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Decision

Offshore Transmission: Draft Cost Assessment for the Beatrice Transmission Assets

Publication date: 9/06/2021

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This document sets out the cost assessment for the Beatrice Offshore Windfarm Limited (**BOWL**) offshore transmission assets. This assessment of costs will be used by the Gas and Electricity Markets Authority (the **Authority**) to determine the value of the BOWL offshore transmission assets to be transferred to the successful bidder in the Tender Process.

The Final Transfer Value of the BOWL offshore transmission assets is established as £437.9m. This value is published in the licence consultation under section 8A of the Electricity Act 1989 (the **Act**), and we do not expect any further changes to the Assessed Costs. However, we do not intend to finalise the Final Transfer Value until the Authority has determined to grant an offshore transmission licence to the successful bidder.

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Contents

Executive summary

This report sets out the cost assessment work that Ofgem has undertaken from the Invitation to Tender (**ITT**) stage of the Tender Process in relation to the Beatrice Offshore Windfarm Limited (**BOWL**) offshore transmission assets (the **Transmission Assets**). This work has been used by the Authority[1] to derive the Assessed Costs and will be used to set the Final Transfer Value (**FTV**) for the assets. Unless otherwise stated or defined in-text, capitalised terms in this report are defined in the Glossary at Appendix 1.

The cost assessment process involves the below three key stages:

- The Initial Transfer Value (**InTV**) for the Transmission Assets was published in the preliminary information memorandum in November 2018[2] and was set at £498.5m based on information provided to Ofgem by the developer, SSE Renewables (the **Developer**);

- The Developer submitted a revised cost assessment template (**CAT**) on 22 November 2018, and again in January 2019. Ofgem reviewed and analysed the cost information and calculated the Indicative Transfer Value (**ITV**) as £448.4m. This updated calculation was communicated to the Developer in June 2019 and the formal ITV letter issued the same month; and

- The Developer submitted a further CAT dated October 2019 with a value of £452m (the **FTV CAT**). Ofgem reviewed this further cost information to calculate the final assessment of costs as £437.9m (the **Assessed Costs**). This is a reduction of £14.1m from the submitted FTV CAT. It is intended that the incoming Offshore Transmission Owner (**OFTO**) will be able to obtain the full benefit of all available capital allowances. Therefore, the final Assessed Costs of £437.9m is the amount that will be used to set the Final Transfer Value (**FTV**) at licence grant.

The key components of the InTV, the ITV and the FTV, together with the Developer's submission (the FTV CAT) are set out in Table 1 below.

[1] References to the "Authority", "Ofgem", "we" and "our" are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work.
[2] https://www.ofgem.gov.uk/system/files/docs/2018/11/tr6_generic_pim_final.pdf

Table 1: Summary of costs components*				
Category	**InTV**	**ITV**	**Developer submitted cost for FTV review (Oct CAT)**	**FTV**
	Sept 18 (£m)	**June 19 (£m)**	**Oct 19 (£m)**	**Feb 21 (£m)**
Capex	**360.9**	**371.4**	**374.0**	**368.2**
Development**	**99.9**	**38.1**	**38.6**	**38.5**
Contingency	**0.0**	**5.0**	**3.0**	**0.0**
IDC	**35.2**	**31.2**	**34.2**	**29.9**
Transaction	**2.5**	**2.5**	**2.2**	**1.3**
Total	**498.5**	**448.2**	**452.0**	**437.9**

**these figures may not add to totals due to rounding*

***Development represents all costs within the cost category 'Other' (CR8) in the Cost Assessment Template. This includes development costs, as well as other common costs.*

Sections 3.29 – 3.88 of this report set out details of the Assessed Costs and any reductions made to the values submitted in the October CAT and against the ITV. The main increases/decreases in the Assessed Costs, against the ITV figures, are as follows:

a) the capital expenditure (**Capex**) component of the FTV has decreased by £3.3m;
b) the development costs have increased by £0.4m;
c) the ITV contingency amount of £5m was removed in its entirety;
d) the Interest During Construction (**IDC**) amount decreased by £1.3m; and
e) the transaction costs have decreased by £1.2m.

Below we summarise the main increases and decreases to each cost category as shown in Table 1 and detailed in sections 3.29 – 3.88. Please note that the figures set out in this section have been rounded.

Capital expenditure (Capex)

The Capex of the FTV has decreased by £3.3m since ITV. The main changes are:

a) costs originally disallowed at ITV for generation assets weight impact;

and decreases for:

a) costs over and above our expected values for subsea cable supply and installation;
b) costs over and above our expected values for onshore cable supply and installation;
c) generation assets weight contribution;
d) fibre optic cables for generation use;
e) costs removed by the Developer; and
f) other minor adjustments.

Development costs

The development costs at FTV have increased by £0.4m since ITV. The main decreases are for:

a) general cost updates;
b) reallocation of costs to Capex; and
c) a mark-up reduction on all SSE staff costs in the construction management agreement.

Contingency

We allowed £5m of contingency in the ITV. This was reduced to £3m and included by the Developer in the FTV CAT submission. This has now been removed in its entirety as it has not been realised at this late stage of the transaction, and hence there is no contingency included in the FTV.

Interest During Construction (IDC)

The IDC amount has decreased by £1.3m since the ITV. This overall decrease in IDC is the result of balancing positive adjustments (for cost increases, and a longer time allowed for the development phase in line with other projects), and negative adjustments (for disallowed costs, including for assets not in the course of construction, and changes to the timing of when assets are considered available for use).

Transaction costs

Transaction costs have been assessed at £1.3m. The transaction costs are composed of both internal and external resource costs arising from the Developer's participation in the Tender Process. These have decreased since the ITV, due to transaction budget being revised and costs firmed up at the FTV stage.

Assessed Costs and FTV for the Transmission Assets

In accordance with Regulation 4(2)(b) of the Tender Regulations, the Assessed Costs of the Transmission Assets are £437,882,831. The Assessed Costs will be used as the FTV in accordance with Regulation 4(8) of the Tender Regulations.

1. Introduction

Context and related publications

1.1. In 2009, the Government introduced the regulatory regime for offshore electricity transmission to connect significant amounts of renewable offshore generation to the onshore electricity network (the **OFTO regime**).

1.2. Offshore Transmission Owners (**OFTOs**) are appointed through a competitive tender process (the **Tender Process**). OFTOs are granted an offshore transmission licence (**OFTO Licence**) with a fixed revenue stream for a specified time.

1.3. From the outset, the OFTO regime has encouraged innovation and attracted new sources of technical expertise and finance, whilst ensuring that grid connections are delivered efficiently and effectively.

1.4. The Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015 (the **Tender Regulations**) provide the legal framework for the Tender Process. The Tender Regulations require the Authority to calculate, based on all relevant information available to it, the economic and efficient costs which ought to be, or ought to have been, incurred in connection with developing and constructing the offshore transmission assets in respect of a qualifying project.

1.5. Where the Authority has determined to grant an OFTO Licence for a particular project, the assessment of costs must be used by the Authority to determine the value of the transmission assets to be transferred to the successful bidder. This value will be reflected in the revenue stream in the granted OFTO Licence.

1.6. This report should be read in conjunction with the "Offshore Transmission: Guidance for Cost Assessment" (the **Cost Assessment Guidance**)[3].

[3] https://www.ofgem.gov.uk/system/files/docs/2019/05/offshore_transmission_guidance_for_cost_assessment_april_2019.pdf

Associated publications

- The Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015 Link
- Tender Process Guidance Document TR6 Link
- Offshore Transmission: Guidance for Cost Assessment Link

2. The cost assessment process

Section summary

The Tender Regulations require the Authority to calculate, based on all relevant information available to it, the economic and efficient costs which ought to be, or ought to have been, incurred in connection with developing and constructing the offshore transmission assets in respect of a project. This section sets out the process that Ofgem followed in carrying out the cost assessment for the Beatrice offshore transmission project (the **Project**).

Overview of the cost assessment process

2.1. The Tender Regulations provide the legal framework for the process we follow for granting offshore electricity transmission licences. This process includes calculating the economic and efficient costs of developing and constructing the offshore transmission assets to be transferred to the new OFTO.

2.2. The calculation of those costs shall be:

a) where the construction of the transmission assets has not reached the stage when those transmission assets are available for use for the transmission of electricity, an estimate of the costs which ought to be incurred in connection with the development and construction of those transmission assets; and

b) where the construction of the transmission assets has reached the stage when those transmission assets are available for use for the transmission of electricity, an assessment of the costs which ought to have been incurred in connection with the development and construction of those transmission assets.

Cost assessment principles

2.3. The cost assessment principles, the reasoning for such principles, and the overall process we have adopted can be found in the Cost Assessment Guidance.

2.4. We have applied these principles in our cost assessment process for the Project and, where appropriate, have taken into account project-specific circumstances.

2.5. The remainder of this section describes some of the key elements of the cost assessment process. Section 3 provides the detail as to how these have been applied to the specifics of the Project.

Data collection

2.6. To undertake cost assessments we gather and review a range of information and supporting evidence. These relate to the forecast and actual costs of developing and constructing the transmission assets that will transfer to the OFTO. Detailed cost information is provided by the developer in the form of cost assessment templates (**CAT**s), contract values, asset cost schedules and cashflows. The developer also provides supporting evidence to substantiate its cost submissions including, amongst other things, contract documentation, supplier payment lists, invoices and receipts.

2.7. We work closely with the developer to gather information relating to the following cost categories in the development and construction of the relevant transmission assets:

a) capital expenditures;
b) development costs;
c) contingency provisions;
d) interest during construction; and
e) transaction costs.

Process stages for cost assessment

2.8. The cost assessment process involves the key stages described below.

Initial Transfer Value (InTV)

2.9. The InTV value is based on cost submissions by the developer for the relevant project. This value is made available to bidders at the Pre-Qualification or the Enhanced pre-qualification (**EPQ**) stage of the tender process. The letter we send to the developer at this time indicates that the calculation might be updated as a result of any further information provided by the developer and our continuing analysis.

Indicative Transfer Value (ITV)

2.10. We provide the estimate of costs for the transmission assets (the **ITV**) for the commencement of the Invitation to Tender (**ITT**) stage of the tender process. This value is used as an assumption underlying the tender revenue stream (**TRS**) bids submitted by bidders at the ITT stage. The ITV letter we send to the developer at this stage confirming the ITV indicates that the calculation might be updated as a result of any further information provided by the developer and our continuing analysis.

Assessed Costs

2.11. As soon as reasonably practicable after the ITV has been completed, we are satisfied that the assets are available for use, and we have obtained any further information that we require, we commence the exercise to determine the Assessed Costs.

2.12. Following this assessment exercise, Ofgem sends the developer a draft cost assessment report (in the form of this report) setting out the amount of the Assessed Costs. This gives the developer the opportunity to correct factual errors and propose the redaction of commercially sensitive information.

2.13. The draft cost assessment report is also sent to the preferred bidder, to allow it to incorporate the Assessed Costs into its estimate of the TRS payable to the OFTO. This TRS amount, incorporating the Assessed Costs, is published in a consultation pursuant to section 8A of the Electricity Act 1989, by which the Authority proposes modifications to the standard conditions of the OFTO Licence on a project specific basis (the **Section 8A Consultation**).

2.14. The draft cost assessment report is published alongside the Section 8A Consultation. The report remains in draft form until the conclusion of the Section 8A Consultation and the Authority has determined to grant the OFTO Licence to the successful bidder.

Final Transfer Value

2.15. If a developer retains some of the benefit of the available capital allowances, we reduce the relevant amount from the Assessed Costs before we derive the FTV. The FTV is confirmed once the Authority has determined to grant an OFTO Licence to the successful bidder. After licence grant, the final cost assessment report and supporting appendices are published on the Ofgem website.

2.16. Ofgem normally finalises the assessment of costs prior to commencement of the Section 8A Consultation. The FTV is taken into account when the TRS for the full licence period is published.

Cost assessment analysis

2.17. Throughout the cost assessment process, Ofgem applies two key tests to the cost information submitted by the developer. These are:

Test 1 - Assessing if a developer's cost submissions are accurate and allocated appropriately

2.18. As a first test, we check the accuracy of the data provided by the developer and the appropriateness of cost allocations, in particular, between the offshore generation and transmission assets. Throughout the cost assessment process, the developer provides cost information to us on an ongoing basis. Where we identify discrepancies in how the developer has allocated these costs, we check with the developer to assess if they have been allocated to the correct asset category and make adjustments accordingly.

2.19. To support the cost assessment process, we undertake a forensic accounting investigation. The scope of this investigation is shared with the developer in advance. This investigation is based on the final costs that the developer provides to us, and applies to a sample of contract costs. The actual sample for each project varies due to the different contracting strategies adopted by the developer and the specific needs of the project, but generally focuses on the most expensive contracts and/or contracts that materially increase in cost.

2.20. The forensic accounting investigation scrutinises the cost allocations provided by the developer. This may indicate the need for amendments to the developer's submissions to reflect, for example:

a) the actual costs incurred (e.g. in respect of exchange rates on foreign currency payments); and/or
b) more relevant metrics for the allocation of shared service costs.

2.21. Where amendments, in our opinion, are required and, in the absence of further evidence from the developer to substantiate the original allocation, we incorporate the recommended changes from the forensic accounting investigation.

Test 2 - Assessing if a developer's cost are economic and efficient

2.22. Under test two we assess whether the costs reported to date by the relevant developer have been economic and efficient.

2.23. We undertake benchmarking analysis using cost reporting data from other projects. This is used to identify cost outliers reported by offshore developers. Where cost outliers are identified on a project, these are further reviewed and Ofgem may use external consultants to investigate the reasons for this and evaluate whether the costs are economic and efficient.

2.24. We also consider the procurement processes adopted by the developer to obtain economic and efficient transmission asset costs.

2.25. When undertaking the assessment of costs to derive the FTV, we review updated information provided by the developer, as well as any cost areas flagged for further investigation at the ITV stage. Where costs have increased since the ITV, we ask the developer to provide supporting documentation to justify these increases. We may undertake a technical investigation that focuses on, for example, a particular cost component, such as an increase of costs in a contract or multiple increases across several contracts.

3. Beatrice Offshore Windfarm cost assessment

Section summary

This section sets out a short description of the wind farm and the transmission assets, based on information provided by the Developer. It then summarises how we have undertaken our cost assessment for the Transmission Assets, from the InTV to the FTV and provides a breakdown of the key cost categories that we have considered and highlights the decisions that we have made.

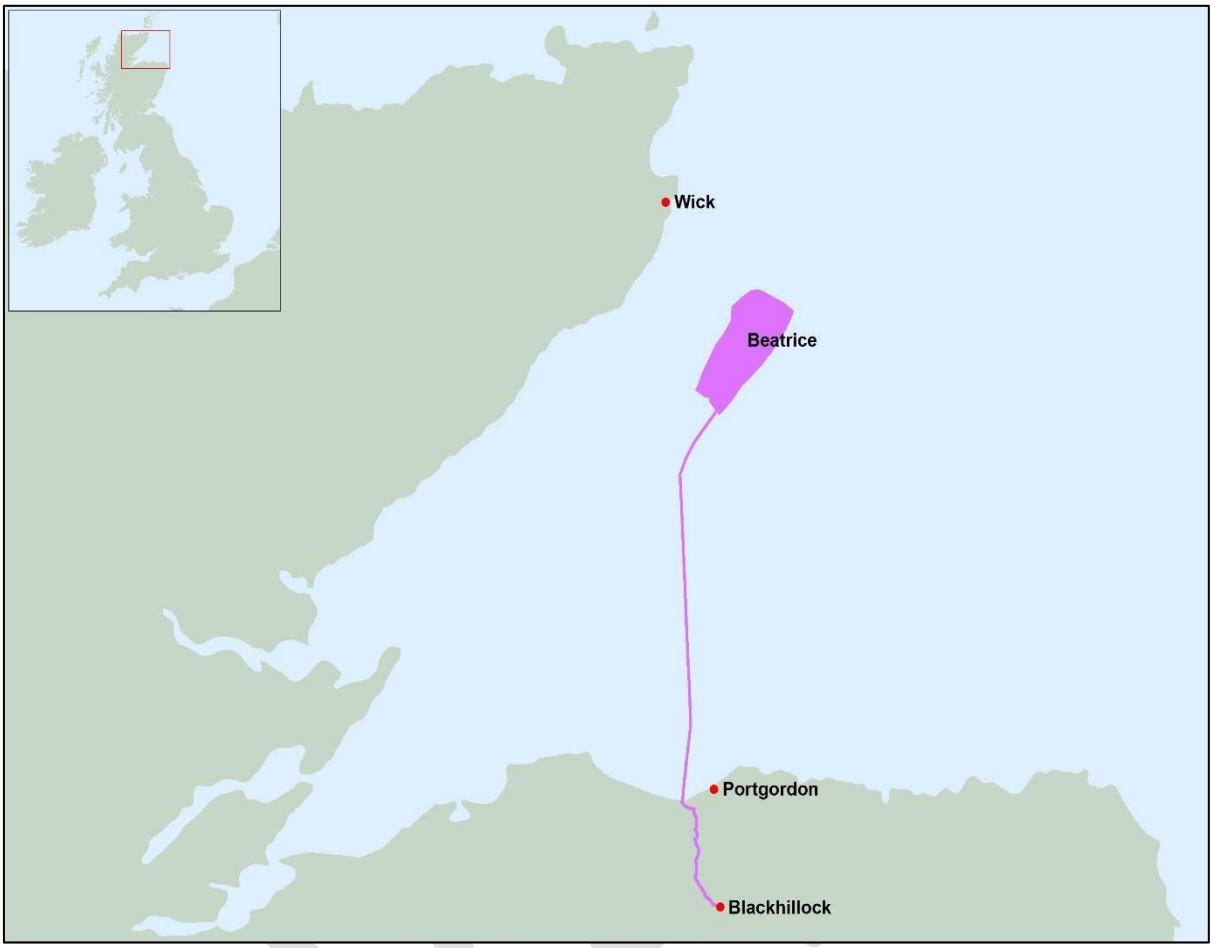
Transmission Assets[4]

3.1. The Beatrice Offshore Wind Farm is located 13.5km (at its closest point) from the Caithness coastline in Northern Scottish territorial waters.

3.2. The wind farm has a 588MW capacity, comprising 84 SGRE 7.0-154 turbines on pre-piled jacket substructures. The power is collected via two Offshore Transformer Modules (**OTMs**), via 33kV array cables and associated equipment. Power is stepped up to 220kV on the OTMs and is exported to the onshore substation at Blackhillock, close to Keith, via circa 90km of offshore and onshore export cables using two circuits. At the onshore substation, the power is stepped up again to 400kV and connected to the adjacent SSEN substation where it joins the National Electricity Transmission System (**NETS**).

[4] The technical information contained in this section of the Report is based on information provided by the Developer and has not been independently verified by Ofgem.

Figure 1: Location of the Beatrice Offshore Wind Farm and Transmission Assets.



3.3. BOWL is owned by SSE Renewables (40%), Red Rock Power (25%), Equitix (17.5%) and The Renewables Infrastructure Group (17.5%). These entities each own their respective shareholdings in the Project via a 'HoldCo' which is the 100% shareholder.

3.4. In addition to equity funding from the owners, BOWL has also secured project financing from a group of commercial banks and the European Investment Bank. The Project went through a comprehensive technical and legal due diligence process before Financial Close was reached in May 2016.

3.5. The Transmission Assets connect to the Beatrice Offshore Wind Farm at the two offshore platforms. The Transmission Assets that are transferring to the OFTO comprise:

a) two offshore transformer modules (**OTMs**) including two 220/33kV grid transformers and 220kV Gas Insulated Switchgear (**GIS**);

b) two buried offshore export cable circuits with an average route length of approximately 70km as well as an interlink cable between the OTMs with a length of 1.5km;
c) one onshore transition joint and two onshore export cable circuits with a route length of approximately 19.3km;
d) one onshore substation including 400kV Air Insulated Switchgear (**AIS**) and two 400/220/33kV Super Grid Transformers; and
e) two 400kV cables of approximately 0.7km in length which link the onshore substation to SSEN's Blackhillock substation.

3.6. The onshore and offshore boundary points proposed by the Developer are as follows:

a) Offshore (Grid Entry Point) - the busbar side of 33kV Grid Transformer incomer circuit breakers on each Offshore Transformer Module; and
b) Onshore (Transmission Interface Point) - the 400kV GIS cable sealing ends within SSEN Blackhillock Substation.

3.7. The spares included in the Transmission Assets that are transferring to the OFTO are:

a) 1km of 1200mm^2 subsea cable and 1km of 1600mm^2 factory jointed to 0.4km of 1200mm^2 subsea cable;
b) various lengths of 400kv and 220kv onshore cable;
c) various joints (transition, straight and cable repair joints);
d) cable terminations; and
e) other miscellaneous spares.

Overview of cost assessment process for Beatrice project

3.8. We received the first cost information from the Developer in September 2018. Since then we have worked with the Developer and our advisers to reach an assessment of the costs which ought to have been incurred in connection with the development and construction of the Transmission Assets. We set out below an outline of the steps taken, and to be taken, in the cost assessment process for the Project.

a) **November 2018**: InTV (£498.5m) published.
b) **October 2018**: Developer submitted the ITV CAT (the **ITV CAT**)
c) **June 2019**: ITV figure (£448.4m) determined and communicated to Developer.
d) **June 2019**: formal ITV letter issued.
e) **July – November 2019:** ITT process (bidding and evaluation).
f) **October 2019:** Developer submitted a revised CAT (the **FTV CAT**).
g) **November 2019 - Jun 2020:** forensic accounting and FTV investigation undertaken.
h) **June - December 2020**: final cost reporting updates and final supporting information received from the Developer.
i) **March 2021:** this draft cost assessment report released to the Developer for comment and the Preferred Bidder for information.
j) **June 2021:** draft cost assessment report published alongside the Section 8A Consultation.
k) **TBC 2021:** The Authority to determine the FTV when granting the licence to the successful bidder. The final cost assessment report will be published after licence grant.

Summary of the InTV and ITV determination

3.9. The InTV of £498.5m was published in November 2018. This value was based on information received from the Developer at an early stage in the construction and development of the Project. This value was included in the EPQ document and Preliminary Information Memorandum (**PIM**) for the commencement of the EPQ stage of the Project.

3.10. The ITV of £448.4m was established in June 2019, with the formal ITV letter issued to the Developer in the same month. Our estimate was supported by our forensic accounting advisors, Grant Thornton (**GT**), our internal analysis, and the supporting information provided by the Developer.

3.11. We conducted an in-depth cost analysis at ITV, however some costs could not be fully investigated and were highlighted as needing further attention at the FTV stage. This included:

a) the revision of unsubstantiated costs through our financial consultants;
b) review of a global settlement;
c) investigation into claims;
d) "remaining" and unsubstantiated costs;
e) calculation of the allocation percentage between Generation/Transmission Assets; and
f) dates relevant to ceasing the IDC.

3.12. Below are the main points arising from our review, the forensic review, and a description of the adjustments applied at ITV. Full details are set out in the ITV letter issued by Ofgem on 14 June 2019 (the **ITV Letter**).

Ofgem review – Crosscutting issue

3.13. In conducting the ITV cost review, we identified a crosscutting issue, that is, an area that applies across more than one cost category, in addition to specific cost category adjustments.

3.14. In December 2018, the Developer executed a global settlement agreement (the **Settlement**) with its main EPCI contractor. We received an updated CAT from the Developer in January 2019 that reflected the financial impact of the Settlement, as well as

other updated costs. At ITV we stated that this settlement would be reviewed at the FTV stage.

Ofgem review – Individual cost categories

3.15. We undertook a detailed review of each cost category. Below we summarise the adjustments made to each category.

Offshore Transformer Modules (OTMs)

3.16. At ITV we reviewed the costs for the design, supply, installation, commissioning and project management of the two OTMs and reduced this category by £27.6m overall. This adjustment was made up of the following reductions for:

a) metering equipment;
b) the OTM's array J-tubes;
c) a spare transformer;
d) additional costs incurred through the design, fabrication and installation of the OTMs;
e) a portion of the OTM related costs in the Settlement which we deemed as not being economic and efficient;
f) liquidated damages retained by the Developer from the main EPCI contractor; and
g) a firming up of costs by the Developer.

Submarine cable supply and installation

3.17. We adjusted the costs submitted for the design, fabrication, installation and project management of the submarine cables which resulted in an overall increase of £0.2m. This adjustment included:

a) an overall increase in the submarine cable related costs in the global settlement, a portion of which we deemed to not be economic and efficient;
b) a reduction in the costs associated with the procurement and delivery of spare submarine cables; and
c) a reduction in relation to spare cable storage as this was deemed an operational cost.

Onshore cables

3.18. We adjusted the costs submitted for the design, fabrication, installation and project management of the onshore cables which resulted in an overall increase of £0.2m. This adjustment included:

a) an overall increase in the onshore cable-related costs in the global settlement; and
b) a reduction to reflect the removal of projected costs for the Horizontal Directional Drilling (**HDD**) works, which were included as part of the global settlement.

Onshore Substation

3.19. We calculated an overall increase of £0.2m to the onshore substation cost category. This was in relation to onshore substation-related costs of the Settlement, and was reviewed further at the FTV stage.

Reactive and harmonic equipment

3.20. The Developer submitted costs for the Project's reactive and harmonic filtering equipment. We did not make any adjustments to this cost for the calculation of the ITV.

Other Costs

3.21. We made an overall reduction of £24.0m to this cost category, made up of the following components:

a) an overall increase of £1.0m in relation to the Settlement, reviewed further at the FTV stage;
b) a reduction of £1.5m in relation to maintenance costs (these are costs that should not be included as part of the Project's development and construction costs);
c) a reduction of £2.5m in relation to operational insurance (again, costs that are not part of construction and development costs);
d) an overall reduction of £19.1m proposed by the Developer to reflect a more accurate representation of the Project's incurred costs; and

e) a reduction of £1.8m in relation to interest payable to the Project's shareholders. Interest during construction (**IDC**) provides for all financing costs during the development and construction of the project, and hence, we do not allow additional financing costs to be included within the transfer value.

Transaction costs

3.22. We recognised that these works are necessary to the Project and included the full cost within the ITV.

Interest During Construction (IDC)

3.23. We made an overall reduction of £3.9m to this cost category, based on:

a) an increase of £1.1m in relation to the adjustments made to the Project's cash flow;
b) a reduction of £2.6m in relation to the Project's final IDC payment being accumulated after the Project's first power date;
c) a reduction of £0.6m in relation to the IDC accumulated during development of the Project over a duration that we consider to be inefficient; and
d) a reduction of £1.9m as a consequence of the total adjustments that we made to the Project's capex costs.

Forensic Review

3.24. When establishing the ITV, we took into account the results of the forensic investigation conducted by our independent consultant GT. They assessed the level of contingency, as a proportion of total costs, and found it reasonable once the Developer proposed a reduction from £25m to £5m. However, GT was unable to substantiate the basis of the contingency calculation and its monetary value. We expect developers to share the full breakdown of contingency, which we noted would be scrutinised at the FTV stage to assess the contingency submitted (if any). GT found that all other costs in the CAT were appropriately stated.

Process for determining the Assessed Costs

Accuracy and Allocation

3.25. The Project was constructed using an EPCI contract. An ex-post forensic accounting investigation was undertaken by GT to ensure that the costs reported to us by the Developer were accurate, in that they represented the actual costs incurred by the Developer during the development and construction of the Project.

3.26. This investigation considered the following main contracts in respect of the Transmission Assets:

a) Siemens Transmission and Distribution Limited / Nexans S.A. (**STDL/Nexans**), in relation to the following: OTM fabrication, supply and installation of the submarine cable, supply and installation of the onshore cable, and installation of the onshore cable at the onshore substation;
b) Subsea 7 (**SHL**), for the transport and installation of the OTMs;
c) Island, in relation to the OTM installation;
d) Seajacks, also in relation to the OTM installation; and
e) a sample of the Developer's internal personnel costs selected at random.

Efficiency

3.27. After costs had been appropriately identified and allocated, we performed an assessment of whether these costs were economic and efficient, which involved an internal benchmarking review as well as a wider review of costs incurred in each cost category.

Summary of Assessment

3.28. Following completion of the development and construction of the transmission assets, the Developer submitted costs in the October 2020 FTV CAT amounting to a value of £452m. Our assessment of the economic and efficient costs which have been or ought to have been incurred, in connection with developing and constructing the Transmission Assets, has established an Assessed Costs value of £437.9m. Table 2 below provides a breakdown of the cost categories for the Project at each stage and the changes between the ITV and the FTV stages, and paragraphs 3.29 – 3.88 set out the issues considered as part of the FTV stage.

Table 2: Summary of cost categories*

these figures may not add to totals due to rounding.

Category	InTV Sept18 (£m)	ITV June19 (£m)	FTV Feb 21 (£m)	FTV-ITV	Reasons for change between ITV and FTV
Capex	360.9	371.4	368.2	-3.3	Increase of: £3.7m net impact of generation assets weight contribution £2.7m for additional staff and PM costs £0.9m for firming up of contract costs £0.2m additional crossing agreement Decrease of: £9.1m for cable costs over benchmarked values £0.5m for generator's use of fibre optics £0.5m for space occupied by generation assets in onshore substation £0.2m for global settlement adjustment £0.2m GT adjustment £0.1m cost of additional cable basket £0.1m cost of telecoms circuit
Development**	99.9	38.1	38.5	0.4	Increase of: £1.6m for firming up of resource costs Decrease of: £0.7m for firming up of contract and consent cost £0.4m for mark-up removed from resource costs £0.1m adjustment for correcting CAT submission to ITV
Contingency	0.0	5.0	0.0	-5.0	Decrease of: £5m due to contingency being released
IDC	35.2	31.2	29.9	-1.3	Increase of: £3m for updated costs submitted £0.6m adjustment to pre-FID duration Decrease of: £4.9m for adjustments related to construction delays, to reductions proportional to disallowances and to dates indicating assets available for use
Transaction	2.5	2.5	1.3	-1.2	Decrease of: £1.2m for costs being made firm
Total	498.5	448.2	437.9	-10.3	

***Development represents all costs within the cost category 'Other' (CR8) in the Cost Assessment Template. This includes development costs, as well as other common costs.*

Capital expenditure

3.29. The Capex element of the Assessed Costs is £368.2m. Overall, the Capex has decreased by £3.3m from the ITV to the FTV stage. This decrease is the overall result of a series of cost increases and decreases, as set out in more detail in Table 2 above.

Accuracy and allocation of Capex costs

3.30. For the majority of Capex costs incurred on the Project, it was clear whether they should be allocated to the Transmission or the Generation Assets in their entirety. For costs shared between Generation Assets and Transmission Assets, the Developer allocated a proportion of costs to the Transmission Assets using the Capex ratio between Generation and Transmission Assets.

Efficiency of Capex costs

3.31. All cost categories showed a decrease. This overall decrease is the result of cost updates from the Developer and adjustments applied following our cost review, which are detailed below.

Crosscutting Issues

Additional Staff Costs

3.32. The Developer submitted additional staff costs across all cost categories. These staff costs were being incurred during the FTV stages and, as such, the Developer could not submit final figures until the work was completed.

Ofgem's view

3.33. We accept that these costs were being incurred during the later stages and were not included as part of the Developer's original submission. The final additional staff costs were allocated to their relevant cost categories minus the estimated profit element detailed in section 3.35. This resulted in an additional £2.7m being included in the FTV.

Final contract costs

3.34. The Developer submitted additional contract costs across all cost categories. These contract costs were being incurred during the FTV stages along with outstanding payments being made. As such, the Developer could not submit final figures until the work was completed and final payments made. The overall cost increase is included in Table 2 above.

Ofgem's view

3.35. We accept that these costs were being incurred during the later stages and were not included as part of the Developer's original submission. The final additional contract costs were allocated to their relevant cost categories and overall has resulted in an additional £0.9m being included in the FTV.

Offshore Transmission Modules (OTM)

Generation assets Weight Impact

3.36. The generator has equipment on the OTMs, which adds to the dimensions for the topside and therefore the support structure required. The additional weight of generation equipment will ultimately drive additional costs to support this equipment, such as an increase in size of jackets needed. We therefore have made an adjustment to the construction costs of the OTMs to reflect the cost contribution from the generator to the overall cost of the OTMs. At the ITV, we calculated this cost to be £4.3m and this value was deducted. At the time, however, discussions had not been finalised and the Developer was to provide further evidence to support its view of the costs associated with the generator's equipment and the impact on the OTMs.

Ofgem's view

3.37. During FTV stage we resumed discussions with the Developer regarding the deductions made and our calculations. The Developer commissioned Atkins to create an independent report wherein they ran structural analysis of both the substation jackets and topsides with and without generation equipment in place. The conclusions from this report showed that the generation equipment weight had a far lower impact on the offshore substations than anticipated. The report submitted by the Developer was reviewed by our own engineering team which agreed with the recommendations.

3.38. As a result of this review, we have reinstated the £4.3m deducted at ITV, and instead deducted only £0.6m in our calculation of the Assessed Costs, which was the value calculated from the independent report's recommendations. This is our view of the economic and efficient value for the impact of the Generation Assets on the OTMs.

Global Settlement

3.39. The Developer's submission included a lump sum in its CAT to cover the Settlement. These claims related to a number of issues including but not limited to adverse weather causing downtime on the export cable trenching works and cable pull-in operations, OTM fabrication delays, and unforeseen flora and fauna on onshore cable route. This lump sum was split across all cost categories as it covered all aspects of the project.

Ofgem's view

3.40. After an extensive review of the claims that the Developer listed, we identified two claims we believed should not be included in the Settlement:

a) A claim for re-design works due to the Marine Installation Contractor changing one of the barges that was to be provided for OTM transportation. We believed that this design work should have been done before fabrication began and as such, we did not include this cost of £0.1m in the FTV as it was not economic and efficient.
b) A claim for additional services provided to the Marine Installation Contactor for OTM barges. We recognised this claim as being a direct result of delays caused by a subcontractor and, as the Cost Assessment Guidance states:

'We expect Developers to manage their contractors effectively. They should provide evidence that project management or contract control processes are put in place upfront (i.e. before the relevant contract is signed) to minimise any cost overruns. Developers should also be able to evidence how they implement their contract and cost control processes through the project lifespan. If a lack of robust contract cost management leads to increased costs in the development and construction of the Transmission Assets, we may conclude that such costs were not economic and efficient and may not, therefore, be allowed.'

Therefore, we have not included the £0.1m in relation to this in the FTV.

3.41. In total, this results in a decrease of £0.2m to the Capex for this cost category.

Additional PM costs originally omitted

3.42. The Developer submitted costs related to additional project management costs which had originally been omitted from the FTV CAT.

Ofgem's view

3.43. We accepted these costs as being economic and efficient and therefore allowed the value of £0.2m to be included in the Assessed Costs. Coupled with the additional staff costs referenced in section 3.35, this resulted in an increase of £2.7m to the Capex for this cost category.

Adjustments proposed by the Developer

3.44. The Developer proposed a minor correction due to an accounting error. This was in relation to a variation order to rectify a faulty battery charger system on one of the OTMs. The value of this order had been included in the Developer's original submission incorrectly.

Ofgem's view

3.45. During the cost assessment process, we regularly discuss with the Developer all those costs that we do not consider economic and efficient. When the Developer recognises that an error has occurred during the CAT completion or agrees with our view, then we propose an adjustment. We then apply it to the cost assessment and describe it as a "Developer proposed adjustment". In total this reduced the Assessed Costs by £12,916.

Submarine cable

Bespoke Cable Baskets

3.46. Costs were submitted for two bespoke cable baskets that needed to be fabricated to store the submarine cable. The Developer had three options available to it: purchase readymade baskets, rent baskets from a third party, or commission baskets to be built. After conducting a cost benefit analysis (**CBA**) on the three options, the Developer decided to have bespoke cable baskets built and a portion of the cost was allocated to the OFTO and submitted in the FTV CAT.

Ofgem's view

3.47. The Developer shared the CBA with us, and we agreed that, of the three options presented to it, the most economic and efficient option was that chosen. As only one of the baskets is being transferred to the OFTO, we therefore only included the cost for one basket, leading to £0.1m not being included in the Assessed Costs.

Fibre optic cables for generation related activities

3.48. Both the submarine and onshore cables installed for the Project contain fibre optic cable. These cables are to be owned by the OFTO but a number of the fibre optic cables are used for the transmission of data for the Generation Assets. No costs for this, however, were allocated to the Generation Assets.

Ofgem's view

3.49. Fibre optic cables are installed alongside or within the onshore and offshore export cables for offshore transmission projects. These fibres are used for both transmission and generation control, monitoring, and communication purposes. As projects are now being constructed on an increasingly larger scale and further offshore, cable lengths are increasing, as are the communication requirements. This means that the cost associated with the supply and installation of the fibre optic cables is a significant cost.

3.50. As the fibres used for generation purposes are not available to the OFTO and the OFTO gains no benefit from them, we requested that the Developer provide us with an evaluation of the cost of the generation portion of the Project for its use of the fibre optic cables. Following the generation allocation review, the value of £0.4m was not included in the FTV to reflect the generator's share of their fibre costs and cannot be included in the FTV.

Additional costs over expected values

3.51. As part of the benchmarking exercise, the submarine cable cost category was identified as being a significant outlier when compared to our expected values. The expected values are based on data from previous projects' submarine cable costs.

3.52. We made allowances for a number of factors including the Project's operating voltage (220kV) and Project specific costs such as larger cable installation vessels.

However, even after revisiting the benchmarking analysis with the Project specific allowances, there was still a significant difference in the submitted costs for this category compared to projects of a similar size and scale.

Ofgem's view

3.53. The Developer was unable to provide any further evidence or justification to explain this difference between the submitted costs and the expected costs. In the cost assessment guidance we state:

> "In the absence of appropriate evidence to justify these differences, we may use the benchmarking data to inform our view of whether or not the relevant costs can be considered economic and efficient."

3.54. As such we, used the benchmarking data and have not included £5.9m of costs associated with this cost category, as this additional level of costs cannot be regarded as economic and efficient. Therefore, this value has not been included in the FTV.

Grant Thornton Deduction

3.55. We used forensic accountants Grant Thornton (**GT**) to conduct a thorough review of the Developer's costs. GT's report, which was made available to both Ofgem and the Developer, only made one proposed adjustment to the Developer's submission. This adjustment was to decrease the cost of the STDL/Nexans contract by £0.2m to reflect the final account of the contract.

Ofgem's view

3.56. We have reviewed this adjustment and agree with GT's suggested treatment and have therefore not included the £0.2m in the Assessed Costs.

Onshore cables

Costs over expected values

3.57. As part of the benchmarking exercise, the onshore cable cost category was also identified as being another significant outlier when compared to our expected values based on previous projects' onshore cable costs.

3.58. We made allowances for a number of factors including the Project's operating voltage (220kV) and Project specific costs such as unforeseen land conditions along the onshore cable route and the difficulties faced due to the area where landfall took place being a Site of Special Scientific Interest (**SSSI**). However, even after revisiting the benchmarking analysis with the Project specific allowances, there was still a significant difference in the submitted costs for this category compared to projects of a similar size and scale.

Ofgem's view

3.59. The Developer was unable to provide any further evidence or justification to explain this difference in the expected values and the submitted costs. Therefore, in relation to this difference and for similar reasons in section 3.51, we have not included £3.2m from this cost category in the Assessed Costs as we view this additional level of costs as not being an economic or efficient for the onshore cable.

Onshore fibre optic cables for generation related activities

3.60. As described earlier, both the submarine and onshore cables contain fibre optic cables and a number of these fibres are used for the transmission of generation data and control. No associated costs for the use of this was allocated to the Generation Assets as it had all been included as Transmission Assets.

Ofgem's view

3.61. As the fibres used for generation purposes are not available to the OFTO and the OFTO gains no benefit from them, we requested that the Developer provide us with an evaluation of the cost that the generation portion of the Project should assume for their use of the fibre optic cables. Following the allocation review, £0.1m was not included in the Assessed Costs to reflect the Developer's share of the fibre costs.

Additional Crossing Agreement Costs

3.62. An additional cost was submitted by the Developer for crossing agreements which relate to the crossing of SGN's gas network by the onshore cable. The associated costs in relation to this agreement were initially omitted by the Developer in error.

Ofgem's view

3.63. We have reviewed these costs and the reason for them being incurred and are of the view that these crossing agreements were necessary. As such, we have included the additional £0.2m in the FTV for this cost.

Onshore substation

Generation Equipment Costs

3.64. As offshore projects are getting larger and their communication requirements increasing, we have observed that the space occupied by equipment housed within the onshore substation for generation purposes is increasing in proportion to the project size. This space is not available for OFTO use and has a cost associated with it.

Ofgem's view

3.65. We routinely scrutinise all costs associated with generation related equipment for new projects to ensure that the apportionment between Generation and Transmission Assets is appropriate and costs remain economic and efficient.

3.66. Therefore, we have apportioned the cost associated with housing the Generation Assets in the onshore substation and we have not included the £0.5m for the generation use of space in the onshore substation. This is because it is considered a generation cost and cannot be included in the FTV.

Telecoms circuits

3.67. Some of the assets proposed to transfer from the Developer to the OFTO include telecoms equipment. As well as this equipment, the Developer also installed three telecoms circuits for the OFTO to use. However, the OFTO has confirmed to the Developer that these three circuits will not be required by them, and the Developer will retain ownership.

Ofgem's view

3.68. As these three circuits have been confirmed as not transferring to the OFTO, we have not included the associated costs of £0.1m in the FTV as they are Generation Assets.

Development costs

3.69. The assessed development expenditure for the Transmission Assets at the FTV is £38.5m, an increase of £0.4m from ITV. The detailed cost increases and decreases are set out in Table 2 above and include updates due to firming-up of previously estimated costs included in the FTV submission and cost reductions as part of the assessment process.

3.70. The FTV CAT included costs of the Developer's employees that it attributed to the Transmission Assets. Whilst we were provided with details of the hours spent by the employees on the Transmission Assets, we were not provided with details of how the hourly rates for each employee/group of employees were calculated or of the constituent parts of those hourly rates. Therefore, we applied a reduction to Construction Management Agreement (**CMA**) costs. This was based on a reduction to costs related to all full time employees of the Developer working on the Project. This was agreed with the Developer as the CMA has an inbuilt mark up on such costs.

3.71. The Developer also made a number of reductions and additions to this cost category, namely additional project management costs and additional support costs originally omitted from the FTV CAT, as well as a cost adjustment to align with the agreed ITV position.

Ofgem's view

3.72. According to the Cost Assessment Guidance, developers are required to transfer the Transmission Assets to the OFTO at cost. Therefore, we do not accept any mark-up or margin on internal resources costs in the transfer value. Following discussions with the Developer, and based on our experience of previous projects, we have reduced the rates included in the CAT for the Developer's internal resource to remove the markup element. This reduced the Capex of internal staff costs by £0.4m.

Contingency

3.73. A value of £3m was included in the FTV CAT for contingency which the Developer accepted was added in error in lieu of other estimated costs.

Ofgem's view

3.74. It is our view that any contingency be removed from the FTV CAT. At this stage of the Project, all costs should be known and either confirmed or be in the process of being finalised. We have therefore not included this value in the FTV.

Interest during construction

3.75. Since the ITV, the Project had been progressing with construction work and incurring additional costs. This has, in turn, resulted in an increase of £3.0m in IDC based on the Developer's updated cost submission in October 2019.

3.76. At the ITV, a reduction of £0.6m was made in relation to an applied abatement of the first 49 months' IDC payments. This was based on our view of the efficient duration of the development phase of a project. The Developer has since provided further information during the FTV process which indicated that the duration of the development phase was as efficient as possible, and any additional duration was due to the consenting process that had to be followed. This has resulted in the £0.6m reduction being reinstated in the FTV following detailed review.

3.77. During the course of construction, the Developer took the decision to place the export cables into 'wet storage' while other delayed work was being completed. Wet storage is the leaving of the export cables on the seabed until the construction can be completed.

3.78. In the Cost Assessment Guidance we state that:

> "*we will consider the length of time over which IDC is applicable, and if we consider there is evidence of inefficient and uneconomic time periods during the pre-construction, construction or commissioning programme for the Transmission Assets, the period of IDC applicability may be adjusted to reflect this.*"

3.79. We identified the assets concerned and the duration that they were wet stored and adjusted the IDC on these assets to reflect that no work was being carried out on them.

3.80. The OTMs were also delayed prior to installation, and were effectively idle, and we have subsequently applied a similar adjustment to the IDC on these assets, as they were in storage in the port or not being worked on.

3.81. Further, a reduction of £2.3m was made related to our adjustment of the timing of the last IDC allowance. The Developer submitted a final IDC payment for July 2018, the month in which it considered the Transmission Assets became available for transmission. This is based on the Developer's position that the Transmission Assets are available for use when the Interim Operational Notification Part B (**ION B**) provided by National Grid is received, which is the first point at which active power can be exported to the grid. We consider, as stated in the Cost Assessment Guidance, that IDC will cease:

> *"…as soon as Transmission Assets are available for use for the transmission of electricity to the onshore network"*

and for reasons noted in section 3.78 above, in relation to the economic and efficient commissioning duration.

3.82. We engaged consultants to advise us on the appropriate point in time when the assets could be considered safely energised and commissioned in order to establish when the IDC should cease. Following advice, we concluded that in this instance the assets could be considered safely energised and commissioned prior to the ION B dates and calculated the interest accrual accordingly, ceasing IDC in June 2018, which resulted in a reduction to the Developer's calculation.

3.83. Finally, a reduction of £0.7m was made representing the adjustment following the conclusion of the broader FTV cost assessment, for the of all costs not included in the FTV after our final position on the economic and efficient costs.

Ofgem's view

3.84. The increases in IDC were offset by the reductions in IDC due to the adjustments to the storge duration, the date the assets were available, and the proportionate reduction in Capex for disallowed costs. The overall reduction to IDC is £4.3m (see Table 2) which results in an overall decrease of £1.3m since ITV. The total IDC for the Transmission Assets at FTV is £29.9m.

Transaction costs

3.85. The Developer had submitted an estimate of the transaction costs it expected to incur up to the point of asset transfer. We have reviewed this estimate and assessed transaction costs at £1.3m.

3.86. The Developer provided a breakdown of the transaction costs submitted. It included both internal and external costs. The external costs related to professional services (e.g. legal) in respect of the tender.

3.87. Transaction costs decreased by £1.2m since the ITV due to the transaction budget being revised and costs estimates being firmed up.

Ofgem's view

3.88. Transaction costs can only be provided to us by developers to a reasonable degree of accuracy towards the end of the tender process. We have considered the level of costs submitted and concluded they are in line with expectations and are considered efficient and economic and were allocated appropriately.

Confirmation in relation to tax benefits

3.89. The ITV was calculated on the basis that the OFTO would obtain the full benefit of all available capital allowances. If this were not the case for the Assessed Costs, we would reduce the assessment of costs for an amount that reflects the value of the tax benefit retained by the Developer. It is intended that the OFTO will be able to obtain the full benefit of all available capital allowances. At the time of licence grant, when FTV will be defined, this will be translated into the FTV coinciding with the Assessed Costs, should no other conditions change.

Conclusion

3.90. In conclusion, in accordance with Regulation 4 of the Tender Regulations, the Authority has assessed the economic and efficient costs which ought to have been incurred in connection with developing and constructing the Transmission Assets as £437,882,831.

Appendices

Index

Appendix 1 - Glossary

A

Assessed Costs

The final assessment of costs determined by Ofgem through the cost assessment process for the Beatrice Offshore Windfarm transmission assets.

C

Capex

Capital Expenditure

CAT

Cost Assessment Template

Cost Assessment Guidance

Can be found here https://www.ofgem.gov.uk/system/files/docs/2019/05/offshore_transmission_guidance_for_cost_assessment_april_2019.pdf

D

Developer

Beatrice Offshore Windfarm Limited

E

EPQ

Enhanced Pre-Qualification

EPCI

Engineering, Procurement, Construction and Installation

F

FTV CAT

The Developer cost assessment template submitted on October 2019

FTV

Final Transfer Value

G

GEMA

The Gas and Electricity Markets Authority

Generation Assets

The Beatrice Windfarm Generation Assets

GT
Grant Thornton

I

IDC

Interest During Construction

InTV

Initial Transfer Value

ITT

Invitation to Tender

ITV

Indicative Transfer Value

ITV CAT

The Developer cost assessment template submitted on October 2018

ITV letter

The formal ITV letter issued to the Developer in June 2018

M

MW

Megawatt

O

OFTO

Offshore Transmission Owner

OFTO licence

See definition in Section 1 of this report

OFTO regime

See definition in Section 1 of this report

OTM

Offshore Transformer Module

P

PIM

Preliminary Information Memorandum detailing the Project's details released to EPQ bidders through the tender portal.

PM

Project Management

Project

The development and construction of the Transmission Assets

Q

QTT

Qualification to Tender

S

Section 8A Consultation

See definition in Section 2.13 of this report

T

Tender process

The competitive tender process run in accordance with the Tender Regulations through which OFTOs are granted offshore electricity transmission licences

Tender Regulations

The Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015

Transmission Assets

The Beatrice Offshore Windfarm Transmission Assets

TRS

Tender Revenue Stream