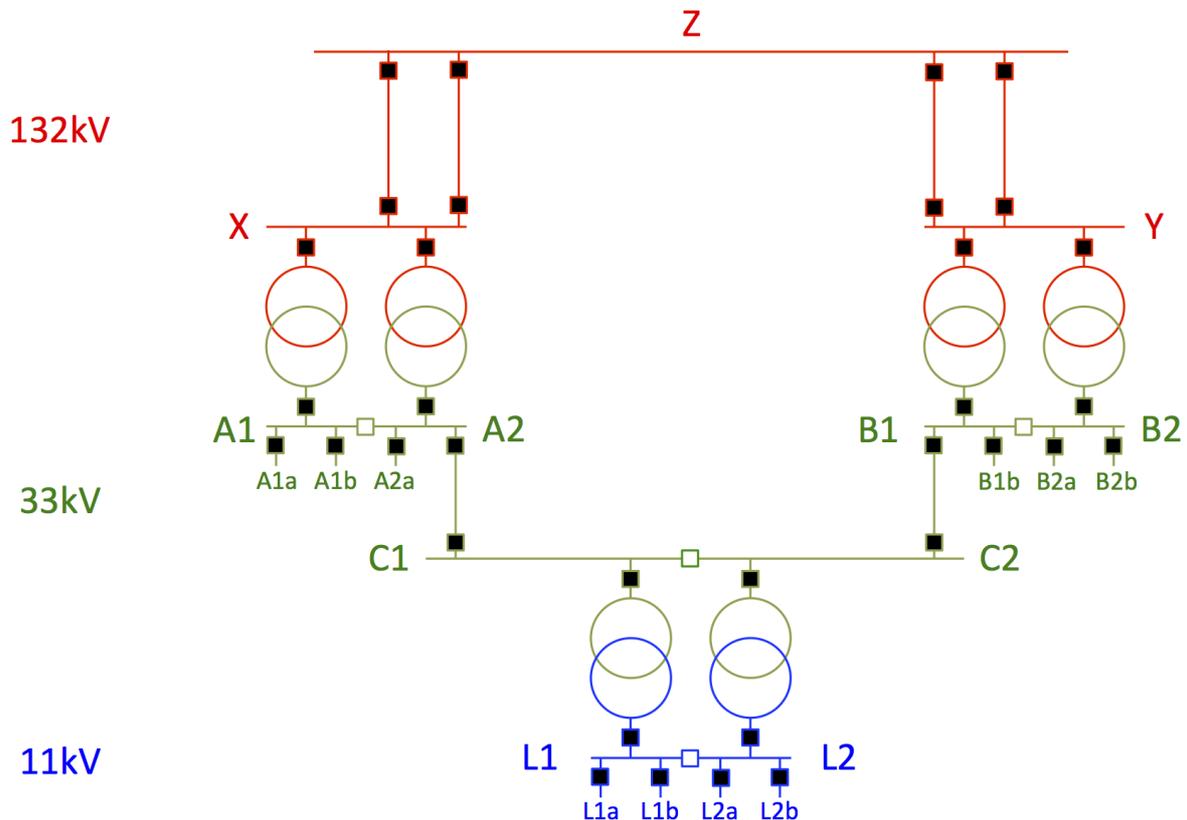


DCP 206 consultation — Attachment E — Case study 1

1. This is an illustrative study, on an illustrative network and with illustrative data, of how DCP 206 would improve the cost reflectivity and the fairness of EDCM charges.
2. This illustrative case study uses the network diagram in figure 1.

Figure 1 Network diagram for the worked examples in this paper



3. In figure 1:
 - (a) Horizontal lines are busbars.
 - (b) Vertical lines are circuits.
 - (c) Black squares are circuit breakers (normally closed).
 - (d) White squares are normally open points.
4. In this illustrative example, the X/A1, X/A2, Y/B1 and Y/B2 transformers are part of the transmission network.
5. The agreed transmission exit capacity is 30 MVA at each substation (based on two 30 MVA transformers at each substation).

6. There is an EDCM customer at A2a. This customer has 10 MVA of maximum import capacity and consumes 5 MW in the super red time band. The sole use assets are valued at £50,000.
7. There is no load at A1a or A1b.
8. There is 49 MVA of load (after taking account of diversity) between L1a, L1b, L2a, L2b, B1b, B2a and B2b.
9. The A2/C1 circuit is 10 miles long in a city centre, and is not safe to operate above 20 MVA. Reinforcing it with a parallel cable would cost £10 million.
10. The B1/C2 circuit is very short: the substations are co-located.
11. The relevant network group is a level 2 group in which the only potential reinforcement project is for the A2/C1 link. The group load is 59 MVA. Load growth is assessed at 2 per cent a year. Reinforcement costing £10 million is therefore needed in year 2 to meet the n-1 contingency of a Y/B1 or Y/B2 outage with an increased load of 60.2 MVA. The FCP discount rate is 5.6 per cent.
12. The FCP formula in DCUSA schedule 17 is populated as follows:

$$0.056 * 10000000 / 60200 * (59000 / 60200)^{(2 * 0.056 / 0.02 - 1)} / (1 - \exp(-0.056 * 10))$$
13. This gives an FCP charge 1 of £19.775/kVA/year.
14. Customer A2a is classified as 0000 for the purpose of demand scaling.
15. Table 1 shows the charges calculated in this illustrative case study, both with the current EDCM methodology and with the post-DCP 206 methodology. It also shows how the total charge in each case is made up of the various applicable elements.

Table 1 Analysis of total charge (all figures in £/year)

	Current EDCM	After DCP 206
Sole use assets	£715	£715
Transmission exit	£27,818	£27,818
Indirect costs	£39,061	£39,061
FCP charge 1	£197,750	
Fixed adder	£5,096	£7,702
Total	£270,450	£75,175

16. These calculations are based on the hypothetical aggregate values across all other EDCM customers in the DNO area that are set out in table 2 below.

17. The net effect of the inclusion of charge 1 in the EDCM is to impose on this customer an additional cost of £195,144 a year. This charge reflects the cost of a possible future upgrade to a cable that is not necessary to supply the customer's load, either now or in the future. In the absence of DCP 206, the customer is being overcharged.
18. The overcharge is unjustified because the investment in network reinforcement is not needed by the customer in question, instead it is needed to supply some other customers out of L1a, L1b, L2a, L2b, B1b, B2a and B2b in some outage conditions (when some of the normally open points on figure 1 would be closed).
19. DCP 206 remedies the defect by ensuring that the customer does not pay for future reinforcement of a DNO network element that the customer does not need.

Table 2 Assumed case study aggregates (excluding the case study customer at A2a)

1113. General inputs

Allowed revenue less transmission exit (£/year)	Transmission exit charges (£/year)	Direct cost (£/year)	Indirect cost (£/year)	Network rates (£/year)
350,000,000	19,000,000	17,000,000	89,000,000	36,000,000

1122. Forecast system simultaneous maximum load (kW) from CDCM users

GSP	EHV circuits	EHV/HV
3,300,000	3,300,000	3,280,000

1131. Assets in CDCM model (£)

EHV circuits	EHV/HV	All HV and LV network levels
720,000,000	210,000,000	2,340,000,000

1191. EDCM demand aggregates (excluding case study customer at A2a)

Total EDCM peak time consumption (kW)	Total marginal effect of indirect cost adder (kVA)	Total marginal effect of demand adder (kVA)	Revenue from demand charge 1 (£/year)
110,000	280,000	280,000	180,000

1192. EDCM generation aggregates

Net forecast EDCM generation revenue (£/year)
2,300,000

1193. EDCM notional asset aggregates

Total sole use assets for demand (£)	Total sole use assets for generation (£)	Total notional capacity assets (£)	Total notional consumption assets (£)
45,000,000	89,000,000	6,800,000	5,700,000