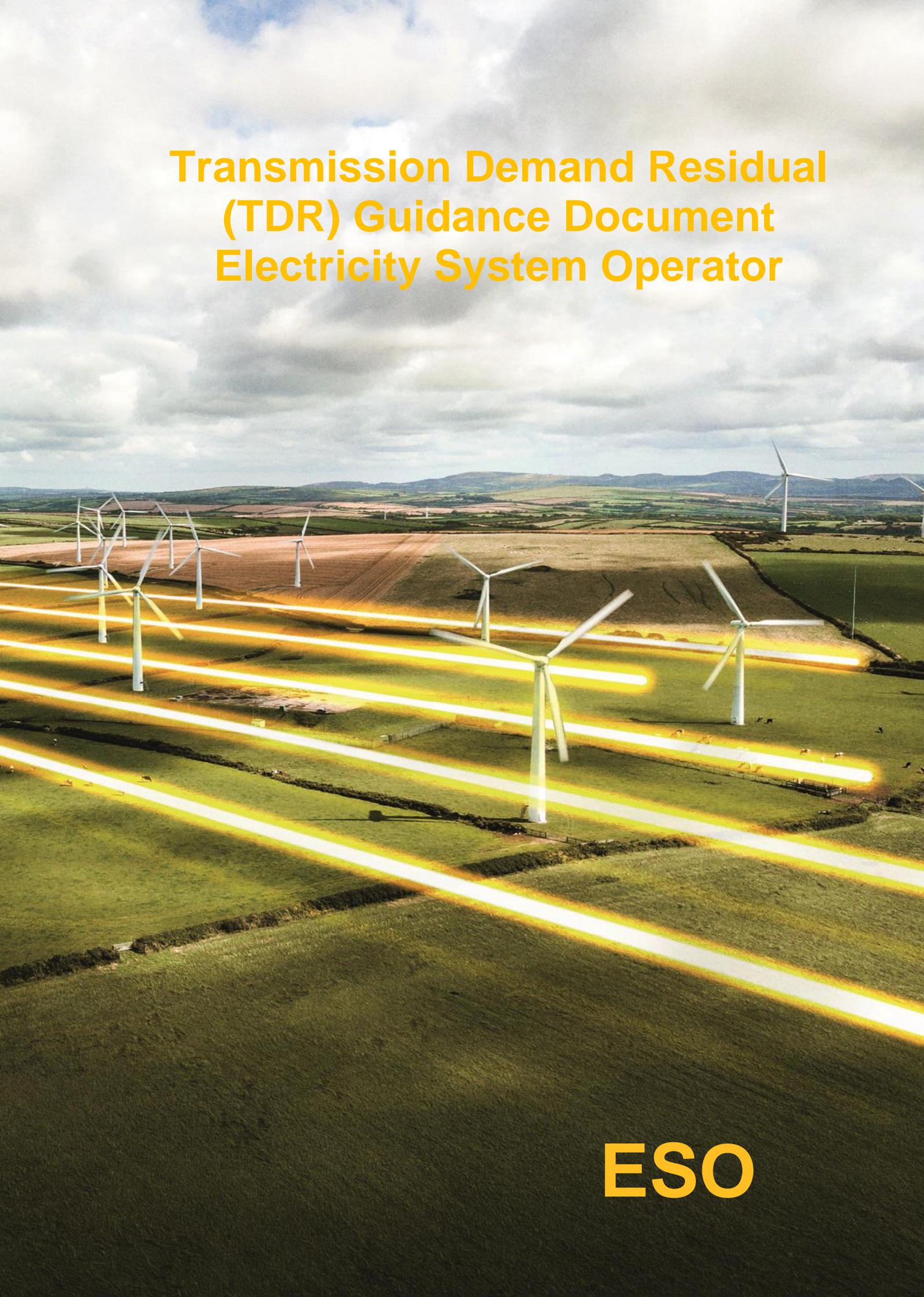


Transmission Demand Residual (TDR) Guidance Document Electricity System Operator



ESO

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1. Background to TDR

The Targeted Charging Review (TCR) was undertaken by Ofgem with respect to improving the UK Energy System in the face of the challenge of Net Zero. The TCR examined the 'residual charges' which recover the remainder of the total network charges needed to fund network expenditure.

Ofgem made their decision on the TCR on the 21st November 2021. The aims of Ofgem were:

- Remove harmful distortions in current charging methodology;
- Create level playing field;
- Make charging fairer for all users of the networks;
- Meet interests of current and future consumers;
- Continue reviewing 'embedded benefits' that may distort investment or despatch decisions.

This has led to a major reform of the TNUoS Demand Residual (TDR) whilst the TNUoS Generation Residual (TGR) will now be set to £0.

TDR

The TCR aims to resolve two problems with the existing residual charge:

1. The residual charge is not designed to provide a signal;
2. Today some Half Hourly (HH) users can adjust their demand to avoid paying almost all residual charges, known as Triad avoidance.

The solution from the TCR is:

- Demand residual to be charged at a fixed rate meaning (CMP336 and CMP343):
 - Non-domestic user charges to be banded based on capacity or consumption where relevant;
 - Users to remain in band for duration of price control;
 - Domestic users to be charged a single tariff.

ES2 Calculating TDR

Currently TNUoS charges are based on HH and Non-Half Hourly (NHH) methodologies for both Location and Non-Locational Demand charges. However, from April 2023 onwards (Ofgem's latest minded to position), the residual element of demand charges will be calculated on a £/Site/Day methodology with sites allocated into a band. The only exception to this £/Site/Day methodology are unmetered (UMS) sites which will be charged p/kWh (this methodology is already used by Distribution Network Operators).

This £/Site/day methodology is consistent across TNUoS and DUoS for network residual charges for demand. They will be applied to a "Final Demand Site" which can be summarised as a connection agreement with demand which is used for purposes other than generation or storage. For example, if a site has a generator or a generator with storage facility alone, the residual charges should not apply. However, if there is anything else at that site such a factory or a data centre then that whole site would be liable for the charge. This may expand to multiple meters – under one connection agreement.

The charging bands have been created by voltage level and percentiles to be applicable during RIIO2 for DUoS and TNUoS. These are available in table 1 below.

Table 1. GB Wide Demand Residual Banding

Measurement Unit	Band	Percentile		Threshold (kWh or kVA)		
		Lower (>)	Upper (≤)	Lower (>)	Upper (≤)	
Domestic *						
Unmetered Supplies (UMS) *						
DUoS & TNUoS	LV no MIC (kWh)	Band 1	-	40	-	3,571
		Band 2	40	70	3,571	12,553
		Band 3	70	85	12,553	25,279
		Band 4	85	100	25,279	∞
	LV MIC (kVA)	Band 1	-	40	-	80
		Band 2	40	70	80	150
		Band 3	70	85	150	231
		Band 4	85	100	231	∞
	HV (kVA)	Band 1	-	40	-	422
		Band 2	40	70	422	1,000
		Band 3	70	85	1,000	1,800
		Band 4	85	100	1,800	∞
	EHV (kVA)	Band 1	-	40	-	5,000
		Band 2	40	70	5,000	12,000
		Band 3	70	85	12,000	21,500
		Band 4	85	100	21,500	∞
TNUoS	Transmission Connected Demand (MWh)	Band 1	-	40	-	33,548
		Band 2	40	70	33,548	73,936
		Band 3	70	93	73,936	189,873
		Band 4	93	100	189,873	∞

* For Domestic customers, there will be a single £/site/Day band. Unmetered customers charging band will be set at p/kWh. A site will be allocated to its band for the duration of the price control period.

How are the bands determined?

This process is undertaken at the start of each price control. The methodology states for each voltage tier (extra high voltage, high voltage, low voltage and extra low voltage – see figure A below for voltage level range for each), there will be a series of bands that will be determined by percentiles.

Voltage	Range
LV No MIC	< 1kV
LV MIC	
HV	> 1kV, < 22kV
EHV	> 22kV

The ESO take information supplied by the DNOs that lists every site with their capacity. These are placed into a ranked list from smallest to largest and then we apply a boundary on the percentiles supplied by Ofgem. Figure 1 shows an example banding situation with 1000 HV demand sites using randomised data between 1kW and 500kW whereby the lowest band is anything less than 206kW whilst the lowest band is anything above or equal to 428kW.

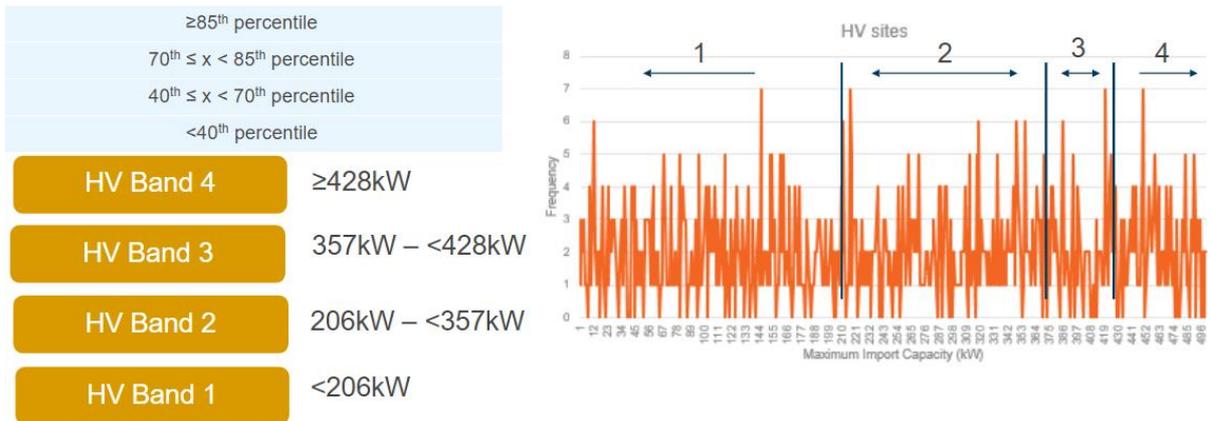


Figure 1. Determining the bands example using 1000 HV demand sites

Once the band boundaries are established, individual sites need to be mapped into the bands. The DNOs will map sites connected to their network (DNO connected sites are managed via DCUSA and any data passed to the ESO will be via P402) and the ESO will map sites connected to the transmission network.

From April 2023 onwards, the TNUoS charging structure will change to that shown in figure 2.

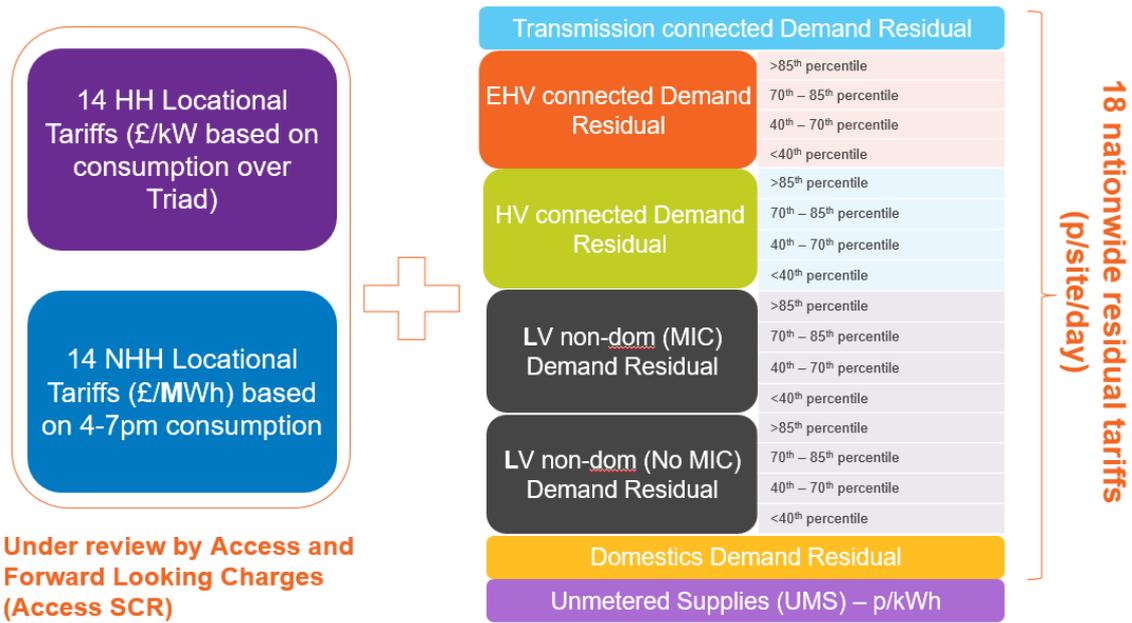


Figure 2. New TNUoS demand charging structure from April 2023. Please note the Locational Tariffs are subject to change under the Access SCR which is not due to come into effect for another couple of years.

Final Demand Sites

The TDR methodology will apply to all ‘Final Demand Sites’. A Final Demand Site is (in summary) - All Users with a Bilateral Connection Agreement, except:

- a) DNOs;
- b) Interconnectors;
- c) Non-Final Demand Site with a valid Declaration.

With respect to c – Non-Final Demand Sites, it’s important to note all sites are liable for the TDR unless they ‘opt out’. The onus is therefore on the customer keep their Declaration up to date should the site change.

Examples of Final Demand Sites

Within this section are a series of example scenarios depicting possible site configurations. These scenarios can be combined to reflect the need of a site if needed. They relate only to Transmission connections (sites connected to the Distribution network will follow the approach in DCUSA).

Meter locations are shown by letters. These meters can be import or export meters. It is confirmed these meters can be full BM Unit metering or a different specification (i.e. Operational Metering);

- Text in red represent additional metering (that can be added)
- Text in blue represents boundary metering

In using the example scenarios, the following Abridged Definitions may be useful (See CUSC Section 11 for full definitions):

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1. **Final Demand** = Means electricity which is consumed other than for the purposes of generation or export onto the electricity network. *E.g. Factory, Steelworks*
2. **Non-Final Demand** = Electricity Storage, Electricity Generation or Eligible Services Facility. *E.g. Wind Farm, CCGT, Battery Storage.*
3. **Mixed Demand** = A mixture of Final and Non-Final Demand. *E.g. Factory with on-site generation; Power Station with a Final Demand Customer.*

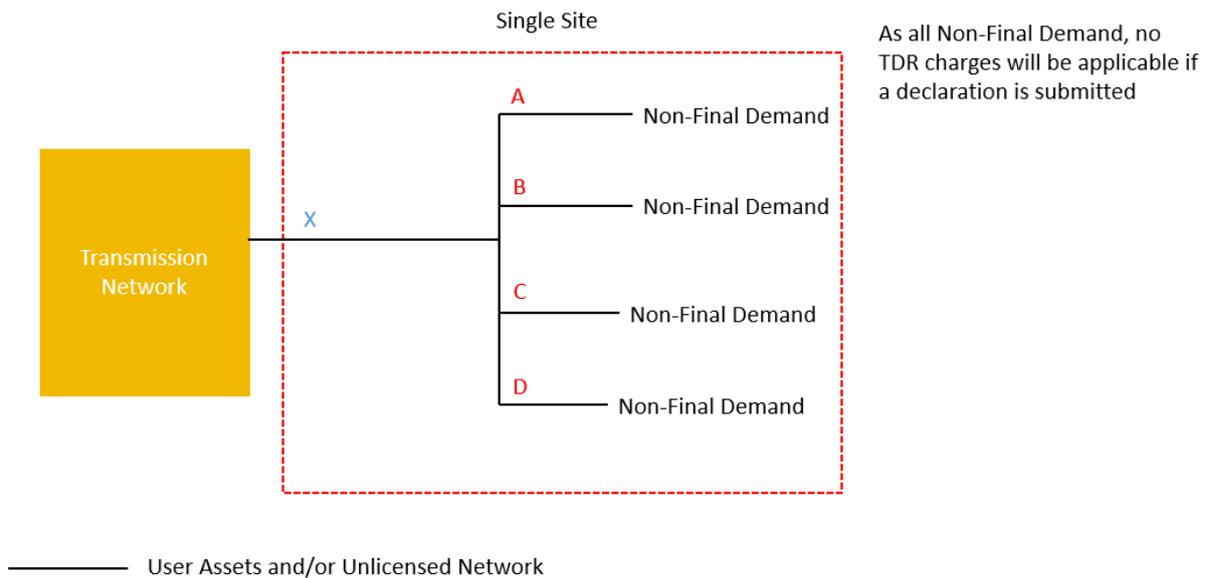


Figure 3. Power Station example

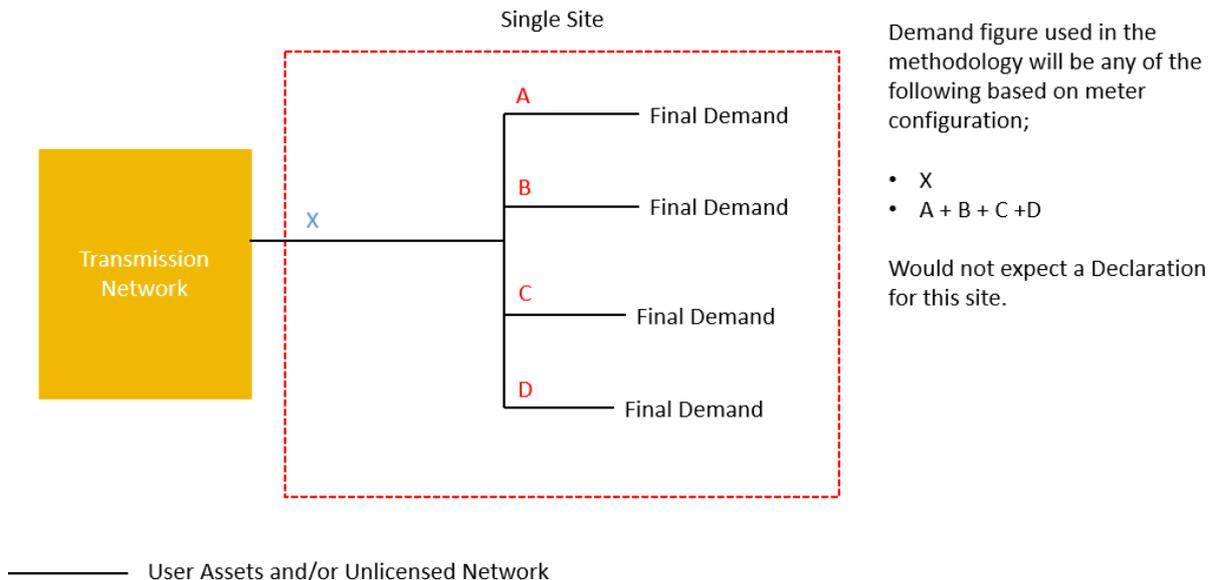
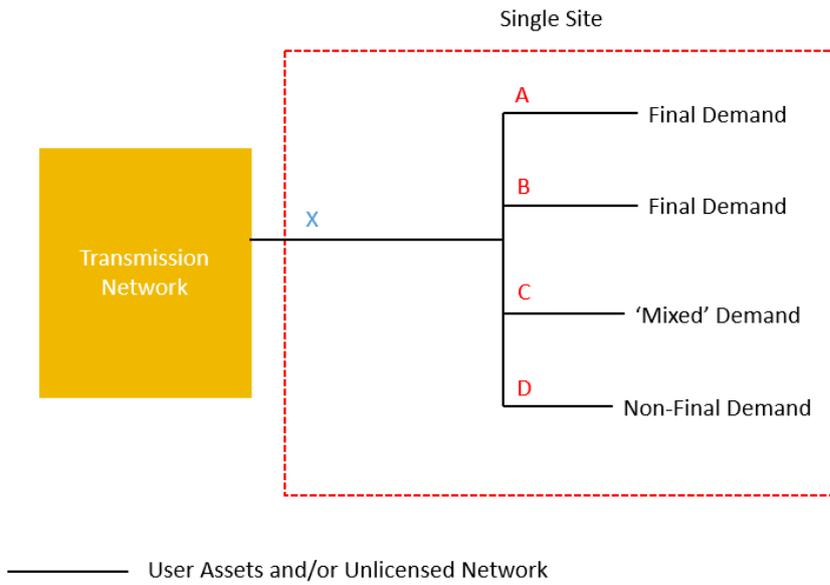


Figure 4. Demand site



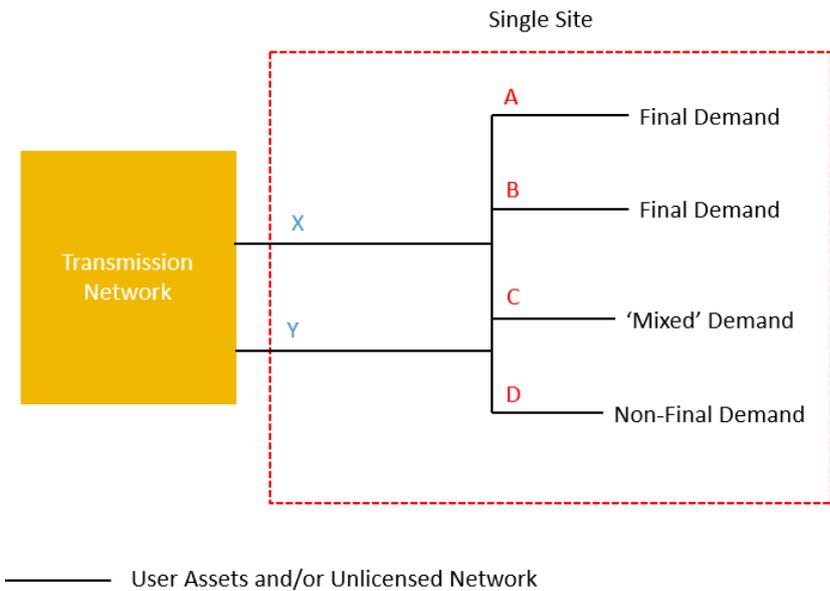
Demand figure used in the methodology will be any of the following based on meter configuration;

- $X - D$
- $X - (A + B + C)$
- $A + B + C$

i.e. separately isolating point D from the rest of the site.

Use of the boundary meter (meter X) is preferred however.

Figure 5. Mixed Demand Site (Simple)



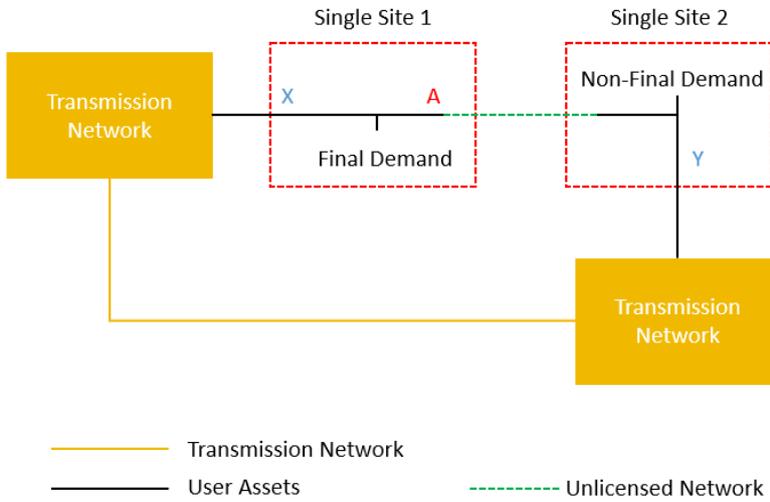
Demand figure used in the methodology will be any of the following based on meter configuration;

- $(X + Y) - D$
- $(X + Y) - (A + B + C)$
- $A + B + C$

i.e. separately isolating point D from the rest of the site.

Use of the boundary meters (meters X and Y) is preferred however.

Figure 6. Mixed Demand Site (Multi Feeder)



Demand figures used in the methodology will be;

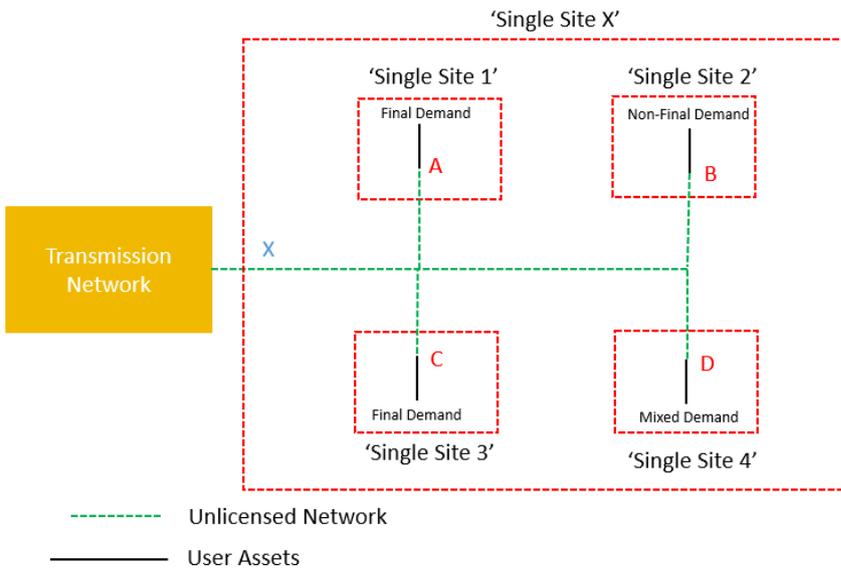
Single Site 1 = $X - A$
 Single Site 2 = Y^*

Notes

* as only Non-Final Demand is present in this example, no change will be applied

This arrangement isn't permitted long-term under Bilateral Connection Agreements (Appendix F5) on safety grounds as it parallels the transmission system.

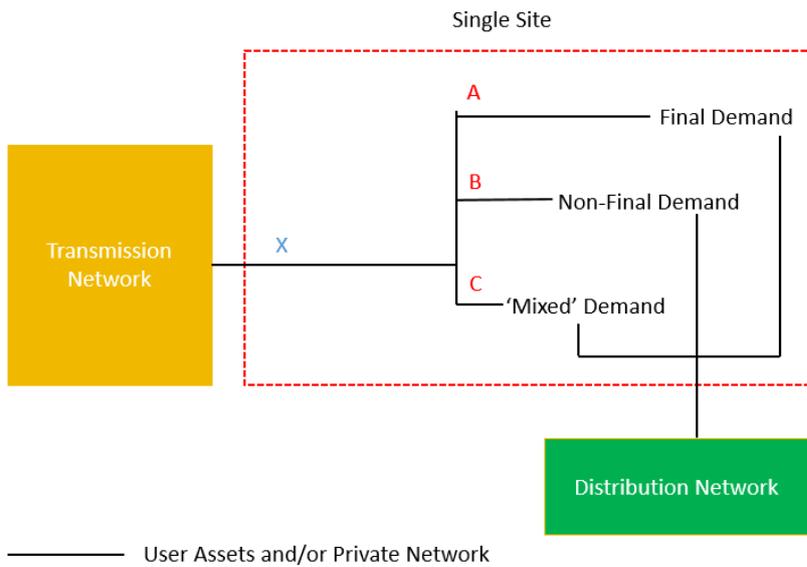
Figure 7. Interconnected Sites



No special treatment proposed;

- a) Direct connection
 - Treated as one Transmission connected 'Single Site'
 - $X - B$
 - $X - (A + C + D)$
- b) Licenced network
 - 4 embedded 'single sites'
 - Unlicensed network would need to follow same requirements as licenced networks

Figure 8. Unlicensed networks (1 large site or multiple small sites)

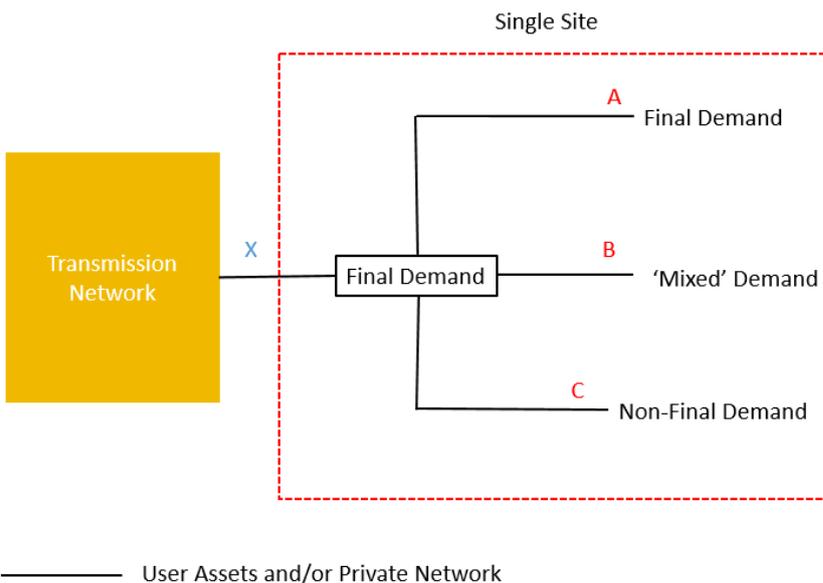


TNUoS charge as per scenario 1, i.e.

- $A + C$
- $X - B$
- $X - (A + C)$

DUoS charge as per the DCUSA methodology as depends on number of distribution connection agreements. i.e. to the DNO, is this 1, 2 or 3 sites?

Figure 9. Multi Network Connection



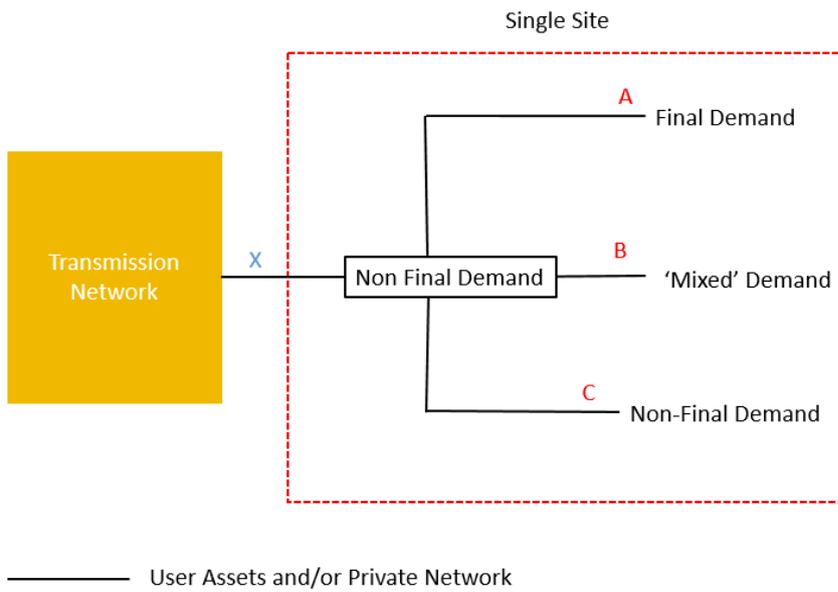
Assuming the 'boxed' Final Demand is only metered at point 'X'

Demand figure used in the methodology will be any of the following based on meter configuration;

- $X - C$

i.e. separately isolating point C from the rest of the site.

Figure 10. Final Demand with additional 'nested' demand



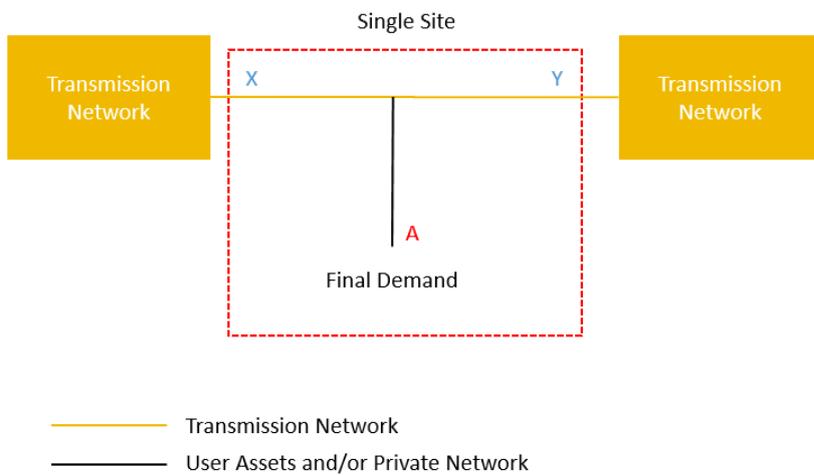
Assuming the 'boxed' Non Final Demand is only metered at point 'X'

Demand figure used in the methodology will be any of the following based on meter configuration;

- A + B

i.e. separately isolating point C from the rest of the site.

Figure 11. Non-Final Demand with additional 'nested' demand



Demand figure used in the methodology will be any of the following based on meter configuration;

- A
- |X - Y|

i.e. separately isolating point A from the rest of the site.

Figure 12. Flow through site

3. Contact Us

We welcome feedback on any aspect of this document and the tariff setting processes.

Do let us know if you have any further suggestions as to how we can better work with you to improve the tariff forecasting process.

Our contact details

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