

SCHEDULE 2D – CURTAILABLE CONNECTIONS

Style Definition: DC Norm Para bullet pt L3

1. SCOPE

- 1.1 This Schedule sets out the methodology for defining curtailable access arrangements (i.e. a Curtailable Connection); specifically:
- (a) how the Company will determine the Curtailment Limit;
 - (b) how the Company will measure Curtailment;
 - (c) reporting requirements on the Company to Customers regarding their Curtailable Connections;
 - (d) measures to be taken by the Company to avoid exceeding the Curtailment Limit, and what happens if the Company exceeds the Curtailment Limit;
 - (e) how the Exceeded Curtailment Price is determined; and
 - (f) end dates for converting a Curtailable Connection into a Non-Curtailable Connection.
- 1.2 This Schedule applies only to DNO/IDNO Parties (each of which is referred to in this Schedule as the Company).
- 1.3 This Schedule does not apply to connection offers for: (a) domestic and non-domestic Customers that are billed on an aggregated and non-site-specific basis or who are metered directly using whole current meters; or (b) Unmetered Supplies.
- 1.4 A Curtailable Connection will only be offered where the Company has identified a requirement for Reinforcement to facilitate provision of the requested connection, and where the Curtailment will provide a network benefit. Reinforcement required solely for fault level and reactive power requirements is not suitable for a Curtailable Connection, because the Curtailment would not provide any network benefit.
- 1.5 When offering a Curtailable Connection, the Company will also provide (if not provided already) the supporting information on the expected costs of a Non-Curtailable Connection.

2. SETTING THE CURTAILMENT LIMIT

- 2.1 Unless otherwise directed by the Authority, the Import Curtailment Limit and Export Curtailment Limit will be determined by assessing the parts of the existing Distribution System that require reinforcement under the Minimum Scheme, in accordance with Paragraphs 2.3 to 2.8.
- 2.2 If the Authority directs the Company to use an alternative approach to determine either the Import Curtailment Limit and/or the Export Curtailment Limit for a Customer, then the Company shall provide to the Customer details of the methodology and data used in the calculation.

Input data

- 2.3 The following data shall be used for the calculation of the Curtailment Limit.
- (a) Profile data (in/converted to kVA based on an assumed 0.95 power factor) relating to the most recent 12 months of available data, including:
- (i) annual half-hourly observed/measured data from the asset to be reinforced;
 - (ii) half-hourly metered data from generation ~~connected to the asset~~ to be reinforced;
 - (iii) half-hourly representative daylight profile (1 to signify day, 0 to signify night) for the asset to be reinforced; and
 - (iv) half-hourly data from battery storage connected to the asset to be reinforced,
- or equivalent data from other sources. The Company shall correct for missing data, erroneously shown negative values and abnormal running arrangements and/or similar anomalies. Where data for the asset is not available, data from (A) the feeding primary substation would be used for HV and LV assets, (B) the relevant bulk supply point for 33kV and 66kV assets, and (C) the relevant grid supply point data for 132kV assets.
- (b) For a Demand Connection, the following data (in kVA unless otherwise stated) shall also be used for the calculation of the Import Curtailment Limit:

- (i) Network Asset Demand Capacity, being the capacity based on the Company's assessment of the thermal ratings, voltage change and upstream restrictions and compliance with its relevant design, planning and security of supply policies
- (ii) Inflight Demand Acceptances, being the aggregated Maximum Import Capacity of all connection offers that utilise the asset being assessed but have yet to be connected/energised and hence are not included in the current maximum demand;
- (iii) Largest Inflight Demand Offers, being the aggregate Maximum Import Capacity of the two largest connection offers that utilise the asset being assessed that have been issued to a Customer but have yet to be accepted;
- (iv) Other Inflight Demand Offers, being the aggregated Maximum Import Capacity of all other connection offers that utilise the asset being assessed that have been issued to a Customer but have yet to be accepted;
- (v) Demand Confidence Factor, being a confidence factor representing the likelihood of the Other Inflight Demand Offers being accepted by Customers, which has the value 50%; and
- (vi) New Demand Connection Capacity, being the requested Maximum Import Capacity of the connection for which the Curtailment Limit is being calculated.

However, for meshed networks, the figures applying under sub-paragraphs (ii), (iii), (iv) and (vi) above may be adjusted by a factor determined through power flow analysis to reflect the extent the asset being assessed is utilised by these connections.

- (c) For a Generation Connection, the following data (in kVA unless otherwise stated) shall also be used for the calculation of the Export Curtailment Limit:
 - (i) Network Asset Generation Capacity, being the capacity based on the Company's assessment of the thermal ratings, voltage change and upstream restrictions and compliance with its relevant design, planning and security of supply policies;

- (ii) Inflight Generation Acceptances, being the aggregated Maximum Export Capacity of all connections offers that utilise the asset being assessed but have yet to be connected/energised and hence are not included in the current maximum generation/minimum demand. The aggregated values shall be categorised as either PV Generation or Non-PV Generation;
- (iii) Largest Inflight Generation Offers, being the aggregate Maximum Export Capacity of the two largest connection offers that utilise the asset being assessed that have been issued to a Customer but not have to be accepted. The aggregated values shall be categorised as either PV Generation or Non-PV Generation;
- (iv) Other Inflight Generation Offers, being the aggregated Maximum Export Capacity of all other connection offers that utilise the asset being assessed that have been issued to a Customer but have yet to be accepted. The aggregated values shall be categorised as either PV Generation or Non-PV Generation;
- (v) Generation Confidence Factor, being a confidence factor representing the likelihood of the Other Inflight Generation Offers being accepted by the Customers, which has the value 50%; and
- (vi) New Generation Connection Capacity, being the requested Maximum Export Capacity of the connection for which the Curtailment Limit is being calculated. This shall be categorised as either PV Generation or Non-PV Generation.

However, for meshed networks, the figures applying under sub-paragraphs, (ii), (iii), (iv) and (vi) may be adjusted by a factor determined through power flow analysis to reflect the extent the asset being assessed is utilised by these connections.

- (d) Curtailment Threshold, being the percentage of the Network Asset Demand Capacity or Network Asset Generation Capacity, which, if exceeded by the Committed Demand Capacity or Committed Generation Capacity, will determine the number of hours where curtailment may be required, which is set at 95%.

Calculating the Import Curtailment Limit

2.4 The following process shall be used for the calculation of the Import Curtailment Limit.

- (a) The underlying true demand will be assessed as follows:
 - (i) Take the annual half-hourly observed/measured data, from the asset as calculated in accordance with Paragraph 2.3(a)(i).
 - (ii) Adjust for 'latent demand' by subtracting data from half-hourly metered generation (negative values) connected to the asset as provided in accordance with Paragraph 2.3(a)(ii).
 - (iii) This gives annual half-hourly true (gross) demand profile. For cases where this demand profile is not available at the asset in question (for example, because it is available at substation level and not at circuits supplied by that substation), the true (gross) demand profile can be scaled to the expected maximum and minimum true demand of the asset in question.
 - (iv) Take this true (gross) demand profile, and subtract the import data for half-hourly battery storage connected to the asset (provided in accordance with Paragraph 2.3(a)(iv)) to calculate the underlying true demand profile (baseline).
 - (v) Adjust for battery storage (if any) that currently utilises the asset to be reinforced by adding the maximum import from the import data for half-hourly battery storage connected to the asset (provided in accordance with Paragraph 2.3(a)(iv)). This is added to the underlying true demand profile (baseline) as a continuous constant profile.
- (b) The underlying true demand profile calculated under Paragraph (v) is then sorted in descending order to produce the underlying true demand duration curve.
- (c) Calculate the Committed Demand Capacity for each half-hour as follows:
 - (i) Take the adjusted demand duration curve under Paragraph 2.4(b).
 - (ii) Add the Maximum Import Capacity of Inflight Demand Acceptances and the Largest Inflight Demand Offers, plus the Other Inflight Demand

Offers multiplied by the Demand Confidence Factor (as each such expression is defined in Paragraph 2.3(b)).

- (iii) Add the Maximum Import Capacity of the new connection for which the Curtailment Limit is being calculated.
- (iv) The sum of (i) to (iii) above is then divided by the Network Asset Demand Capacity to represent it as a percentage of the firm capacity of the asset.
- (d) The Import Curtailment Limit will be determined by assessing the number of hours for which demand exceeds the capacity threshold as follows:
 - (i) Quantify the number of hours that the Committed Demand Capacity relative to the Network Asset Demand Capacity exceeds the Curtailment Threshold.
 - (ii) If the true demand profile does not correspond to a whole year, the calculated hours from the previous step is divided by the number of hours in the true demand profile to determine the percentage curtailed. This is then multiplied by 8760 to determine an annual figure for the Import Curtailment Limit.
- (e) Where multiple assets require reinforcement, the Import Curtailment Limit for each asset will be calculated and the largest value so calculated will be used as the Import Curtailment Limit.

Calculating the Export Curtailment Limit

2.5 The Export Curtailment Limit will be calculated as follows.

- (a) Assessment of underlying generation:
 - (i) Take the underlying true demand profile (baseline) as calculated in accordance with Paragraph 2.4(a)(iv) and add in the annual half-hourly generation from assets (generation is treated as negative values) as provided under with Paragraph 2.3(a)(ii). The generation data may need to be scaled to the expected output of the generation where this profile is not available at the asset in question (for example, because it is available at substation level and not at circuits supplied by that substation), in which

case the generation profile can be scaled to the expected maximum gross generation (excluding battery charging) of the asset in question.

- (ii) This gives annual half-hourly generation profile without the effects of battery charging.
- (b) The Committed Generation Capacity will then be calculated as follows:
 - (i) Take the generation profile determined under Paragraph 2.5(a)(ii).
 - (ii) Add the Maximum Export Capacity (expressed as a negative value) of Inflight Generation Acceptances and the Largest Inflight Generation Offers, plus the Other Inflight Generation Offers multiplied by the Generation Confidence Factor (as each such expression is defined in Paragraph 2.3(c)). PV Generation is only added to half-hourly periods where it is daylight by multiplying the PV Generation data by the representative daylight profile provided under Paragraph 2.3(a)(iii).
 - (iii) Add the Maximum Export Capacity (expressed as a negative value) of the connection for which the Curtailment Limit is being calculated. PV Generation is only added to half-hourly periods where it is daylight by multiplying the PV Generation data by the representative daylight profile provided under Paragraph 2.3(a)(iii).
 - (iv) The sum of (i) to (iii) above is then divided by the Network Asset Generation Capacity to represent it as a percentage of the firm capacity of the asset.
- (c) The Committed Generation Capacity as a percentage of the Network Asset Generation Capacity calculated under Paragraph 2.5(b)(iv) is then sorted in descending order to produce the committed generation duration curve.
- (d) The Export Curtailment Limit is determined by assessing the number of hours reverse power flows exceed the capacity threshold, as follows:
 - (i) Quantify the number of hours that the Committed Generation Capacity relative to the Network Asset Generation Capacity exceeds the Curtailment Threshold.
 - (ii) If the generation profile (excluding battery charging) does not correspond to a whole year, the calculated hours from the previous step is divided by

the number of hours in the profile to determine the percentage curtailed. This is then multiplied by 8760 to determine an annual figure for the Export Curtailment Limit.

- (e) Where multiple assets require reinforcement, the Export Curtailment Limit for each asset will be calculated and largest value used for the Export Curtailment Limit.

General

- 2.6 The Curtailment Limit(s) applying to a connection offer (and to the Curtailable Connection Agreement pursuant to that offer) will not be recalculated once the connection offer has been issued to the Customer; unless there has been material change in circumstances and both the Company and the Customer agree to the recalculation or the Authority directs that a different Curtailment Limit is to be used. Where the Company and Customer cannot agree, the matter should be resolved through the disputes process set out in the Curtailable Connection Agreement.
- 2.7 A worked example of a calculation modelling tool will be published and made available on the Website.
- 2.8 The Company may use whatever software tool it chooses providing it gives the same answer as the tool described in Paragraph 2.7. The Company should make available data used in its calculations when requested by the Customer.

3. MEASURING CURTAILMENT

Quarterly Reporting

- 3.1 The Full Import Curtailment Hours for each Curtailable Connection shall be calculated as follows at the end of each Quarter for that Quarter and the previous three Quarters (i.e., a rolling four Quarters):

$$= \sum_{i=1}^n di_i \times civ_i \div cic$$

where,

di = the duration of each period of Curtailment (in hours, partial or full) determined from the time at which the Company instructs the Customer to Curtail its Maximum Import Capacity to the time at which the Company notifies the Customer that there is no longer a requirement to Curtail;

n = the number of Curtailment instructions in those four Quarters;

civ = the Curtailment Instruction Value for each Curtailment instruction; and

cic = the Curtailable Import Capacity.

- 3.2 The Full Export Curtailment Hours for each Curtailable Connection shall be calculated as follows at the end of each Quarter for that Quarter and the previous three Quarters (i.e., a rolling four Quarters):

$$= \sum_{i=1}^n de_i \times civ_i \div cec$$

where,

de = the duration of each period of Curtailment (in hours, partial or in full) determined from the time at which the Company instructs the Customer to Curtail its Maximum Export Capacity to the time at which the Company notifies the Customer that there is no longer a requirement to Curtail;

n = the number of Curtailment instructions in those four Quarters;

civ = the Curtailment Instruction Value for each Curtailment instruction; and

cec = the Curtailable Export Capacity.

Annual Payment

- 3.3 At the end of every fourth Quarter (ending after energisation of the connection), if the Full Import Curtailment Hours exceed the Import Curtailment Limit, then the Company shall make a payment to the Customer (within 30 days following the end of such fourth Quarter), with the payment amount calculated as follows:

$$= (fich - icl) \times cic \times eicp$$

where,

fich = the Full Import Curtailment Hours;

icl = the Import Curtailment Limit;

cic = Curtailable Import Capacity (MVA); and

eicp = the Exceeded Import Curtailment Price at the end of such fourth Quarter.

- 3.4 At the end of every fourth Quarter (ending after ~~energisation~~ energisation of the connection), if the Full Export Curtailment Hours exceeds the Export Curtailment Limit, then the Company shall make a payment to the Customer (within 30 days following the end of such fourth Quarter), with the payment amount calculated as follows:

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$$= (fech - ecl) \times cec \times eecp$$

where,

fech = the Full Export Curtailment Hours;

ecl = the Export Curtailment Limit;

cec = Curtailable Export Capacity (MVA); and

eecp = the Exceeded Export Curtailment Price at the end of such fourth Quarter.

4. CURTAILMENT REPORTING

- 4.1 Where a Customer has been subject to Curtailment within a Quarter, the Company shall notify the Customer of the number of Full Import Curtailment Hours and/or Full Export Curtailment Hours that the Customer has been instructed to make.
- 4.2 Each such notification shall be made within 30 days after the end of the Quarter, and shall include:

- (a) each period of Curtailment during the Quarter (with start and end dates and times); and
- (b) the applicable Exceeded Curtailment Price.

5. EXCEEDING CURTAILMENT LIMITS

- 5.1 The Company shall use reasonable endeavours to provide the required network capacity or procure Distribution Flexibility Services such that the Full Import Curtailment Hours do not exceed the Import Curtailment Limit and the Full Export Curtailment Hours do not exceed the Export Curtailment Limit.
- 5.2 The Company shall use reasonable endeavours to notify the Customer in advance if it appears likely that the Full Import Curtailment Hours and/or Full Export Curtailment Hours will exceed the Import Curtailment Limit and/or Export Curtailment Limit respectively.
- 5.3 If the Company fails to notify a Customer in advance, the Company shall use reasonable endeavours to notify the Customer as soon as reasonably possible after the event.

6. EXCEEDED CURTAILMENT PRICE

- 6.1 Unless otherwise directed by the Authority, the Exceeded Import Curtailment Price and Exceeded Export Curtailment Price shall be determined by the Company in accordance with this Paragraph 6.
- 6.2 The Exceeded Import Curtailment Price applies to demand turn down/generation turn up and the Exceeded Export Curtailment Price applies to demand turn up/generation turn down.
- 6.3 An IDNO Party should use the Exceeded Import Curtailment Price and the Exceeded Export Curtailment Price determined by the DNO Party in whose Distribution Services Area a Customer is seeking to connect to the Distribution System of that IDNO Party.

Market prices for flexibility

- 6.4 From 1 April 2023, and then by the first Working Day of each April and October thereafter, each DNO Party shall determine the Flexibility Market Import Price (in £/MWh) and the Flexibility Market Export Price (in £/MWh).

- 6.5 The Flexibility Market Import Price shall be one of the following (as applicable):
- (a) the highest contracted price for pre-fault Distribution Flexibility Services, for demand turn down/generation turn up, under contracts (if any) entered into by the DNO Party for delivery in the current Regulatory Year (at the time of setting the price) or in the two previous Regulatory Years (subject to Paragraph 6.7); or
 - (b) if (within the period referred to in Paragraph 6.5(a)) the DNO Party has not entered into a contract for pre-fault Distribution Flexibility Services for demand turn down/generation turn up but has issued and published tenders for Distribution Flexibility Services for those requirements, then the Flexibility Market Import Price shall be the highest maximum utilisation price from those tenders (subject to Paragraph 6.7); or
 - (c) if neither (a) nor (b) above apply, then the Flexibility Market Import Price shall be zero.
- 6.6 The Flexibility Market Export Price shall be one of the following (as applicable):
- (a) the highest contracted price for pre-fault Distribution Flexibility Services, demand turn up/generation turn down, under contracts (if any) entered into by the DNO Party for delivery in the current Regulatory Year (at the time of setting the price) or in the two previous Regulatory Years (subject to Paragraph 6.7); or
 - (b) if (within the period referred to in Paragraph 6.6(a)) the DNO Party has not entered into a contract for pre-fault Distribution Flexibility Services for demand turn up/generation turn down but has issued and published tenders for Distribution Flexibility Services for those requirements, then the Flexibility Market Export Price shall be the highest maximum utilisation price from those tenders (subject to Paragraph 6.7); or
 - (c) if neither (a) nor (b) above apply, then the Flexibility Market Export Price shall be equal to the Flexibility Market Import Price.
- 6.7 In making any assessment under ~~Paragraph~~ Paragraph 6.5 or 6.6, the DNO Party shall exclude any prices that are equal to or greater than the Outlier Import Threshold or Outlier Export Threshold, respectively. The Outlier Import Threshold and Outlier Export Threshold shall be the lowest of the prices contained within the Flexibility

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Market Import Price Data or Flexibility Market Export Price Data (respectively, and determined separately) that meets all the following criteria:

- (a) the price is greater ~~that~~ than the 95th percentile when the price data is arranged in descending price order;
- (b) the price is more than 20% greater than the next lowest unique value in the price data; and
- (c) the volume (in MW) associated with the price (in aggregate with any other prices caught within the threshold) is less than 5% of the total aggregated volume (in MW) covered by all of the prices.

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Flexibility Market Price Statement

6.8 By the fifth Working Day of April and October in each year, each DNO Party shall provide to the Secretariat a completed version of the table in Appendix A (the Flexibility Market Price Statement) to this Schedule showing:

- (a) the Flexibility Market Import Price and Flexibility Market Export Price which will apply to the 6 months from such April or October (converted to £/MVAh and uplifted in accordance with Paragraph 6.12(a)); and
- (b) the Flexibility Market Import Price Data and Flexibility Market Export Price Data used in calculating such prices.

6.9 The Secretariat shall, within three Workings Days of receiving each Flexibility Market Price Statement, publish the Flexibility Market Price Statement on the Website.

Cost of reinforcement

6.10 The Reinforcement Cost is identified in the Minimum Scheme at the voltage of the Point of Connection and the voltage above, less any contribution by the Customer for costs in excess of the high-cost project threshold. This is converted to a £/MVA by dividing by the requested Maximum Import Capacity or Maximum Export Capacity as applicable.

6.11 The annualised Reinforcement Cost per MVA is converted to £/MVAh using the formula:

$$\frac{\text{Reinforcement Cost (£ per MVA per year)} \times \text{Pseudo Load Coefficient}}{\text{hours in year}}$$

where the Pseudo Load Coefficient is determined in accordance with paragraph 70(c) of Schedule 16 (Common Distribution Charging Methodology), and the Pseudo Load Coefficient for the HV Site Specific tariff shall be used for this purpose.

Exceeded Curtailment Price

6.12 The Company's Exceeded Import Curtailment Price and Exceeded Export Curtailment Price for each period of 6 months starting with April or October shall be (subject to Paragraph 6.3):

- (a) the applicable Flexibility Market Import Price and Flexibility Market Export Price (respectively), converted to £/MVAh by dividing by an assumed 0.95 power factor, and then multiplied by 1.2; or
- (b) where such Flexibility Market Import Price or Flexibility Market Export Price (as applicable) is zero, then the Cost of Reinforcement determined under Paragraph 6.11 multiplied by 1.2.

7. CURTAILABLE CONNECTION END DATES

7.1 Subject to Paragraph 7.2, the Curtailment End Date will be the date on which the Customer and the Company agree to make the Curtailable Connection a Non-Curtailable Connection.

7.2 The Company may amend the Curtailment End Date to such reasonable date as the Company may specify in a written notice to the Customer; always provided that the Company gives such notice to the Customer within a reasonable period of time after the Company becomes aware of any of the circumstances necessitating such amendment (as described in Paragraph 7.3).

7.3 The circumstances described in Paragraph 7.2 are as follows:

- (a) severe weather conditions that either of themselves prevent the Company from carrying out the requisite work or (being of any of the categories 1, 2 or 3 of severity as defined in the Electricity (Standards of Performance) Regulations

2015), cause the Company (acting reasonably) to postpone pre-planned works in order to restore supplies to Customers as quickly as possible;

- (b) a network system emergency that causes the Company (acting reasonably) to redirect its resources and thereby prevents it from completing any action required to convert the Curtailable Connection to a Non-Curtailable Connection;
- (c) an inability to undertake live working on the Distribution System because of compliance with safety procedures in circumstances where the Company would normally expect to undertake such working and where this restriction has a material impact on the timescale for completion of the works needed to convert the Curtailable Connection to a Non-Curtailable Connection;
- (d) delays imposed by a requirement to obtain a notice and/or permit for street works under the Traffic Management Act 2004 or the New Roads and Street Works Act 1991;
- (e) delays in obtaining any necessary consents or rights, and/or in acquiring any necessary interest in land, in relation to the location of electric lines and electrical plant needed to provide the Non-Curtailable Connection;
- (f) that works that are stated in the accepted connection offer needed to convert the Curtailable Connection to a Non-Curtailable Connection to be prerequisite to the commencement or completion (as appropriate) of the works needed to convert the Curtailable Connection to a Non-Curtailable Connection, and that are not the responsibility of the Company, have not been completed in the agreed manner or within the time agreed; and
- (g) that any other matters stated in the accepted connection offer needed to convert the Curtailable Connection to a Non-Curtailable Connection to be prerequisite to the commencement or completion (as appropriate) of the works needed to convert the Curtailable Connection to a Non-Curtailable Connection, and that are not the responsibility of the Company, have not been satisfied in the manner or within the time envisaged by the accepted offer.

7.4 If the Customer does not request a Non-Curtailable Connection, or does not accept the cost of converting the Curtailable Connection to a Non-Curtailable Connection, the Connection shall continue to be a Curtailable Connection until such a time as the

Customer requests a Non-Curtailable Connection and accepts the cost of converting the Curtailable Connection to a Non-Curtailable Connection.

8. CURTAILABLE CONNECTION AGREEMENT

- 8.1 The Company must use the form of agreement set out in Appendix B when entering into a contract for the ongoing provision of a Curtailable Connection, unless otherwise agreed with the Customer.

9. DEFINITIONS

- 9.1 Words beginning with a capital letter that are not otherwise defined in this Schedule have the meanings given to them in Clause 1 of the main body of this Agreement, and the rules of interpretation set out in that Clause 1 also apply.
- 9.2 In this Schedule, unless the context otherwise requires, the expressions below shall have the meanings set out below:

Committed Demand Capacity	is calculated in accordance with Paragraph 2.4(c).
Committed Generation Capacity	is calculated in accordance with Paragraph 2.5(c).
Company	means a DNO/IDNO Party.
Connection Point	means an Exit Point or Entry Point.
Curtail/Curtailment	means any action taken by the Company to restrict the flow of electricity at the Connection Point, except where that restriction is caused by: (a) an Interruption to the Customer's supply; and/or (b) curtailment as a result of constraints on the transmission network.
Curtailable Connection	means a connection to the Company's Distribution System which is made on the basis that it is expressly subject to Curtailment (and for which the connection application was received on or after 1 April 2023).
Curtailable Connection Agreement	means an agreement between the Company and a Customer on the terms set out in Appendix 2.

Curtable Export Capacity	means the Maximum Export Capacity less the Non-Curtable Export Capacity.
Curtable Import Capacity	means the Maximum Import Capacity less the Non-Curtable Import Capacity.
Curtable End Date	means the date (if any) from which the Company has agreed to make the Curtable Connection a Non-Curtable Connection (subject to amendment in accordance with Paragraph 7.2).
Curtable Instruction Value	means the value by which the Company instructs the Customer to limit their Maximum Import Capacity or Maximum Export Capacity. This cannot be greater than the Curtable Import Capacity or Curtable Export Capacity (as applicable).
Curtable Limit	means Import Curtable Limit and/or Export Curtable Limit.
Customer	means an owner or occupier of premises whose premises are (or are required to be) connected to the Company's Distribution System (whether for the purposes of receiving a supply of electricity and/or exporting electricity), and includes an electricity supplier when acting on behalf of such an owner/occupier.
Demand Connection	has the meaning given to it in Part B of Schedule 22 (Common Connection Charging Methodology).
Distribution Flexibility Services	has the meaning given to that term in the Distribution Licence.
Exceeded Curtable Price	means the Exceeded Import Curtable Price and/or Exceeded Export Curtable Price.
Exceeded Export Curtable Price	means the price calculated in accordance with Paragraph 6.12. For the purposes of calculating any payments under Paragraph 3, the Company shall use the price applying at the end of the four-Quarter period to which the payment applies.

Exceeded Import Curtailment Price	means the price calculated in accordance with Paragraph 6.12. For the purposes of calculating any payments under Paragraph 3, the Company shall use the price applying at the end of the four-Quarter period to which the payment applies.
Export Curtailment Limit	means the number of full hours per annum (measured over a twelve-month period) during which the Customer could be required to reduce its Maximum Export Capacity to the Non-Curtailable Export Capacity.
Flexibility Market Export Price	means the value calculated in accordance with Paragraph 6.6.
Flexibility Market Import Price	means the value calculated in accordance with Paragraph 6.5.
Flexibility Market Export Price Data	means either: (a) the prices referred to in Paragraph 6.5(a) (if any); or (b) if there are no such prices, the prices referred to in Paragraph 6.6(b).
Flexibility Market Import Price Data	means either: (a) the prices referred to in Paragraph 6.6(a) (if any); or (b) if there are no such prices, the prices referred to in Paragraph 6.5(b).
Full Export Curtailment Hours	means the value calculated in accordance with Paragraph 3.2.
Full Import Curtailment Hours	means the value calculated in accordance with Paragraph 3.1.
Generation Connection	has the meaning given to it in Part B of Schedule 22 (Common Connection Charging Methodology).
Import Curtailment Limit	means, the number of full hours per annum (measured over a twelve-month period) during which the Customer could be required to reduce its Maximum Import Capacity to the Non-Curtailable Import Capacity.
Interruption	has the meanings given to it in Annex F of the Regulatory Instructions and Guidance under the Distribution Licences of the DNO Parties.

Minimum Scheme	has the meaning given to it in Part B of Schedule 22 (Common Connection Charging Methodology).
Network Asset Demand Capacity	has the meaning given to it in Paragraph 2.3(b).
Network Asset Generation Capacity	has the meaning given to it in Paragraph 2.3(c).
Non-Curtailable Connection	means a connection which is not a Curtailable Connection.
Non-Curtailable Connection Offer	means an offer provided by the Company to provide a Non-Curtailable Connection.
Non-Curtailable Export Capacity	means the amount of export capacity (expressed in kW or kVA) which the Customer is permitted to use that is not subject to Curtailment. This is determined as the amount of capacity which can be connected at the Point of Connection without the need for network Reinforcement.
Non-Curtailable Import Capacity	means the amount of import capacity (expressed in kW or kVA) which the Customer is permitted to use that is not subject to Curtailment. This is determined as the amount of capacity which can be connected at the Point of Connection without the need for network Reinforcement.
Non-PV Generation	means electricity generation other than PV Generation.
Outlier Import Threshold	means the value calculated in accordance with Paragraph 6.7.
Outlier Export Threshold	means the value calculated in accordance with Paragraph 6.7.
Point of Connection	has the meaning given to it in Part B of Schedule 22 (Common Connection Charging Methodology).
PV Generation	means electricity generation from solar PV which can only export onto the Distribution System during hours of daylight (i.e. it is not combined with a storage capability).
Reinforcement	has the meaning given to it in Part B of Schedule 22 (Common Connection Charging Methodology).

Reinforcement Cost	means the cost of Reinforcement as calculated in accordance with Part B of Schedule 22 (Common Connection Charging Methodology).
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APPENDIX A:

FLEXIBILITY MARKET PRICE STATEMENT

[DNO Party]	
Flexibility Market Price Data (contracted)	
Flexibility Market Import Price (£/MWh)	
Flexibility Market Export Price (£/MWh)	
Flexibility Market Price Data (tendered)	
Flexibility Market Import Price (£/MWh)	
Flexibility Market Export Price (£/MWh)	
Exceeded Import Curtailment Price (demand turn down/generation turn up)	
Exceeded Import Curtailment Price (£/MVAh)	
Exceeded Export Curtailment Price (demand turn up/generation turn down)	
Exceeded Export Curtailment Price (£/MVAh)	

DISTRIBUTION FLEXIBILITY SERVICES CONTRACT DATA					
[DNO Party]					
Import Prices (£/MWh)	Capacity requirement (MW)	Regulatory Year of Delivery	Export Prices (£/MWh)	Capacity requirement (MW)	Regulatory Year of Delivery

DISTRIBUTION FLEXIBILITY SERVICES TENDER DATA					
[DNO Party]					
Import Prices (£/MWh)	Capacity requirement (MW)	Regulatory Year of Delivery	Export Prices (£/MWh)	Capacity requirement (MW)	Regulatory Year of Delivery

APPENDIX B:

FORM OF CURTAILABLE CONNECTION AGREEMENT

BETWEEN:

(1) [Distributor Name] [Company Number] [Registered Address] (the “**Company**”) **AND**

(2) [Connectee Name] [Company Number] [Registered Address] (the “**Customer**”)

1. The Company agrees to the Connection of the Customer’s Installation to the Company’s Distribution System on the terms and conditions of this Curtailable Connection Agreement.
2. Subject to the express provisions of this Curtailable Connection Agreement, Section 3 of the National Terms of Connection (the “Applicable NTC Section”) will apply (as amended from time to time) and as amended by Appendix 2 of this Agreement as if it was set out in this Curtailable Connection Agreement, and as if references in the Applicable NTC Section to “this agreement” or to “this Agreement” were to this Curtailable Connection Agreement.
3. The National Terms of Connection are available in writing from the Energy Networks Association, 1st Floor, 4 More London Riverside, London, SE1 2AU, or from the website at www.connectionterms.co.uk.
4. Expressions used in this Curtailable Connection Agreement shall have the same meanings as is given to them in the Applicable NTC Section.
5. Details of the Premises, the Connection Points, the technical characteristics of the Connection Points and other matters are set out in Annex 1 to this Curtailable Connection Agreement.
6. The Parties may agree variations to this Curtailable Connection Agreement, which variations must be recorded in writing and signed by an authorised representative of each Party. Each Party shall negotiate in good faith the terms of any variation proposed by the other. If any variation has not been agreed within 1 month of its being proposed, either Party may refer the matter to the Authority for resolution pursuant to section 23

of the Act. The Parties shall give effect to any such determination, and shall enter into any agreement as shall be necessary to give effect to any such determination.

7. Address for notices

(a) to the Company: for the attention of [name], [address], [email address]

(b) to the Customer: for the attention of [name], [address], [email address]

SIGNED by (signature)

for and on behalf of the **Company** (print name)

(job title)

(date)

SIGNED by (signature)

for and on behalf of the **Customer** (print name)

(job title)

(date)

ANNEX 1

GENERAL PARTICULARS OF THE CURTAILABLE CONNECTION

The characteristics of the connection shall be as follows:

- (a) characteristics of supply:
 - (i) number of phases: [Number]
 - (ii) current: [Alternating current]
 - (iii) voltage: [Enter Statutory Voltage kV $\pm 6\%$ / $+10\%/-6\%$]
 - (iv) frequency: [50 Hertz $\pm 1\%$]
- (b) Connection Point(s): either
 - (i) where the connection is provided from the Company's final cut-out fuse, isolator, switch, metering switch fuse or metering circuit breaker, unless otherwise stated in this Curtailable Connection Agreement the Connection Points are the outgoing terminals of the Company's final cut-out fuse, isolator, switch, metering switch fuse or metering circuit breaker, or
 - (ii) where the Company's electric lines connect directly to a Customer's intake isolator, switch, metering switch fuse or metering circuit breaker, unless otherwise stated in this Curtailable Connection Agreement the Connection Points are the incoming terminals of the Customer's intake isolator, switch, metering switch fuse or metering circuit breaker,

and, for the avoidance of doubt, the Connection Points may be remote from the Customer's Installation where third party electric lines and/or electric plant provide the intermediate electrical connection from the Company's Distribution System to the Customer's Installation.
- (c) use of system tariff type: [state here or else "Rates published in relevant charging statement"]
- (d) Details of Premises:
 - (i) Address: [SITE ADDRESS HERE]

(ii) MPANs: [IMPORT MPANS HERE]

[EXPORT MPANS HERE]

(iii) Commencement Date: [COMMENCEMENT DATE DD/MM/YYYY]

(e) Capacity Information:

(i) Maximum Import Capacity: [xxx] kVA

With effect from [DD/MM/YYYY]

First date for Reduction [DD/MM/YYYY]

(ii) Maximum Export Capacity: [xxx] kVA

With effect from [DD/MM/YYYY]

First date for Reduction [DD/MM/YYYY]

(f) Curtailment Information:

(i) Non-Curtailable Import Capacity: [xxx] kVA

(ii) Non-Curtailable Export Capacity: [xxx] kVA

(iii) Curtailable Import Capacity: [xxx] kVA

(iv) Curtailable Export Capacity: [xxx] kVA

(v) Curtailment End Date: [[N/A] or DD/MM/YYYY]

(vi) Import Curtailment Limit: [hours]

(vii) Export Curtailment Limit: [hours]

(viii) Exceeded Import Curtailment Price (subject to change): [£/MVAh]

(ix) Exceeded Export Curtailment Price (subject to change): [£/MVAh]

ANNEX 2

AMENDMENTS TO THE APPLICABLE NTC SECTION

Section 3 of the National Terms of Connection (the “Applicable NTC Section”) shall be amended as set out below.

1. DEFINITIONS & INTERPRETATION

The following additional definitions shall be included and the following amendments to existing definition shall be made:-

“Curtail”/ “Curtailment”/ “Curtailed” means any action taken by the Company to restrict the flow of electricity at the Connection Point, except where that restriction is caused by: (a) an Interruption to the Customer’s supply; and/or (b) curtailment as a result of constraints on the transmission network.

“Curtable Export Capacity” means the Maximum Export Capacity less the Non-Curtable Export Capacity.

“Curtable Import Capacity” means the Maximum Import Capacity less the Non-Curtable Import Capacity.

“Curtailment End Date” means the date (if any) from which the Company has agreed to make the connection a Non-Curtable Connection, as set in Annex 1 or as otherwise agreed between the Parties (but always subject to Clause 12.18);

“Curtailment Instruction” has the meaning given to that expression in Clause 12.16;

“Curtailment Instruction Value” means the value by which the Company instructs the Customer to limit its Maximum Import Capacity and/or Maximum Export Capacity (which cannot be greater than the Curtable Import Capacity or Curtable Export Capacity, as applicable).

“Curtailment Period” means the period from the date of Energisation of the Connection Point to the Curtailment End Date (inclusive).

“Exceeded Export Curtailment Price” means: the price specified on the Company’s website or as provided by the Company to the Customer, calculated in accordance with Schedule 2D of the DCUSA. For the purposes of calculating any payments under Clause 12.23, the Company shall use the price applying at the end of the four-Quarter period to which the payment applies.

“Exceeded Import Curtailment Price” means: the price specified on the Company’s website or as provided by the Company to the Customer, calculated in accordance with Schedule 2D of the DCUSA. For the purposes of calculating any payments under Clause 12.22, the Company shall use the price applying at the end of the four-Quarter period to which the payment applies.

“Export Curtailment Limit” means the number of full hours per annum (measured over a twelve-month period) during which the Customer could be required to reduce its Maximum Export Capacity to the Non-Curtailable Export Capacity;

“Interruption” has the meaning given to it in Annex F of the Regulatory Instructions and Guidance as defined in the Electricity Distribution Licence.

“Full Export Curtailment Hours” means the value calculated in accordance with Clause 12.21.

“Full Import Curtailment Hours” means the value calculated in accordance with Clause 12.20.

“Import Curtailment Limit” means the number of full hours per annum (measured over a twelve-month period) during which the Customer could be required to reduce its Maximum Import Capacity to the Non-Curtailable Import Capacity.

“Non-Curtailable Connection” means that the connection is no longer subject to Curtailment.

“Non-Curtailable Export Capacity” means the amount of export capacity (expressed in kW or kVA) which the Customer is permitted to use that is not subject to Curtailment, as set out in Annex 1.

“Non-Curtailable Import Capacity” means the amount of import capacity (expressed in kW or kVA) which the Customer is permitted to use that is not subject to Curtailment, as set out in Annex 1.

“**Monitoring Equipment**” means any monitoring and metering equipment that may be used by the Company for the purposes of managing Curtailment, and for measuring or checking consumption otherwise than for settlement;

“**Quarter**” means, the period of three months commencing on 1 January, 1 April, 1 July and 1 October respectively in each year.

5. DE-ENERGISATION

The following additional clause 5.12 shall be included:-

Curtailment

5.12 The Company may De-energise a Connection Point if the Customer fails to comply with a Curtailment Instruction, but only for such time as the Company requires the Connection Point to be Curtailed or until the Customer complies with the Curtailment Instruction.

12. LIMITATION OF CAPACITY

Clause 12.2 shall be amended to read as follows:-

12.2 Subject to the other provisions of this Agreement, the Company shall use reasonable endeavours to:

12.2.1 ensure that the Maximum Import Capacity and the Maximum Export Capacity is available at the Connection Point at all times during the period of this Agreement except where the Capacity is Curtailed under provisions of Clause 12.16; and

12.2.2 maintain the connection characteristics at the Connection Point.

The following new clauses 12.15 to 12.26 shall be added:-

Curtailment

12.15 During the Connection Period, the Company may install additional equipment at the Connection Point designed to limit the import and/or export of electricity from or to the

Distribution System to the Non-Curtailable Import Capacity and/or the Non-Curtailable Export Capacity (as applicable).

- 12.16 The Company may give the Customer a “**Curtailment Instruction**” at any time during the Curtailment Period. The Company shall notify the Customer when the need to Curtail has finished.
- 12.17 The Company shall not instruct the Customer to reduce its Maximum Import Capacity and/or the Maximum Export Capacity to less than the Non-Curtailable Import Capacity or the Non-Curtailable Export Capacity (as applicable) and the Customer is not obliged to reduce its Maximum Import Capacity and/or the Maximum Export Capacity to below these levels even if the Company instructs it to do so.
- 12.18 The Company may amend the Curtailment End Date to such reasonable date as the Company may specify in a written notice of such amendment to the Customer; always provided that the Company gives such notice to the Customer within a reasonable period of time after the Company becomes aware of any of the circumstances necessitating such amendment (as described in Clause 12.19).
- 12.19 The circumstances described in Clause 12.18 are as follows:
- (a) severe weather conditions that either of themselves prevent the Company from carrying out the requisite work or (being of any of the categories 1, 2 or 3 of severity as defined in the Electricity (Standards of Performance) Regulations 2015), cause the Company (acting reasonably) to postpone pre-planned works in order to restore supplies to customers as quickly as possible;
 - (b) a network system emergency that causes the Company (acting reasonably) to redirect its resources and thereby prevents it from completing any action required to convert the Curtailable connection to a Non-Curtailable Connection;
 - (c) an inability to undertake live working on the Distribution System because of compliance with safety procedures in circumstances where the Company would normally expect to undertake such working and where this restriction has a material impact on the timescale for completion of the works needed to convert the Curtailable connection to a Non-Curtailable Connection;

- (d) delays imposed by a requirement to obtain a notice and/or permit for street works under the Traffic Management Act 2004 or the New Roads and Street Works Act 1991;
- (e) delays in obtaining any necessary consents or rights, and/or in acquiring any necessary interest in land, in relation to the location of electric lines and electrical plant needed to provide the Non-Curtailable Connection;
- (f) that works that are stated in the accepted connection offer needed to convert the Curtailable connection to a Non-Curtailable Connection to be prerequisite to the commencement or completion (as appropriate) of the works needed to convert the Curtailable connection to a Non-Curtailable Connection, and that are not the responsibility of the Company, have not been completed in the agreed manner or within the time agreed; and
- (g) that any other matters stated in the accepted connection offer needed to convert the Curtailable connection to a Non-Curtailable Connection to be prerequisite to the commencement or completion (as appropriate) of the works needed to convert the Curtailable connection to a Non-Curtailable Connection, and that are not the responsibility of the Company, have not been satisfied in the manner or within the time envisaged by the accepted offer.

12.20 The Full Import Curtailment Hours shall be calculated as follows at the end of each Quarter for that Quarter and the previous three Quarters (i.e., a rolling four Quarters):

$$= \sum_{i=1}^n di_i \times civ_i \div cic$$

Where,

di = the duration of each period of Curtailment (in hours, partial or full) determined from the time at which the Customer instructs the Customer to Curtail its Maximum Import Capacity to the time at which the Company notifies the Customer that there is no longer a requirement to Curtail;

n = the number of Curtailment Instructions in those four Quarters;

civ = the Curtailment Instruction Value for each Curtailment Instruction; and

cic = the Curtailable Import Capacity.

- 12.21 The Full Export Curtailment Hours shall be calculated as follows at the end of each Quarter for that Quarter and the previous three Quarters (i.e., a rolling four Quarters):

$$= \sum_{i=1}^n de_i \times civ_i \div cec$$

Where,

de = the duration of each period of Curtailment (in hours, partial or in full) determined from the time at which the Company instructs the Customer to Curtail its Maximum Export Capacity to the time at which the Company notifies the Customer that there is no longer a requirement to Curtail;

n = the number of Curtailment Instructions in those four Quarters;

civ = the Curtailment Instruction Value for each Curtailment Instruction; and

cec = the Curtailable Export Capacity.

- 12.22 At the end of every fourth Quarter (ending after energisation of the connection), if the Full Import Curtailment Hours exceeds the Import Curtailment Limit, then the Company shall make a payment to the Customer (within 30 days following the end of such fourth Quarter), with the payment calculated as follows:

$$= (fich - icl) \times cic \times eicp$$

Where,

fich = the Full Import Curtailment Hours;

icl = the Import Curtailment Limit;

cic = Curtailable Import Capacity (MVA); and

eicp= the Exceeded Import Curtailment Price at the end of such fourth Quarter.

- 12.23 At the end of every fourth Quarter (ending after energisation of the connection), if the Full Export Curtailment Hours exceeds the Export Curtailment Limit, the Company

shall make a payment to the Customer (within 30 days following the end of such fourth Quarter), with the payment amount calculated as follows:

$$= (fech - ecl,) \times cec \times eecp$$

Where,

fech = the Full Export Curtailment Hours;

ecl = the Export Curtailment Limit;

cec = Curtailed Export Capacity (MVA); and

eeep= the Exceeded Export Curtailment Price at the end of such fourth Quarter.

12.24 Where a Customer has been subject to Curtailment within a Quarter, the Company shall notify the Customer of the number of Full Import Curtailment Hours and/or Full Export Curtailment Hours that the Customer has been instructed to make.

12.25 Each such notification shall be made within 30 days after the end of the Quarter, and shall include:

(a) each period of Curtailment during the Quarter (with start and end dates and times); and

(b) the applicable Exceeded Curtailment Price.

12.26 Any and liability of the Company for exceeding the Import Curtailment Limit and/or the Export Curtailment Limit shall be limited to the payments calculated in accordance with Clauses 12.22 and 12.23.

ANNEX 3 – TECHNICAL CONDITIONS

Part 1 – Connection Points

Part 2 – Technical Supply Capacities and Sole Use Assets

Part 3 – Site Responsibility Schedules

Part 4 – Site Specific Operating Arrangements

Part 5 – Site Specific Technical Conditions

Part 6 – Geographic Plans

Part 7 – Operational Diagrams

Part 8 – Generating Equipment

Part 9 – Technical Derogations

Part 10 – Property Documents

Part 11 – Technical Arrangements for Curtailment

SCHEDULE 22 – COMMON CONNECTION CHARGING METHODOLOGY

Introduction

1. This Schedule 22 sets out the Common Connection Charging Methodology (CCCM). The CCCM is the whole of this Schedule 22 excluding only this introductory section.
2. Each DNO Party is obliged by Standard Licence Condition 13 to have a connection charging methodology in force (each a **Connection Charging Methodology**). Each DNO Party is obliged by Standard Licence Condition 13 to include the CCCM within its Connection Charging Methodology.
3. The DNO Party will include within the document containing its Connection Charging Methodology other matters which are outside the scope of the CCCM.
4. The CCCM ~~contains two Parts: Part A which applies to connection applications that are received before 1 April 2023; and Part B which applies to connection applications that are received on or after 1 April 2023. Each such Part~~ is split into two sections numbered '1' and '2', and refers to other sections of the document in which the CCCM is to be included. When each DNO Party includes the CCCM within the document containing its Connection Charging Methodology, the DNO Party shall replace such section numbering and cross-references with the section numbers and cross-references appropriate for its document.
5. Modifications to this Schedule 22 are governed by the provisions of this Agreement.
6. The glossary forming part of the CCCM contains definitions of terms and acronyms used in the CCCM. In the case of any conflict between the defined terms and acronyms set out in the CCCM (on the one hand) and the definitions and rules of interpretation set out in Clause 1 of this Agreement (on the other), the defined terms and acronyms set out in the CCCM shall prevail for the purposes of the CCCM.

Common Connection Charging Methodology

~~PART A: Applications Received Before 1 April 2023~~

~~Section 1—Common Connection Charging Methodology~~

~~This Section sets out the Common Connection Charging Methodology that is implemented to ensure a consistent approach in the way your Connection Charge is calculated.~~

~~This Section applies to all connection applications that are received before 1 April 2023.~~

~~1.——Minimum Scheme~~

~~1.1—The Minimum Scheme is the Scheme with the lowest overall capital cost (as estimated by us), solely to provide the Required Capacity. The Minimum Scheme will be subject to:~~

- ~~•——accepted industry standards, including the requirements of the Distribution Code;~~
- ~~•——the status and configuration of the Relevant Section of Network (RSN);~~
- ~~•——the standard sizes and types of equipment currently used by us on our Distribution System which shall be reasonable in all the circumstances;~~
- ~~•——maintaining our ability to minimise regulatory penalties associated with the Interruptions Incentive Scheme and the Guaranteed Standards of Performance; and~~
- ~~•——where the Customer is an LDNO, maintaining the Customer's ability to minimise regulatory penalties associated with the Guaranteed Standards of Performance.~~
- ~~•——and shall be consistent with our statutory and licence obligations including the requirement to develop, maintain and operate an efficient, co-ordinated and economical electricity Distribution System.~~

~~1.2—We will make available our design policies and standards as appropriate.~~

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~~1.3 Subject to paragraphs 1.4 and 1.7 below, we will calculate the Connection Charge based on the estimated costs of the Minimum Scheme.~~

~~1.4 In certain circumstances we may decide to design an Enhanced Scheme. This will include one or more of the following:~~

- ~~• additional assets not required as part of the Minimum Scheme;~~
- ~~• assets of a larger capacity than required by the Minimum Scheme;~~
- ~~• assets of a different specification than required by the Minimum Scheme.~~

~~1.5 If we decide to design an Enhanced Scheme, the Connection Charge that will apply will be the lower of the Connection Charge associated with the Minimum Scheme and the Connection Charge associated with the Enhanced Scheme.~~

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~~1.6 The Connection Charge associated with the Enhanced Scheme will be calculated subject to the exclusion of costs of any additional assets not necessary for the provision of your connection.~~

~~1.7 We may recover the reasonable costs incurred, both direct and indirect, in providing a connection and may, where allowed by our Licence, apply a margin on some of those costs. The factors taken into account by us to calculate the Connection Charge will include, but are not limited to:~~

- ~~• industry standards governing the Distribution System;~~
- ~~• the Required Capacity;~~
- ~~• available capacity of the existing Distribution System;~~
- ~~• whether any necessary extension or Reinforcement of the existing Distribution System is by underground cable or overhead lines;~~
- ~~• whether any diversionary work is required as a result of the development and the required disconnection of any assets;~~
- ~~• the length of cable or line required;~~

- type of ground requiring excavation, the type and extent of reinstatement necessary (including New Roads and Street Works Act requirements and any other relevant legislation), and the need for road, bridge crossings etc;
- any Electrical Plant and civil costs required, allowing for any civil works undertaken by you with our agreement;
- the cost of installing communication equipment;
- the costs of installing system management equipment;
- the requirement to work outside of normal working hours;
- the costs of undertaking the design;
- the costs of securing wayleaves/easements for plant, cables or lines including any consents;
- the costs of securing suitable substation sites including any necessary Land Rights;
- any overhead line surveys required;
- the costs of public enquiries and environmental impact studies;
- charges for any other costs associated with the work on Sites of Special Scientific Interest (SSSI), railway lines etc; and
- any variations in respect of the actual costs that were reasonably incurred as specified in the Connection Offer.

Cost Allocation

1.8 The costs to be charged to you as a Connection Charge may be split into three categories:

- Costs for providing the connection which are to be paid in full by you (see paragraphs 1.10 to 1.15);

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• Costs for providing the connection which are to be apportioned between you and us (see paragraphs 1.16 to 1.28; and

• Costs to be paid by you in respect of works that have previously been constructed or are committed and are used to provide the connection (see paragraph 1.29).

1.9 Some costs may be borne in full by us and will not be included in your Connection Charge (see paragraphs 1.30 to 1.32).

Costs to be paid in full by you

1.10 The costs of providing Extension Assets are charged in full to you.

1.11 Where you have requirements for additional security or the characteristics of your load requires us to install assets in excess of the Minimum Scheme then you will pay the costs in excess of the Minimum Scheme in full. Where you have requested a three phase connection and/or a supply voltage that is not necessary to meet the Required Capacity, and the local Distribution System is not of the requested number of phases and/or voltage, then you will pay in full the cost of Reinforcement of the Distribution System to your specified number of phases and/or voltage.

1.12 The costs of the future operation and maintenance of any additional assets requested by you (over and above those associated with the Minimum Scheme) will be payable in full. This would normally be levied as a one off charge representing the net present value of the future operation and maintenance costs and calculated as a percentage (specified in Section [6]) of the additional capital cost of the Scheme. See Example 3 for an illustration of where you request additional security.

1.13 Work required to reconfigure the Distribution System to meet your requirements where no additional Network or Fault Level Capacity is made available shall be charged in full to you. See Example 8D.

1.14 Where the Extension Assets would normally require the extension of existing switchgear equipment and this is not possible, the cost of the full replacement

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of the switchgear (using the nearest standard size) will be charged to you, provided that there is no Reinforcement of the Distribution System (see paragraph 1.20).

~~1.15 For generation connections only, Reinforcement costs in excess of the high-cost project threshold of £200/kW shall be charged to you in full as a Connection Charge. Where both this paragraph 1.15 and paragraph 1.30 below apply to a generation connection, the provisions of paragraph 1.30 shall take precedence.~~

~~Costs to be apportioned between you and us~~

~~1.16 Reinforcement is defined as assets installed that add capacity (network or fault level) to the existing shared use Distribution System. The costs of Reinforcement shall be apportioned between you and us. The methods used to apportion the costs of Reinforcement are set out in paragraphs 1.23—1.28. There are five exceptions to this rule. Where an exception applies Reinforcement will be treated as Extension Assets and costs will not be apportioned. These exceptions are described below and the application of exceptions 1, 2, 4, and 5 is demonstrated in the Examples.~~

~~1.17 Exception 1: Where the Reinforcement is:~~

- ~~• down stream of the POC; and~~
- ~~• over and above the Minimum Scheme; and~~
- ~~• provided at our request; and~~
- ~~• provided by connecting two points on the existing Distribution System; and~~
- ~~• there is little or no prospect of the capacity created being required within the next five years,~~

~~then the apportionment rules will not apply. You will pay the costs associated with the Minimum Scheme and we will pay the costs over and above the Minimum Scheme. See Example 2B.~~

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~~1.18 Exception 2: Where the Reinforcement is in excess of the Minimum Scheme and is at your request, the Reinforcement will be treated as Extension Assets and the apportionment rules will not apply. The costs in excess of the Minimum Scheme will be borne in full by you (see paragraphs 1.11 and 1.12 above).~~

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~~1.19 Exception 3: Where the Reinforcement is provided to accommodate a Temporary Connection the Reinforcement will be treated as Extension Assets and the apportionment rules will not apply. The costs associated with the Temporary Connection will be borne in full by you. Temporary Connections are defined as connections that are only required for a period of up to five years, but exclude connections to provide the initial connection to a development, where the Reinforcement will subsequently be required for the permanent connection.~~

~~1.20 Exception 4: Where the replacement of switchgear results in an increase in fault level capacity and:~~

- ~~• that increase is solely as a result of the fault level rating of the standard switchgear equipment used by us being higher than that of the existing switchgear; and~~
- ~~• that increase in fault level capacity is not needed to accommodate your connection.~~

~~— then, unless the switchgear adds network capacity and the Security CAF applies, the switchgear replacement will be treated as Extension Assets and the apportionment rules will not apply. You will pay the full cost of the switchgear replacement. See Example 7B.~~

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~~1.21 Exception 5: Where the Reinforcement:~~

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- ~~• is provided by connecting two points on the existing distribution system; and~~
- ~~• is providing connection to a development with a number of Entry/ Exit Points,~~

then the additional network length (measured from suitable points close to the site boundaries which would allow for a clear demarcation of Contestable and Non-Contestable Work) required to provide connectivity within the development will be considered to be Extension Assets and the apportionment rules will not apply. You will pay the full cost of the additional network length. See Example 8B.

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1.22 For avoidance of doubt, where the costs of Reinforcement are borne in full by you and any capacity created is used to accommodate new or increased connections within the ECCR Prescribed Period, the ECCR will apply (see paragraphs 1.35–1.38).

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1.23 The costs of Reinforcement will be apportioned using one of two Cost Apportionment Factors (CAFs), dependent upon which factor is driving the requirement for Reinforcement:

- The ‘Security CAF’; and
- The ‘Fault Level CAF’.

1.24 The following definitions are used in the application of the CAFs:

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Existing Capacity	For existing Customers their Existing Capacity will be either:
	(a) the Maximum Capacity used in the calculation of their use of system charges; or
	(b) for Customers who are not charged for use of system on the basis of their Maximum Capacity the lower of:
	No. of phases x nominal phase-neutral voltage (kV) x fuse rating (A); and
	The rating of the service equipment.

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— Fault Level Contribution from Connection	— is the assessment of the Fault Level contribution from the equipment to be connected taking account of its impact at the appropriate point on the Distribution System. Where an existing Customer requests a change to a connection then the “Fault Level Contribution from Connection” is defined as the incremental increase in Fault Level caused by the Customer.
— New Fault Level Capacity	— is the Fault Level rating, following Reinforcement, of the equipment installed after taking account of any restrictions imposed by the local network Fault Level capacity. For the avoidance of doubt this rule will be used for all equipment types and voltages.
— New Network Capacity	— is either the secure or non-secure capacity of the Relevant Section of Network (RSN) following Reinforcement. Whether secure or non-secure capacity is applicable depends upon the type of capacity that can be provided from the RSN. For example, if the capacity provided to the Customer by the RSN is secure, but the capacity requested by the Customer at the point of connection is non-secure, the secure capacity will be used. See Example 12.

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	<p>— The capacity to be used will be based on our assessment of the thermal ratings, voltage change and upstream restrictions and compliance with our relevant design, planning and security of supply policies. The equipment ratings to be used are the appropriate operational rating at the time of the most onerous operational conditions taking account of seasonal ratings and demand.</p>
<p>— Relevant Section of Network (RSN)</p>	<p>— is that part or parts of the Distribution System which require(s) Reinforcement. Normally this will comprise:</p> <p>— the existing assets, at the voltage level that is being reinforced; that would have been used to supply you (so far as they have not been replaced) had sufficient capacity been available to connect you without Reinforcement; and/or</p> <p>— the new assets, at the same voltage level, that are to be provided by way of Reinforcement.</p> <p>— Where it is unclear what assets would have supplied the Customer in the event that sufficient capacity had been available, the existing individual assets</p>

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	<p>with the closest rating to the new assets will be used. See Example 13.</p> <p>There may be more than one RSN (e.g. at different voltage levels).</p>
Required Capacity	<p>is the Maximum Capacity agreed with the Customer. In the case of multiple connections (e.g. a housing development) it may be adjusted after consideration of the effects of diversity. Where an existing Customer requests an increase in capacity then it is the increase above their Existing Capacity.</p>

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1.25 The 'Security CAF' is applied, where the costs are driven by either thermal capacity or voltage (or both) as assessed against the relevant standard. This rule determines the proportion of the Reinforcement costs that should be paid by you as detailed below.

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$$\text{Security CAF} = \frac{\text{Required Capacity}}{\text{New Network Capacity}} \times 100\% \quad (\text{max } 100\%)$$

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1.26 The 'Fault Level CAF' is applied, where the costs are driven by Fault Level restrictions. This rule determines the proportion of the Reinforcement costs that should be paid by you as detailed below.

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$$\text{Fault Level CAF} = 3 \times \frac{\text{Fault Level Contribution from Connection}}{\text{New Fault Level Capacity}} \times 100\% \quad (\text{max } 100\%)$$

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1.27 For clarity, where you require an augmentation to an existing connection, both the Security and Fault Level CAFs will be based on the increase in Required Capacity and increase in Fault Level Contribution from the connection respectively. Any related increases within the previous three year period will be taken into account in determining the increase in the Required Capacity or

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increase in the Fault Level Contribution from the connection to be applied within the CAF.

1.28 On some Schemes there may be interaction between the two rules. In such cases, the 'Security' CAF will be applied to costs that are driven by the security requirement. The 'Fault Level CAF' will be applied to costs that are driven by Fault Level requirements. See the Examples for illustrations on the application of the CAFs.

Recovery of costs for previous works

1.29 Where, in order to provide your connection;

- we propose to utilise existing Distribution System assets that were previously installed to provide a connection to another Customer, and
- the other Customer has paid us (either in part or in full) a Connection Charge for those assets or paid an ICP for those assets which were adopted by us

you may be required to make a payment towards them. The ECCR prescribes the circumstances where such payment is required. Charges for such works only apply where the new connection is provided within the ECCR Prescribed Period.

Costs to be paid in full by us

1.30 We will fully fund Reinforcement carried out greater than one voltage level above the voltage at the POC to the existing Distribution System.

1.30A We will fully fund Reinforcement carried out to allow the installation of all equipment at an existing premises which remain connected via an existing low voltage single, two or three phase service fused at 100 amperes or less per phase which is metered with whole current metering; provided that (to the extent relevant);

- the Reinforcement is carried out to allow the installation of equipment as part of a single application for a single or multiple installations;

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• any and all electricity generation equipment installed has a rated output not greater than 16 amperes per phase (or not greater than 16 amperes per phase at any single premises if a single application for multiple installations);

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• any and all equipment installed which does not constitute a modification to the existing service conforms with the technical requirements of the following standards (notwithstanding that the equipment may have an input current that is more than 16 amperes per phase):

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• BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current \leq 16 A per phase); and

• BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current \leq 16 A per phase and not subject to conditional connection

1.30B Where it is necessary to modify a low voltage single phase looped service for an existing premises, this shall be considered to have remained connected under Paragraph 1.30A above.

1.31 Where another LDNO with a distribution network that is connected to our Distribution System requires an increase in capacity to its distribution network, the voltage at the POC for assessing the one voltage rule will be:

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• In the case of a new extension to the network of the other LDNO, the voltage of connection at which the Extension Assets will connect to the other LDNO's network; or

• In the case of additional capacity required in respect of a Customer connected to the existing assets of the LDNO, the voltage at which the Customer connects to the LDNO's network; or

• In the case of additional capacity required to meet general load growth on the LDNO's network then the Reinforcement costs will be borne by us. The LDNO will be required to provide justification in such circumstances.

1.32 The table below illustrates the application of the one voltage rule in relation to Reinforcement. You will be required to contribute towards the cost of any Reinforcement provided at one voltage level above the POC, up to and including the cost of circuit breakers provided at that voltage.

England & Wales

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	Voltage at the POC			
V	L	H	E	I
o	V	V	H	3
l			V	2
t	((k
a	b	a	(V
g	e	b	a	
e	l	o	b	
o	o	v	o	
f	w	e	v	
	l	l	e	
S	0	k	2	
e	0	V	2	
h	0	b	k	
e	V	#	V	
n)	t	b	
e		l	#	
A		e	t	
s		s	l	
s		s	e	
e		t	s	
t		h	s	
s		a	t	
		#	h	
		2	a	
		2	#	
		k	7	

		V)	2 k V)	
1 3 2 k V A e t w e r k	W e f u n d	W e f u n d t	A p p o r t i o n e d	A p p o r t i o n e d
1 3 2 k V / E H V S u b s t a t	W e f u n d	E H V e i r e u i t b r e a k e r s	A p p o r t i o n e d	N o t a p p o r t i l i t y e a b l e

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i e n		e n t y A p p e r i e n e d		
E H V N e t w e r k	W e f n e d	A p p e r i e n e d	A p p e r i e n e d	N e t w e r k e
I 3 2 k V f	H V e i e n	A p p e r i	N e t w e r k	N e t w e r k

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H V S # b s t a t i o n	# b r e a k e r s o n l y A p p o # i o n e d	o n e d	# e a b l e	# e a b l e
<u>E</u> H V / H V S # b s	<u>H</u> V e # e # b r e	<u>A</u> p p o # i o n	<u>N</u> o t a p p li e a b	<u>N</u> o t a p p li e a b

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t a t i o n	a k e r s o n l y A p p o r t i o n e d	e d	t e	t e
H V A e t w o r k	A p p o r t i o n e d	A p p o r t i o n e d	N o t a p p h e a b l e	N o t a p p h e a b l e

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H V / L V S u b s t a t i o n	A p p o n i o n e d	N o t a p p h e a b i e	N o t a p p h e a b i e	N o t a p p h e a b i e
L V N e t w o r k	A p p o n i o n e d	N o t a p p h e a b i e	N o t a p p h e a b i e	N o t a p p h e a b i e

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~~Except where there is direct transformation from 132kV to HV when the costs are apportioned.~~

~~Scotland~~

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	Voltage at the POC		
Voltage of Scheme Assets	LV (below 1000 V)	HV (above 1kV but less than 22kV)	EHV (above 22kV but less than 72kV)
EHV Network	We fund	Appor tioned	Appor tioned
EHV/HV Sub station	HV circuit break ers only Appor tioned	Appor tioned	Not applic able
HV Network	Appor tioned	Appor tioned	Not applic able
HV/LV Sub	Appor tioned	Not applic able	Not applic able

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station			
LV Net work	Appor tioned	Not applie able	Not applie able

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Additional Cost Allocation for Flexible Connections

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1.32A To facilitate a Flexible Connection, we may need to install and maintain specific system management equipment, either or both at your Premises and further upstream in other parts of the Distribution System. Some of the costs associated with installing, operating and maintaining the system management equipment will be directly attributed to your connection and be included as part of your Connection Charge (see illustrative table in paragraph 1.32B). The proportion of the costs which you must fund depends on whether your connection forms part of a Dedicated Scheme or a Wide Area Scheme, as described below:

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Type 1 Dedicated Scheme: A scheme managing constraint(s) where there are no Customers downstream of the constraint(s) who could connect new or additional demand or generation without being controlled by the Dedicated Scheme:

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• Type '1A' considers a scenario involving only one customer; and

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• Type '1B' considers a scenario involving multiple customers.

Type 2 Wide Area Scheme: A scheme managing constraint(s) where there are Customers downstream of the constraint(s) who could connect new or additional demand or generation without being controlled by the Wide Area Scheme.

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1.32B The table below illustrates the scheme types and methodology for cost recovery associated with each type of Flexible Connection. The methodology covers Type 1A, Type 1B and Type 2 (as each is described in paragraph 1.32A).

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Typical connection components. ⁴	Type 1A - Single	Type 1B - Multiple	Type 2
Extension Assets for customer	Yes	Yes	Yes
End user control unit for the customer	Yes	Yes	Yes

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⁴We will describe the main connection components within the relevant connection offer, which will also include the funding arrangements for each such connection component (if different to that stated in this illustrative table).

			n d
Local system manageme nt unit	Y ou fu nd	Shared equally betwee n partici pants	W e fu n d
Scheme manageme nt unit	Y ou fu nd	Shared equally betwee n partici pants	W e fu n d
Central manageme nt unit	N/ A	N/A	W e fu n d
Scheme specific ongoing costs e.g. communie ations	W e fu nd	We fund	W e fu n d

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~~Recovered Equipment and Deferment of Asset Replacement~~

~~1.33 Normally, you will not receive any credit for the value of any equipment recovered by us as a result of the connection. However, where a Temporary~~

~~Connection is to be Disconnected, we will determine the value of recovered equipment that we can subsequently reuse (net of depreciation and removal and refurbishment costs). Where there is a net value in the recovered equipment that can be reused, we will pay you the amount of such net value subject to a de minimis level as specified in Section [6].~~

~~1.34 — You will not receive any credit for the value of any deferment of asset renewal expenditure by us.~~

~~—— Rebates~~

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~~1.35 — For Distribution System assets where you have paid in full, then you may be entitled to a future rebate of charges should another Customer connect to those assets. These circumstances are detailed in the ECCR.~~

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~~1.36 — For Distribution System assets where you have paid in proportion to your Required Capacity, then you are not entitled to a future rebate of charges should another Customer connect to those assets.~~

~~1.37 — Your entitlement to receive payments under the ECCR only applies to connections made within the ECCR Prescribed Period from the first provision of the connection.~~

~~1.38 — These provisions do not apply where your connection was made before 6 April 2017 and we have adopted the assets from an ICP. However, for connections made on or after 6 April 2017, these provisions do apply to assets we have adopted from an ICP (as further described in the ECCR).~~

~~—— Speculative Developments~~

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~~1.39 — Developments which have one or more of the following characteristics may be considered as speculative:~~

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- ~~• — their detailed electrical load requirements are not known;~~
- ~~• — the development is phased over a period of time and the timing of the phases is unclear;~~

- the capacity requested caters for future expansion rather than the immediate requirements of (an) end user(s);
- the capacity requested caters for future speculative phases of a development rather than the initial phase(s) of the development; or
- the infrastructure only is being provided, with no connections for end users requested.

1.40 Where we are asked to provide a connection to a speculative development then the cost of the work including any Reinforcement is charged in full and the CAFs do not apply. Additional charges to reflect ongoing operation, repair and maintenance costs may also be levied.

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1.41 We may, at our sole discretion, allow capacity to be reserved on the infrastructure provided to service the speculative development on the commercial terms agreed between you and us in respect of the development.

Connection Alterations

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1.42 Where you request an alteration to your connection arrangements, including a change in the supply voltage, the costs are charged in full to you. For the avoidance of doubt increases in the Required Capacity are dealt with in accordance with the previous Sections.

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National Electricity Transmission System Operator (NETSO) Charges

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1.43 We have an obligation under the CUSC to discuss certain requests for connection or changes in connection with the NETSO. Such requests are typically for large electrical demand or generation projects. Under certain circumstances, as determined by the NETSO, they may apply charges to assess the potential impact on the GB Transmission System of a request or the combined effect of a number of requests and these will be included in the Connection Charge, or through a separate mechanism agreed between you and us.

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~~1.44 Subsequent to such assessment, the NETSO may also require works to be undertaken on the GB Transmission System as a condition of the connection being permitted. In the event of NETSO applying charges for these works, we will reflect these charges in our charges to you.~~

~~1.44A Should GB Transmission System works be required, NETSO may apply a cancellation charge in the event that your project is cancelled or the capacity of your project reduces. The NETSO also calculates a secured amount in respect of this cancellation charge (being a percentage of the cancellation charge, which reduces at certain trigger points). We may ask you for security in respect of this cancellation charge, but we will not ask you for more than the secured amount calculated by the NETSO.~~

~~Land Rights~~

~~1.45 Where Land Rights are required from a third party, the cost of acquiring those rights will be included in either the Connection Charge to you or through a separate mechanism agreed between you and us.~~

~~1.46 If the Land Rights that we require cannot be obtained by negotiation, we may, following discussion with you, exercise our powers of compulsory purchase (Section 10 and Schedule 3 of the Act) or apply to the Secretary of State or the Scottish Government in Scotland for a ‘necessary wayleave’ (paragraphs 6-8 of Schedule 4 of the Act). If we do so, the costs that we incur, including those of the Lands Tribunal/ Lands Tribunal for Scotland (which determine issues of compensation) will be charged to you. The Lands Tribunal may award compensation to the landowner and/or anyone who holds an interest in the land and this will be included in the Connection Charge or through a separate mechanism agreed between you and us.~~

~~Unmetered Supplies~~

~~1.47 For some street lighting and other installations, we may allow items of equipment to be connected to our Distribution System without a meter. This is subject to the equipment having a low and predictable pattern of consumption~~

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~~and meeting the requirements of The Electricity (Unmetered Supply) Regulations 2001.~~

~~1.48 — Where we agree that a meter is not required the provision of such a connection is dependent on the owner entering into an unmetered Connection Agreement and providing and maintaining an auditable inventory, in a format agreed with us, so that an accurate estimate of the consumption can be produced.~~

~~1.49 — Where certain criteria are met the provision of services for unmetered connections may be made via a time based connection service charge, e.g. Rent a Jointer Services. This is subject to us entering into a contract with you for the provision of such services.~~

~~1.50 — You may elect to appoint an accredited ICP to carry out the Contestable Work for unmetered connections. The ICP will be allowed to carry out live jointing on low voltage underground cables. Where you use an ICP, arrangements must first be established as follows:~~

- ~~• — You will enter into an agreement with the ICP to carry out and complete the Contestable Work; and~~
- ~~• — We will enter into an agreement and/or an Adoption Agreement with you and/or your appointed ICP as appropriate.~~

~~• —~~

~~— Capacity Ramping for LDNOs~~

~~1.51 — For an LDNO the Required Capacity (expressed in kVA) is the Maximum Capacity to be provided at the boundary between the LDNO's distribution network and our Distribution System. This value will be agreed with us and stated in the Bilateral Connection Agreement for the relevant embedded network.~~

~~1.52 — When a connection is provided to an LDNO the take up of capacity may grow over a period of time as the site develops and individual customers are~~

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~~connected. In such circumstances the Bilateral Connection Agreement shall include a phased Required Capacity based on the Development Phase.~~

~~1.53 During the Development Phase a review may be undertaken annually on the anniversary of the Energisation of the embedded network. Any unused capacity identified in such review may be released for use by other customers and the Maximum Capacity reduced to an agreed level within the Bilateral Connection Agreement.~~

~~1.54 The Required Capacity agreed with us as being required at the end of the Development Phase shall be used to determine the Required Capacity for determination of the Cost Apportionment Factors where applicable.~~

~~1.55 Should additional capacity subsequently be required, the LDNO may incur additional Connection Charges for any Reinforcement based on the increase in capacity.~~

~~Disconnection and De-Energisation~~

~~1.56 If we either Disconnect or De-energise your Entry/ Exit Point~~

~~• at the request of your Supplier; or~~

~~• due to a failure of your Supplier to comply with the terms of the DCUSA~~

~~then the cost of such disconnection or De-energisation will be borne by your Supplier.~~

~~1.57 If we either Disconnect or De-energise your Entry/ Exit Point~~

~~• at your request; or~~

~~• due to a failure by you to comply with the terms of your Connection Agreement;~~

~~then the cost of such disconnection or De-energisation will be borne by you.~~

~~1.58 On termination of your Connection Agreement, we retain the right to remove our Electrical Plant and Electric Lines and charge you if we do so. Apparatus~~

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~~which is not cost effective for us to recover (e.g. Electric Lines laid underground) will normally be made safe and left at the Premises, but if you require us to remove them, the cost of removal will be payable by you. All such apparatus will remain our property unless otherwise agreed in writing.~~

~~Adoption Payments~~

~~1.59 Where we adopt assets installed by an ICP we will not make any adoption payment in respect of those assets.~~

~~Competition in Connection~~

~~1.60 Where you choose to have any Contestable Work undertaken by an ICP, we levy CIC Charges associated with the design approval, inspection and adoption of the Contestable Works as set out in Section [6] and Section [7].~~

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— ~~Worked Examples Illustrating the Application of the Connection Charging Methodology~~

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— ~~The following Examples are to illustrate the application of the Connection Charging Methodology and are not intended to provide an accurate estimate of the charges which a person would become liable in respect of the provision of a connection. The Examples do not necessarily represent the Minimum Scheme for a specific connection application.~~

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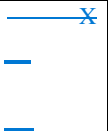

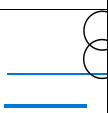

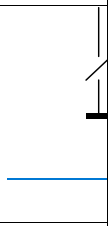
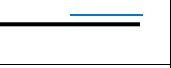
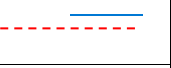
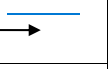
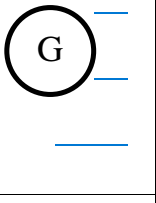
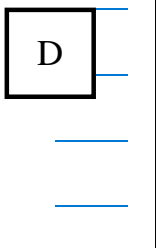
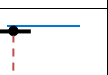
— ~~The figures quoted in the Examples are illustrative. Section [7] of this statement provides our charges and indicative costs to undertake various activities.~~

— ~~The Examples illustrate where we undertake both the Contestable and Non-Contestable Work. These costs will include the determination of the POC and assessment and design costs, though these may not be explicitly identified in the Examples.~~

— ~~Where Contestable Work is undertaken by an ICP, we will apply CIC Charges for services associated with the Contestable Works which would cover activities including design approval, inspection and monitoring. The CIC Charges shown in the Examples are for illustration only. For the avoidance of doubt, in each Example, where an ICP undertakes the Contestable Work, our Connection Charge will include the cost of the Non-Contestable Work and the CIC Charges but exclude the cost of Contestable Work.~~

— ~~The Examples are generic and standard for all LDNOs, but they do not represent the network analysis and subsequent design solutions that would be completed for an actual connection scheme. The actual designs are subject to our design policies.~~

Key to Illustrations

	Circuit Breaker (any voltage)
	Switch
	Transformer
	Joint on cable
	High voltage ring main unit
	Existing cable
	Proposed cable
	Normal Open Point (NOP)
	Generator Customer
	Demand Customer
	Point of Connection (POC)

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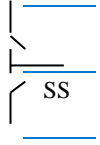

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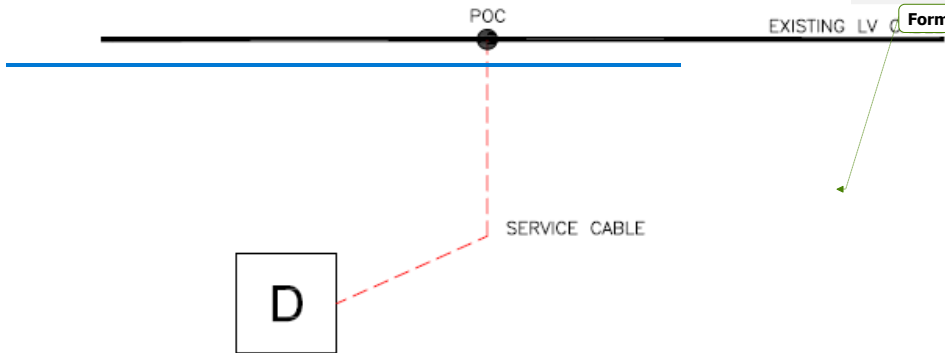
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Example 1: A new connection to a domestic premise

A Customer requests a LV single phase connection to a new house. The Premises can be connected to an existing LV main cable in the street.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:

		A	
		p	
		p	
		o	
		ft	
		i	
		o	
		n	
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				£
Contestable Work				£
15m service cable, excavation in footpath for joint hole to Customer laid duct, backfill and termination		n	7	£
Non-Contestable Work				£
Single service breech joint		n	4	£
Total Extension Asset Cost				£
CIC Charges				£

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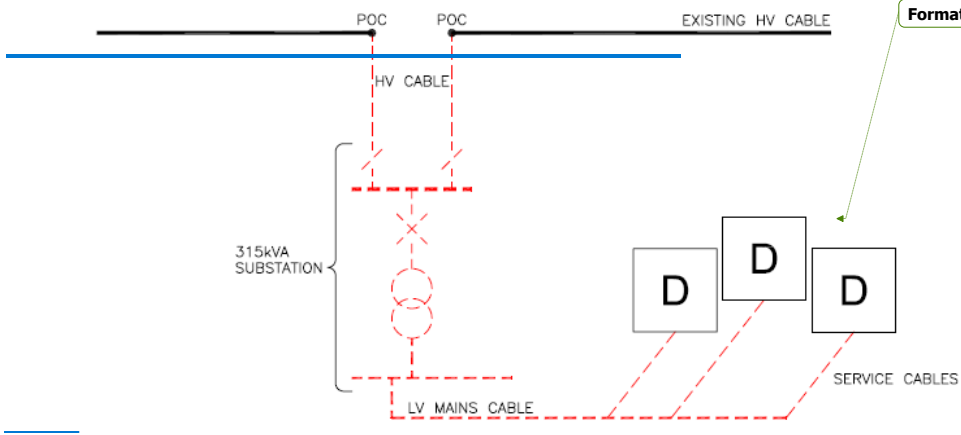
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Total Connection Charge = £1,100

Example 2A: New connections on a domestic housing development

A housing developer requests connections for 200 domestic Premises. The Required Capacity to supply the 200 homes is 250kVA. A new distribution substation will be established to provide the Required Capacity of the site. The Minimum Scheme requires the substation to be looped into the existing HV network.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:

		A	
		p	
		p	
		e	
		n	
		i	
		e	
		n	
		m	
		e	

		<p> n t </p>	<p> t r i b u t i o n </p>
Contestable Work			
Provision and installation 100m HV cable		<p> n / a </p>	<p> t r i b u t i o n </p>
315kVA substation		<p> n / a </p>	<p> t r i b u t i o n </p>
LV mains, service cables and terminations		<p> n / a </p>	<p> t r i b u t i o n </p>

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			6
			6
Non-Contestable Work			
Two HV cable joints		n	4
		/	2
		#	7
			6
			6
			6
Total Extension Asset Cost			4
			2
			6
			7
			5
			6
			6
CIC Charges			4
			4
			5
			6
			6

Total Connection Charge = £207,000

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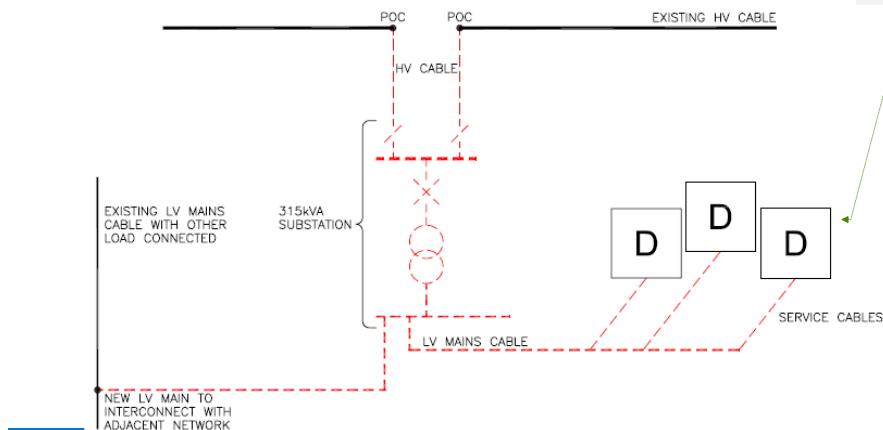
Example 2B: New connections on a domestic housing development with interconnection.

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This Example demonstrates the application of two of the exceptions to the apportionment rules, Exception 1 (paragraph 1.17) and Exception 2 (paragraph 1.18).

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As in Example 2A, a housing developer requests connections for 200 domestic Premises. The Required Capacity to supply the 200 homes is 250kVA. A new distribution substation will be established to provide the Required Capacity of the site. The Minimum Scheme requires the substation to be looped into the existing HV network. However, in this Example there is an option to provide an additional LV cable to interconnect the distribution substation with the existing LV network. This option is over and above the Minimum Scheme.



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Interconnecting into the existing LV network will increase the capacity of the existing Distribution System. Therefore, the assets that connect the HV and LV network would normally be considered to be Reinforcement. These assets (as shown on the diagram above) include the HV cable, the 315kVA substation and the interconnecting LV main. They exclude the LV mains and service cables from the 315kVA substation to the Customer's development. However, whether these assets are to be considered Reinforcement or Extension Assets depends upon who requested the LV interconnection and

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whether any capacity created is likely to be used. One of three scenarios will apply—

a) The LV interconnection is requested by the Customer (Exception 2).

In this case the Reinforcement is over and above the Minimum Scheme and requested by the Customer. Therefore, Exception 2 applies and all assets (including the interconnecting LV cable) will be treated as Extension Assets and their costs will be borne in full by the Customer. As the interconnecting LV main and associated LV joint are over and above the Minimum Scheme, a charge for their future operation and maintenance will be made.

The Connection Charge for this Scheme is calculated as follows:

Extension Assets:

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		A	
		p	t
		p	s
		o	t
		h	e
		i	n
		o	e
		n	r
		m	e
		e	n
		n	t
		t	r
			i
			b
			t
			t
			i

Contestable Works				
Provision and installation 100m 11kV cable (from existing HV network to substation)				
315kVA substation				
LV mains, service cables and terminations (from substation to the Customer's development)				
Interconnecting LV Cable (from substation to existing LV network)				

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Non-Contestable Works			
Two HV cable joints			
LV cable joint			
Difference between Minimum and the actual Scheme is £11,000. Operation & Maintenance @20%* of £11,000			
Total Extension Asset Cost			

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b) ~~The LV interconnection is requested by us in order to create additional network capacity (No exception).~~

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~~In this case, the assets connecting the existing HV and LV network add capacity to the existing network and none of the exceptions described in paragraphs 1.17-1.21 apply. Therefore they will be treated as Reinforcement. The costs of the Reinforcement assets that form part of the Minimum Scheme (the HV cable and associated HV joints; the 315kVA substation) will be apportioned. The interconnecting LV cable and associated LV joint are considered to be Reinforcement but, as they are over and above the Minimum Scheme and requested by us, the costs will be borne in full by us.~~

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~~Reinforcement:~~

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~~The RSN is that part or parts of the Distribution System that can be used to supply the Customer in both normal and abnormal running arrangements which, in this case, is the distribution substation and the HV Cables.~~

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~~Security CAF calculation: the numerator in the CAF calculation is based upon the Required Capacity of the Customer, which is 250kVA. The denominator is based on the New Network Capacity following Reinforcement, which is 315kVA, i.e. the secure capacity of the distribution substation and HV cables.~~

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		<div> <div></div> <div>7</div> <div>9</div> <div>4</div> <div>%</div> </div>	
315 kVA substation		<div> <div></div> <div>as</div> <div>a</div> <div>b</div> <div>e</div> <div>v</div> <div>e</div> </div>	
Two HV cable joints		<div> <div></div> <div>as</div> <div>a</div> <div>b</div> <div>e</div> <div>v</div> <div>e</div> </div>	
Interconnecting LV Cable (from substation to existing LV network)		<div> <div></div> <div>In</div> <div>e</div> <div>*</div> <div>ee</div> <div>ss</div> <div>of</div> <div>M</div> <div>in</div> <div>i</div> <div>m</div> <div>u</div> <div>m</div> <div>S</div> </div>	

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		e h e m e	
LV Cable Joint		In e x c e e s s o f M i n i m u m S e h e m e	
Total Reinforcement Cost			

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Extension Assets:

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		<p>A</p> <p>P</p> <p>P</p> <p>or</p> <p>ti</p> <p>o</p> <p>n</p> <p>m</p> <p>e</p> <p>nt</p>	
Contestable Work			
LV mains, service cables and terminations (from the substation to the Customer's development)		n/ a	

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Total Extension Asset Cost			
CIC Charges			
Total Connection Charge = £29,365 + £170,000 = £199,365			

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a) The LV interconnection is requested by us but there is little prospect of the capacity created being used (Exception 1).

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In this case all the requirements of Exception 1 (paragraph 1.17) are met so the assets that connect the existing HV and LV Distribution System will be treated as Extension Assets and their costs will not be apportioned. The Customer will pay the costs associated with the Minimum Scheme in full. The interconnecting LV cable and associated LV joint as they are over and above the Minimum Scheme and requested by us, therefore the costs will be borne in full by us

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The Connection Charge for this Scheme is calculated as follows:

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Extension Assets:

		A	
		P	
		P	
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		#	
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		o	
		n	
		m	
		e	
		n	
		t	

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Contestable Works				
Provision and installation 100m 11kV cable (from existing HV network to substation)		n / a		
315 kVA substation		n / a		
LV mains, service cables and terminations (from substation to the Customer's development)		n / a		
Non-Contestable Works				
Two HV cable joints		n / a		

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Interconnecting LV Cable (from substation to existing LV network)		Interconnecting LV Cable (from substation to existing LV network)	
LV Cable Joint		LV Cable Joint	

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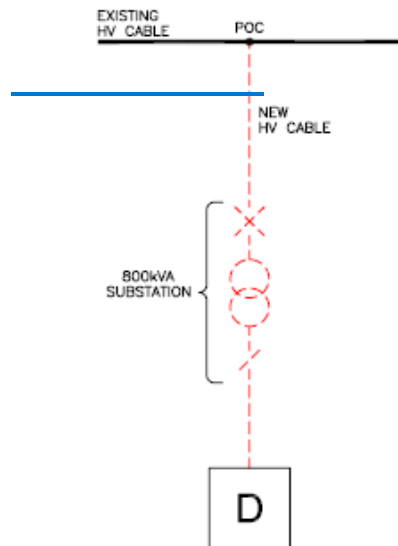
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Example 3: A new connection to a commercial Premises

A Customer requests a new LV three phase 600kVA connection to commercial Premises. Four scenarios for connection are considered below. The Minimum Scheme will be dependent on the specific circumstances as set out in paragraphs 1.1 to 1.7.

(a) Where the Minimum Scheme is a new 800kVA substation teed onto the existing HV network.



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— The Connection Charge for this Scheme is calculated as follows:

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— Extension Assets:

		A p p o rt i o n m e n t	
Contestable Work			
Provision and installation of 150m of HV cable		n / a	

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800kVA substation		n /	4 1 7 7 6 6 6
Provision and installation LV cabling		n /	4 7 4 6 6
Metering panel		n /	4 8 6 6
Non-Contestable Work			
HV joint to network		n /	4 1 7 9 6 6
Total Extension Asset Cost			4 5 4 7 1

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		<p>A</p> <p>P</p> <p>P</p> <p>o</p> <p>#</p> <p>i</p> <p>o</p> <p>#</p> <p>m</p> <p>e</p> <p>#</p> <p>t</p>	
Contestable Work			
Provision and installation of 300m of HV cable		<p>n</p> <p>/</p> <p>a</p>	
800kVA substation		<p>n</p> <p>/</p> <p>a</p>	

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Difference between Minimum and the actual Scheme is £9,000. Operation & Maintenance @20%* of £9,000			
Total Extension Asset Cost			
CIC Charges			

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Total Connection Charge = £64,900

*Note, the 20% Operation and Maintenance figure is illustrative.

(e) The Minimum Scheme is as for scenario a) above but we request an Enhanced Scheme where the substation is looped into the existing HV network.

The Connection Charge for this Scheme is calculated as follows:

Extension Assets:

		A	
		P	

800kVA substation			
Provision and installation LV cabling			
Metering panel			
Non-Contestable Work			
HV joints to network			

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(d) The Minimum Scheme is a new 800kVA substation looped into existing HV network.

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The Connection Charge for this Scheme is calculated as follows:

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Extension Assets:

		A P P e # i e # # e # t	
Contestable Work			
Provision and installation of 300m of HV cable looped to network, HV Ring Main Unit, 800kVA transformer		n / a	

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800kVA substation		n /	
Provision and installation LV cabling		n /	
Metering panel		n /	
Non-Contestable Work			
HV joints to network		n /	
Total Extension Asset Cost			

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CIC Charges			

Total Connection Charge = £63,100

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~~Example 4: Additional load application for commercial Premises (requiring a new connection from the HV network)~~

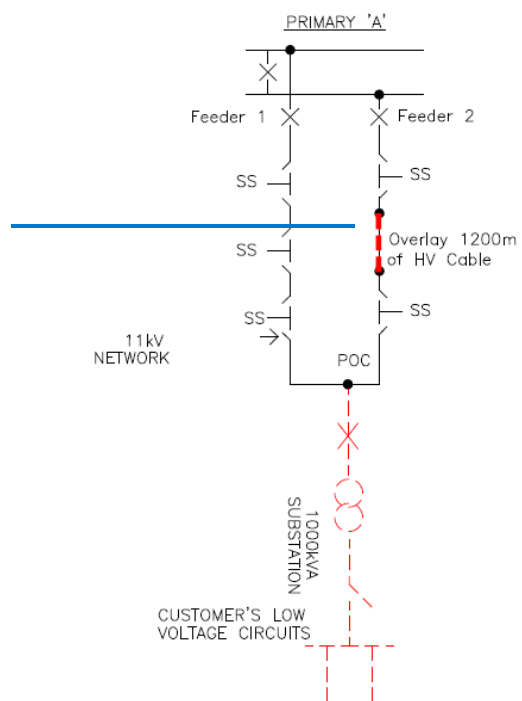
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~~A Customer requests to increase the Maximum Capacity of their existing LV connection from 200kVA to 850kVA; an increase of 650kVA (the Required Capacity).~~

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~~As the Customer's existing LV connection is unable to deliver the Required Capacity a new connection will be required from the local HV network. This will be a non-secure connection to a secure network. The Minimum Scheme is to overlay part of the nearest HV circuit (Feeder 2) which only has spare capacity of 200kVA. The Reinforcement to make the capacity available requires 1200m of existing HV cable to be overlaid with a larger capacity cable.~~

~~Following the Reinforcement the New Network Capacity will be 8000kVA. (i.e. after Reinforcement, in this particular case, the section of cable with the lowest rating in the ring represented by Feeder 1 and Feeder 2 is rated at 8000kVA).~~



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Reinforcement:

The RSN is the two feeder ring comprising Feeder 1 and Feeder 2.

Security CAF calculation: As this request is from an existing customer the numerator in the CAF calculation is based upon the increment of capacity requested, i.e. 650kVA (850kVA 200kVA). The denominator is based upon the New Network Capacity following the Reinforcement.

Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use distribution network and the Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:

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		i	
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		e	
		#	
		t	

Non-Contestable Work			
Overlay 1200m of HV cable		6 5 0 7 8 0 0 0 X 1 0 0 % = 8 . 1 %	
HV Jointing		A s a b e v e	

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Total Reinforcement Cost			
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~~Extension Assets:~~

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Contestable Work			
Provision and installation HV cable		<p> n / a </p>	

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1000kVA substation		<div> <div></div> <div></div> <div></div> </div>	
Termination of Customer's LV cables		<div> <div></div> <div></div> <div></div> </div>	
LV Metering panel		<div> <div></div> <div></div> <div></div> </div>	
Non-Contestable Work		<div> <div></div> </div>	
HV Jointing		<div> <div></div> <div></div> <div></div> </div>	
		<div> <div></div> </div>	
Total Extension Asset Cost		<div> <div></div> </div>	

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CIC Charges			

$$\text{Total Connection Charge} = £10,140 + £52,800 = £62,940$$

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Example 5: Connection of a new embedded generator that requires Reinforcement involving Security and Fault Level CAFs.

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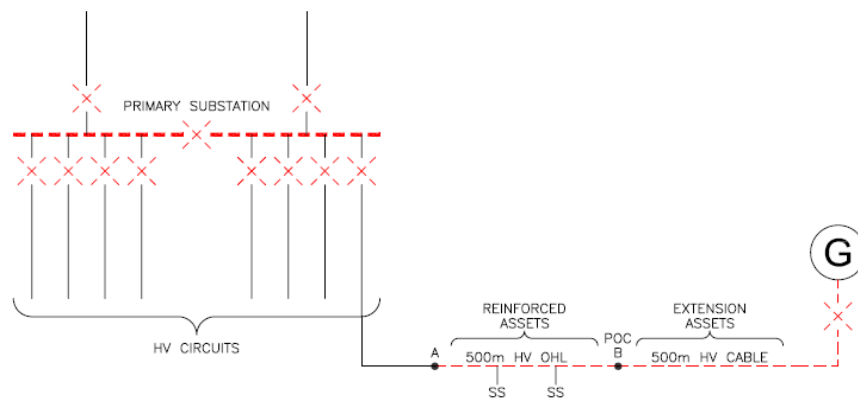
A Customer requests a connection to a generator with a Required Capacity for export purposes of 3MVA. The Fault Level contribution at the primary substation from the generation connection is 10MVA.

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The POC is to the existing HV network at point B and it is proposed to install 500m of HV underground cable from the POC to the Customer's installation. This is a non-secure connection that requires reinforcement of a non-secure network.

The connection requires the Reinforcement of 500m of HV overhead line between points A and B for a thermal capacity requirement and replacement of the existing 11 panel HV switchboard at the primary substation in order to increase its fault level rating from 150MVA to 350MVA. However, the new fault level will be limited by the fault level rating of the local network of 250MVA.

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Reinforcement:

The RSN is the HV network from the primary substation to Point B.

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- Security CAF calculation: the numerator in the CAF calculation is based upon the Required Capacity of the Customer, i.e. 3MVA. The denominator is based on the New Network Capacity following Reinforcement, which is 7.6MVA, i.e. after Reinforcement, in this particular case, the section of cable with the lowest rating.
- The RSN is the 11kV switchboard at the primary substation.
- Fault Level CAF calculation: The numerator in the CAF calculation is based upon the Fault Level contribution from the Customer's new generator connection, in this Example 10MVA. The denominator is based upon the New Fault Level Capacity, which is the lower of the Fault Level capacity of the new HV switchboard, 350MVA or of the local system, 250MVA in this Example.
- The Connection Charge for this Scheme is calculated as follows:
- Reinforcement:

		A	
		P	
		P	
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Non-Contestable Work			
Re-conductor of 500m of HV-overhead-line		3 7 7 6 * + 0 0 % = 3 0 7 5 % S e e # # t y € A F	

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Replacement of existing 11 panel 11kV switchgear		3	
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		A F	
Total Reinforcement Cost			

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Extension Assets:

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		A P P e r t i e n n e t	
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Contestable Work			
Installation of 500m HV cable			
HV circuit breaker at Customer's substation			
Non-Contestable Work			
HV pole top termination			
Total Extension Asset Cost			

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CIC Charges			
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Total Connection Charge = £84,142 + £58,400 = £142,542

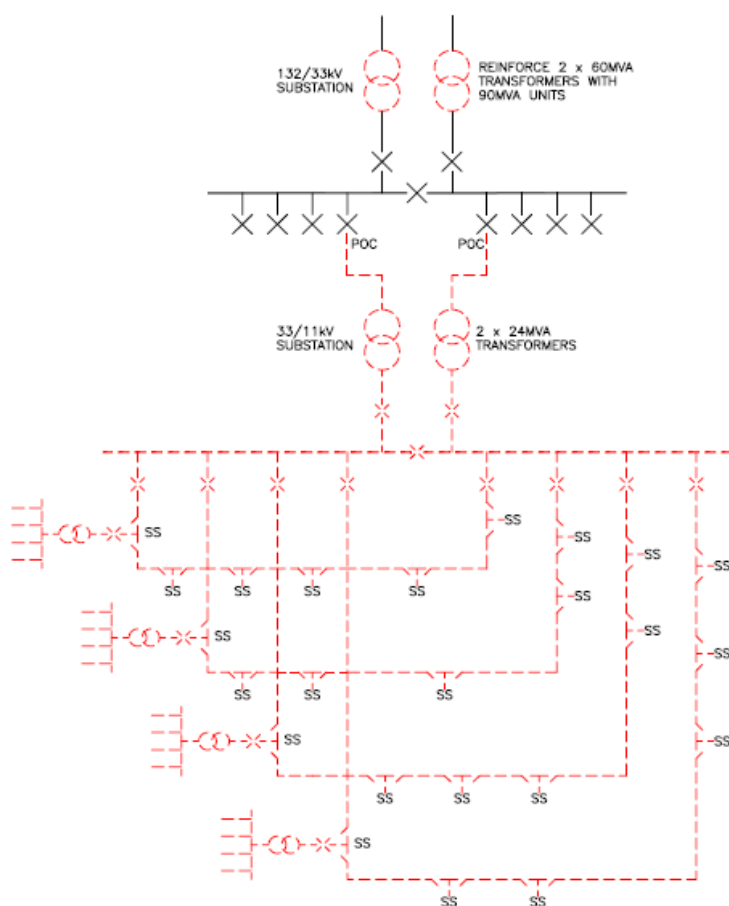
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Example 6: Connection of Mixed Housing and Commercial Development

The Customer requests 18MVA for a new mixed housing & commercial development site which comprises of 7,000 plots and a mixture of small commercial Premises. The POC on the network will be at the two existing 33kV circuit breakers located at the 132/33kV substation approximately 600m from the site boundary. In order to accommodate the Required Capacity it will be necessary to reinforce the two 60MVA, 132/33kV, transformers with 90MVA transformers. It will then be necessary to extend the network and establish a 2 by 24MVA transformer 33/11kV substation on site with an extendable HV board in this new substation. The HV board will comprise of 2 incomer, 1 bus section and 8 outgoing circuit breakers. From this substation there will be 3km of HV cable required to supply 24 substations. From each of

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these 24 substations there will be associated LV cable and services as required.

Reinforcement:

The RSN for the Reinforcement is the transformers at the existing 132/33kV substation

Security CAF calculation: the numerator in the CAF calculation is based upon the Required Capacity of the Customer, i.e. 18MVA. The denominator is based on the secure New Network Capacity following Reinforcement, i.e. 90MVA.

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— Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

— The Connection Charge for this Scheme is calculated as follows:

— Reinforcement:

		A P P e ft i e n m e n t	
Non-Contestable Work			
Replace two 60MVA, 132/33kV transformers with two 90MVA transformers.		1 8 7 9	

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Extension Assets:

		Apprenticeship	
Contestable Work			
600m of 2 by 33kV cable		7	

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3000m of HV circuits, 24 HV/LV substations, LV cable and services		£	
2 by 24MVA transformer substation		£	
Non-Contestable Work			
Terminate two 33kV cables on to two existing 33kV circuit breakers.		£	
Total Extension Asset Cost			

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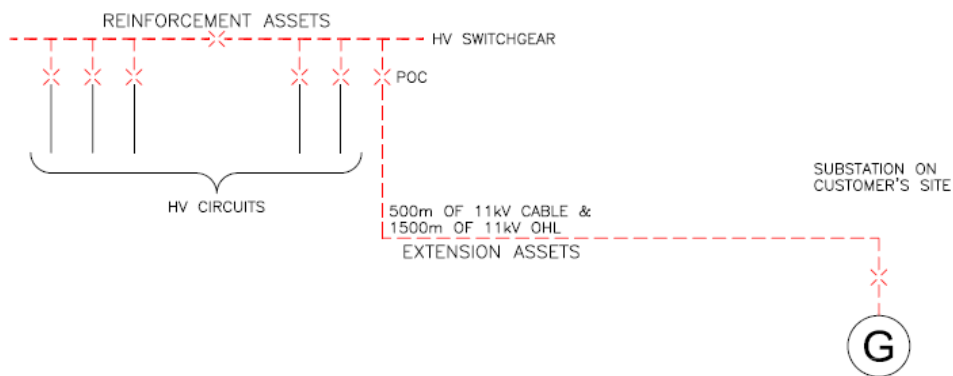
CIC Charges			
Total Connection Charge = £9,205,000 + £300,000 = £9,505,000			

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Example 7A: New 3MVA Generation Connection, Fault Level Triggered Reinforcement

A Customer wishes to connect a new generator with a Required Capacity for export purposes of 3MVA. The connection of the generator requires the installation of 500m of 11kV cable and 1500m of overhead line between a new circuit breaker, added to the 11kV extensible switchgear panel at an existing primary substation and a new substation at the Customer's Premises. The 24MVA Fault Level contribution from the generator necessitates Reinforcement works to replace the 11kV switchgear at the existing primary substation with switchgear of a higher fault level rating.



Reinforcement:

Fault Level CAF calculation: The numerator in the CAF calculation is based upon the Fault Level contribution from the Customer's new generator connection, in this Example 24MVA. The denominator is based upon the New Fault Level Capacity, in this Example the Fault Level capacity of the new 11kV switchboard, 315MVA.

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— The Connection Charge for this Scheme is calculated as follows:

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— Reinforcement:

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— Non-Contestable Work			
— Replacement HV switchboard (excluding Customer's sole use circuit breaker)		3	
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Extension Assets:

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Installation of a 1500m HV overhead line			
HV circuit breaker at Customer substation			
Total Extension Asset Cost			
CIC Charges			

$$\text{Total Connection Charge} = \pounds 102,857 + \pounds 125,000 = \pounds 227,857$$

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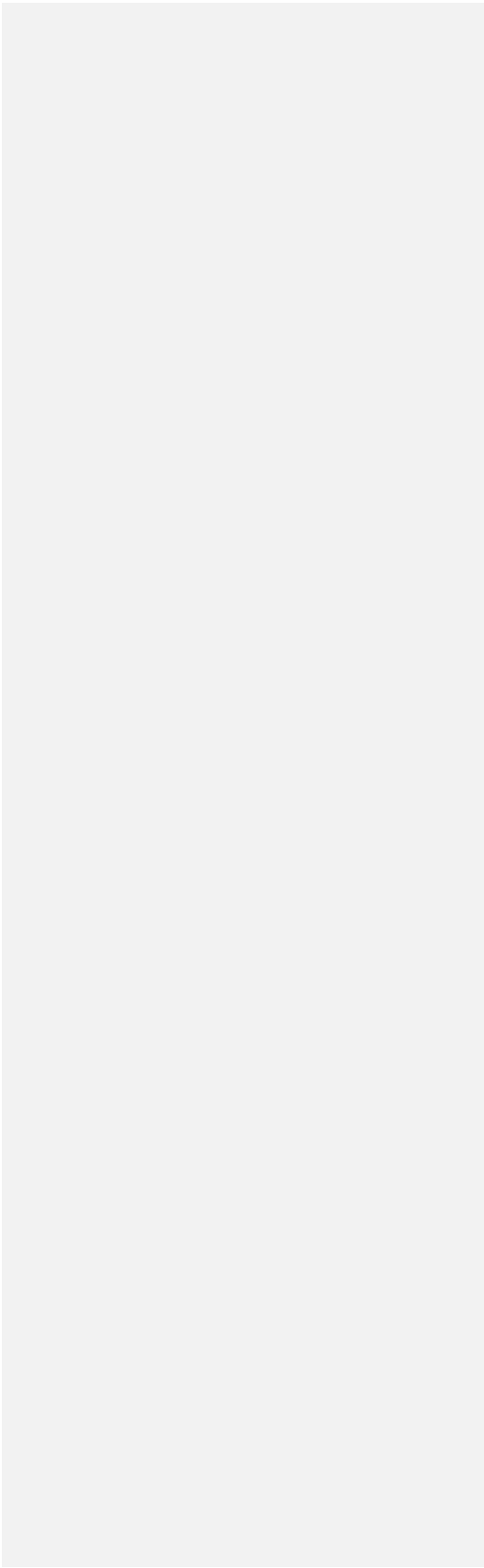
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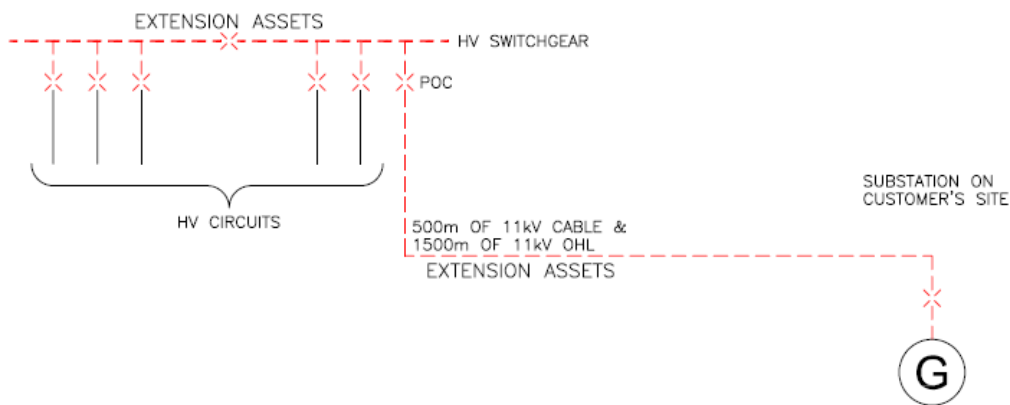


Example 7B: New 3MVA Generation Connection, Switchgear Extension Not Possible

This example demonstrates the application of Exception 4 (paragraph 1.20).

A Customer requests to connect a new generator with a Required Capacity for export purposes of 3MVA. The connection of the generator requires the installation of the works as provided in Example 7A above. In this scenario, however, there is no Fault Level issue but, as the connection cannot be facilitated by an extension of the existing switchgear equipment in our primary substation, a full replacement of the existing switchgear installation is required. As no capacity is added to the existing shared use distribution

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network, the Customer will be required to fund the full cost of the switchgear installation replacement.

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The existing switchgear had fault level rating of 250MVA. The company no longer uses switchgear with a fault level rating of 250MVA, so uses the closest equivalent switchgear used by it as standard, which has a slightly higher rating. Whilst the replacement switchgear increases the fault level capacity and could be considered Reinforcement, in this case this is due solely to the fault level rating of the standard equipment used by the company being higher than the fault level rating of the existing switchgear. The increase in

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~~fault level capacity is not required to connect the customer. Therefore, Exception 4 (Paragraph 1.20) applies and the switchgear will be considered to be Extension Assets and its costs will be charged in full to the customer.~~

— The Connection Charge for this Scheme is calculated as follows:

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— Extension Assets:

		A P P e r i o n m e n t	
Contestable Work			
Installation of a 500m HV cable		n /	

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Installation of a 1500m HV overhead line			
HV circuit breaker at Customer substation			
Non-Contestable Work			
Replacement 11kV switchboard			
New Extension Asset circuit breaker			

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Total Extension Asset Cost			
CIC Charges			

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Total Connection Charge = £575,000

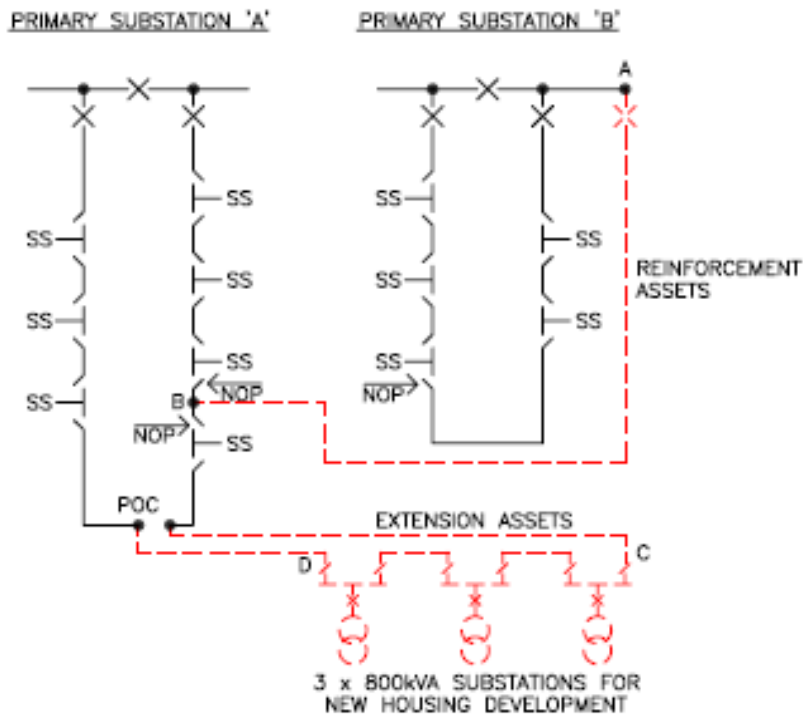
Example 8A: Connection of housing development with network Reinforcement

A new housing development has a Required Capacity of 2MVA to serve 900 plots. The local 11kV feeder has a network capacity of 7.7MVA based upon the limitation of the existing 400 Amp circuit breakers at Primary Substation A. The existing load on the circuit is 7.6MVA. It is therefore not possible to connect the new load to this circuit without Reinforcement works. To reinforce the circuit it is proposed to install a new circuit breaker at Primary Substation B and install a new 11kV feeder (also rated at 7.7MVA) to the local 11kV circuit. The new 11kV feeder is used to split the existing circuit from a secure two to a secure three feeder network. The newly installed cable between point A and B is 1300m long. The newly installed cable to connect the development from the POC is 1200m.

This Reinforcement will allow a POC to be taken from the local 11kV circuit to supply the new development. Three 800kVA distribution substations are established onsite. The above work represents the Minimum Scheme to provide services to the new site.

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The figure below shows the proposed Reinforcement and POC to the 11kV



network:

Reinforcement:

The RSN for the Reinforcement

For the Reinforcement CAF the RSN is considered to be the secure three feeder 11kV network comprising the two feeders from Primary Substation A and the new feeder from Primary Substation B as this new feeder is capable of feeding either of the existing circuits. The numerator in the CAF calculation is based upon the Required Capacity of the new development, i.e. 2MVA. In this case, the New Network Capacity (under secure N-1 conditions) following the Reinforcement works is equal to $(3-1) \times 7.7\text{MVA} = 15.4\text{MVA}$.

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— Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

— The Connection Charge for this Scheme is calculated as follows:

— Reinforcement:

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Non-Contestable Work			
1300m of 11kV Cable		2	
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Extension Assets:

		At present the extension is	
Contestable Work			
1200m of 11kV Cable		is	

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3 by 800kVA distribution substations			
On site LV mains and services			
Non-Contestable Work			
2 by 11kV closing joints			
Total Extension Asset Cost			

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CIC Charges			

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$$\text{Total Connection Charge} = \pounds 23,117 + \pounds 605,000 = \pounds 628,117$$

Example 8B: Connection of housing development

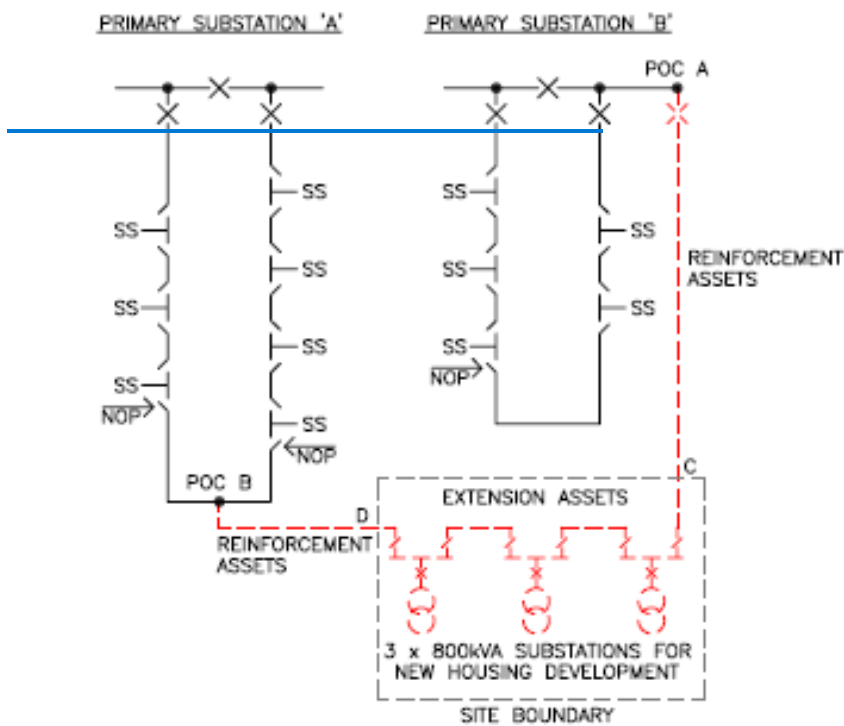
This example demonstrates the application of Exception 5 (paragraph 1.21)

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In this variation of the previous Example the site is closer to Primary Substation B and the Minimum Scheme is to connect the new load to the new 11kV feeder from Primary Substation B and provide interconnection to an existing secure 11kV feeder from Primary Substation A. In this Example 600m of 11kV cable on site (between Points C and D) is required to provide connectivity within the development and is considered to be Extension Assets.

The figure below shows the proposed network.

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The assets connecting POC A and POC B add capacity to the existing network, so would normally be treated as Reinforcement. These comprise

- the assets between the Customer's site and POC A (POC A to point C);
- the assets between the Customer's site and POC B (POC B to point D); and
- the 600m of 11kV cable on site.

The three 800kVA substations are not considered to provide connection between POC A and POC B. The 600m of 11kV cable on site is additional network length to provide connectivity between multiple exit points on the Customer's site. Therefore, Exception 5 applies and the 600m of 11kV cable on site will be treated as Extension Assets and its costs will be charged in full to the customer. No exceptions apply to the assets between POC A and point C and POC B and point D. Therefore, these will be treated as Reinforcement and their costs will be apportioned.

Reinforcement:

The RSN for the Reinforcement

The RSN is considered to be the secure three feeder 11kV network comprising the two feeders from Primary Substation A and the new feeder from Primary Substation B. As in the above example the numerator in the CAF calculation is based upon the Required Capacity of the new development, i.e. 2MVA. In this case, however the work to provide the connection will increase the capacity of the existing shared use Distribution System from 7.7MVA to 15.4MVA. The New Network Capacity (under secure N-1 conditions) following the Reinforcement works is equal to $(3-1) \times 7.7\text{MVA} = 15.4\text{MVA}$.

Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use Distribution System and Fault Level CAF is therefore not applicable here.

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— The Connection Charge for this Scheme is calculated as follows:

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— Reinforcement:

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— Non-Contestable Works			
— 1 new 11kV Circuit Breaker tailed out from primary substation B		<p>2</p> <p>/</p> <p>+</p> <p>5</p> <p>7</p> <p>4</p> <p>*</p> <p>+</p>	

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<u>Total Reinforcement Cost</u>			
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<u>Extension Assets:</u>		<u>A</u>	
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Contestable Works			
600m of 11kV cable on site		<ul style="list-style-type: none"> • 	
3 by 800KVA unit Substation		<ul style="list-style-type: none"> • 	
On site LV mains and services		<ul style="list-style-type: none"> • 	
Non-Contestable Work			
2 by 11kV cable box terminations		<ul style="list-style-type: none"> • 	

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Total Extension Asset Cost			
CIC Charges			
Total Connection Charge = £23,376 + £542,000 = £565,376			

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Example 8C: Connection of housing development with remote network Reinforcement

This further variation shows the arrangements that will apply where it is necessary to reinforce a different part of the Distribution System so that existing demand may be transferred in order to release capacity for the new connection:

A new housing development has a Required Capacity of 2MVA to serve 900 plots. The local 11kV feeder has a network capacity of 7.7MVA based upon the limitation of the existing 400 Amp circuit breakers at Primary Substation A. The existing load on the circuit is 7.6MVA. It is therefore not possible to connect the new load to this circuit without Reinforcement works.

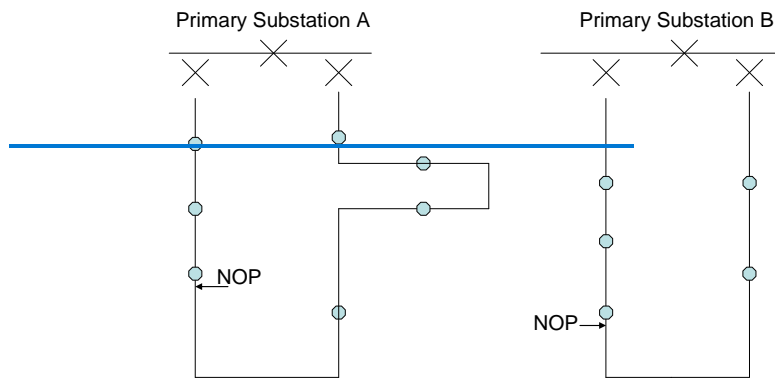
It is proposed to reinforce an adjacent network so that two existing substations may be transferred on to it, in order to release capacity so that the new connections can be made. Primary Substation B has sufficient spare capacity to accommodate the two existing substations. A new circuit breaker is to be installed at Primary Substation B and a new 11kV feeder (also rated at 7.7MVA) is to be installed between points A—B and between points E—F for connection to the local 11kV circuit at point F. The existing circuit will be cut at point BE so that the new joints can be made. This will convert the Primary Substation B network from a two-feeder to a three-feeder network. The total new cable length between points A—B and points E—F is 500m. The network will be reconfigured by the installation of two short straps C—D and G—H in order to maintain connectivity.

This Reinforcement will allow a POC to be taken from the local 11kV circuit to supply the new development. The newly installed cable to connect the development from the POC is 1200m long. Three 800kVA distribution substations are to be established onsite. The above work represents the Minimum Scheme to provide connections to the new site.

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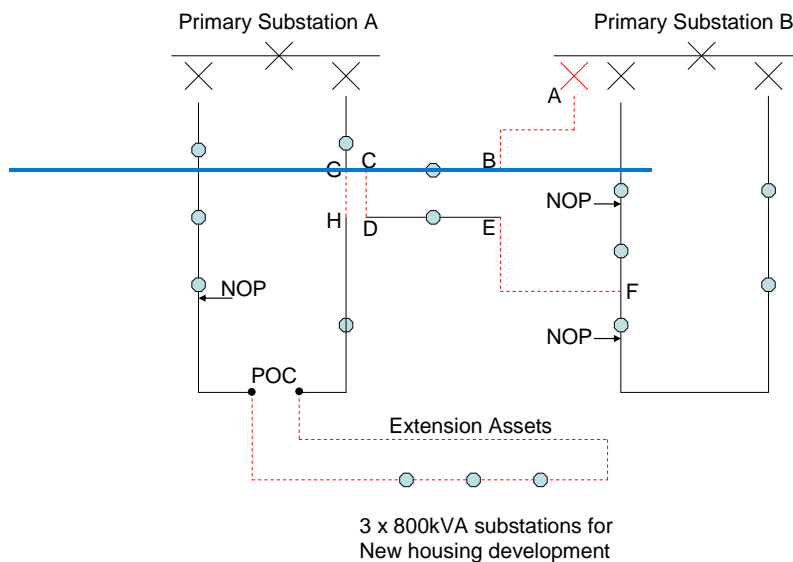
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~~Proposed network:~~



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Reinforcement:

The RSN for the Reinforcement

For the Reinforcement CAF the RSN is the three-feeder network from Primary Substation B which supplies the loads on the existing two feeders from Primary Substation B as well as the loads at points C and D transferred from the network from the Primary Substation A. The Relevant Section of Network does not supply the new development in this case. The numerator in the CAF calculation is based upon the Required Capacity of the new development, i.e. 2MVA. In this case, the New Network Capacity (under N-1 conditions) following the Reinforcement works is equal to $(3-1) \times 7.7\text{MVA} = 15.4\text{MVA}$.

Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared-use distribution network and Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

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Reinforcement:

	Cost	Apportionment	Customer Contribution
Non Controllable Work			
500m of 11kV cable: A-B, C-D, E-F	£50,000	2/15.4 x 100% = 13%	£6,500
11kV Circuit Breaker at Primary Substation B	£45,000	As above	£5,844
11kV jointing at Points	£10,000	As above	£1,300

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A,B,C ,D,E,F			
Total reinfor cemen t cost	£1 05, 00 0		£13,6 44

Extension Assets:

	Co st	Apporti onment	Custo mer Contri bution
Cont estab le Wor k			
1200 m of 11kV cable inc. strap at G -H	£12 0,0 00	n/a	£120, 000

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3 by 800kVA distribution substations	£150,000	n/a	£150,000	Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single
On site LV mains and services	£330,000	n/a	£330,000	Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single
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Non Contenable Work				Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single
4 by 11kV closing joints at POC and	£10,000	n/a	£10,000	Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single

at point s G,H			
Total exten sion asset cost	£61 0,0 00		£610, 000
CiC charg es			£3,50 0

Total Connection Charge = £13,644 + £610,000 = £623,644

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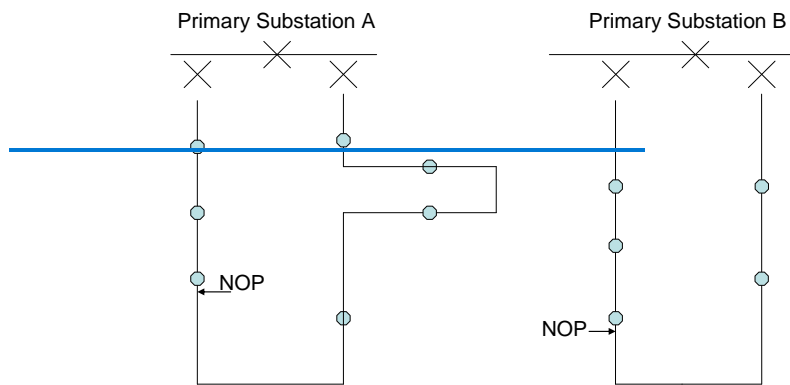
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- Example 8D: Connection of housing development with load transfer
- An additional variation shows the arrangements that will apply where it is necessary to reconfigure the Distribution System so that existing demand may be transferred in order to release capacity for the new connection.
- A new housing development has a Required Capacity of 2MVA to serve 900 plots. The local 11kV feeder has a network capacity of 7.7MVA based upon the limitation of the existing 400 Amp circuit breakers at Primary Substation A. The existing load on the circuit is 7.6MVA. It is therefore not possible to connect the new load to this circuit as presently configured.
- It is proposed to reconfigure the Distribution System such that two existing substations may be transferred on to an adjacent network, in order to release capacity so that the new connections can be made. Primary Substation B has sufficient spare capacity to accommodate the two existing substations. New cables are to be installed between points A—B and between points E—F. The existing circuit will be cut at point BE so that the new joints can be made. The total new cable length between points A—B and points E—F is 100m. The network will be reconfigured by the installation of two short straps C—D and G—H in order to maintain connectivity.
- This transfer of existing demand will allow a POC to be taken from the local 11kV circuit to supply the new development. The newly installed cable to connect the development from the POC is 1200m long. Three 800kVA distribution substations are to be established onsite. The above work represents the Minimum Scheme to provide connections to the new site.

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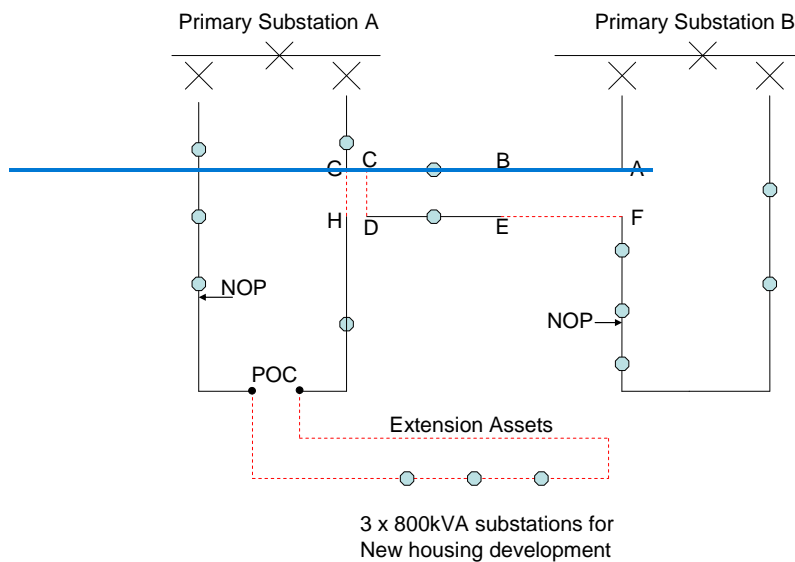
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~~Proposed network:~~



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:

Asset	Cost	Apportionment	Customer Contribution
Contestable Work			
1300m of 11kV cable including A-B;	£120,000	n/a	£120,000

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C-D, E- F, G-H and from POC to the develop ment			
3 by 800kVA distribut ion substatio ns	£1 50 ,0 00	n/a	£150 ,000
On-site LV mains and services	£3 30 ,0 00	n/a	£330 ,000
Non Contesta ble Work			
10 by 11kV closing joints at POC and at	£2 5, 00 0	n/a	£25, 000

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points A,B,C,D E,F,G, H			
Total extension asset cost	£6 25 ,0 00		£625 ,000
CiC charges			£3,5 00

Total Connection Charge = £625,000

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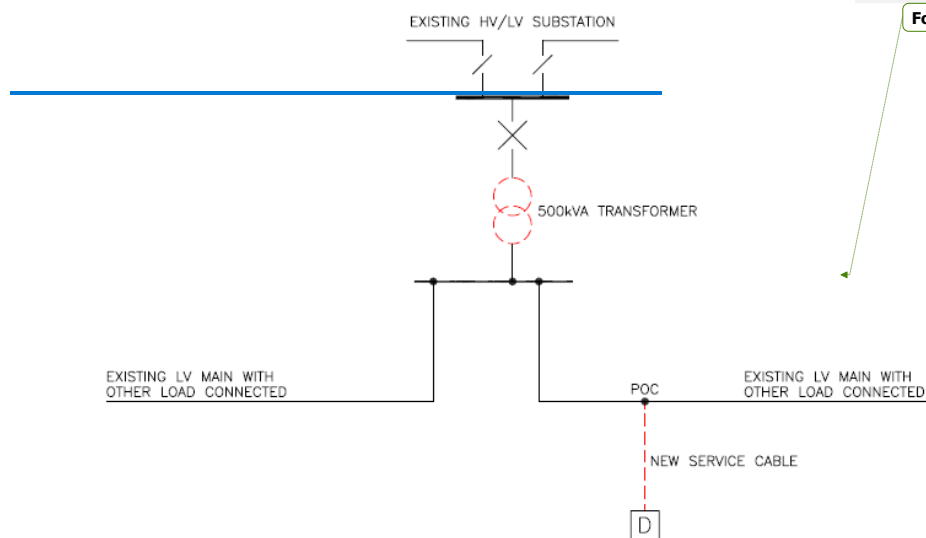
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Example 9: Minimum Scheme

A Customer requests a new 100kVA connection. There is sufficient spare capacity on the adjacent LV main but the existing 300kVA transformer at the local 11kV/LV substation is fully loaded.

(a) The Minimum Scheme is to provide a new service cable and to replace the 300kVA transformer at the local substation with a 500kVA transformer.



Reinforcement:

The RSN for the Reinforcement is the HV/LV transformer

Security CAF calculation: the numerator in the CAF calculation is based upon the Required Capacity of the Customer, i.e. 100kVA. The denominator is based on the New Network Capacity following Reinforcement, i.e. 500kVA.

Fault Level CAF calculation: This scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

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— The Connection Charge for this Scheme is calculated as follows:

— Reinforcement:

		<div>A</div> <div>P</div> <div>P</div> <div>⊖</div> <div>⊞</div> <div>i</div> <div>⊖</div> <div>⊞</div> <div>⊞</div> <div>e</div> <div>⊞</div> <div>t</div>	
— Non-Contestable Work			
— Replacement 500kVA transformer		<div>1</div> <div>⊖</div> <div>⊖</div> <div>/</div> <div>5</div> <div>⊖</div> <div>⊖</div> <div>*</div>	

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Contestable Work			
Provision and installation of LV service cable			
Non-Contestable Work			
LV joints to network			
Total Extension Asset Cost			

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CIC Charges			

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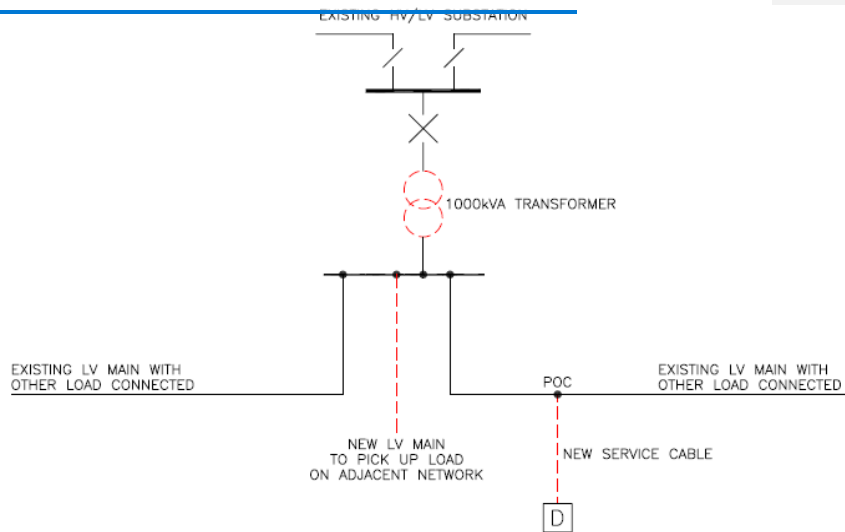
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Total Connection Charge = £2,000 + £2,000 = £4,000

(b) However the DNO wishes to carry out an Enhanced Scheme to install a 1000kVA transformer at the local substation and install a new LV main that will connect to and pick up load from an adjacent LV network.

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The RSN for the Reinforcement is the HV/LV transformer

Security CAF calculation: the numerator in the CAF calculation is based upon the Required Capacity of the Customer, i.e. 100kVA. The denominator is based on the New Network Capacity following Reinforcement, i.e. 1000kVA.

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~~Fault Level CAF calculation: This scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.~~

Reinforcement:

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		A P P e H i o n m e n t	
Non Contestable Work			
Replacement 1000kVA transformer		L O / L O O O *	

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Contestable Work			
Provision and installation of LV service cable			
Non-Contestable Work			
LV joints to network			
Total Extension Asset Cost			

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CIC Charges			

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Total Connection Charge = £1,500 + £2,000 = £3,500

The cost of the new LV mains will be met by us and does not form part of the Connection Charge.

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In this instance the Connection Charge resulting from the Enhanced Scheme is lower than that resulting from the Minimum Scheme and the Customer would benefit from the lower Connection Charge and pay £3,500 (paragraph 1.5 refers).

(c) If, however under the proposed DNO Scheme the transformer cost was £25,000 then the resultant Connection Charge would be considered as follows:

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Reinforcement:

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		A	
		P	
		P	
		0	
		#	
		i	
		0	
		n	
		m	
		e	

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Non-Contestable Work			
Replacement 1000kVA transformer			

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Total Reinforcement Cost			
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Extension Assets:			
		<p>A</p> <p>P</p> <p>P</p> <p>+</p> <p>#</p> <p>i</p> <p>+</p> <p>#</p> <p>m</p> <p>e</p> <p>#</p> <p>t</p>	
Contestable Work			

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Provision and installation of LV service cable		£	
		£	
Non-Contestable Work			
LV joints to network		£	
		£	
Total Extension Asset Cost			
CIC Charges			

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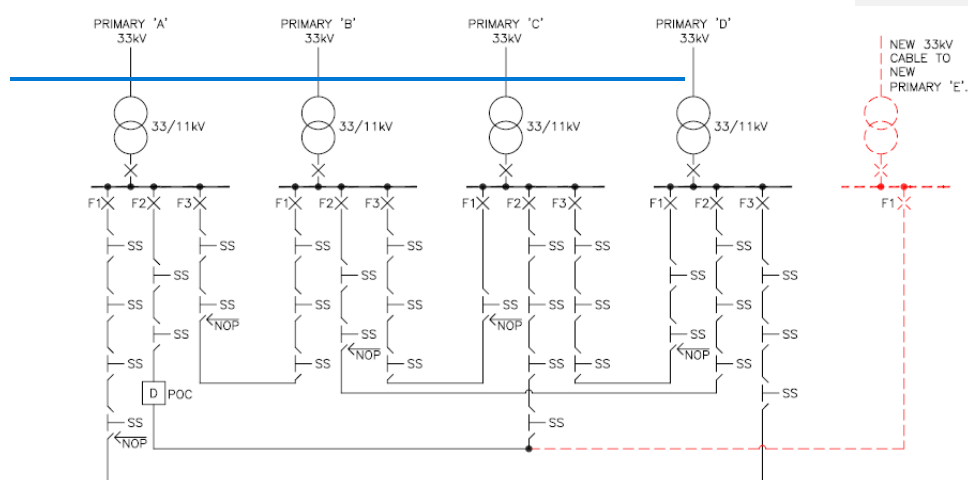
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Total Connection Charge = £2,500 + £2,000 = £4,500 but in this instance the Customer contribution will be capped at the contribution that would have been due under the Minimum Scheme, i.e. £4,000 (paragraph 1.5 refers).

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Example 10: A new connection application for commercial Premises on a meshed 11kV distribution system requiring Reinforcement.

A Customer requests a new connection to a commercial premise requiring a 4MVA HV metered connection. The local 11kV network is of a meshed design whereby the 11kV network is supplied from single 33/11kV primary transformers via 33kV radial feeds as shown below.



The existing network consists of four 10MVA primary transformer substations and associated 11kV switchgear. A new connection of 4MVA has been requested in the vicinity of F2 from Primary A.

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The existing relevant primary transformer group is loaded to its secure capacity so the primary transformer group will require Reinforcement to enable the new connection to progress.

To provide the Required Capacity, the 11kV network will be reinforced by the installation of a new primary substation connected to the nearest 33kV circuit. The new primary substation (Primary E) will contain a 10MVA transformer, associated 11kV switchgear and a new 11kV (7.7 MVA) cable installed to interconnect into the existing 11kV network (from F2 at Primary A to F2 at Primary C).

~~Reinforcement:~~
~~Security CAF calculation: In this example there are two different security CAFs applied. This is because the RSN is different when considering the new network capacity in respect of different elements of the Reinforcement works.~~
~~The RSN for the Reinforcement comprising the 11kV Cable Works:~~
~~For the 11kV cable assets the RSN is considered to be the secure three feeder 11kV network from Primary A (Feeder 2), Primary C (Feeder 2) and Primary E (Feeder 1). In this case the New Network Capacity (under secure N-1 conditions) following the Reinforcement works is equal to~~
 ~~$(3 - 1) \times 7.7\text{MVA} = 15.4\text{MVA}$~~
~~This is due to the fact that following the Reinforcement work both of the existing circuits; Primary A, Feeder 2 and Primary C, Feeder 2 can be loaded to their full capacity and will have the newly installed clean feeder from Primary E to act as a back feed to meet the requirements of P2/6.~~
~~The security CAF for these assets will therefore be $4/15.4 \times 100\% = 26.0\%$~~
~~The RSN for the Reinforcement comprising the Primary substation assets:~~
~~In this instance the RSN comprises Primary A, C and E within the group that can be used to supply the customer. The New Network Capacity of this RSN (under secure N-1 conditions) following the Reinforcement works is equal to 17.7MVA. (10MVA from either Primary A or Primary C and 7.7MVA from Primary E which is limited by the single 11kV cable connected to it.~~
~~The security CAF for these assets will therefore be $4/17.7 \times 100\% = 22.6\%$~~
~~Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.~~

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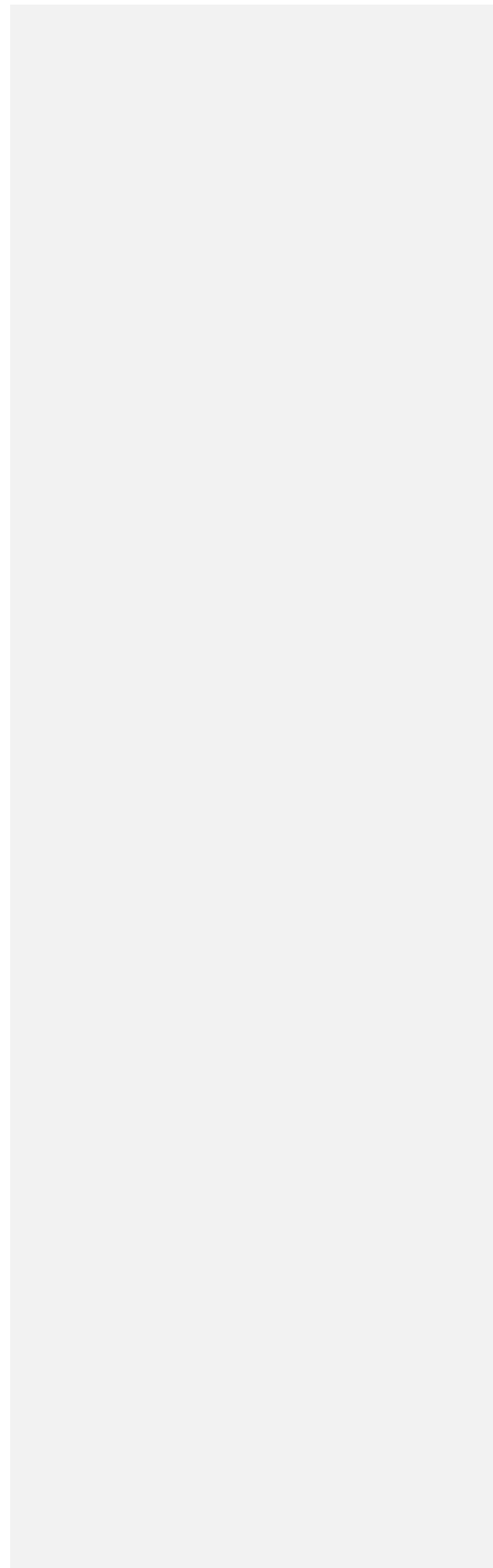
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— The Connection Charge for this Scheme is calculated as follows:

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— Reinforcement:

		A P P e t i e n m e n t	
Non-Contestable Works			
500m 11kV cable from new primary substation E		4 / + 5 / 4 X +	

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		7 6 %	
Primary transformer		A s a b e v e	
2.5km of 33kV cable installation		A s a b e v e	
33kV Circuit Breaker		A s a b e v e	
33kV Terminations		A s a b e	

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		e	
Total Reinforcement Cost			

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~~Extension Assets:~~

		<p>A</p> <p>P</p> <p>P</p> <p>e</p> <p>ft</p> <p>i</p> <p>e</p> <p>n</p> <p>m</p> <p>e</p> <p>n</p> <p>t</p>	
Contestable Work			
HV ring main unit		<p>n</p> <p>/</p> <p>a</p>	

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HV metering unit		1	1
500m of 11kV cable		1	1
Non-Contestable Work			
2 by 11kV closing joints		1	1
Total Extension Asset Cost			

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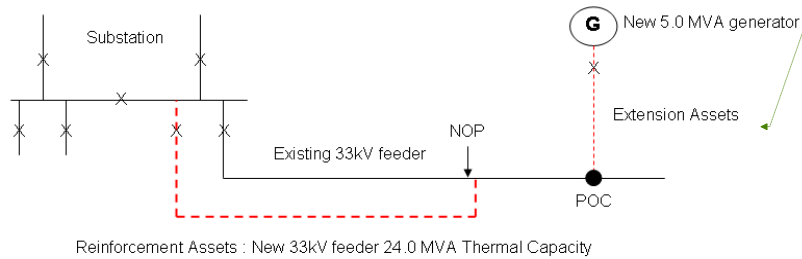
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~~Total Customer Contribution = £298,771 + £135,000 = £433,771~~

Example 11: Non-Secure Connection With Non-Secure Reinforcement

A Customer wishes to connect a new generator with a Required Capacity for export purposes of 5 MVA. The connection of the generator requires the installation of 1,000m of 33kV cable and a 33kV metering circuit breaker, these being Extension Assets. An existing spare circuit breaker at the substation is utilised which, in this case, is not chargeable to the Customer.

As there is insufficient capacity in the existing 24.0 MVA thermal capacity rated 33kV feeder for the new generation due to the presence of existing generation, the connection also requires the installation of a new 33kV feeder, which also has a thermal capacity of 24.0 MVA, as Reinforcement. This is the Minimum Scheme as it is cheaper to do this, to the extent as shown in the diagram below, rather than upgrade the existing 33kV feeder to the same point along it.



Reinforcement:

The numerator in the CAF calculation is the Required Capacity of the new generator, which is 5.0 MVA.

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~~The Relevant Section of Network in this case is the existing 33kV feeder and the new 33kV feeder. The New Network Capacity is calculated using the non-secure capacity and is therefore the sum of the thermal capacities of the two feeders, which is 48.0 MVA. This is the denominator in the CAF calculation.~~

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The Connection Charge for this Scheme is calculated as follows:

Reinforcement:

	Cost	Apportionment	Customer Contribution
Contestable Work			
Installation of new 33kV feeder	£50,000	$\frac{5.0}{48.0} \times 100\% = 10.4\%$	£52,000
Total Reinforcement Cost	£50,000		£52,000

Extension Assets:

	Cost	Apportionment	Customer Contribution

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Cont establ e Work			
Instal lation of 1,000 m 33kV cable	£ 20 0, 00 0	n/a	£ 200,0 00
Instal lation of 33kV meter ing circuit break er	£ 70 0, 00	n/a	£ 70,00 0
Non- Cont establ e Work			
Joints to 33kV	£ 10	n/a	£ 10,00 0

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netw ork	0 00		
Total Exten sion Asset Cost	£ 28 0, 00 0		£ 280,0 00
CIC Char ges			£ 3,500

Total Connection Charge = £ 52,000 + £ 280,000 = £ 332,000

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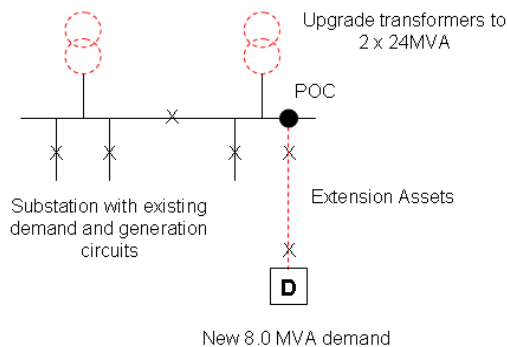
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Example 12: Non-Secure Connection With Secure Reinforcement

A Customer requests a new connection to industrial premises requiring an 8 MVA metered demand connection. In this case, the Customer has exercised their option to request non-secure Extension Assets in the provision of the connection.

The existing network comprises a substation which has 2 x 15 MVA transformers. The Minimum Scheme to provide the connection is to install 750m of 11 kV cable from the substation to the industrial premises, as Extension Assets. As there is insufficient capacity available from the existing 2 x 15 MVA transformers to provide the new connection, it will be necessary to upgrade the transformers to 2 x 24 MVA units. Both transformers at the substation must be upgraded to ensure the 11kV network load can be maintained during planned or unplanned outages of one of the transformers. Although the Customer wishes to accept a non-secure connection, the substation must provide secure capacity to its Group Demand (which includes the Customer) to comply with the requirements of Engineering Recommendation P2/6. As the Extension Assets will be provided solely for the Customer, these can be provided on the basis of a single circuit to provide a non-secure connection, at the Customer's request.



Reinforcement:

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— The numerator in the CAF calculation is the Required Capacity of the new demand, which is 8.0 MVA.

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— The Relevant Section of Network in this case is the transformers at the substation. The New Network Capacity is the secure capacity of the transformers, which is 24 MVA. This is the denominator in the CAF calculation.

— The Connection Charge for this Scheme is calculated as follows:

— Reinforcement:

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	Cost	Apportionment	Customer Contribution
Non-Contestable Work			
Installation of 2 x 24 MVA 33/11 kV transformers	£1,500,000	8.0/24.0 x 100% = 33.3%	£500,000

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Total	£		£
Reinforce	1,5		500,00
ment Cost	00		00
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Extension Assets:

	Cost	Apportionment	Customer Contribution
Contestable Work			
Installation of 750m 11kV cable	£ 75,00	n/a	£ 75,00
Installation of 11kV metering circuit	£ 50,00	n/a	£ 50,00

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break er			
Non- Cont establ e Work			
Joints to 11kV netw ork	£ 5, 00 0	n/a	£ 5,000
Total Exten sion Asset Cost	£ 13 0, 00 0		£ 130,0 00
CIC Char ges			£ 1,100

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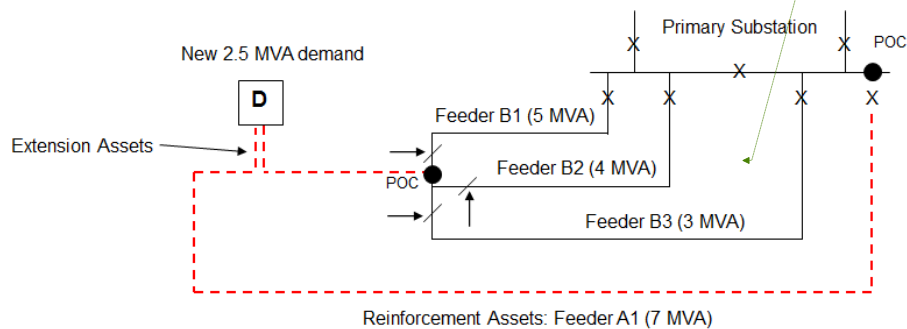
Total Connection Charge = £ 500,000 + £ 130,000 = £ 630,000

Example 13: Secure Connection With Secure Reinforcement

A Customer requests a new connection to commercial premises which has a Required Capacity of 2.5 MVA. The connection is to be provided on a secure basis and the Minimum Scheme is as shown:

On the existing network, only Feeder B1 has sufficient thermal capacity available to accommodate the additional demand. To comply with demand security requirements, it is necessary to install a new feeder (Feeder A1) with a thermal capacity of 7 MVA, as a Reinforcement of the network.

The Extension Assets in this case are two 11 kV cable circuits of 25m each.



Reinforcement:

If sufficient capacity had been available in the existing network, only two of the existing feeders would have been required to provide the required security. To determine which two feeders are relevant, the feeders with the closest ratings to the new feeder are considered.

In this case, Feeders B1 (5 MVA) and B2 (4 MVA) have the closest ratings to the new Feeder A1 (7 MVA). Therefore, the Relevant Section of Network is (B1 and B2) and A1. Note that the RSN will at most be limited to a three-feeder ring.

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- The New Network Capacity is determined by applying (N – 1) security to the three feeder RSN. This gives a secure NNC of (5 MVA + 4 MVA) = 9 MVA. This recognises the possible loss of feeder A1 and supply through Feeder B1.
- Therefore, the numerator in the CAF calculation is the Required Capacity of 2.5 MVA and the denominator is the New Network Capacity of 9.0 MVA.
- The Connection Charge for this Scheme is calculated as follows:
- Reinforcement:

	— € Cost	— Apportionment	— Customer Contribution
— Contestable Work			
— Installation of new 11kV feeder	— £ 25,000	— 2.5 / 9.0 x 100% = 27.8%	— £ 69,500
— Total Reinforcement Cost	— £ 25,000		— £ 69,500

- Extension Assets:

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		Apper tionme nt	€ # \$ t @ m e r € @ # t r i b # t i @ #
Contestable Work			
Installation of 2 x 25m 11kV cable		n/a	£ + @ r @ @ @
Installation of 2 x 11kV		n/a	£ +

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metering circuit breakers			0 0 7 0 0 0
Non- Contestable Work			
Joints to 11kV network		n/a	£ 5 7 0 0 0
Total Extension Asset Cost			£ + + 5 7 0 0 0
CIC Charges			£ + 7 + 0 0

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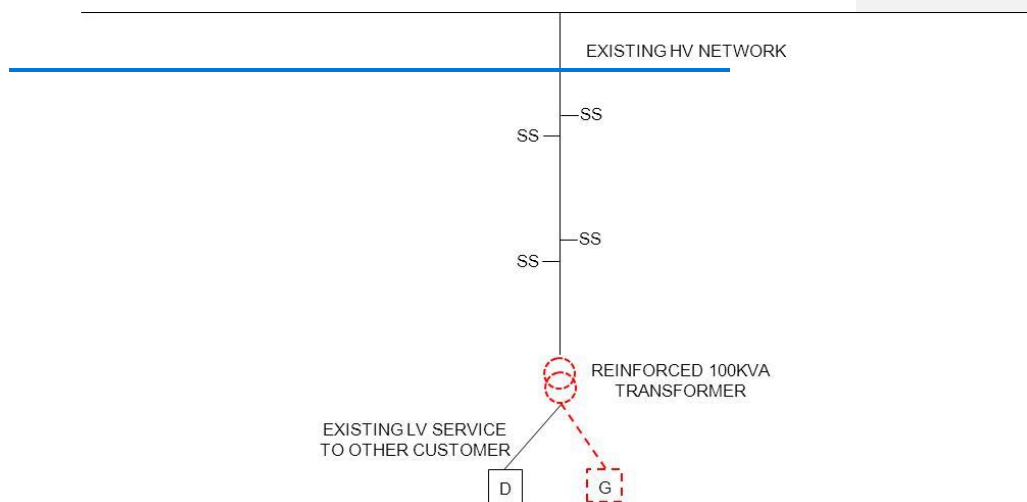
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 $\text{Total Connection Charge} = \text{£ } 69,500 + \text{£ } 115,000 = \text{£ } 184,500$

Example 14: New 25kVA Generation Connection, Voltage Rise Triggered Reinforcement

An existing Customer wishes to connect a new generator with a Required Capacity for export of 25kVA. The Minimum Scheme for connection of the generator requires the local 25kVA pole mounted transformer to be reinforced with a 100kVA split phase transformer in order to keep voltage rise within acceptable limits. A new 95mm² service cable is to be installed to the premises.



Reinforcement:

The RSN for the Reinforcement is the HV/LV transformer.

Security CAF calculation: the numerator in the CAF calculation is the Required Capacity of the Customer, i.e. 25kVA. The denominator is the New Network Capacity following Reinforcement, this being the maximum generation output that could be connected whilst keeping the voltage rise within acceptable limits, i.e. 40kVA in this case.

Fault Level CAF calculation: this scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

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— The Connection Charge for this Scheme is calculated as follows:

—

— Reinforcement:

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Non-Contestable Work			
Replacement 100kVA transformer		25/ 40 * 100 %	€ 9 7 3

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		= 62. 5%	7 5
Total Reinforcement Cost			9 5 3 7 5

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Contestable Work			
Provision and installation of LV service cable		n/a	<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>
Non-Contestable Work			
LV joints to network		n/a	<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>
Total Extension Asset Cost			<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>
CIC Charges			<div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>

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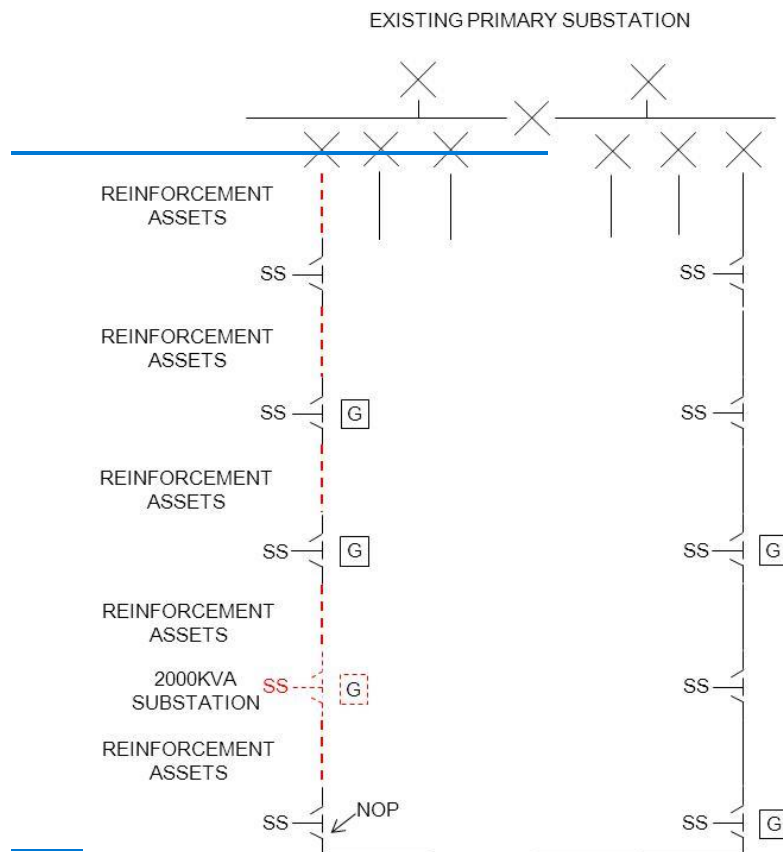
— Total Connection Charge = £9,375 + £2,000 = £11,375

— (Note for simplicity, the high cost generation project threshold of £200/kW has been ignored in this example, but would apply in respect of the costs illustrated. Refer to paragraph 1.15.)

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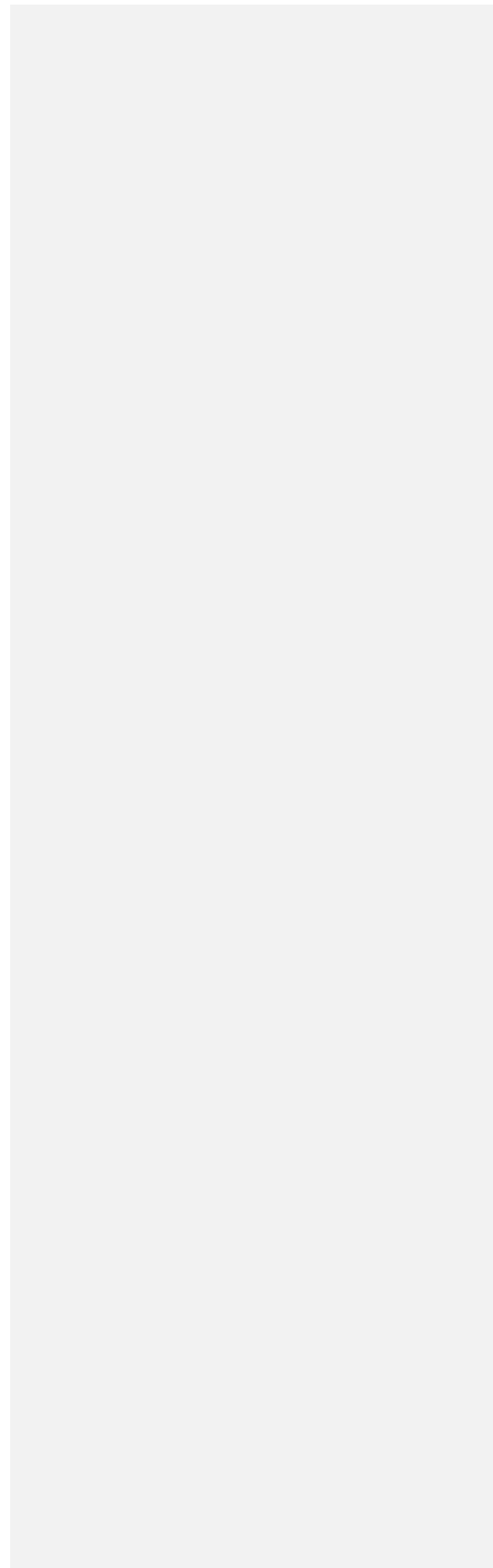
Example 15: New 2MVA Generation Connection, Voltage-Rise Triggered Reinforcement

A Customer wishes to connect a new generator with a Required Capacity for export purposes of 2MVA. The local 11kV feeder has a large amount of generation already connected and will need to be reinforced in order to keep voltage rise within acceptable limits. The Minimum Scheme requires Reinforcement of the existing 185mm² 11kV underground cable with 300mm² underground cable and installation of a new substation for connection of the 2MVA export capacity. The total length of the reinforced cable is 2km. The thermal rating of the 300mm² underground cable is 8MVA. The 11kV underground cable on the other side of the normal open point is already 300mm² and does not require to be reinforced.



|

|



Reinforcement:

The RSN for the Reinforcement is the 11kV feeder.

Security CAF calculation: the numerator in the CAF calculation is the Required Capacity of the Customer, i.e. 2MVA. The denominator is the New Network Capacity following Reinforcement, this being the maximum generation that could be connected whilst keeping the voltage rise within acceptable limits, i.e. 6MVA in this case.

Fault Level CAF calculation: this scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:

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			⊕ #
Non Contestable Work			
2km 300mm 11kV cable		2/6 * 100 % = 33. 3%	£ 6 6 5 6 6
Total Reinforcement Cost			£ 6 6 5 6 6
Extension Assets:			
		Ap por tio nm ent	€ # s t ⊕ m e f

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			€ 0 m t F i b t i 0 m
Contestable Work			
2MVA 11kV substation		n/a	€ 4 0 0 0 0
Non-Contestable Work			
2 by 11kV closing joints		n/a	€ 5 0 0 0
Total Extension Asset Cost			€ 4

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			5 7 0 0 0
CIC Charges			£ 2 0 0

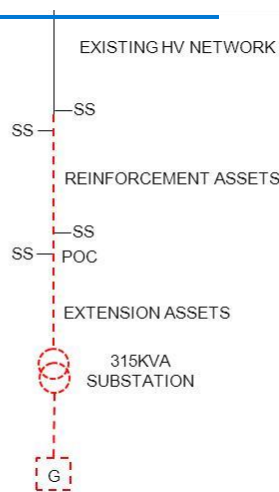
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$$\text{Total Connection Charge} = \pounds 66,666 + \pounds 45,000 = \pounds 111,666$$

Example 16: New 250kVA Generation Connection, Voltage Rise Triggered Reinforcement

A Customer wishes to connect a new generator with a Required Capacity for export of 250kVA. The Minimum Scheme for connection of the generator requires the local 11kV overhead line to be reinforced with 100mm² conductor over part of its length in order to keep voltage rise within acceptable limits. The thermal capacity of the 100mm² overhead line is 5MVA. The thermal capacity of the original 50mm² overhead line is 3MVA. A new 315kVA ground mounted substation requires to be installed at the premises. The overhead line is 1km in length but only 500m is required to be reinforced in order to keep voltage rise within acceptable limits.



Reinforcement:

The RSN for the Reinforcement is the 11kV overhead line.

Security CAF calculation: the numerator in the CAF calculation is the Required Capacity of the Customer, i.e. 250kVA. The denominator is the New Network Capacity following Reinforcement, this being the maximum generation that could be connected whilst keeping the voltage rise within

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acceptable limits. As the length of overhead line to be reinforced has been determined to accommodate the 250kVA requirement only, then this is also 250kVA in this case.

— Fault Level CAF calculation: this scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

— The Connection Charge for this Scheme is calculated as follows:

— Reinforcement:

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Non Contestable Work			

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Replacement 11kV overhead line conductor		250 /25 0 100 % = 100 %	€ 2 5 5 0 0 0
Total Reinforcement Cost			€ 2 5 5 0 0 0

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			£ i b t t i 0 t
Contestable Work			
Provision and installation of 315kVA substation		n/a	£ 5 0 5 0 0 0
Non-Contestable Work			
11kV joint to network		n/a	£ 1 5 0 0 0
Total Extension Asset Cost			£ 5 1

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			7 0 0 0
CIC Charges			£ 2 0 0

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$$\text{Total Connection Charge} = £25,000 + £51,000 = £76,000$$

Section 2 Glossary of Terms

Act	the Electricity Act 1989 (as amended)
Adoption Agreement	<p>is an agreement for us to adopt the Contestable Work, subject to the satisfaction of certain conditions. This agreement, amongst other things, addresses a number of fundamental principles:</p> <ul style="list-style-type: none"> • The transfer of title from the asset owner (normally the Customer or the ICP) to us; • The quality and safety of the adopted asset; • Any required sureties; • The transfer of Land Rights; • The procedure for us to Energise the assets installed by the ICP during the works; • The payment of any residual Connection Charges or fees; • Planning permissions and compliance with street works legislation; and • Defect correction processes, where applicable. <p>The parties to the Adoption Agreement may vary depending on the circumstances and may be between:-</p> <ul style="list-style-type: none"> • us and you • us and your appointed ICP

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	<ul style="list-style-type: none"> us, you and your appointed ICP
<ul style="list-style-type: none"> Bilateral Connection Agreement 	<ul style="list-style-type: none"> an agreement between us and another LDNO setting out the terms and conditions under which an embedded network shall be entitled to be and remain connected to the Distribution System
<ul style="list-style-type: none"> Business Day 	<ul style="list-style-type: none"> any day other than a Saturday, a Sunday, Christmas Day, Good Friday or a day which is a bank holiday within the meaning of the Banking and Financial Dealings Act 1971 and will be from 9:00am to 5:00pm (GMT or BST as applicable).
<ul style="list-style-type: none"> CIC Charges 	<ul style="list-style-type: none"> are the charges detailed in parts D, E, G, H, I, and J of Section [7] of this document.
<ul style="list-style-type: none"> Connection Agreement 	<ul style="list-style-type: none"> The owner/occupier of the Premises to which the connection is to be provided will be required to enter into a Connection Agreement with us. The Connection Agreement will set out the terms upon which they will be, and remain, connected to our Distribution System. The Connection Agreement will normally be provided on our behalf by the owner/occupier's chosen Supplier for the Premises as part of their application for a supply of electricity. However, in some cases for larger connections, or where non-standard conditions exist, we will provide a site-specific Connection Agreement, which replaces any Connection Agreement put in place via the

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	<p>Supplier, as part of the connection process.</p> <p>This particular Connection Agreement will only take effect upon completion of the connection and will set out, in more detail, our rights and obligations to one another.</p> <p>Additionally, it may contain the technical detail of the installation being connected to the Distribution System and will require the owner/occupier of the Premises to comply with the provisions of the Distribution Code.</p>
— Connection Charge	— the payment to be made by the applicant to us for the provision of the connection.
— CUSC	— the Connection and Use of System Code which constitutes the contractual framework for connection to, and use of, the GB Transmission System.
— Customer	— the person requesting the connection.
— DCUSA	— the Distribution Connection and Use of System Agreement designated as such by the Authority under condition 22 of the Licence
— Dedicated Scheme	— is defined in paragraph 1.32A.
— De-energise	— to deliberately prevent the flow of electricity to or from an Exit/Entry Point for any purpose other than a system outage on the our Distribution System (and cognate expressions shall be construed accordingly).

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Development Phase	the five year period, unless otherwise agreed with us, commencing on the date of Energisation of an embedded network during which period the development is to be constructed.	Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single
Disconnect	means to permanently De-energise an Exit/ Entry Point by the removal of all or part of our equipment (and cognate expressions shall be construed accordingly.	Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single
Distributed Generation Connections Guide	The guide produced by us as required by our Licence which provides guidance on the connection process for distributed generation.	Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single
Distribution Code	covers, amongst other matters, all material technical aspects relating to: <ul style="list-style-type: none"> connection to, and the operation and use of a LDNO's Distribution System; and the operation of electrical lines and electrical plant or apparatus connected to an LDNO's Distribution System. A copy of the Distribution Code can be downloaded from the Distribution Code website at www.dcode.org.uk.	Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, No bullets or numbering Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single
Distribution System	the system (as defined in the Licence) consisting (wholly or mainly) of electric lines owned or operated by us and used for the distribution of electricity.	Formatted: DC Norm Para bullet pt L3, Space Before: 0 pt, After: 0 pt, Line spacing: single

ECCR	the Electricity (Connection Charges) Regulations 2002 (SI 2002/93) as amended from time to time or the Electricity (Connection Charges) Regulations 2017 (SI 2017/106) as amended from time to time, as applicable.
ECCR Prescribed Period	the relevant period from the date on which a connection is made as prescribed by the ECCR, being either (a) five years, for connections made prior to 6 April 2017; or (b) ten years, for connections made on or after 6 April 2017.
EHV	more than 22kV but not more than 72kV
Electric Lines	<p>means any line which is used for carrying electricity to or from an Exit/ Entry Point and includes, unless the context otherwise requires:</p> <p>(a) any support for such line, that is to say, any structure, pole or other thing in, on, by or from which any such line is or may be supported, carried or suspended;</p> <p>(b) any apparatus connected to such line for the purpose of carrying electricity; and</p> <p>(c) any wire, cable, tube, pipe or other similar thing (including its casing or coating) which surrounds or supports, or is surrounded or supported by, or is installed in close proximity to, or is supported,</p>

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	carried or suspended in association with, any such line.
Electric Plant	means any plant, equipment, apparatus or appliance used for or for purposes connected with the distribution of electricity (including any metering equipment) other than an Electric Line.
Energise	to deliberately allow the flow of electricity to or from an Exit/ Entry Point where such a flow of electricity has never previously existed (and cognate expressions shall be construed accordingly).
Enhanced Scheme	is defined in paragraph 1.4.
Entry/ Exit Point	A point at which electricity, whether metered or unmetered, enter or exit our Distribution System.
Existing Capacity	is defined in paragraph 1.24.
Extension Assets	are assets installed to connect a party or parties to the existing distribution network but which exclude Reinforcement assets.
Fault Level	the maximum prospective current or power that will flow into a short circuit at a point on the network, usually expressed in MVA or kA.
Fault Level Contribution	is defined in paragraph 1.24.

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from Connection	
Flexible Connections	are connection arrangements whereby a Customer's export or import of electricity is managed (often through real time control) based upon contracted and agreed principles of available capacity. Flexible Connections typically allow quicker and cheaper connection to the Distribution System but are made on the basis that there is no limit on the extent to which a user's access can be interrupted.
GB Transmission System	the system consisting (wholly or mainly) of high voltage electric wires owned or operated by transmission licensees within Great Britain.
Guaranteed Standards of Performance	standards of service backed by a guarantee and set out in the Electricity (Standards or Performance) Regulations 2015.
HV	more than 1kV but not more than 22kV
Independent Connections Provider (ICP)	a person with sufficient accreditation to carry out all or part of the Contestable Work.
Interruptions Incentive Scheme	the scheme which provides incentives on us to deliver a good level of performance in respect of customer interruptions and customer minutes lost.
Land Rights	all such rights in, under or over Land as are necessary for the construction, installation,

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	operation, repair, maintenance, renewal or use of the Contestable Work or Non-Contestable Work.
— Licensed Distribution Network Operator (LDNO)	— the holder of a Licence to distribute electricity.
— LV	— not more than 11kV
— Maximum Capacity	— means in relation to any connection the maximum amount of electricity, as agreed with us and expressed in kW or kVA, that can be imported from or exported onto our Distribution System.
— Meter Point Administration Number (MPAN)	— is a 21 digit reference to uniquely identify Exit/ Entry Point, such as individual domestic residences.
— Minimum Scheme	— is defined in paragraphs 1.1 to 1.7.
— New Fault Level Capacity	— is defined in paragraph 1.24.
— New Network Capacity	— is defined in paragraph 1.24.
— NETSO	— means the national electricity transmission system operator for Great Britain from time to time

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Point of Connection (POC)	is the point (or points) of physical connection to our existing Distribution System.
Premises	means any land, building or structure
Reinforcement	is defined in paragraphs 1.16 to 1.21.
Relevant Section of Network	is defined in paragraph 1.24.
Rent a Joinder Services	the service relating to hiring of resource from us to facilitate the provision of unmetered connections.
Required Capacity	is defined in paragraph 1.24.
Scheme	our network design to provide the connection.
Speculative Developments	is defined in paragraph 1.39.
Supplier	a person who holds a Supply Licence.
Supply Licence	a licence granted under section 6(1)(d) of the Act.
Supply Number	a unique identifier of those Entry/ Exit Points on the Distribution System which are used for the purposes of either taking a supply of electricity or for the connection of a distributed generator, and which forms the basis of the metering point record on the Company's registration system.

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Temporary Connections	is defined in paragraph 1.19.
Validity Period	The period for which a connection Offer or POC Offer is open for acceptance.
Voltage of Connection	is the voltage at the POC between the existing distribution network and the assets used to provide the connection. For clarity, this is not necessarily the voltage of supply to the Customer
Wide Area Scheme	is defined in paragraph 1.32A.
Working Day	Any day other than a Saturday, a Sunday, Christmas Day, Good Friday or a day which is a bank holiday within the meaning of the Banking and Financial Dealings Act 1971.

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Section 1 – Common Connection Charging Methodology

This Section sets out the Common Connection Charging Methodology that is implemented to ensure a consistent approach in the way your Connection Charge is calculated.

~~This Section applies to all connection applications that are received on or after 1 April 2023.~~

Minimum Scheme

1.1 The Minimum Scheme is the Scheme with the lowest overall capital cost (as estimated by us), solely to provide the Required Capacity. The Minimum Scheme will be subject to:

- accepted industry standards, including the requirements of the Distribution Code;
- the status and configuration of the Relevant Section of Network (RSN);
- the standard sizes and types of equipment currently used by us on our Distribution System which shall be reasonable in all the circumstances;
- maintaining our ability to minimise regulatory penalties associated with the Interruptions Incentive Scheme and the Guaranteed Standards of Performance; and
- where the Customer is an LDNO, maintaining the Customer's ability to minimise regulatory penalties associated with the Guaranteed Standards of Performance.

and shall be consistent with our statutory and licence obligations including the requirement to develop, maintain and operate an efficient, co-ordinated and economical electricity Distribution System.

1.2 We will make available our design policies and standards as appropriate.

1.3 Subject to paragraphs 1.4 and 1.7 below, we will calculate the Connection Charge based on the estimated costs of the Minimum Scheme.

1.4 In certain circumstances we may decide to design an Enhanced Scheme. This will include one or more of the following:

- additional assets not required as part of the Minimum Scheme;
- assets of a larger capacity than required by the Minimum Scheme;
- assets of a different specification than required by the Minimum Scheme.

1.5 If we decide to design an Enhanced Scheme, the Connection Charge that will apply will be the lower of the Connection Charge associated with the Minimum Scheme and the Connection Charge associated with the Enhanced Scheme.

1.6 The Connection Charge associated with the Enhanced Scheme will be calculated subject to the exclusion of costs of any additional assets not necessary for the provision of your connection.

1.7 We may recover the reasonable costs incurred, both direct and indirect, in providing a connection and may, where allowed by our Licence, apply a margin on some of those costs. The factors taken into account by us to calculate the Connection Charge will include, but are not limited to:

- industry standards governing the Distribution System;
- the Required Capacity;
- available capacity of the existing Distribution System;
- whether any necessary extension or Reinforcement of the existing Distribution System is by underground cable or overhead lines;
- whether any diversionary work is required as a result of the development and the required disconnection of any assets;
- the length of cable or line required;
- type of ground requiring excavation, the type and extent of reinstatement necessary (including New Roads and Street Works Act requirements and any other relevant legislation), and the need for road, bridge crossings etc;
- any Electrical Plant and civil costs required, allowing for any civil works undertaken by you with our agreement;

- the cost of installing communication equipment;
- the costs of installing system management equipment;
- the requirement to work outside of normal working hours;
- the costs of undertaking the design;
- the costs of securing wayleaves/easements for plant, cables or lines including any consents;
- the costs of securing suitable substation sites including any necessary Land Rights;
- any overhead line surveys required;
- the costs of public enquiries and environmental impact studies;
- charges for any other costs associated with the work on Sites of Special Scientific Interest (SSSI), railway lines etc; and
- any variations in respect of the actual costs that were reasonably incurred as specified in the Connection Offer.

Cost Allocation

1.8 The costs to be charged to you as a Connection Charge may be split into three categories:

- Costs for providing the connection which are to be paid in full by you (see paragraphs 1.10 to 1.16);
- Costs for providing the connection which are to be apportioned between you and us (see paragraphs 1.29 to 1.34); and
- Costs to be paid by you in respect of works that have previously been constructed or are committed and are used to provide the connection (see paragraph 1.35).

1.9 Some costs may be borne in full by us and will not be included in your Connection Charge (see paragraphs 1.36 to 1.40).

Costs to be paid in full by you

- 1.10 The costs of providing Extension Assets are charged in full to you.
- 1.11 Where you have requirements for additional security or the characteristics of your load requires us to install assets in excess of the Minimum Scheme then you will pay the costs in excess of the Minimum Scheme in full. Where you have requested a three-phase connection and/or a supply voltage that is not necessary to meet the Required Capacity, and the local Distribution System is not of the requested number of phases and/or voltage, then you will pay in full the cost of Reinforcement of the Distribution System to your specified number of phases and/or voltage.
- 1.12 The costs of the future operation and maintenance of any additional assets requested by you (over and above those associated with the Minimum Scheme) will be payable in full. This would normally be levied as a one-off charge representing the net present value of the future operation and maintenance costs and calculated as a percentage (specified in Section [6]) of the additional capital cost of the Scheme. See Example 3-7 for an illustration of where you request additional security.
- 1.13 Work required to reconfigure the Distribution System to meet your requirements where no additional Network or Fault Level Capacity is made available shall be charged in full to you. See Example 20.
- 1.14 Where the Extension Assets would normally require the extension of existing switchgear equipment and this is not possible, the cost of the full replacement of the switchgear (using the nearest standard size) will be charged to you, provided that there is no Reinforcement of the Distribution System (see paragraph 1.25).
- 1.15 If your development is considered to be speculative then the Reinforcement costs will be charged to you in full (see paragraphs 1.49 to 1.71).

Commented [BAH5]: Incorrect cross reference

1.16 Reinforcement costs for the Minimum Scheme in excess of the High-Cost Project Threshold, shall be charged to you in full as a Connection Charge. For the avoidance of doubt, where Paragraph 1.36 applies, the High-Cost Project Threshold will not apply. The calculation of this charge will include all costs for Reinforcement carried out at the same Voltage Level and one Voltage Level above the Point of Connection to the existing Distribution System. For Generation Connections the High-Cost Project Threshold is £200/kW; for Demand Connections the High-Cost Project Threshold is £1,720/kVA. Reinforcement costs below the High-Cost Project Threshold will follow the methodology outlined under paragraphs 1.17 to 1.27. For Generation Connections, where the Reinforcement costs at the same Voltage Level as the Point of Connection are greater than the High-Cost Project Threshold then the methodology outlined under paragraphs 1.17 to 1.27 will be applied to Reinforcement costs up to and including the High-Cost Project Threshold only. The table below illustrates the application of the High-Cost Project Threshold.

Commented [BAH6]: Potential contradiction with 1.36. Additional wording added to clarify on the basis that there is no change in Ofgem policy regarding 100A existing premises which predated Access SCR (note SLC 13C was retained in the licence)

Commented [BAH7]: Extra wording would be helpful to clarify that for Generation same voltage, the methodology would be applied to the lower off the actual reinforcement costs and the HCPT.

Commented [WL(P8)]: As amended this would be 1.27

England and Wales

	Voltage at the POC			
Voltage of Scheme Assets	LV (at or below 1000V)	HV (above 1kV but not more than 22kV)	EHV (above 22kV but not more than 72kV)	132kV
132kV Network	Excluded from assessment ¹	Excluded from assessment ¹	Included in assessment	Included in assessment
132kV/ EHV Substation	Excluded from assessment ²	EHV CBs only included in assessment	Included in assessment	Not applicable
EHV Network	Excluded from assessment ¹	Included in assessment	Included in assessment	
132kV/ HV Substation	HV CBs only included in assessment	Included in assessment	Not applicable	
EHV/HV Substation	HV CBs only included in assessment	Included in assessment		
EHV/LV substation	Included in assessment	Not applicable		

HV Network	Included in assessment	Included in assessment		
HV/ LV Substation	Included in assessment	Not applicable		
LV Network	Included in assessment			

¹ Except where there is direct transformation from 132kV to HV or EHV to LV when the higher voltage costs are included.

² Except where there is direct transformation from 132kV to HV or EHV to LV when the higher voltage circuit breaker costs are included.

NB: The above table may not accommodate every possible set of circumstances, where this is the case, the Voltage Level (as defined in the Glossary) shall be applied.

Scotland

	Voltage at the POC		
Voltage of Scheme Assets	LV (at or below 1000V)	HV (above 1kV but not more than 22kV)	EHV (above 22kV but not more than 72kV)
EHV Network	Excluded from assessment ¹	Included in assessment	Included in assessment
EHV/HV Substation	HV CBs only included in assessment	Included in assessment	Not applicable
EHV/LV substation	Included in assessment	Not applicable	
HV Network	Included in assessment	Included in assessment	
HV/ LV Substation	Included in assessment	Not applicable	
LV Network	Included in assessment		

¹ Except where there is direct transformation from EHV to LV when the higher voltage costs are included.

NB: The above table may not accommodate every possible set of circumstances, where this is the case, the Voltage Level (as defined in the Glossary) shall be applied.

Costs of Reinforcement

~~1.17 If you choose not to pay (i) Reinforcement costs for the Minimum Scheme for a Non-Curtailable Connect or (ii) Reinforcement costs in excess of the high cost project threshold for a Non Curtailable Connection, then you can request an enduring Curtailable Connection instead (i.e. one which will not convert to a Non Curtailable Connection in the future). If you subsequently require a Non Curtailable Connection, then this would require a new connection request which may still be subject to Reinforcement costs, potentially in excess of the high cost project threshold.~~

~~1.18~~ **1.17** Reinforcement is defined as assets installed that add capacity (network or fault level) to the existing shared use Distribution System.

Commented [BAH9]: This paragraph was approved under DCP 404. The DCP 404 Legal Text stated to create a new paragraph 1.17. However the revised numbering of the preceding paragraphs was not taken into account in creating the Pre Implementation version of Schedule 22. It has been moved to create a new 1.21 which is in a consistent location to the intent of DCP 404

~~1.19~~1.18 For Generation Connections, where the Reinforcement is at the same Voltage Level of the voltage at the POC to the existing Distribution System, then the costs of Reinforcement shall be apportioned between you and us, unless other exceptions apply which take precedence. The methods used to apportion the costs of Reinforcement are set out in paragraphs 1.29 – 1.34.

~~1.20~~1.19 For Demand Connections, the costs of Reinforcement will be paid in full by us, unless other exceptions apply which take precedence.

1.20 Where one of the exceptions set out in paragraphs 1.22 to 1.27 applies, Reinforcement will be treated as Extension Assets and the costs of the Reinforcement will not be apportioned or paid in full by us. The application of the exceptions is demonstrated in the Examples.

1.21 If you choose not to pay (i) Reinforcement costs for the Minimum Scheme for a Non-Curtailable Connection or (ii) Reinforcement costs in excess of the High-Cost Project Threshold for a Non-Curtailable Connection, then you can request an enduring Curtailable Connection instead (i.e. one which will not convert to a Non-Curtailable Connection in the future). If you subsequently require a Non-Curtailable Connection, then this would require a new connection request which may still be subject to Reinforcement costs, potentially in excess of the High-Cost Project Threshold.

1.22 Exception 1: Where the Reinforcement is:

- down-stream of the POC; and
- over and above the Minimum Scheme; and
- provided at our request; and
- provided by connecting two points on the existing Distribution System,

then the apportionment rules will not apply. You will pay the costs associated with the Minimum Scheme and we will pay the costs over and above the Minimum Scheme. See Example 4.

Commented [TT10]: Legal text - '1.21 to 1.25'

Commented [DT11]: Housekeeping - suggest this is amended to 'Connection'

Commented [BAH12R11]: Tracking not visible as paragraph has been moved. Was Connect

Commented [WL(P13R11)]: Should this paragraph be before 1.20 as it now sits between the intro to the exceptions and then the detail?

Commented [BAH14R11]: I don't think it makes sense to be before as the paragraph used Reinforcement which is defined in 1.17. This positioning just replicated where 404 put it. We could just move it to the end of the Exceptions

Commented [DT15]: Housekeeping

Commented [BAH16R15]: Typo but change not tracked . Was Reinforcement

Commented [BAH17]: Should be capitalised, tacked not shown

Commented [TP(P18)]: "Downstream" is one word

1.23 **Exception 2:** Where the Reinforcement is in excess of the Minimum Scheme and is at your request, the Reinforcement will be treated as Extension Assets and the apportionment rules will not apply. The costs in excess of the Minimum Scheme will be borne in full by you (see paragraphs 1.11 and 1.12 above). [See Example 3.](#)

Commented [TP(P19)]: Add "See Example 3" at end

Commented [BAH20R19]: For consistency

1.24 **Exception 3:** Where the Reinforcement is provided to accommodate a Temporary Connection, the Reinforcement will be treated as Extension Assets and the apportionment rules will not apply. Consequently, in such circumstances, you will pay in full the costs associated with the Temporary Connection. Temporary Connections are defined as connections that are only required for a period of up to five years, but exclude connections to provide the initial connection to a development, where the Reinforcement will subsequently be required for the permanent connection.

1.25 **Exception 4:** Where the replacement of switchgear results in an increase in fault level capacity and:

- that increase is solely as a result of the fault level rating of the standard switchgear equipment used by us being higher than that of the existing switchgear; and
- that increase in fault level capacity is not needed to accommodate your connection.

then, unless the switchgear adds network capacity and the Security CAF applies, the switchgear replacement will be treated as Extension Assets and the apportionment rules will not apply. Consequently, in such circumstances, you will pay the full cost of the switchgear replacement. See Example 15.

Commented [WL(P21)]: Double space

1.26 **Exception 5:** Where the Minimum Scheme requires Reinforcement that is provided by connecting two points on the existing Distribution System to provide connectivity to your Premises, then the lowest cost feeder shall be treated as an Extension Asset and all other feeders required to connect your Premises shall be treated as Reinforcement. See Example 17.

1.27 **Exception 6:** Where the Reinforcement:

- is provided by connecting two points on the existing Distribution System; and
- is providing connection to a development with a number of Entry/ Exit Points,

then the additional network length (measured from suitable points close to the site boundaries which would allow for a clear demarcation of Contestable and Non-Contestable Work) required to provide connectivity within the development will be considered to be Extension Assets and the apportionment rules will not apply. Consequently, in such circumstances, you will pay the full cost of the additional network length. See Example 18.

~~1.28~~ For avoidance of doubt, where the costs of Reinforcement are borne in full by you and any capacity created is used to accommodate new or increased connections within the ECCR Prescribed Period, the ECCR will apply (see paragraphs 1.45—1.48).

Costs to be apportioned between you and us

~~1.29~~ **1.28** The costs of Reinforcement will be apportioned using one of two Cost Apportionment Factors (CAFs), dependent upon which factor is driving the requirement for Reinforcement:

- The ‘Security CAF’; and
- The ‘Fault Level CAF’.

~~1.30~~ **1.29** The following definitions are used in the application of the CAFs.

Existing Capacity	For existing Customers their Existing Capacity will be either: <ul style="list-style-type: none"> (a) the Maximum Capacity used in the calculation of their use of system charges; or (b) for Customers who are not charged for use of system on the basis of their Maximum Capacity the lower of: <ul style="list-style-type: none"> • No. of phases x nominal phase-neutral voltage (kV) x fuse rating (A); and • The rating of the service equipment.
Fault Level Contribution from	is the assessment of the Fault Level contribution from the equipment to be connected taking account of its impact at

Commented [BAH22]: This is potentially misleading. The changes to ECCR means that if the customer has paid in full for the reinforcement, they will not receive any reimbursement from any second comers. So, whilst technically correct in that the ECCR will apply there will be no payment to the first comer which is what could be inferred by the paragraph.

XXXX Note cross reference will need to be checked

Commented [BM23R22]: Agree, this should be deleted to avoid any confusion

Connection	the appropriate point on the Distribution System. Where an existing Customer requests a change to a connection then the “Fault Level Contribution from Connection” is defined as the incremental increase in Fault Level caused by the Customer.
New Fault Level Capacity	is the Fault Level rating, following Reinforcement, of the equipment installed after taking account of any restrictions imposed by the local network Fault Level capacity. For the avoidance of doubt this rule will be used for all equipment types and voltages.
New Network Capacity	<p>is either the secure or non-secure capacity of the Relevant Section of Network (RSN) following Reinforcement. Whether secure or non-secure capacity is applicable depends upon the type of capacity that can be provided from the RSN. For example, if the capacity provided to the Customer by the RSN is secure, but the capacity requested by the Customer at the point of connection is non-secure, the secure capacity will be used. See Example 24.</p> <p>The capacity to be used will be based on our assessment of the thermal ratings, voltage change and upstream restrictions and compliance with our relevant design, planning and security of supply policies. The equipment ratings to be used are the appropriate operational rating at the time of the most onerous operational conditions taking account of seasonal ratings and demand.</p>
Relevant Section of Network (RSN)	<p>is that part or parts of the Distribution System which require(s) Reinforcement. Normally this will comprise:</p> <ul style="list-style-type: none"> the existing assets, at the Voltage Level that is being reinforced, that would have been used to supply you (so far as they have not been replaced) had sufficient capacity been available to connect you without Reinforcement; and/or

	<ul style="list-style-type: none"> the new assets, at the same Voltage Level, that are to be provided by way of Reinforcement. <p>Where it is unclear what assets would have supplied the Customer in the event that sufficient capacity had been available, the existing individual assets with the closest rating to the new assets will be used.</p> <p>There may be more than one RSN (e.g. at different Voltage Levels).</p>
Required Capacity	is the Maximum Capacity agreed with the Customer. In the case of multiple connections (e.g. a housing development) it may be adjusted after consideration of the effects of diversity. Where an existing Customer requests an increase in capacity then it is the increase above their Existing Capacity.

4.341.30 The ‘Security CAF’ is applied, where the costs are driven by either thermal capacity or voltage (or both) as assessed against the relevant standard. This rule determines the proportion of the Reinforcement costs that should be paid by you as detailed below.

$$\text{Security CAF} = \frac{\text{Required Capacity}}{\text{New Network Capacity}} \times 100\% \quad (\text{max } 100\%)$$

4.321.31 The ‘Fault Level CAF’ is applied, where the costs are driven by Fault Level restrictions. This rule determines the proportion of the Reinforcement costs that should be paid by you as detailed below.

$$\text{Fault Level CAF} = 3 \times \frac{\text{Fault Level Contribution from Connection}}{\text{New Fault Level Capacity}} \times 100\% \quad (\text{max } 100\%)$$

4.331.32 For clarity, where you require an augmentation to an existing connection, both the Security and Fault Level CAFs will be based on the increase in Required Capacity and increase in Fault Level Contribution from the connection respectively. Any related increases within the previous three year period will be taken into account in determining the increase in the Required Capacity or increase in the Fault Level Contribution from the connection to be applied within the CAF.

~~4.34~~4.33 On some Schemes there may be interaction between the two rules. In such cases, the 'Security' CAF will be applied to costs that are driven by the security requirement. The 'Fault Level CAF' will be applied to costs that are driven by Fault Level requirements. See the Examples for illustrations on the application of the CAFs.

Recovery of costs for previous works

~~4.35~~4.34 Where, in order to provide your connection;

- we propose to utilise existing Distribution System assets that were previously installed to provide a connection to another customer, and
- the other customer has paid us (either in part or in full) a Connection Charge for those assets or paid an ICP for those assets which were adopted by us,

you may be required to make a payment towards them. The ECCR prescribes the circumstances where such payment is required. Charges for such works only apply where the new connection is provided within the ECCR Prescribed Period.

Costs to be paid in full by us

~~4.36~~4.35 For Demand Connections we will fully fund all Reinforcement. For Generation Connections, we will fully fund Reinforcement carried out at a Voltage Level higher than the Voltage Level at the POC to the existing Distribution System. However, there are exceptions to these two approaches, as set out elsewhere in this methodology.

~~4.37~~4.36 We will fully fund Reinforcement carried out to allow the installation of all equipment at an existing Premises which remain connected via an existing low-voltage single, two or three phase service fused at 100 amperes or less per phase which is metered with whole-current metering; provided that (to the extent relevant):

- the Reinforcement is carried out to allow the installation of equipment as part of a single application for a single or multiple installations;
- any and all electricity generation equipment installed has a rated output not greater than 16 amperes per phase (or not greater than 16 amperes per phase at any single Premises if a single application for multiple installations);

- any and all equipment installed which does not constitute a modification to the existing service conforms with the technical requirements of the following standards (notwithstanding that the equipment may have an input current that is more than 16 amperes per phase):
 - BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase); and
 - BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

1.381.37 Where it is necessary to modify a low-voltage single phase looped service for an existing Premises, this shall be considered to have remained connected under paragraph 1.37 above.

1.391.38 Where another LDNO with a distribution network that is connected to our Distribution System requires an increase in capacity to its distribution network, the voltage at the POC for assessing the Voltage Level will be:

- in the case of a new extension to the network of the other LDNO, the voltage of connection at which the Extension Assets will connect to the other LDNO's network; or
- in the case of additional capacity required in respect of a customer connected to the existing assets of the LDNO, the voltage at which the customer connects to the LDNO's network; or
- in the case of additional capacity required to meet general load growth on the LDNO's network then the Reinforcement costs will be borne by us. The LDNO will be required to provide justification in such circumstances.

~~1.401.39~~ The tables below illustrate the application of the voltage rules in relation to Reinforcement for Demand Connections and Generation Connections. For Generation Connections, you will be required to contribute towards the cost of any Reinforcement provided at the Voltage Level of the POC, up to and including the cost of circuit breakers provided at that voltage.

England and Wales

Commented [BAH24]: Table shaded consistent with earlier tables

Demand Connections				
	Voltage at the POC			
Voltage of Scheme Assets	LV (at or below 1000V)	HV (above 1kV but not more than 22kV)	EHV (above 22kV but not more than 72kV)	132kV
132kV Network	We fund	We fund	We fund	We fund
132kV/ EHV Substation	We fund	We fund	We fund	Not applicable
EHV Network	We fund	We fund	We fund	Not applicable
132kV/ HV Substation	We fund	We fund	Not applicable	Not applicable
EHV/HV Substation	We fund	We fund	Not applicable	Not applicable
EHV/LV substation	We fund	Not applicable	Not applicable	Not applicable
HV Network	We fund	We fund	Not applicable	Not applicable
HV/ LV Substation	We fund	Not applicable	Not applicable	Not applicable
LV Network	We fund	Not applicable	Not applicable	Not applicable

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NB: The above table may not accommodate every possible circumstance, where this is the case, the Voltage Level (as defined in the Glossary) shall be applied.

Generation Connections				
	Voltage at the POC			
Voltage of Scheme Assets	LV (at or below 1000V)	HV (above 1kV but not more than 22kV)	EHV (above 22kV but not more than 72kV)	132kV
132kV Network	We fund	We fund [†]	We fund	Apportioned
132kV/ EHV Substation	We fund	We fund	EHV circuit breakers only Apportioned	Not applicable
EHV Network	We fund	We fund	Apportioned	Not applicable
132kV/ HV Substation	We fund	HV circuit breakers only Apportioned	Not applicable	Not applicable
EHV/HV Substation	We fund	HV circuit breakers only Apportioned	Not applicable	Not applicable
EHV/LV Substation	LV board only Apportioned	Not applicable	Not applicable	Not applicable
HV Network	We fund	Apportioned	Not applicable	Not applicable
HV/ LV Substation	LV board only Apportioned	Not applicable	Not applicable	Not applicable
LV Network	Apportioned	Not applicable	Not applicable	Not applicable

[†] Except where there is direct transformation from 132kV to HV when the costs are apportioned.

NB: The above table may not accommodate every possible circumstance, where this is the case, the Voltage Level (as defined in the Glossary) shall be applied.

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Scotland

Demand Connections			
	Voltage at the POC		
Voltage of Scheme Assets	LV (at or below 1000V)	HV (above 1kV but not more than 22kV)	EHV (above 22kV but not more than 72kV)
EHV Network	We fund	We fund	We fund
EHV/HV Substation	We fund	We fund	Not applicable
EHV/LV substation	We fund	Not applicable	Not applicable
HV Network	We fund	We fund	Not applicable
HV/ LV Substation	We fund	Not applicable	Not applicable
LV Network	We fund	Not applicable	Not applicable

NB: The above table may not accommodate every possible circumstance, where this is the case, the Voltage Level (as defined in the Glossary) shall be applied.

Generation Connections			
	Voltage at the POC		
Voltage of Scheme Assets	LV (at or below 1000V)	HV (above 1kV but not more than 22kV)	EHV (above 22kV but not more than 72kV)
EHV Network	We fund	We fund	Apportioned
EHV/HV Substation	We fund	HV circuit breakers only Apportioned	Not applicable
EHV/LV Substation	LV board only Apportioned	Not applicable	Not applicable
HV Network	We fund	Apportioned	Not applicable
HV/ LV Substation	LV board only Apportioned	Not applicable	Not applicable
LV Network	Apportioned	Not applicable	Not applicable

NB: The above table may not accommodate every possible circumstance, where this is the case, the Voltage Level (as defined in the Glossary) shall be applied.

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Additional Cost Allocation for Flexible Connections and Curtailable Connections

~~1.41~~1.40 To facilitate the provision of a Flexible Connection or a Curtailable Connection, we may need to install and maintain specific system management equipment, at your Premises and/or further upstream in other parts of the Distribution System. Some of the costs associated with installing, operating and maintaining the system management equipment will be directly attributed to your connection and be included as part of your Connection Charge (see illustrative table in paragraph 1.42). The proportion of the costs which you must fund depends on whether your connection forms part of a Dedicated Scheme or a Wide Area Scheme, as described below:

Type 1 – Dedicated Scheme: A scheme managing constraint(s) where there are no customers downstream of the constraint(s) who could connect new or additional demand or generation without being controlled by the Dedicated Scheme:

- Type ‘1A’ considers a scenario involving only one customer; and
- Type ‘1B’ considers a scenario involving multiple customers.

Type 2 – Wide Area Scheme: A scheme managing constraint(s) where there are customers downstream of the constraint(s) who could connect new or additional demand or generation without being controlled by the Wide Area Scheme.

~~1.42~~1.41 The table below illustrates the scheme types and methodology for cost recovery associated with each type of Flexible Connection or a Curtailable Connection. The methodology covers Type 1A, Type 1B and Type 2 (as each is described in paragraph 1.41)

Typical connection components ¹	Type 1A - Single	Type 1B - Multiple	Type 2 - Wide Area
Extension Assets for customer	You fund	You fund	You fund
End user control unit for the customer	You fund	You fund	You fund
Local system management unit	You fund	Shared equally between participants	We fund
Scheme management unit	You fund	Shared equally between participants	We fund
Central management unit	N/A	N/A	We fund
Scheme specific ongoing costs e.g. communications	We fund	We fund	We fund

¹We will describe the main connection components within the relevant connection offer, which will also include the funding arrangements for each such connection component (if different to that stated in this illustrative table).

Recovered Equipment and Deferment of Asset Replacement

~~1.43~~1.42 Normally, you will not receive any credit for the value of any equipment recovered by us as a result of providing the connection. However, where a Temporary Connection is to be Disconnected, we will determine the value of recovered equipment that we can subsequently reuse (net of depreciation and removal and refurbishment costs). Where there is a net value in the recovered equipment that can be reused, we will pay you the amount of such net value subject to a de minimis level as specified in Section [6].

~~1.44~~1.43 You will not receive any credit for the value of any deferment of asset renewal expenditure by us.

Rebates

~~1.45~~1.44 For Distribution System assets where you have paid in full, then you may be entitled to a reimbursement payment under the ECCR should another Customer connect to those assets. These circumstances are detailed in the ECCR.

~~1.46~~1.45 For Distribution System assets where you have paid in proportion to your Required Capacity, then you are not entitled to a future rebate of charges should another Customer connect to those assets.

~~1.47~~1.46 Your entitlement to receive payments under the ECCR only applies to connections made within the ECCR Prescribed Period from the first provision of the connection.

~~1.48~~1.47 These provisions do not apply where your connection was made before 6 April 2017 and we have adopted the assets from an ICP. However, for connections made on or after 6 April 2017, these provisions do apply to assets we have adopted from an ICP (as further described in the ECCR).

Speculative Developments

~~1.49~~1.48 Developments which have one or more of the following characteristics may be considered as speculative:

- their detailed electrical load requirements are not known;
- the development is phased over a period of time and the timing of the phases is unclear;
- the capacity requested caters for future expansion rather than the immediate requirements of (an) end user(s);
- the capacity requested caters for future speculative phases of a development rather than the initial phase(s) of the development; or
- the infrastructure only is being provided, with no connections for end users requested.

~~1.50~~1.49 Where we are asked to provide a connection to a speculative development then the cost of the work including any Reinforcement is charged in full and the CAFs do not apply. Additional charges to reflect ongoing operation, repair and maintenance costs may also be levied.

~~1.51~~1.50 We may, at our sole discretion, allow capacity to be reserved on the infrastructure provided to service the speculative development on the commercial terms agreed between you and us in respect of the development.

~~1.52~~1.51 Applications will be assessed to determine whether they are a Speculative Development by using the Speculative Developments scoring system described in paragraphs 1.53-1.71, which will be applied as follows:

- Consideration will be given to the fact that some aspects of an application may have a greater bearing on whether the application should be considered as not being a Speculative Development. In recognition of this, the criteria used in the scoring system are weighted as either high or low significance.
- Only the points identified in the scoring criteria shall be placed against each respective criterion that is relevant to the application. Each high significance criterion shall be scored 2 points and each low significance criterion shall be scored 1 point, without exception.
- The number of points entered in the 'speculative' and 'non-speculative' columns shall be added up to give a total number for the respective column, as shown in the scoring proforma below.
- If the total value of points for the 'speculative' column is greater than the total value of points for the 'non-speculative' column, then the application will be considered as being a Speculative Development.
- If there is no score in either column, then we reserve the right to obtain additional information prior to making the assessment.
- All criteria may not apply to every application.

Scoring Proforma		
Criteria	Non-Speculative Points	Speculative Points
1		
2		
3		
4		Not applicable

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5		
6		Not applicable
Total points		

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Criterion 1: Programme (domestic and non-domestic developments)

~~1.53~~1.52 This criterion is deemed to be of low significance.

~~1.54~~1.53 The application will receive points in the 'non-speculative' column, if:

- the development has an overall timescale of up to two years from the date of the initial application is made until the completion of the final phase; or
- the applicant has provided a clear phasing plan for the complete development.

~~1.55~~1.54 The application will receive points in the 'speculative' column, if:

- the development has an overall timescale of more than ten years from the date on which the initial application is made to completion of the final phase; and
- the applicant does not provide a clear phasing plan for the complete development.

~~1.56~~1.55 Should the Customer's development be phased over a period greater than two years but less than or equal to ten years, then no points shall be entered in either the 'speculative' or 'non-speculative' columns.

Criterion 2: Programme (domestic developments only)

~~1.57~~1.56 This criterion is deemed to be of high significance.

~~1.58~~1.57 The application will receive points in the 'non-speculative' column if the complete development comprises less than 100 dwellings or requires less than three permanent HV/LV substations beyond the POC.

~~1.59~~1.58 The application will receive points in the 'speculative' column, if the complete development includes more than 5,000 dwellings or requires more than ten permanent HV/LV substations beyond the POC.

~~1.60~~1.59 Should the characteristics of the customers development fall between these two thresholds, then no points shall be entered in either of the ‘speculative’ or ‘non-speculative’ columns.

Criterion 3: Load Profile

~~1.61~~1.60 This criterion is deemed to be of high significance.

~~1.62~~1.61 The application will receive points in the ‘non-speculative’ column if the application is for a development that is (or will become) a Phased Capacity Site.

~~1.63~~1.62 The application will receive points in the ‘speculative’ column if the applicant does not provide an acceptable (to us) capacity ramp profile and a portion of the Required Capacity is for future expansion.

Criterion 4: Financial Commitment

~~1.64~~1.63 This criterion is deemed to be of low significance.

~~1.65~~1.64 The application will receive points in the ‘non-speculative’ column if the applicant makes a financial commitment in support of the application. A financial commitment is made where the applicant agrees to pay for:

- assets installed at initial connection which are sized sufficiently to accommodate the complete future development and which are greater than the assets to accommodate the capacity to be utilised in the early phases of construction; and
- any operation and maintenance costs for such increased assets which may be included within the connection offer prior to the initial energisation of the connection.

Criterion 5: Future Provision

~~1.66~~1.65 This criterion is deemed to be of high significance.

~~1.67~~1.66 The application will receive points in the ‘non-speculative’ column if at least 75% of the total connections and/or at least 75% of the total load are delivered in the first phase of the development (excluding any temporary works).

~~1.68~~1.67 The application will receive points in the ‘speculative’ column if only infrastructure is being provided, with no connections for end users requested, and the development is not within the relevant local authority’s development plans.

Criterion 6: Planning Permission

~~1.69~~1.68 The application will receive points in the ‘non-speculative’ column reflective of a high significance criterion if the complete development has achieved Full Planning Permission.

~~1.70~~1.69 The application will receive points in the ‘non-speculative’ column reflective of a low significance criterion if the complete development has only achieved Outline Planning Permission.

~~1.71~~1.70 For clarity, the absence of any planning permission/consent for the development will not result in any points being added to the ‘speculative’ column.

Connection Alterations

~~1.72~~1.71 Where you request an alteration to your connection arrangements, including a change in the supply voltage, the costs are charged in full to you. For the avoidance of doubt increases in the Required Capacity are dealt with in accordance with the previous Sections.

National Electricity Transmission System Operator (NETSO) Charges

~~1.73~~1.72 We have an obligation under the CUSC to discuss certain requests for connection or changes in connection with the NETSO. Such requests are typically for large electrical demand or generation projects. Under certain circumstances, as determined by the NETSO, they may apply charges to assess the potential impact on the GB Transmission System of a request or the combined effect of a number of requests and these will be included in the Connection Charge, or through a separate mechanism agreed between you and us.

~~1.74~~1.73 Subsequent to such assessment, the NETSO may also require works to be undertaken on the GB Transmission System as a condition of the connection being permitted. In the event of NETSO applying charges for these works, we will reflect these charges in our charges to you.

~~1.75~~1.74 Should GB Transmission System works be required, NETSO may apply a cancellation charge in the event that your project is cancelled or the capacity of your project reduces. The NETSO also calculates a secured amount in respect of this cancellation charge (being a percentage of the cancellation charge, which reduces at certain trigger points). We may ask you for security in respect of this cancellation charge, but we will not ask you for more than the secured amount calculated by the NETSO.

Land Rights

~~1.76~~1.75 Where Land Rights are required from a third party, the cost of acquiring those rights will be included in either the Connection Charge to you or through a separate mechanism agreed between you and us.

~~1.77~~1.76 If the Land Rights that we require cannot be obtained by negotiation, we may, following discussion with you, exercise our powers of compulsory purchase (Section 10 and Schedule 3 of the Act) or apply to the Secretary of State or the Scottish Government in Scotland for a 'necessary wayleave' (paragraphs 6-8 of Schedule 4 of the Act). If we do so, the costs that we incur, including those of the Lands Tribunal/ Lands Tribunal for Scotland (which determine issues of compensation) will be charged to you. The Lands Tribunal may award compensation to the landowner and/or anyone who holds an interest in the land and this will be included in the Connection Charge or through a separate mechanism agreed between you and us.

Unmetered Supplies

~~1.78~~1.77 For some street lighting and other installations, we may allow items of equipment to be connected to our Distribution System without a meter. This is subject to the equipment having a low and predictable pattern of consumption and meeting the requirements of The Electricity (Unmetered Supply) Regulations 2001.

~~1.79~~1.78 Where we agree that a meter is not required the provision of such a connection is dependent on the owner entering into an unmetered Connection Agreement and providing and maintaining an auditable inventory, in a format agreed with us, so that an accurate estimate of the consumption can be produced.

~~1.80~~1.79 Where certain criteria are met the provision of services for unmetered connections may be made via a time-based connection service charge, e.g. Rent-a-Jointer Services. This is subject to us entering into a contract with you for the provision of such services.

~~1.81~~1.80 You may elect to appoint an accredited ICP to carry out the Contestable Work for unmetered connections. The ICP will be allowed to carry out live jointing on low voltage, underground cables. Where you use an ICP, arrangements must first be established as follows:

- You will enter into an agreement with the ICP to carry out and complete the Contestable Work; and
- We will enter into an agreement and/or an Adoption Agreement with you and/or your appointed ICP as appropriate.

Capacity Ramping for LDNOs

~~1.82~~1.81 For an LDNO the Required Capacity (expressed in kVA) is the Maximum Capacity to be provided at the boundary between the LDNO's distribution network and our Distribution System. This value will be agreed with us and stated in the Bilateral Connection Agreement for the relevant embedded network.

~~1.83~~1.82 When a connection is provided to an LDNO the take-up of capacity may grow over a period of time as the site develops and individual customers are connected. In such circumstances the Bilateral Connection Agreement shall include a phased Required Capacity based on the Development Phase.

~~1.84~~1.83 During the Development Phase a review may be undertaken annually on the anniversary of the Energisation of the embedded network. Any unused capacity identified in such review may be released for use by other customers and the Maximum Capacity reduced to an agreed level within the Bilateral Connection Agreement.

~~1.85~~1.84 The Required Capacity agreed with us as being required at the end of the Development Phase shall be used to determine the Required Capacity for determination of the Cost Apportionment Factors where applicable.

~~1.86~~1.85 Should additional capacity subsequently be required, the LDNO may incur additional Connection Charges for any Reinforcement based on the increase in capacity.

Phased Capacity Site

~~1.87~~1.86 If a Customer has a requirement for capacity to increase over a period of time, then a phased Required Capacity can be agreed. The phased Required Capacity will be documented in the Connection Agreement for the connection.

~~1.88~~1.87 The DNO will use the phased Required Capacity to assess the needs of the Distribution System and what, if any, Reinforcement is required. Any Reinforcement will be charged in accordance with the Charging Methodology for a Demand Connection or Generation Connection, as appropriate.

~~1.89~~1.88 The DNO will use the phased Required Capacity, updated in the Connection Agreement and as applicable at the relevant time, as the Maximum Capacity for the purposes of calculating the Customer's Use of System Charges.

~~1.90~~1.89 By agreeing a phased Required Capacity, the Customer is committing to pay, from Energisation of the connection, Use of System Charges based upon the residual charging band allocated in accordance with DCUSA Schedule 32 (Residual Charging Bands) based on the Required Capacity for the complete development. For example, if the connection will be ramped from 1MVA to 5MVA over 10 years, the Customer is committing to pay Use of System Charges for a 5MVA connection in line with the ramped profile (i.e. when the capacity is ramped to 5MVA in year 10).

~~1.91~~1.90 During the Development Phase a review may be undertaken annually on or around the anniversary of the date of Energisation of the connection. The results of that review will be discussed, and we may require reasonable changes to the phasing as a result of that review.

Disconnection and De-Energisation

~~1.92~~1.91 If we either Disconnect or De-energise your Entry/ Exit Point:

- at the request of your Supplier; or

- due to a failure of your Supplier to comply with the terms of the DCUSA,
- then the cost of such disconnection or De-energisation will be borne by your Supplier.

~~1.93~~1.92 If we either Disconnect or De-energise your Entry/ Exit Point:

- at your request; or
 - due to a failure by you to comply with the terms of your Connection Agreement,
- then the cost of such disconnection or De-energisation will be borne by you.

~~1.94~~1.93 On termination of your Connection Agreement, we retain the right to remove our Electrical Plant and Electric Lines and charge you if we do so. Apparatus which is not cost effective for us to recover (e.g. Electric Lines laid underground) will normally be made safe and left at the Premises, but if you require us to remove them, the cost of removal will be payable by you. All such apparatus will remain our property unless otherwise agreed in writing.

Adoption Payments

~~1.95~~1.94 Where we adopt assets installed by an ICP we will not make any adoption payment in respect of those assets.

Competition in Connections

~~1.96~~1.95 Where you choose to have any Contestable Work undertaken by an ICP, we levy CIC Charges associated with the design approval, inspection and adoption of the Contestable Works as set out in Section [6] and Section [7].

Worked Examples Illustrating the Application of the Connection Charging Methodology

The following Examples are to illustrate the application of the Connection Charging Methodology and are not intended to provide an accurate estimate of the charges for which a person would become liable in respect of the provision of a connection. The Examples do not necessarily represent the Minimum Scheme for a specific connection application or how we would classify a connection between what is a Demand Connection or Generation Connection. Where an example only applies to either Demand or Generation Connections, then this is identified in the Example title, otherwise the examples apply to both.

The figures quoted in the Examples are illustrative. Section [7] of this statement provides our charges and indicative costs to undertake various activities.

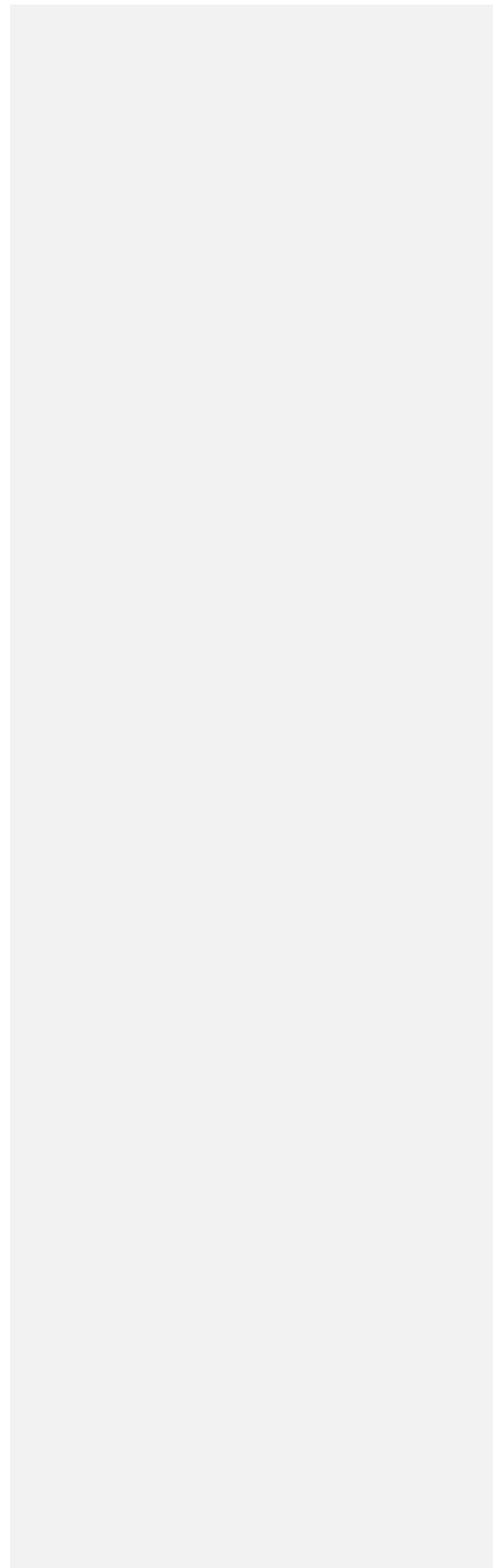
The Examples illustrate where we undertake both the Contestable and Non-Contestable Work. These costs will include the determination of the POC and assessment and design costs, though these are not explicitly identified in the Examples.

Where Contestable Work is undertaken by an ICP, we will apply CIC Charges for services associated with the Contestable Works which would cover activities including design approval, inspection and monitoring. The CIC Charges are not shown in the Examples. For the avoidance of doubt, in each Example, where an ICP undertakes the Contestable Work, our Connection Charge will include the cost of the Non-Contestable Work and the CIC Charges but exclude the cost of Contestable Work.

The Examples are generic and standard for all LDNOs, but they do not represent the network analysis and subsequent design solutions that would be completed for an actual connection scheme. The actual designs are subject to our design policies.

For illustrative purposes only, the rated capacities of the Examples use 'kVA, MVA' and 'kW, MW' interchangeably.

|



Index of Examples

Example	Description	Purpose
1	A new connection at LV	To show Extension Assets are charged in full to the Customer.
2	A new connection at HV	To show LV and HV Extension Assets are charged in full to the Customer.
3	A new connection on a domestic housing development with interconnection requested by Customer	To illustrate Exception 2 where the interconnection is treated as Extension Assets and are charged in full to the Customer.
4	A new connection with interconnection requested by us.	To illustrate Exception 1 where LV and HV Extension Assets are charged in full to the Customer, but the interconnection is paid in full by us.
5	A new connection where the Minimum Scheme is a new substation teed onto the existing HV network.	Simple example of a commercial connection, Extension Assets only, so charged in full to the Customer.
6	A new connection where the Minimum Scheme is a new substation looped into existing HV network.	Simple example of looped connection, Extension Assets only, so charged in full to the Customer.
7	A new connection where the Minimum Scheme is as for Example 5 but the Customer requests an enhanced connection arrangement where the substation is looped into existing HV network.	Shows that for a Customer requested Enhanced Scheme that the Customer pays costs above the Minimum Scheme plus O&M.
8	A new connection where the Minimum Scheme is as for Example 5 but we request an Enhanced Scheme where the substation is looped into the existing HV network.	Shows that for a DNO requested Enhanced Scheme that the DNO pays for all costs above Minimum Scheme.
9	An additional load application requiring a new connection from the HV network and Reinforcement.	To demonstrate the treatment of Reinforcement cost for a Demand Connection that drives Reinforcement.
10	A new connection that results in a Point of Connection further away than the nearest network.	To show that the Minimum Scheme may result in a Point of Connection that is further away than the nearest network and may result in increased Extension Asset costs that are charged in full to the Customer.
11	A new Generation Connection with capacity triggered Reinforcement.	To demonstrate the treatment of Reinforcement cost for a Generation Connection which drives Reinforcement using the Security CAF.

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Example	Description	Purpose
12	A new Generation Connection with Fault Level Triggered Reinforcement.	To demonstrate how the Fault Level CAF calculation is applied.
13	A new Generation Connection that requires Reinforcement involving both Security and Fault Level CAFs.	To demonstrate Reinforcement charging principles for a Generation Connection where both Security CAF and Fault Level CAF are applicable.
14	A new Generation Connection with Reinforcement at a voltage above that of the Point of Connection.	To illustrate that a Generation Connection does not contribute to Reinforcement costs at a voltage level above the connection voltage.
15	New Generation Connection where switchgear extension is not possible and switchgear replacement is needed	Illustrate Exception 4, if switchgear extension not possible, then treated as Extension Assets and costs are charged in full to the Customer.
16	A new Storage Connection that triggers Reinforcement	To show that Storage, when not co-located with other demand, is treated as a Generation Connection for the purposes of charging and any Reinforcement at the same Voltage of the POC will be charged, irrespective of whether the Reinforcement is due to the import or the export.
17	A new connection that is connected by Reinforced assets	To demonstrate the application of Exception 5 where the Customer needs to pay for the assets that connect them to the existing network.
18	A new connection of a development	To demonstrate the application of Exception 6 where the Customer pays for assets within the site boundary.
19	A new connection with remote network Reinforcement	To show treatment where capacity is created on a different part of the network and a load transfer is required to allow the connection. Example again demonstrates which elements are Reinforcement and which are Extension Assets.
20	A new connection with load transfer	Variation to Example 19 where a load transfer is required to free up capacity, but no new capacity is created and demonstrates why elements become Extension Assets.
21	A new Generation Connection with an Enhanced Scheme at the DNO's request.	To show how the Security CAF calculation is applied where the DNO requests an Enhanced Scheme.
22	A new Generation Connection on a meshed HV distribution system requiring Reinforcement.	To show that a contribution is required where Reinforcement is carried out at the same voltage as the Point of Connection for a Generation Connection.

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Example	Description	Purpose
23	A non-secure Generation Connection with non-secure Reinforcement.	To show that a contribution is required where Reinforcement is carried out at the same voltage as the Point of Connection for a Generation Connection in relation to a non-secure system.
24	A new non-secure Generation Connection with secure Reinforcement.	To show the application of the apportionment rule where secure Reinforcement is provided but the connection for a Generation Connection is non-secure.
25	A new Generation Connection with voltage rise triggered Reinforcement.	To show that a Generation Connection pays for Reinforcement at the voltage level of connection based on the CAF.
26	A new Generation Connection with voltage rise triggered Reinforcement.	To show that if voltage rise Reinforcement is tailored so that just the amount of network is upgraded to meet the Customer requirements, the CAF is 100% for a Generation Connection.
27	A new Generation Connection with Fault Level Triggered Reinforcement and transmission works.	To show how the Fault Level CAF calculation is applied and how the cost of transmission works are treated for a Generation Connection.
28	A new Generation Connection with Fault Level triggered Reinforcement and transmission works.	To show the treatment of Reinforcement costs at more than one voltage level above the POC and the cost of transmission works for a Generation Connection.
29	A new Demand Connection that has Reinforcement above the High-Cost Project Threshold.	To show how the Demand High-Cost Project Threshold is applied.
30	A new Generation Connection that has Reinforcement above the High-Cost Project Threshold.	To show how a Generation Connection that triggers the Generation High-Cost Project Threshold is charged when the Reinforcement required is at the same voltage of connection.
31	The Customer requirements for supply characteristics are greater than the Minimum Scheme.	To illustrate that the Customer specifically requesting a three-phase connection, where the existing network is not of a sufficient number of phases, pays for any Reinforcement.

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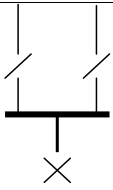






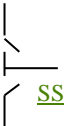
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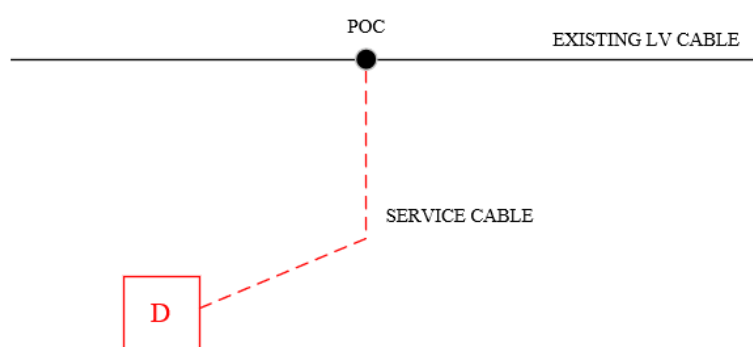
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Key to Illustrations

	Circuit Breaker (any voltage)
	Switch
	Transformer
	Joint on cable
	High voltage ring main unit
	Existing cable
	Proposed cable
	Normal Open Point (NOP)
	Generation Connection
	Demand Connection
	Point of Connection (POC)
	Sub Station

Example 1: A new connection at LV**Purpose:** To show Extension Assets are charged in full to the Customer.

A Customer requests a LV single phase connection to a new house. The Premises can be connected to an existing LV main cable in the street.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:

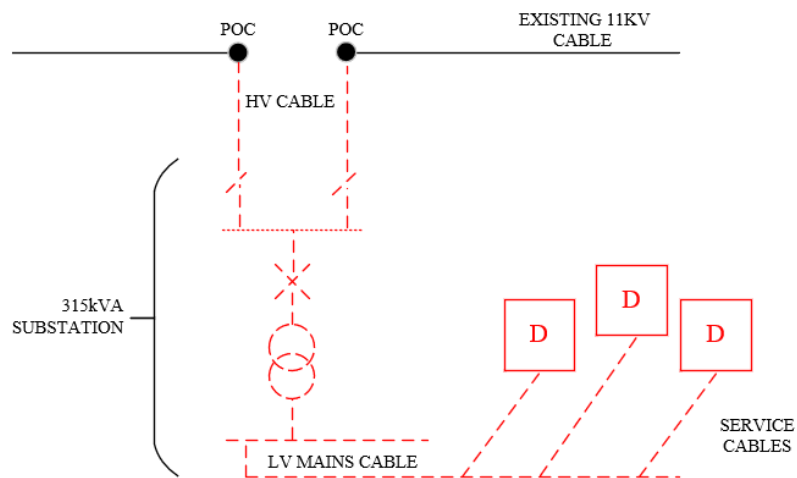
	Cost	Apportionment	Customer Contribution
15m service cable, excavation in footpath for joint hole to Customer laid duct, backfill and termination	£1,600	n/a	£1,600
Single service breech joint	£300	n/a	£300
Total Extension Asset Cost	£1,900		£1,900

Total cost of the work = **£1,900**

Total Connection Charge to Customer = **£1,900**

Example 2: A new connection at HV**Purpose:** To show LV and HV Extension Assets are charged in full to the Customer.

A housing developer requests connection for 200 domestic Premises. The Required Capacity to supply the 200 homes is 250kVA. A new distribution substation will be established to provide the Required Capacity of the site. The Minimum Scheme requires the substation to be looped into the existing 11kV network.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
Provision and installation 100m 11kV cable	£30,000	n/a	£30,000
315kVA substation	£60,000	n/a	£60,000
LV mains, service cables and terminations	£200,000	n/a	£200,000
Two 11kV cable joints	£6,000	n/a	£6,000
Total Extension Asset Cost	£296,000		£296,000

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Total cost of the work = £296,000

Total Connection Charge to Customer = £296,000

Example 3: A new connection on a domestic housing development with interconnection requested by Customer

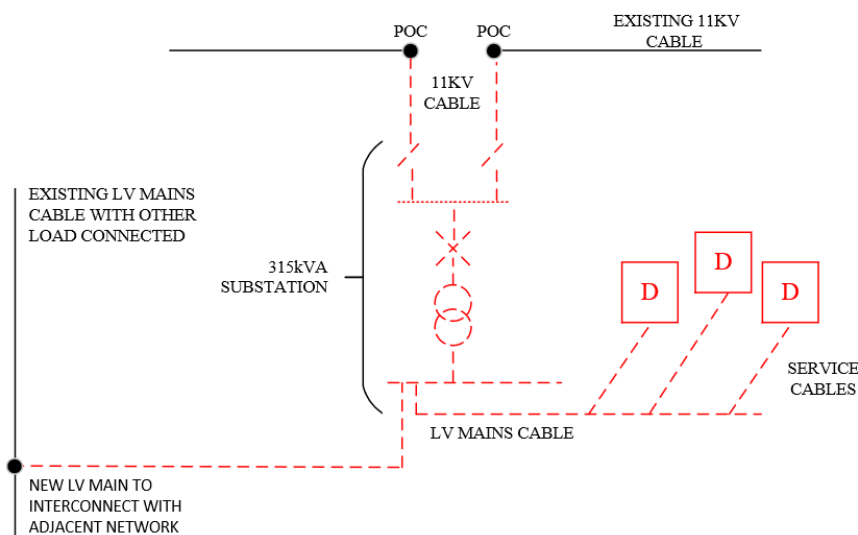
Purpose: To illustrate Exception 2 where the interconnection is treated as Extension Assets and are charged in full to the Customer.

As in Example 2, a housing developer requests connections for 200 domestic Premises. The Required Capacity to supply the 200 homes is 250kVA. A new distribution substation will be established to provide the Required Capacity of the site. The Minimum Scheme requires the substation to be looped into the existing 11kV network. However, in this example there is an option to provide an additional LV cable to interconnect the distribution substation with the existing LV network. This option is over and above the Minimum Scheme.

Interconnecting into the existing LV network will increase the capacity of the existing Distribution System. Therefore, the assets that connect the 11kV and LV network would normally be considered to be Reinforcement. These assets (as shown on the diagram below) include the 11kV cable, the 315kVA substation and the interconnecting LV main. They exclude the LV mains and service cables from the 315kVA substation to the Customer's development. However, whether these assets are to be considered Reinforcement or Extension Assets depends upon who requested the LV interconnection.

In this case Exception 2 (Paragraph 1.23) applies as the LV interconnector is over and above the minimum scheme and requested by the Customer, therefore all assets (including the interconnecting LV cable) will be treated as Extension Assets and their costs will be borne in full by the Customer. As the interconnecting LV main and associated LV joint are over and above the Minimum Scheme, a charge for their future operation and maintenance will be made.

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The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
Provision and installation 100m 11kV cable (from existing 11kV network to substation)	£30,000	n/a	£30,000
315kVA substation	£60,000	n/a	£60,000
LV mains, service cables and terminations (from substation to the Customer's development)	£200,000	n/a	£200,000
Two 11kV cable joints	£6,000	n/a	£6,000
Interconnecting cable (from substation to existing LV network)	£12,000	In excess of Minimum Scheme	£12,000
LV cable joint	£300	In excess of Minimum Scheme	£300
Difference between Minimum Scheme and actual Scheme is £12,300. Operations & maintenance @ 20%* of £12,300		20%* of £12,300	£2,460
Total Extension Asset Cost	£308,300		£310,760

*Note, the 20% Operation and Maintenance percentage has been used for illustrative purposes only.

Total cost of the work = £308,300

Total Connection Charge to Customer = £308,300 + £2,460 = £310,760

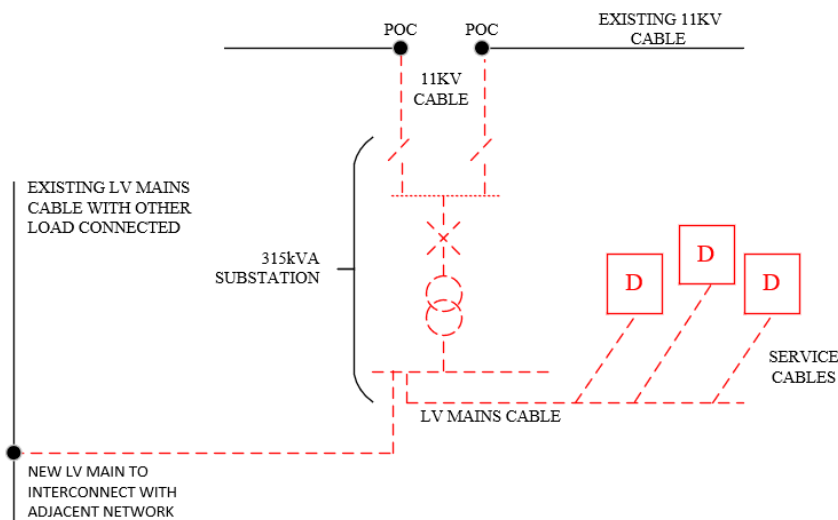
Example 4: A new connection with interconnection requested by us

Purpose: To illustrate Exception 1 where LV and HV Extension Assets are charged in full to the Customer, but the interconnection is paid in full by us.

As in Example 2, a housing developer requests connections for 200 domestic Premises. The Required Capacity to supply the 200 homes is 250kVA. A new distribution substation will be established to provide the Required Capacity of the site. The Minimum Scheme requires the substation to be looped into the existing 11kV network. However, in this Example there is an option to provide an additional LV cable to interconnect the distribution substation with the existing LV network. This option is over and above the Minimum Scheme.

Interconnecting into the existing LV network will increase the capacity of the existing Distribution System. Therefore, the assets that connect the 11kV and LV network would normally be considered to be Reinforcement. These assets (as shown on the diagram below) include the 11kV cable, the 315kVA substation and the interconnecting LV main. They exclude the LV mains and service cables from the 315kVA substation to the Customer's development. However, whether these assets are to be considered Reinforcement or Extension Assets depends upon who requested the LV interconnection.

In this case all the requirements of Exception 1 (paragraph 1.22) are met so the assets that connect the existing 11kV and LV Distribution System will be treated as Extension Assets. The Customer will pay the costs associated with the Minimum Scheme in full. The interconnecting LV cable and associated LV joint, as they are over and above the Minimum Scheme and were requested by us, therefore the costs will be borne in full by us.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
Provision and installation 100m 11kV cable (from existing 11kV network to substation)	£30,000	n/a	£30,000
315kVA substation	£60,000	n/a	£60,000
LV mains, service cables and terminations (from substation to the Customer's development)	£200,000	n/a	£200,000
Two 11kV cable joints	£6,000	n/a	£6,000
Interconnecting cable (from substation to existing LV network)	£12,000	In excess of Minimum Scheme	£0
LV cable joint	£300	In excess of Minimum Scheme	£0
Total Extension Asset Cost	£308,300		£296,000

Total cost of the work = £308,300

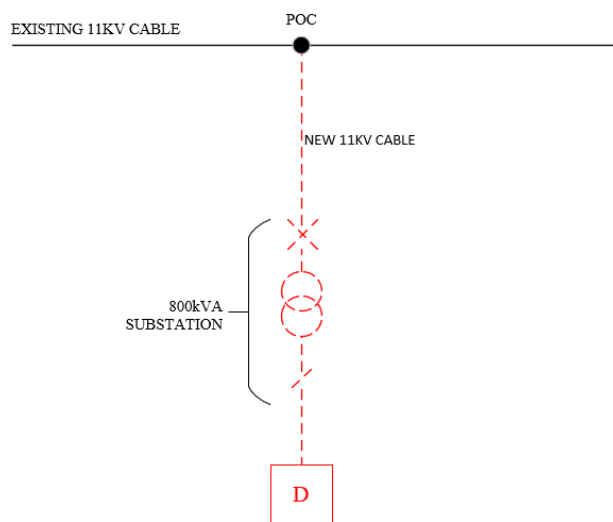
Total Connection Charge to Customer = £296,000

Example 5: A new connection where the Minimum Scheme is a new substation teed onto the existing HV network.

Purpose: Simple example of a commercial connection, Extension Assets only, so charged in full to the Customer.

A Customer requests a new LV three phase 600kVA connection to commercial Premises. Four scenarios for connection are considered in Examples 5 to 8. The Minimum Scheme will be dependent on the specific circumstances as set out in paragraphs 1.1 to 1.7.

In this example the Minimum Scheme is a new 800kVA substation teed onto the existing 11kV network. The figure below shows the proposed network.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
Provision and installation of 150m of 11kV cable	£45,000	n/a	£45,000
800kVA substation	£875,000	n/a	£875,000
Provision and installation LV cabling	£6,000	n/a	£6,000
LV Metering Panel	£4,000	n/a	£4,000
11kV joint to network	£3,000	n/a	£3,000
Total Extension Asset Cost	£1,433,000		£1,433,000

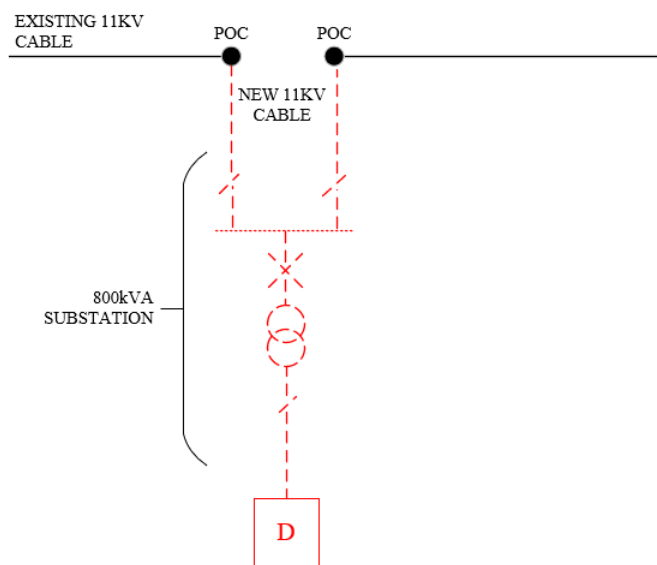
Total cost of the work = £1,433,000

Total Connection Charge to Customer = £1,433,000

Commented [BAH29]: The costs of the transformer only in subsequent examples is also £75,000 which might be confusing so value increased to create a differential

Example 6:	A new connection where the Minimum Scheme is a new substation looped into existing HV network.
Purpose:	Simple example of looped connection, Extension Assets only, so charged in full to the Customer.

In this variation to Example 5, the Customer is connected with a looped connection, as illustrated in the following diagram. The Minimum Scheme is a new 800kVA substation looped into existing 11kV network.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
Provision and installation of 300m (2x150m) of 11kV cable looped into the network,	£90,000	n/a	£90,000
800kVA substation transformer	£75,000	n/a	£75,000
Ring Main Unit	£25,000	n/a	£25,000
Provision and installation LV cabling	£6,000	n/a	£6,000
LV Metering Panel	£4,000	n/a	£4,000
11kV joints to network	£6,000	n/a	£6,000
Total Extension Asset Cost	£206,000		£206,000

Total cost of the work = £206,000

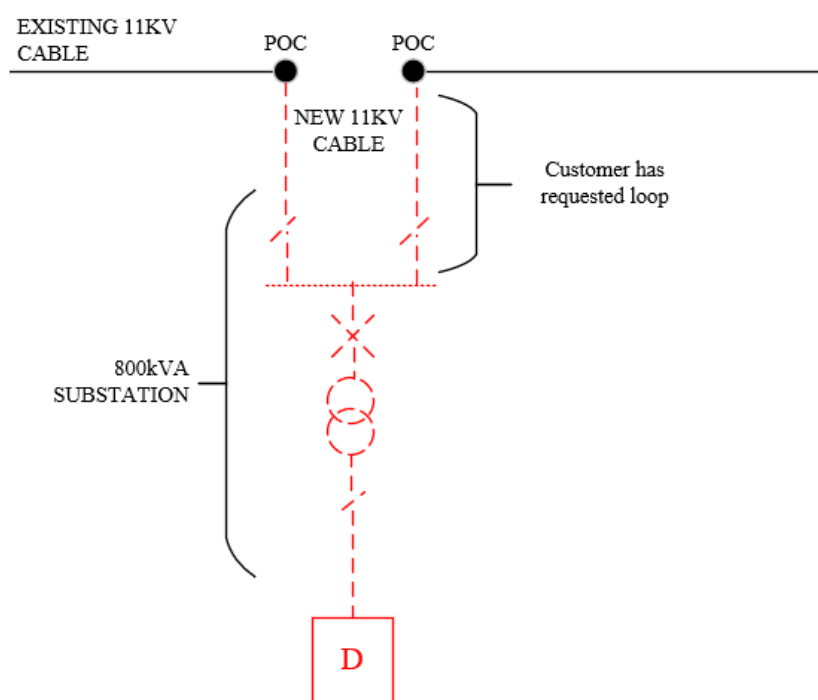
Total Connection Charge to Customer = £206,000

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Example 7: A new connection where the Minimum Scheme is as for Example 5 but the Customer requests an enhanced connection arrangement where the substation is looped into existing HV network.

Purpose: Shows that for a Customer requested Enhanced Scheme that the Customer pays costs above the Minimum Scheme plus O&M.

In this variation to Example 5, the Customer requests an enhanced connection arrangement where the substation is looped into existing 11KV network, as illustrated in the following diagram. The Minimum Scheme is as for Example 5.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
Provision and installation of 300m (2x150m) of 11kV cable looped into the network	£90,000	n/a	£90,000
800kVA substation transformer	£75,000	n/a	£75,000
Ring Main Unit	£25,000	n/a	£25,000
Provision and installation LV cabling	£6,000	n/a	£6,000
LV Metering Panel	£4,000	n/a	£4,000
11kV joints to network	£6,000	n/a	£6,000
Total Extension Asset Cost	£206,000		£206,000
Difference between Minimum and the actual Scheme is £73,000 (£206,000-£133,000). Operation & Maintenance @20%* of £73,000.		20%* of £73,000	£14,600
Total Extension Asset Cost incl O&M			£220,600

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*Note, the 20% Operation and Maintenance percentage has been used for illustrative purposes only

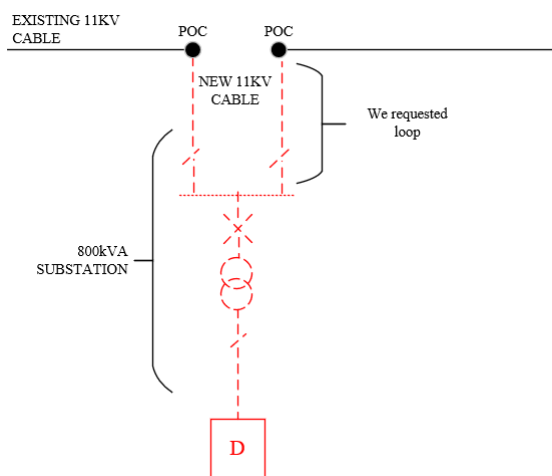
Total cost of the work = £206,000

Total Connection Charge to Customer = £206,000 + £14,600 = £220,600

Example 8: A new connection where the Minimum Scheme is as for Example 5 but we request an Enhanced Scheme where the substation is looped into the existing HV network.

Purpose: Shows that for a DNO requested Enhanced Scheme that the DNO pays for all costs above Minimum Scheme.

In this variation to Example 5, the Customer is connected with a looped connection, as illustrated in the following diagram. The Minimum Scheme is as for Example 5 but we request an Enhanced Scheme where the substation is looped into the existing 11kV network.



The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
Provision and installation of 300m (2x150m) of 11kV cable	£90,000	Minimum Scheme charges apply	£45,000
800kVA transformer	£75,000	n/a	£875,000
Ring Main Unit	£25,000	Minimum Scheme charges apply	0
Provision and installation LV cabling	£6,000	n/a	£6,000
LV Metering Panel	£4,000	n/a	£4,000
11kV joints to network	£6,000	Minimum Scheme charges apply	£3,000
Total Extension Asset Cost	£206,000		£143,000

Total cost of the work = £206,000

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Total Connection Charge to Customer = £143,000

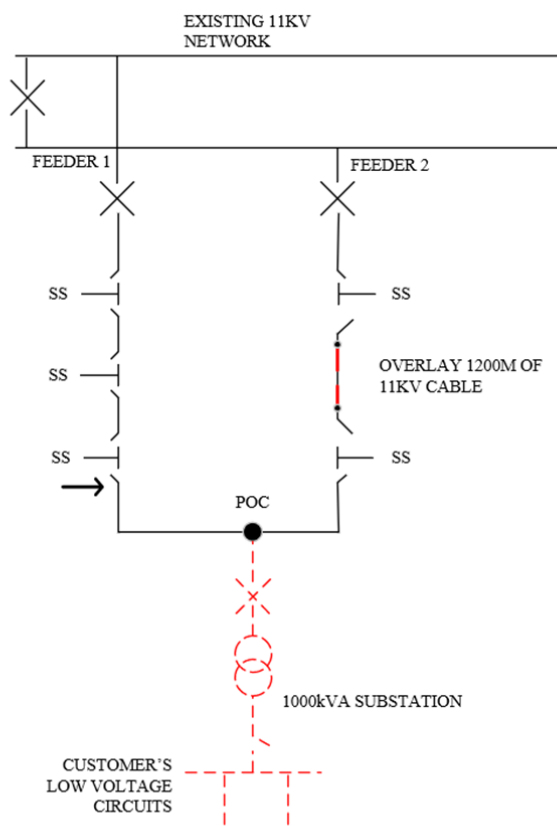
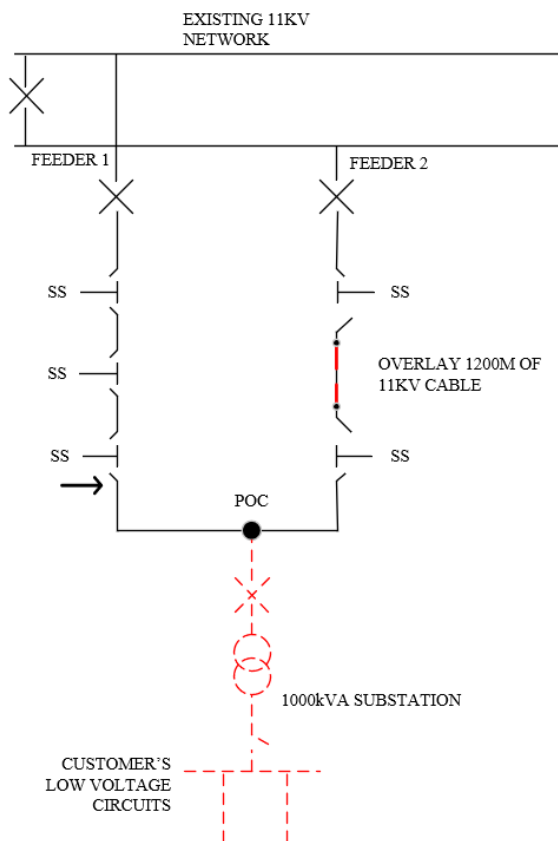
Example 9:	An additional load application requiring a new connection from the HV network and Reinforcement.
Purpose:	To demonstrate the treatment of Reinforcement cost for a Demand Connection that drives Reinforcement.

A Customer requests to increase the Maximum Capacity of their existing LV connection from 200kVA to 850kVA; an increase of 650kVA (the Required Capacity). The Connection is a Demand Connection.

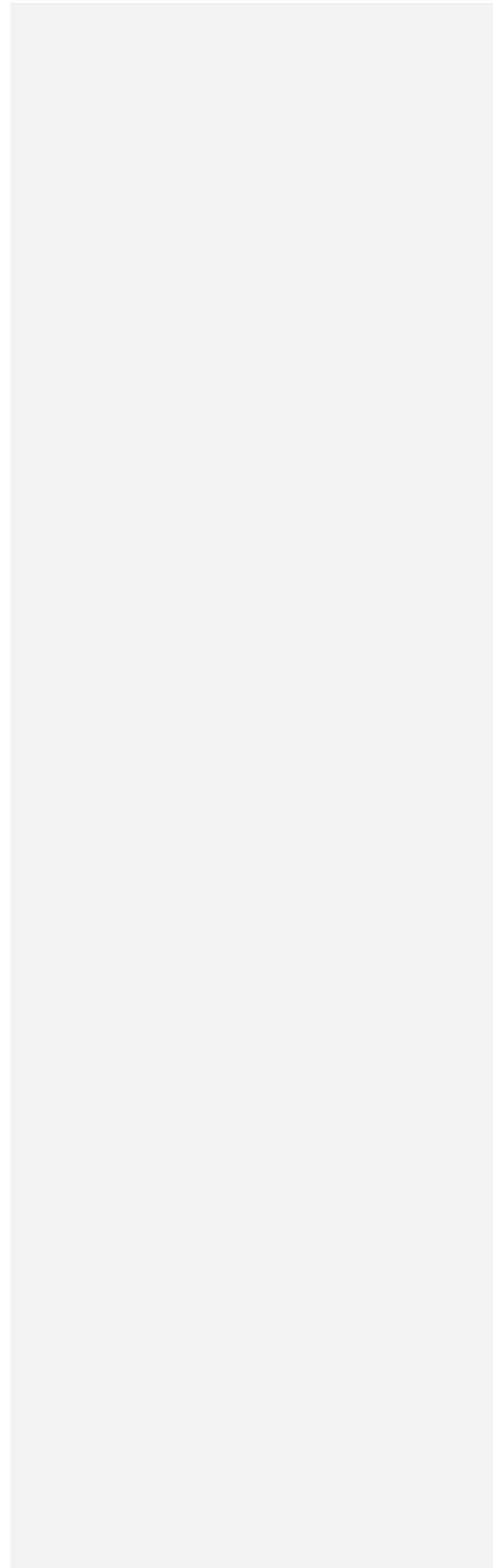
As the Customer's existing LV connection is unable to deliver the Required Capacity a new connection will be required from the local 11kV network. This will be a non-secure connection to a secure network. The Minimum Scheme is to overlay part of the nearest 11kV circuit (Feeder 2) which only has spare capacity of 200kVA. The Reinforcement to make the capacity available requires 1200m of existing 11kV cable to be overlaid with a larger capacity cable. Costs of the disconnection of the existing LV connection have not been included in this example.

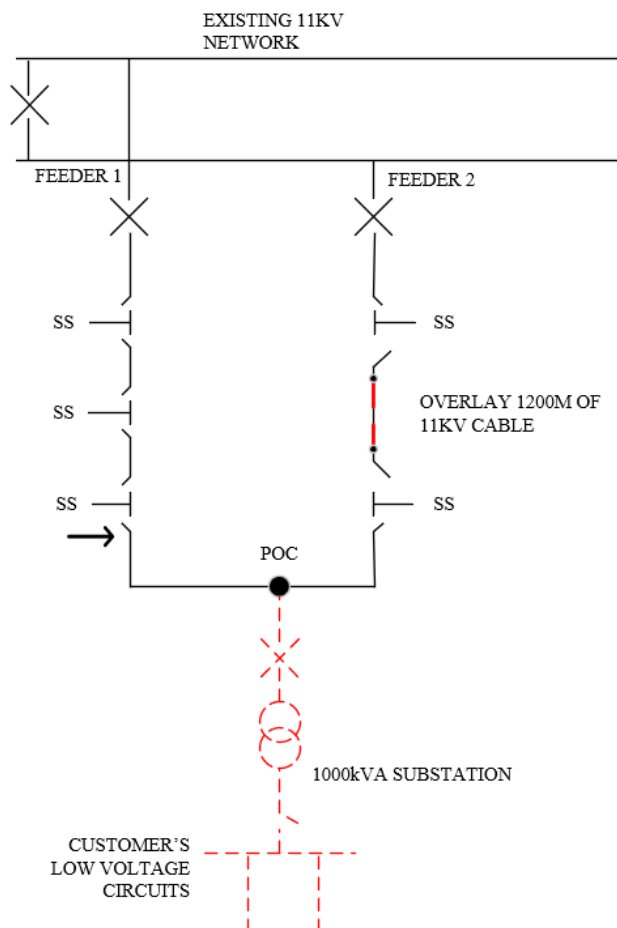
Commented [TT35]: The example is 'An additional load application requiring a new connection from the HV Network and Reinforcement' however the calculation of costs only includes for the new HV Cable / Substation and does not show the cost of disconnecting the customer's existing LV connection

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|





Reinforcement:

The Relevant Section of Network is the two feeder ring comprising Feeder 1 and Feeder 2.

As this connection is a Demand Connection the Customer will not be charged for Reinforcement. The Connection Charge for this Scheme is calculated as follows:

Reinforcement	Cost	Apportionment	Customer Contribution
Overlay 1200m of 11KV cable	£360,000	0%	£0
11KV Jointing	£6,000	0%	£0

Total Reinforcement Cost	£366,000		£0

Extension Assets	Cost	Apportionment	Customer Contribution
Provision and installation 11KV cable	£60,000	n/a	£60,000
1000kVA substation	£80,000	n/a	£80,000
Termination of Customer's LV cables	£4,000	n/a	£4,000
LV Metering panel	£4,000	n/a	£4,000
11KV Jointing	£3,000	n/a	£3,000
Total Extension Asset Cost	£151,000		£151,000

Total Cost of the Work = £366,000 + £151,000 = **£517,000**

Total Connection Charge to Customer = **£151,000**

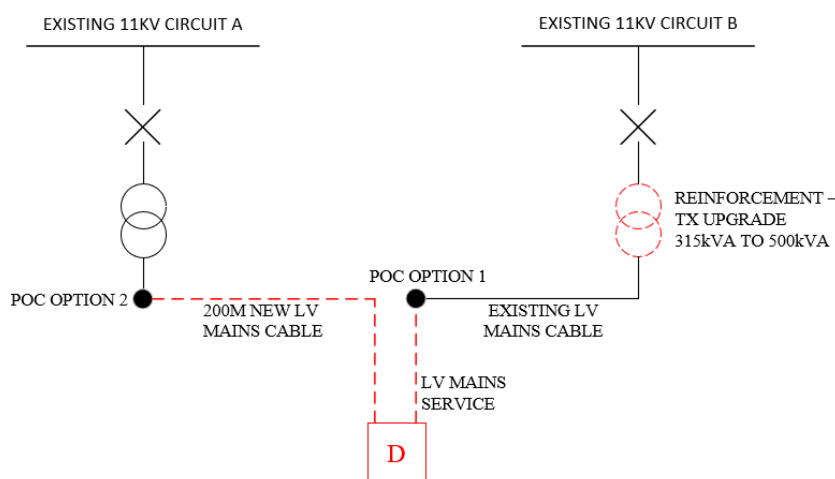
Example 10:	A new connection that results in a Point of Connection further away than the nearest network.
Purpose:	To show that the Minimum Scheme may result in a Point of Connection that is further away than the nearest network and may result in increased Extension Asset costs that are charged in full to the Customer.

A Customer applies for a new connection with a Maximum Capacity of 100kVA.

Assessment of the local network identifies that there is an existing LV cable to the front of the development, which is fed from a 315kVA transformer. The LV cable has sufficient spare capacity for the connection; however, the transformer is at full capacity and would therefore require Reinforcement work to upgrade it from a 315kVA to 500kVA transformer.

Two design options are considered.

1. For the first option, the cost of this work is estimated to be £70,000, and the cost of the LV Extension Assets Mains Service is estimated to be £5,000.



The Connection Charge for this Option 1 would be calculated as follows:

Reinforcement Assets:	Cost	Apportionment	Customer Contribution
Upgrade 315kVA transformer to 500kVA	£70,000	0%	£0
Total Reinforcement Asset Cost	£70,000		£0

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Extension Assets:	Cost	Apportionment	Customer Contribution
LV Extension Assets	£5,000	n/a	£5,000
Total Extension Asset Cost	£5,000		£5,000

Total cost of the work = £70,000 + £5,000 = **£75,000**

Total Connection Charge to Customer = £5,000 = **£5,000**

2. For the second option, there is a large cross-sectional LV cable 200m from the development which is fed from a 1000kVA transformer, and both the LV cable and transformer have sufficient spare capacity to provide a connection to the development without Reinforcement work. This design requires Extension Assets involving 200m of LV Cable estimated to cost £40,000 and a mains type service; -the cost of the LV [Extension Assets](#) [Mains Service](#) is £5,000 consistent with the first option.

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The Connection Charge for Option 2 would be calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
200m of LV mains cable	£40,000	n/a	£40,000
LV Extension Assets	£5,000	n/a	£5,000
Total Extension Asset Cost	£45,000		£45,000

Total cost of the work = **£45,000**

Total Connection Charge to Customer = **£45,000**

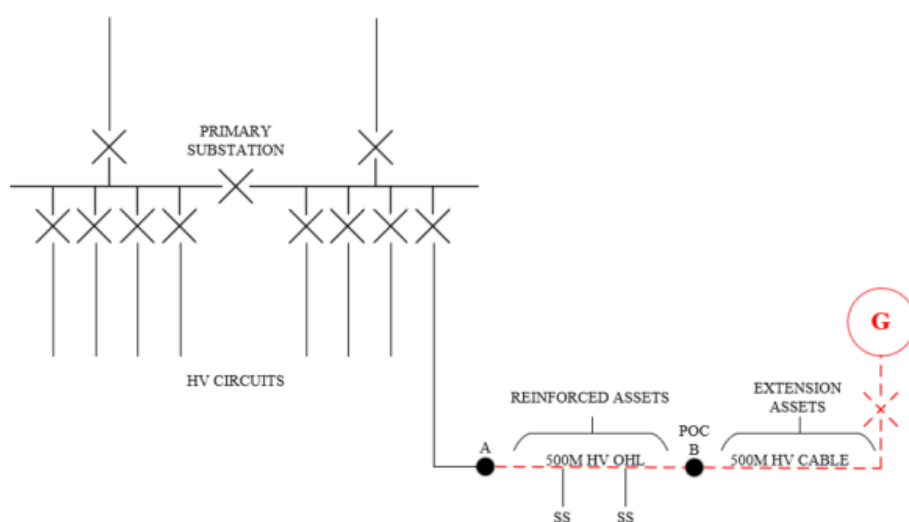
Option 2 has the lower overall capital cost of £45,000 (compared to £75,000 for Option 1) and therefore represents the Minimum Scheme. Whilst Option 2 results in a higher charge to the Customer, it is the overall capital cost that is used to determine the Minimum Scheme. The connection offer to the Customer would therefore be based on Option 2.

Example 11: A new Generation Connection with capacity triggered Reinforcement.

Purpose: To demonstrate the treatment of Reinforcement cost for a Generation Connection which drives Reinforcement using the Security CAF.

A Customer requests a Generation Connection with a Required Capacity for export purposes of 3MW. The Minimum Scheme requires the Reinforcement of 500m of 11kV overhead line between points A and B to provide 7.6MVA of capacity.

The POC is to the existing 11kV network at point B and it is proposed to install 500m of 11kV underground cable from the POC to the Customer's installation and this cable is treated as Extension Assets.

**Reinforcement:**

The Relevant Section of Network is the 11kV OHL between points A and B and the Security CAF applies. The numerator in the CAF calculation is based upon the Required Capacity of the Customer, i.e. 3MVA and the denominator is based on the New Network Capacity following Reinforcement, i.e. 7.6MVA.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
Re-conductor 500m of 11kV overhead line at a higher capacity (7.6MVA)	£60,000	$3/7.6 \times 100\% = 39.5\%$	£23,700
Total Reinforcement Cost	£60,000		£23,700

Extension Assets:	Cost	Apportionment	Customer Contribution
Installation of 500m 11kV cable	£45,000	n/a	£45,000
11kV circuit breaker at Customer's substation	£25,000	n/a	£25,000
Total Extension Asset Cost	£70,000		£70,000

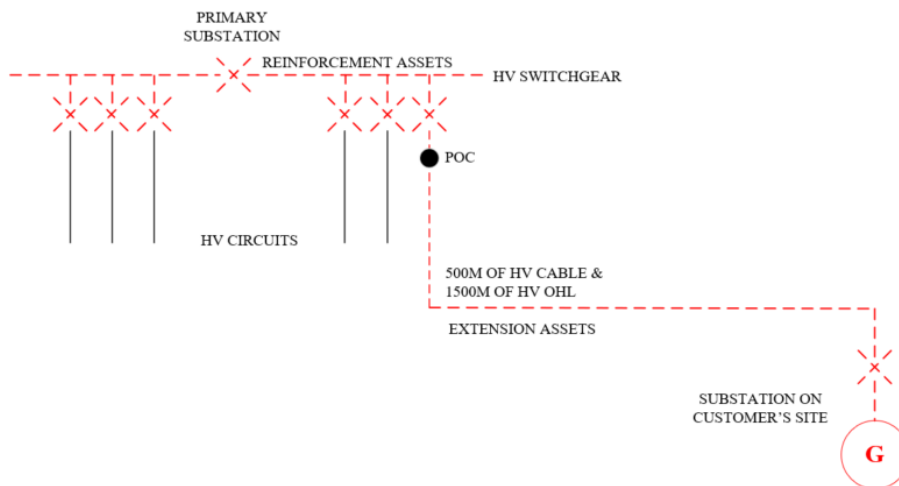
Total cost of the work = £60,000 + £70,000 = **£130,000**

Total Connection Charge to Customer = £23,700 + £70,000 = **£93,700**

Example 12: A new Generation Connection with Fault Level-Triggered Reinforcement.**Purpose:** To demonstrate how the Fault Level CAF calculation is applied.

A Customer wishes to connect a new generator with a Required Capacity for export purposes of 6MW. The connection of the generator requires the installation of 500m of 11kV cable and 1500m of overhead line between a new circuit breaker, added to the 11kV extensible switchgear panel at an existing primary substation and a new substation at the Customer's Premises. These assets are treated as Extension Assets.

The connection of the generator necessitates Reinforcement works to replace the 11kV switchgear at the existing primary substation with switchgear of a higher fault level rating.

**Reinforcement:**

Fault Level CAF calculation: The numerator in the CAF calculation is based upon the Fault Level contribution from the Customer's new generator connection, in this [Example example](#), 24MVA. The denominator is based upon the New Fault Level Capacity; in this Example the Fault Level capacity of the new 11kV switchboard, 315MVA.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
Replacement 11kV switchboard (excluding Customer's sole use circuit breaker)	£800,000	$3 \times (24/315) \times 100\% = 22.9\%$	£182,857
Total Reinforcement Cost	£800,000		£182,857

Extension Assets:	Cost	Apportionment	Customer Contribution
Installation of a 500m 11KV cable	£150,000	n/a	£150,000
Installation of a 1500m 11KV overhead line	£120,000	n/a	£120,000
11KV circuit breaker at Customer substation	£25,000	n/a	£25,000
Total Extension Asset Cost	£325,000		£325,000

Total cost of the work = £800,000 + £325,000 = **£1,125,000**

Total Connection Charge to Customer = £182,857 + £325,000 = **£507,857**

Example 13	A new Generation Connection that requires Reinforcement involving both Security and Fault Level CAFs.
Purpose:	To demonstrate Reinforcement charging principles for a Generation Connection where both Security CAF and Fault Level CAF are applicable.

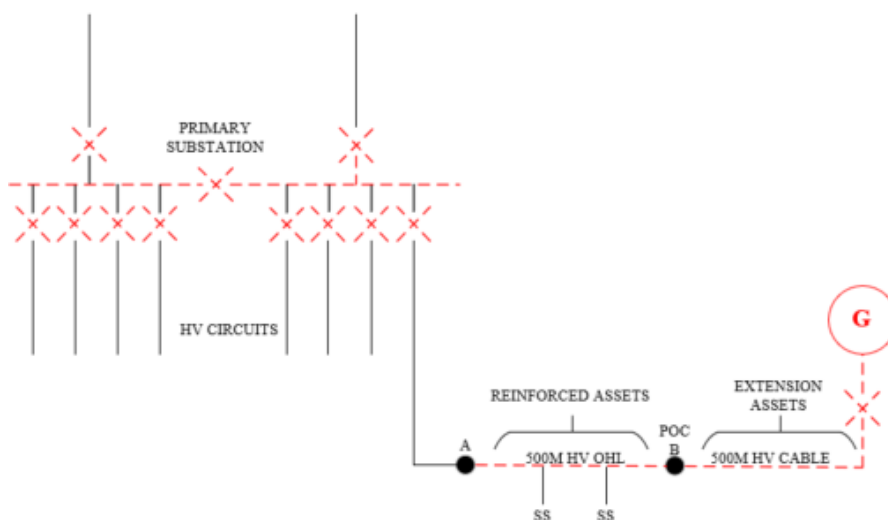
A Customer requests a connection to a generator with a Required Capacity for export purposes of 6MW. The Fault Level contribution at the primary substation from the generation connection is ~~10MW~~10MVA.

The POC is to the existing 11kV network at point B and it is proposed to install 500m of 11kV underground cable from the POC to the Customer's installation. This is treated as Extension Assets.

The connection requires the Reinforcement of 500m of 11kV overhead line between points A and B for a thermal capacity requirement and the Security CAF applies. The connection also requires the replacement of the existing ~~11 panel~~ 11kV switchboard at the primary substation in order to increase its fault level rating from 150MVA to 350MVA and the Fault Level CAF applies. However, the new fault level will be limited by the fault level rating of the local network of 250MVA.

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Reinforcement:

The Relevant Section of Network is the 11kV network from the primary substation to Point B.

Security CAF calculation: the numerator in the CAF calculation is based upon the Required Capacity of the Customer, i.e. 6MW. The denominator is based on the New Network Capacity following Reinforcement, which is 7.6MVA, i.e. after Reinforcement, in this particular case, the section of cable with the lowest rating.

The Relevant Section of Network is the 11kV switchboard at the primary substation.

Fault Level CAF calculation: The numerator in the CAF calculation is based upon the Fault Level contribution from the Customer's new generator connection, in this Example 10MVA. The denominator is based upon the New Fault Level Capacity, which is the lower of the Fault Level capacity of the new 11kV switchboard, 350MVA or of the local system, 250MVA in this Example.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement	Cost	Apportionment	Customer Contribution
Re-conductor of 500m of 11kV overhead line	£20,000	$6/7.6 \times 100\% = 78.9\%$ Security CAF	£15,789
Replacement 11kV switchboard	£800,000	$3 \times (10/250) \times 100\% = 12.0\%$ Fault Level CAF	£96,000
Total Reinforcement Cost	£820,000		£111,789

Extension Assets	Cost	Apportionment	Customer Contribution
Installation of 500m 11kV cable	£150,000	n/a	£150,000
11kV circuit breaker at Customer's substation	£12,000	n/a	£12,000
11kV pole top termination	£2,500	n/a	£2,500
Total Extension Asset Cost	£164,500		£164,500

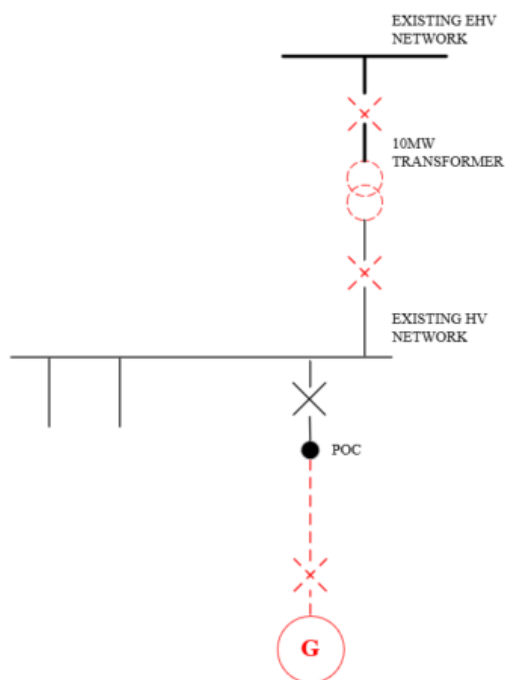
Total cost of the work: = £820,000 + £164,500 = **£984,500**

Total Connection Charge to Customer = £111,789 + £164,500 = **£276,289**

Example 14	A new Generation Connection with Reinforcement at a voltage above that of the Point of Connection.
Purpose:	To illustrate that a Generation Connection does not contribute to Reinforcement costs at a voltage level above the connection voltage.

A Customer requests a Generation Connection with a Required Capacity for export purposes of 36.0MW. A new single circuit cable will be required to connect the Customer to the existing 11kV network. There is sufficient spare capacity on the existing 11kV network main but the existing 7.5MVA transformer at the local 11kV/33kV substation is fully loaded.

The Minimum Scheme is to provide a new 250m 11kV cable from the POC which is treated as Extension Assets. The connection also requires the replacement of the 7.5MW transformer at the local substation with a 10MVA transformer and is treated as Reinforcement. The 11kV and 33kV switchgear either side of the transformer also requires replacement due to exceedance of its thermal capacity.



Reinforcement:

Security CAF calculation: The numerator in the CAF calculation is based upon the Required Capacity of the Customer, which is 36.0MW. The denominator is based on the New Network Capacity following Reinforcement, which is 10MVA.

Reinforcement is required at both the 11kV and 33kV levels, however the CAF is only required at the same voltage of connection, which in this case is 11kV.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
11KV Jointing	£3,000	3/10 x 100% = 30% Security CAF	£900
11KV circuit breaker	£30,000	3/10 x 100% = 30% Security CAF	£9,000
33KV circuit breaker	£80,000	0%	£0
Transformer replacement	£1,500,000	0%	£0
Total Reinforcement Cost	£1,613,000		£9,900

Extension Assets:	Cost	Apportionment	Customer Contribution
Install 200m of 11KV cable	£60,000	n/a	£60,000
11KV circuit breaker at Customer's substation	£25,000	n/a	£25,000
11KV Jointing	£3,000	n/a	£3,000
Total Extension Asset Cost	£88,000		£88,000

Total cost of the work = £1,613,000 + £88,000 = **£1,701,000**

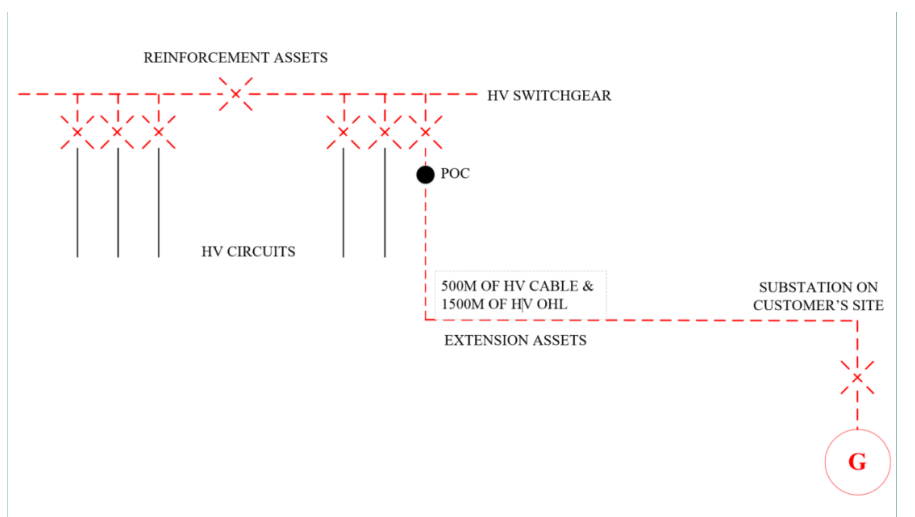
Total Connection Charge to Customer = £9,900 + £88,000 = **£97,900**

Example 15: A new Generation Connection where switchgear extension is not possible and switchgear replacement is needed.

Purpose: Illustrate Exception 4, if switchgear extension not possible, then treated as Extension Assets and costs are charged in full to the Customer.

This example demonstrates the application of Exception 4 (paragraph 1.25).

A Customer requests to connect a new generator with a Required Capacity for export purposes of 3MW. The connection of the generator requires the installation of the works as provided in Example 13 above. In this scenario, however, there is no Fault Level issue but, as the connection cannot be facilitated by an extension of the existing switchgear equipment in our primary substation, a full replacement of the existing switchgear installation is required. As no capacity is added to the existing shared use distribution network, the Customer will be required to fund the full cost of the switchgear installation replacement.



The existing switchgear had fault level rating of 250MVA. The company no longer uses switchgear with a fault level rating of 250MVA, so uses the closest equivalent switchgear used by it as standard, which has a slightly higher rating. Whilst the replacement switchgear increases the fault level capacity and could be considered Reinforcement, in this case this is due solely to the fault level rating of the standard equipment used by the company being higher than the fault level rating of the existing switchgear. The increase in fault level capacity is not required to connect the Customer. Therefore, Exception 4 (Paragraph 1.25) applies and the switchgear is considered Extension Assets and its costs will be charged in full to the Customer.

Commented [TP(P42)]: Exception 4 is where the switchgear results in an increase in Fault Level which isn't required to accommodate the connection – it doesn't mention Reinforcement so should this be "Switchgear replacement treated as Extension Assets"?

Commented [BAH43R42]: Suggest just change "Reinforcement Assets" to "Primary Substation"

Commented [BM44R42]: Agreed - We should make this our convention for all diagrams so that the diagrams can be used for multiple examples whereby the treatment of the new works can be designated in the descriptive text and the associated Charging Tables accordingly.

The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
Installation of a 500m 11KV cable	£150,000	n/a	£150,000
Installation of a 1500m 11KV overhead line	£120,000	n/a	£120,000
11KV circuit breaker at Customer substation	£25,000	n/a	£25,000
Replacement 11kV switchboard	£450,000	n/a	£450,000
New Extension Asset circuit breaker	£25,000	n/a	£25,000
Total Extension Asset Cost	£770,000		£770,000

Total cost of the work = £770,000

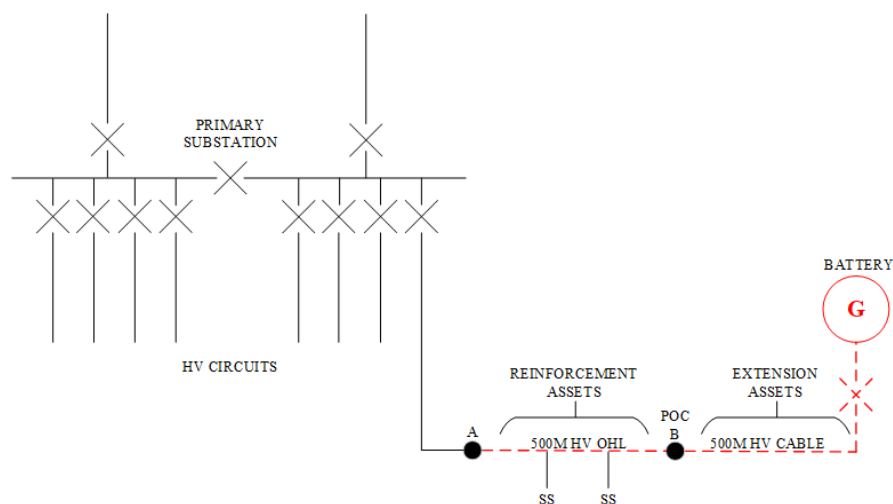
Total Connection Charge to Customer = £770,000

Example 16: A new Storage Connection that triggers Reinforcement.

Purpose: To show that Storage, when not co-located with other demand, is treated as a Generation Connection for the purposes of charging and any Reinforcement at the same Voltage of the POC will be charged, irrespective of whether the Reinforcement is due to the import or the export.

A Customer requests to connect a Battery with a Required Capacity of 3MW export and 3MVA import. The Minimum Scheme requires the Reinforcement of 500m of 11kV overhead line between points A and B to provide 7.6MVA of capacity.

The POC is to the existing 11kV network at point B and it is proposed to install 500m of 11kV underground cable from the POC to the Customer's installation and this cable is treated as Extension Assets.

**Reinforcement:**

The Relevant Section of Network is the 11kV OHL between points A and B and the Security CAF applies. The numerator in the CAF calculation is based upon the Required Capacity of the Customer. In this instance, the reinforcement is driven by the Required Capacity for import, i.e. 3MVA and the denominator is based on the New Network Capacity following Reinforcement, i.e. 7.6MVA.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
Re-conductor 500m of 11kV overhead line at a higher capacity (7.6MVA)	£60,000	$3/7.6 \times 100\%$ = 39.5%	£23,700
Total Reinforcement Cost	£60,000		£23,700

Extension Assets:	Cost	Apportionment	Customer Contribution
Installation of 500m 11KV cable	£45,000	n/a	£45,000
11KV circuit breaker at Customer's substation	£25,000	n/a	£25,000
Total Extension Asset Cost	£70,000		£70,000

Total cost of the work = £60,000 + £70,000 = **£130,000**

Total Connection Charge to Customer = £23,700 + £70,000 = **£93,700**

Example 17: A new housing development connection that is connected by Reinforced assets

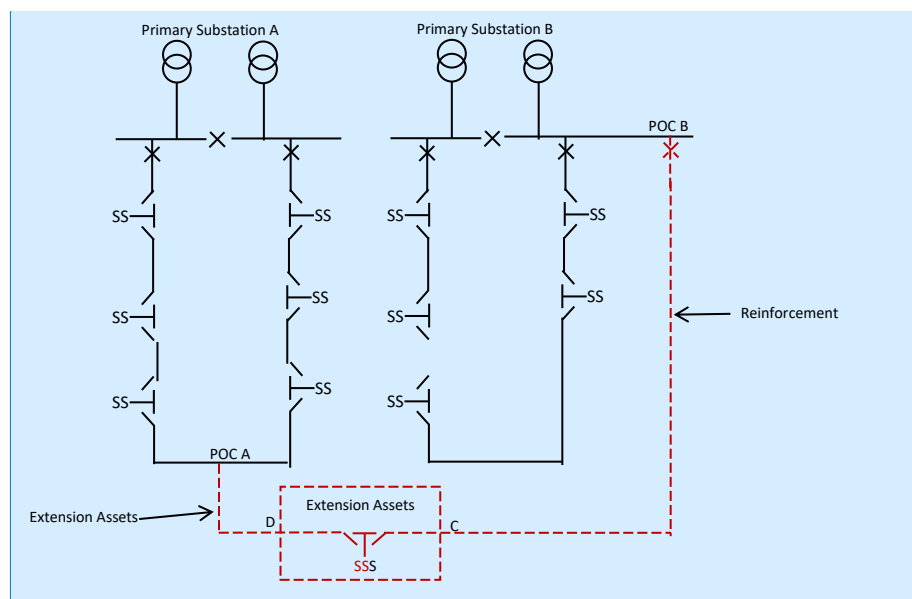
Purpose: To demonstrate the application of Exception 5 where the Customer needs to pay for the assets that connect them to the existing network

A new housing development has a Required Capacity of 1MVA to serve 450 plots. The local 11kV feeder has a network capacity of 7.7MVA based upon the limitation of the existing 400 Amp circuit breakers at Primary Substation A. The existing load on the circuit is 7.6MVA. The new load will be connected to the existing 11kV feeder from Primary Substation A with 100m of 11kV cable from POC A to the point D at the boundary of the site and provide interconnection with 700m of 11kV cable from POC B at Primary Substation B to the boundary of the site at point C. In this example:

- 200m of 11kV cable on site (between points C and D) is required to provide connectivity within the development and is considered to be Extension Assets.
- 100m of 11kV cable from POC A to the point D.
- 700m of 11kV cable from POC B to the point C

The Minimum Scheme requires the site to be connected onto the existing network. In this case the lowest cost feeder is the 11kV cable from A to D and is treated as an Extension Asset. The alternative connection to POC B at Primary Substation B is required to meet the minimum network security requirements and is treated as Reinforcement.

The figure below shows the proposed network.



Reinforcement:

The 700m of 11kV cable from POC B at Primary Substation B to point C is treated as reinforcement however as this is a demand connection the reinforcement work is funded by us.

Commented [BAH45]: To align with index

Commented [TP(P46): Extra space needs deleting

Commented [BAH47]: In the box at bottom it says SSS? Also part in black text?

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
1 new HV Circuit Breaker from POC B	£30,000	0%	£0
2 by HV closing joints	£6,000	0%	£0
700m of HV cable from POC B to point C	£210,000	0%	£0
Total Reinforcement Cost	£246,000		£0

Extension Assets:	Cost	Apportionment	Customer Contribution
100m of HV cable from POC A to point D	£30,000	n/a	£30,000
One 1000kVA Substation	£225,750.00	n/a	£225,750.00
On site LV mains and services	£24,900	n/a	£24,900
2 by HV cable box terminations	£24,000	n/a	£24,000
Total Extension Asset Cost	£303,153.90		£303,153.90

Commented [TP(P48)]: Housekeeping – this should be one substation at £75,000 not £225,000 as that's for 3 substations

Total cost of the work = £246,000 + £303,153.90 = **£549,399.90**

Total Connection Charge to Customer = £303,153.90 = **£303,153.90**

Example 18: A new connection of a development

Purpose: To demonstrate the application of Exception 5-6 where the Customer pays for assets within the site boundary.

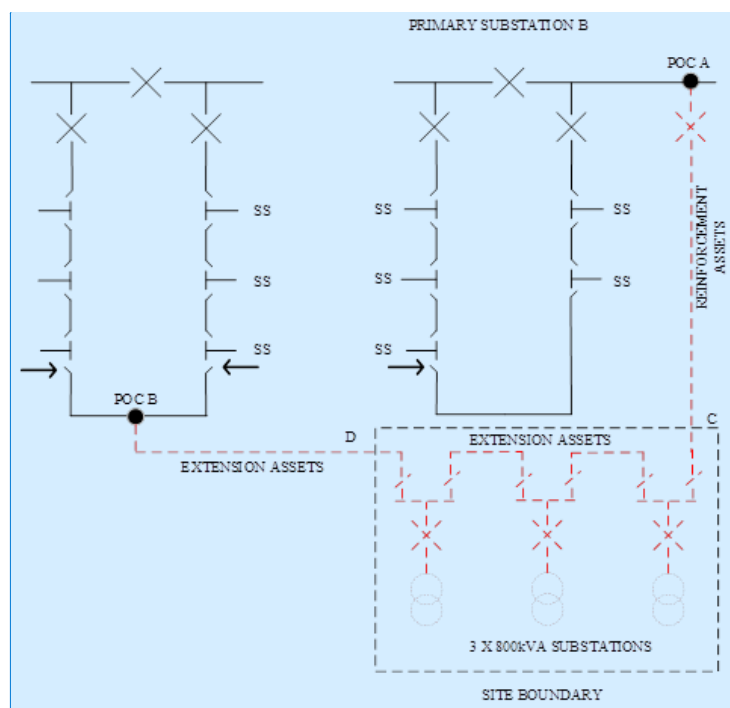
Commented [BAH49]: should be Exception 6

This example demonstrates the application of Exception 6 (paragraph 1.27) where the Customer pays for assets within the site boundary.

A new housing development (a Demand Connection) has a Required Capacity of 2MVA to serve 900 plots. The local 11kV feeder has a network capacity of 7.7MVA based upon the limitation of the existing 400 Amp circuit breakers at Primary Substation A. The existing load on the circuit is 7.6MVA. It is therefore not possible to connect the new load to this circuit without Reinforcement works. The Minimum Scheme is to connect the new load to the new 11kV feeder from Primary Substation B and provide interconnection to an existing secure 11kV feeder from Primary Substation A. In this Example 600m of 11kV cable on site (between Points C and D) is required to provide connectivity within the development and is considered to be Extension Assets.

The three 800kVA substations are not considered to provide connection between POC A and POC B. The 600m of 11kV cable on site is additional network length to provide connectivity between multiple exit points on the Customer's site. Therefore, Exception 6 applies and the 600m of 11kV cable on site will be treated as Extension Assets and its costs will be charged in full to the Customer.

The figure below shows the proposed network.



Commented [BAH50]: Need to add Primary Substation A to diag

Reinforcement:

The assets connecting POC ~~B~~-A and point C add capacity to the existing network will be treated as Reinforcement and funded by us.

Commented [BAH51]: Change to A

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
1 new 11 KV <u>KV</u> Circuit Breaker tailed out from Primary Substation B (POC A)	£30,000	0%	£0
2 by 11 KV <u>KV</u> closing joints	£6,000	0%	£0
700m of 11 KV <u>KV</u> cable from Primary Substation B to site	£210,000	0%	£0
Total Reinforcement Cost	£246,000		£0

Extension Assets:	Cost	Apportionment	Customer Contribution
600m of 11 KV <u>KV</u> cable on site	£180,000	n/a	£180,000
3 by 800 KV <u>KV</u> A unit Substation	£225,000	n/a	£225,000
On site LV mains and services	£24,900	n/a	£24,900
2 by 11 KV <u>KV</u> cable box terminations	£24,000	n/a	£24,000
600m of 11 KV <u>KV</u> cable from POC A -B to site	£180,000	n/a	£180,000
Total Extension Asset Cost	£633,900		£633,900

Commented [BAH52]: Change to B

Total cost of the work = £246,000 + £633,900 = **£879,900**

Total Connection Charge to Customer = £0 + £633,900 = **£633,900**

Example 19: A new connection with remote network Reinforcement

Purpose: To show treatment where capacity is created on a different part of the network and a load transfer is required to allow the connection. Example again demonstrates which elements are Reinforcement and which are Extension Assets.

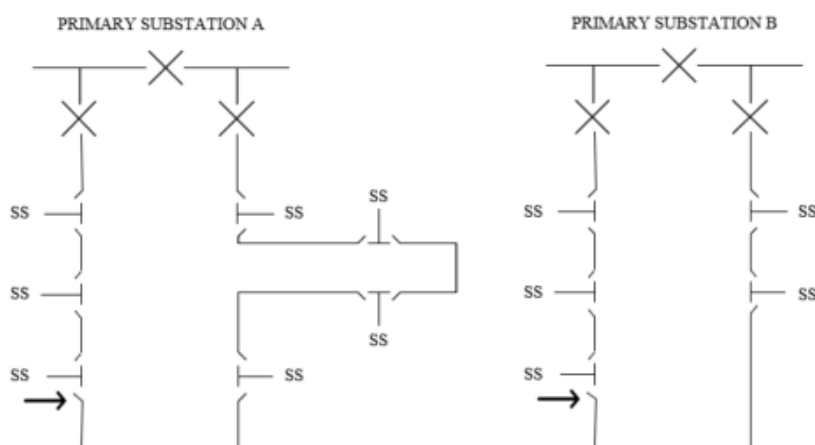
This example shows the arrangements that will apply where it is necessary to reinforce a different part of the Distribution System so that existing load may be transferred in order to release capacity for the new connection.

A Customer requests a Generation Connection with a Required Capacity of 2MW. The local 11kV feeder has a network capacity of 7.7MW based upon the limitation of the existing 400 Amp circuit breakers at Primary Substation A. The existing load on the circuit is 7.7MW. It is therefore not possible to connect the new generation to this circuit without Reinforcement works.

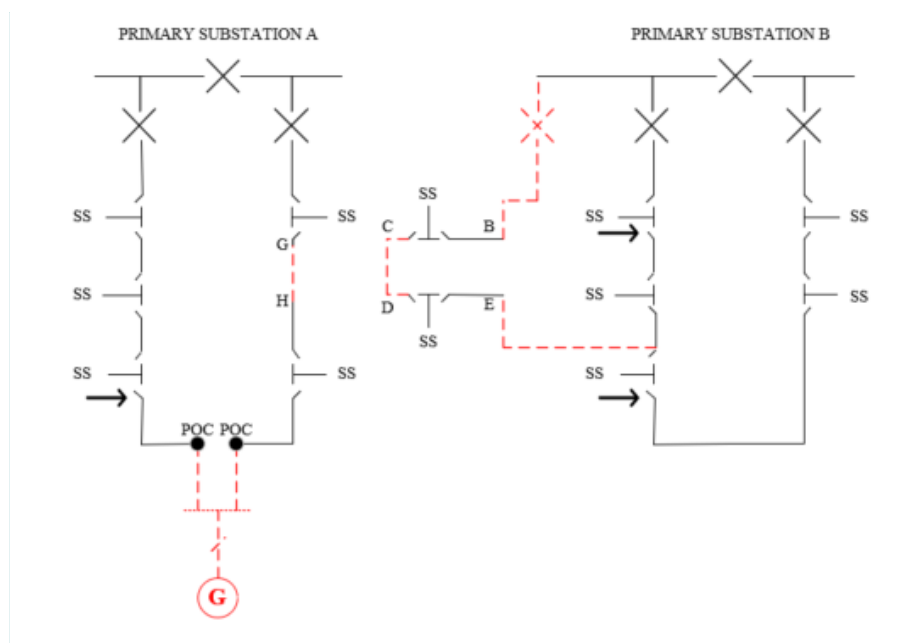
It is proposed to reinforce an adjacent network from primary substation B so that two existing substations may be transferred on to it from primary substation A, in order to release capacity to accommodate the new connection. Primary Substation B has sufficient spare capacity to accommodate the two existing substations. A new circuit breaker is to be installed at Primary Substation B and a new 11kV feeder (also rated at 7.7MW) is to be installed between points A – B and between points E – F for connection to the local 11kV circuit at point F. The existing circuit will be cut at point BE so that the new joints can be made. This will convert the Primary Substation B network from a two-feeder to a three-feeder network. The total new cable length between points A – B and points E - F is 500m. The network will be reconfigured by the installation of two short straps C – D and G - H in order to maintain connectivity.

This Reinforcement will allow a POC to be taken from the local 11kV circuit to supply the new generation. The newly installed cable to connect the generation from the POC is 1200m long. The above work represents the Minimum Scheme to provide connections to the new site.

The figure below shows the original network.



The figure below shows the proposed network.



Commented [TP(P53)]: Both the DCUSA text and this version are missing "point A" and "point F"

Reinforcement:

The Relevant Section of Network is the three-feeder network from Primary Substation B which supplies the loads on the existing two feeders from Primary Substation B as well as the loads at points C and D transferred from the network from the Primary Substation A. The RSN does not supply the new generation in this case. The numerator in the CAF calculation is based upon the Required Capacity of the new generation, i.e. 2MW. In this case, the New Network Capacity (under N-1 conditions) following the Reinforcement works is equal to $(3 - 1) \times 7.7\text{MW} = 15.4\text{MW}$.

Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
500m of 11kV cable: A-B, C-D, E-F	£150,000	$2/15.4 \times 100\% = 13\%$	£19,480
11kV Circuit Breaker at Primary Substation B	£30,000	As above	£3,896
11kV jointing at Points A,B,C,D,E,F	£18,000	As above	£2,337
Total Reinforcement Cost	£198,000		£25,713

Extension Assets:	Cost	Apportionment	Customer Contribution
1200m of 11KV cable inc. strap at G – H	£360,000	n/a	£360,000
3 by 800kVA distribution substations	£225,000	n/a	£225,000
On site LV mains and services	£24,900	n/a	£24,900
4 by 11KV closing joints at POC and at points G,H	£12,000	n/a	£12,000
Total Extension Asset Cost	£621,900		£621,900

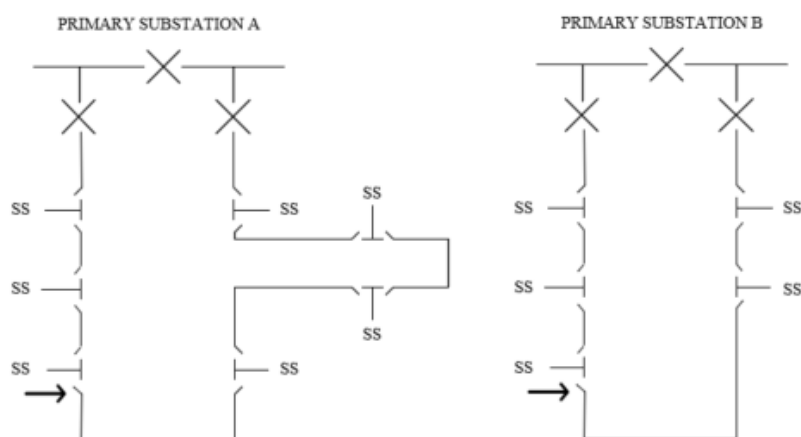
Total cost of the work = £198,000 + £621,900 = **£819,900**

Total Connection Charge to Customer = £25,713 + £621,900 = **£647,613**

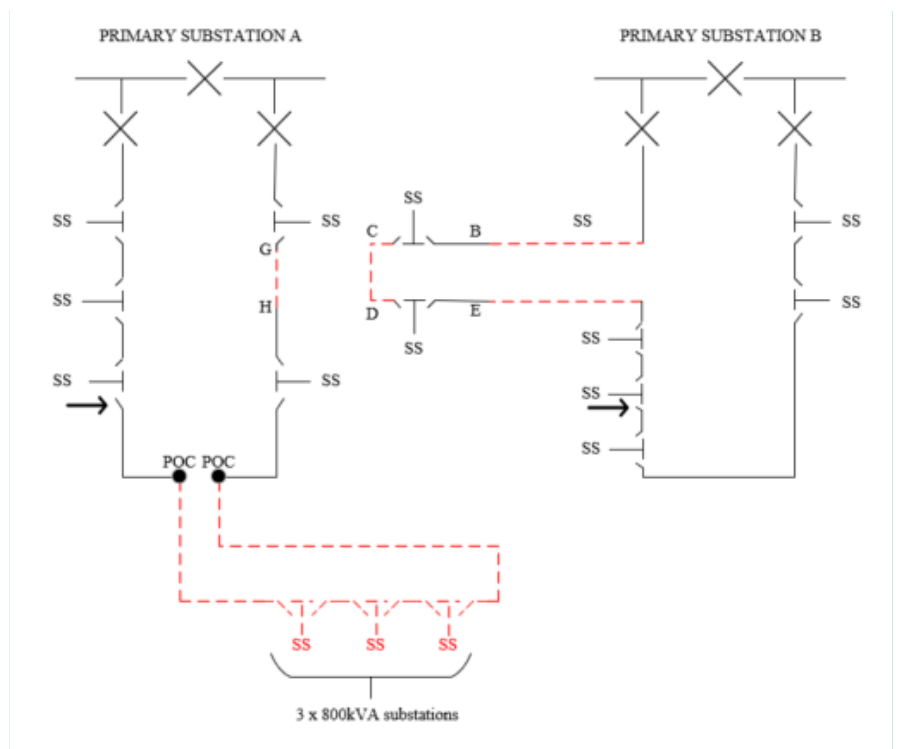
Example 20: A new connection with load transfer	
Purpose:	Variation to Example 19 where a load transfer is required to free up capacity but no new capacity is created and demonstrates why elements become Extension Assets.

This variation of Example 19 shows the arrangements that will apply where it is necessary to reconfigure the Distribution System so that existing demand may be transferred in order to release capacity for the new connection.

The figure below shows the original network.



The figure below shows the proposed network.



Commented [TP(P54)]: Both the DCUSA text and this version are missing "point A" and "point F"

Reinforcement:

It is proposed to reconfigure the Distribution System such that two existing substations may be transferred on to an adjacent network, in order to release capacity so that the new connections can be made. Primary Substation B has sufficient spare capacity to accommodate the two existing substations. New cables are to be installed between points A – B and between points E – F. The existing circuit will be cut at point B & E so that the new joints can be made. The total new cable length between points A – B and points E – F is 100m. The network will be reconfigured by the installation of two short straps C – D and G - H in order to maintain connectivity. As this work involves the transfer of capacity there is no Reinforcement work required.

This transfer of existing demand will allow a POC to be taken from the local 11kV circuit to connect the new development. The newly installed cable to connect the development from the POC is 1200m long. Three 800kVA distribution substations are to be established onsite. The above work represents the Minimum Scheme to provide connections to the new site.

The Connection Charge for this Scheme is calculated as follows:

Extension Assets:	Cost	Apportionment	Customer Contribution
1300m of 11kV cable including A-B, C-D, E-F, G-H and from POC to the development	£390,000	n/a	£390,000
3 by 800kVA distribution substations	£225,000	n/a	£225,000
On site LV mains and services	£24,900	n/a	£24,900
10 by 11kV closing joints at POC and at points A,B,C,D,E,F,G,H	£30,000	n/a	£30,000
Total Extension Asset Cost	£669,900		£669,900

Total cost of the work = £669,900

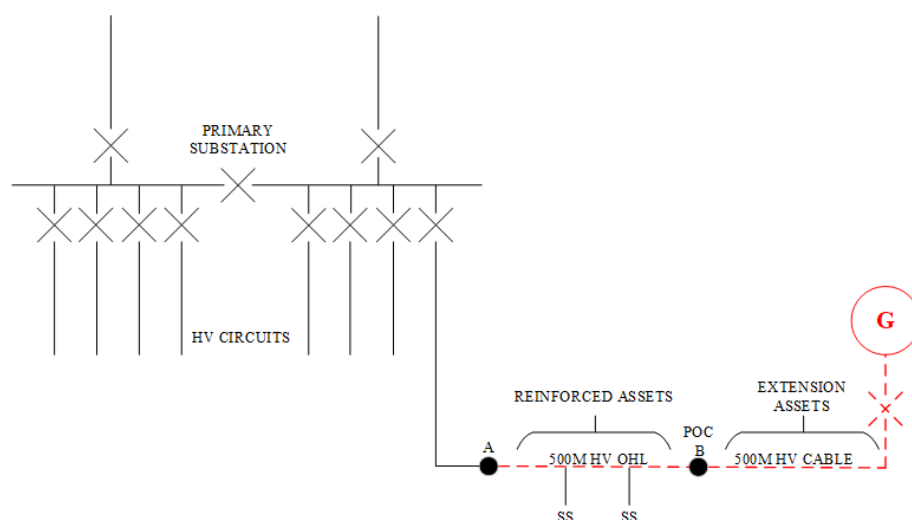
Total Connection Charge to Customer = £669,900

Example 21: A new Generation Connection with an Enhanced Scheme at the DNO's request.

Purpose: To show how the Security CAF calculation is applied where the DNO requests an Enhanced Scheme.

Please refer to Example 11, which is the Minimum Scheme for this project. In this example, a Customer requests a Generation Connection with a Required Capacity for export purposes of 3MW. The Minimum Scheme requires the Reinforcement of 500m of 11kV overhead line between points A and B to provide 7.6MVA of capacity. However, the DNO has decided to install an Enhanced Scheme by increasing the capacity of the 11kV overhead line to 13MVA.

The POC is to the existing 11kV network at point B and it is proposed to install 500m of 11kV underground cable from the POC to the Customer's installation.

**Reinforcement:**

The Relevant Section of Network is the 11kV OHL between points A and B

Security CAF calculation: The numerator in the CAF calculation is based upon the Required Capacity of the new generation, i.e. 3MW. In this example the DNO has decided to install an Enhanced Scheme and the Connection Charge that will apply will be the lower of the Connection Charge associated with the Minimum Scheme (see Example 11) and the Enhanced Scheme. The numerator in the CAF calculation is based upon the Required Capacity of the Customer, i.e. 3MW and the denominator is based on the Enhanced Scheme New Network Capacity following Reinforcement, i.e. 13MVA.

Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use distribution network so the Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
Re-conductor 500m of 11kV overhead line at a higher capacity (13MVA)	£70,000	3/13 x 100% = 23.1%	£16,170
Total Reinforcement Cost	£70,000		£16,170

Extension Assets:	Cost	Apportionment	Customer Contribution
Installation of 500m 11kV cable	£45,000	n/a	£45,000
11kV circuit breaker at Customer's substation	£25,000	n/a	£25,000
Total Extension Asset Cost	£70,000		£70,000

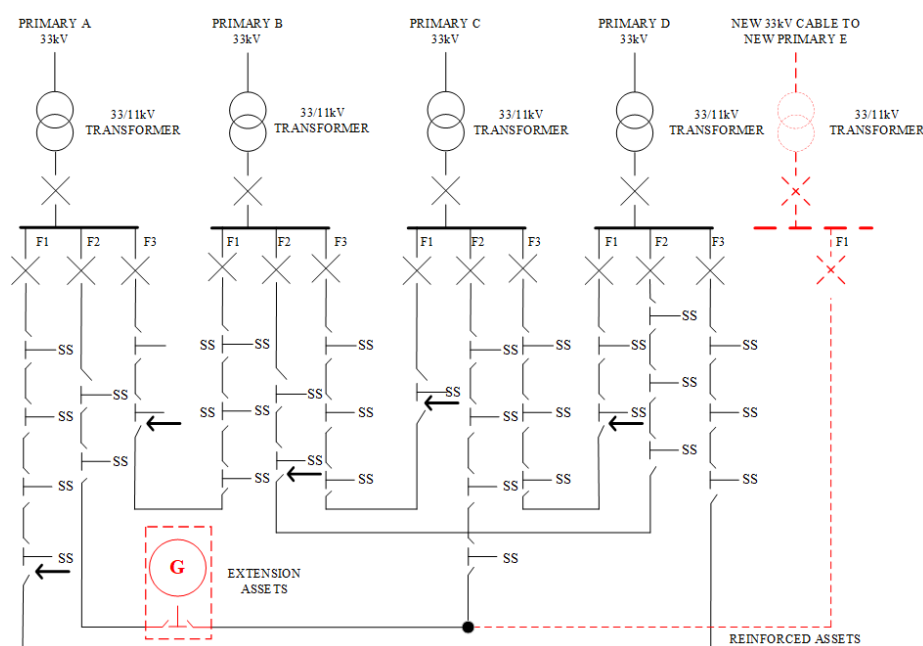
Total cost of the work = £70,000 + £70,000 = **£140,000**

Total Connection Charge to Customer = £16,170 + £70,000 = **£86,170**

Example 22: A new Generation Connection on a meshed HV distribution system requiring Reinforcement.

Purpose: To show that a contribution is required where Reinforcement is carried out at the same voltage as the Point of Connection for a Generation Connection.

A Customer requests a new Generation Connection requiring a 4MVA 11kV metered connection. The local 11kV network is of a meshed design whereby the 11kV network is supplied from single 33/11kV primary transformers via 33kV radial feeds as shown below.



The existing network consists of four 10MVA primary transformer substations and associated 11kV switchgear. A new connection of 4MVA has been requested in the vicinity of F2 from Primary A.

The existing relevant primary transformer group is loaded to its secure capacity so the primary transformer group will require Reinforcement to enable the new connection to progress.

To provide the Required Capacity, the 11kV network will be reinforced by the installation of a new primary substation connected to the nearest 33kV circuit. The new primary substation (Primary E) will contain a 10MVA transformer, associated 11kV switchgear and a new 11kV (7.7 MVA) cable installed to interconnect into the existing 11kV network (from F2 at Primary A to F2 at Primary C).

Reinforcement:

Security CAF calculation: In this example there are two different Security CAFs applied. This is because the Relevant Section of Network is different when considering the New Network Capacity in respect of different elements of the Reinforcement works.

The Relevant Section of Network for the Reinforcement comprising the 11kV Cable Works:

For the 11kV cable assets the Relevant Section of Network is considered to be the secure three feeder 11kV network from Primary A (Feeder 2), Primary C (Feeder 2) and Primary E (Feeder 1). In this case the New Network Capacity (under secure N -1 conditions) following the Reinforcement works is equal to

$$(3 - 1) \times 7.7\text{MVA} = 15.4\text{MVA}$$

This is due to the fact that following the Reinforcement work both of the existing circuits; Primary A, Feeder 2 and Primary C, Feeder 2 can be loaded to their full capacity and will have the newly installed clean feeder from Primary E to act as a back feed to meet the requirements of P2.

The Security CAF for these assets will therefore be $4/15.4 \times 100\% = 26.0\%$

The Relevant Section of Network for the Reinforcement comprising the Primary substation assets:

In this instance the Relevant Section of Network comprises Primary A, C and E within the group that can be used to supply the Customer in normal and abnormal conditions. The New Network Capacity of this Relevant Section of Network (under secure N -1 conditions) following the Reinforcement works is equal to 17.7MVA. (10MVA from either Primary A or Primary C and 7.7MVA from Primary E which is limited by the single 11kV cable connected to it.

The Security CAF for these assets will therefore be $4/17.7 \times 100\% = 22.6\%$ towards the 11kV assets to be installed.

Due to the voltage rule, contributions will not be required towards the 33kV assets.

Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:

Reinforcement:	Cost	Apportionment	Customer Contribution
500m 11kV cable from new primary substation E	£150,000	4/15.4 X 100% = 26.0%	£39,000
1 by 11kV closing joints	£3,000	As above	£780
11kV switchgear at new Primary E	£30,000	4/17.7 X 100% = 22.6%	£6,780
Primary transformer	£6,500,000	0%	£0
2.5km of 33kV cable installation	£1,000,000	0%	£0
33kV Circuit Breaker	£80,000	0%	£0
33kV Termination	£30,000	0%	£0
Total Reinforcement Cost	£7,793,000		£46,560

Extension Assets:	Cost	Apportionment	Customer Contribution
11kV ring main unit	£25,000	n/a	£25,000
11kV metering unit	£12,000	n/a	£12,000
500m of 11kV cable	£150,000	n/a	£150,000
2 by 11kV closing joints	£6,000	n/a	£6,000
Total Extension Asset Cost	£193,000		£193,000

Total cost of the work = £7,793,000 + £193,000 = **£7,986,000**

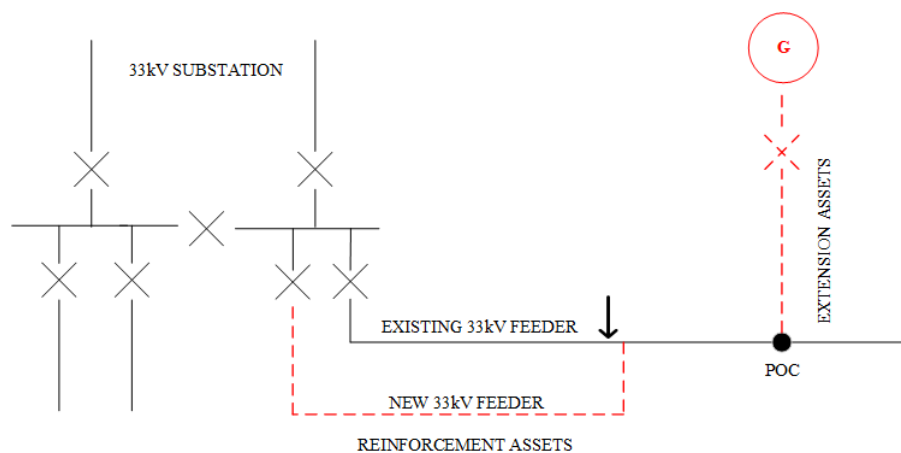
Total Connection Charge to Customer = £46,560 + £193,000 = **£239,560**

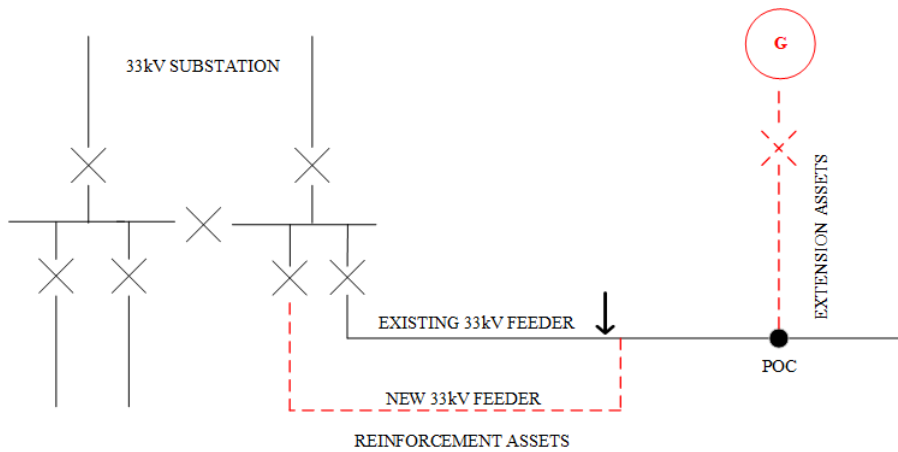
Example 23: A non-secure Generation Connection with non-secure Reinforcement.

Purpose: To show that a contribution is required where Reinforcement is carried out at the same voltage as the Point of Connection for a Generation Connection in relation to a non-secure system.

A Customer wishes to connect a new generator (a Generation Connection) with a Required Capacity for export purposes of 5 MVA. The connection of the generator requires the installation of 1,000m of 33kV cable and a 33kV metering circuit breaker, these being Extension Assets. An existing spare circuit breaker at the substation is utilised which, in this case, is not chargeable to the Customer.

As there is insufficient thermal capacity in the existing 24.0 MVA thermal capacity rated 33kV feeder for the new generation due to the presence of existing generation, the connection also requires the installation of a new 33kV feeder, which also has a thermal capacity of 24.0 MVA, as Reinforcement. This is the Minimum Scheme as it is cheaper to do this, to the extent as shown in the diagram below, rather than upgrade the existing 33kV feeder to the same point along it.





Reinforcement:

The numerator in the CAF calculation is the Required Capacity of the new generator, which is 5.0 MVA.

The RSN in this case is the existing 33kV feeder and the new 33kV feeder. The New Network Capacity is calculated using the non-secure capacity and is therefore the sum of the thermal capacities of the two feeders, which is 48.0 MVA. This is the denominator in the CAF calculation.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:

Reinforcement:	Cost	Apportionment	Customer Contribution
Installation of new 33KV feeder	£500,000	5.0 / 48.0 x 100% = 10.4%	£52,000
Total Reinforcement Cost	£500,000		£52,000

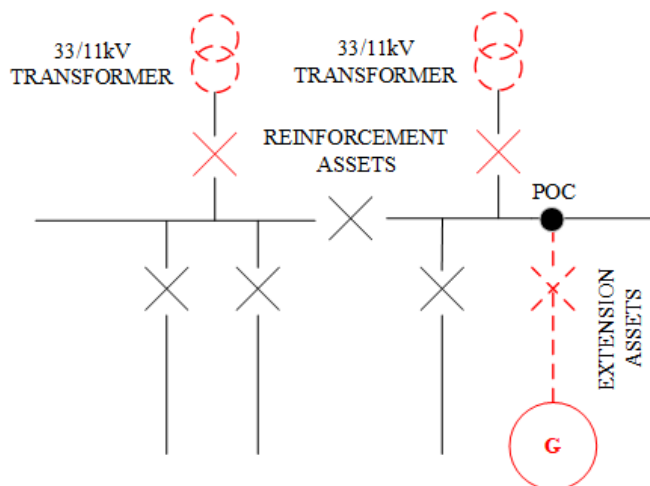
Extension Assets:	Cost	Apportionment	Customer Contribution
Installation of 1,000m 33KV cable	£400,000	n/a	£400,000
Installation of 33KV metering circuit breaker	£80,000	n/a	£80,000
11KV Jointing x2	£6,000	n/a	£6,000
Total Extension Asset Cost	£486,000		£486,000

Total cost of the work = £500,000 + £486,000 = **£986,000**

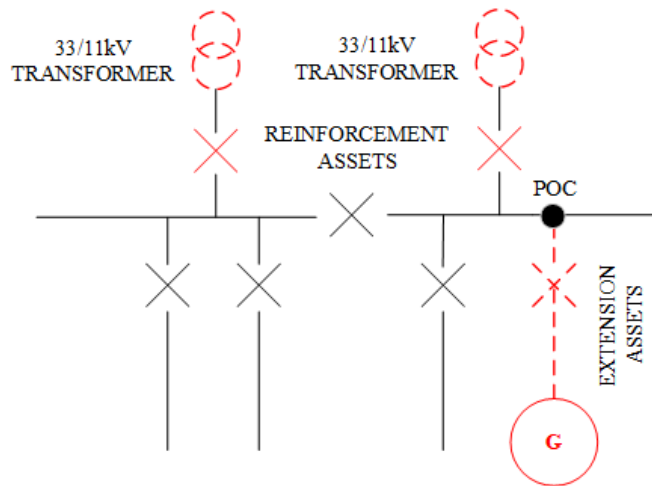
Total Connection Charge to Customer = £52,000 + £486,000 = **£538,000**

Purpose: To show the application of the apportionment rule where secure Reinforcement is provided but the connection for a Generation Connection is non-secure.

The existing network comprises a substation which has 2 x 15 MVA 33/11kV transformers. The Minimum Scheme to provide the connection is to install 750m of 11kV cable from the substation to the industrial premises, as Extension Assets. As there is insufficient capacity available from the existing 2 x 15 MVA transformers to provide the new connection, it will be necessary to upgrade the transformers to 2 x 24 MVA units along with their associated 11kV circuit breakers. The Reinforcement is required to ensure the 11kV network load can be maintained during planned or unplanned outages of one of the transformers. Although the Customer wishes to accept a non-secure connection, the substation must provide secure capacity to its Group Demand (which includes the Customer) to comply with the requirements of Engineering Recommendation P2. As the Extension Assets will be provided solely for the Customer, these can be provided on the basis of a single circuit to provide a non-secure connection, at the Customer's request.



In my view the only reason why both these transformers would need to be replaced is if under system intact conditions there was insufficient capacity to accommodate 8MW of export. If this is the intent of the example, that's fine, but I think P2 isn't relevant."



Reinforcement:

As the transformer Reinforcement is a voltage above, the generator will not contribute towards this part of the works.

The numerator in the CAF calculation is the Required Capacity, which is 8.0 MVA.

The New Network Capacity is the secure capacity of the transformers, which is 24 MVA. This is the denominator in the CAF calculation.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
Installation of 2 x 24MVA 33/11kV transformers	£6,500,000	0%	£0
2 x 11kV circuit breakers	£60,000	8 / 24 x 100% = 33.3%	£20,000
Total Reinforcement Cost	£6,560,000		£20,000

Extension Assets:	Cost	Apportionment	Customer Contribution
750m 11kV cable	£225,000	n/a	£225,000
11kV metering circuit breaker	£30,000	n/a	£30,000
11kV joints x2	£6,000	n/a	£6,000
Total Extension Asset Cost	£261,000		£261,000

Total cost of the work = £6,560,000 + £261,000 = **£6,821,000**

Total Connection Charge to Customer = £20,000 + £261,000 = **£281,000**

Example 25: A new Generation Connection with voltage rise triggered Reinforcement.

Purpose: To show that a Generation Connection pays for Reinforcement at the voltage level of connection based on the CAF.

A Customer wishes to connect a new generator (a Generation Connection) with a Required Capacity for export purposes of 2MVA.

The local 11kV feeder has a large amount of generation already connected and will need to be reinforced in order to keep voltage rise within acceptable limits.

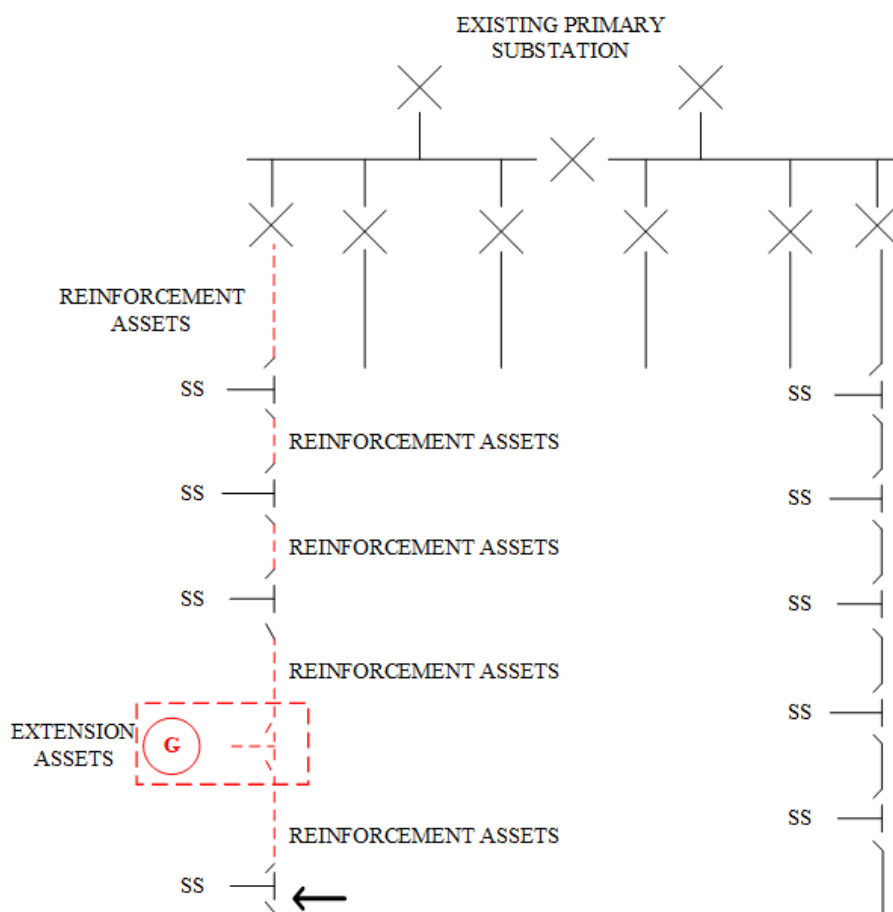
The Minimum Scheme requires Reinforcement of the existing 185mm² 11kV underground cable with 300mm² underground cable and installation of a new substation for connection of the 2MW export capacity. The total length of the reinforced cable is 2km. The thermal rating of the 300mm² underground cable is 8MVA. The 11kV underground cable on the other side of the normal open point is already 300mm² and does not require to be reinforced.

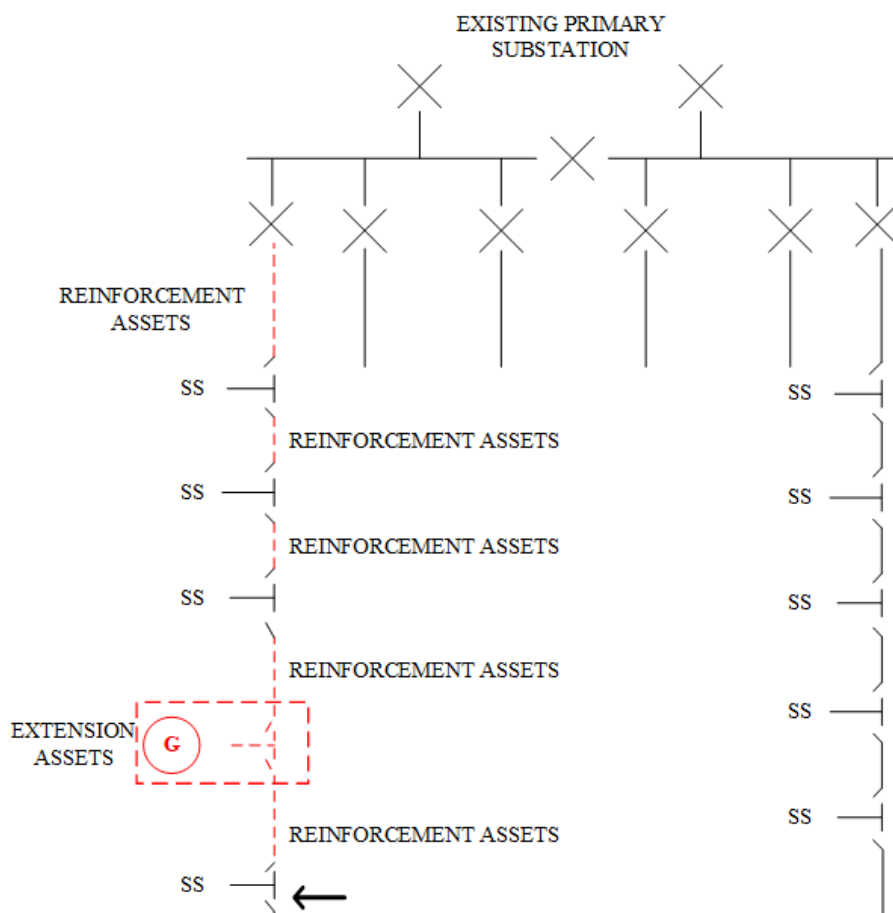
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Reinforcement:

The Relevant Section of Network for the Reinforcement is the 11kV feeder.

Security CAF calculation: the numerator in the CAF calculation is the Required Capacity of the Customer, i.e. 2MW. The denominator is the New Network Capacity following Reinforcement, this being the maximum generation that could be connected whilst keeping the voltage rise within acceptable limits, i.e. 8MVA in this case.

Fault Level CAF calculation: this scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
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2km 300mm 11kV Cable	£600,000	2 / 8 x 100% = 25%	£150,000
Total Reinforcement Cost	£600,000		£150,000

Extension Assets:	Cost	Apportionment	Customer Contribution
2MVA 11kV Substation	£160,000	n/a	£160,000
2 by 11kV Closing Joints	£6,000	n/a	£6,000
Total Extension Asset Cost	£166,000		£166,000

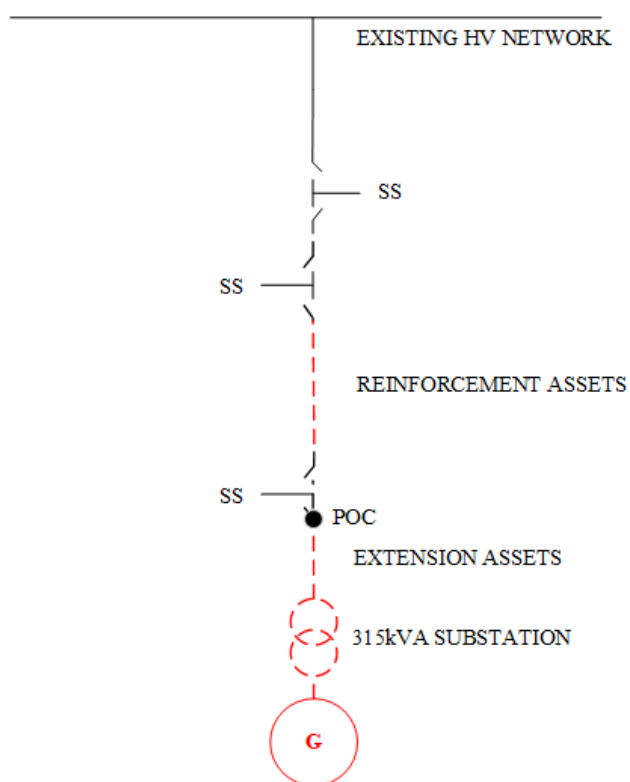
Total cost of the work = £600,000 + £166,000 = **£766,000**

Total Connection Charge to Customer = £150,000 + £166,000 = **£316,000**

Example 26 A new Generation Connection with voltage rise triggered Reinforcement.

Purpose: To show that if voltage rise Reinforcement is tailored so that just the amount of network is upgraded to meet the Customer requirements, the CAF is 100% for a Generation Connection.

A Customer wishes to connect a new generator (a Generation Connection) with a Required Capacity for export of 250kW. The Minimum Scheme for connection of the generator requires the local 11kV overhead line to be reinforced with 100mm² conductor over part of its length in order to keep voltage rise within acceptable limits. The thermal capacity of the 100mm² overhead line is 5MVA. The thermal capacity of the original 50mm² overhead line is 3MVA. A new 315kVA ground mounted substation requires to be installed at the premises. The overhead line is 1km in length but only 500m is required to be reinforced in order to keep voltage rise within acceptable limits.



Reinforcement:

The Relevant Section of Network for the Reinforcement is the 11kV overhead line

Security CAF calculation: the numerator in the CAF calculation is the Required Capacity of the Customer, i.e. 250kW. The denominator is the New Network Capacity following Reinforcement, this being the maximum generation that could be connected whilst keeping the voltage rise within acceptable limits. As the length of overhead line to be reinforced has been determined to accommodate the 250kW requirement only, then this is also 250kW in this case.

Fault Level CAF calculation: this scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
Replacement 11kV overhead line conductor	£40,000	$250 / 250 \times 100\% = 100\%$	£40,000
Total Reinforcement Cost	£40,000		£40,000

Extension Assets:	Cost	Apportionment	Customer Contribution
Provision and installation of 315kV substation	£60,000	n/a	£60,000
11kV joint to network	£3,000	n/a	£3,000
Total Extension Asset Cost	£63,000		£63,000

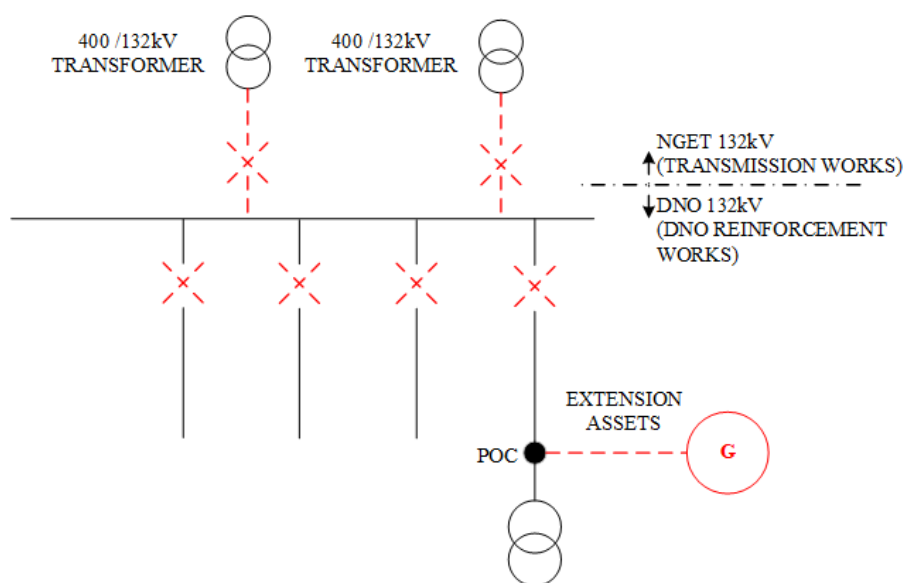
Total cost of the work = £40,000 + £63,000 = **£103,000**

Total Connection Charge to Customer = £40,000 + £63,000 = **£103,000**

Example 27: A new Generation Connection with Fault Level Triggered Reinforcement and transmission works.

Purpose: To show how the Fault Level CAF calculation is applied and how the cost of transmission works are treated for a Generation Connection.

A Customer requests a 65MW connection for a new 132kV generator (a Generation Connection) and the 85MVA Fault Level contribution from the generator necessitates Reinforcement works to replace the 132kV switchgear at the existing grid supply point with switchgear of a higher fault level rating. The Fault Level contribution also requires upgrades to the transmission system to replace the 132kV transformer tails and associated switchgear. New 132kV Extension Assets from the existing 132kV system will be required to connect the generator.



Reinforcement

In this example the Reinforcement is at the voltage level of the POC and the Fault Level CAF is applied to the DNO works only.

Fault Level CAF calculation: The numerator in the CAF calculation is based upon the Fault Level contribution from the Customer's new generator connection, i.e. 85MVA. The denominator is based upon the New Fault Level Capacity, in this Example the Fault Level capacity of the new 132kV switchgear, i.e. 9,140MVA.

Transmission

The cost of the transmission works ~~are~~^{is} fully funded by the Customer.

The Connection Charge for this Scheme is calculated as follows:

Transmission Works:	Cost	Apportionment	Customer Contribution
Replace the 132kV transformer tails and associated switchgear	£5,000,000	N/A	£5,000,000
Total Transmission Cost	£5,000,000		£5,000,000

Reinforcement:	Cost	Apportionment	Customer Contribution
Reinforcement: replace the existing 132kV switchgear	£102,000,000	3x(85/9140) x 100% = 2.8%	£336280,000
Total Reinforcement Cost	£102,000,000		£336280,000

Extension Assets:	Cost	Apportionment	Customer Contribution
Installation of 200m 132kV underground cable	£400,000	N/A	£400,000
Total Extension Asset Cost	£400,000		£400,000

Total cost of the work = £5,000,000 + £102,000,000 + £400,000 = **£1715,400,000**

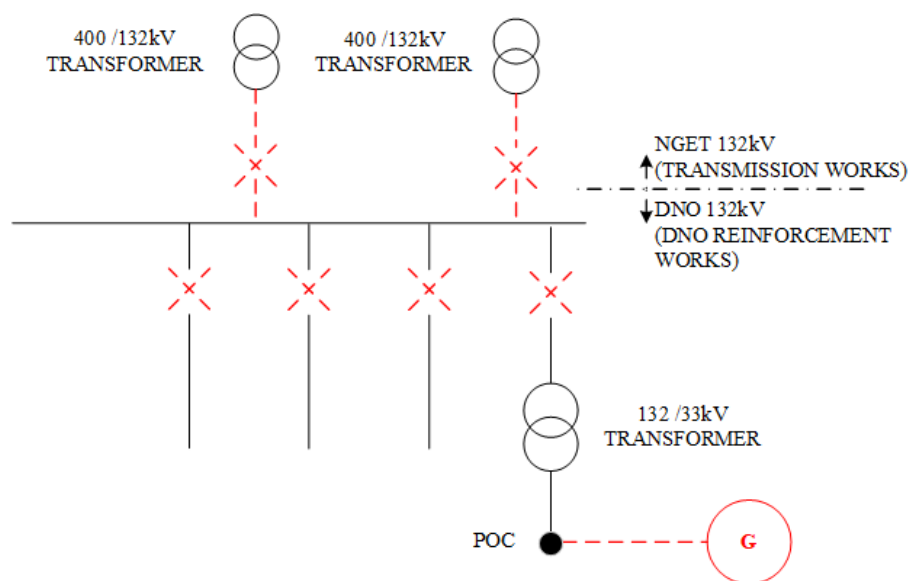
Total Connection Charge to Customer = £5,000,000 + £336280,000 + £400,000 = **£5,736680,000**

This same principle would apply in Scotland where there is no 132kV Distribution System and the connection Customer would pay for any transmission works they trigger.

Example 28: A new Generation Connection with Fault Level Triggered Reinforcement and transmission works.

Purpose: To show the treatment of Reinforcement costs at more than one voltage level above the POC and the cost of transmission works for a Generation Connection.

A Customer requests an ~~8MW~~ 50MW connection for a new 33kV generator (a Generation Connection) and the ~~24MVA~~ 75MVA Fault Level contribution from the generator necessitates Reinforcement works to replace the 132kV switchgear at the existing grid supply point with switchgear of a higher fault level rating. The Fault Level contribution also requires upgrades to the transmission system to replace the 132kV transformer tails and associated switchgear. New 33kV Extension Assets from the existing 33kV system will be required to connect the generator.



Reinforcement

In this example the Reinforcement is at the voltage level above the POC and fully funded by the DNO.

Transmission

The Connection Charge for this Scheme is calculated as follows:

Transmission Works:	Cost	Apportionment	Customer Contribution
Replace the 132kV transformer tails and associated switchgear	£5,000,000	N/A	£5,000,000
Total Transmission Cost	£5,000,000		£5,000,000

Reinforcement:	Cost	Apportionment	Customer Contribution
Replacement 132kV switchboard (excluding Customer's sole use circuit breaker)	£102,000,000	N/A	£0
Total Reinforcement Cost	£102,000,000		£0

Commented [BAH57]: This would take it over the HCPT so ideally costs and/or capacity changed to it doesn't apply

Commented [BM58R57]: Now corrected

Extension Assets:	Cost	Apportionment	Customer Contribution
Installation of a 500m 33kV cable	£40,000	N/A	£40,000
33kV circuit breaker at Customer substation	£25,000	N/A	£25,000
Total Extension Asset Cost	£75,000		£75,000

Total cost of the work = £5,000,000 + £102,000,000 + £75,000 = **£107,075,000**

Total Connection Charge to Customer = £5,000,000 + £75,000 = **£5,075,000**

This same principle would apply in Scotland where there is no 132kV Distribution System and the connection Customer would pay for any transmission works they trigger.

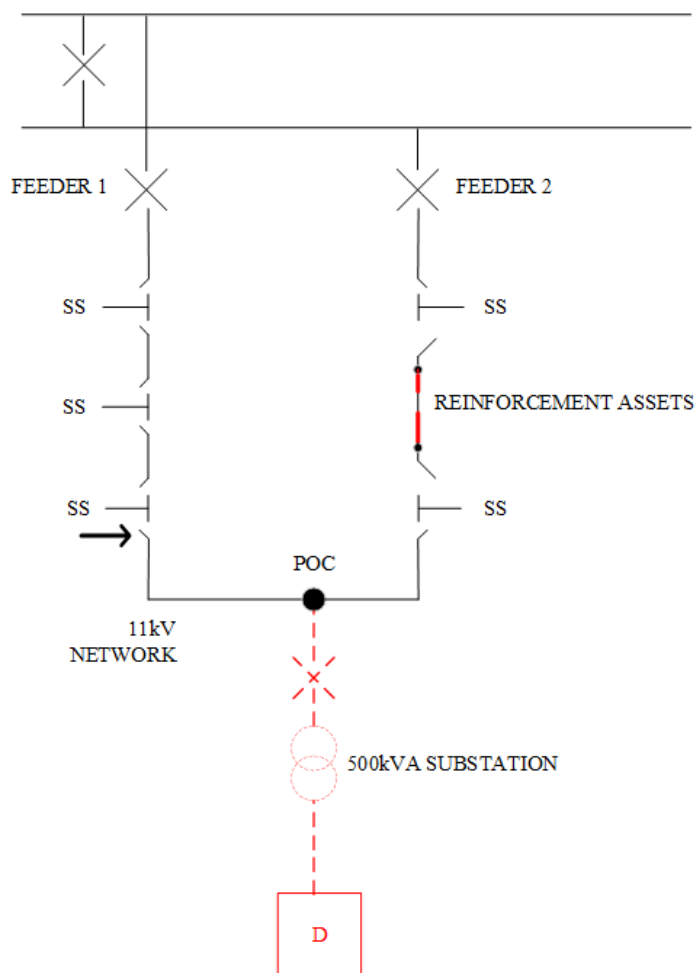
Example 29: A new Demand Connection that has Reinforcement above the High-Cost Project Threshold.

Purpose: To show how the Demand High-Cost Project Threshold is applied.

A Customer wishes to connect a new supply to a commercial premise for 70kVA (the Required Capacity). This will be a non-secure Demand Connection to a secure network.

The Minimum Scheme is to overlay part of the nearest 11kV circuit (Feeder 2) which only has spare capacity of 50kVA. The Reinforcement to make the capacity available requires 1200m of existing 11kV cable to be overlaid with a larger capacity cable.

Following the Reinforcement the New Network Capacity will be 8000kVA. (i.e. after Reinforcement, in this particular case, the section of cable with the lowest rating in the ring represented by Feeder 1 and Feeder 2 is rated at 8000kVA).



Reinforcement:

The Relevant Section of Network is the two-feeder ring comprising Feeder 1 and Feeder 2.

As this is a Demand Connection, no CAF contribution is required.

The High-Cost Project Threshold (HCPT) applied is the Required Capacity x HCPT of £1,720 per kVA.

In this instance;

$70 \times £1,720 = £120,400$. The Customer will pay the costs in excess of £120,400 for works up to one voltage above the Point of Connection, therefore £363,000 (i.e. total Reinforcement cost - £120,400 = £242,600).

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
Overlay 1200m of 11kV cable	£360,000	Total cost exceeding HCPT £363,000- £120,400	£242,600
11kV Jointing	£3,000		
Total Reinforcement Cost	£363,000		£242,600

Extension Assets:	Cost	Apportionment	Customer Contribution
500m 11kV cable	£150,000	n/a	£150,000
500kVA substation	£70,000	n/a	£70,000
Termination of Customer's LV cable	£2,000	n/a	£2,000
LV Metering panel	£4,000	n/a	£4,000
11kV Jointing x2	£6,000	n/a	£6,000
Total Extension Asset Cost	£232,000		£232,000

Total cost of the work = £363,000 + £232,000 = **£595,000**

Total Connection Charge to Customer = £242,600 + £232,000 = **£474,600**

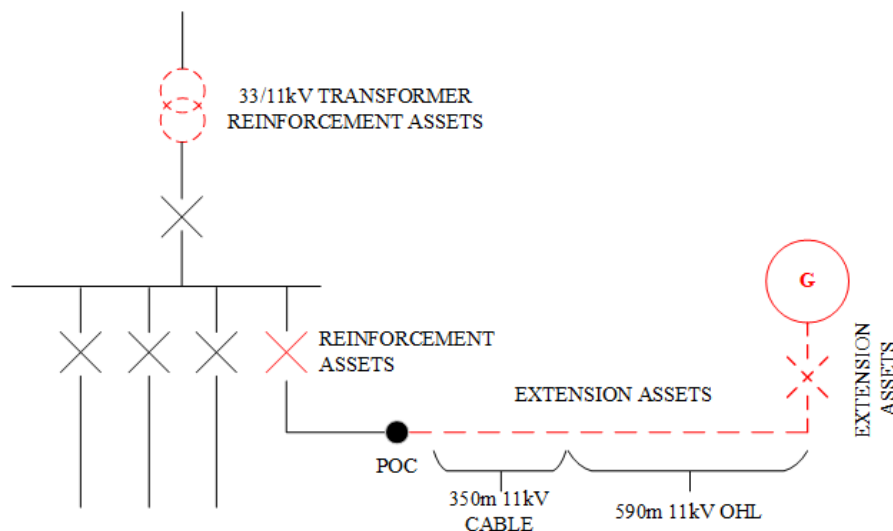
Example 30: A new Generation Connection that has Reinforcement above the High-Cost Project Threshold.

Purpose: To show how a Generation Connection that triggers the Generation High-Cost Project Threshold is charged when the Reinforcement required is at the same voltage of connection.

A Customer wishes to connect a 225kVA wind farm (a Generation Connection).

In order to connect the wind farm the Minimum Scheme involves the installation of 590m of 11kV overhead line, 350m of 11kV cable and associated jointing and install switchgear into the substation. In addition, Reinforcement is required to replace the 33/11kV transformer to facilitate reverse power flow and the 11kV circuit breaker in the primary substation. The New Network Capacity following Reinforcement is 19,700 kVA. The total cost of the Reinforcement is £505,400.

The High-Cost Project Threshold (HCPT) applies to this connection. The HCPT is £200/kW and costs in excess of this threshold will be charged in full to the Customer.



Reinforcement:

Security CAF calculation: the numerator in the CAF calculation is the Required Capacity of the Customer, i.e. 225kVA. The denominator is the New Network Capacity following Reinforcement, this being the maximum generation that could be connected whilst keeping the voltage rise within acceptable limits. This is 19,700kVA.

The High-Cost Project Threshold for Generation Connections is £200/kW.

The Reinforcement required to provide the connection is:

- 33/11kV transformer; and
- 11kV circuit breaker.

The 33/11kV transformer Reinforcement is one Voltage Level above the POC and not subject to the Security CAF. The work is covered by the High-Cost Project Threshold of £200/kW.

HCPT: £200 x 225 = £45,000

£505,400 - £45,000 = £460,400 Customer Contribution

The 11kV circuit breaker Reinforcement is at the Voltage Level of the POC and is subject to the Security CAF. The work is under the High-Cost Project Threshold of £45,000 (£200 x 225) and not covered.

Security CAF: (225/19,700) x 100 = 1.14%

£30,000 x 1.14% = £342 Customer Contribution

The Connection Charge for this Scheme is calculated as follows:

Reinforcement Over High-Cost Project Threshold:	Cost	Apportionment/ HCPT	Customer Contribution
33/11kV Transformer Replacement	£475,400	£505,400- £45,000= £460,400	£460,400
11kV circuit breaker	£30,000		
Total Reinforcement Cost	£505,400		£460,400

Reinforcement Under High-Cost Project Threshold:	Cost	Apportionment/ HCPT	Customer Contribution
11kV circuit breaker	£30,000	225/19,700 = 1.14%	£342
Total Reinforcement Cost	£30,000		£342

Extension Assets:	Cost	Apportionment	Customer Contribution
Electrical substation works	£34,500	n/a	£34,500
Install 590m of 11kV Overhead Line	£53,500	n/a	£53,500
Install 350m of 11kV XLPE cable	£14,000	n/a	£14,000
Total Extension Asset Cost	£102,000		£102,000

Total cost of the work = £505,400 + £102,000 = **£607,400**

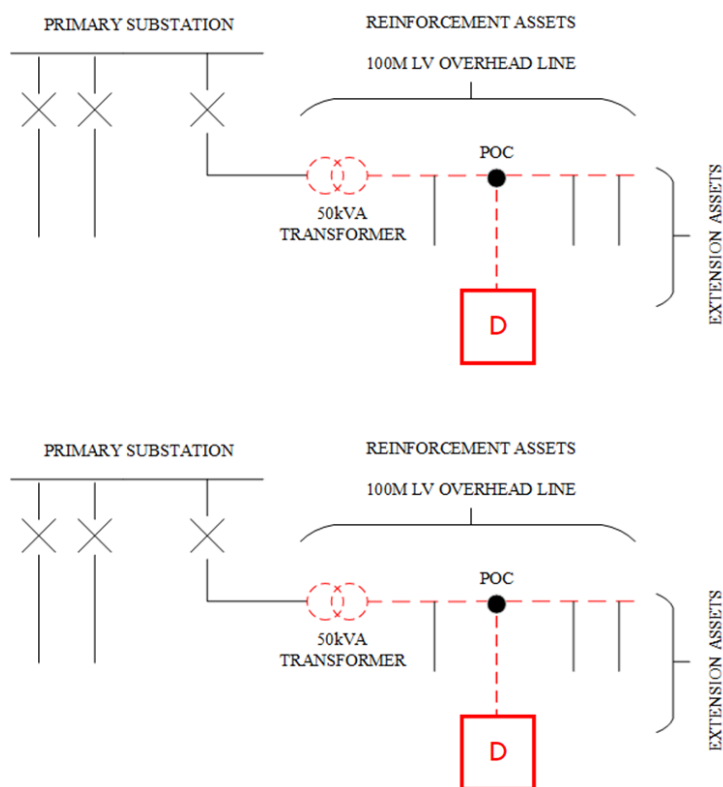
Total Connection Charge to Customer = £460,400 + £342 + £102,000 = **£562,742**

Example 31 The Customer requirements for supply characteristics are greater than the Minimum Scheme.

Purpose: To illustrate that when a Customer specifically requests a three-phase connection, where the existing network is not of a sufficient number of phases, the Customer pays for any Reinforcement.

A Customer with an existing single phase domestic connection with rated at 100 Amps (23 kVA) requests a three-phase connection to allow them to connect a three-phase load (e.g. a three-phase domestic welder). The property is located halfway along on a single phase 100m LV overhead line, which connects to a single phase 50kVA pole-top transformer feeding four properties. The pole-top transformer connects to the local Primary substation via a three-phase underground cable.

The existing network has sufficient capacity to accommodate the Required Capacity but the existing 50kVA pole-top transformer and 100m LV overhead line do not have a sufficient number of phases.



Reinforcement:

The Minimum Scheme is to replace the existing 100m LV overhead line in its entirety with a three-phase overhead line. The existing single phase 50kVA pole-top transformer will need to be replaced

with a three-phase equivalent. The existing three-phase cable feed and the Primary substation are of sufficient capacity.

As the Reinforcement is only to accommodate the required number of phases, no cost apportionment will be applied.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement:	Cost	Apportionment	Customer Contribution
Replace existing single-phase LV Overhead Line with new 100m three-phase LV Overhead Line	£12,600	100%	£12,600
New three-phase 50kVA pole-top transformer	£20,000	100%	£20,000
LV Jointing	£300	100%	£300
Total Reinforcement Cost	£32,900		£32,900
Operation & Maintenance @32%* of £32,900	£10,528		£10,528

*Note, the 32% Operation and Maintenance figure is illustrative.

Extension Assets:	Cost	Apportionment	Customer Contribution
New 30m three-phase 100A service	£1,600	n/a	£1,600
Single service breach joint	£300	n/a	£300
Total Extension Asset Cost	£1,900		£1,900

Total cost of the work = £43,428 + £1,900 = **£45,328**

Total Connection Charge to Customer = £43,428 + £1,900 = **£45,328**

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Section 2 – Glossary of Terms

Act	the Electricity Act 1989 (as amended).
Adoption Agreement	<p>is an agreement for us to adopt the Contestable Work, subject to the satisfaction of certain conditions. This agreement, amongst other things, addresses a number of fundamental principles:</p> <ul style="list-style-type: none"> • The transfer of title from the asset owner (normally the Customer or the ICP) to us; • The quality and safety of the adopted asset; • Any required sureties; • The transfer of Land Rights; • The procedure for us to Energise the assets installed by the ICP during the works; • The payment of any residual Connection Charges or fees; • Planning permissions and compliance with street works legislation; and • Defect correction processes, where applicable. <p>The parties to the Adoption Agreement may vary depending on the circumstances and may be between:-</p> <ul style="list-style-type: none"> • us and you • us and your appointed ICP • us, you and your appointed ICP.
Bilateral Connection Agreement	an agreement between us and another LDNO setting out the terms and conditions under which an embedded network shall be entitled to be and remain connected to the Distribution System.

Commented [TT59]: this is one sentence - incorrect in Legal Text DCP406/406A

Commented [TT60]: this is one sentence - incorrect in Legal Text DCP406/406A

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Business Day	any day other than a Saturday, a Sunday, Christmas Day, Good Friday or a day which is a bank holiday within the meaning of the Banking and Financial Dealings Act 1971 and will be from 9:00am to 5:00pm (GMT or BST as applicable).
CIC Charges	are the charges detailed in parts D, E, G, H, I, and J of Section [7] of this document.
Connection Agreement	<p>the owner/ occupier of the Premises to which the connection is to be provided will be required to enter into a Connection Agreement with us. The Connection Agreement will set out the terms upon which they will be, and remain, connected to our Distribution System. The Connection Agreement will normally be provided on our behalf by the owner/occupier's chosen Supplier for the Premises as part of their application for a supply of electricity.</p> <p>However, in some cases for larger connections, or where non-standard conditions exist, we will provide a site-specific Connection Agreement, which replaces any Connection Agreement put in place via the Supplier, as part of the connection process. This particular Connection Agreement will only take effect upon completion of the connection and will set out, in more detail, our rights and obligations to one another. Additionally, it may contain the technical detail of the installation being connected to the Distribution System and will require the owner/occupier of the Premises to comply with the provisions of the Distribution Code.</p>
Connection Charge	the payment to be made by the applicant to us for the provision of the connection.
Curtailable Connection	means a connection whereby the Required Capacity can be reduced by the Company.

Commented [WL(P62)]: I don't like this definition for various reasons including (i) we can't technically reduce the Required Capacity – we can constrain the customer such that it can't "have" it; (ii) it is not the same definition used in Schedule 2D (which means we have two different DCUSA definitions and a separate (and different) one for the DSO incentive in the licence); and (iii) this could equally apply to a Flexible Connection which is not the same as a Curtailable Connection (which has more "bells and whistles")

Commented [WL(P63R62)]: I understand why we don't cross reference to another DCUSA Schedule given the CCCM becomes a standalone document, but we do refer to external sources such as the licence and I consider that a more difficult document to find (the EPR is horrendous)

Commented [WL(P64R62)]: For ease I suggest we reference Schedule 2D, or use the same words and introduce definitions as needed as a result e.g. Curtailment would need to be defined

Commented [WL(P65R62)]: For the avoidance of doubt this does not change intent therefore would be housekeeping

Commented [BM66R62]: I agree with Lee's points above but whatever definition we do agree, it needs to be inserted here as well as referenced to the source

Commented [BM67R62]: I would also advocate that a general rider is included somewhere that states something along the lines of 'where a definition has been reproduced in this Glossary of Terms from a source document, the definition in the referenced source document shall take precedent should the definitions fall out of alignment'

CUSC	the Connection and Use of System Code which constitutes the contractual framework for connection to, and use of, the GB Transmission System.
Customer	the person requesting the connection.
DCUSA	the Distribution Connection and Use of System Agreement designated as such by the Authority under condition 22 of the Licence.
Dedicated Scheme	is defined in paragraph 1.41.
De-energise	to deliberately prevent the flow of electricity to or from an Exit/ Entry Point for any purpose other than a system outage on the our Distribution System (and cognate expressions shall be construed accordingly).
Demand Connection	a connection which is not a Generation Connection.
Development Phase	the five year period, unless otherwise agreed with us, commencing on the date of Energisation of an embedded network during which period the development is to be constructed.
Disconnect	means to permanently De-energise an Exit/ Entry Point by the removal of all or part of our equipment (and cognate expressions shall be construed accordingly).
Distributed Generation Connections Guide	the guide produced by us as required by our Licence which provides guidance on the connection process for distributed generation.
Distribution Code	covers, amongst other matters, all material technical aspects relating to: <ul style="list-style-type: none"> • connection to, and the operation and use of, the Distribution System; and

	<ul style="list-style-type: none"> the operation of electrical lines and electrical plant or apparatus connected to the Distribution System. <p>A copy of the Distribution Code can be downloaded from the Distribution Code website at www.dcode.org.uk.</p>
Distribution System	the system (as defined in the Licence) consisting (wholly or mainly) of electric lines owned or operated by us and used for the distribution of electricity.
ECCR	the Electricity (Connection Charges) Regulations 2017 (SI 2017/106) as amended from time to time.
ECCR Prescribed Period	the relevant period from the date on which a connection is made as prescribed by the ECCR, being ten years, for connections made on or after 6 April 2017.
EHV	more than 22kV but not more than 72kV.
Electric Lines	<p>means any line which is used for carrying electricity to or from an Exit/ Entry Point and includes, unless the context otherwise requires:</p> <ul style="list-style-type: none"> (a) any support for such line, that is to say, any structure, pole or other thing in, on, by or from which any such line is or may be supported, carried or suspended; (b) any apparatus connected to such line for the purpose of carrying electricity; and (c) any wire, cable, tube, pipe or other similar thing (including its casing or coating) which surrounds or supports, or is surrounded or supported by, or is installed in close proximity to, or is supported, carried or suspended in association with, any such line.
Electric Plant	means any plant, equipment, apparatus or appliance used for or for purposes connected with the distribution of electricity

	(including any metering equipment) other than an Electric Line.
Electricity Storage	is the conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy.
Electricity Generation	is the process of generating electricity.
Energise	to deliberately allow the flow of electricity to or from an Exit/ Entry Point where such a flow of electricity has never previously existed (and cognate expressions shall be construed accordingly).
Enhanced Scheme	is defined in paragraph 1.4.
Entry/ Exit Point	a point at which electricity, whether metered or unmetered, enter or exit our Distribution System.
Existing Capacity	is defined in paragraph 1.30.
Extension Assets	are assets installed to connect a party or parties to the existing distribution network but which exclude Reinforcement assets.
Fault Level	the maximum prospective current or power that will flow into a short circuit at a point on the network, usually expressed in MVA or kA.
Fault Level Contribution from Connection	is defined in paragraph 1.30.
Flexible Connections	are connection arrangements whereby a Customer's export or import of electricity is managed (often through real-time control) based upon contracted and agreed principles of available capacity. Flexible Connections typically allow quicker and cheaper connection to the Distribution System

	but are made on the basis that there is no limit on the extent to which a user's access can be interrupted.
Full Planning Permission	an approval in writing by the relevant planning authority of all of the details of a proposed development such that the proposed development may proceed in accordance with that approval.
GB Transmission System	the system consisting (wholly or mainly) of high voltage electric wires owned or operated by transmission licensees within Great Britain.
Generation Connection	<p>means a connection to a Premises where the primary purpose of the Premises is wholly or mainly Electricity Generation and/or Electricity Storage. In determining such primary purpose we will consider:</p> <ul style="list-style-type: none"> i. if the Maximum Capacity of the connection of the Premises to the Distribution System for export is greater than the Maximum Capacity for import; ii. if the Premises has a Generation Licence; iii. if the Premises has a Generation Licence Exemption; and/or iv. any other information we consider relevant.
Generation Licence	means the owner or occupier of the Premises holds a licence to carry out the activity specified in section 4(1)(a) of the Act.
Generation Licence Exemption	means the owner or occupier of the Premises has an exemption from holding a Generation Licence, including under the Electricity (Class Exemptions from the Requirement for a Licence) Order 2001.

Guaranteed Standards of Performance	the standards of service set out in the Electricity (Standards of Performance) Regulations 2015 (as amended from time to time).
High-Cost Project Threshold	is defined in paragraph 1.16.
HV	more than 1kV but not more than 22kV
Independent Connections Provider (ICP)	a person with sufficient accreditation to carry out all or part of the Contestable Work.
Interruptions Incentive Scheme	the scheme which provides incentives on us to deliver a good level of performance in respect of customer interruptions and customer minutes lost.
Land Rights	all such rights in, under or over Land as are necessary for the construction, installation, operation, repair, maintenance, renewal or use of the Contestable Work or Non-Contestable Work.
Licensed Distribution Network Operator (LDNO)	the holder of a Licence to distribute electricity.
LV	not more than 1kV.
Maximum Capacity	means in relation to any connection the maximum amount of electricity, as agreed with us and expressed in kW or kVA, that can be imported from or exported onto our Distribution System.
Meter Point Administration Number (MPAN)	is a 21 digit reference to uniquely identify Exit/ Entry Point, such as individual domestic residences.
Minimum Scheme	is defined in paragraphs 1.1 to 1.7.
New Fault Level Capacity	is defined in paragraph 1.30.

New Network Capacity	is defined in paragraph 1.30.
NETSO	means the national electricity transmission system operator for Great Britain from time to time.
Non-Curtailable Connection	means a connection which is not a Curtailable Curtailable Connection.
Outline Planning Permission	a decision in writing by the relevant planning authority on the general principles of how a site can be developed, which is subject to subsequent approval of one or more reserved matters.
Point of Connection (POC)	is the point (or points) of physical connection to our existing Distribution System.
Premises	means any land, building or structure.
Reinforcement	is defined in paragraphs 1.187 to 1.28.
Relevant Section of Network	is defined in paragraph 1.30.
Rent-a-Jointer Services	the service relating to hiring of resource from us to facilitate the provision of unmetered connections.
Required Capacity	is defined in paragraph 1.30.
Scheme	our network design to provide the connection.
Speculative Developments	is defined in paragraph 1.49.
Supplier	a person who holds a Supply Licence.
Supply Licence	a licence granted under section 6(1)(d) of the Act.
Supply Number	a unique identifier of those Entry/ Exit Points on the Distribution System which are used for the purposes of either

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	taking a supply of electricity or for the connection of a distributed generator, and which forms the basis of the metering point record on the Company's registration system.
Temporary Connections	is defined in paragraph 1.24.
Validity Period	the period for which a connection Offer or POC Offer is open for acceptance.
Voltage of Connection	is the voltage at the POC between the existing distribution network and the assets used to provide the connection. For clarity, this is not necessarily the voltage of supply to the Customer.
Voltage Level	is the voltage at the transforming point between two points on the Distribution System that is directly associated with the Customer's connection. The higher voltage is one Voltage Level above the Voltage Level of the POC.
Wide Area Scheme	is defined in paragraph 1.4240.
Working Day	any day other than a Saturday, a Sunday, Christmas Day, Good Friday or a day which is a bank holiday within the meaning of the Banking and Financial Dealings Act 1971.

SCHEDULE 32 – RESIDUAL CHARGING BANDS

1. SCOPE

- 1.1 Residual charges are levied once forward-looking charges have been applied, to ensure the DNO Party recovers the revenue allowed under the price control conditions.
- 1.2 In the case of Unmetered Supplies, all residual charges will be applied on a consumption basis, so premises which receive Unmetered Supplies are not subject to this Schedule.
- 1.2A Furthermore, premises with a Back-up Connection will not be subject to residual charges in respect of the Back-up Connection. One or more premises connected via a Back-up Connection will not be counted as a Single Site in their own right (and so cannot be assessed as a separate Final Demand Site for the purposes of residual charging), but those premises will still comprise or form part of the Single Site connected pursuant to the Connection Agreement governing the primary connection.
- 1.3 Subject to Paragraphs 1.2 and 1.2A, residual fixed charges will be applied to all premises other than Non-Final Demand Sites.
- 1.4 This Schedule describes how the charging bands for residual fixed charges are to be determined in respect of Non-Domestic Premises. Domestic Premises are allocated to a single charging band and are not therefore covered by this Schedule.
- 1.5 Non-Domestic Premises which are Final Demand Sites are divided into a number of groups as follows (as such groups are further described in Schedule 16 and Schedule 17 or 18):
 - (a) Designated EHV Properties;
 - (b) Designated Properties connected at HV;
 - (c) Designated Properties connected at LV, with a Maximum Import Capacity as the basis for their current Use of System Charge; and
 - (d) Designated Properties connected at LV, without a Maximum Import Capacity as the basis for their current Use of System Charges.

- 1.6 Each of these groups will then be sub-divided into four charging bands based on the criteria set out in Paragraph 2.1.
- 1.7 These charging bands will be reviewed periodically and be implemented effective from the beginning of each onshore electricity transmission owner price control period.
- 1.8 This Schedule sets out:
- (a) the process for the initial determination of the charging bands for each group of Final Demand Sites to apply from 1 April 2022 to 31 March 2026 (see Paragraph 2);
 - (b) the process to be used to review and determine the charging bands for subsequent onshore electricity transmission owner price control periods (see Paragraph 3);
 - (c) the process for allocating Final Demand Sites to each of those charging bands (see Paragraph 4); and
 - (d) the processes via which a site can be moved from one charging band to another part way through an onshore electricity transmission owner price control period (see Paragraphs 5, 5A, 6 and 7).
- 1.9 The Use of System tariffs that will be applicable to each of the groups of Final Demand Sites identified under Paragraph 1.5 will be defined in Schedule 16, 17 or 18.
- 1.10 The DNO/IDNO Party will use the criteria in the table below to determine whether a Single Site is considered to be a Final Demand Site or a Non-Final Demand Site, and therefore whether or not to apply the residual fixed charge to that site.

Criteria	Meets the criteria	Outcome
DNO/IDNO Party has been provided with valid certification that a Single Site is an Non Final Demand Site	Yes	Single Site is a Non-Final Demand Site
	No	Single Site is a Final Demand Site

2. INITIAL DETERMINATION OF CHARGING BANDS

- 2.1 On or before 30 September 2020, each DNO/IDNO Party shall provide to the Banding Agent the following information (and shall take reasonable steps to ensure that such information is accurate):
- (a) for each Final Demand Site within the groups identified in Paragraph 1.5(a), 1.5(b) or 1.5(c), the Maximum Import Capacity used as the basis for the Use of System Charge billed by the DNO/IDNO Party in August 2020, which will be in respect of the Maximum Import Capacity held as at July 2020; and
 - (b) for each Final Demand Site within the group identified in Paragraph 1.5(d):
 - (i) if half hourly settled, a calculated estimate of the annual metered import consumption prior to August 2020; or
 - (ii) if non-half hourly settled, the Estimated Annual Consumption from the August 2020 P0222 Report (or, if that is not available, the most recent Estimated Annual Consumption from an earlier P0222 Report).
- 2.2 On or before 31 October 2020, the Banding Agent shall provide to each DNO/IDNO Party the boundaries of each charging band for each of the groups of Final Demand Sites identified under Paragraph 1.5, such boundaries being at the 40th, 70th and 85th percentiles when all the Final Demand Sites in the given group (on a GB-wide basis) are listed in ascending order of Maximum Import Capacity or annual consumption (using the figures provided under Paragraph 2.1).
- 2.3 Each of these boundaries will then be rounded-up to the nearest kVA/kWh integer.
- 2.4 These rounded boundaries will then be used to identify four charging bands within each of the groups of Final Demand Sites identified under Paragraph 1.5 as follows:
- (a) Residual Charging Band 1: where the Maximum Import Capacity or annual consumption (as applicable) is less than or equal to the 40th percentile band boundary;
 - (b) Residual Charging Band 2: where the Maximum Import Capacity or annual consumption (as applicable) is greater than the 40th percentile band boundary and less than or equal to the 70th percentile band boundary;

(c) Residual Charging Band 3: where the Maximum Import Capacity or annual consumption (as applicable) is greater than the 70th percentile band boundary and less than or equal to the 85th percentile band boundary; and

(d) Residual Charging Band 4: where the Maximum Import Capacity or annual consumption (as applicable) is greater than the 85th percentile band boundary.

2.5 On or before 31 December 2020, each DNO/IDNO Party shall provide each Supplier Party with a list of each and every MPAN associated with a Non-Domestic Premises that is connected to the DNO/IDNO Party's Distribution System, identifying the charging band to which each such MPAN has been allocated, the LLFC Id which is assigned to the MPAN, and the provisional LLFC Id which will be assigned to the MPAN with effect from 1 April 2022.

3. REVIEW OF CHARGING BANDS

3.1 On or before 31 March in the Regulatory Year (t-3) three years prior to the commencement of the onshore electricity transmission owner price control period (t), each DNO/IDNO Party shall provide to the Banding Agent the following information (and shall take reasonable steps to ensure that such information is accurate):

(a) for each Final Demand Site within the groups identified in Paragraph 1.5(a), 1.5(b) or 1.5(c), the Maximum Import Capacity used as the basis for the Use of System Charge billed by the DNO/IDNO Party in February of that Regulatory Year, which will be in respect of the Maximum Import Capacity held as at January in that Regulatory Year.

(b) for each Final Demand Site within the group identified in Paragraph 1.5(d):

- (i) if half hourly settled, a calculated estimate of the annual metered import consumption prior to February of that Regulatory Year; or
- (ii) if non-half hourly settled, the Estimated Annual Consumption from the P0222 Report for the February of that Regulatory Year (or, if that is not available, the most recent Estimated Annual Consumption from an earlier P0222 Report).

- 3.2 On or before 30 April following the 31 March referred to in Paragraph 3.1, the Banding Agent shall provide to each DNO/IDNO Party the boundaries for each charging band for each group of Final Demand Sites on the same basis as that set out in Paragraph 2.2.
- 3.3 Each of these boundaries will be rounded-up on the same basis as that set out in Paragraph 2.3.
- 3.4 These rounded boundaries will then be used to identify four charging bands within each of the groups of Final Demand Sites identified under Paragraph 1.5 on the same basis as that set out in Paragraph 2.4.
- 3.5 On or before 30 June following the 31 March referred to in Paragraph 3.1, each DNO/IDNO Party shall provide each Supplier Party with a list of each and every MPAN associated with a Non-Domestic Premises that is connected to the DNO/IDNO Party's Distribution System, identifying the charging band to which each such MPAN has been allocated (in accordance with the allocation rules in Paragraph 4).
- 3.6 The charging bands revised in accordance with this Paragraph 3 will be applicable from the commencement of the next onshore electricity transmission owner price control period commencing after completion of the review under this Paragraph 3.

4. ALLOCATION OF CUSTOMERS TO CHARGING BANDS BY DNO/IDNO PARTIES

- 4.1 For Final Demand Sites within the groups identified in Paragraph 1.5(a), 1.5(b) or 1.5(c), each DNO/IDNO Party shall allocate its Final Demand Sites to the relevant charging band based on the following criteria (subject to Paragraph 4.2A):
- (a) if 24 months of data is available, the average Maximum Import Capacity over that period; or if not available
 - (b) allocation to a charging band will be based on the following criteria:
 - (i) the average of Maximum Import Capacity over that period for which data is available; or

- (ii) if no such data is available, other available information that is appropriate for a typical profile of a similar site to best estimate the expected demand of the Final Demand Site.

4.2 For Final Demand Sites within the group identified in Paragraph 1.5(d), each DNO/IDNO Party shall allocate its Final Demand Sites to the relevant charging band based on the following criteria (subject to Paragraph 4.2A):

(a) for a Final Demand Site that is half hourly settled:

- (i) if 24 months of data is available, the average annual import consumption based on metered data over the 24 months; or if not available
- (ii) when a minimum of 12 months of data is available, the average annual import consumption over the period for which metered data is available; or if not available
- (iii) other available information that is appropriate for a typical profile of a similar site to best estimate the expected annual import consumption of the Final Demand Site.

(b) for a Final Demand Site that is non-half hourly settled:

- (i) the most recent Estimated Annual Consumption for that Final Demand Site; or if not available
- (ii) the Default Estimated Annual Consumption for that class of Final Demand Site; or if not available
- (iii) other available information that is appropriate for a typical profile of a similar site to best estimate the expected annual import consumption of the Final Demand Site.

4.2A If a Final Demand Site has been reallocated to a different charging band in accordance with Paragraph 6.1 or 7.17 with effect from a time which falls within the 24 months before the time of the assessment under Paragraph 4.1 or 4.2, then the time period used for the purposes of such assessment shall be the time since the date when the last band reallocation became effective.

- 4.3 Each Final Demand Site will be allocated in accordance with Paragraphs 4.1 to 4.2A to the charging band where its capacity or consumption (as applicable) is greater than the minimum threshold for that charging band, and less than or equal to the maximum threshold for that charging band (as determined under Paragraph 2 or 3).
- 4.4 The allocation of each Final Demand Site will be re-assessed by the DNO/IDNO Party prior to the start of each onshore electricity transmission owner price control period, following the relevant review under Paragraph 3.
- 4.5 Subject to Paragraphs 4.6 and 5A, Final Demand Sites will remain in a charging band for the duration of the onshore transmission owner price control period, subject to any exceptional circumstances as defined in Paragraph 6 and/or a successful dispute as defined in Paragraph 7.
- 4.6 During the period to 31 October 2021, a site may be re-classified as a Final Demand Site (from a Non-Final Demand Site) or as a Non-Final Demand Site (from a Final Demand Site) in accordance with Paragraph 5.

5. TRANSITIONAL PERIOD AS A RESULT OF A RE-CLASSIFICATION OF A SINGLE SITE

- 5.1 Subject to Paragraph 5.3, a DNO/IDNO Party shall no longer treat a Single Site as a Final Demand Site (and shall re-classify it as a Non-Final Demand Site) if the DNO/IDNO Party has, by no later than 31 July 2021, been provided with the certification necessary to satisfy the definition of a Non-Final Demand Site.
- 5.2 Subject to Paragraph 5.3, a DNO/IDNO Party shall no longer treat a Single Site as a Non-Final Demand Site (and shall re-classify it as a Final Demand Site) if the DNO/IDNO Party has not, by 31 July 2021, been provided with the certification necessary to satisfy the definition of a Non-Final Demand Site.
- 5.3 Where Paragraph 5.1 or 5.2 applies, the DNO/IDNO Party will notify the relevant Customer's import/export Registrant(s) of the re-classification and the new charging band by 31 August 2021. A Customer, its Registrant or an agent authorised to act on the Customer's behalf (in each such case, the 'appointed agent') can challenge the new charging band by notifying the DNO/IDNO Party of such challenge by no later than 30

September 2021. Where a DNO/IDNO Party and the Customer (or its appointed agent) cannot come to an agreement with respect to the new charging band by 31 October 2021, then the charging band determined by the DNO/IDNO Party shall be used (subject to Paragraphs 5A, 6 and/or 7).

5A. RE-CLASSIFICATION OF A SINGLE SITE

5A.1 A DNO/IDNO Party shall no longer treat a Single Site as a Final Demand Site (and shall re-classify it as a Non-Final Demand Site) if the DNO/IDNO Party at any time has been notified that the Single Site is an Eligible Services Facility and has been provided with the certification necessary to satisfy the definition of a Non-Final Demand Site.

5A.1A For premises with a Back-up Connection which were previously treated as a separate Final Demand Site (in addition to being treated as comprising or forming part of another Final Demand Site pursuant to the primary connection), where the evidence necessary to satisfy the definition of a Back-up Connection has been provided to and accepted by the DNO/IDNO Party, no residual charges shall apply to those premises in respect of the Back-up Connection.

5A.2 Where Paragraph 5A.1 or 5A.1A applies the:

- (a) DNO/IDNO Party will notify the relevant Customer's import/export Registrant(s) of the re-classification by the end of the following month;
- (b) re-classification shall apply from the next billing period; and
- (c) the Registrant may be eligible for a rebate (applied from the date on which the DNO/IDNO Party received the necessary certification under Paragraph 5A.1 or the necessary evidence under Paragraph 5A.1A).

6. EXCEPTIONAL CIRCUMSTANCES AND ANNUAL ALLOCATION
REVIEW RESULTING IN RE-ALLOCATION TO A DIFFERENT BAND WITHIN A
PRICE CONTROL PERIOD

Exceptional circumstances

- 6.1 A Final Demand Site may be reallocated to a different charging band if one or more of the following criteria apply (following the Final Demand Site's allocation to a charging band under Paragraph 4):
- (a) the voltage of connection of the Final Demand Site changes;
 - (b) the Final Demand Site has a change of use or change of site configuration, and this is reflected by a significant change (as further described in Paragraph 6.3) to its:
 - (i) Maximum Import Capacity; or
 - (ii) forecast annual consumption; and/or
 - (c) the Final Demand Site moves from one of the groups identified in Paragraph 1.5 to another, and as a result it becomes a site for which the Maximum Import Capacity is to be used under Paragraph 2.1 (when annual consumption was previously to be used) or becomes a site for which annual consumption is to be used under Paragraph 2.1 (when Maximum Import Capacity was previously to be used).
- 6.2 Where a Customer or its Registrant applies to the DNO/IDNO Party to have a Final Demand Site reallocated as described in Paragraph 6.1(b), such application must be accompanied by:
- (a) for Paragraph 6.1(b)(i), a signed Connection Agreement for the Final Demand Site, and a signed letter from the Customer's company director (or equivalent) confirming exceptional and significant changes to the use of the site; or
 - (b) for Paragraph 6.1(b)(ii), a signed letter from the Customer's company director (or equivalent) confirming exceptional and significant changes to consumption (including historical consumption) for the Final Demand Site and the reason for the change of use or change of site configuration.
- 6.3 The exceptional circumstances described in Paragraph 6.1(b) will be subject the following materiality threshold:
- (a) (subject to Paragraph 6.3(b)) for Final Demand Sites allocated in accordance with Paragraph 4.1(a) or 4.1(b)(i), the Maximum Import Capacity at the Final Demand

Site must have either increased or decreased by more than 50 percent in comparison to the Maximum Import Capacity of the Final Demand Site at the end of the period used for the purposes of such allocation (and the average Maximum Import Capacity is not to be used as the comparator);

- (b) for Final Demand Sites allocated in accordance with Paragraph 4.1(a) or 4.1(b)(i) and then re-allocated under Paragraph 6.1, the Maximum Import Capacity at the Final Demand Site must have either increased or decreased by more than 50 percent in comparison to the Maximum Import Capacity of the Final Demand Site at the end of the period used for the purposes of such re-allocation (and the average Maximum Import Capacity is not to be used as the comparator);
- (c) Final Demand Sites allocated in accordance with Paragraph 4.1(b)(ii) may only be re-allocated under Paragraph 6.1 following their re-allocation under Paragraph 6.7, and only if the Maximum Import Capacity at the Final Demand Site has either increased or decreased by more than 50 percent in comparison to the Maximum Import Capacity of the Final Demand Site at the end of the period used for the purposes of such re-allocation (and the average Maximum Import Capacity is not to be used as the comparator); and/or
- (d) for Final Demand Sites allocated under Paragraph 4.2 (whether or not re-allocated under this Paragraph 6), the forecast annual consumption at the Final Demand Site must have increased or decreased by more than 50 percent in comparison to the consumption which was used for the purposes of the allocation which the applicant is seeking to have changed.

- 6.4 Reallocation of a Final Demand Site to a different charging band may result in the Registrant for the Final Demand Site being either eligible for a rebate (which shall be backdated to the time when the request was received) or subject to an additional charge (which shall be backdated to the date on which the DNO/IDNO Party notified the Registrant of the charge's application). The revised charging band will be applied from the next billing period.

Annual allocation review of new Final Demand Sites including those allocated based on no recorded data

- 6.5 Subject to Paragraph 6.6, each September, each DNO/IDNO Party shall review the allocation of all Final Demand Sites allocated to a charging band in accordance with Paragraph 4.1(b)(ii), Paragraph 4.2(a)(iii), Paragraph 4.2(b)(ii) and Paragraph 4.2(b)(iii). This is known as the “Annual Allocation Review” and may result in a Final Demand Site being reallocated from its current charging band (the “Old Charging Band”) to a new charging band (the “New Charging Band”).
- 6.6 Without prejudice to Paragraph 6.1, once each Final Demand Site has been allocated in accordance with Paragraph 4, it will be subject to the Annual Allocation Review only once.
- 6.7 For Final Demand Sites allocated in accordance with Paragraph 4.1(b)(ii), and where a Final Demand Site has a minimum of 12 months of Maximum Import Capacity data up to and including 30 June of that year, the Final Demand Site will be reallocated based on the average Maximum Import Capacity over that period.
- 6.8 For Final Demand Sites allocated in accordance with Paragraph 4.2(a)(iii), and where a Final Demand Site has a minimum of 12 months metered import consumption data up to and including 30 June of that year, the Final Demand Site will be reallocated based on the average annual import consumption over that period.
- 6.9 For Final Demand Sites allocated in accordance with Paragraph 4.2(b)(ii) or Paragraph 4.2(b)(iii), and where a Final Demand Site has an Estimated Annual Consumption which is not a Default Estimated Annual Consumption from a P0222 Report up to and including May of that year, the Final Demand Site will be reallocated based on the most recent Estimated Annual Consumption which is not a Default Estimated Annual Consumption.
- 6.10 On or before 15 September of the Annual Allocation Review, the DNO/IDNO Party shall provide each Supplier Party with a list of each and every MPAN associated with a Non-Domestic Premises that is connected to the DNO/IDNO Party’s Distribution System that has been reallocated to a New Charging Band as a result of the Annual Allocation Review, identifying the Old Charging Band and New Charging Band to which each such MPAN has been allocated, and the LLFC Id which is assigned to the MPAN.

- 6.11 Reallocation of a Final Demand Site to a New Charging Band may result in the Registrant for the Final Demand Site being either eligible for a rebate or subject to an additional charge both of which shall be backdated to the date on which the Final Demand Site was first charged the Old Charging Band residual fixed charge. The New Charging Band will be applied from the next billing period.

7. DISPUTES

Initial Notification

- 7.1 Each DNO/IDNO Party shall take reasonable steps to ensure that each Final Demand Site is allocated to the correct charging band (as determined in accordance with this Schedule).
- 7.2 Where the Customer or its Registrant or an agent authorised to act on the Customer's behalf (in either case, being the 'appointed agent'), has contacted a DNO/IDNO Party with sufficient information disputing the allocation to a charging band of a Customer's Final Demand Site, then that DNO/IDNO Party shall be required to investigate. Such an investigation shall be carried out using the information provided by the Customer or its appointed agent and the information available to the DNO/IDNO Party. The DNO/IDNO Party will initiate good faith negotiations with any such Customer or its appointed agent to find a resolution to the dispute.

Formal Dispute Notice

- 7.3 Where a DNO/IDNO Party and the Customer or its appointed agent cannot come to an agreement with respect to a Final Demand Site's allocation to a charging band, then the Customer or its appointed agent may send a formal dispute notice (a "**Dispute Notice**") to the Secretariat, which shall:
- (a) be in the format of any proforma made available for such purpose on the Website;
and
 - (b) contain a detailed description of the Customer's case for why the Final Demand Site should be reallocated to a different charging band, including reasonable evidence to support the dispute.

- 7.4 Where the Secretariat receives a Dispute Notice, it shall within two Working Days, issue the Dispute Notice to the relevant DNO/IDNO Party. Upon receipt of the Dispute Notice, the relevant DNO/IDNO Party shall provide its case for why the Final Demand Site should not be reallocated, and shall send this to the Secretariat within 10 Working Days.
- 7.5 Following receipt of the relevant section of the Dispute Notice completed by the DNO/IDNO Party, the Secretariat shall issue the whole Dispute Notice to both parties to the dispute and request that the Customer or its appointed agent provide confirmation that it wishes to progress the dispute to the Disputes Committee. Upon issuing the whole Dispute Notice, the Secretariat shall notify each recipient that progression to the Disputes Committee is subject to such confirmation, which is time limited to 10 Working Days. If no such confirmation is received by the Secretariat within such period, the Secretariat shall not put the dispute before the Disputes Committee and the dispute shall be considered closed.
- 7.6 Any additional information received from either party to the dispute as a consequence of the information shared under Paragraph 7.5 will be added by the Secretariat to the Dispute Notice for consideration by the Disputes Committee.

Disputes Committee

- 7.7 The Panel shall establish a Working Group to be known as the Disputes Committee for the purpose of facilitating the resolution of an unresolved disputes between DNO/IDNO Parties and Customers or their appointed agents. The remit of the Disputes Committee shall only be in respect of Dispute Notices for which confirmation has been received in accordance with Paragraph 7.5.
- 7.8 The Disputes Committee shall consist of:
- (a) three individuals elected by the DNO/IDNO Parties, each with an alternate
 - (b) three individuals elected by the Supplier Parties, each with an alternate,
 - (c) any additional individuals appointed by the Authority in accordance with Paragraph 7.9; and

- (d) any of the currently serving Panel Members but only acting in that capacity when called upon by a member of the Disputes Committee or the Secretariat to act in the capacity of a reserve member, where a scheduled meeting of the Disputes Committee would not otherwise be quorate.

7.9 Where at any time, the Authority considers that there is a class or category of person having an interest in the distribution of electricity in Great Britain whose interests are not adequately represented in the composition of the Disputes Committee at that time, and whose interests would be better represented if a particular individual was appointed as an additional Disputes Committee member, the Authority may (by notice to the Panel and the Secretariat) appoint that particular individual as a Disputes Committee member. The Authority may, at any time thereafter by notice to the Panel and the Secretariat, remove that individual from the Disputes Committee.

7.10 The following persons shall be entitled to attend and speak (but not vote) at any meeting of the Disputes Committee:

- (a) one person appointed from time to time, by notice to the Secretariat, by the Authority; and
- (b) one person appointed from time to time, by notice to the Secretariat, by the Consumer Body (Citizens Advice and Citizens Advice Scotland acting together to jointly appoint one person).

7.11 Dispute Committee members and their alternates:

- (a) shall be elected in accordance with the provisions for the election of Panel Members, except where such provisions could only apply to the election of the Panel Members themselves; and
- (b) shall be subject to the same term of office and removal of office process and timeline as that of the Panel Members.

Meetings of the Disputes Committee

7.12 All meetings of the Disputes Committee shall be convened by the Secretariat in accordance with the Dispute Committee's terms of reference.

- 7.13 The notice of each Disputes Committee meeting shall contain the time, date and venue and/or teleconference/web conference details, and an agenda and any supporting papers for, the relevant meeting (including the Dispute Notice). The Secretariat shall circulate amendments to the agenda where necessary.
- 7.14 For a meeting of the Disputes Committee to be quorate, a minimum of three members must attend, at least one of whom must have been elected by the Supplier Parties and at least one of whom must have been elected by the DNO/IDNO Parties; and all of whom must be independent of the dispute (meaning that none of the parties to the dispute are a Related Person of the member).
- 7.15 A decision to reallocate a Final Demand Site from one charging band to another requires a vote in favour by a simple majority of the Disputes Committee members who vote at the meeting. Such a decision shall be binding for the purposes of this Agreement, but is without prejudice to any statutory rights that the Customer may have.
- 7.16 The data on the Dispute Notice is confidential and can only be viewed by the Disputes Committee, the DNO/IDNO Party which the dispute is against, the Customer (and/or its appointed agent) which raised the dispute, the Secretariat, and the Authority.
- 7.17 Where the decision of the Disputes Committee is that a Final Demand Site be reallocated from one charging band to another, the Registrant for the Final Demand Site will be eligible for a rebate. The rebate for that Final Demand Site will be backdated to the time when the analysis shows that the Customer was first charged the incorrect residual fixed charge, up to a maximum of six years (five years in Scotland). The revised charging band will be applied from the next billing period.

8. DEFINITIONS

- 8.1 Words beginning with a capital letter that are not otherwise defined in this Schedule have the meanings given to them in Clause 1 of the main body of this Agreement, and the rules of interpretation set out in that Clause 1 also apply.
- 8.2 In this Schedule, unless the context otherwise requires, the expressions below shall have the meanings set out below:

Active Power	the product of the voltage, current and cosine of the phase angle between them, measured in watts.
Ancillary Services	has the meaning given to that term in the CUSC.
Back-up Connection	means a back-up connection to the DNO/IDNO Party's Distribution System which can only be used at times when the capacity provided via another (primary) connection to the DNO/IDNO Party's Distribution System is unavailable. The back-up connection must not be capable of being used in parallel with the primary connection, and the back-up connection must be for the same or a smaller capacity than the primary connection (when the back-up connection capacity is aggregated with the capacity of any and all other back-up connections associated with the same primary connection). A connection shall only be classified as a Back-up Connection if the Customer has provided the DNO/IDNO Party with clear supporting documentary evidence to the reasonable satisfaction of the DNO/IDNO Party.
Balancing Services	has the meaning given to that term in the National Electricity Transmission System Operator Licence.
Banding Agent	is the National Electricity Transmission System Operator or its appointed agent, as notified by the National Electricity Transmission System Operator to the DNO/IDNO Parties from time to time.
Customer	for each Single Site, is either the user as described in Schedule 16, or the EHV Customer as described in Schedule 17 and Schedule 18.
Default Estimated Annual Consumption	has the meaning to that term in the Balancing & Settlement Code.

Disputes Committee	is the committee established under Paragraph 7.7.
Estimated Annual Consumption or EAC	as the meaning to that term in the Balancing & Settlement Code
Electricity Storage	is the conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy.
Electricity Generation	is the process of generating electricity.
Eligible Services	shall mean any Balancing Services or Ancillary Services which imports or exports Reactive Energy but does not result in the production or export of any Active Power to the DNO/IDNO Party's Distribution System.
Eligible Services Facility	means a Single Site that can only and solely provide Eligible Services to the National Electricity Transmission System Operator and does not undertake Electricity Storage or Electricity Generation or consume any Active Power other than for the provision of the Eligible Services.
Final Demand	means electricity which is consumed other than for the purposes of generation or export onto the electricity network.
LLFC Id	has the meaning given in the Energy Market Data Specification to the expression ' Line Loss Factor Class Id '.
Non-Domestic Premises	means premises which are not Domestic Premises.
Non-Final Demand Site	is a Single Site: (a) at which either or both Electricity Storage and/or Electricity Generation occurs (whether the facility(ies) at the site are operating or

	<p>being commissioned, repaired or decommissioned), and that has an export Metering Point or Metering System and an import Metering Point or Metering System with associated metering equipment which only measures export from Electricity Storage and/or Electricity Generation and import for or directly relating to Electricity Storage and/or Electricity Generation (and not export from another source and/or import for another activity); or</p> <p>(b) which is an Eligible Services Facility;</p> <p>and (in the case of either (a) or (b)):</p> <p>(i) if registered in MPAS, is subject to certification from a Supplier Party that the site meets the criteria in paragraph (a) or (b) above, which certificate has been provided to the DNO/IDNO Party; or</p> <p>(ii) if registered in CMRS, is subject to certification from the Customer (or its CVA Registrant) that the site meets the criteria in paragraph (a) or (b) above, which certificate has been provided to the DNO/IDNO Party.</p>
P0222 Report	is the P0222 'EAC Data to Distributor Data Report' as set out in Balancing and Settlement Code Procedure (BSCP) 505 'Non Half Hourly Data Aggregation For SVA Metering Systems Registered in SMRS'.
Reactive Energy	has the meaning given to that term in the Balancing and Settlement Code.

Registrant	for each Metering Point or Metering System, the Supplier Party or CVA Registrant that is Registered for that Metering Point or Metering System.
Single Site	means one or more Non-Domestic Premises that are connected to the DNO/IDNO Party's Distribution System pursuant to a single Connection Agreement (whether a Bespoke Connection Agreement or one created via the National Terms of Connection). In making this assessment, the Connection Agreements for Back-up Connections will be disregarded, so that: (a) premises with a single Connection Agreement which is not for a Back-up Connection and one or more Connection Agreements which are for Back-up Connections will be treated as a Single Site; and (b) premises connected pursuant to the Connection Agreement governing the Back-up Connection will not be treated as a separate Single Site (but will still comprise or form part of the Single Site connected pursuant to the Connection Agreement governing the primary connection).