

Model documentation: Amendments to the previously created CDCM model for DCP 328 (Request E02-1)

DCUSA/ElectraLink

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Contents

1. INTRODUCTION	4
2. SPECIFICATION	4
2.1. Overview	4
2.2. Reference files.....	4
2.3. New files.....	5
2.4. Assumptions and clarifications	5
2.5. 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	7
4. IMPACT STATEMENT.....	8
4.1. Summary.....	8
4.2. Inputs.....	8
4.3. Validation.....	8
4.4. Impacts.....	8

1. INTRODUCTION

This document describes charging models and supporting documentation developed for DCUSA to support DCUSA Change Proposal (DCP) 328. 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;
- 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 make amendments to versions of the CDCM and EDCM (LRIC & FCP) models previously developed to implement DCP 328 – *“Use of system charging for private networks with competition in supply”*.

The intent of DCP 328 is to create DUoS charges which permit customers within licence exempt systems (LES) to request competition in supply.

The DCP328 Working Group previously asked the modelling consultants to develop versions implementing two approaches – Options A and B.

Both options involved calculating charges which exclude costs relating to network levels within the LES and a portion of the residual charge. Option A applied these charges with respect to EHV boundary levels but converted them to rebates for HV/LV boundary levels which private network operators can claim back. Option B applied charges with respect to all boundary levels. Options A and B also differed with respect to whether revenue matching in the CDCM model took into account the difference in expected net revenue arising from offering bespoke charges and / or rebates to private network operators. Option A made no attempt to resolve under-recovery within the charging year, which would be recovered by the prior year correction term in the following charging year instead. Option B included adjustments the revenue-matching step for LES volumes and charges.

The Working Group issued a second consultation on these options and decided that Option B should be progressed with amendments – primarily the removal of LES tariffs for the HV/LV boundary level from the CDCM model (to maintain consistency with LDNO tariffs). The changes described in this document implement those amendments, as set out in draft legal text provided by the working group on 22 June 2022, subject to the assumptions and clarifications noted below.

2.2. 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.

These reference files were submitted to the Working Group on 29 April 2021 in response to its previous modelling request for DCP328. The baseline versions for that request were the 2022/23 charging models submitted to DCUSA on 23 February 2021, incorporating DCP 379 – *“Amend Table 1 of Schedule 15 to maintain alignment with the distribution licence”*.

For the purposes of the impact assessment, we use inputs from the 2022/23 charging models first published by DNOs in December 2020 – as used in the previous impact assessment – rather than the versions reissued in January 2022 in response to Ofgem’s decision to expedite the recovery of supplier of last resort payments.

The reference files are not the most recent versions of the charging model suite, which was published for charge-setting on 22 November 2021 and was used as the baseline for a further set of models prepared for the DCP395 Working Group on 03 March 2022. These changes will need to be consolidated for charge-setting if they are all approved.

No changes to the EDCM have been made under this service request. The versions submitted to the working group on 29 April 2021 remain compatible with the amended CDCM.

Table 2.1: Reference files

Model	Model file name	Date sent
CDCM	CDCM_v8_DCP328-B_20210429	29/04/2021

2.3. NEW FILES

The following table sets out the versions of the charging models and impact assessment provided to the DCP 328 Working Group in response to the request described above.

Table 2.2: New files

Model	Model file name	Date sent
CDCM	CDCM_v8_DCP328-B_20220816	16/08/2022
Impact assessment	ImpactAssessment_DCP328-B_20220816	16/08/2022

We understand that the new files listed in Table 2.2 will be considered by the DCP 328 working group and may be shared for consultation.

2.4. ASSUMPTIONS AND CLARIFICATIONS

Model documentation for the model versions previously submitted to the DCP 328 working group on 29 April 2021 listed several assumptions that we made in our interpretation of the draft legal text where the meaning was vague or to reflect clarifications given by the working group. All those assumptions relating to Option B still apply to the amended version described in this document.

The service request cover sheet provided by the working group required that “LES HV/LV level tariffs should not be an output on their own and should instead be combined with the LES HV level tariffs, in the same way as is done for LDNO HV tariffs in the ‘CDCM discounts’ sheet of the PCDM”. The cover sheet suggested an approach for making this amendment by **re-linking LES HV boundary tariffs** to those for a LES HV/LV boundary, which would not achieve the intended result. The working group clarified the intended treatment following an email exchange, and confirmed that LES HV boundary tariffs should remain unchanged. That is, customers served by a LES with an HV/LV boundary should receive LES HV boundary tariffs – as indicated by tables 146C.1, and 146C.2, Schedule 16 in the draft legal text.

We assume that LES tariffs should not be produced for “**no RP Charge**” generation customer categories because: (i) these are not available for LDNO-connected customers; (ii) no LES tariffs have reactive power charges, so the distinction is unnecessary; and (iii) the conversion of reactive power charges to the fixed charge component would create an unwarranted difference between “no RP Charge” tariffs and standard generation tariffs. This amendment is made pre-rounding, at the same point as for LDNO tariffs.

2.5. OUTSTANDING LEGAL TEXT ISSUES

Model documentation for the DCP328 model versions previously submitted to the working group on 29 April 2021 recommended that the modelling assumptions relating to Option B set out in that document should be reflected in the legal text.

The legal text version provided by the working group included a newly inserted **paragraph 106 of Schedule 16** which required a floor to LES charges to prevent the typical bill for a LES-connected customer being lower than for an LDNO-connected customer. The working group dropped this requirement in an email exchange on 19 July 2022 which was reflected in an updated service request cover sheet issued on 20 July 2022, but no adjustment was made to the draft legal text. Paragraph 106 of Schedule 16 should be removed from the draft legal text at a later date.

Paragraph 94 of Schedule 16 requires that revenue-matching must not result in non-negative charges. The working group did not require this for LES tariffs in the versions previously submitted on 29 April 2021. Therefore, **negative fixed charges** can occur for some LES-connected customers when the residual is negative (our impact assessment found nine instances in the LPN licence area). This approach could be acceptable since negative fixed charges will not necessarily be passed on to end-customers. The working group may want to confirm whether this approach still satisfies its intent and, if so, clarify that in the legal text.

Beyond this, there was one instance of a **revision to a paragraph number** in the legal text draft version provided to us on 22 June 2022. The paragraph previously numbered as 28.5 had been renumbered as 28.6 – which we have reflected in the amended CDCM. We were not provided with complete text for the relevant schedule, so it was not clear why this change was made or whether it was intentional. The working group may wish to check this to confirm that no other references need to be updated.

3. MODEL REVISIONS

3.1. STRUCTURAL CHANGES

There are no structural changes in the CDCM.

3.2. ADDITIONAL OR MODIFIED INFORMATION SECTIONS

In the CDCM, changes were made in the following sheets:

- **'Version control'**.
- **'Index'**.

3.3. ADDITIONAL OR MODIFIED INPUT SECTIONS

In the CDCM, changes were made in the following input sheets:

- **'Inputs by customer type'**. *"Input 102-D: Proportion of users which are LES customers"* – LES HV/LV boundary row removed.

3.4. ADDITIONAL OR MODIFIED CALCULATION SECTIONS

In the CDCM, changes were made in the following calculation sheets:

- **'LES boundaries'**. *"Section 117-F: Pre revenue-matching charges by LES boundary"* – charges at HV/LV boundary row greyed-out. Annotation added stating that customers with an HV/LV LES boundary receive the same charges as for an HV LES boundary, with a legal text reference to tables 146C.1 & 146C.2.
- **'LES revenue'**. LES HV/LV boundary levels removed throughout.
- **'Revenue matching'**. *"Section 120-B: LES volume discounts"* – LES HV/LV boundary rows removed.
- **'LES charges'**. LES HV/LV boundary levels removed throughout.
- **'Net revenue summary'**.
 - LES HV/LV boundary levels removed throughout.
 - LES charges for "no RP Charge" generation tariffs greyed-out for consistency with LDNO charges.
 - Row order changed throughout from LDNO LV, LDNO HV, LES HV, LES LV to LDNO LV, LES LV, LDNO HV, LES HV for consistency and ease of comparison.

3.5. ADDITIONAL OR MODIFIED OUTPUT SECTIONS

In the CDCM, changes were made in the following output sheets:

- **'Tariff summary'**.
 - LES HV/LV boundary level tariff block removed.
 - Formatting of LES charges updated to "blank" style for "no RP Charge" generation tariffs for consistency with LDNO charges.
 - Order of tariff blocks changed from LDNO LV, LDNO HV, LES HV, LES LV to LDNO LV, LES LV, LDNO HV, LES HV for consistency and ease of comparison.

4. IMPACT STATEMENT

4.1. SUMMARY

The impact assessment submitted under this service request sets out the impact of DCP 328 on all outputs of the CDCM for the 2022/23 charging year relative to: (i) published charges; and (ii) charges under the DCP328 Option B solution previously modelled for the working group. For the purpose of this impact statement we describe the original Option B version as “Option B1” and the amended version with LES tariffs for HV/LV boundary levels removed as “Option B2”.

The impact assessment does not include EDCM outputs because we do not have access to actual EDCM data. Likewise, all impacts are presented before resolution of inter-model circularities, as we do not have access to the actual EDCM data needed to do that. Moreover, no changes were made to the EDCM model through this service request.

4.2. INPUTS

Inputs were taken from:

- published ARP models for the 2022/23 charging year (as published in December 2020); and
- a working group assumption that 0.5% of customers are LES-connected for the sake of the impact assessment;
- a working group assumption that the breakdown across different LES boundaries should be a third LV, a third HV/LV, and a third HV – and that customers with HV/LV and HV LES boundaries should be aggregated together under Option B2 since both sets of customers receive a common set of tariffs.

4.3. VALIDATION

The following steps were used to check and validate post-DCP 328 models:

- under Options B1 and B2, expected net revenue is approximately³ equal to baseline levels;
- pre-matching expected net revenue is lower under Option B2 than Option B1;
- workbook review software used to demonstrate model changes and highlight inconsistent formulae;
- impact assessment results sense-checked and explained; and
- impact assessment can be replicated manually.

4.4. IMPACTS

Impact on revenue recovered

Model documentation previously submitted for Option B1 explained why expected net revenue was not exactly equal to baseline levels. The difference in net revenue between Option B1 and the baseline ranges between +/-

³ Model documentation previously submitted for Option B1 explained why expected net revenue was not exactly equal to baseline levels. For the values used in the impact assessment, the size of the remaining mismatch is comparable to or less than already seen in the tariff models due to the rounding of charges to two or three decimal places.

0.015% under the volume assumptions provided by the working group (c. £0.15 million in total across all fourteen DNOs). The remaining mismatch appears to be caused by an interaction between LES and LDNO discounting, as well as rounding. Option B2 has a similar magnitude of effect on expected net revenue, which is also within +/- 0.015% of baseline levels under the volume assumptions provided by the working group.

The difference in expected net revenue between Options B1 and B2 is of a similar scale. The difference results from LES-connected customers with an HV/LV boundary being moved to the same tariffs as for LES-connected customers with an HV boundary. This reduces charges levied by the DNO to the LES boundary point with respect to those customers, reducing pre-matching expected revenue, and increasing residuals to be recovered across the customer base. After revenue matching and rounding, the final impact on expected revenue can be positive or negative.

Figure 4.1 illustrates the expected net revenue by DNO under each option. At this scale, the difference is barely visible. Figure 4.2 shows the percentage change in expected net revenue – demonstrating little change. Directional changes can be positive or negative due to rounding, as expected.

Figure 4.1: Expected net revenue by option & DNO

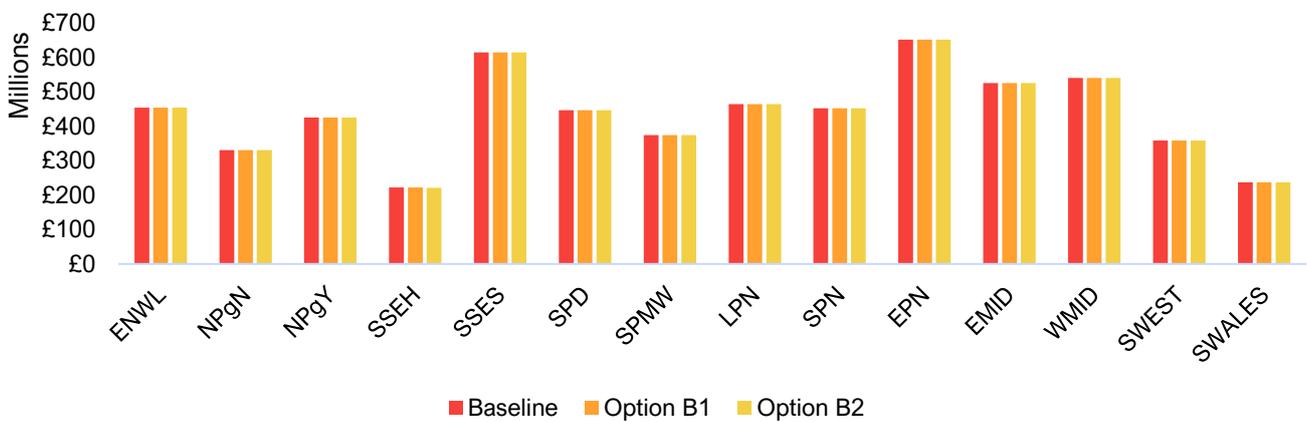


Figure 4.2: Change in expected net revenue by option & DNO

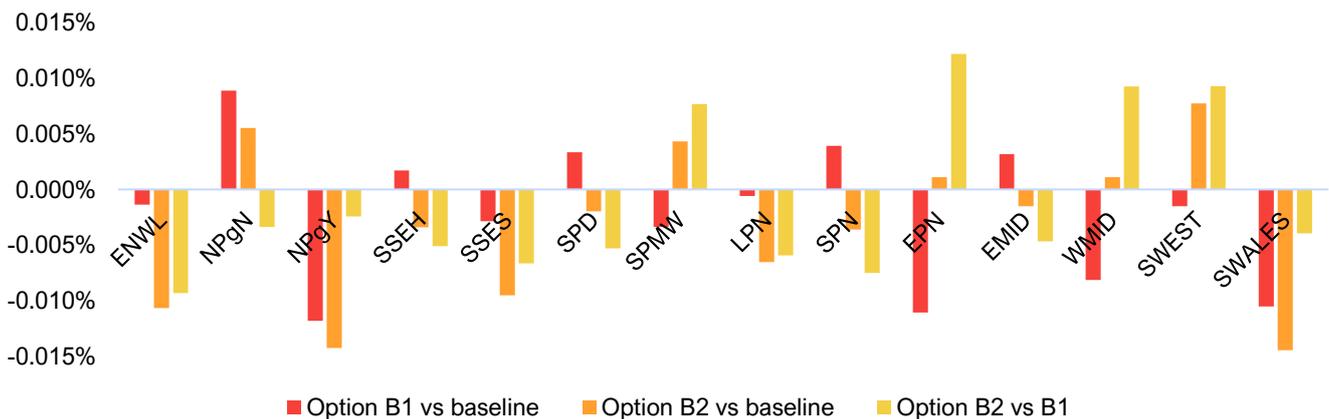
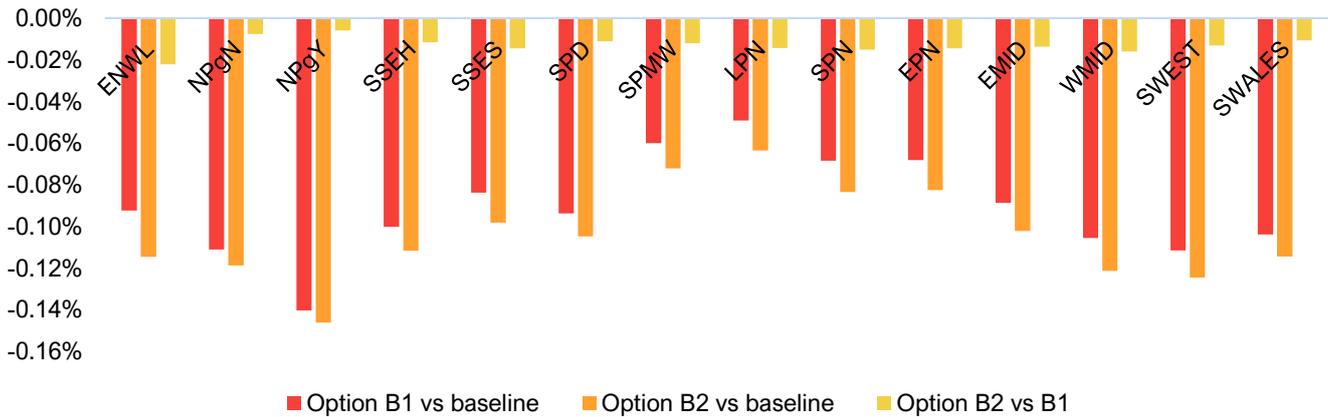


Figure 4.3 shows the percentage change in pre-matching net revenue – which is reduced by introducing LES charges (Option B1 vs baseline) and reduced slightly further by removing separate LES tariffs for HV/LV boundaries (Option B2 vs baseline). The aggregate reduction in pre-matching net revenue across all DNOs under Option B1 vs baseline is £3.47 million. Removing separate LES tariffs for HV/LV boundaries reduces pre-matching net revenue by a further £0.57 million.

These amounts are recovered through higher residual charges. Using volume assumptions suggested by the working group, the difference in ATW typical bills relative to the baseline ranges between 0% and 0.16%, depending on the DNO and tariff. The assumed share of LES customers by tariff can also affect the allocation of the residual between tariffs as well as the overall amount.

Figure 4.3: Change in pre-matching net revenue by option & DNO

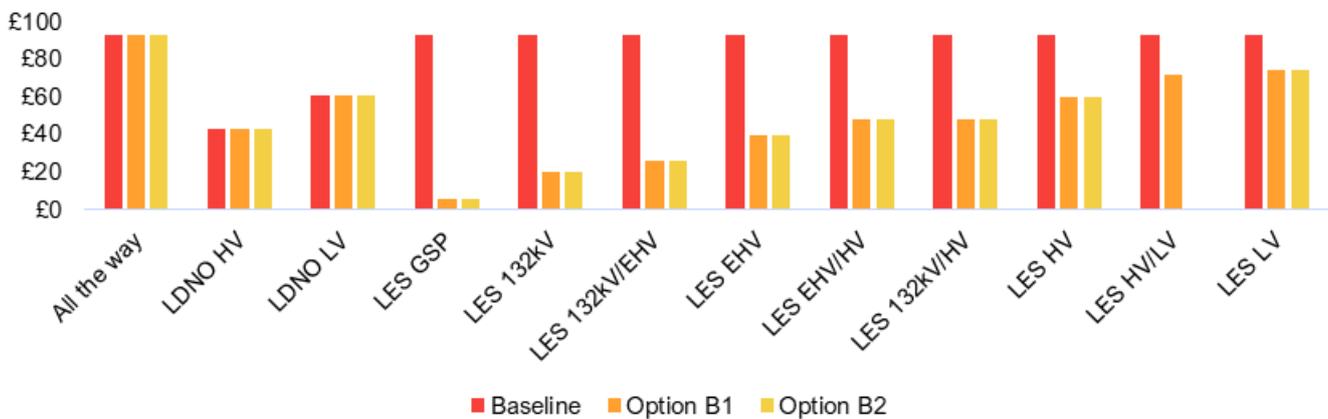


Comparison between LES and all-the-way bills

Figure 4.4 demonstrates that, for an example tariff and DNO, typical bills applied with respect to LES customers decrease for boundary points further up the network, as expected, under options B1 and B2. The only visible difference in bills between Options B1 and B2 at this scale is the absence of a separate tariff for LES customers with a HV/LV boundary, as expected. LES previously facing this tariff would now face the HV boundary tariff, which is lower. This is equivalent to the approach taken with respect to LDNO-connected customers. Otherwise, slight differences may arise from revenue matching and rounding.

The scale of the difference between LES and ATW tariffs can fluctuate significantly between different tariffs and / or DNOs due to the different costs which apply at network levels below the LES boundary.

Figure 4.4: Typical bills by LES boundary, ENWL, Domestic Aggregated



Comparison between LES and LDNO bills

Amendments introduced by Option B2 do not affect the relationship between LES and LDNO tariffs (a floor on LES charges which was originally included in the draft legal text was dropped by the working group). LES tariffs can therefore be greater or lesser than LDNO tariffs for the equivalent boundary level.

The working group has considered whether amendments should be made to reduce instances of LES tariffs being lower than the equivalent LDNO tariffs (in light of the more onerous licence obligations on LDNOs). Table 4.1 and Table 4.2 give an indication of how common and material these instances are. They express the difference between LDNO and LES typical bills as a proportion of ATW typical bills. These tables demonstrate that it is common for LES and LDNO bills to be very different for equivalent customers. Positive values highlighted in red indicate where LES bills are lower than LDNO bills. These instances are more common for some tariffs than others, and in some DNO areas than others. Values may be misleading for generation tariffs, for which typical bills can be positive or negative.

These differences arise due to the very different approaches taken in the PCDM and the CDCM for determining costs arising from each network level.

Table 4.1: LDNO vs LES typical bills as a % of ATW typical bills, LV boundary level

	ENWL	NPgN	NPgY	SSEH	SSSES	SPD	SPMW	LPN	SPN	EPN	EMID	WMID	SWEST	SWALES
Domestic Aggregated with Residual	-15%	-12%	-2%	-16%	-24%	-19%	-26%	-20%	-23%	-23%	-17%	-19%	-25%	-19%
Domestic Aggregated (Related MPAN)	-35%	-40%	-40%	-29%	-35%	-39%	-38%	-27%	-32%	-32%				
Non-Domestic Aggregated No Residual	-4%													
Non-Domestic Aggregated Band 1	-4%	3%	14%	10%	7%	7%	-5%	-9%	-9%	-12%	18%	13%	11%	19%
Non-Domestic Aggregated Band 2	-26%	-26%	-19%	-17%	-21%	-24%	-29%	-23%	-26%	-27%	-12%	-16%	-18%	-12%
Non-Domestic Aggregated Band 3	-31%	-34%	-30%	-24%	-29%	-32%	-34%	-25%	-29%	-30%	-22%	-25%	-28%	-23%
Non-Domestic Aggregated Band 4	-34%	-38%	-37%	-28%	-33%	-37%	-37%	-27%	-31%	-31%	-27%	-31%	-35%	-30%
Non-Domestic Aggregated (Related MPAN)	-35%	-40%	-40%	-29%	-35%	-39%	-38%	-27%	-32%	-32%				
LV Site Specific No Residual	-30%													
LV Site Specific Band 1	-30%	-38%	-35%	-26%	-32%	-34%	-33%	-26%	-31%	-31%	-28%	-31%	-34%	-29%
LV Site Specific Band 2	-33%	-40%	-38%	-27%	-34%	-37%	-36%	-27%	-32%	-31%	-30%	-33%	-36%	-31%
LV Site Specific Band 3	-34%	-40%	-39%	-28%	-34%	-38%	-33%	-27%	-32%	-32%	-30%	-33%	-37%	-32%
LV Site Specific Band 4	-35%	-41%	-39%	-29%	-35%	-39%	-27%	-28%	-33%	-32%	-30%	-32%	-37%	-33%
Unmetered Supplies	35%	-40%	-40%	32%	28%	-13%	-21%	-10%	-7%	-9%	12%	19%	5%	9%
LV Generation Aggregated	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%				
LV Generation Site Specific	0%	1%	1%	1%	-1%	-2%	0%	-10%	-4%	1%	1%	-1%	1%	0%

Table 4.2: LDNO vs LES typical bills as a % of ATW typical bills, HV boundary level

	ENWL	NPgN	NPgY	SSEH	SSSES	SPD	SPMW	LPN	SPN	EPN	EMID	WMID	SWEST	SWALES
Domestic Aggregated with Residual	-19%	-22%	-12%	-23%	-27%	-28%	-34%	-23%	-25%	-23%	-12%	-6%	-22%	-26%
Domestic Aggregated (Related MPAN)	-36%	-54%	-53%	-45%	-40%	-50%	-47%	-36%	-38%	-36%				
Non-Domestic Aggregated No Residual	-8%													
Non-Domestic Aggregated Band 1	-8%	-5%	5%	7%	8%	-1%	-12%	-3%	-3%	-4%	22%	22%	15%	12%
Non-Domestic Aggregated Band 2	-30%	-38%	-30%	-29%	-27%	-35%	-38%	-28%	-30%	-29%	-12%	-12%	-22%	-25%
Non-Domestic Aggregated Band 3	-34%	-47%	-42%	-38%	-36%	-44%	-43%	-32%	-35%	-34%	-23%	-23%	-35%	-38%
Non-Domestic Aggregated Band 4	-37%	-51%	-49%	-43%	-41%	-49%	-46%	-34%	-37%	-36%	-30%	-30%	-43%	-46%
Non-Domestic Aggregated (Related MPAN)	-36%	-54%	-53%	-45%	-42%	-51%	-47%	-35%	-38%	-37%				
LV Site Specific No Residual	-20%													
LV Site Specific Band 1	-20%	-39%	-37%	-19%	-18%	-30%	-30%	-18%	-17%	-17%	-9%	-5%	-15%	-22%
LV Site Specific Band 2	-22%	-38%	-36%	-21%	-18%	-32%	-32%	-13%	-15%	-12%	-4%	2%	-8%	-18%
LV Site Specific Band 3	-22%	-37%	-36%	-21%	-19%	-33%	-31%	-14%	-16%	-13%	-4%	2%	-7%	-18%
LV Site Specific Band 4	-23%	-38%	-36%	-22%	-20%	-34%	-26%	-15%	-17%	-14%	-5%	3%	-7%	-21%
LV Sub Site Specific No Residual	-11%	-15%												
LV Sub Site Specific Band 1	-11%	-24%	5%	-22%	-13%	-18%	-17%	-9%	2%	-8%	-12%	25%	-14%	-28%
LV Sub Site Specific Band 2	-14%	-26%	-10%	-19%	-14%	-21%	-19%	-7%	7%	-6%	-1%	12%	-14%	-19%
LV Sub Site Specific Band 3	-15%	-26%	-20%	-20%	-14%	-22%	-17%	-7%	0%	-6%	-2%	5%	-14%	-22%
LV Sub Site Specific Band 4	-16%	-24%	-21%	-21%	-15%	-23%	-16%	-7%	-6%	-6%	0%	4%	-14%	-22%
HV Site Specific No Residual	-7%	-15%												
HV Site Specific Band 1	-7%	-6%	5%	-8%	-6%	-15%	-12%	-9%	-7%	-7%	-2%	-2%	-7%	-9%
HV Site Specific Band 2	-12%	-13%	-6%	-25%	-12%	-21%	-16%	-11%	-12%	-10%	-6%	-6%	-14%	-19%
HV Site Specific Band 3	-13%	-15%	-10%	-27%	-13%	-23%	-17%	-12%	-12%	-11%	-7%	-7%	-15%	-20%
HV Site Specific Band 4	-14%	-16%	-11%	-27%	-15%	-23%	-16%	-12%	-13%	-11%	-7%	-8%	-16%	-21%
Unmetered Supplies	21%	-47%	-45%	16%	16%	-23%	-29%	-12%	-10%	-10%	11%	20%	0%	-3%
LV Generation Aggregated	16%	6%	6%	8%	10%	8%	7%	8%	9%	9%				
LV Sub Generation Aggregated				0%	0%	0%	0%							
LV Generation Site Specific	16%	7%	6%	8%	10%	6%	7%	-1%	6%	10%	11%	13%	10%	7%
LV Sub Generation Site Specific	1%	1%	-1%	0%	100%	7%	0%	-1573%	130%	1%	1%	0%	1%	-1%
HV Generation Site Specific	0%	0%	0%	0%	0%	0%	-3%	-3%	0%	0%	0%	0%	0%	-1%

Impact on banded residuals

The approach to converting charge elements to the fixed charge for LES tariffs under Option B increases the occurrence of a pre-existing issue causing fixed charges to be higher for lower residual bands (e.g. band 1) than higher residual bands (e.g. band 4).

The post-DCP361 approach of allocating residual charges between bands in proportion to the volume-intensity of MPANs in that band means that it is possible for all-the-way tariffs to have higher fixed charges at lower bands. This occurs when volume inputs in the CDCM imply that lower bands use energy more intensively than higher bands. This is rare. In the published charges used for this impact assessment there were seven instances of a fixed charge being higher for a lower band (across all DNOs and tariffs).

These occurrences are more common for LES tariffs than ATW tariffs because LES tariffs have one more step involving the use of average volumes to convert capacity charge components into fixed charge components. Under Option B2 there are 41 instances among LES tariffs.

The working group may want to consider whether further actions are warranted to avoid these instances – either through changing the models or encouraging DNOs to amend their inputs.



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