

Model documentation: Update models and guidance for DCP 452 (Request H01-1)

DCUSA/ElectraLink

23 May 2025



Important notice

This report was prepared by CEPA¹ and TNEI² for the exclusive use of the recipient(s) named herein.

The information contained in this document has been compiled by CEPA and TNEI and may include material from other sources, which is believed to be reliable but has not been verified or audited. Public information, industry and statistical data are from sources we deem to be reliable; however, no reliance may be placed for any purposes whatsoever on the contents of this document or on its completeness. No representation or warranty, express or implied, is given and no responsibility or liability is or will be accepted by or on behalf of CEPA and TNEI or by any of their directors, members, employees, agents or any other person as to the accuracy, completeness or correctness of the information contained in this document and any such liability is expressly disclaimed.

The findings enclosed in this report may contain predictions based on current data and historical trends. Any such predictions are subject to inherent risks and uncertainties.

The opinions expressed in this document are valid only for the purpose stated herein and as of the date stated. No obligation is assumed to revise this report to reflect changes, events or conditions, which occur subsequent to the date hereof.

CEPA and TNEI do not accept or assume any responsibility in respect of the document to any readers of it (third parties), other than the recipient(s) named therein. To the fullest extent permitted by law, CEPA and TNEI will accept no liability in respect of the report to any third parties. Should any third parties choose to rely on the report, then they do so at their own risk.

¹ "CEPA" is the trading name of Cambridge Economic Policy Associates Ltd (Registered: England & Wales, 04077684), CEPA LLP (A Limited Liability Partnership. Registered: England & Wales, OC326074) and Cambridge Economic Policy Associates Pty Ltd (ABN 16 606 266 602).

© 2025 CEPA.

² "TNEI" is the trading name of TNEI Services Ltd (Registered: England & Wales, 03891836).

Contents

1. INTRODUCTION	4
2. SPECIFICATION	4
2.1. Overview.....	4
2.2. Legal text version	4
2.3. Reference files	5
2.4. New files	5
2.5. Assumptions and clarifications.....	5
2.6. Outstanding legal text issues.....	5
3. MODEL REVISIONS	7
3.1. Structural changes.....	7
3.2. Additional or modified information sections	7
3.3. Additional or modified input sections	7
3.4. Additional or modified calculation sections	7
3.5. Additional or modified output sections	8
4. IMPACT STATEMENT.....	9
4.1. Summary of the change	9
4.2. Impact assessment approach.....	9
4.3. Inputs.....	9
4.4. Validation	9
4.5. Impacts	10

1. INTRODUCTION

This document describes charging models and supporting documentation developed relating to DCUSA Change Proposal (DCP) 452. The following sections set out:

- the specification for the new files, including the identity of the reference files for the revisions noted here within and the new file names;
- the revisions to the models; and
- the impact of those changes.

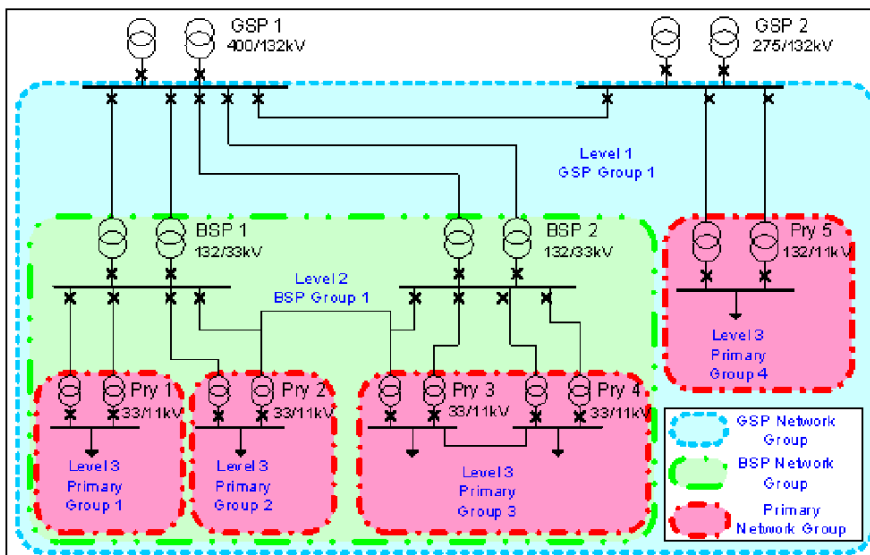
2. SPECIFICATION

2.1. OVERVIEW

The models and supporting documentation described herein were developed in response to a request to produce versions of the EDCM (LRIC & FCP) models that implement DCP 452 – “Correct application of Forward Cost Pricing EDCM charges to users connected directly to a Grid Supply Point”.

The changes of DCP 452 are relevant to the Forward Cost Pricing (FCP) variant of the Extra High Voltage (EHV) Distribution Charging Methodology (EDCM). The intent of DCP 452 is to ensure that network users connected directly to a Grid Supply Point (GSP), are deemed to not use any shared network assets, and are therefore not exposed to forward looking charges/credits for the downstream FCP network group in that location. Figure 1 is the diagram from the DCUSA legal text which shows the network groups within the FCP. From this diagram it can be seen that any customers connected directly to the GSP would not use any of the assets within the GSP Group 1 (or any other group). There is no equivalent issue under the Long Run Incremental Cost (LRIC) variant of the EDCM as the LRIC approach derives a cost-reflective charge of zero for all users which are connected direct to the GSP.

Figure 1: Forward Cost Pricing group diagram from DCUSA legal text



2.2. LEGAL TEXT VERSION

Model changes were implemented in line with the draft DCUSA text shared with the modelling team on 2nd May 2025. The change in the legal text is in paragraphs 6.2 and 6.3 of schedule 17. It now includes clarification that, for customers connected directly to the GSP (Customer Category 0000), the super-red rate, capacity charge and super-red export rate are all set to zero.

2.3. REFERENCE FILES

The following table sets out the reference versions of the charging models used as the starting point for the revisions described in this document.

Table 1a: Reference files

Model	Model file name	Date sent
EDCM (FCP)	EDCM-FCP_v12_20241025	29/10/2024
EDCM (LRIC)	EDCM-LRIC_v12_20241025	29/10/2024

2.4. NEW FILES

The following table sets out the versions of the charging models and impact assessment provided to the DCP 452 Working Group in response to the request described above.

Table 1b: New files

Model	Model file name	Date sent
EDCM (FCP)	EDCM-FCP_v12_20241025_DCP452	23/05/2025
EDCM (LRIC)	EDCM-LRIC_v12_20241025_DCP452	23/05/2025

We understand that the new files listed in Table will be considered by the DCP 452 working group and may be shared for consultation.

2.5. ASSUMPTIONS AND CLARIFICATIONS

This section lists assumptions that we have made in our interpretation of the draft legal text.

Discrepancy between legal text and specification

There was a small discrepancy between the legal text and the suggested implementation in the model specification.

The legal text indicates that all three of the super-red rate, capacity charge and super-red export rate should be set to zero for Connectees with ‘Customer Category 0000’. However, the suggested implementation in the model specification would only apply to the capacity charge and super-red export rate. In particular, in the model specification, it was suggested that an additional “if” statement be included on rows 152 and 179 of the “Charge 1 (FCP)” worksheet setting the output to 0 if customer category is “0000”. Rows 152 and 179 calculate the output for the capacity charge and super-red export rate respectively, while row 136 calculates the output for the super-red rate.

CEPA/TNEI requested clarity on this subject from the Proposer. It was confirmed that it is correct to align with the legal text and amend row 136 of the “Charge 1 (FCP)” worksheet to ensure the output for the super-red rate is set to 0 if customer category is “0000”. The reason that this change was not included in the model specification is because the super-red import charge will always be zero for customers with category 0000. This is because the super-red import charge is based on the Charge 1 values of the parent and grandparent network groups (voltage levels above the point of connection). For Customer Category 0000, the point of connection is the transmission network, and there are no higher voltage levels within the distribution system. As a result, there are no applicable parent or grandparent Charge 1 values, and the super-red import charge is therefore zero.

2.6. OUTSTANDING LEGAL TEXT ISSUES

While not an issue per se, we would note that customers connected directly to the GSP do make use of DNO network assets such as busbars and circuit breakers. However, these assets are not valued by the power flow methodology and therefore these customers are not deemed to use these assets in the FCP. DCP 452 exempts

customers connected directly to the GSP from paying for network assets they don't use but does not resolve the fact that these customers don't pay for a selection of DNO assets they do use.

There are other circumstances in which the grouping of customers within the FCP systematically increases the charges of some customers compared to others. For example, customers connected to the EHV busbar of a Bulk Supply Point substation will pay FCP charges for a group which includes EHV circuit assets, even though they do not use these assets to serve their peak demand when supplied from the higher voltage levels of the network.

Similarly, the FCP averages charges across network groups. As a result, customers within a group who use fewer assets will subsidise costs for customers that use more assets.

3. MODEL REVISIONS

3.1. STRUCTURAL CHANGES

There are no structural changes in the EDCM (LRIC) or EDCM (FCP).

3.2. ADDITIONAL OR MODIFIED INFORMATION SECTIONS

In the EDCM (LRIC), changes were made in the following sheets:

- **'Version control'**.
- **'Cover'**.

In the EDCM (FCP), changes were made in the following sheets:

- **'Version control'**.
- **'Cover'**.

3.3. ADDITIONAL OR MODIFIED INPUT SECTIONS

There are no additional or modified input sections in the EDCM (LRIC) or EDCM (FCP).

3.4. ADDITIONAL OR MODIFIED CALCULATION SECTIONS

In the EDCM (LRIC), changes were made in the following calculation sheets:

- **'Charge 1 (LRIC). "Tariff information" –**
 - In *"Tariff information"* row 21 has been added. The row is labelled under "Tariff Information" as "Customer category for demand scaling".
- **'Charge 1 (FCP). "Tariff information" –**
 - In *"Tariff information"* row 21 has been added. The row is labelled under "Tariff Information" as "Customer category for demand scaling".
 - In "Section 304-A: Identification of FCP parent and grandparent group" row 53 has been added. The row is labelled "Override FCP Charge 1 if connected directly to Grid Supply Point".
 - In "Section 304-D: Super-red charge" the calculations were changed for the 'Super-red rate' for all tariffs.
 - In "Section 304-E: Capacity charge" the calculations were changed for the 'Capacity charge' for all tariffs.
 - In "Section 304-G: Export charge 1" the calculations were changed for the 'Super-red export rate' for all tariffs.

In the EDCM (FCP), changes were made in the following calculation sheets:

- **'Charge 1 (LRIC). "Tariff information" –**
 - In *"Tariff information"* row 21 has been added. The row is labelled under "Tariff Information" as "Customer category for demand scaling".
- **'Charge 1 (FCP). "Tariff information" –**
 - In *"Tariff information"* row 21 has been added. The row is labelled under "Tariff Information" as "Customer category for demand scaling".

- In “Section 304-A: Identification of FCP parent and grandparent group” row 53 has been added. The row is labelled “Override FCP Charge 1 if connected directly to Grid Supply Point”.
- In “Section 304-D: Super-red charge” the calculations were changed for the ‘Super-red rate’ for all tariffs.
- In “Section 304-E: Capacity charge” the calculations were changed for the ‘Capacity charge’ for all tariffs.
- In “Section 304-G: Export charge 1” the calculations were changed for the ‘Super-red export rate’ for all tariffs.

3.5. ADDITIONAL OR MODIFIED OUTPUT SECTIONS

There are no additional or modified output sections in the EDCM (LRIC) or EDCM (FCP).

4. IMPACT STATEMENT

4.1. SUMMARY OF THE CHANGE

DCP 452 sets the “charge 1 (FCP)” import capacity charge, import super-red rate and export super-red rate to zero for 0000 customers.

The super-red import rate for 0000 customers is already always zero because the super-red import rate is calculated using the parent and grandparent groups of a connection. But 0000 customers are connected directly to the GSP and therefore do not have parent or grandparent groups to contribute to the calculation. As a result, DCP 452 has no impact on the super-red import rate.

Zeroing-out the other two charge components can affect EHV customers both directly (for 0000 customers) and indirectly (via impacts on residual revenue recovery). It can also have knock-on effects in the CDCM model if revenue recovered in the EDCM changes overall.

4.2. IMPACT ASSESSMENT APPROACH

The impact assessment under this service request sets out how DCP 452 would affect **EDCM customers** – directly (for GSP-connected customers) and indirectly (by reallocating the EDCM residual revenue across import customers) – and how it might affect **CDCM customers** by changing revenue recovery across the EDCM and CDCM models.

This impact assessment is largely **qualitative** in nature. CEPA-TNEI has not been given access to real EDCM data, which would be needed to undertake a proper impact assessment – including full resolution of inter-model circularities. Since we do not have access to real EDCM data, the dummy data that was provided to CEPA-TNEI during model redevelopment in 2017 and 2018 has been used to explore the general nature of the impacts that will arise from DCP 452. This should help DNO working group members to confirm these impacts and quantify them precisely using actual data.

The DCP 452 working group shared a file (“Attachment C_DCP 452 Collated RFI Results”) with the service request containing specific data from their populated EDCM models. The data related to the number of GSP-connected customers for DNOs that currently use the EDCM-FCP, and the value of export super-red credits and charge 1 capacity charges which could be directly affected. While this information helps to demonstrate that some DNOs have large numbers of directly affected customers, while others have none, it cannot be used to estimate the magnitude of direct or indirect impacts without access to the fully populated EDCM models. Therefore, the file was not used for the purposes of this impact assessment.

4.3. INPUTS

Inputs were taken from:

- The EDCM dummy data that was provided by DNOs to TNEI-CEPA during model redevelopment in 2017 and 2018.

4.4. VALIDATION

The following steps were used to check and validate post-DCP 452 models:

- EDCM models (filled with dummy data) with and without DCP 452 applied were compared;
- dummy data was manipulated to cover various credible scenarios and edge cases;
- impact assessment results were sense-checked and explained; and
- model review software was used to confirm that the changes made were as expected, and no unintended changes were introduced.

4.5. IMPACTS

Effects on customers in category 0000

Customers in category 0000 no longer receive credits from the charge 1 super-red export rate. The export capacity and fixed charge are not impacted for these customers. As a result, the only change in export revenue is an increase in net revenue recovered from the super-red units for generation customers in category 0000.

The import capacity charge for all 0000 customers decreases since these customers no longer receive a charge 1 capacity charge. However, there is an increase in the import fixed charge for final demand customers. The loss of revenue from the charge 1 capacity charge for 0000 customers leads to a shortfall in total import capacity charge revenue. This shortfall is compensated for via an increase in the residual added to the fixed charge for final demand sites. The impact on charges for generation and demand customers in category 0000 are shown in **Error!**

Reference source not found. below.

Table 2: Summary of impact on charges for EHV customers in category 0000

Charge	Import (final demand)	Import (non-final demand)	Export
Capacity charge	Decrease	Decrease	-
Super-red unit charge	-	-	Decrease in credits (set to zero)
Fixed charge	Increase	-	-

Effects on other EHV customers (not in category 0000)

DCP 452 has no impact on any of the three export charges (capacity charge, super-red and fixed) for other EHV customers. However, there is an indirect effect on import fixed charge for EHV final demand customers. As explained in the section above, the import fixed charge increases for final demand customers to recover the residual revenue shortfall. The effects on import charges experienced by EHV customers not in category 0000 is summarised in Table 3 below.

Table 3: Summary of impact on charges for EHV customers not in category 0000

Charge	Import (final demand)	Import (non-final demand)	Export
Capacity charge	-	-	-
Super-red unit charge	-	-	-
Fixed charge	Increase	-	-

Cumulative effects on EDCM revenue

The reduction in revenue recovered from 0000 customers (via a decrease in import capacity charge) is compensated for by an increase in revenue recovered from EHV final demand customers (via an increased import fixed charge for these customers). However, there is a slight decrease in total revenue recovered from import charges in total. This is partially due to the rounding permitted by the EDCM and an indirect effect on import fixed charge revenue caused by the change in super-red export credits (no longer given to 0000 customers). In short, the increase in revenue from super-red units causes a small decrease in the EDCM demand revenue target, thus decreasing the residual added to the fixed charge for final demand sites. The resulting impact is a small decrease in total revenue recovered from import charges.

The cumulative effect on total revenue recovered from export charges is an increase. The magnitude of this increase is dependent on the number of 0000 customers and the value of credits they no longer receive from the super-red export rate. The working group will need to use real data in the EDCM to determine the exact magnitude of increase in revenue recovered from export charges for each licence area.

The cumulative effect on total revenue collected from the EDCM is an increase, again dependent on the number of 0000 customers and the value of credits they no longer receive from the super-red export rate. This is because the increase in revenue recovered from export charges will always exceed the decrease in revenue recovered from import charges. This is summarised in Table 4 below.

Table 4: Summary of cumulative effects on revenue recovered in the EDCM

Type of revenue recovered	Impact
Export	Net increase
Import	Net decrease
Total	Net increase

Effects on customers in CDCM and PCDM models

There is **no impact on the PCDM** from DCP 452 since neither the EDCM outputs to the PCDM (notional EHV asset values) nor CDCM outputs to the PCDM (CDCM notional EHV asset values; Pass-through Smart Meter Communication Licence Costs) are affected.

As explained previously, DCP 452 can only increase revenue recovered from the EDCM. Any increase in EDCM revenue will reduce CDCM target revenue via the “*Revenue raised outside CDCM - EDCM and Certain Interconnector Revenue*” input on the CDCM ‘General inputs’ sheet. As a result, **DCP 452 may reduce CDCM customers’ residual charges** (typically through the banded fixed charge, but sometimes through volumetric charges if the residual is sufficiently negative).

Any decrease in CDCM charges may be small to the point of being negligible because: (i) EDCM revenue is small relative to CDCM revenue; and (ii) changes to EDCM revenue primarily come from 0000-connected export customers, which DNOs may not have many (or even any) of. The working group will need to use actual EDCM data to determine the exact magnitude of effects on CDCM charges.

Changes to CDCM charges should be carried across to the EDCM to calculate discounted LDNO tariffs for customers connected at LV/HV network levels but served by an LDNO with an EHV boundary. Lower EDCM revenue from discounted LDNO tariffs will need to be passed back into the CDCM. It may require several iterations to fully resolve this circularity between the EDCM and CDCM.



UK

Queens House
55-56 Lincoln's Inn Fields
London WC2A 3LJ

T. +44 (0)20 7269 0210

E. info@cepa.co.uk

www.cepa.co.uk

 **cepa-ltd**  **@cepaltd**

Australia

Level 20, Tower 2 Darling Park
201 Sussex St
Sydney NSW2000

T. +61 2 9006 1307

E. info@cepa.net.au

www.cepa.net.au