ESO

Code Administrator Consultation

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 move the cost of DRCE to 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 via the offshore local circuit tariff for the lifetime of the project.

Modification process & timetable

1. **Proposal Form**
   02 August 2023
2. **Workgroup Consultation**
   02 January 2024 - 22 January 2024
3. **Workgroup Report**
   15 February 2024
4. **Code Administrator Consultation**
   29 February 2024 - 21 March 2024
5. **Draft Modification Report**
   18 April 2024
6. **Final Modification Report**
   08 May 2024
7. **Implementation**
   01 April 2025

Have 10 minutes? Read our Executive summary

Have 30 minutes? Read the full Code Administrator Consultation

Have 45 minutes? Read the full Code Administrator Consultation and Annexes.

Status summary: The Workgroup have finalised the proposer's solution. We are now consulting on this proposed change.

This modification is expected to have a:

Medium impact on Offshore Wind Farm Generators

Governance route	A Standard Governance modification has been assessed by a Workgroup	
Who can I talk to about the change?	**Proposer:** Giulia Licocci Giulia.licocci@oceanswind.com 07733827480	**Code Administrator Chair**: Claire Goult Claire.goult@nationalgrideso.com 07938737807
How do I respond?	Send your response proforma to cusc.team@nationalgrideso.com by 5pm on **21 March 2024**	

ESO

Legal text

ESO

Executive summary

What is the issue?

There is a discrepancy against the CUSC charging objectives regarding the treatment of the cost of certain reactive compensation equipment; the approach differs between offshore and onshore Generators. This proposal would implement a minor change to the existing regime to facilitate compliance with CUSC objective (a), thus promoting effective competition in the generation and supply of electricity.

ESO is responsible for maintaining the voltage on the transmission system within ±10%. This is achieved by a combination of tap changers on transformers and Generators Dynamic Reactive Compensation Equipment (DRCE) to provide reactive power to the system. All Generators connected to the transmission system that operate over 46MW are required to have the capability to provide this service, as set out in the Grid Code. This service is compensated via the Obligatory Reactive Power Service (ORPS)[1] for onshore Generators, but ORPS compensation is not available to offshore Generators due to the methodology applied in the Offshore Transmission Owner (OFTO) charging framework that allocates ownership of onshore assets to the OFTO.

Specifically, DRCE is transferred to the OFTO at OFTO transaction. At this point, the DRCE enables the OFTO to comply with their mandatory reactive compensation requirements. Despite this, the offshore wind farm developer in the current system:

- Provides upfront capital costs for the DRCE before transferring to OFTO and installs the DRCE.
- Covers the cost of DRCE via the offshore local circuit tariff for the lifetime of the project.
- The offshore Generator is not compensated via ORPS but is still exposed to the capital and maintenance costs of DRCE through its local TNUoS tariff.

What is the solution and when will it come into effect?

Proposer's solution: The recommendation is to move the costs associated with DRCE for OFTO-connected wind farms to the wider tariff, through the proposed change to the charging methodology of the CUSC. This approach would ensure a more appropriate allocation of DRCE costs and recognise the broader benefits that DRCE provide to the grid while encouraging the further development and integration of offshore wind farms into the National Electricity Transmission System (NETS). This would involve allocating the cost of DRCE out of the "Circuit Tariff" into the "Onshore Substation Tariff." This removes the cost from the Generators annual local offshore tariff and includes it in the general TNUoS via the demand residual[2].

Implementation date: 1 April 2025

Workgroup conclusions: The Workgroup concluded unanimously that the Original better facilitated the Applicable Objectives than the Baseline.

[1] Obligatory reactive power service
[2] TNUoS charging for offshore Generators

What is the impact if this change is made?

- Provides a more equitable commercial environment for onshore and offshore Generators regarding cost exposure and revenue recovery for DRCE, thus facilitating competition.
- Lower charges would reduce financial barriers for future offshore wind developers.
- OFTOs will continue to receive the revenue via their Tender Revenue Stream (TRS) as before and will not be financially impacted by this modification (the ESO will merely recover the part of OFTO income that relates to DRCE, from different parties).
- A more equitable allocation of costs improves the overall cost reflectivity of the system charging methodology for both OFTOs and Generators.
- Consumer impact of CMP418 is expected to be net-off (please see **Annex 7**)

Interactions

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

The ESO confirmed that this modification does not relate to terms offered by the ESO for energy balancing and does not fall under the EBR regulation.

What is the issue?

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 Blake Clough report (**Annex 3**) found that there are discrepancies against the CUSC charging objectives and that a change to the existing regime would facilitate compliance with CUSC objective a), thus promoting effective competition in the generation and supply of electricity.

The defect identified relates to the treatment of DRCE in the context of offshore wind and in relation to the allocation of offshore TNUoS costs at OFTO transaction. The Grid Code requirements for offshore Generators and OFTOs are set out in Figure 1.

Grid Code reference	Requirement	How is it achieved?
CC.6.3.2(e)(i) Offshore Generator Requirement	Radially connected offshore windfarms are required to maintain zero reactive transfer at the Offshore Grid Entry Point	Generators typically use the reactive capability of the WTGs 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.
CC.6.3.2 (c) OFTO Requirement	The OFTO is required to maintain 0.95 power factor lagging and 0.95 power factor leading at the Onshore Interface Point	This is achieved via the installation of DRCE. The absorption or delivery of reactive power from the SVC is continuously adjusted to meet the requirement for reactive power flow

Figure 1- Grid Code Requirements for Reactive Power

The offshore Generator complies with its reactive compensation requirement to maintain zero reactive transfer at the Offshore Grid Entry Point. Generators typically use the reactive capability of the Wind Turbine Generators (WTG) 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. From a commercial perspective, there is no remuneration associated with this compliance.

The DRCE enable OFTOs 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 and (i) provides upfront capital costs for the DRCE before transferring to OFTO and (ii) covers the cost of DRCE via the offshore local circuit tariff for the lifetime of the project. From a commercial perspective, ESO confirmed that OFTOs are remunerated for the provision of the mandatory reactive power service via their Base Revenue.

Importantly, the requirement for reactive compensation is placed on the OFTO via the installation of DRCE and not the wind farm because it is not efficient to comply with the

normal Generator dynamic reactive compensation requirements offshore due to the long Offshore Export Cable (OEC) lengths**.**

To provide further clarity, it is helpful to compare the status quo treatment of DRCE between onshore and offshore windfarms as set out in Figure 2. Further technical information on this can be found in **Annex 5**.

	Installs DRCE?	Who owns DRCE?	Pays the cost of DRCE in TNUoS?	Who is paid via the Obligatory Reactive Power Service (ORPS) ?
Onshore Windfarm	Yes if the WTGs cannot meet the full Grid Code requirements on their own	Onshore Windfarm	No	Onshore Windfarms
Offshore Windfarm	Yes unless it is very close to shore (e.g. 0.5 miles)	Offshore Transmission Owners after OFTO transaction	Yes	OFTO - Remunerated as part of the Base revenue

Figure 2- technical and commercial treatment of DRCE

Why change?

The current regulatory regime requires the offshore wind 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 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 primarily used for mitigating the impact of the offshore cables but in enabling Grid Code compliance for the OFTO at the onshore interface point to provide voltage support services to the ESO.

Therefore, while it is appropriate that shunt reactor costs fall into the local circuit tariff, it should not follow that DRCE are treated in the same way. Ultimately, shunt reactors are used by Generators to compensate for cable capacitance and the DRCE is deployed by the ESO to achieve voltage control on the grid network, for which the OFTO is compensated. Consequently, the Generator pays for an asset located within the onshore transmission which enables the OFTO to comply with its Grid Code requirements and receive remuneration via the Base Revenue.

The change in approach and change in the allocation of DRCE costs is consistent with CUSC objectives because it promotes a more equitable distribution of costs and benefits. The cost for the provision of reactive compensation by onshore windfarms is remunerated via the ORPS payment, this is funded by Balancing Services Use of System (BSUoS) charges, which is paid by demand. The modification proposed under CMP418 would harmonise the treatment between onshore and offshore Generators as the cost for the provision of reactive compensation by OFTOs would now be funded by demand through the Transmission Demand Residual (TDR) instead of the offshore Generator. Accordingly, the proposed solution under CMP418 facilitates effective competition in the

generation of electricity while also encouraging the development of renewable energy sources, and potentially lowering energy prices.

Ocean Winds engaged with the wider industry through presentations in the Transmission Charging Methodology Forum (TCMF) as well as 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 poses a defect within the CUSC methodology.

What is the solution?

Proposer's solution

The recommendation is to move the costs associated with DRCE to the wider tariff, ensuring an equal treatment between the onshore and offshore Generators, through the proposed change to the charging methodology of the CUSC. This approach would ensure a more appropriate allocation of DRCE costs while encouraging the further development and integration of offshore wind farms into the NETS.

Workgroup considerations

The Workgroup convened six times to discuss the perceived issue, detail the scope of the proposed defect, devise potential solutions, and assess the proposal in terms of the Applicable Objectives.

The Workgroup held their Workgroup Consultation between 02 January 2024 – 22 January 2024 and received six non-confidential responses in total. The full responses and a summary of the responses can be found in **Annex 10.**

Consideration of the proposer's solution

The Proposer gave a presentation to the Workgroup outlining Reactive Compensation Compliance, OFTO Transfer and TNUoS charges, the defect, proposed solution, and initial assessment against the Terms of Reference (**Annex 4**).

The Proposer clarified that Ocean Winds had highlighted this commercial discrepancy unfairly weighted against offshore Generators a couple of years ago with the ESO, but Ocean Wind had not had the capacity until now to take the issue forward as a modification.

The Workgroup discussed the length of cables and at what length the requirement for Static Var Compensators (SVC's) (a typical DRCE asset) becomes more prevalent. The Proposer agreed to take an action to Investigate boundaries that could be applied to CMP418. Workgroup members discussed this item, and it was agreed that boundaries would not be necessary. This is because the DRCE is required for any offshore windfarm that is 0.5 miles farther from shore. All offshore windfarms in the UK pipeline will all be located much further than 0.5 miles from shore and thus require onshore DRCE.

The Proposer highlighted that consideration of the Holistic Network Design (HND) was requested by the CUSC Panel. The Workgroup discussed this, and it was clarified that if

approved, this modification will apply to all radially connected offshore windfarms within the HND or not. The reason is because the defect stems from the allocation of cost of DRCE at OFTO transaction related to the requirements in the Grid Code for radially connected offshore windfarms.

The Workgroup discussed the fact that the allocation of costs for offshore TNUoS is an interpretation and is not codified in the CUSC. On Panel's recommendation, the Workgroup discussed whether more complex legal text changes should be suggested as part of the modification. The Workgroup agreed not only that this would be outside of the scope of the modification but above all that the codification of offshore TNUoS cost allocation should not be part of the CUSC. An example was given that CUSC Price controls are not codified – that has been the case so far and ESO agrees. It is not required for the TNUoS cost allocation to be codified for the defect set out in this modification to be addressed.

Cross Code Impacts

The Workgroup discussed a possible cross code impact with the current STC modification CM085.

One Workgroup member raised the point CM085 is ongoing and yet to be determined by the Authority. The Proposer expressed CM085 is codifying what already happens and therefore CMP418 and CM085 support each other.

An ESO Subject Matter Expert (SME) was invited to the Workgroup to present an overview of CM085 and clarify any interaction with CMP418. It was explained to Workgroup members that for the ESO to manage the Transmission System, any reactive power that is available to them may be utilised if it is an economic and efficient choice, and OFTO assets are treated in the same way as onshore assets. The SME confirmed that the Cost Benefit Analysis (CBA) performed as part of CM085 supports this approach.

One Workgroup member expressed concern that CMP418 is predicated on an assumption that DRCE can be used for wider system reasons, and not just for compensating the effects of the OFTO's AC cable, referencing STC Section K. The member suggested a possible consequential change to the STC might be needed as part of CMP418 to clarify this point. The member felt the STC was clear that DRCE is an OFTO asset and not for wider system use, otherwise Section K is being misunderstood by OFTOs. Two members of the Workgroup responded to say it was a technicality and does not affect what happens in real-life. A member felt this issue was being covered by STC change CM085, which was raised by the ESO to clarify that these DRCE assets can be so used.

The Proposer confirmed the modification is not seeking to change this aspect, and Workgroup members concluded no change is required to the STC as part of CMP418. The ESO Representative reiterated this lies at the core of STC change CM085,and if that Workgroup decides to issue a recommendation to amend the wording in STC Section K it will be passed onto the wider ESO team.

The Workgroup was asked to consider CMP418 in the context of different OFTO set ups identified within CM085. The Workgroup discussed this in detail and agreed that the proposal is addressing specifically the set up whereby OFTO controls onshore volts, wind

turbines compensate for the cable. The ESO confirmed this includes most offshore wind farms to date and therefore include all wind farms that will be deployed, as the DRCE installation is required when farther than 0.5 miles from shore. However, CMP418 automatically applies to any instance where a DRCE is required and is transferred to the OFTO at OFTO transaction (and for which the developer becomes liable of paying offshore local circuit tariff for the DRCE).

Terms of Reference (ToR) Update

Following a discussion in Workgroup two, Workgroup members reviewed and agreed to update the Terms of Reference (ToR) as follows:

- Amend ToR f) by substituting Static Var Compensator (SVC) to **Dynamic Reactive Compensation Equipment (DRCE),** noting this is a Grid Code defined term. The Workgroup evidenced that SVC was an example and subset of DRCE, but DRCE was the range which covered other similar equipment.

- Remove ToR i) as no longer required after the change to ToR f).

It was pointed out by the Proposer that accepting the ToR amendments would also result in changes to the CMP418 proposal. The Workgroup discussed the changes and then agreed to the Proposers request to amend the modification title and overview as follows:

- Any reference to SVC within the Original Proposal to be replaced with DRCE.

The Workgroup agreed that the scope, principle, and defect of the modification have not been altered because of the update to the ToR accepting SVCs were an example and subset of DRCE, but DRCE was the range which covered other similar equipment. The Proposer clarified that the analysis presented at Workgroup one remains the same. The updated final proposal form can be found in **Annex 1**.

The Workgroup ToR updates and amended modification title were presented to the CUSC Panel on 24 November 2023. Panel members confirmed the change of title and agreed that points within the Terms of Reference did not constitute a change in defect. Panel members confirmed the Original Proposal and ToR could be updated as requested and asked for the Workgroup to resume.

Wider Tariff Discussion

The Proposer explained to Workgroup members that a point had been raised by the CUSC Panel on 24 November 2023 regarding the term ‘Wider Tariff’. The Panel member had requested the Workgroup to consider if the term should be capitalised in all modification documents as it is a defined term. The Proposer asked the ESO Representative for clarification as there were instances in the CUSC where it appears both capitalised and non-capitalised. The Chair explained to members if the term were capitalised, a definition for Wider Tariff would be required as part of the legal text changes. The ESO Representative confirmed the legal team had reviewed Section 14 and their opinion was that wider tariff does not require capitalisation. Workgroup members agreed.

DRCE Ownership Models

The Proposer presented an outline of DRCE ownership models (**Annex 5**) to members describing both the current and proposed technical and commercial treatment of DRCE for onshore and offshore wind farms. The Proposer clarified that the modification is not looking to change asset ownership but moving the OFTO transaction DRCE cost from the local tariff to the wider tariff.

In Workgroup meeting three, slides on DRCE (**Annex 6**) were presented to the Workgroup covering what reactive power is, why do we want to manage reactive power, reactive power in a typical AC offshore Transmission System and four main examples of DRCE (switched inductors or capacitors, synchronous machines, SVC/STATCOM and inverter/converter).

Confirm Transmission Owner (TO) Payment of Obligatory Reactive Power Service (ORPS)

The Workgroup discussed revenue streams including who receives revenue and for what assets and services. The ESO Representative presented a slide (**Annex 8**) referencing an extract from the transmission standard licence condition E15 and verified TO's are paid for Transmission Services as part of their Base Revenue. The ESO Representative confirmed they are not paid ORPS. The Proposer emphasised the modification is not asking OFTOs be paid but that offshore Generators are not unreasonably burdened with the cost of DRCE through their local TNUoS tariff.

Impact on Wider TNUoS Charges

The Workgroup considered the impact on TNUoS charges if the proposed change were approved by the Authority and if DRCE were treated as generation assets what would the ESO pay in balancing services.

The Proposer presented **Annex 7** - Impact of Proposed Solution on Wider TNUoS Charges. One Workgroup member questioned the rationale for using 45 years for an asset that only had a 25-year TRS and was not aware an asset lasted that long and possibly only 5 years. Another member felt the short shelf life would potentially strengthen the argument for the modification as the OFTO would be paying more but not getting any benefits of owning the asset. The ESO SME explained onshore 45-year life is a standard assumption. A Workgroup member described how originally it was 20 years as Wind Turbine Generators had a design life of 20 years and this was extended up to 25 years after Ofgem sought advice from different parties. The member felt there was still disparity in terms of the length of time the TRS is allocated for.

The Proposer stated within the presentation that the offshore wind capacity would increase annually and quoted a figure of 3.5GW. A member questioned how many years has been assumed it will continue at that level. The Proposer responded to say there is a target of 40GW of offshore wind by 2030. The same member questioned what comes after that in terms of Government targets out to 2050. Following the discussion, this was updated by the Proposer to a 50GW target by 2030 and 125GW by 2050.

Workgroup members discussed the calculations in detail raising questions around operating costs, overhead factors for maintenance and if this information needs to be separated out in future in terms of the OFTO as the Generator is only given a single number.

The Proposer initially suggested looking at the wider tariff impact of the proposal by using an annuity calculation. This raised doubt among Workgroup members over the correct asset life, rate of return, and maintenance cost required for the calculation. Following Workgroup discussions, the Proposer agreed to simplify the calculation initially proposed. The updated calculation is provided in **Annex 3** and in **Annex 7**.

The Proposer explained to members the calculation has been simplified by looking at the TRS impact of the DRCE. As confirmed by the ESO revenue team, Local Circuit and Substation Charges are classed as Connection Assets and therefore should be excluded when calculating how much revenue can be collected from Generators under the EU Cap. This means that any changes to the Connection Exclusion amount affects the Transmission Demand Residual (TDR). In line with the purpose of CMP418, if the offshore Generator no longer pays for DRCE, then the amount of the OFTO revenue which accounts for that equipment moves from the offshore local circuit tariff to the Transmission Demand Residual (TDR) tariffs (spread proportionally across all TDR tariffs).

In the status quo, the Tender Revenue Stream (TRS) attributable to DRCE would be recovered through project specific offshore tariff but they in effect represent the amount that would then have to be moved to TDR in line with the recommendation of this CUSC modification and would cover both CAPEX and OPEX. Hence, to calculate the amount that would need to be recovered from TDR, the TRS/Final Transfer Value (FTV) ratio was used to derive the TRS impact. More details on the impact of this change on the wider tariff can be found in **Annex 9**. Importantly, due to the positive impact of CMP418 on CfD prices by reducing offshore developers' costs, it is expected that the impact on consumers will be net off. The updated TRS calculation removed the need for a consideration of maintenance cost percentage, the correct asset life and rate of return.

The Proposer talked through **Annex 9** to consider the consumer impact of enabling offshore windfarms to retain the DRCE they install rather than transferring the assets. Although not the solution proposed, the Proposer felt this analysis evaluates how enabling offshore windfarms to retain the DRCE would impact consumers more, as allowing offshore windfarms to retain DRCE would entail reimbursing them for reactive power services via ORPS payments.

Consideration of retrospectivity without opening tariffs

The Workgroup discussed retrospective application of this modification. The Proposer made it clear that the initial proposed solution was not intended to be applied retrospectively.

Several Workgroup members noted that the Authority historically are not keen for changes to be applied retrospectively as could lead to opening tariffs from previous years. The ESO Representative commented that retrospective application could take

different forms and gave retro charging or inclusion as examples of different approaches, but also commented that any retrospective application does complicate.

The Workgroup discussed how retrospectivity without opening tariffs could be achieved. A Workgroup member clarified it is a calculation and would not involve a change to the methodology as offshore circuit charges are calculated regularly. This means it would be adjusted and applied to all AC connected offshore local circuit tariffs where the OFTO has adopted the DRCE. The offshore circuit charges from the statement of charges after the Implementation Date of the modification would be calculated without the DRCE's cost. This avoid having a discriminatory approach going forward between some windfarms and others and does not involve reopening tariff. The OFTO revenue, its TRS, does not change. It will be collected by ESO from different parties, no longer paid by the connected Generator but from wider TNUoS paid by other users.

Other options/Alternatives

No other options or Alternatives were raised as part of the Workgroup consultation or in the Workgroup phase.

Workgroup consultation summary

The Workgroup held their Workgroup Consultation between 02 January 2024 – 22 January 2024. The Workgroup consultation received six non-confidential responses in total. The full responses and summary table can be found in **Annex 10**.

A summary of the six non-confidential Workgroup Consultation responses were presented to Workgroup members:

- Three respondents stated the Original proposal better facilitated objective a)
- Two respondents stated the Original proposal better facilitated objective b) and e)
- One respondent stated the Original proposal was negative against objective b)
- Four of the respondents supported the implementation approach.
- In regards to the ongoing DRCE operation and maintenance costs, three respondents felt the value of 1.5% seemed reasonable and equitable to align with onshore TO revenue allowance cost. One respondent felt there was insufficient evidence to understand the origins of the figures or definitions of activities it intends to cover.
- Three respondents agreed the modification should not be applied retrospectively with one stating it avoids reopening tariffs. Another respondent reasoned it should only apply to new installations to prevent understating of costs relating to the Original.

Reasons given in support of the Original proposal:

- Better facilitates competition correcting a commercial defect in onshore/offshore treatment bringing a level of parity
- Does not seek to open up ORPS to offshore
- Recognises the broader benefits DRCE provides to network Users
- Reduces the already substantial TNUoS charge faced by Generators

Reasons given against the Original proposal:

- Socialising costs means these could be considered transmission assets
- The OFTO would need to seek assurance from the Developer that the DRCE is capable of operating to the expected capabilities from the ESO
- Insufficient evidence provided to understand the origins of the 1.5% figure for DRCE operation and maintenance costs, within the consultation, or the definition of what activities it is intended to cover

The Chair asked if members would like to add anything to the summary. No additions were suggested. One Workgroup member agreed this was a fair synopsis of the responses received.

A statement made in a response supportive of the proposal was highlighted to the Workgroup by the Chair:

'Dynamic Reactive Category should capture all types of Dynamic Reactive Devices including STATCOM.'

The Chair suggested the respondent was referring to an earlier version of the proposal and this issue had already been addressed when the proposal was updated. Workgroup members agreed changing the CMP418 proposed legal text detail from Static Var Compensators (SVC) to Dynamic Reactive Compensation Equipment (DRCE) already captured STATCOM as suggested by the respondent.

Workgroup Consultation Responses Review

One respondent had raised several points unsupportive of the solution. The Proposer prepared responses to these arguments and shared these with the Workgroup.

The first argument was that the current charging arrangement reflects an historical expectation that Generators are obliged to provide reactive services and compliance with Grid Code (GC). The Proposer explained Generators are obligated to provide reactive services in compliance with the GC and confirmed this will not change as a result of CMP418. The Proposer also pointed out it had been explained in the consultation that onshore DRCE will be required to ensure GC compliance for any offshore wind farms farther than 0.5 miles from shore. This proposal will not change the obligations under the GC for offshore wind Generators or OFTOs.

The second argument, made by the respondent, was that by changing the charging arrangement so that the cost is moved to the wider tariff rather than directed to the party that triggers them means these could be considered transmission assets rather than operated for the benefit of the windfarm. The Proposer clarified DRCE ownership is transferred to the Offshore Transmission Owner (OFTO) at OFTO transaction, and the Generator is then liable for TNUoS costs for the DRCE. The Proposer confirmed the proposed solution will not change the existing arrangements, and ownership of DRCE will remain with the OFTO, post the at OFTO transaction. If the asset were not considered part of the transmission assets, the OFTO would not be remunerated for its provision of reactive services via the Base Revenue, as it currently is. Similarly, if the asset was considered a Generator asset, then the offshore Generator would be able to access the ORPS, which they are not. Workgroup members agreed with the Proposer's assessment.

Concerns were also raised by the same respondent surrounding the interaction of CMP418 and CM085. The Proposer recalled the ESO Subject Matter SME had found no

interaction between the modifications. The SME also confirmed CM085 requires no changes to the current DRCE set up or the Grid Code requirements. A Workgroup member perceived this had already been made clear in the consultation and felt the Workgroup response should be that CM085 is relating to a separate issue and that CMP418 does not impact on CM085. Workgroup members agreed with this statement.

Consumer Impact

The Proposer requested support to understand what the consumer impact of CMP418 will be and to confirm the interaction with the connection exclusion and the demand residual. The ESO Representative agreed to consult with the ESO revenue team to provide information on connection exclusion charges, the end consumer financial impact of DRCE being included within this and associated change to ESO cost recovery. The Representative informed members this will not necessarily be analysed.

The Chair inquired if any members could share any insight on consumer impact and interaction with the conclusion exclusion to support the proposal. One Workgroup member offered to also answer the question posed by the Proposer but requested the ESO to confirm this is aligned with thoughts from the charging team. The ESO revenue team confirmed the understanding that local circuit tariffs are part of the Connection Exclusion and therefore the change proposed under CMP418 would mean moving the recovery of DRCE costs from offshore Generators to the TDR.

Legal text

The legal text for this change can be found in **Annex 12**.

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 in blue in the draft legal text below.

Offshore Circuit Expansion Factors

14.15.80 Offshore expansion factors (£/MWkm) are derived from information provided by Offshore Transmission Owners for each offshore circuit. Offshore expansion factors are Offshore Transmission Owner and circuit specific. Each Offshore Transmission Owner 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 DRCE), harmonic filtering equipment, asset spares and HVDC converter stations. Dynamic Reactive Compensation Equipment is a term defined in the Grid Code Glossary & Definitions.

(N.B The changes highlighted in red throughout Annex 12 are not being consulted on, these are corrections to the baseline made as part of CUSC Section 14 v1.39a)

What is the impact of this change?

Proposer's assessment against Code Objectives

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. It mitigates the revenue opportunity that onshore Generators can receive through providing voltage control service that is unavailable to offshore Generators, even though both parties are exposed to the cost and installation of DRCE. Ultimately the change proposed creates a parity of approach with regards to reactive power compensation costs between onshore and offshore Generators.
(b) That compliance with the use of system charging methodology results in charges which reflect, as far as is 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);	**Positive** Generators should not be responsible for bearing the cost of OFTO's Grid Code compliance with the mandatory reactive compensation requirements. The proposed change will amend the status quo and ensure that charges accurately reflect the costs

	incurred by transmission licensees.
(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;	**Neutral** CUSC would neither be more nor less adaptable to developments in transmission licensees' transmission businesses
(d) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency *; and	**Neutral** No impact
(e) Promoting efficiency in the implementation and administration of the system charging methodology.	**Positive** A more equitable allocation of costs that takes better account of OFTOs and offshore Generators mandatory requirements under the Grid Code. Improves the overall cost-reflectivity of the system charging methodology. It ensures that OFTOs, onshore, and offshore Generators treatment is aligned in respect of mandatory reactive power requirements.
**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.	

Proposer's assessment of the impact of the modification on the stakeholder / consumer benefit categories	
Stakeholder / consumer benefit categories	**Identified impact**
Improved safety and reliability of the system	**Neutral** 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	**Positive** 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. The DRCE will be paid for by TDR, and therefore this will lead to a minimal increase in demand charges. Due to the positive impact on CfD prices of reducing offshore developers' costs, it is expected that the impact on consumers will be net off.
Benefits for society as a whole	**Positive** 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.
Reduced environmental damage	**Positive** 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.
Improved quality of service	**Positive** 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.

Workgroup vote

The workgroup met on 08 February 2024 to carry out their workgroup vote. The full Workgroup vote can be found in **Annex 11**. The table below provides a summary of the Workgroup members view on the best option to implement this change.

The Applicable CUSC (charging) Objectives are:
CUSC charging objectives

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;

b) That compliance with the use of system charging methodology results in charges which reflect, as far as is 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);
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;
d) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency *; and
e) To promote efficiency in the implementation and administration of the system charging methodology

*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.

The Workgroup concluded unanimously that the Original better facilitated the Applicable Objectives than the Baseline.

Option	Number of voters that voted this option as better than the Baseline
Original	6

When will this change take place?

Implementation date
01 April 2025

Date decision required by
30 September 2024

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

Interactions

☐Grid Code	☐BSC	☐STC	☐SQSS
☐European Network Codes	☐ EBR Article 18 T&Cs[3]	☐Other modifications	☐Other

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

[3] If the modification has an impact on Article 18 T&Cs, it will need to follow the process set out in Article 18 of the Electricity Balancing Regulation (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.

The ESO confirmed that this modification does not relate to terms offered by the ESO for energy balancing and does not fall under the EBR regulation.

How to respond

Code Administrator Consultation questions

- Please provide your assessment for the proposed solution against the Applicable Objectives?
- Do you have a preferred proposed solution?
- Do you support the proposed implementation approach?
- Do you have any other comments?

Views are invited on the proposals outlined in this consultation, which should be received by 5pm on **21 March 2024**. Please send your response to cusc.team@nationalgrideso.com using the response pro-forma which can be found on the modification page.

If you wish to submit a confidential response, mark the relevant box on your consultation proforma. Confidential responses will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

Acronyms, key terms and reference material

Acronym / key term	Meaning
BSC	Balancing and Settlement Code
CBA	Cost Benefit Analysis
CfD	Contract for Difference
CMP	CUSC Modification Proposal
CUSC	Connection and Use of System Code
DRCE	Dynamic Reactive Compensation Equipment
EBR	Electricity Balancing Regulation
ESO	Electricity System Operator
FTV	Final Transfer Value
HND	Holistic Network Design
HVDC	High Voltage Direct Current
NETS	National Electricity Transmission System
OEC	Offshore Export Cable
OFTO	Offshore Transmission Owner
ORPS	Obligatory Reactive Power Service
POC	Point of Connection
SME	Subject Matter Expert
STC	System Operator Transmission Owner Code
SQSS	Security and Quality of Supply Standards
SVC	Static Var Compensator
TCMF	Transmission Charging Methodology Forum
TNUoS	Transmission Network Use of System Charges
TO	Transmission Owner
TRS	Tender Revenue Stream
WTG	Wind Turbine Generators

Annexes

Annex	Information
Annex 1	Proposal form
Annex 2	Terms of reference
Annex 3	Operation of DRCE in Power Systems Report
Annex 4	Introduction to the Proposed Solution
Annex 5	DRCE Ownership Models
Annex 6	Dynamic Reactive Compensation Equipment
Annex 7	Impact of Proposed Solution on Wider charges
Annex 8	TO Payment of ORPS Confirmation
Annex 9	Consumer impact of DRCE Treatment as Generation Assets
Annex 10	Workgroup Consultation Responses and Summary Table
Annex 11	Workgroup Vote
Annex 12	Legal Text