

STAKEHOLDER CONSULTATION PROCESS OFFSHORE GRID NL

Type: Position paper
 Work Stream: Interface Management
 Topic: I04 – Nature Inclusive Design
 Filename: ONL TTB-05454
 Version: V 1.0
 Pages: 6 pages

QUALITY CONTROL

Prepared: OD
 Reviewed: AMO / NLO-OD / BLIX
 Approved: Consultation Board
 Release: BLIX

Table of Contents

1. BACKGROUND MATERIAL.....2

2. SCOPE AND CONSIDERATIONS.....2

3. TOPIC NATURE INCLUSIVE DESIGN3

 3.1 BACKGROUND..... 3

 3.2 NID IN THE OFFSHORE GRID CONCEPT 3

 3.2.1 *Bird deck* 4

 3.2.2 *Fish hotel* 4

 3.2.3 *Platform safety zone*..... 5

 3.2.4 *Monitoring and shared knowledge* 5

4. POSITION TENNET6

1. Background Material

LITERATURE USED:

- Further information on TenneT's Corporate Social Responsibility can be found at: <https://www.tennet.eu/company/our-responsibility/tennet-and-csr/>

2. Scope and Considerations

For the roadmap offshore wind 2030 (routekaart windenergie op zee 2030) TenneT is tasked with the connection of several offshore wind farms up to 2030. The wind farm zones 'Hollandse kust West' and 'Ten Noorden van de Waddeneilanden' will be connected with TenneT's previously established and consulted standardized 700 MW grid connection concept. Due to its size and distance to shore, a new grid connection concept has been established for the wind farm zone IJmuiden Ver. The figure below shows a schematic cross-section of this new grid connection concept. Wind turbines are connected through 66 kV "inter-array" cables (in orange) to an offshore (HVDC) converter station. Using 2 GW high voltage (525 kV) export cables (in green) the electricity is transported to shore. TenneT will be responsible for the offshore grid, from the onshore substation up to and including, the offshore substation. TenneT intends to create a new standard HVDC grid connection concept for both connections to IJmuiden Ver and potential future far shore wind farms.

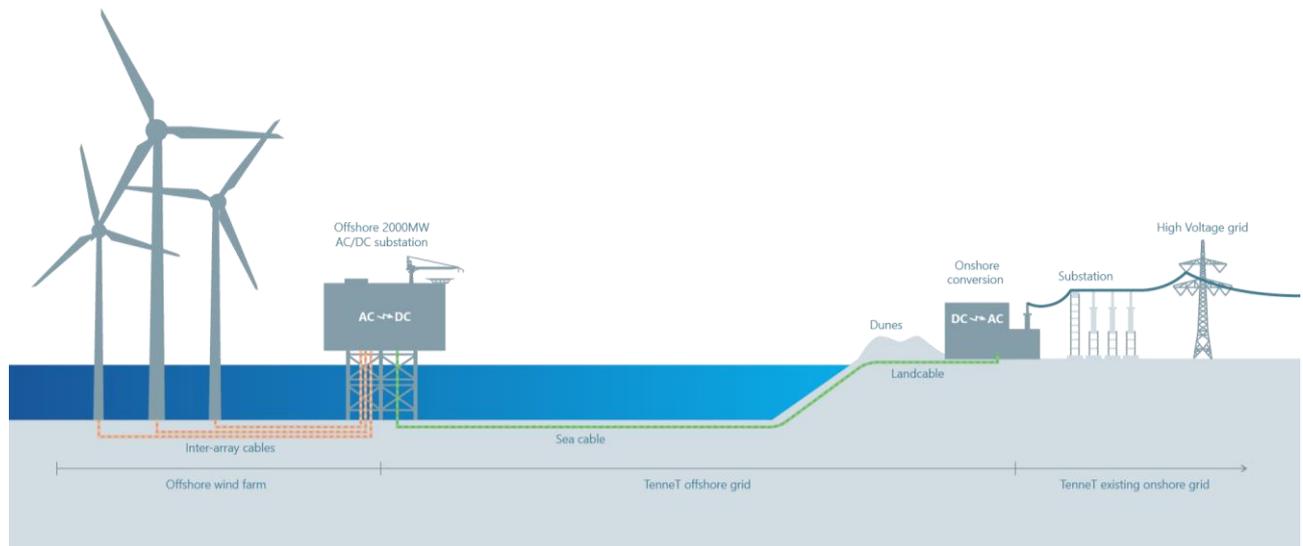


Figure 1 - HVDC grid connection concept

This paper describes how TenneT, as the offshore grid connection owner, proposes to deal with Nature Inclusive Design for the 2 GW HVDC grid concept.

3. Topic Nature Inclusive Design

3.1 Background

In meetings with the governmental stakeholders and NGO's on the Offshore Wind Roadmap 2030, it became clear that ecological aspects will become a limiting factor for the continued increase of offshore wind. With the ongoing offshore grid expansion, consisting of platforms and cables offshore, TenneT also has an increasing ecological impact during the realisation and operation of the offshore grid. Additionally, recent publications of the Climate Agreement¹ and North Sea Agreement² show growing support to introduce nature inclusive design measures in order to benefit from new opportunities created by offshore wind farm zones. These developments precipitated the idea of using the offshore grid infrastructure to realise opportunities to increase nature diversity and to achieve additional societal benefits.

The internal driver for TenneT to minimise its ecological impact can be found in the Corporate Social Responsibility policy: "We strive to enhance the energy transition in a sustainable manner, leading the way in maximising our societal contribution and minimizing our impact as a TSO." [³] Several ambition areas are defined with targets. With regards to the ambition area "nature", the CSR target is described as: "Our commitment to nature is to take our responsibility to minimise our impact and protect and improve local nature".

3.2 NID in the offshore grid concept

The abovementioned two developments have lead to a re-assessment of the standardised 700 MW AC offshore grid concept in terms of opportunities for nature enhancement and further ecological monitoring and contribution to knowledge increase. Nature Inclusive Design implies ecology-friendly measures are integrated in the offshore grid design, as a basic condition.

An initial longlist of measures for nature inclusive design was further assessed by both ecologists, platform and jacket experts as well as the asset manager and service provider. Risks, technical feasibility and costs were considered, resulting in a shortlist of measures. It is the expectation that inclusion of nature inclusive design measures during early design stage results in limited additional cost and risk compared to the project investment.

The shortlist includes options for different aspects of the design: the topside, jacket and within the safety zone of the platform. The possible nature inclusive design options are illustrated and detailed below.

¹ Climate Agreement, <http://www.klimaataakkoord.nl/>

² Noordzeekaakkoord (still in draft),
<https://overlegorgaanfysiekeleefomgeving.nl/samenwerken/noordzeeoverleg/default.aspx>

³ Further information on TenneT's Corporate Social Responsibility can be found at: <https://www.tennet.eu/company/our-responsibility/tennet-and-csr/>



Figure 2 -Overview of possible nature inclusive design options

3.2.1 Bird deck

Practice shows that birds will use the platform for resting and nesting. The hypothesis for this design is that birds can be guided to a location on the platform where the electrical operation of, and access to the platform is not disturbed. If successful, this could reduce maintenance activities like cleaning and painting and positively influence health and safety for people working at the platform. At the topside or on top of the jacket, a bird deck can be attached. Depending on local species, the bird deck shall be designed in more detail. Feeding facilities are not foreseen. Also, if a helideck is added to the design, bird scaring measures could be applied at the top deck. Bird deterring measures at unwanted areas (for example bird netting at the stairs and ventilation areas) are still to be used. The pro's and con's of a bird deck are subject of further investigation within TenneT and with external stakeholders.

3.2.2 Fish hotel

Within the jacket, fish-friendly structures could be attached to provide shelter for multiple species, accessible for the target species though protected from predators. An example is a frame filled with pipes with different diameters and hole sizes. Another option is a biocage type, open structure of mesh filled half with oyster shells or quarry stone and half open space. In total nine of these fish-friendly structures with a size of approximately 2m x 1m x 1m and a maximum weight of 250 kg could be mounted to the jacket at three different levels below seawater. For installation purposes, two attachment points per frame in the form of a flange connection are foreseen, on sufficient distance from the jacket to prevent interference with structural integrity and conservation. The exact configuration is to be determined during detailed design of the jacket.

3.2.3 Platform safety zone

Within the safety zone around the platform, disturbance of the seabed is not allowed during the operational lifetime of the offshore grid. Within certain parts of the safety zone, hard substrate or banks with living species like oysters or mussels could be added to increase biodiversity, without the risk of disturbance by operational activities. The cable trajectory and its maintenance zone also offer spatial opportunities, however as the seabed may be disturbed in case of repair works, this seems less effective. The wind area itself could also offer opportunities to enhance the total available space in a cooperative approach by OWF-developers and TenneT.

The added structures should not interfere with any offshore operations and therefore a certain distance to the offshore grid assets, both platform and all HV cables, should be observed. The hard substrate may consist of different types of structures to target specific species, for example: layered build-up reef balls of approximately one meter height, hexagon shaped objects and lobster boxes (preferably different sizes for different age classes), and cages or baskets with oyster shells. The expectation is that the reefs will start to grow towards each other after some years.

3.2.4 Monitoring and shared knowledge

It should be noted actual application of nature inclusive design is still in its early stages and monitoring of the nature inclusive design measures is required to gather data on impact and effectiveness in practice. Monitoring of the abovementioned NID shortlist forms an incremental part of the measure.

Further insights could be derived from the actual pilots in practice. Several stakeholders are currently in the process of performing or preparing pilots. Involvement of external stakeholders like government, NGO's and the offshore wind developers will add to the success, as leverage can be created from shared experiences.

4. Position TenneT

Above considerations lead TenneT to the following position:

TenneT has to follow the legal requirements as given in the Dutch legislation, Development framework and Codes. The current documents do not yet incorporate specific requirements regarding Nature Inclusive Design. However, as discussions with stakeholders during sessions for the Offshore Wind Roadmap 2030 showed, there is broad support for such measures in order to benefit from new opportunities created by offshore wind areas. TenneT has initiated Nature Inclusive Design measures for the 700 MW AC grid concept and with this paper proposes a similar approach for the 2 GW HVDC grid concept. This implies TenneT will investigate feasibility of NID measures like a bird deck, fish hotel and adding hard substrate in the safety zone around the platform from an ecological, technical and project perspective.

As many parties are currently pioneering in this field, combining efforts where possible seems the rational thing to do. TenneT strongly prefers to perform common investigation with the OWF developer(s) in the wind area to assure design, realisation and monitoring of NID measures in the whole wind area (including the offshore grid) are aligned by these parties prior to implementation and the maximum nature enhancing effect can be achieved.
