MULBARTON PARISH COUNCIL

Offshore Transmission Network Review

Response to Ofgem Consultation, September 2021

Consultation	Changes intended to bring about greater coordination in the development of offshore energy networks
Publication date	14th July 2021
Response deadline	8th September 2021

Introduction

The government's latest review of offshore transmission was launched on an urgent basis more than one year ago on 5th July 2020. The urgency arose from the failure of the existing planning and regulatory framework for connecting wind farms to the onshore grid.[1]

Ofgem is now consulting on three components of the Offshore Transmission Network Review, namely: Early opportunities, Pathway to 2030, and Multi-purpose interconnectors. Consultation responses have been invited from all stakeholders and interested parties.

Mulbarton Parish Council registered as a stakeholder for the Review in September 2020 and has submitted several contributions. Like many communities across Norfolk, Suffolk, and Essex, it has deep and grave concerns over the way in which this important subject is being addressed. These concerns extend well beyond a focus on the East Anglia region.

This consultation is described as the first in a series on different aspects of the Offshore Transmission Network Review. It poses a list of more than 20 specific questions, but also raises many important issues around the conduct of the Review and the consultation itself.

Although these broader issues are not directly the subject of specific questions in this consultation, they provide important background and context. Each of the broader issues relates to one or more of the questions, and thus falls within the scope of this consultation.

Part One of this response therefore deals with background, context, and broader issues. Part Two responds to the individual consultation questions, with some cross-references to the consultation document itself indicated by square brackets.

7th September 2021

1 Current proposals are demonstrably not efficient, economic or coordinated, and experience long delays.

Part One: General points

1.1 Scope of the review and of this consultation

The scope of the Offshore Transmission Network Review, and this consultation, must include the offshore wind leasing Round 3 projects and also the proposed Eastern Link.

Table 1 sets out the deployment targets for each leasing round. It shows that Round 3 projects are the main opportunity to benefit from offshore transmission until after 2030.

Year	Leasing Round	Deployment target (GW)	Typical capacity of each individual project (MW)
2001	1	1.2	50
2003	2	7.2	500
2008	3	26.7	1,200 to 3,600
2021	4	7.0	1,500

Table 1: Deployment target by leasing round

Table 2 shows East Coast capacity analysed by leasing round. All the Round 3 projects and Round 2 extensions are in relatively shallow waters and inherently capable of rapid deployment. The offshore aspects are all well defined, and offshore consenting issues are close to resolution. These projects therefore offer the least risk for anticipatory investment, and are also a high priority in terms of their potential for early climate change benefits.

Projects by zone	East Coast capacity	Including Round 3	Round 4 only
Dogger Bank zone			
Projects A, B & C	3.6	3.6	
Project D (Sofia)	1.4	1.4	
Leasing Round 4	3.0	3.0	3.0
Hornsea zone			
Projects 1 & 2	2.6	2.6	
Project 3	2.4	2.4	
Project 4	1.0	1.0	
Leasing Round 4	1.5	1.5	1.5
East Anglia zone			
Dudgeon and Sheringham Shoal	0.7		
Galloper and Greater Gabbard	0.8		
Round 2 extension projects	1.6	1.6	
Norfolk Vanguard & Boreas	3.6	3.6	
East Anglia One & Three	2.1	2.1	
East Anglia One North & Two	1.7	1.7	
Total capacity (GW)	26.0	24.5	4.5

Table 2: East Coast capacity by leasing round

East Coast Round 4 projects have already been announced as shown in Table 2 above. These can be incorporated within an overall scheme of integrated offshore transmission, but will not provide as large an increase in total capacity as Round 3. There are no further offshore wind farm projects planned in these zones for the ten year period up to 2030.

Round 3 wind farms off the north-east coast of Scotland include Beatrice, Moray East and Moray West, with a combined capacity of 2.4GW. Bidding has recently closed for the equivalent of Round 4, which aims to add a further 8.0GW of capacity by 2030. Most of the potential new seabed leases capable of early development are located off the East Coast.

These developments, up to and including Round 3 in England and Scotland, made clear long ago the need for additional north-to-south transmission capacity. This was recognised in proposals for the Eastern Link project, first planned in 2011 to accompany Round 3, and now the subject of a separate Ofgem consultation as the Eastern HVDC project.[2]

The economic justification recently submitted for the Eastern HVDC project shows that the higher cost of offshore construction is more than offset by the avoidance of constraint payments associated with the onshore alternative. Equally important, however, is the loss of renewable energy generation which those constraint payments would represent.

In its latest form the Eastern Link consists of two HVDC offshore transmission links of 2.0GW each from Scotland to the East Coast of England. The need has been triggered by the transmission of electricity from offshore wind projects in Scotland across the congested network boundary to England. Completion of the project is due by 2030 and falls within the timeframe of the Offshore Transmission Network Review and of this consultation, but it will not be effective as an investment if it is implemented as a stand-alone point to-point link.

In our view, it would be unreasonable to exclude the Round 3 offshore wind projects in England and Scotland, or the Eastern HVDC project, from the scope of this consultation.

1.2 The planning and regulatory framework

It is nearly ten years since Ofgem conducted a very similar consultation for the Offshore Transmission Coordination Project (OTCP). Most of the key issues were addressed at that time, including anticipatory investment, and the final report was published in March 2012.[3]

Because of the critical importance of the Round 3 East Coast offshore wind projects, the very large investment costs, and the recognised weakness of the transmission network in East Anglia, this was followed by the Integrated Offshore Transmission Project feasibility study, IOTP (East), which published its final report in August 2015. It concluded that:

> "In no circumstance does the radial connection design offer economic advantage, even when coupled with a £870m onshore reinforcement package. Where IOTP (East) wind capacities of 10GW or more exist these results look stable." [4]

This conclusion was temporarily set aside on the grounds that less than 10.0GW of East Coast wind projects might come forward. Within six months, however, the UK accepted the Paris Climate Agreement of 12th December 2015, and it was reasonably foreseeable that East Coast offshore wind deployments of greater than 10.0GW would be required by 2030 to meet the UK's international climate change commitments.

The IOTP (East) study evaluated East Coast offshore wind capacity levels from a lower bound of 10.0GW up to the full contracted grid connection capacity of 17.2GW by 2030.

2 The Eastern Link as currently proposed consists of two 2.0GW HVDC interconnectors (i) from Torness to Hawthorn Pit, and (ii) from Peterhead to Drax, North Yorkshire. Both projects are due to be completed by 2030. It is expected that this will not be enough to accommodate the Round 4 projects off the East Coast of Scotland, and that two more interconnectors of similar capacity will be needed shortly after 2030.

3 Offshore Transmission Coordination Project, Conclusions Report, 1st March 2012.

4 IOTP (East) Feasibility study, Appendix 3, Cost Benefit Analysis, page 35.

Figure 1 shows the IOTP (East) network design for 10.0GW of East Coast offshore wind by 2030. Due to the prevailing westerly wind direction, there is a wide statistical variation of wind energy from north to south. Transmission infrastructure is therefore shared by the three offshore wind farm zones and is also used to relieve onshore network constraints.

This detailed and costed design was produced by the developers of the Dogger Bank, Hornsea, and East Anglia zones working with National Grid. It includes the Eastern Link as part of an integrated offshore transmission network. The design process is consistent with the existing regulatory framework and the outcome is economic, efficient and coordinated.

In May 2016 the developer of the Hornsea Three project requested an increase in the size of its existing grid connection. Table 3 shows that this project marks the point at which the 10.0GW level was exceeded, and that the IOTP (East) conclusions now apply. At the start of the Offshore Transmission Network Review in July 2020, it was already clear that the 17.2GW upper bound of the IOTP (East) study would be exceeded before 2030.

Project	**Capacity (GW)**	**Start of formal planning**
Dogger Bank Projects A, B & C	3.6	18th February 2014
Dogger Bank Project D (Sofia)	1.2 *	5th August 2014
Hornsea Project 1	1.2	10th December 2013
Hornsea Project 2	1.4	16th June 2015
East Anglia One	1.2	25th June 2013
East Anglia Three	1.2	28th June 2016
Capacity at December 2016	**9.8**	
Hornsea Three	2.4	2nd October 2018
Norfolk Vanguard & Boreas	3.6	10th December 2018
Capacity at December 2018	**15.8**	
East Anglia One North & Two	1.7	6th October 2020
Capacity at December 2020	**17.5**	

* The maximum output of Project D (Sofia) was increased from 1.2GW to 1.4GW in 2019.

Table 3: East Coast offshore wind capacity by year

Figure 2 shows the fragmented network design developed by National Grid over the last few years. This design is not efficient, economic or coordinated, and would lead to:

- grid connections for offshore wind projects moving from locations with high grid capacity and low transmission constraints, to locations with low grid capacity and high constraints;
- increased loss of renewable energy generation, delaying progress towards *Net Zero*;
- inefficient use of the sea bed resource, due to the greater number of landing points;
- cables laid at the same time crossing over each other, both onshore and offshore;
- higher network access charges for East Coast offshore wind projects;
- unreasonable and unnecessary impacts on local communities;
- additional costs passed on to final consumers of up to £6bn.

This approach has also created difficulties for offshore wind developers, setting them in opposition to the communities they are supposed to serve, and giving rise to serious legal challenges and lengthy consenting delays. This situation can only be described as a failure of the planning and regulatory framework.

1.3 Vision for the future

The network design shown in Figure 2 is, in our view, unacceptable, unreasonable, and potentially unlawful, and is unlikely to be compatible with UK climate change legislation.

The central challenge of the Offshore Transmission Network Review is to correct this error as a matter of urgency. Much of the relevant information has been available to the general public for several years prior to the start of the latest Review in July 2020.

Some of the Round 3 offshore wind projects described above have been described as being ‘in flight’. Whilst this may fairly describe the offshore wind generation components, in many cases the onshore elements are stalled.

The Hornsea Three project as currently proposed does not have an economically viable onshore grid connection. It would be dependent on onshore grid reinforcements that have already been shown to be uneconomic, and have not yet entered the planning system.

Planning consent for the Norfolk Vanguard project was quashed in February 2021 by order of the High Court, and a decision on Norfolk Boreas is not expected until December. The Eastern Link, as currently proposed, also requires new onshore grid extensions.

Figure 3 shows the benefits of integrated offshore transmission, which brings together both the offshore and the onshore aspects in a fully coordinated design. This approach is already required by the existing legislative, planning and regulatory framework. It reduces the use of seabed resources, reduces the loss of renewable energy generation, reduces rather than increases the size of onshore infrastructure, and reduces costs for consumers.

The East Coast Pathfinder project has been described in detail in previous contributions to the Review. It provides a viable alternative for the Hornsea Three, Norfolk Vanguard and Boreas projects and is capable of development into an integrated scheme of offshore transmission. Anticipatory investment is not required because the onshore infrastructure is smaller than for individual point-to-point links, and the offshore transmission link between the offshore wind zones is constructed at the end of the projects, and not at the beginning.

Dialogue with developers has suggested that the main barrier to the implementation of an efficient, coordinated, and integrated transmission design has been the operation of the OFTO (Offshore Transmission Operator) licensing and tendering regime. It follows that one of the options to be considered is to suspend, or amend, these regulations for offshore wind projects coming forward for connection to the onshore grid in the period up to 2030, leaving the way clear for simple bi-lateral agreements between project developers.

The main function of Ofgem is the regulation of National Grid in its monopoly of onshore transmission. Offshore generation and transmission does not fall within the National Grid monopoly, and there is no obvious reason to apply the same type of regulation to offshore generation and to the potential offshore transmission activities of other organisations.

National Grid is, however, also the monopoly provider of connections to the onshore transmission grid with the opportunity to exercise effective control of the applicant’s costs, grid connection timescales, and ongoing charges for transmission network access.

In our view, the process by which grid connection agreements are made should be open to examination and scrutiny, and amenable to change, as part of the application process for development consent. This would help to ensure an outcome that is efficient, economic and coordinated, and acceptable to local communities and statutory consultees.

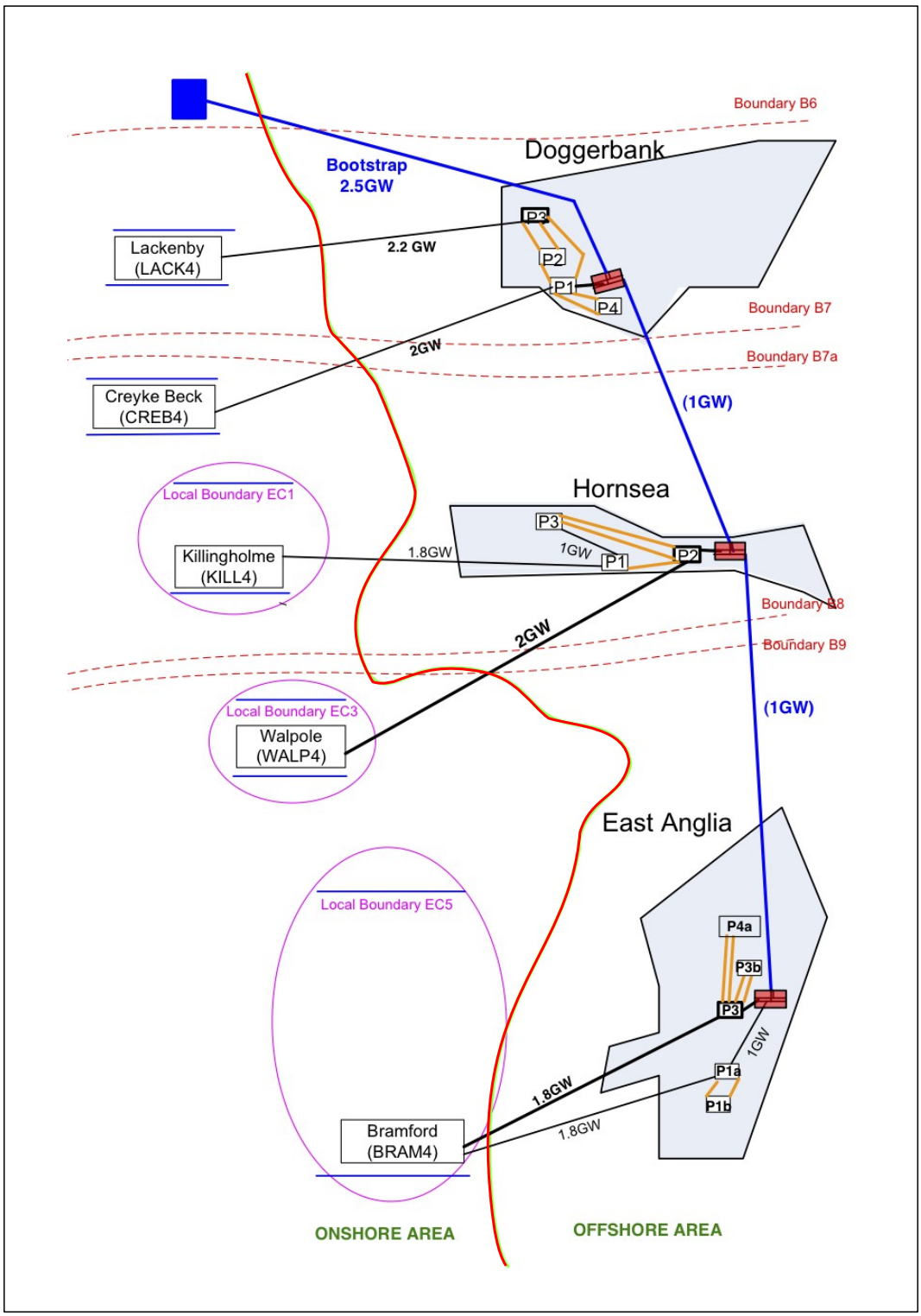

Figure 1: IOTP (East) feasibility study

This is the basic network design for the lower bound of 10.0GW of East Coast offshore wind deployment. The Eastern Link is shown as a 2.5GW bootstrap from Peterhead to the Dogger Bank zone. The Dogger Bank, Hornsea and East Anglia zones are interconnected.

The weak point of the design is the limited out-of-region transmission capacity available from East Anglia towards London through the Bramford to Twinstead overhead line route.

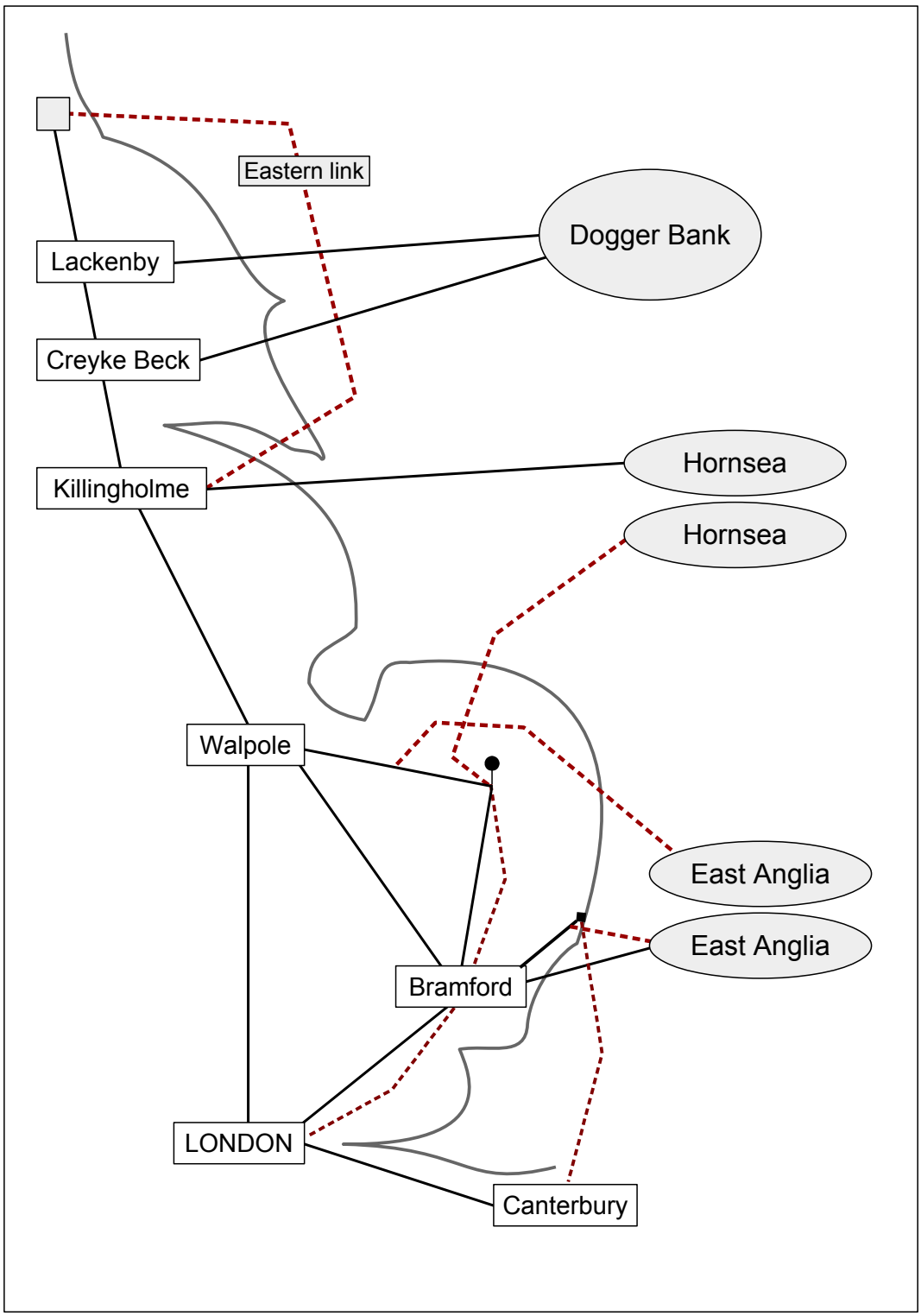

Figure 2: Point-to-point links

The Eastern Link fails to relieve onshore network constraints between Grimsby and the main centres of demand further south. Offshore wind zones are not interconnected and no infrastructure is shared within or between zones. Renewable energy generation is subject to severe network constraints, leading to higher costs for consumers and slower progress toward climate change mitigation. Cables laid at the same time cross over each other, both onshore and offshore. There are no economic arguments in favour of this outcome.

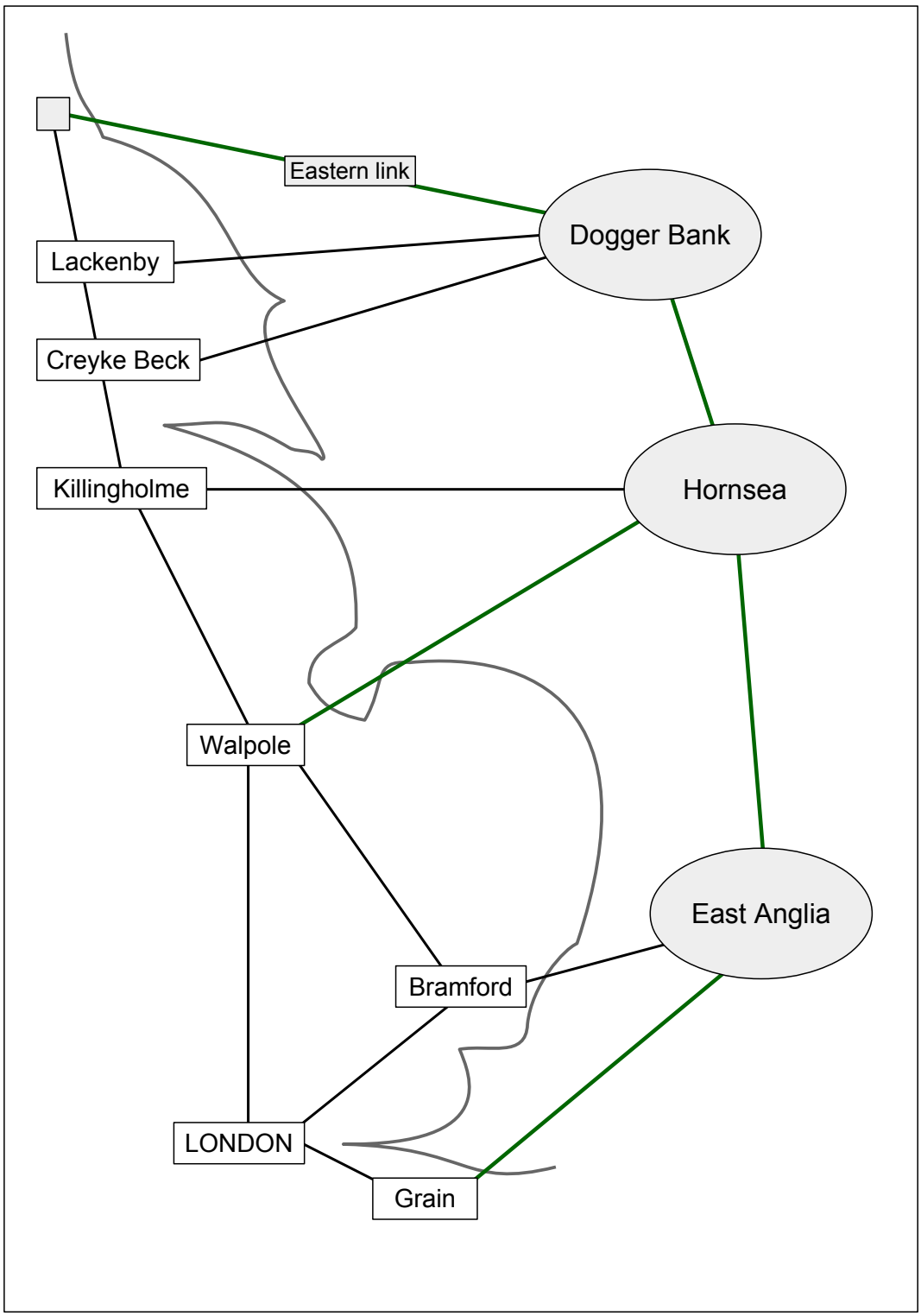

Figure 3: Integrated Offshore Transmission

The weak point of the IOTP (East) reference design is overcome by an extension to the Isle of Grain. Renewable energy generation is not subject to severe network constraints, and the sharing of onshore infrastructure between zones reduces costs and environmental impacts by at least 20%. These savings are passed on to final consumers.

Alternatives to the use of Bramford include Bradwell in Essex.

Part Two: Specific questions

2.1 Early Opportunities questions

Question 1: Are there any concepts we have not identified and which developers may wish to progress?

The developers of the Dogger Bank, Hornsea and East Anglia offshore wind zones, in consultation with National Grid, have already identified the concept shown in Figure 1 and as described in Section 1 of this response, and as further developed in Figure 3. Given the strong economic advantages of this concept, it is reasonable to assume that developers would wish to progress it. This concept reduces both infrastructure and landing points.

The East Coast Pathfinder project has been described in numerous contributions to the Offshore Transmission Network Review and is a staged implementation of this concept.

Figure 5 in the consultation document is a different concept in which wind farm projects located in the same meteorological zone are interlinked. This is a fundamentally different concept and does not offer the same advantages. [*Quasi bootstrap*, p19]

Viable concepts for offshore wind projects are defined by geography, meteorology, and the existing transmission network. The consultation concepts do not address these factors.

The definition of a 'developer' should include any person wishing to construct or operate offshore infrastructure, including transmission links between offshore zones, and not only a person seeking an onshore grid connection agreement. This could include, for example, The Crown Estate, or a consortium of local authorities. [*Glossary*, p115]

Question 2: Should anticipatory investment risk be shared with consumers? If it should, what level of risk is it appropriate for consumers to bear?

No. Consumers have no visibility of any of the issues that would allow them to judge or to manage risk. Developers are the only actors in a position to assess and manage risk associated with their own investment decisions. Where projects are linked, these risks are best managed through bi-lateral or multi-lateral agreements between project developers, or between developers and National Grid as the monopoly provider of grid connections.

Part of the risk faced by developers arises from the fact that National Grid controls the grid connection offer, and is in a position to influence and to modify the risk of consenting delays, the management of grid constraints, the determination of connection charges, and the network access charges faced by different project proposals. [*AI vs highly AI,* p27]

Question 3: For concepts that are intended to provide a wider system benefit, e.g. by mitigating an onshore constraint, how should the need for investment be demonstrated by the developer?

This question assumes the continuation of the existing barriers to implementation, which mostly derive from the OFTO regulations as described in Section 1.3 of this response.

Developers demonstrate the need for investment by making investment decisions in the light of commercial opportunities using their own commercial judgment. Except in the case of National Grid as the monopoly operator of the onshore transmission network, there is no need for a developer to demonstrate a need for investment to a regulator. Projects which provide mitigation of an onshore constraint will automatically have a valid business case. [*AI vs highly AI,* p28]

Question 4: What options are available to developers in demonstrating a reasonable expectation they intend to connect to the system?

As described in Section 1 of this consultation response, the main practical scope of the Offshore Transmission Network Review, and of this consultation, consists of the Round 3 offshore wind projects. For the East Coast, these projects have already demonstrated their intention to connect to the onshore grid, as shown in Table 3 of this consultation response.

An intention to 'connect to the system' is a logical component of preparing any bid for a sea-bed lease. In the absence of barriers to the Early Opportunities concepts, developers will also seek interconnection between projects where there is a commercial reason to do so. This will include agreement of the technical interfaces between projects. National Grid may also undertake a commercial risk assessment as part of the grid connection process, to the extent that it makes onshore grid investments at its own risk. [*AI vs highly AI,* p28]

For offshore development, it is simply not possible 'to ensure that consumers' interests are protected from the risk of inefficient AI'. This concept relates primarily to the regulation of National Grid as the monopoly operator of the onshore transmission network and as the monopoly provider of connections to that network. [*AI vs highly AI,* p28]

Question 5: To what extent do you agree with our proposals to remove barriers to the Early Opportunity concepts? Please explain your answer.

For the reasons set out in Section 1 of this response, and in answer to Questions 1 to 4, the proposals to remove barriers to the Early Opportunities concepts will not be effective. The consultation concepts are poorly defined and incomplete. [*AI vs highly AI,* p28]

Question 6: Do you believe a Significant Code Review is required to give effect to a potential decision to 'share' AI risk between consumers and developers?

No. Risks associated with anticipatory investment should not be shared with consumers separately from other types of project investment risk.

In November 2017 National Grid decided to allow offshore wind generation projects to connect to the onshore grid without the prior completion of the necessary onshore grid reinforcements. This decision seems to have removed a significant amount of onshore risk from offshore developers and transferred it to consumers. It may also have influenced the grid connection process and the outcome of development consent applications. It can be argued that this far-reaching network policy decision was properly a part of the regulatory function of Ofgem. [*Other issues to be addressed for Early Opportunities Concepts,* p38]

Question 7: Do you agree with Ofgem's proposed approach to deliver the objectives of the Early Opportunities workstream?

The objective of the Early Opportunities workstream is to facilitate greater coordination in the connection of offshore wind projects which are at a relatively advanced stage of the development process. [*Objective and scope of Early Opportunities*, p17]

For the reasons given in Section 1 of this consultation response, the proposed approach set out in the consultation document is unlikely to be successful. [*Early Opportunities*, p38]

As shown in Section 1 of this response, the IOTP (East) feasibility study has already demonstrated the optimum approach for the connection of offshore wind projects which are at a relatively advanced stage of the development process. The emphasis now should be on removing the barriers to its implementation by 2030.

2.2 Pathway to 2030 questions

Question 8: We consider that a holistic design will result in a more coordinated, economic and efficient network. Do you agree? Please give reasons for your answer.

This question is mis-conceived. The term 'holistic' implies that the relationship between the different aspects is considered. By definition, this should always lead to an economic, efficient, and therefore integrated network – an outcome that is already required.

It has already been suggested in earlier contributions to Offshore Transmission Network Review that specific details of the 'holistic network design' produced by National Grid ESO, and published as part of the Review, are unlikely to satisfy this definition in practice.

Co-ordination may be taken to mean mere consolidation of multiple projects onto larger radial connections. As shown in Section 1 of this response, co-ordination in this sense is not the same concept as integration, and is not necessarily either economic or efficient.

Local communities will continue to oppose any attempt to introduce over-sized radial connections which are 'coordinated' in this sense. Such an outcome would not be 'holistic' within the sense of the consultation question. Local communities will resist any attempt to impose a central network design, using this type of 'coordinated' radial connection, through the planning and consenting process.

Instead of 'requiring developers to build infrastructure in line with the HND', which could be based on such an interpretation of the terms 'coordinated' and 'holistic', more emphasis should be placed on removing the barriers to the implementation of an integrated offshore transmission network. This would be consistent with the objective of the Review. [p50]

Question 9: Do you agree with the planned work for a detailed network design offshore?

No. Please refer to Section 1 of this response and the answers given above.

Question 10: Who do you believe is best placed to undertake the detailed design for assets that are in offshore waters?

Detailed design is invariably undertaken by project developers and their suppliers.

Question 11: Do you agree that the existing developer led model should be retained and applied where the HND indicates a radial solution should be used? Please explain your answer.

The developer led model should be retained where, for smaller projects or for specific situations, a radial solution is the only viable network design. The use of 'co-ordinated' radial connections in the sense described above, imposed as part of a centrally planned 'holistic network design' (HND), would not be acceptable and should be firmly rejected.

Question 12: Please provide your views on each of the delivery options we have described in this document. In providing your views, please comment on the issues we have raised. Please also give your views on the implementation issues we have raised.

Please refer to Section 1 of this consultation response and the answers given above.

Question 13: Please describe any feasible delivery options that we have not set out in this document.

Please refer to Section 1 of this consultation response and the answers given above.

2.3 Multi-purpose interconnector questions

Questions 14 to 22, and BEIS Question 1

The basic design of the IOTP (East) feasibility study network shown in Figure 1, and as developed further in Figure 3, is technically very similar to the concept of a multi-purpose interconnector. It has the added advantage of being located entirely within UK jurisdiction, and therefore can be implemented very quickly. The north-to-south geographical alignment and re-use of offshore transmission capacity to mitigate onshore grid constraints confer an additional and very important advantage.

The staged approach to implementation of the East Coast Pathfinder project provides an opportunity for progressive risk reduction. Useful precedents within the UK include the Western HVDC link, the Shetland HVDC link, which is due to be extended as the UK's first multi-terminal HVDC system, and the Eastern HVDC Link, now called Eastern HVDC.

This is the fastest route to meeting the UK's climate change obligations whilst avoiding unnecessary costs to the consumer of accomplishing the journey to *Net Zero by 2050*. It is not enough to build more turbines; the critical timescale is the completion of the connecting infrastructure, and in this respect offshore transmission typically has the advantage.

Multi-purpose interconnectors in an international context are much more complex, as the consultation questions show, and do not need to form part of the Early Opportunities or Pathway to 2030 workstreams. Fresh primary legislation would probably be required, and it is difficult to see how any meaningful or useful progress could be made prior to 2030.

Implementation of the East Coast Pathfinder, followed by the development of integrated offshore transmission as shown in Figure 3 of this consultation response, would however provide an important pre-cursor of direct experience and risk reduction to carry forward to any international multi-purpose interconnector efforts that may be appropriate after 2030.