perspective by paragraph 119; about 88% of the study area is occupied by arable land. This makes it all the more important to maintain and take care of the non-arable, such as hedgerow, and grass margins (where in place, and not become running tracks) to support wildlife With the 2015 CAP reform agri-environment payments fell to about 60% of previous decades, with a view to reviewing this in 2020; but now we are in Brexit, and farming as a whole is in limbo with the only certainty that the £2 billion a year support funding will be nowhere near that, albeit there is hope that the emphasis will be on a Green Brexit, as it should be.* ***At the foremost of this should be farmland ponds. Restoration work starting in the Glaven-Bure headwaters around 2009 with a local farmer has become a multi-partnership project across the county. It is startling at how rapidly they are colonised by a range of wildlife species. At 2016 it became clear that ponds at watershed areas are particularly important as they form a stepping stone oasis from one river to the other, repairing what is the weakest link in the most important part of the ecological network, our river valleys. Ponds have a much wider importance than the possible presence of the great crested newt (112).***

122, 123 This provides a brief reference to ecological networks by saying that the area is not located within any of the Wildlife Trust's 'Living Landscapes; but the onshore project area crosses three key ecological networks reported by the 2006 *Report of Ecological Network Mapping Project for Norfolk (NWT, 2006)*, namely the River Wensum and River Bure river valleys and the Dilham Canal.

Comment: *You can liken a river valley to a leaf, with the artery being the river, and the veins being the tributaries to provide the structure to contain various types of habitat, stretching to the an adjacent river catchment area (and at the watershed the point of two leaves might touch to make a connection, albeit through mainly arable land). Since 2006 we have not only had another decade of intensive farming, but a greater understanding of the ecological network and its importance.* ***We consider that at this PEIR stage the value and function of the ecological network requires a deeper consideration; including for both the defining of the cabling route and also in terms of mitigation measures. Further that restored farmland ponds, and those capable of restoration, should be avoided. Ponds should be in the same category of hedgerows for special attention. For both this aim would be much helped by the adoption of HVDC rather than HVAC for cabling; less take of hedgerow, and more wriggle room for ponds.***

214, 215. The Ecological Impact Assessment (EcIA) uses the Rochdale Envelope principle against a defined project worst case scenario, and the Worst Case Scenario (WSC) with respect to onshore ecology.

Comment: ***We find the use of the Rochdale envelope discussed in Chapter 5 Project Description, Chapter 19 Ground Conditions and Contaminants, Chapter 20 Water Resources and Flood Risk, Chapter 21 Land and Agriculture, and here in Chapter 22 Ecology. The first three comprehensively obscure the fact that the WSC is the use of HVAC rather than HVDC for onshore transmission of electricity. The fourth gives clear information that HVAC is the WCS but offers no data for HVDC. Nor is it made explicit that with Boreas to come about one year later there will be a requirement for two CRSs at Happisburgh South and two substations at Necton. This Chapter at***

Table 22.17 overall is the clearest, provides more comparative data in a concise form on HVAC vs HVDC, not least on noise levels *(including at the Cable Relay Stations (required for HVAC only) and at the Necton National Grid substation).*

238. There are seven ancient woodlands located within 500m of the cable route. The embedded mitigation for this feature will be adhered to in that the cable route will not extend within 15m of these woodlands.

Comment: *This would be extended by use of HVDC .*

239. The Forestry Commission's guidance on assessing the impacts of development (2014) that there are potential impacts on ancient woodland from development that should be considered. These include the fragmentation and loss of ecological connections with surrounding woodland/veteran trees and the wider rural natural landscape; and reduction in the area of other semi-natural habitats adjoining adjacent ancient woodland. In response (240) it is said that two of the seven woodlands are unlikely to arise given their distance from the cable corridor. In addition it is stated that neither woodland is located on an important ecological corridor.

Comment: *There is a difference between a corridor such as a river valley and the wider ecological network. The first is a key part, but the lesser parts also make a contribution.*

CPRE Norfolk, 10th December 2017.