

CUSC Modification Proposal Form

**CMP418:
Refine the allocation of
Dynamic Reactive
Compensation
Equipment (DRCE) costs
at OFTO transfer**

Overview: Modification of the DRCE cost allocation for offshore wind farms. The proposal seeks to socialise DRCE costs through wider TNUoS charges. Instead of the current system where offshore wind farm generators both (i) provide upfront capital costs for the DRCE before transferring to OFTO and (ii) cover the cost of DRCE equipment via the offshore local circuit tariff for the lifetime of the project.

Modification process & timetable



Status summary: The Proposer has raised a modification and is seeking a decision from the Panel on the governance route to be taken.

This modification is expected to have a: **Medium impact**

on Offshore Wind Farm Generators

Proposer's recommendation of governance route	Standard Governance modification to proceed to Code Administrator Consultation	
Who can I talk to about the change?	Proposer: Giulia Licocci Giulia.licocci@oceanwinds.com +44 7733827480	Code Administrator Contact: Milly Lewis milly.lewis@nationalgrideso.com 07811036380

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What is the issue?

Dynamic Reactive Compensation Equipment (DRCE) associated with offshore wind farms is located onshore and provides benefits to the wider electricity network rather than the offshore wind farm.

Ocean Winds commissioned an external consultant, Blake Clough, to explore the purpose of DRCE in power systems, their treatment in Transmission Network Use of System (TNUoS) charges and whether this is consistent with relevant Connection and Use of System Code (CUSC) objectives.

The report found that there are discrepancies against the CUSC charging objectives and that a change to the existing regime would facilitate compliance with CUSC objective (b) of charges accurately reflecting the costs incurred by transmission licensees.

DRCE enables Offshore Transmission Owners (OFTO) to comply with their mandatory reactive compensation requirements to maintain 0.95 power factor lagging and 0.95 power factor leading at the Onshore Interface Point (Grid Code CC.6.3.2 (c)).

Despite this, the offshore wind farm developer installs the DRCE, (i) provides upfront capital costs for it before transferring to OFTO and (ii) covers the cost of the DRCE via the offshore local circuit tariff for the lifetime of the project

Why change?

Currently, the costs of DRCE are borne entirely by the generator, despite the DRCE being of benefit mainly to the Electricity System Operator (NGESO) rather than the wind farm itself, as evidenced in the study by Blake Clough Consulting (Annex 1). The current regulatory regime requires the developer to bear the cost of the DRCE installed at the onshore substation.

During the OFTO Transaction, the DRCE is transferred to the OFTO owner via the Final Transfer Value (FTV), which is the basis for the Tender Revenue Stream (TRS). The TRS, including the cost of the DRCE, is fed into the TNUoS offshore local circuit tariff paid by the generator for the lifetime of the asset. However, after the OFTO transfer, an offshore wind farm's point of connection (POC) is offshore, and the DRCE is not used for compliance at this POC.

The Offshore generator complies with its reactive compensation requirement to maintain zero reactive transfer at the Offshore Grid Entry Point. Generators typically using the reactive capability of the Wind Turbine Generators to compensate for the inductance of the inter-array cables and achieve zero reactive transfer at the offshore grid entry point.

Shunt reactors/switched reactors are used to compensate for the offshore export cables. The requirement for reactive compensation is placed on the OFTO and not the wind farm. It is not efficient to comply with the normal generator dynamic reactive compensation requirements offshore due to the long Offshore Export Cable (OEC) lengths.

Therefore, while it is intuitive that the shunt reactor costs fall into the local circuit tariff, it should not follow that the DRCE is treated in the same way. Ultimately, shunt reactors are used by generators to compensate for cable capacitance and the DRCE is not used to provide direct cable compensation. Consequently, the generator pays for an asset located within the onshore transmission system that is used for wider network management rather than wind farm compliance.

Ocean Winds engaged with the wider industry through presentations in grid and charging working groups. Also, also with Scottish Renewables and Renewable UK and via one to one with various other developers. There is consensus that the current allocation of DRCE costs does not reflect OFTOs and generators mandatory requirements under the Grid Code and should be addressed.

Given the high capital costs associated with DRCE, which can reach tens of millions of pounds, the existing allocation of capital costs and TNUoS charges is inconsistent with CUSC objective (b) of charges accurately reflecting the costs incurred by transmission licensees. This is potentially detrimental to the investment level and growth of the renewable energy sector.

What is the proposer’s solution?

The recommendation is to socialise the costs associated with DRCE, distributing the costs more equitably among all users of the power system, through the proposed change to the Charging Statement of the CUSC. This approach would ensure a more appropriate allocation of DRCE costs and recognise the broader benefits that DRCE provides to the grid while encouraging the further development and integration of offshore wind farms into the NETS.

This will require a minor change to 14.15.80 of the Charging Statement to make clear that DRCE will be excluded from the offshore circuit revenue calculation. The addition to this clause is highlighted in red in the draft legal text below.

Draft legal text

Offshore Circuit Expansion Factors

14.15.80 Offshore expansion factors (£/MWkm) are derived from information provided by OFTOs for each offshore circuit. Offshore expansion factors are OFTO and circuit specific. Each OFTO will periodically provide, via the STC, information to derive an annual circuit revenue requirement. The offshore circuit revenue shall include revenues associated with the Offshore Transmission Owner’s reactive compensation equipment (excluding Dynamic Reactive Compensation Equipment), harmonic filtering equipment, asset spares and HVDC converter stations.

What is the impact of this change?

Proposer’s assessment against CUSC Charging Objectives	
Relevant Objective	Identified impact
(a) That compliance with the use of system charging methodology facilitates effective competition in the generation and supply of electricity and (so far as is consistent therewith) facilitates competition in the sale, distribution and purchase of electricity;	Positive Lower charges would reduce financial barriers for future offshore wind developers, potentially enabling offshore wind to better compete with other sources of generation.
(b) That compliance with the use of system charging methodology results in charges which reflect, as far as is	Positive

<p>reasonably practicable, the costs (excluding any payments between transmission licensees which are made under and accordance with the STC) incurred by transmission licensees in their transmission businesses and which are compatible with standard licence condition C26 requirements of a connect and manage connection);</p>	<p>OFTOs should bear the cost of complying with their mandatory reactive compensation requirements. The proposed change will amend the status quo and ensure that charges accurately reflect the costs incurred by transmission licensees</p>
<p>(c) That, so far as is consistent with sub-paragraphs (a) and (b), the use of system charging methodology, as far as is reasonably practicable, properly takes account of the developments in transmission licensees’ transmission businesses;</p>	<p>Neutral CUSC would neither be more nor less adaptable to developments in transmission licensees’ transmission businesses</p>
<p>(d) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency *; and</p>	<p>Neutral No impact</p>
<p>(e) Promoting efficiency in the implementation and administration of the system charging methodology.</p>	<p>Positive A more equitable allocation of costs that takes better account of OFTOs and generators mandatory requirements under the GC improves the overall cost-reflectivity of the system charging methodology for both OFTOs and generators.</p>
<p>**The Electricity Regulation referred to in objective (d) is Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (recast) as it has effect immediately before IP completion day as read with the modifications set out in the SI 2020/1006.</p>	

<p>Proposer’s assessment of the impact of the modification on the stakeholder / consumer benefit categories</p>	
<p>Stakeholder / consumer benefit categories</p>	<p>Identified impact</p>
<p>Improved safety and reliability of the system</p>	<p>Neutral</p>

	No impact on safety and reliability, as the technical details of the equipment do not change. The proposed modification is to the charging methodology only.
Lower bills than would otherwise be the case	<p>Positive</p> <p>DRCE costs will no longer be part of the offshore local circuit tariff borne by the developer. Since offshore wind projects participate in the Contracts for Difference (CfD) scheme, which provides a long-term guarantee on price per MWh, these savings have the potential to reduce the CfD price by an amount equal to the annual saving.</p> <p>DRCE will be paid for in a socialised way through wider TNUoS charges, and therefore this will lead to a minimal increase in charges for transmission-connected customers.</p> <p>Due to the potential impact on CfD prices, it is expected that there will be a net small positive impact to consumers.</p>
Benefits for society as a whole	<p>Positive</p> <p>Lower costs means that offshore wind farms are likely to be more competitive overall, and therefore more likely to be developed and connect. This can contribute towards the UK meeting its 50GW offshore wind by 2030.</p>
Reduced environmental damage	<p>Positive</p> <p>Lower costs mean that offshore wind farms are likely to be more competitive overall, hence potentially displacing more fossil fuel generation more quickly. This reduces the carbon in the grid, enabling de-carbonisation of the electricity system to happen more quickly.</p>
Improved quality of service	<p>Positive</p> <p>Less cost for offshore wind farms is likely to lead to an increase in the number of projects that will be undertaken in GB, thus generating more jobs to facilitate these projects.</p>

When will this change take place?

Implementation date

1 April 2024

Date decision required by

20 January 2024

Implementation approach

No systems or processes will need to change as a result of this proposal

Proposer's justification for governance route

Governance route: Standard Governance modification to proceed to Code Administrator Consultation

We expect this modification proposal will not be assessed as urgent. Given the fully developed solution proposed, we believe that this CUSC modification should fall under Standard Governance modification to proceed to Code Administrator Consultation.

Interactions

- | | | | |
|---|---|--|--------------------------------|
| <input type="checkbox"/> Grid Code | <input type="checkbox"/> BSC | <input type="checkbox"/> STC | <input type="checkbox"/> SQSS |
| <input type="checkbox"/> European Network Codes | <input type="checkbox"/> EBR Article 18 T&Cs ¹ | <input type="checkbox"/> Other modifications | <input type="checkbox"/> Other |

It is not foreseen that this modification interacts with other codes, industry documents, modifications, or industry projects.

Acronyms, key terms and reference material

Acronym / key term	Meaning
BSC	Balancing and Settlement Code
CfD	Contract for Difference
CMP	CUSC Modification Proposal
CUSC	Connection and Use of System Code
EBR	Electricity Balancing Regulation
FTV	Final Transfer Value
NETS	National Electricity Transmission System
NGESO	National Grid
OEC	Offshore Export Cable
OFTO	Offshore Transmission Owner
POC	Point of Connection
STC	System Operator Transmission Owner Code
SQSS	Security and Quality of Supply Standards
DRCE	Dynamic Reactive Compensation Equipment
T&Cs	Terms and Conditions
TNUoS	Transmission Network Use of System Charges
TRS	Tender Revenue Stream

Annexes

Annex	Information
Annex 1	Operation of SVC in Power Systems

¹ If your modification amends any of the clauses mapped out in Exhibit Y to the CUSC, it will change the Terms & Conditions relating to Balancing Service Providers. The modification will need to follow the process set out in Article 18 of the Electricity Balancing Guideline (EBR – EU Regulation 2017/2195) – the main aspect of this is that the modification will need to be consulted on for 1 month in the Code Administrator Consultation phase. N.B. This will also satisfy the requirements of the NCER process.