

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

**Wednesday 29 November 1pm**

**Online Meeting via Teams**

# WELCOME







# Objectives

Claire Goult – ESO Code Administrator



## Objectives

- **Timeline Update**
- **CUSC Panel Update/ Wider Tariff Discussion**
- **Action Review**
- **Action 5 – Dynamic Reactive Compensation Equipment**
- **Action 6 – Confirm TO Payment of ORPS**
- **Action 8 – Consider retrospectivity without opening tariffs**
- **Review and Finalise Workgroup Consultation**
- **Consider Workgroup Specific Consultation Questions**
- **AOB/ Next steps**



# Timeline Update

Claire Goult – ESO Code Administrator

# Timeline for CMP418 – Updated 23 November 2023

Milestone	Date	Milestone	Date
Proposal Presented to Panel	17 August 2023	Panel sign off that Workgroup Report has met its Terms of Reference	<b>CUSC Panel Date 23 February 2024</b>
Workgroup Nominations	29 August 2023 – 26 September 2023 (Extended)	Code Administrator Consultation (15 working days)	29 February 2024 – 21 March 2024
Workgroup 1 – Understand / discuss proposal and solution(s), review and agree on Terms of Reference and Timeline, review cross code impacts, review analysis and agree next steps.	19 October 2023	Draft Final Modification Report (DFMR) issued to Panel	18 April 2024
Workgroup 2/3 – Refine solution(s), draft legal text, consider potential Workgroup Consultation questions and finalise Workgroup Consultation	7 November 2023 29 November 2023	Panel undertake DFMR recommendation vote	<b>CUSC Panel Date 26 April 2024</b>
Workgroup Consultation (20 Working Days at Christmas)	<del>30 November 2023 – 21 December 2023</del> 5 December to 5 January?	Final Modification Report issued to Panel to check votes recorded correctly (5 working days)	29 April 2024 – 03 May 2024
Workgroup 4 – Review Workgroup Consultation responses, consider new points raised, refine solution, review legal text and discuss any potential alternatives	10 January 2024	Final Modification Report issued to Ofgem	06 May 2024
Workgroup 5 – Finalise solutions (including legal text) and alternatives and hold alternative vote. Finalise Workgroup Report and hold Workgroup Vote	31 January 2024	Ofgem decision	By 30 September 2024
Workgroup Report issued to Panel (5 working days)	15 February 2024 (Papers Day)	Implementation Date	01 April 2025



# **CUSC Panel Update/ Wider Tariff Discussion**

**Claire Goult – ESO Code Administrator**

# CMP418: Refine the allocation of Dynamic Reactive Compensation Equipment (DRCE) ~~Static Var Compensators (SVC)~~ costs at OFTO transfer

## Amended Workgroup Terms of Reference

- a) Consider EBR implications;
- b) Consider any cross code impacts and interactions, specifically with the STC, Grid Code and CM085;
- c) Confirm whether the change is proposed to be retrospective or to apply only to future plant;
- d) Consider whether changes are required to Section 11 via a separate modification;
- e) Consider the extent to which the revenue recovery requirements need to be codified to provide clarity for parties;
- f) If ~~SVC~~ DRCE asset costs are socialised, or alternatively if they are not socialised, consider whether parties who bear the costs of those assets as a consequence should also receive Balancing Services revenue for the associated reactive provision.
- g) Consider the impact of the change on the different OFTO set-ups and if this change is likely to impact future design set-ups;
- h) Consider aligning the definitions used with the Grid Code;
- ~~i) Consider the impact on other Dynamic Reactive Compensation Equipment.~~

## CMP418 – Panel Response

- **CONFIRMED** the amended title and points within Terms of Reference did not constitute a change in defect



# CUSC Panel Update/ Wider Tariff Discussion

## Structure of Generation Charges

14.18.3 Generation Tariffs are comprised of Wider and Local Tariffs. The **Wider Tariff** is comprised of (i) a Peak Security element, (ii) a Year Round Not-Shared element, (iii) Year Round Shared element and (iv) and, (iv) the Adjustment tariff (if required). The Peak Security element of the **Wider Tariff** is not applicable for intermittent generators as the PS flag is set to zero. The Year Round Not Shared element is multiplied by the YRNS Flag, which for Non-Conventional Carbon Generators results in no change to the tariff, whereas for Conventional Carbon generators the tariff is reduced by ALF



# Action Review

Claire Gault – ESO Code Administrator

## Actions

4	WG1	JL	Explanation of what constitutes Dynamic Reactive Compensation Equipment, with a diagram if possible.
5	WG2	HT	To confirm TO payment of ORPS with a slide on asset clarification.
6	WG2	GL	Provide details of the impact on TNUoS if the proposed change was approved by the Authority.
7	WG2	GL	If DRCE were treated as generation assets what would the ESO pay in balancing services.
8	WG2	ALL	Investigate how retrospectivity could be applied to this modification without reopening tariffs.



## **Action 4 – Dynamic Reactive Compensation Equipment**

**Jonathan Lakey – Ocean Winds**

CMP418:  
DYNAMIC REACTIVE COMPENSATION EQUIPMENT

# OCEAN WINDS

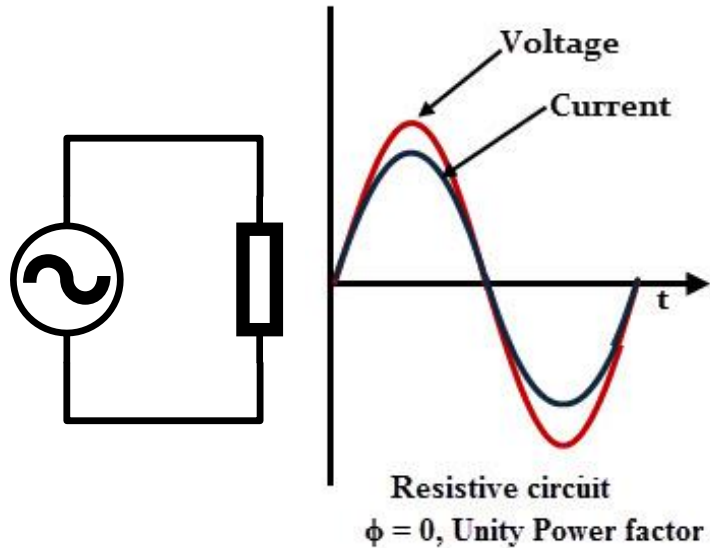
2023



# What is reactive power?

Alternating Current (AC) has a sinusoidal voltage waveform.

AC voltage across a RESISTOR causes a sinusoidal current to flow in sync with the voltage.



Current through a resistor does WORK

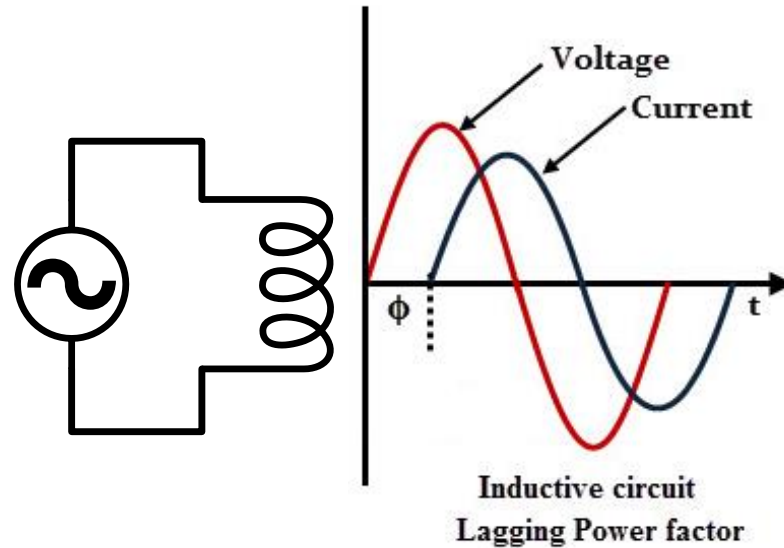
Electrical energy is converted (heat produced).

This is **ACTIVE CURRENT**.

Active Current causes Active Power or Real Power.

This is what is metered, what is bought by consumers.  
Measured in MW.

AC voltage across an INDUCTOR causes the current wave to "LAG" behind the voltage (inductors "store" current).



Current through an inductor or capacitor does NO WORK.

No energy is converted, it is returned to the source.

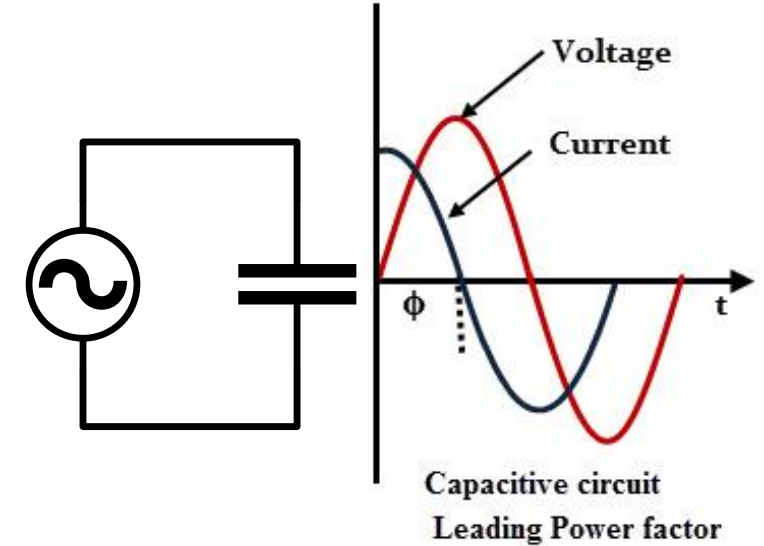
This current is REACTIVE CURRENT.

Reactive Current causes Reactive Power.

Inductive/lagging current is negative.

Inductors "ABSORB" reactive power.

AC voltage across a CAPACITOR causes the current to "LEAD" the voltage (capacitors "store" voltage).



Capacitive/leading current is positive.

Capacitors "GENERATE" reactive power.

# Why do we want to manage reactive power?

## LOSSES

Even though it does no work - REACTIVE CURRENT still must be produced and flow from the source.

Power lines have resistance which causes losses – Both the Real Current and the Reactive Current cause these losses.

The transmission operator will limit the amount of reactive power that can be transferred. This must be compensated to reduce the flow of reactive power into the transmission network.

## VOLTAGE CONTROL

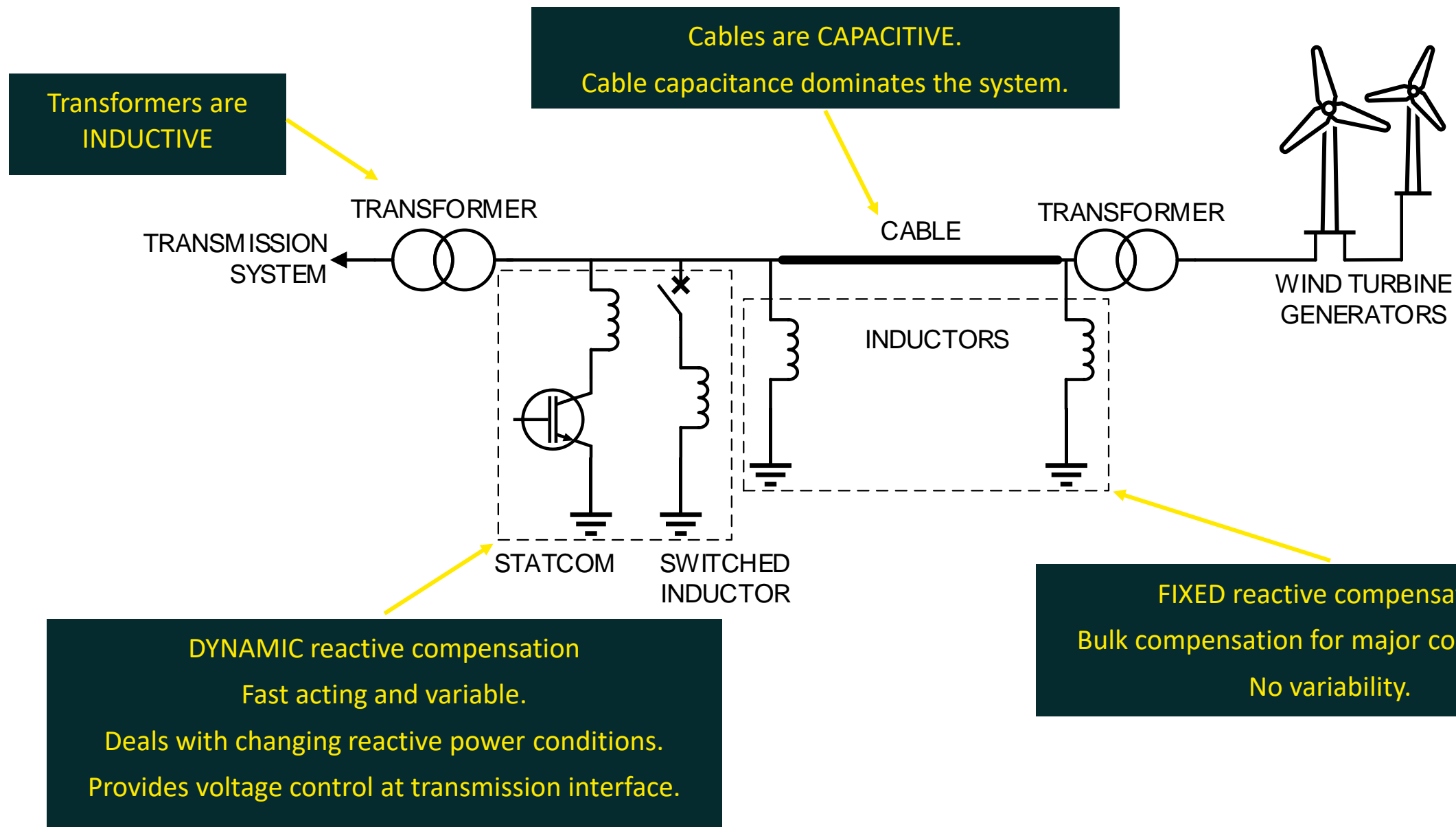
Voltage at the transmission interface can be controlled by the flow of reactive power.

IMPORTING Reactive Power by being more INDUCIVE decreases voltage.

EXPORTING Reactive Power by being more CAPACITIVE increases voltage.



# Reactive power in a typical AC Offshore Transmission System?





# Examples of dynamic reactive compensation equipment

## Switched Inductors or Capacitors

Inductors or capacitors that are connected and disconnected from the network.  
Older technology.  
Can be slow to switch.  
Limited by the size of individual components.  
Lack of precise control.



## Synchronous Machines

Changes too the excitation current of synchronous machines causes changes to reactive power production. These are either large generators (coal/gas/hydro/nuclear) Or synchronous condensers.



## SVC/STATCOM

Power electronics switches used in series with an inductor. Can produce or absorb reactive power. Very fast response.



## Inverter/Converter

For Example:

- Solar or Wind inverter.
- HVDC converter.

Can vary production/absorption of reactive power along with active power.





## **Action 5 – TO Payment of ORPS**

**Harvey Takhar – ESO Representative**



# As detailed in the below extract of the standard licence condition E15. TOs are already paid for providing transmission services as part of their base transmission revenue.

## *Condition **E15**: Obligation to provide transmission services*

1. The licensee shall, in accordance with the STC, provide to the system operator the transmission services set out in paragraph 2.
2. The transmission services which the licensee shall provide in accordance with paragraph 1 shall consist of the following:
  - (a) making available those parts of the licensee's transmission system which are intended for the purposes of conveying, or affecting the flow of, electricity so that such parts are capable of doing so and are fit for those purposes;
  - (b) a means of enabling the system operator to direct the configuration of those parts of the licensee's transmission system made available to it and, consistent with such means, giving effect to any such direction from time to time; and
  - (c) a means of enabling the system operator to obtain information in relation to the licensee's transmission system which is needed by the system operator to enable it to co-ordinate and direct the flow of electricity onto and over the national electricity transmission system and, consistent with such means, providing such information to the system operator.

## Actions 6 and 7

Giulia Licocci - Proposer

6	WG2	GL	Provide details of the impact on TNUoS if the proposed change was approved by the Authority.
7	WG2	GL	If DRCE were treated as generation assets what would the ESO pay in balancing services.



## **Action 8 - Potential solutions to address retrospectivity without reopening tariffs**

**All**



## **Review and Finalise Workgroup Consultation**

**All**



## Consider Workgroup Specific Consultation Questions

All

Question to be included in consultation: In regard to the ongoing DRCE operation and maintenance costs, is a value of [1.87%, the value used for onshore price control, an appropriate value ?





# **AOB**

**Claire Goult– ESO Code Administrator**



## **Next Steps**

**Claire Goult – ESO Code Administrator**