East Anglia ONE North and East Anglia TWO Offshore Windfarms

Regulatory Context Note

Applicants: East Anglia TWO Limited and East Anglia ONE North Limited
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Applicable to East Anglia ONE North and East Anglia TWO

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Glossary of Acronyms

BEIS	Department for Business, Energy and Industrial Strategy
BETTA	British Electricity Trading and Transmission Arrangements
CBA	Cost Benefit Analysis
CfD	Contract for Difference
CION	Connection and Infrastructure Options Note
CMP	CUSC Modification Proposal
CPA	Construction Planning Assumptions
CUSC	Connection and Use of System Code
DCO	Development Consent Order
DNO	Distribution Network Operator
ELSI	Electricity Scenario Illustrator
ETYS	Electricity Ten Year Statement
FES	Future Energy Scenarios
GB	Great Britain
GEMA	Gas and Electricity Markets Authority
kV	Kilovolt
LCCC	Low Carbon Contracts Company
MTS	Main Integrated Transmission System
MW	MegaWatt
NETS	National Electricity Transmission System
NGESO	National Grid Electricity System Operator Limited
NGET	National Grid Electricity Transmission plc
NOA	Network Options Assessment
NPS	National Policy Statement
Ofgem	Office of Gas and Electricity Markets
OFTO	Offshore Transmission Owner
PPA	Power Purchase Agreement
RAB	Regulated Asset Base
RIIO	Revenues = Incentives + Innovation + Outputs (Ofgem Price Control Model)
SHETL	Scottish Hydro Electric Transmission
SPT	ScottishPowerTransmission
STC	System Operator Transmission Owner Code
STCP	System Operator Transmission Owner Code Procedure
TEC	Transmission Entry Capacity
TNUoS	Transmission Network Use of System
TO	Transmission System Operator

Glossary of Terminology

Applicants	East Anglia ONE North Limited and East Anglia TWO Limited
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia TWO project Development Consent Order but will be National Grid owned assets.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO / East Anglia ONE North project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order.
Projects	The East Anglia ONE North project and the East Anglia TWO project.

1 Introduction and Summary

1.1 Introduction

1. The purpose of this note is to outline key features of the current regulatory regime which governs the Great Britain electricity industry as it relates to offshore wind developments.

2. Section 1.2 contains a summary of key aspects of the regime.

3. In section 2 we then go on to provide background as follows:

    a. Section 2.1 The structure of the GB electricity industry.

    b. Section 2.2 Key laws governing the Great Britain[1] electricity sector.

    c. Section 2.3 Ofgem's legal duties.

    d. Section 2.4 Support for offshore renewable generation, the Contract for Difference regime.

4. Section 3 describes certain aspects of the regulation of electricity transmission in more detail as follows:

    a. Section 3.1 The roles and responsibilities of the TOs and NGESO.

    b. Section 3.2 Planning developments to the transmission system.

    c. Section 3.3 Recovering the costs of the transmission system.

5. Finally, section 4 describes some further elements of the regulatory regime as applicable to offshore wind developments as follows:

    a. Section 4.1 Delivery models for the offshore transmission network, the OFTO regime.

    b. Section 4.2 The relationship between NGESO, the TOs and offshore wind developers up to final connection and energisation.

    c. Section 4.3 Selection of the onshore point of connection: the CION process and offshore wind developments.

6. This document is applicable to both the East Anglia ONE North and East Anglia TWO applications, and therefore is endorsed with the yellow and blue icon used to identify materially identical documentation in accordance with the Examining

[1] The Northern Ireland electricity sector is subject to a different regime, albeit with similarities.

Authority's procedural decisions on document management of 23rd December 2019. Whilst for completeness of the record this document has been submitted to both Examinations, if it is read for one project submission there is no need to read it again for the other project.

1.2 Summary and Key Aspects of the Regime

7. The focus of this note is on the regulation of electricity transmission in the context of offshore windfarm developments. Some key points are set out in this section 1.2.

8. Connections to the Great Britain transmission system are provided by the electricity system operator, National Grid Electricity System Operator, (NGESO), along with the transmission system operators (the TOs). Each of NGESO and the TOs are separate companies.

9. The legal regime governing the electricity industry reflects underlying policy. NGESO, the TOs and Ofgem are subject to a range of legal obligations designed to secure the following outcomes:

   a. A reduction in carbon emissions. Great Britain was subject to a legally binding target to increase the proportion of electricity generated by renewable sources under EU law. Ofgem, NGESO and the TOs are under various obligations to ensure that renewable generators have fair and non-discriminatory access to the electricity transmission system. The TOs and NGESO are obliged to offer such access.

   b. Economy and efficiency. Costs for consumers should be kept as low as possible. For this reason, the legal regime supports competition in electricity generation and the reduction of the cost of low carbon electricity. This is why the CfD support regime for offshore wind is conducted on an auction basis pursuant to the Energy Act 2013 and EU State aid rules.

   c. Economy and efficiency in transmission. The provision of electricity transmission is, principally a monopoly activity. Network costs are a significant proportion of electricity costs. The TOs and NGESO are under clear duties to ensure that their operations are conducted in an efficient, co-ordinated and economical manner. Ofgem is under clear duties to work to secure this outcome. This reflects the need to ensure that the costs to consumers are kept as low as possible.

   d. It is to be noted that the costs to consumers is a material consideration. This reflects the fact that the costs of the generation, transmission, distribution and supply of electricity are passed on to consumers. The considerations of costs applies to all classes of consumers, for example, industrial and commercial consumers as well as domestic consumers.

10. The CfD regime brings significant competitive pressure on offshore wind farm developers. They are incentivised to minimise costs, including the costs of the offshore electricity transmission network. This is in the consumers' interests, as costs are minimised.

11. The TOs and NGESO are subject to licences under the Electricity Act 1989, (the 1989 Act). The licences are subject to supervision by Ofgem. The TOs and NGESO are under a specific duty under the 1989 Act to:

    a. "*to develop and maintain an efficient, co-ordinated and economical system of electricity transmission*;" and

    b. "*to facilitate competition in the supply and generation of electricity*."[2]

12. Failure to comply can lead to significant fines and revocation of the licence. The duty to facilitate competition includes, by necessary implication, a duty to provide connections for new generating stations.

13. NGESO plans the development of the transmission system over a long term (ten year) horizon. The NGESO transmission licence requires NGESO to prepare, and update, annually: a "Ten Year Statement", which amongst other matters identifies where over that period "Major National Electricity Transmission System Reinforcements" are likely to be required, and a "Network Options Assessment" which assesses the options for reinforcements to the transmission system.[3]

14. NGESO must approach these tasks so as to facilitate the development of an *"efficient, co-ordinated and economical system of electricity transmission"*, consistent with its 1989 Act duty.[4] The TOs assist NGESO with these tasks and must approach this task in compliance with their section 9 duty. NGESO and the TOs are subject to robust supervision by Ofgem in carrying out these tasks. The TOs and NGESO must report to Ofgem on a wide range of matters. Ofgem has significant investigatory powers, can impose material fines and revoke transmission licences.

15. NGESO's and the TOs' proposed expenditure is periodically reviewed by Ofgem. Ofgem assesses expenditure proposals. These reviews are thorough and wide ranging. Ofgem disallows expenditure proposals if Ofgem considers that they are not efficient and economical.

[2] 1989 Act section 9(2)
[3] Transmission Licence Standard Conditions consolidated to 18 June 2020, conditions C11 and C27. Available at https://epr.ofgem.gov.uk//Content/Documents/Electricity%20transmission%20full%20set%20of%20consolidated%20standard%20licence%20conditions%20-%20Current%20Version.pdf
[4] Transmission Licence standard Conditions consolidated to 18 June 2020, conditions C11(2) and C27(8)

16. Specific arrangements (the OFTO regime) apply to the construction and operation of the offshore network from offshore windfarms to the onshore transmission network. These arrangements are designed to promote competition and a robust approach to costs. Offshore developers can opt for construction of the network by an OFTO. However, offshore developers typically build the offshore transmission network. This is because this enables the developers to better manage project risks, and conduct the construction process efficiently. The network is then transferred to an OFTO under a process operated by Ofgem. Ofgem determines the sum that the OFTO must pay to acquire the offshore network from the developer, (the Transfer Value). Ofgem will only allow the developer to recover

    "*the economic and efficient costs which ought to be, or ought to have been, incurred in connection with developing and constructing the transmission assets*".[5]

    This reflects the imperative of minimising costs to consumers.

17. This is a material incentive on the generator developer to ensure that the costs of the offshore network are "economic and efficient". The selection of an uneconomic and inefficient design would put the generator at a disadvantage. This is because the allocation of support for offshore wind is carried out on a competitive basis under the contract for difference regime. Support is provided on an auction basis, and less efficient generators will not obtain support. The wholesale market for electricity is competitive, and therefore the generator is not likely to be able to pass on inefficient costs.

18. NGESO and the TOs must offer to connect offshore windfarms to the transmission system. They are under licence obligations to do so.[6] The provision of these connections also engages the section 9 1989 Act duty, in order to secure compliance with the section 9 duty the TOs and NGESO, along with the relevant generator comply with the NGESO CION process.

19. The NGESO CION Guidance Note states:

    "*The CION process evaluates the respective transmission options required which leads to the identification and development of the overall efficient, coordinated and economical connection point, onshore connection design and, where applicable, offshore transmission system / interconnector design in line with*

[5] The Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015, regulation 4.
[6] Transmission Standard Licence Conditions consolidated to 18 June 2020, conditions C18 and D4A.

obligation to develop and maintain an efficient, coordinated and economical system of the electricity transmission network." (Page 3).[7]

This is another critical element of compliance with the section 9 duty. There is a clear incentive on NGESO and the TOs to ensure that the design is efficient and economical because Ofgem may disallow the design and inefficient costs.

[7] Open Letter Update on the Connection and Infrastructure Options Note (CION) Process v4.0, National Grid ESO, 14 November 2018. Available at https://www.nationalgrideso.com/document/45791/download

2 An Overview of the Regulation of the Electricity Industry

2.1 The Structure of the Great Britain Electricity Industry

20. The purpose of this section is to summarise, at a high level, the overall structure of the Great Britain electricity industry.

21. The basic structure is as follows:

    a. Generators produce electricity and sell it to suppliers. Generation is competitive. Generators compete to sell power to suppliers.

    b. Electricity is transferred over transmission and distribution systems to consumers. Transmission and distribution are monopoly activities.

    c. Consumers buy from suppliers with delivery taking place at their points of connection to the relevant network.

22. The activities are regulated by a regulator, the Gas and Electricity Markets Authority (GEMA) or Ofgem. The Westminster Government and the devolved administrations determine key elements of overall energy policy.

2.1.1 Generation

23. Generators connect to transmission and distribution systems. They typically sell their power to suppliers. They also sell transmission related services to the system operator, NGESO.

24. The electricity generation market is highly competitive. In 2019 Ofgem reported[8] that:

    a. There were 189 firms in Great Britain with a licence to generate electricity.

    b. "The high number of firms entering and exiting electricity generation suggests that any barriers to entry and exit that may exist are low and not a concern."[9] Competition in the wholesale electricity market appears to be working reasonably well.

25. It should be noted that electricity generators face competition from interconnectors. There are several electricity interconnectors between Great

[8] State of the energy market, 2019 Report. Ofgem, 3 October 2019, available at https://www.ofgem.gov.uk/publications-and-updates/state-energy-market-2019
[9] State of the Energy Market, page 70

Britain and other electricity markets.[10] In their State of the Energy Market report,[11] Ofgem say that in Q1 of 2019 imports to Great Britain via interconnectors accounted for 7% of total GB electricity demand.

26. More interconnectors are planned, further increasing competition in the wholesale power markets.[12]

2.1.2 Transmission

27. Electricity transmission involves the bulk transfer of electricity at high voltage across the transmission system from entry points to exit points. In England and Wales, the transmission system operates at 275kV and 400kV. In Scotland the transmission system operates at 132kV, 275kV and 400kV.

28. The entry points are, principally power stations. Interconnectors from other systems, e.g. France, the Republic of Ireland and Northern Ireland function as entry and exit points, with power flows reflecting the relative prices of power in the relevant jurisdictions. Distribution systems have traditionally functioned as exit points, although some now export due to the increase in distribution connected generation.

29. Transmission splits into two functions: transmission system operation and transmission system ownership. The transmission system owners (TOs), and offshore transmission system owners (OFTOs), make their systems available to a separate company the GB system operator, National Grid Electricity System Operator Limited (NGESO). As we explain below, all of these entities are subject to 1989 Act licences to participate in electricity transmission, and therefore robust oversight by Ofgem.

30. NGESO co-ordinates and directs the flow of electricity over the TOs' and OFTOs' networks and carries out an overall system planning role. The system operation role includes:

    a. keeping the UK system in electrical balance in real time, including by buying power and paying generators to reduce generation to balance the system, and giving instructions to those using the transmission system so as to achieve this objective; and

[10] The Scotland Northern Ireland Moyle Interconnector, (500MW). The Republic of Ireland Interconnector, (EWIC), (500MW). The France/Sellindge Interconnexion France-Angleterre, (2,000MW). Netherlands/BritNEd, (1,000MW). Belgium, Nemolink, (1,000MW).
[11] Paragraph 3.102
[12] See for example list of existing and future interconnector projects, available at Ofgem's website. https://www.ofgem.gov.uk/electricity/transmission-networks/electricity-interconnectors

b. entering into and managing contractual relationships with transmission system users, principally generators and suppliers for connection to and use of the transmission system.

31. The TOs own, maintain and operate the onshore systems. The TOs are Scottish Power Transmission plc, (SPT), Scottish Hydro Electric Transmission plc, (SHETL) and National Grid Electricity Transmission plc, (NGET). There are various OFTOs, who own and operate the transmission systems between the onshore transmission system and offshore windfarms.

2.1.3 Distribution

32. Distribution Network Operators, (DNOs) operate the low voltage distribution systems. The entry points are typically connections with the transmission system and power stations. The exit points are generally customer premises.

2.1.4 Supply

33. Supply is carried out by suppliers. Suppliers purchase power from generators, (or use power provided by generators in the same group) to supply customers. Customers have a choice of supplier. Suppliers contract with NGESO to transport electricity across the transmission system.

2.1.5 Ofgem/GEMA and the Governments

34. The industry currently is regulated by the Gas and Electricity Markets Authority, (GEMA) assisted by its office of civil servants, the Office of Gas and Electricity Markets (Ofgem).[13] Whilst in legal terms there is a distinction between Ofgem and GEMA, on a day to day basis people treat it as one entity. Legally the key decision making powers vest in GEMA, unless delegated by GEMA, e.g. to a staff member at Ofgem. In this note we follow the usual practice of referring to Ofgem as including GEMA.

35. The UK Government determines key aspects of general energy policy, although the devolved administrations have an important role. As an example the Scottish Government grants consents for new power stations. It therefore has significant influence over the generation mix in Scotland.

36. This background reflects a general approach to the privatisation of utilities in the United Kingdom. They were privatised on the basis that they would be subject to robust oversight by a specialist sectoral regulator but with continued government involvement at a policy level.

[13] See Utilities Act 2000 section 1 and schedule 1

2.2 Key Laws Governing the Great Britain Electricity Sector

37. We now turn to describe some key elements of the legal framework for the electricity industry. We do so in the following order:

    a. Section 2.2.1 Policy background.

    b. Section 2.2.2 The Electricity Act 1989.

    c. Section 2.2.3 EU law, the Renewables Directive.

    d. Section 2.2.4 Other relevant EU law.

    e. Section 2.2.5 Climate change legislation.

    f. Section 2.2.6 Licences.

    g. Section 2.2.7 Codes.

2.2.1 Policy Background

38. The legal framework reflects the underlying policy background. In the context of offshore wind, the following longstanding policy objectives should be noted:[14]

    a. The electricity sector should continue to reduce its carbon emissions and operate in an environmentally sustainable way. The result is that a range of legal obligations are directed at increasing the proportion of electricity generated by renewable sources under both EU and Great Britain law.

    b. Electricity generators should have fair and non-discriminatory access to the electricity transmission system. The result is that the TOs and NGESO are obliged to offer such access.

    c. A key aim is to reduce the cost of low carbon electricity over time and minimise costs to consumers. For this reason the support regime for offshore wind is conducted on a competitive auction basis pursuant to the Energy Act 2013 framework and EU State aid rules.

    d. The provision of electricity transmission is, principally a monopoly activity. The TOs and NGESO should be under clear duties to ensure that their operations are conducted in an efficient, co-ordinated and economical manner so that costs are minimised.

39. As noted above, cost minimisation is a key objective.

[14] The longstanding way of expressing policy has been as a “trilemma” of achieving secure, affordable and clean energy.

2.2.2 The Electricity Act 1989

40. The principal legislation governing the industry is the 1989 Act. This set the framework for privatisation and the day to day regulation of the industry. The 1989 Act sets out the statutory duties powers and functions of GEMA/Ofgem, which we discuss in more detail in the next section.[15]

41. The 1989 Act creates a licensing framework that enables Ofgem to provide a regulatory oversight of the electricity industry. The 1989 Act:

    a. provides that the key industry activities of generation, transmission, distribution and supply, as well as participation in the operation of interconnectors are to be licensed, and that engaging in these activities without a licence is a criminal offence;[16]

    b. provides GEMA/Ofgem with the power to grant licences to carry out these activities. Licences contain detailed conditions about the licensees' conduct of the relevant activity;[17]

    c. imposes duties on licensees, in particular for transmission licensees "*to develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and… to facilitate competition in the supply and generation of electricity*."[18]

    d. enables GEMA/Ofgem to modify the licences following consultation.[19] If a licensee is aggrieved about a modification it can appeal to the Competition and Markets Authority, (the CMA).[20]

    e. provides GEMA/Ofgem with powers to investigate breaches, make orders requiring licensees to comply with their licences and fine licensees for breach of their licences and 1989 Act duties.[21]

42. It requires that persons holding a transmission licence, (i.e. operating transmission networks) must be certified as independent from generation and supply businesses so as to help ensure that access to networks is fair and non-discriminatory.[22] This requirement applies to NGESO, each TO and the OFTOs.

43. The 1989 Act has been amended to reflect developments in the sector including by the Utilities Act 2000 and the Energy Acts 2004, 2008, 2010 and 2013. The

[15] 1989 Act sections 3A to 3F
[16] 1989 Act section 4. Various exemptions from the requirement for a licence are available.
[17] 1989 Act sections 6 to 7
[18] 1989 Act section 9(2)
[19] 1989 Act section 11A
[20] 1989 Act sections 11C to 11H
[21] 1989 Act sections 25 to 28
[22] 1989 Act sections 10A to 10O

Energy Act 2004 makes amendments to the regulatory regime to allow for offshore windfarms and transmission. The Energy Act 2008 amended the regulatory regime to further provide for the offshore transmission of electricity. The Energy Act 2013 put in place the framework for the contract for difference regime.

2.2.3 EU Law: The Renewables Directive

44. There is an extensive body of EU law which underpins the electricity sector. Whilst the United Kingdom has left the EU, the substance of much of that legislation will remain enforceable under domestic law for example because it has been transposed into domestic law. Great Britain legislation to date has been framed so as to comply with EU law. Accordingly, it remains relevant to understanding the domestic law framework.

45. Key EU instruments to note in this context include the Renewables Directive.[23] Two key elements are as follows:

46. The first is ensuring that renewables have access to the transmission system. Under the directive Member States were to ensure that renewable generators were "guaranteed" access to the grid (Article 16(1)).[24] Article 16 provides *inter alia* as follows.

"***Article 16***

Access to and operation of the grids

1. Member States shall take the appropriate steps to develop transmission and distribution grid infrastructure, intelligent networks, storage facilities and the electricity system, in order to allow the secure operation of the electricity system as it accommodates the further development of electricity production from renewable energy sources, including interconnection between Member States and between Member States and third countries. Member States shall also take appropriate steps to accelerate authorisation procedures for grid infrastructure and to coordinate approval of grid infrastructure with administrative and planning procedures.

2. Subject to requirements relating to the maintenance of the reliability and safety of the grid, based on transparent and non-discriminatory criteria defined by the competent national authorities:

[23] Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources
[24] The deadline for transposition of the directive was 5 December 2010, (Article 27).

(a) Member States shall ensure that transmission system operators and distribution system operators in their territory guarantee the transmission and distribution of electricity produced from renewable energy sources;

(b) Member States shall also provide for either priority access or guaranteed access to the grid-system of electricity produced from renewable energy sources;"

47. Article 16 goes on to specify a range of other steps which Member States must take in order secure that renewable generators have fair and reasonable access to transmission systems in the EU. Most, if not all of Article 16 was reflected in the existing Great Britain regulatory framework at the deadline for transposition of the directive, 5 December 2010.[25]

48. The second is target setting for renewable generation. Article 3 sets out an overall EU target of at least 20% for generation of energy from renewable sources in 2020. In order to achieve this, each Member State is assigned a mandatory national target for the share of energy from renewable sources in its gross final consumption of energy, specified in Part A Annex I of the Renewables Directive. The UK's national target is 15%. Member States are required to report on a bi-annual basis from 2011 in accordance with the criteria in Article 22. The sixth (final) report is required to be submitted by 31 December 2021.[26]

2.2.4 Other Relevant EU Law

49. Any form of subsidy, direct or indirect can constitute State aid. This is of particular importance for offshore wind. The EU has been particularly active in this context. It has published guidelines that emphasise that support for renewables projects should be granted on a competitive basis.[27] It approved the Great Britain Contract for Difference support scheme on the basis that support would be awarded on a competitive basis.[28]

[25] Article 27
[26] For an update on progress see *"Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Renewable Energy Progress Report*", European Commission, Brussels, 14.10.2020 COM(2020) 952 final, available at https://ec.europa.eu/transparency/regdoc/rep/1/2020/EN/COM-2020-952-F1-EN-MAIN-PART-1.PDF
[27] Communication from the Commission Guidelines on State aid for environmental protection and energy 2014-2020 (2014/C 200/01), section 3.3.2 (operating aid granted to energy from renewable sources), available at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014XC0628(01)&from=EN
[28] See Letter to the United Kingdom, Brussels, 23.7.2014 C(2014) 5079 final, Case SA.36196 Contract for Difference for renewables in UK, available at https://ec.europa.eu/competition/state_aid/cases/253263/253263_1583351_110_2.pdf

2.2.5 Climate Change Legislation

50. More generally it should be noted that UK climate change legislation, the Climate Change Act 2008 requires significant reductions in carbon emissions, and therefore the reduction of emissions in the context of electricity generation.

2.2.6 Licences

51. As noted above, industry participants must be licensed. These are detailed documents and regulate key elements of licensees' conduct. By way of example, provisions applicable to all transmission licensees[29] include:

a. A requirement to provide regulatory accounts to Ofgem (Standard Condition B1).

b. A restriction on disposal of assets, (Standard Condition B3).

c. Provisions, designed to ensure that the licensee operates on a prudent financial basis, (Standard Conditions B6-B10).

d. Provisions requiring compliance with industry codes and agreements.

52. Each transmission licensee is subject to "price control" conditions.[30] These conditions specify mechanisms to calculate how much money and the costs licensees are permitted to recover from users of the GB transmission system. This is an important protection for electricity consumers.

2.2.7 Codes

53. Licences require compliance with a number of industry codes. These are detailed documents and provide significant detail about how industry participants must conduct their licensed activities and the allocation of responsibilities amongst industry parties. Examples include:

a. The Connection and Use of System Code or CUSC[31]. This deals with arrangements for connection to and use of the British transmission system. Suppliers, generators, distribution network operators and NGESO must all comply with the CUSC.

b. The System Operator Transmission Owner Code, (STC)[32] which regulates the relationship between the System Operator, NGESO, the TOs, (NGET, SPT and SHETL), and the OFTOs. Each must comply with this code.

[29] Transmission Licence Standard Conditions consolidated to 18 June 2020.
[30] For example, under NGET's Electricity Transmission Licence Special Conditions, consolidated 27 March 2020. Chapter 3.
[31] See NGESO CUSC webpage at https://www.nationalgrideso.com/industry-information/codes/connection-and-use-system-code-cusc
[32] See NGESO STC webpage at https://www.nationalgrideso.com/industry-information/codes/system-operator-transmission-owner-code-stc

54. These documents are regulatory documents, licence holders must comply with them as a matter of their licences. These codes are also contractual documents and enforceable on a contractual basis as between the parties. It follows that a breach can lead to regulatory action and action on a contractual basis, e.g. a claim for damages.

55. Each Code has modification procedures. The final decision as to whether a modification can proceed is generally taken by Ofgem.

2.3 Ofgem's Legal Duties

56. The purpose of this section is to set out the basis on which Ofgem/GEMA must approach its tasks.

57. It is to be seen that Ofgem has a central role in the regulation of the electricity. As noted above, it grants licences, and can modify them. The modification power is significant, because it allows Ofgem to promote reform of the industry. It also has significant powers in respect of the codes, for example it can veto modifications to critical industry codes. Ofgem's power is not unfettered. The 1989 Act regulates Ofgem's approach to its task, in particular by setting out various policy considerations that Ofgem must consider when taking decisions.

2.3.1 Ofgem's Principal Objective

58. In approaching its tasks Ofgem must, in particular, have regard to its "principal objective". This is set out at section 3(1) and 3(1A) of the 1989 Act as follows:

"(1) The principal objective of the Secretary of State and the Gas and Electricity Markets Authority (in this Act referred to as "the Authority") in carrying out their respective functions under this Part is to protect the interests of existing and future consumers in relation to electricity conveyed by distribution systems or transmission systems.

(1A) Those interests of existing and future consumers are their interests taken as a whole, including—

(a) their interests in the reduction of electricity-supply emissions of targeted greenhouse gases;

(b) their interests in the security of the supply of electricity to them; and

(c) their interests in the fulfilment by the Authority, when carrying out its functions as designated regulatory authority for Great Britain, of the objectives set out in Article 36(a) to (h) of the Electricity Directive."

59. As can be seen, the consumer interest also includes the fulfilment of the objectives set out Article 36 of the Electricity Directive. Article 36 provides for various objectives, including the following:

> ***"Article 36 General objectives of the regulatory authority***
>
> *In carrying out the regulatory tasks specified in this Directive, the regulatory authority shall take all reasonable measures in pursuit of the following objectives…*
>
> *(a) promoting, in close cooperation with the Agency, regulatory authorities of other Member States and the Commission,* ***a competitive, secure and environmentally sustainable internal market in electricity*** *within the Community, and effective market opening for all customers and suppliers in the Community* ***and ensuring appropriate conditions for the effective and reliable operation of electricity networks, taking into account long-term objectives****;*
>
> *…*
>
> *(d)* ***helping to achieve, in the most cost-effective way, the development of secure, reliable and efficient non-discriminatory systems*** *that are consumer oriented, and* ***promoting system adequacy*** *and, in line with general energy policy objectives, energy efficiency as well* ***as the integration of large and small-scale production of electricity from renewable energy sources*** *and distributed generation in both transmission and distribution networks;*
>
> *(e)* ***facilitating access to the network for new generation capacity, in particular removing barriers that could prevent access for new market entrants and of electricity from renewable energy sources****;*
>
> *(f) ensuring that* ***system operators and system users are granted appropriate incentives, in both the short and the long term, to increase efficiencies*** *in system performance and foster market integration;"*

60. Ofgem's objectives are of relevance to large offshore wind projects.

    a. Article 36(a) emphasises the importance of environmental sustainability and the 1989 Act makes the reduction of greenhouse gas emissions a key element of Ofgem's principal objective. Offshore wind contributes to environmental objectives, in particular the reduction of greenhouse gases.

    b. A reduction in electricity related greenhouse gas emissions necessitates steps to ensure that renewable generation such as wind can connect to the transmission system, consistent with Article 16 of the 2009 renewables directive. The importance of renewable energy projects to the achievement of these objectives is recognised by the requirement on Ofgem to help to achieve the integration of renewables.

c. Ofgem's principal objective under the 1989 Act clearly requires Ofgem to consider the cost of energy to consumers, as does Article 36. Competition in electricity generation is a particularly important means of keeping costs low. New entry from renewables contributes to competition.

d. Consumers, (present and future) clearly have an interest in the provision of efficient and economical electricity transmission. Network costs are a material part of consumers' energy costs.[33] This is why Article 36 refers to efficiency. This is also why Ofgem must carry out its functions in a manner which it considers is "*best calculated to promote efficiency and economy on the part*" of electricity transmission licensees.[34]

61. In this regard, the 1989 Act recognises the importance of efficiency and economy on the part of transmission licensees, including NGESO, the TOs and the OFTOs by making express provision for this. NGESO and the TOs are subject to section 9(2) of the Electricity Act 1989 which says:

"It shall be the duty of the holder of a licence authorising him to participate in the transmission of electricity—

(a) to develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and

(b) to facilitate competition in the supply and generation of electricity."

62. The 1989 Act also prescribes a range of other factors which Ofgem must consider, by way of example:

a. The need to secure that all reasonable demands for electricity are met;

b. The need to secure that licence holders are able to finance their licensed activities;

c. The need to contribute to sustainable development; and

d. The interests of vulnerable customers.

[33] Ofgem data suggests that for a typical domestic consumer network costs account for 22.26% of the electricity bill. See Infographic: Bills, prices and profits, Ofgem, 25 September 2020. https://www.ofgem.gov.uk/publications-and-updates/infographic-bills-prices-and-profits
[34] 1989 Act, section 3(5).

2.4 Support for Offshore Renewable Generation: The Contract for Difference Regime

63. Offshore wind generation projects are supported by the Contracts for Difference, (CfD) regime put in place under the Energy Act 2013. This section provides a high level summary of the regime in the following order:

    a. Section 2.4.1 Description of Contract for Difference.

    b. Section 2.4.2 Overview of auction process.

    c. Section 2.4.3 Government commitment to hold further auctions.

    d. Section 2.4.4 Other routes to market.

2.4.1 Description of Contract for Difference

64. The CfD scheme is the UK Government's main mechanism for supporting low-carbon electricity generation. The CfD is a long-term (15 year) contract between an electricity generator and the Low Carbon Contracts Company (LCCC) (a government owned company).

65. Under the CfD the revenues that can be earned by the generator are set at a pre-agreed level, known as the Strike Price. The payment mechanism works as follows:

    a. When the market price for electricity generated from a CfD project (the reference price) is below the Strike Price, a payment will be made from the LCCC to the generator to make up the difference to the Strike Price. When the reference price is above the Strike Price, the generator has to pay the difference back to the LCCC.

    b. The payments made to generators under the CfD are ultimately funded by consumers, through a statutory levy on UK-based licensed electricity suppliers, known as the Supplier Obligation. Payments made by generators to the LCCC, (when the reference price is above the Strike Price) are returned to consumers on the same basis. The operational costs of the LCCC are also funded by suppliers, (and therefore electricity consumers) through the Operational Costs Levy.

2.4.2 Overview of Auction Process

66. There have so far been three CfD auctions, known as allocation rounds, through which different renewable generators compete to secure a contract.

67. CfDs are allocated on a competitive basis. In particular, they compete on the Strike Price. In simple terms if three generators bid in the same quantity, (MW), for the same year of delivery, the generator with the lowest Strike Price would win.

68. This ensures the strike price is set at a level which results in lower prices to consumers. The CfD auctions are a form of State aid. EU Commission approval was obtained for the scheme. The Commission expects that market instruments such as auctions or competitive bidding processes normally ensure that subsidies are reduced to a minimum.[35] This can be illustrated by the outcome of the auctions which show that the price set administratively as a cap was higher than the auction price.

Table 1 Round 1 onshore wind administrative strike prices and clearing prices (2012 prices)

	Round 1 Delivery 2016/17	Round 1 Delivery 2017/18	Round 1 Delivery 2018/19
Administrative strike price[36]	£95.00 / MWh	£90.00 / MWh	£90.00 / MWh
Clearing price[37]	£79.23 / MWh	£79.99 / MWh	£82.50 / MWh

[35] See Letter to the United Kingdom, Brussels, 23.7.2014 C(2014) 5079 final, Case SA.36196 Contract for Difference for renewables in UK; para 64 - 65

[36] This was a price set on the basis of expert advice. See Investing in renewable technologies – CfD contract terms and strike prices; Department of Energy and Climate Change; December 2013, page 7 – available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/263937/Final_Document_-_Investing_in_renewable_technologies_-_CfD_contract_terms_and_strike_prices_UPDATED_6_DEC.pdf

[37] All at 2012 prices. See Contracts for Difference (CFD) Allocation Round One Outcome; 26 February 2015 – available at https://www.gov.uk/government/publications/contracts-for-difference-cfd-allocation-round-one-outcome

Table 2 Rounds 1, 2 and 3 offshore wind administrative strike prices and clearing prices (2012 prices)

	Round 1[38]		Round 2[39]		Round 3[40]	
	Delivery 2017/18	Delivery 2018/19	Delivery 2021/22	Delivery 2022/23	Delivery 2023/24	Delivery 2024/25
Administrative strike price	£140.00 / MWh	£140.00 / MWh	£105.00 / MWh	£100.00 / MWh	£56.00 / MWh	£53.00 / MWh
Clearing price	£119.89 / MWh	£114.39 / MWh	£74.75 / MWh	£57.50 / MWh	£39.65 / MWh	£41.611 / MWh

69. The costs of the provision of the offshore network is material for offshore generators. If the cost is too high, it will place the generator at a disadvantage in securing a CfD.

2.4.3 Government Commitment to Hold Further Auctions

70. In 2018 the government announced its intention to hold a CfD auction every two years from 2019.

2.4.4 Other "Routes to Market" for Offshore Generators

71. Securing a CfD is not guaranteed. There are, in theory two other routes to market for an offshore wind project.

72. The first is a Corporate Power Purchase Agreement (PPA). A Corporate PPA is an agreement between an electricity generator and a business under which the business agrees to buy power generated from a project at an agreed price over a fixed period. Whilst an increasing number have been signed in the UK over the past few years these have been for onshore projects. There are at most limited counterparties which have sufficient credit strength, energy demands and price expectations to support an offshore wind project.

[38] All at 2012 prices. These prices were set within the same framework as onshore wind, and are available within the documents set out in the two footnotes below.
[39] For administrative strike price, see Round 2 CfD Budget Notice, 13 March 2017, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/598824/Budget_Notice.pdf. For clearing price, (all at 2012 prices), see CFD Allocation Round Two Results, 11 September 2017, available at https://www.gov.uk/government/publications/contracts-for-difference-cfd-second-allocation-round-results
[40] For administrative strike price, see Contracts for Difference Scheme for Renewable Electricity Generation, Allocation Round 3: Allocation Framework, 1 May 2019, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/799074/Allocation_Round_3_Allocation_Framework__2019.pdf. For clearing price, all at 2012 prices see CFD Allocation Round Three Results, 11 October 2019, available at https://www.gov.uk/government/publications/contracts-for-difference-cfd-allocation-round-3-results

73. The second is a pure merchant approach, under which the generator builds the unit with a view to selling power to suppliers on the wholesale market. This would be higher risk and is likely to result in a higher cost of capital.

74. So far as we are aware no project has been completed in Great Britain on the basis of such alternative routes. However, we understand at least one project, Seagreen, which is a joint venture between Total and SSE plc will proceed on a part CfD part merchant approach.[41]

[41] See SSE plc announcement 3 June 2020, "SSE plc SEAGREEN OFFSHORE WIND FARM Financial close" available at https://www.investegate.co.uk/sse-plc/rns/seagreen-offshore-wind-farm/202006031532168651O/#:~:text=SSE%20Renewables%20has%20reached%20financial,generate%20around%205%2C000GWh%20annually.&text=30%25%20of%20the%20project%20will%20be%20contracted%20with%20the%20SSE%20Group.

3 The Regulation of Electricity Transmission

3.1 The Roles and Responsibilities of NGESO and the TOs

75. In this section we outline the roles and responsibilities of NGESO and the TOs and outline some of the key legal duties imposed on them. We do so in the following order:

a. Section 3.1.1 The roles and responsibilities of the TOs and NGESO.

b. Section 3.1.2 Legal requirements on NGESO and the TOs: The efficiency duty.

c. Section 3.1.3 Legal requirements on NGESO and the TOs: The duty to facilitate competition.

3.1.1 Roles and Responsibilities of the TOs and NGESO

76. Under the current "BETTA"[42] arrangements the TOs own and operate the transmission system in their respective areas. The TOs are responsible for maintaining the systems and constructing any additions to the system. They do so in co-operation with NGESO and under the supervision of Ofgem.

77. The TOs make their transmission systems available to NGESO under Standard Condition D2, (Obligation to provide transmission services) of their transmission licences and in accordance with a regulated contract between NGESO and the TOs, the System Operator-Transmission Owner Code, (STC). Each transmission licensee must comply with the STC, pursuant to Standard Condition B12, (System Operator – Transmission Owner Code). The objectives of the STC, set out at Standard Condition B12.3 include:

"(a) efficient discharge of the obligations imposed upon transmission licensees by transmission licences and the Act;

(b) development, maintenance and operation of an efficient, economical and coordinated system of electricity transmission;

(c) facilitating effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the distribution of electricity;

[42] British Electricity Trading and Transmission, (BETTA). This was a set of arrangements introduced in 2005 which merged the previously separate Scottish electricity market with the England and Wales market. It involved, in particular, the creation of the "system operator" role.

(d) protection of the security and quality of supply and safe operation of the national electricity transmission system insofar as it relates to interactions between transmission licensees;

(e) promotion of good industry practice and efficiency in the implementation and administration of the arrangements described in the STC;

(f) facilitation of access to the national electricity transmission system for generation not yet connected to the national electricity transmission system or distribution system;"

78. NGESO in turn makes the transmission system available to users of the system under their licence, Standard Condition C8, (Requirement to offer terms), and pursuant to a regulated contract between NGESO and the users, the Connection and Use of System Code (CUSC).

79. NGESO leads on the overall planning of the GB transmission system with input from the TOs. NGESO takes an "overall system" view.

80. NGESO and NGET are separate companies. Whilst NGESO is part of the same corporate group as NGET (one of the TOs), it is subject to strict ring-fencing requirements, under Special Condition 2O of its transmission licence (Business separation requirements and compliance obligations, and conduct of the System Operator in performing its System Operator Functions). These ring-fencing requirements secure that NGESO is directed, managed and operated separately from NGET, with ring-fencing of premises, IT and personnel even though they are part of the same corporate group. The ring-fencing requirements are subject to compliance reporting to Ofgem. Ofgem take compliance with these requirements very seriously.

3.1.2 Legal Requirements on TOs and NGESO: The Efficiency Duty

81. The TOs and NGESO are subject to over-arching legal requirements which are relevant in this context.

82. They have been granted licences to participate in the transmission of electricity pursuant to section 6 of the 1989 Act. They must comply with their licences. It is a criminal offence to participate in the transmission of electricity without a licence or exemption (1989 Act sections 4-5).

83. A key legal requirement is the section 9 duty. NGESO and the TOs are subject to section 9(2) of the Electricity Act 1989 which says:

"It shall be the duty of the holder of a licence authorising him to participate in the transmission of electricity—

(a) to develop and maintain an efficient, co-ordinated and economical system of electricity transmission; and

(b) to facilitate competition in the supply and generation of electricity."

In this context the section 9 duty means that any connection works to connect a new power station must be efficient, co-ordinated and economical.

84. Any offer to connect must provide for an economical, co-ordinated and efficient solution. After that offer is made NGESO must continue to review whether the proposed solution remains economical and efficient.

85. This reflects the fact that the costs of the GB transmission system are ultimately borne by electricity consumers. Accordingly, NGESO and the TOs are under a duty to develop and maintain an economical, co-ordinated and efficient transmission system. The discharge of this duty is subject to robust oversight by Ofgem.

3.1.3 Legal Requirements on TOs and NGESO: The Duty to Facilitate Competition in Electricity Generation

86. As noted above, the section 9 duty includes a duty to "*facilitate competition in the supply and generation of electricity*". This has a number of material implications, including that:

a. Connections for new power stations should be provided in a reasonably expeditious way, otherwise new entrants to the generation market would be delayed, and competition would not be facilitated.

b. Connections to the system and use of the transmission system should be provided on the basis of reasonable and non-discriminatory terms. Standard Condition C7 requires NGESO "not to discriminate as between any persons or class or classes of person". Standard Condition C8 requires NGESO to offer terms for connection to and use of the transmission system. The TOs are under analogous duties in terms of Standard Condition D2 which requires the TOs to provide "transmission services" to NGESO, Standard Condition D4A, which requires TOs to offer terms for connection and Standard Condition D5 which prohibits preferential or discriminatory behaviour.

87. When an offshore generator wants to connect an offshore windfarm and its associated offshore transmission network to the GB transmission system it must apply to NGESO for a connection. Subject to certain limited exceptions NGESO must make an offer to connect.

3.2 Planning Developments to the Transmission System

88. Each TO and NGESO has legal obligations to carry out extensive forward planning. The purpose of this section is to explain two particular processes that are of relevance here, the Ten Year Statement process and the Network Options Assessment process. These processes form an important part of the arrangements to secure compliance with the section 9 duty.

89. The critical point to note, in the context of offshore wind projects, is that these two processes require NGESO to address, along with the TOs how best to develop the transmission system over the long term so as to ensure that the system is developed in an efficient, co-ordinated and economical way, and so that competition in generation is facilitated.

90. In simple terms NGESO carry out system planning in three stages:

a. Future Energy Scenarios.[43]

The Future Energy Scenarios are typically published annually in July. The preparation and review of these scenarios is subject to consultation and Ofgem oversight, under Standard Condition C11. These "future energy scenarios" address the material uncertainties that arise as a result of decarbonisation, and the potential rates of decarbonisation. NGESO produces the Future Energy Scenarios (FES) every year. The latest FES presents four different scenarios around the development of the electricity system according to different levels and paces of societal change with the overall aim of achieving net zero by 2050. The deployment of renewable energy sources increases significantly across all scenarios identified in the latest FES for 2020.[44] Various factors could change the FES, for example a material change in Government policy that has a material impact on energy demand in Great Britain or the electricity generation mix.

These scenarios assist NGESO in identifying a range of credible demand and supply scenarios up to 2050.

b. The Ten Year Statement.[45]

This is also published each year, as part of NGESO's annual electricity transmission planning cycle. The Ten Year Statement sets out the likely future transmission requirements of bulk power transfer capability of the National Electricity Transmission System. This is based on the Future

[43] NGESO Future Energy Scenarios 2020, available at https://www.nationalgrideso.com/document/173821/download
[44] NGESO Future Energy Scenarios 2020, page 83
[45] NGESO Electricity Ten Year Statement, available at https://www.nationalgrideso.com/document/157451/download

Energy Scenarios (FES), which assist NGESO in deriving a wide range of future network requirements. In simple terms this assesses the likely flows of power across parts of the GB transmission system.

c. The Network Options Assessment.[46]

This document sets out NGESO's assessment of the proposed options for reinforcement of the GB transmission system to address the power flows in identified in the Ten Year Statement. This assessment is made on the basis of detailed economic assessments. The Network Options Assessment recommends investments in the GB Transmission System on an annual basis.

The recommended investments are carried out by the TOs. However, it is important to note that whether the investments are carried out is a matter for the TOs, and NGESO cannot direct the TOs to carry out investments.

91. We now turn to set out more detail about the Ten Year Statement and the Network Options Assessment.

3.2.1 The Ten Year Statement

92. The Ten Year Statement is an important document, in facilitating the discharge of the section 9 efficiency and competition duty. The process is subject to Ofgem supervision.

93. Standard Condition C11 (Production of information about the national electricity transmission system) requires NGESO to publish, annually: "*a statement of network development information ("the electricity ten year statement") in a form approved by the Authority*".

94. That statement must set out a range of matters including information to assist those seeking to connect to the transmission system, (an important part of facilitating competition in generation). Standard Condition C11.1.(a) provides that the statement must:

"set out in respect of the current financial year and each of the nine succeeding financial years: circuit capacity, forecast power flows and loading on each part of the national electricity transmission system and fault levels for each transmission node, together with:

(a) such further information as shall be reasonably necessary to enable any person seeking use of the national electricity transmission system to identify and

[46] NGESO Network Options Assessment, available at https://www.nationalgrideso.com/document/162356/download

evaluate the opportunities available when connecting to and making use of such system;

(b) a commentary prepared by the licensee indicating those parts of the national electricity transmission system most suited to new connections and transport of further quantities of electricity;"

95. It also requires NGESO to provide information about its long term plans for the system including:

"(bb) a commentary prepared by the licensee indicating where Major National Electricity Transmission System Reinforcements[47] are likely to be required;

(c) such further information as may be necessary for: authorised electricity operators, interconnected system operators, or any other transmission system operator or distribution system operator (as defined in the Electricity Directive) with whose system the licensee's transmission system is connected or with whom the licensee interfaces, to ensure the secure and efficient operation, coordination development and interoperability of the interconnected system;

(d) a reasonable number of future scenarios prepared pursuant to paragraph 12;…"

96. Standard Condition C11.3 requires that NGESO set out various other matters with reference to the future scenarios including:

"(b) the licensee's best view of the potential reinforcements to the national electricity transmission system that may be required to connect onshore and offshore generating stations and interconnector(s);

(c) the licensee's best estimates of the costs associated with connecting onshore and offshore generating stations and interconnector(s);"

97. NGESO must revise the plan at least every six months, (Standard Condition C11.7. NGESO must also consult on and review the statement at least annually, (Standard Condition C11.5). A fresh Ten Year Statement is published annually.

98. Standard Condition C11.2 provides that NGESO must

"prepare the electricity ten year statement in such a form and manner as is necessary to facilitate the development of an efficient, co-ordinated and

[47] These are defined in NGESO's Network Options Assessment methodology as "a project or projects in development to deliver additional boundary capacity or alternative system benefits as identified in the Electricity Ten Year Statement or equivalent document" (page 15). These are projects that provide wider system benefits e.g. that lead to a significant increase in the ability of the transmission system to transfer energy between parts of Great Britain.

economical system of electricity transmission ("the co-ordinated development objective")"

99. The TOs must support NGESO in this work, as set out in section D of the STC.

3.2.2 The Network Options Assessment Process

100. The network options assessment process is also an important process in facilitating the discharge of the section 9 duty. The process is also subject to Ofgem supervision.

101. NGESO's licence requires NGESO to undertake a "Network Options Assessment" (NOA). The purpose of this is described at Standard Condition C27.1.: (The Network Options Assessment process and reporting requirements), as follows:

"The network options assessment (NOA) process is designed to facilitate the development of an efficient, co-ordinated and economical system of electricity transmission and the development of efficient interconnector capacity"

102. The NOA assessment is designed, in particular to ensure that NGESO keeps under review all relevant options to develop the system in compliance with the section 9 efficiency duty.

103. There are two key aspects to this process.

104. The first is the drafting and approval by Ofgem of the NOA methodology. The methodology must meet the design requirements specified at Standard Condition C27.8 which provides:

"The NOA methodology must be designed to facilitate the development of an efficient, co-ordinated and economical system of electricity transmission, and must include (but need not be limited to):

(a) the approach used for determining what constitutes Major National Electricity Transmission System Reinforcements;

(b) the approach (which must be in accordance with paragraph 9) used for identifying and assessing options to meet system needs in accordance with the development of an efficient, co-ordinated and economical system of electricity transmission to be set out in the NOA report in accordance with 16;

(c) how the licensee will engage with interested parties to share relevant information and how that information will be used to review and revise the NOA methodology; and

(d) details of the licensee's proposed timetable for updating and consulting on the methodology for the NOA reports."

105. The second is the publication by NGESO, annually, a "NOA Report" prepared in accordance with the methodology. Standard Condition C27.16 provides that the report must assess alternative solutions in determining how to develop the transmission system as follows:

"*set out the licensee's best view of the options for Major National Electricity Transmission System Reinforcements and additional interconnector capacity that could meet the needs identified in the electricity ten year statement (ETYS) and facilitate the development of an efficient, co-ordinated and economical system of electricity transmission, including (but not limited to) any:*

(i) options for Non Developer-Associated Offshore Wider Works;

(ii) options that involve construction of new transmission capacity;

(iii) options that do not involve, or involve minimal, construction of new transmission capacity;

(iv) options based on commercial arrangements with users to provide transmission services and balancing services;

(v) options that require liaison with a holder of a distribution licence on distribution system solutions;

(vi) options recommended previously by the licensee to proceed but which have not been progressed by the transmission licensee to which the recommendation was given;

(vii) options that cross the boundaries of two or more electricity licensee's transmission areas; and

(viii) options suggested by other interested persons.

(b) set out, in accordance with paragraph 17, the licensee's best view of the relative suitability of each option or combination of options set out pursuant to paragraph 16, for facilitating the development of an efficient, co-ordinated and economical system of electricity transmission.

(c) set out the licensee's recommendations on which, if any, of the option(s) set out pursuant to paragraph 16(a) should be developed further to facilitate the development of an efficient, co-ordinated and economical system of electricity transmission;

(d) set out the licensee's best view of which, if any, of the options recommended pursuant to paragraph 16(c) comprise assets some or all of which satisfy the criteria in the Guidance on the Criteria for Competition, being a document of that

name issued by the Authority and updated by the Authority from time to time, following consultation;

(e) set out the licensee's best view of which, if any, connections (or modifications to existing connections) which arise from applications made for the purposes of standard condition C8 (Requirement to offer terms), comprise assets some or all of which satisfy the criteria in the Guidance on the Criteria for Competition, being a document of that name issued by the Authority and updated by the Authority from time to time, following consultation;

(f) be consistent with the ETYS and where possible align with the Ten Year Network Development Plan as defined in standard condition C11 (Production of information about the national electricity transmission system), in the event of any material differences between the Ten Year Network Development plan and the NOA report an explanation of the difference and any associated implications must be provided; and

(g) have regard to interactions with existing agreements with parties in respect of developing the national electricity transmission system and changes in system requirements."

106. Paragraph 17 goes on to provide that:

"17. The licensee's best view, set out pursuant to paragraph 16(b), must include (but need not be limited to) the licensee's assessment of the impact of different options on the national electricity transmission system and the licensee's ability to co-ordinate and direct the flow of electricity onto and over the national electricity transmission system in an efficient, economic and co-ordinated manner."

107. The TOs must assist NGESO in this task under section D of the STC.

3.2.3 The Transmission Owners' obligations and implementation

108. As noted above the TOs are not compelled to implement NGESO's Network Options Assessment recommendations. However, the recommendations are of very persuasive value.

109. In carrying out their respective functions in respect of the planning and development of the transmission system each must comply with their section 9 duty and the National Electricity Transmission System Security and Quality of Supply Standard.[48]

110. The TOs have significant involvement in the preparation of the Ten Year Statement, and the STC section D makes detailed provision in this regard. They

[48] For NGESO see Standard Condition C17 and the TOs see Standard Condition D3.

also have significant involvement in the preparation of the Network Options Assessment, with section D of the STC setting out requirements for joint working.

111. The Network Options Assessment results in a range of recommendations following detailed economic analysis. The TOs are involved in that analysis along with NGESO. There would need to be cogent evidence that a recommendation in the Network Options Assessment was wrong before a TO could discount it.

112. Further, section D of the STC provides that the TOs must put in place a Transmission Investment Plan which must set out for the current and following nine years setting out a range of matters including proposed changes to and investments in their respective transmission systems. NGESO must be provided with the plan. This plan is to be informed by Planning Assumptions provided by NGESO, and drawn up and revised in consultation with NGESO. If there is disagreement about the Planning Assumptions the issue can be disputed with Ofgem. In preparing these plans each TO must co-ordinate with each other. TOs and NGESO can raise disputes about the plans with Ofgem.

113. Each TO must give effect to its Transmission Investment Plan. In other words, if a TO sets out plans to carry out works in a Transmission Investment Plan it must do so, or revise its plan. Any revision can be disputed by NGESO.

114. It is to be seen that the TOs and NGESO are legally required to work together on the formulation of the Ten Year Statement, Network Options Assessment and the Transmission Investment Plans. The TOs must themselves develop the Transmission Investment Plans consistent with their section 9 duty and the National Electricity Transmission System Security and Quality of Supply Standard.

115. The outcome of these arrangements is a set of plans for the GB Transmission System that have been the subject of extensive scrutiny and economic assessment.

116. There is also a further layer of assessment for the TOs activity, the Ofgem RIIO[49] price control process, to which we now turn.

3.3 Recovering the Costs of the Transmission System

117. The TOs and OFTOs incur costs in maintaining and operating their respective systems. These costs are recovered from NGESO. NGESO in turn recover such costs from generators and suppliers. These costs are then passed onto consumers. The purpose of this section is to explain how Ofgem regulate the

[49] RIIO stands for Revenue=Incentives+Innovation+Outputs

charges that network operators charge, and therefore the costs to electricity consumers.

118. Two issues arise here:

a. How much can the TOs charge for the costs of maintaining and operating their respective systems? This is addressed, for the TOs, principally, under the RIIO price control regime.

b. Which classes of customers have to pay for these costs? This is addressed under the charging regime.

119. We address matters as follows:

a. Section 3.3.1 The purpose of the price control regime.

b. Section 3.3.2 The RIIO regime.

c. Section 3.3.3 The RIIO regime and uncertainty mechanisms.

d. Section 3.3.4 Transmission charging.

3.3.1 The Purpose of the Price Control Regime

120. In 2013 Ofgem explained the purpose of price controls as follows:

"Price controls are needed as these networks are natural monopolies and therefore there is no realistic way of introducing competition across the whole sector. Price controls are a method of setting the amount of money (allowed revenue) that can be earned by the network companies over the length of a price control. These companies recover their allowed revenues from their charges to suppliers who in turn pass these costs through to customers. The revenues have to be set at a level which covers the companies' costs and allows them to earn a reasonable return subject to them delivering value for consumers, behaving efficiently and achieving their targets as set by Ofgem."[50]

121. Any price control involves long-term decisions. This is because a regulator's decision to permit expenditure has long term consequences. A significant proportion of TO[51] expenditure is recovered on a long term basis. It is credited to a regulated asset base, (RAB) for the TO, which operates as a balance sheet. Investments are then depreciated over a 45-year period. Accordingly, each year, consumers pay for:

[50] Price controls explained, Ofgem, March 2013, available at https://www.ofgem.gov.uk/ofgem-publications/64003/pricecontrolexplainedmarch13web.pdf

[51] We focus here on TOs because the system operator function is much less capital intensive as the system operator does not own the network.

a. Depreciation of the RAB;

b. Indexation of the RAB, (as it is indexed to account for inflation);

c. The cost of capital, representing the notional cost of funding the balance sheet through a mixture of debt and equity.

122. All of these parameters are determined by Ofgem in periodic reviews of TO expenditure plans, along with the efficiency of the TOs' proposed expenditure. Since privatisation these have been conducted principally on a five-year basis, save for the period 2013 to 2021 when an 8 year price control was set.

123. Network costs make up over 22% of domestic consumers' bills.[52] On that basis the price controls are one, if not the most important decisions Ofgem takes.

3.3.2 The RIIO Regime

124. The current price control regime, "RIIO" operates as follows:

a. The TOs make proposals to Ofgem in the form of Business Plans. These contain proposals for expenditure and investments over a relevant period. The Business Plans submitted by the TOs in December 2019 cover the period 1 April 2021 to 31 March 2026. The proposals include major capital expenditure proposals, for example new overhead transmission lines.

b. Ofgem assess the proposals in detail. They assess whether the expenditure is required at all. If the expenditure is required, they assess whether the expenditure is efficient and economical, using a range of techniques. As an example they compare the TOs proposed expenditure on items against Ofgem records[53] and the other TOs' proposals and they assess whether the proposed engineering solution is efficient, using in-house engineering expertise and external experts.

c. Ofgem consults on the outcome of their review of the Business Plans. They propose expenditure allowances for TOs along with a package of incentives. The current Ofgem proposals (contained in Ofgem's draft determination) were published in July 2020[54], for consultation.

[52] Infographic: Bills, prices and profits, Ofgem, 25 September 2020.
[53] Ofgem has a significant volume of data on historic TO expenditure.
[54] See Ofgem Draft Determinations Core Document (available at https://www.ofgem.gov.uk/system/files/docs/2020/07/draft_determinations_-_core_document_redacted.pdf) and Draft Determinations – ET Sector (available at https://www.ofgem.gov.uk/system/files/docs/2020/07/draft_determinations_-_et_sector_0.pdf)

d. Ofgem consider the responses to that consultation and publish a final determination. The final determination for the price control to run from 2021-2026 is expected in December 2020.

e. Following the final determination Ofgem publish a formal notice under the 1989 Act. That formal notice sets out licence modifications to the TOs' licences which prescribe in detail the maximum they can recover in the relevant years according to a range of provisions.

f. Unless a TO appeals against Ofgem's decision to the Competition and Markets Authority under the 1989 Act, the licence modifications come into force on 1 April 2021.

125. The consequence of this process is that each TO is limited as to the revenues it can recover.

126. On any view Ofgem's approach to cost assessment is robust, reflecting Ofgem's focus on efficiency and economy, which flows from their, and the TOs' statutory duties, outlined above.

127. Ofgem's approach in the draft determinations to expenditure proposals was as follows.

Table 3 Outline of TOs' proposed spend vs. Ofgem proposed allowances at Draft Determination

(£m)	Ofgem Allowed	Proposed	Reduction	Percentage Reduction
National Grid Electricity Transmission	£3,331.7	£7,090	£3,758.3	53.0%
Scottish Hydro Electricity Transmission	£1,608.7	£2,388.4	£779.7	32.6%
ScottishPower Transmission	£969.6	£1,388.5	£418.9	30.2%

3.3.3 The RIIO Regime and Uncertainty Mechanisms

128. When setting a price control Ofgem does not approve expenditure plans when the need for the expenditure is unclear, for example because it is unclear whether a generation project will proceed.

129. When the need for investment is sufficiently clear, a TO wishing to undertake expenditure must apply to Ofgem for a revision to their expenditure allowances. Ofgem assesses a range of matters including whether the need for the

investment has been demonstrated and whether the proposed expenditure represents an efficient and economical solution.

130. In assessing whether expenditure is efficient, Ofgem will have regard to planning and environmental considerations. However, Ofgem can challenge whether a TO has approached such matters appropriately. Ofgem will consider whether the TO has balanced its duties to achieve what may be environmentally desirable and what is in the interests of consumers in providing an efficient network. They will assess whether, for example, putting forward alternative proposals in the planning application would have led to a more economic and efficient outcome.

3.3.4 Transmission Charging

131. Any generator connected to the transmission system has to pay (i) Connection charges; and (ii) Transmission Network Use of System (TNUoS) charges. Suppliers have to pay TNUoS charges.

132. The "Charging Methodologies" for calculating and levying the charges are published by NGESO, as part of the CUSC, and also subject to robust Ofgem oversight.[55] CUSC section 14 contains the three Charging Methodologies as follows: (i) The Statement of the Connection Charging Methodology; (ii) The Statement of the Transmission Use of System Charging Methodology; and (iii) The Statement of the Balancing Services Use of System Charging Methodology.[56]

133. The following paragraphs provide a high level overview of charges.

3.3.4.1 Connection Charges

134. Connection charges cover the cost of connection assets. These are assets solely needed to connect a generator to the national electricity transmission system. These must normally be sole use assets and not used by another party and not capable of being shared. Under the "plugs" charging model, assets that are shared or capable of being shared by more than one user are recovered via TNUoS charges. The result of this "plugs" model is that the vast majority of network costs are recovered as TNUoS.

135. Connection charges can be material, and it is in the interests of generators to ensure that these are appropriate. If the charges are inefficient and uneconomic

[55] https://www.nationalgrideso.com/industry-information/codes/connection-and-use-system-code-cusc/code-documents

[56] In addition NGESO publishes a range of documents which include: charging forecasts; final tariffs, available at https://www.nationalgrideso.com/charging/transmission-network-use-system-tnuos-charges, "TNUoS guidance for generators," April 2019 (available at https://www.nationalgrideso.com/document/138046/download) and "TNUoS charging for offshore generators and the Offshore Transmission Owner regime" (available at https://www.nationalgrideso.com/document/135311/download)

the generator risks being put at some disadvantage in the wholesale market or in a competitive CfD allocation round.

3.3.4.2 TNUoS Charges

136. TNUoS charges cover the cost of the shared transmission system assets. In simple terms the calculation of TNUoS are designed to recover the costs of the transmission system. These are split between generators and suppliers.

137. The maximum amount that is recoverable from generators and suppliers, under TNUoS, the "Maximum Allowed Revenue," is calculated according to arrangements put in place by Ofgem under the RIIO price control arrangements, (discussed above). The current elements of TNUoS break down into a number of elements:

138. **The Locational Charge (Wider TNUoS).** This is calculated using the NGESO "Transport model" It is designed to reflect the incremental cost of power being added to the system at different geographical points or "nodes". For generators the charge is made up of various elements. These are calculated according to a range of factors, including the zone in which power station is located and Transmission Entry Capacity.[57]

139. The wholesale price for electricity is not locational. TNUoS charges are locational. The objective of locational charging is to encourage economically efficient decisions about the location of generation plant by reflecting the impact a generator will have on transmission costs when connecting to the transmission system.[58] The result is that this element of charges is locational, with generators in the North of GB charged significantly more than generators in the South.

140. **The Residual Charge (Wider TNUoS).** Sums that are recoverable in line with the Maximum Allowed Revenue, but are not recovered under the above locational charges, are recovered via this charge so that the total allowed revenue is recovered.

141. **The Local Circuit Charge (Local Circuit TNUoS).** Where generators do not connect directly to the main transmission system they pay an additional charge for the relevant "spur". For offshore generators, a specific regime applies which is designed to recover the cost of the offshore transmission circuits and associated substations.

[57] See for example NGESO Final TNUoS Tariffs for 2019/20 – Tables Z and AA. Available at https://www.nationalgrideso.com/document/137351/download
[58] CUSC Section 14 – Charging Methodologies v1.29 - 14.14.6. Available at https://www.nationalgrideso.com/document/91411/download

142. Some costs of the offshore network are recovered by all TNUoS customers. This includes the costs of the onshore substation.[59]

143. However, the vast majority of the cost of the offshore element of the transmission system is covered by the specific renewable generator. The result is that offshore generators have a very clear incentive to ensure that offshore networks are designed and constructed in an efficient and economic manner, as they operate in competitive markets for wholesale electricity and CfD support is allocated on a competitive auction basis.

3.3.4.3 Supervision by Ofgem

144. The basis on which the charges are levied are subject to control by Ofgem. The charging methodologies can be modified as a result of proposals by Ofgem, NGESO and third parties. Amendments require Ofgem approval, and must follow a process designed to ensure that consultation occurs.

145. It is to be seen that:

a. Ofgem determines how much the TOs can recover from NGESO under the RIIO price control arrangements.

b. NGESO recovers these charges, by way of TNUoS from generators and suppliers. These charges are subject to control by Ofgem.

c. The generators will to the maximum extent possible seek to recover their TNUoS and connection charges when selling electricity on the wholesale market.

d. Suppliers purchase electricity on the wholesale market, or from generators in the same group. A component of the price paid will represent TNUoS and connection charges. Suppliers will, to the maximum extent possible seek to pass these costs onto their customers, i.e. electricity consumers.

e. Suppliers also have to pay TNUoS and they too will seek to recover such costs from the customers to the maximum extent possible.

146. It follows that network costs fall, ultimately, on consumers.

[59] TNUoS charging for offshore generators and the Offshore Transmission Owner regime January 2019, NGESO

4 Special Considerations for the Connection of the Offshore Transmission System to the NETS

4.1 Delivery Models for the Offshore Transmission Network: OFTO and Generator Build

147. In this section we explain some key elements of the offshore transmission regime. We do so as follows:

a. Section 4.1.1 Options for developers.

b. Section 4.1.2 The process of the transfer of the offshore transmission network to the OFTO.

c. Section 4.1.3 The determination of the Transfer Value for the offshore network.

4.1.1 Options for Developers

148. Offshore windfarms typically connect to the onshore transmission system by offshore transmission networks. Developers have two options for the construction of offshore transmission networks.

a. They can choose to design and construct the network themselves under the "Generator Build" model, with the offshore network being acquired by an OFTO (Offshore Transmission Owner) after the network has been commissioned. This is the option all offshore developers have adopted to date.

b. They can opt to have an OFTO design and construct the connection. We are not aware of any "OFTO build" examples in practice. Under this model the offshore generator designs, finances and constructs the offshore transmission assets which are then transferred to the appointed OFTO after commissioning of the station and the offshore network.

149. Developers prefer the "Generator Build" model for a range of reasons. These include the following:

a. The developer keeps control of the design and construction of a critical element of the works to connect the power station to the onshore grid, thus minimising risk. Offshore construction is complex, and involves specialist supply chains for plant, materials, labour and vessels. It is best managed on a "one project" basis at the construction stage.

b. There are cost efficiencies involved.

c. Using the OFTO build model can build in timetable delays.

4.1.2 The Process of Transfer of the Offshore Transmission Network to the OFTO

150. Save for an initial period after commissioning it is unlawful for a generator to own and operate a transmission network. Accordingly, an offshore network constructed by a developer must be transferred to an OFTO.

151. Offshore transmission licences are granted through a competitive tender process run by Ofgem. Bidders bid on a range of assumptions, with the successful bidder being selected broadly on the basis of overall cost over a twenty-year operational term.

152. When the OFTO pays the Transfer Value, the transmission assets will transfer from the developer to the OFTO. This is governed by a Transfer Agreement.

4.1.3 The Determination of the Transfer Value for the Offshore Network

153. A critical element of the transfer process is the determination of the "Transfer Value". This is the sum that the acquiring OFTO will pay to the developer.

154. The developer is not entitled to a straight pass through of its costs. Ofgem will assess the developer's costs pursuant to *the Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015* (**Tender Regulations**). Ofgem:

"must calculate, based on all relevant information available to the Authority at that time, other than further information that the Authority required under paragraph (3) and decided not to take into account in accordance with paragraph (7), the economic and efficient costs which ought to be, or ought to have been, incurred in connection with developing and constructing the transmission assets" (Regulation 4(1)).

155. It is this value that Ofgem must use to determine the "Transfer Value". (Regulation 4(8)). Accordingly, developers seek to ensure that the offshore network is efficient and economic. If the generator fails it will not recover all of its costs and be put at a competitive disadvantage in a CfD allocation round and the wholesale electricity market.

4.2 The Relationship between NGESO, the TOs and Offshore Wind Developers up to Final Connection and Energisation

156. The purpose of this section is to set out the relationship between NGESO, the TOs and offshore wind developers up to final connection and energisation. It does so in the following order:

a. Section 4.2.1 Overview.

b. Section 4.2.2 High level summary of key terms of grid agreements.

c. Section 4.2.3 Guaranteed sums and secured liabilities.

4.2.1 Overview

157. The process for grid connection of an offshore windfarm to the Great Britain transmission system is regulated by two key documents :

a. the Transmission Standard Licence Conditions[60] applicable to National Grid Electricity System Operator, (NGESO), and

b. the Connection and Use of System Code, (CUSC).

158. NGESO must comply with both the Transmission Standard Licence Conditions and the CUSC. Failure to comply is a basis for enforcement action by Ofgem.

159. A NGESO offer to connect an offshore windfarm includes two key documents:

a. a "Construction Agreement" which deals with the construction phase, setting out the work required to provide the connection; and

b. a "Bilateral Connection Agreement" which deals with the enduring post connection stage. The connection arrangements in Great Britain provide for a firm export capacity, with high system reliability and a right to compensation payments from NGESO if the system is unavailable to accept the generator's power.

160. Pro-formas of these agreements are available as Schedules to the CUSC. The documents specify a point of connection to the transmission system and the works required by the generator and the relevant TO in order to connect the relevant project.

161. Under the BETTA arrangements NGESO does not carry out the physical works to make the connection. This is carried out by the TOs. NGESO "backs off" its obligations to the generator under the STC.

4.2.2 High Level Summary of Key Terms of Grid Agreements

162. Entering into a connection arrangement creates various liabilities.

163. **Costs.** Entry into the agreements will trigger application of the CMP 192 / guarantee regime, under which generators must provide securities for costs to connect the project to the transmission system and a share of the wider costs of the reinforcement of the transmission system.

[60] Transmission Licence Standard Conditions consolidated to 18 June 2020.

164. **Termination.** The NGESO agreements will include a backstop date for connection after which NGESO will be entitled to terminate, even if the generator is not at fault for the delay. NGESO can increase costs if there is a delay.

165. **Cost certainty.** Even if NGESO make an offer, given the likely date of connection there will be cost uncertainty. The NGESO Construction Agreement contains a range of provisions which permit NGESO to revise costs, works and the timetable.

166. **Transmission Entry Capacity, (TEC).** The Transmission Entry Capacity is the capacity that the proposed windfarm can export.

167. **Timetable.** Contractual remedies for delay are limited. Damages for economic loss, e.g. loss of revenue due to delay to the start of generation, is expressly excluded under the contractual arrangements.

4.2.3 Guaranteed Sums and Secured Liabilities

168. The objective of NGESO's User Commitment Methodology is to ensure that generators bear some risk of stranding arising from their projects, if the project does not go ahead or is reduced in size. This is via the Cancellation Charge. This is a key liability for generators under these agreements. Detail can be found in CUSC 15 and the NGESO User Commitment Methodology Guidance and Implementation Document. [61]

169. **Liability for Works**. During the construction phase if the generator cancels the project it is liable for 100% of the attributable amount, the cost of "Attributable Works". Broadly speaking, these are works to connect the new power station to the "Main Integrated Transmission System", (MITS). The liability is calculated in accordance with CUSC section 15 and covers "the fees, expenses and costs of whatever nature reasonably and properly incurred or due in respect of each component within the Attributable Works".[62] In other words the liability is based on actual TO expenditure. The generator is also liable for a share of the "wider works" on the transmission system triggered by the new project. Security must be provided for these liabilities including for prospective costs over the period covered by the security.

[61] CUSC Section 15 - User Commitment Methodology. Guidance and Implementation Document. February 2013. Version 0.1. Available at https://www.nationalgrid.com/sites/default/files/documents/5638-CMP192%20Updated%20Guidance%20Document.pdf

[62] Connection and Use of System Code, Section 11.3 - Definitions; Defined term for "Attributable Works Capital Cost", as applied in Section 15, available at https://www.nationalgrideso.com/document/91396/download.

170. This liability is potentially significant. Accordingly, it is in generators' interests to ensure that any works proposed by NGESO and the relevant TO are appropriate as this limits the exposure to cancellation charges.

4.3 Selection of the Onshore Points of Connection: the CION Process and Offshore Wind Developments

171. The purpose of this section is to describe how NGESO, the TOs and developers approach the task of ensuing that the connection of a new windfarm is achieved in an economic, efficient and co-ordinated way, so as to meet the relevant legal requirements. It does so as follows:

a. Section 4.3.1 Overview.

b. Section 4.3.2 Objectives of the CION process.

c. Section 4.3.3 The CION.

d. Section 4.3.4 Criteria for the selection of the preferred connection option.

e. Section 4.3.5 The CION and connection process: the application and offer stage.

f. Section 4.3.6 The connection offer. Post Acceptance. Review of connection point and transmission system works, the CION process.

g. Section 4.3.7 The iterative nature of the process.

4.3.1 Overview

172. Identification of the onshore connection point involves three key sets of parties: the offshore developer, NGESO and the TOs.

173. As has been set out, NGESO is under significant legal duties and incentives to ensure that the connection is provided in an economic, co-ordinated and efficient way. Further, as is discussed below, an offshore windfarm developer must also promote an economic and efficient connection. It will not be permitted to recover inefficient costs.

174. The connection must also be feasible against a range of other considerations. These include technical, environmental, planning and deliverability considerations.

175. The identification of the connection point is therefore a complex exercise. For that reason, a dedicated process applies to this activity. The process is set out in an NGESO document, The Connection and Infrastructure Options Note (CION) Process Guidance Note V4.0, November 2018, (the **CION Guidance Note**).

176. This process implements Standard Licence Condition C.8.5A of NGESO's transmission licence which says:

"5A. The licensee must have in place and publish governance arrangements for the processes it undertakes when identifying (and keeping under review) the overall efficient, coordinated and economical solution to be included in the offer to enter into a bilateral agreement and/or construction agreement under this condition."

4.3.2 Objectives of the CION Process

177. The CION Guidance Note states:

"The CION process evaluates the respective transmission options required which leads to the identification and development of the overall efficient, coordinated and economical connection point, onshore connection design and, where applicable, offshore transmission system / interconnector design in line with obligation to develop and maintain an efficient, coordinated and economical system of the electricity transmission network." (Page 3).

4.3.3 The CION

178. The output of the CION process is a document, the Construction and Infrastructure Options Note or CION. The CION Guidance Note describes this as follows:

"The Connection and Infrastructure Options Note (CION) is the document where the output of the CION optioneering process is recorded. It provides a joint record of the rationale for the selection of the overall preferred connection option from the technical, commercial, regulatory, environmental, planning and deliverability aspects.

For the purpose of this guidance note, connection option refers to;

- *The onshore connection point, the onshore transmission design and*
- *The offshore transmission system design for offshore transmission or interconnectors.*

The CION is a live document and evolves over time to inform the TO and Developer's investment decisions on the respective transmission infrastructure and the associated planning/consenting processes.

The CION requires input from NGESO as System Operator, TOs and Developers. NGESO as System Operator coordinates this input.

Within the CION;

- *The Onshore TOs record details of their assessment of all feasible onshore connection points together with the required transmission construction works*
- *The Offshore TOs record details of their assessment of all feasible offshore connection designs together with the required offshore transmission construction works*
- *During the pre-offer CION process, NGESO records any initial offshore design assumptions made about the offshore transmission design.*
- *During the post-signature CION process, the developer of the offshore transmission system or OFTO records the offshore design and cost assumptions during the development of the project.*
- *During the post-signature CION process, the developer of an interconnector records the interconnector design and cost assumptions during the development of the project.*
- *NGESO records the economic assessment undertaken to determine the most economic connection option.*
- *NGESO records the overall economic, efficient and deliverable connection option, together with the selection rationale as agreed by the Parties to the CION process."*

4.3.4 Criteria for Selection of the Preferred Connection Option

179. The CION Guidance Note describes the criteria at section 6. This reflects the legal background.

> *"**6 What criteria are considered in selection of the preferred connection option?***
>
> *A number of considerations are taken into account in order to select the overall preferred connection option. The main objective for the parties to the CION process in selecting the preferred option is to ensure that the most economic and efficient connection option is developed for the overall benefit of the GB consumer.*
>
> *The selection of the preferred connection option does not only look at the most economic option from the Cost Benefit Analysis (CBA) exercise but also considers the following criteria; environmental impact, deliverability, time of market, technology risk, PCI[63] status, planning and consenting risk. It should be*

[63] PCIs are "Projects of Common Interest", key cross border infrastructure projects that link the energy systems of EU countries

noted that the listed criteria is not a conclusive list. The parties to the CION process will also consider other criteria alongside those listed criteria which they deem relevant to the project during the selection of the preferred connection option."

4.3.5 The CION and Connection Process: The Application and Offer Stage

180. The Construction Agreement for an offshore wind project will normally specify an onshore connection point and the works required on the transmission system to connect the windfarm to the onshore transmission system.

181. The selection of the initial connection point is governed by the "pre-offer CION process". This is set out at pages 5 to 7 of the CION Guidance Note. Activities include:

a. Assessment of onshore connection options by the onshore TOs. The onshore TOs provide NGESO with a list of required onshore transmission works, their cost and an appraisal of *"technical, environmental, planning consent and deliverability issues related to each onshore connection point*". (Page 5)

b. Development of offshore transmission designs, by NGESO or the developer. (Page 6)

c. An economic assessment of the options by NGESO using a Cost Benefit Analysis methodology. (Pages 6 to 7)

182. The process should conclude with a meeting between the TOs, NGESO and the developer to select the overall preferred connection option. The option which is selected forms the basis of the connection offer. NGESO describe this as follows:

*"**Selection of the overall preferred connection option***

"NGESO sets up meeting(s) with representatives from each of the parties involved within the CION process. The purpose of this meeting is for all parties to select the overall preferred connection option.

*The main objective in selecting the overall preferred connection option **is to ensure that the most economic and efficient design connection option is developed for the overall benefit of the Great Britain (GB) consumer.***

In order to select the overall preferred connection option, the parties consider;

- *The CBA results provided by NGESO*
- *The technical, environmental, planning, consenting and deliverability issues associated with each connection option as highlighted within the CION.*

NGESO records the selected preferred connection option together with the selection rationale within the CION.

The selected preferred connection option forms the basis of the connection offer issued to the developer in accordance with the CUSC." (Page 7) (Original emphasis)

4.3.6 The Connection Offer. Post Acceptance. Review of Connection Point and Transmission System Works, the CION Process

183. There is a range of variables which mean that the onshore connection point and associated works may need to change. This is a particular risk for larger developments as the date of connection may be some time away. Accordingly, the connection point and associated works are kept under review.

184. This reflects the fact that the section 9 duty is not frozen at the offer date.

185. NGESO and the TOs could not continue with a project that was manifestly inefficient. This would breach the section 9 duty.

186. At the same time the developer could not continue with a manifestly inefficient option because it would not be able to recover inefficient costs under the OFTO regime. Against this background the works specified in the Construction Agreement may need to change because alternative more efficient options may emerge.

187. The CION process describes how the parties ensure the connection is kept under review at sections 4.4. and 4.5 of the CION Guidance Note. This states:

"4.4 Post-Signature CION Process

The post-signature CION process is the optioneering process that takes place after the developer has a signed connection offer which has within it the works associated with the preferred connection option.

A post-signature CION process can be initiated by NGESO, the developer or the TO(s), following a material trigger which could result in a change to the onshore connection point, the onshore transmission design or the offshore transmission design. The CION optioneering process will be revisited to re-assess whether the preferred connection option remains or whether an alternative option is the overall economic and efficient option.

The material trigger(s) generally require a Modification Application or a Modification Notice as defined within the CUSC and STCP 18-1.

The review of the impact of the trigger on the connection options will follow the process as described for the pre-offer CION process, although in this case, the

offshore transmission design assumptions and costs will be updated and documented within the CION by the respective developer or OFTO rather than NGESO (i.e. As described in 'Development of Offshore Transmission designs - Option B'). The onshore TO(s) will also provide any available updates on the onshore connection point and onshore transmission design.

Any changes to the preferred connection option, together with the selection justifications will be recorded in the CION, which is saved as an incremental version."

188. The triggers are described at section 5 of the CION Guidance Note.

*"**5 Triggers for the review of the CION process***

Material triggers are any changes that affect the overall design or connection point that will require for the need to review the connection option…

The CION review following a material trigger will need to consider the deliverability of the connection options by taking into account the impact and cost of any project developments undertaken so far such as planning status, consenting status, cost of preliminary works by the CION parties and where applicable, a risk assessment to capture sunk costs.

Examples of material changes which could affect the onshore connection point, or the onshore or offshore transmission designs include:

- *Changes in SO assumptions – such as significant changes in the Construction Planning Assumptions (CPA) or generation background.*
- *Changes in TO assumptions – such as changes in generation background that impact on TO investments and affects the Construction Planning Assumptions that form the basis for the TO Construction offer to NGESO.*
- *Changes to the developer assumptions – such as changes in Transmission Entry Capacity (TEC), changes in offshore technology, etc.*
- *Planning decisions*
- *Changes to the electricity regulatory framework.*
- *Changes to key fundamental economics inputs for CBA – such as FES, ETYS, ELSI model etc."*

4.3.7 The Process is Iterative

189. It should be emphasised that the CION process is iterative. The process does not stop. Section 7 of the CION Guidance Note states:

> *"**7 Do we "freeze" the CION?***
>
> *The CION is a live document which evolves with the project both pre-offer and post-signature to reflect any changes and/or updates to the preferred connection option. The CION will continually be reviewed throughout the development of the project with reviews initiated periodically or by material triggers to ensure that the preferred connection option is the still the most economic, efficient and deliverable option. Any CION review will take into account the project's development at that point in time. The CION will continue to be revised until there is no further enhancement of benefit to the GB consumer."*

190. This reflects the fact that the types of material developments listed above can occur at any time.[64]

[64] It should be noted that the CION process relies on the exchange of highly sensitive commercial data between the TOs and NGESO, and the provision of highly sensitive commercial information by the generator to the TOs and NGESO. The regulatory framework imposes significant confidentiality obligations on NGESO and the TOs, which enables generators to provide such information to NGESO and the TOs.

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