

A case for assessing the EAN1, EAN2 and associated development DCOs against the Offshore Transmission Network Review criteria and not the outdated July 2011 EN1

The case will be developed in three sections

**Section 1** The Secretary of State's responsibility to update EN1

**Section 2** The industry changes that make EN1 outdated

**Section 3** How the Offshore Transmission Network Review will be completed in time to be implemented during EAN1 and EAN2 timescales

An offshore wind farm and substation to be completed in 2022



Document submitted by Alan Hatfield EN010077,EN010078

## Section 1 The Secretary of State's responsibility to update EN1

According to the 2008 Planning Act the Secretary of State for BEIS has a duty to review and amend the Overarching National Policy Statement for Energy (EN-1)

6

### Review

- (1) The Secretary of State must review each national policy statement whenever the Secretary of State thinks it appropriate to do so.
- (2) A review may relate to all or part of a national policy statement.
- (3) In deciding when to review a national policy statement the Secretary of State must consider whether—
  - (a) since the time when the statement was first published or (if later) last reviewed, there has been a significant change in any circumstances on the basis of which any of the policy set out in the statement was decided,
  - (b) the change was not anticipated at that time, and
  - (c) if the change had been anticipated at that time, any of the policy set out in the statement would have been materially different.
- (4) In deciding when to review part of a national policy statement ("the relevant part") the Secretary of State must consider whether—
  - (a) since the time when the relevant part was first published or (if later) last reviewed, there has been a significant change in any circumstances on the basis of which any of the policy set out in the relevant part was decided,
  - (b) the change was not anticipated at that time, and
  - (c) if the change had been anticipated at that time, any of the policy set out in the relevant part would have been materially different.
- (5) After completing a review of all or part of a national policy statement the Secretary of State must do one of the following—
  - (a) amend the statement;

The Minister has to consider a change to the policy statement if there has been a significant change in any circumstances

Source

<https://www.legislation.gov.uk/ukpga/2008/29/section/6#text%2525252525252525252525252525252525253D100>

## EN1 Document July 2011

## Wind farms couldn't pull the skin off a rice pudding, says Boris Johnson

Wind farms couldn't pull the skin off a rice pudding, Boris Johnson has said, warning the UK is facing a major energy crisis.

## This PM quote July 2013

“wind farms  
couldn't pull the  
skin off a rice  
pudding”



Around 100 Tory MPs have been fighting against wind farms in their constituencies Photo: PA



By Rowena Mason, Political Correspondent

10:35AM BST 02 Jul 2013

[Follow](#) 17.5K followers

**Energy**

[News » Politics »](#)

[Conservative »](#)

[David Cameron »](#)

[Rowena Mason »](#)

## This PM quote Oct 2020

‘Your kettle, your washing machine, your cooker, your heating, your plug-in electric vehicle – the whole lot of them will get their juice cLEANly and without guilt from the breezes that blow around these islands.

‘And we will not only build fixed arrays in the sea, we will build windmills that float on the sea – enough to deliver one gigawatt of energy by 2030,



significant change in  
any circumstances

The minister has announced {24 Aug 2020} an Offshore Transmission Network Review where he explains that the EN1 is outdated.

### Background

Energy Minister Kwasi Kwarteng has announced the scope of a review into the existing offshore transmission regime to address the barriers it presents to further significant deployment of offshore wind, with a view to achieving net zero ambitions.

The current approach to designing and building offshore transmission was developed when offshore wind was a nascent sector and industry expectations were as low as 10GW by 2030. It was designed to de-risk the delivery of offshore wind by leaving the project developers in control of building the associated transmission assets to bring the energy onshore. This approach has contributed to the maturing of the sector, the significant reduction in costs of offshore wind energy and has helped position the UK at the forefront of global offshore wind deployment.

However, in the context of increasingly ambitious targets for offshore wind, constructing individual point to point connections for each offshore wind farm may not provide the most efficient approach and could become a major barrier to delivery given the considerable environmental and local impacts, particularly from the associated onshore infrastructure required to connect to the national transmission network. Offshore wind is expected to play an important role in delivering net-zero emissions by 2050, and it is right that the framework for delivering offshore transmission connections is reviewed in the context of our increased ambition.

Under the 2008 Planning Act the Secretary of State for BEIS must

- (3) In deciding when to review a national policy statement the Secretary of State must consider whether—
- (a) since the time when the statement was first published or (if later) last reviewed, there has been a significant change in any circumstances on the basis of which any of the policy set out in the statement was decided,
  - (b) the change was not anticipated at that time, and
  - (c) if the change had been anticipated at that time, any of the policy set out in the statement would have been materially different.

By his own quote above

However, in the context of increasingly ambitious targets for offshore wind, constructing individual point to point connections for each offshore wind farm may not provide the most efficient approach and could become a major barrier to delivery given the considerable environmental and local impacts, particularly from the associated onshore infrastructure required to connect to the national transmission network.

The proposed Sub Station at Friston and part of EAN1 and EAN2 associated development is an “individual point to point connection” that “could become a major barrier to delivery”.

EN1 refers to the work done by ENSG reports

3.7.4 An idea of the scale and urgency of need for new electricity network infrastructure is conveyed by the work of the Electricity Networks Strategy Group (ENSG), an industry group jointly chaired by Government and Ofgem, which was set the task of:

- developing electricity generation and demand scenarios consistent with the EU target for 15% of the UK’s energy to be produced from renewable sources by 2020; and
- identifying and evaluating a range of possible electricity transmission networks solutions that would be required to accommodate these scenarios.

Page 18 of the 2020 report says...

## **English East Coast and East Anglia**

The volume of generation off the East Coast is expected to increase significantly over the study period under the Gone Green 2011 scenario. The East Coast has been extremely active in terms of proposed generation connections, with the three largest potential offshore wind developments (Dogger Bank, Hornsea and East Anglia, potentially amounting to around 25GW) all seeking to connect (at least in part) into this area. By 2020 the Gone Green 2011 scenario shows just under 6GW of offshore wind connecting..... There is about 8.4GW generation currently connected within the region. This includes just over 7GW of gas and over 1GW of nuclear generation. Contined on next page

Sources

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/47854/1938-overarching-nps-for-energy-en1.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf)

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48274/4263-ensgFull.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48274/4263-ensgFull.pdf)

Given the high levels of potential generation and uncertainties about timing of connections and eventual scale of generation a large number (21) of possible reinforcement options (onshore and offshore) have been identified by NGET for the East Coast & East Anglia region that could enable the transmission system to meet the required power transfer levels. 17 of these possible reinforcement options did not appear in the 2009 ENSG Report.

2008 Planning Act states...

In deciding when to review a national policy statement the Secretary of State must consider whether—

(a) since the time when the statement was first published or (if later) last reviewed, there has been a significant change in any circumstances on the basis of which any of the policy set out in the statement was decided,

(b) the change was not anticipated at that time, and

(c) if the change had been anticipated at that time, any of the policy set out in the statement would have been materially different.

17 of the 21 infrastructure changes needed did not appear in the 2009 ENSG report

At the Norfolk Vanguard Offshore Wind Farm planning from 24 July 2018

The local Member of Parliament, [REDACTED] provided his written objections which contained notice of a “significant change” in the EN1 requirements

“Understandably, as is often the case when a Nationally Significant Infrastructure Project of this scale is being proposed, the application has caused considerable concern in Necton, along with a number of the surrounding villages. It has brought to the fore a number of issues concerning Localism and the NSIP planning process too, as well as the lack of any strategic planning in respect of the connection of offshore wind farms to the National Grid. It is clear that ... the continued ramshackle approach to NSIP applications (particularly in relation to the offshore wind energy sector), will only serve to greatly undermine public trust in the planning system as a whole ... (I am sure you are aware of the various other offshore wind farm applications that are currently on the cards here in the East -and the huge furore they are causing within the communities that will be affected by their cable corridors and substations).” [RR-154]

The Secretary of State should have noticed this lack of strategy and initiated an immediate review of the 2011 EN1

## Section 2 The industry changes that make EN1 2011 outdated

### Why we need international collaboration on offshore wind infrastructure – including with the UK



Source <https://windeurope.org/newsroom/news/why-we-need-international-collaboration-on-offshore-wind-infrastructure-including-with-the-uk/>

© OLE JØRGEN BRATLAND / EQUINOR

**On 17 September WindEurope CEO Giles Dickson moderated a panel organised by the UK Mission to the EU with UK Energy Minister Kwasi Kwarteng. Also taking part were: Christian Stenberg from the Danish Energy & Climate Ministry; Pernille Weiss, Member of the European Parliament; Danielle Lane of Vattenfall; and Martin Cook of National Grid Ventures. All stressed the importance of cross-country collaboration on the build-out of offshore wind and the grid infrastructure to support it.**



this. And now it's reviewing its energy transmission infrastructure, as this will be key to connect the new offshore capacity to the grid.

Other European countries are developing similarly ambitious plans for offshore wind in the North Sea. So coordinating work on energy transmission infrastructure will help reduce costs and minimise impacts on the environment and local communities, both at sea and on shore.

“We are considering how best to realise the benefits of multi-purpose hybrid interconnector projects with our European neighbours” said Minister Kwasi Kwarteng.

He cited the Viking Link infrastructure between the UK and Denmark, now under construction, and the planned North Sea Link between the UK and Norway – which will turn the North Sea into a “green energy super highway”.

“The offshore transmission review aims at establishing what incentives and support we can provide to stimulate this” he added, calling for an “open and friendly” dialogue between European neighbours.

Christian Stenberg shared Minister Kwarteng's vision: “We need to build out offshore wind in a coordinated way if we are to achieve our climate ambitions by 2050. This is a completely new way of doing offshore wind” he said. He mentioned the [Danish Government's plan](#) to build two giant ‘energy islands’ that will act as hubs allowing the connection of several offshore wind farms and distributing power between the countries connected to them, such as Denmark and the UK.

Pernille Weiss asked the panel what policies would further allow for greater coordination in offshore wind and energy infrastructure, as the EU Commission is expected to publish its Strategy on Offshore Renewable Energy in the coming weeks.

“Favour co-use of the sea space and co-location of projects over dividing the sea into different zones” answered Danielle Lane. “It brings down the costs while ensuring that all stakeholders' interests are respected.”

“And keep doing CfDs”, she added. First adopted by the UK and now used by other countries such as Denmark, Contracts for Difference (CfDs) incentivise investment by protecting developers from volatile market prices, while also protecting consumers from paying increased support costs when electricity prices are high. “A stable policy environment makes it straightforward to build offshore wind today. In markets where we have CfDs, we can see that we'll find investors willing to support infrastructure.”

Martin Cook stressed the importance of the UK's Offshore Transmission Network Review having an international perspective to factor in how the UK will interact with its European neighbours on the build-out of grid infrastructure in the North Sea, notably for the “hybrid” offshore wind farms which will have grid connections to more than one country.

Start 16/09/2020  
 Finish 2022



Source: GE Grid Solutions

GE's Grid Solutions will be in charge of the design, manufacturing, installation, and commissioning of the high-voltage electrical equipment as well as the substation's control and protection system.

GE's Grid Solutions forecasts that the electrical substation's commissioning tests will take place during 2022.

The offshore substation, to be built by Eiffage Métal and Engie Solutions, will be positioned at the centre of the 496 MW Saint-Brieuc wind farm, on a jacket type foundation.

It will house the wind farm's fully automated control systems, as well as all the equipment to ensure the reliable electrical connection between the wind turbines and the power grid on land.

The substation will collect the electricity produced by the wind farm's 62 Siemens Gamesa 8 MW wind turbines and by increasing voltage, through power transformers, to limit energy losses when the energy gets transferred to the coast. Within the offshore substation, voltage is elevated from 66,000 to 225,000 volts

Source <https://www.offshorewind.biz/2020/09/16/ge-grid-solutions-kit-for-saint-brieuc-offshore-substation/>

# Connecting Offshore Wind farms

## 2.1 AC Technology

Figure 3 provides a schematic overview of currently applied AC connection concepts. As the wind turbine capacity and total wind farm size are increasing, the market is progressively switching to higher voltage levels of inter-array cables, focusing mainly on 66 kV.

Additionally, TSO's are developing hub systems to allow multiple wind farm connections i.e. asset sharing (b). Higher cable voltage levels allow for more wind turbines to be connected to a single interarray cable, thus lowering the cost by cutting down on the number of strings within the OWF. The 66kV system does require higher substation equipment cost (compensation equipment, switchgear, Jtubes), however, the higher equipment cost is compensated with fewer inter-array strings leaving a

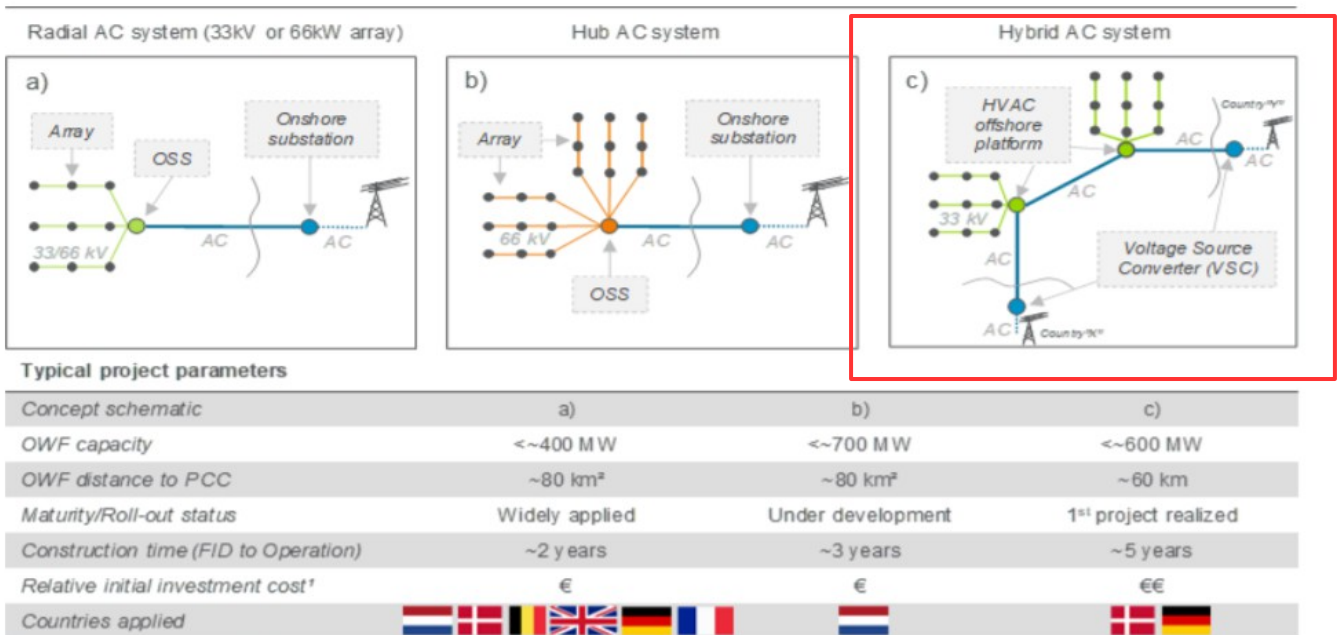
positive impact on the total LCoE. Finally, a hybrid AC system solution (c) has recently been installed linking Kriegers Flak wind farm in Denmark with the Baltic 2 wind farm in Germany, which allows the electricity to be traded in both directions reducing the need for power curtailment

Full document

<https://guidehouse.com/-/media/www/site/downloads/energy/2019/2019-navigant-comparison-offshore-grid-development.pdf>

Continued from previous page

Figure 3 Schematic AC offshore grid connection concepts



Source: Navigant analysis

<sup>1</sup>Euro symbols indicate initial investment level requirement, it does not reflect the LCoE

<sup>2</sup>1 onn distance AC connections applied in the UK with intermediate compensation platforms

Off shore inter connectors which attach wind farms directly to separate country grids are being installed. These connections allow electricity to be exported directly without overloading national grids.

# UKCS Energy Integration Final Report Example

ogauthority.co.uk/media/6625/ukcs\_energy\_integration\_phase-ii\_report\_website-version-final.pdf

## 1. Offshore electrification – recommendations

### 1: Industry should engage and collaborate on electrification opportunities across energy sectors

- Sourcing electricity for O&G directly from offshore renewables to reduce project lifecycle costs
- Consider hybrid schemes that are Capex-efficient, e.g. partial platform electrification, with gas-to-wire generation capacity to provide power continuity and optimise (or avoid) link to shore
- Engage developers of interconnectors for access to international supply options (e.g. Norway) and sharing of transmission infrastructure
- Investigate wider industry participation (supply chain, and midstream) to improve project economics

### 3: Enhanced co-ordination among regulators to facilitate cross-industry projects


- Align planning and consenting regimes to support cross-industry developments (O&G and windpower)
- Regulatory co-ordination to expedite industry projects

### 2: Government should consider measures to promote investments in offshore electrification, e.g.


- Energy-intensive industry (EII) tariffs exemption for offshore users
- Carbon price on offshore power emissions more in line with onshore

#### Enhanced co-ordination in offshore electrification<sup>1</sup>


**Vision:** Enable offshore electrification to reduce O&G industry GHG emissions and accelerate offshore windpower growth in the 2020s. Proactively support industries connecting and facilitate joint projects.




Oil & Gas Authority




Department for Business, Energy & Industrial Strategy




Planning Inspectorate




THE CROWN ESTATE




ofgem



marine scotland



HSE




Crown Estate Scotland  
Ownership of Crown Assets

Show all


ogauthority.co.uk/media/6625/ukcs\_energy\_integration\_phase-ii\_report\_website-version-final.pdf

## 1. Offshore electrification – findings



**Electrification is an essential response by O&G industry to net zero**

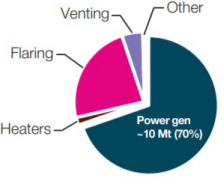
- Abate power emissions from O&G platforms (10 MtCO<sub>2</sub>, 70% of offshore emissions or 10% of total UK energy sector)
- Extend operating life of existing assets and achieve cost efficiencies in the development of new oil and gas fields
- Economics critically depend on electricity and carbon pricing - power from UK shore would be unattractive at current prices
- Joint projects to share infrastructure and sourcing power directly from offshore windfarms can significantly improve economics



**Opportunity to accelerate offshore windpower growth**

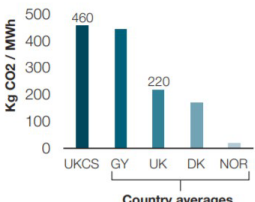
- Large potential growth in offshore windpower (75GW in 2050)
- Expansion in new areas (eg Scottish waters) with favourable wind conditions but water depth and infrastructure challenges
- Energy supply to O&G platforms could represent a commercial

#### UKCS O&G emissions (14MtCO<sub>2</sub>e)




Source: EEMS 2018, EIP

#### Carbon intensity of power generation

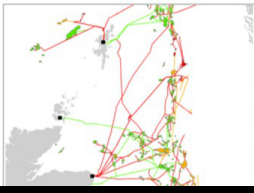


Country averages  
GY – Germany, DK – Denmark, NOR – Norway

#### ScotWind Leasing expansion



#### O&G fields and infrastructure



Show all

Full document link

[https://www.ogauthority.co.uk/media/6625/ukcs\\_energy\\_integration\\_phase-ii\\_report\\_website-version-final.pdf](https://www.ogauthority.co.uk/media/6625/ukcs_energy_integration_phase-ii_report_website-version-final.pdf)

**Section 3** How the Offshore Transmission Network Review will be completed in time to be implemented during EAN1 and EAN2 timescales

## **Review Approach**

The review will be led by the Department for Business, Energy & Industrial Strategy (BEIS) with support from a range of government and Industry bodies and an industry expert group.

The review will be split into 2 main workstreams:

The medium-term workstream will seek to:

identify and implement changes to the existing regime to facilitate coordination in the short-medium term assess the feasibility and costs/benefits of centrally delivered, enabling infrastructure to facilitate the connection of increased levels of offshore wind by 2030

explore early opportunities for coordination through pathfinder projects, considering regulatory flexibility to allow developers to test innovative approaches

focus primarily on projects expected to connect to the onshore network after 2025

If an onshore substation is built as per the DCO completion it will take place after 2025 and therefore should be subjected to the review process.

If however, an offshore substation is built, completion could take place earlier than 2025 see [offshorewind.biz](http://offshorewind.biz) page previously.

Source <https://www.gov.uk/government/publications/offshore-transmission-network-review/offshore-transmission-network-review-terms-of-reference>