Transmission Demand Residual (TDR) Guidance Document National Energy System Operator

NESO
National Energy System Operator

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1. What is Transmission Network Use of System (TNUoS)?

All users of the GB electricity network pay to use it in some way. Generators use the network to transport their electricity to where it is needed. Demand users use the network to consume electricity when they need it.

Transmission Network Use of System (TNUoS) charges recover the cost of installing and maintaining the transmission network in England, Wales, Scotland and offshore.

2. Background to TDR

For Transmission Network Use of System (TNUoS) Tariffs there are three 'types' of demand:

- Half hourly settled (generally commercial)
- Non-half hourly (generally domestic, or smaller non-domestic premises)
- Transmission Demand Residual

This guidance note explains the third element, the Transmission Demand Residual (TDR) and its introduction.

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 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 aimed to resolve two problems with the existing residual charge:

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

The solution from the TCR was:

- Demand residual to be charged at a fixed rate;
    - 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.

3. Calculating TDR

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 also used by Distribution Network Operators – DNO's).

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 as 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 1a below.

These charging bands have been reviewed and updated for the next Price control period (RIIO3), which will run from 2026/27 to 2030/31. These updated charging bands are available in table 1b below.

Table 1a: RII02 Bands

GB Wide Demand Residual Banding – RII02 period – 2021/22 to 2025/26

	Measurement Unit	Band	Percentile (%)		Threshold (kWh or kVA)	
			Lower	Upper	Lower (>)	
DUoS & TNUoS	Domestic *					
	Unmetered Supplies (UMS)*					
	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	TCS (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 is 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.

Table 1b. RII03 Bands

GB Wide Demand Residual Banding – RII03 period – 2026/27 to 2030/31

	Measurement Unit	Band	Percentile (%)		Threshold (kWh or kVA)	
			Lower	Upper	Lower (>)	
DUoS & TNUoS	Domestic *					
	Unmetered Supplies (UMS)*					
	LV no MIC (kWh)	Band 1	-	40	-	<= 3,986
		Band 2	40	70	> 3,986	<= 13,677
		Band 3	70	85	> 13,677	<= 27,543
		Band 4	85	100	> 27,543	∞
	LV MIC (kVA)	Band 1	-	40	-	<= 90
		Band 2	40	70	> 90	<= 150
		Band 3	70	85	> 150	<= 250
		Band 4	85	100	> 250	∞
	HV (kVA)	Band 1	-	40	-	<= 500
		Band 2	40	70	> 500	<= 1,100
		Band 3	70	85	> 1,100	<= 2,000
		Band 4	85	100	> 2,000	∞
	EHV (kVA)	Band 1	-	40	-	<= 3,500
		Band 2	40	70	> 3,500	<= 11,000
		Band 3	70	85	> 11,000	<= 20,000
		Band 4	85	100	> 20,000	∞
TNUoS	TCS (MWh)	Band 1	-	40	-	<= 25,131
		Band 2	40	70	> 25,131	<= 64,451
		Band 3	70	93	> 64,451	<= 163,880
		Band 4	93	100	> 163,880	∞

* For Domestic customers, there is 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?

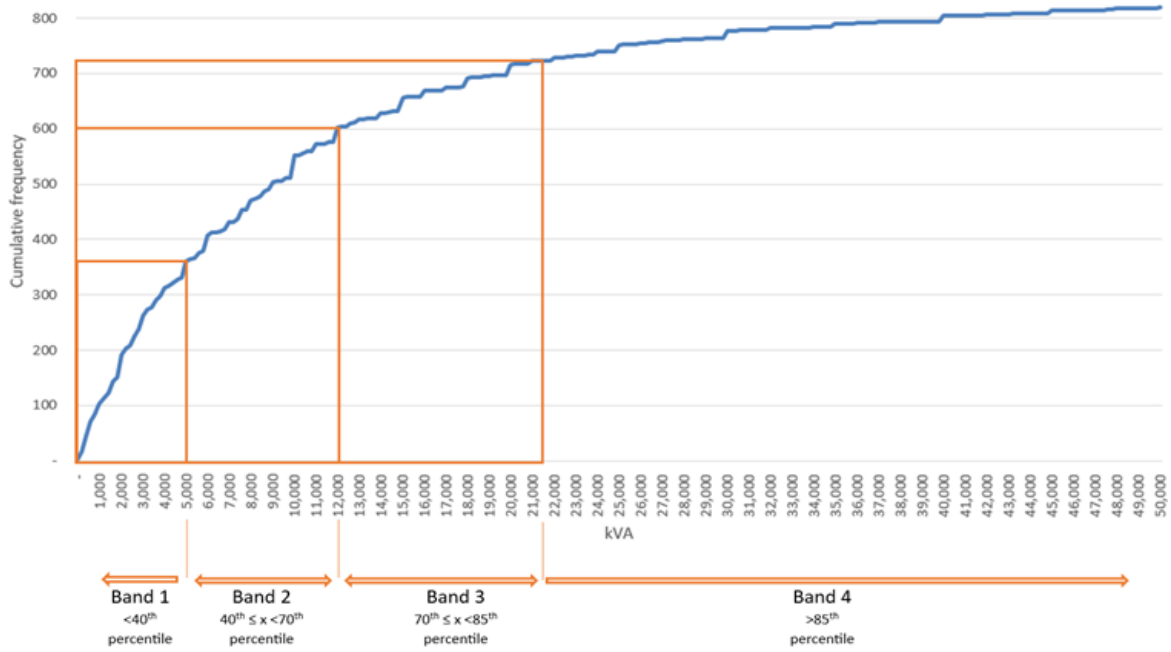
This process is undertaken at the start of each price control. The methodology states for each voltage tier - Extra High Voltage (EHV), High Voltage (HV), Low Voltage (LV - with and without a MIC) – see figure A below for voltage level range for each), there will be a series of bands that will be determined by percentiles.

Figure A : Voltage Levels

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

NESO take information supplied by the DNOs that lists the capacity of every site. 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 the cumulative frequency of all customers for a particular voltage band with the band groups been determined by the agreed threshold percentile values.

Figure 1. Determining the bands example using EHV demand sites

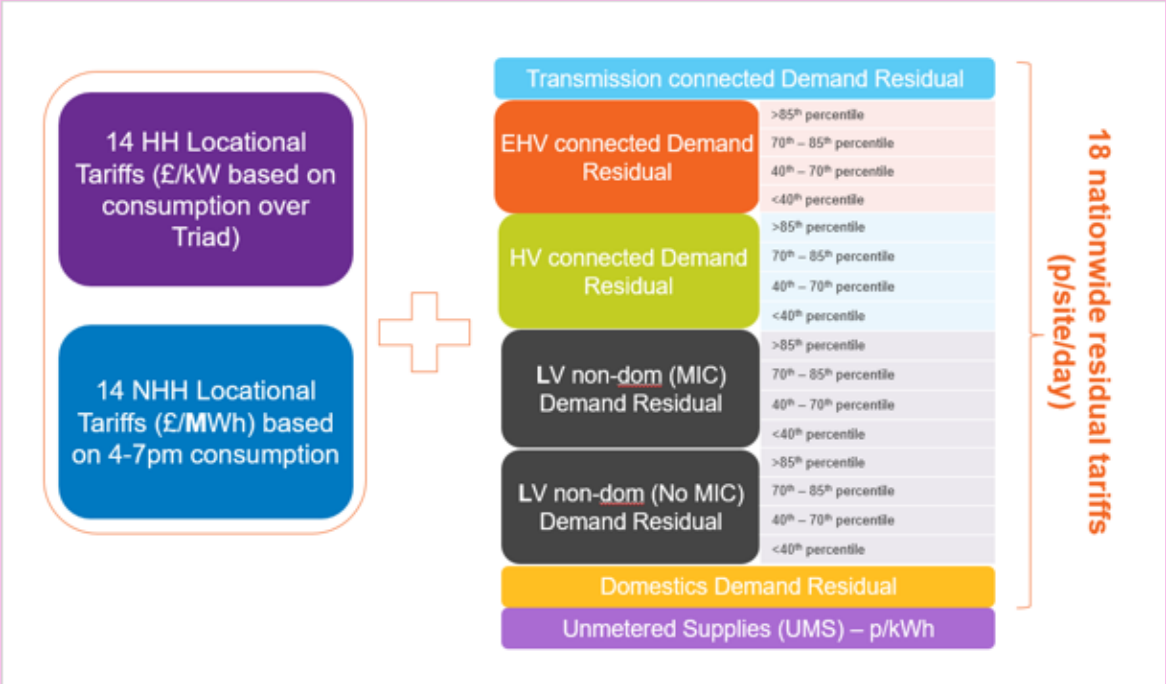


This shows the cumulative frequency of the EHV bands. Other voltage groups use this same methodology.

Once the band boundaries are established, individual sites are mapped into the bands. The DNOs have mapped sites connected to their network (DNO connected sites are managed via DCUSA and any data passed to NESO via P402 data flow) and NESO has assigned bands to sites connected to the transmission network.

From April 2023, the TNUoS charging structure was changed to that shown in figure 2.

Figure 2. TNUoS demand charging structure



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 to 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).

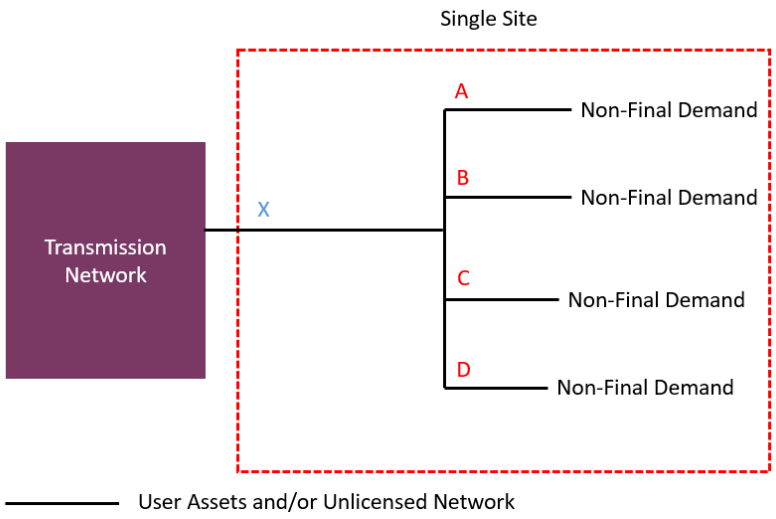
Meter locations are shown by letters. These meters can be import or export meters. It is confirmed these meters can be full BM Unit metering or a different specification (i.e. Operational Metering);

- 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):

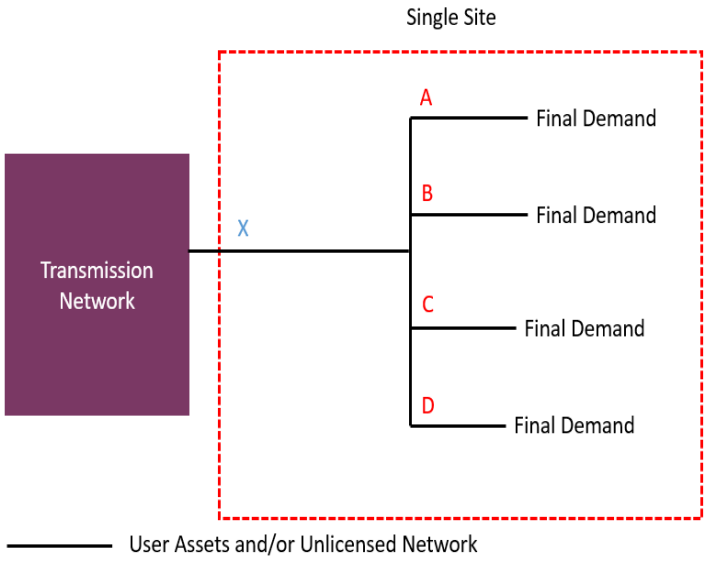
1. **Final Demand** = Means electricity which is consumed other than for the purposes of generation or export onto the electricity network. E.g. Factory, Steelworks
2. **Non-Final Demand** = Electricity Storage, Electricity Generation or Eligible Services Facility. E.g. Wind Farm, CCGT, Battery Storage.
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



As all Non-Final Demand, no TDR charges will be applicable if a declaration is submitted

Figure 4. Demand site

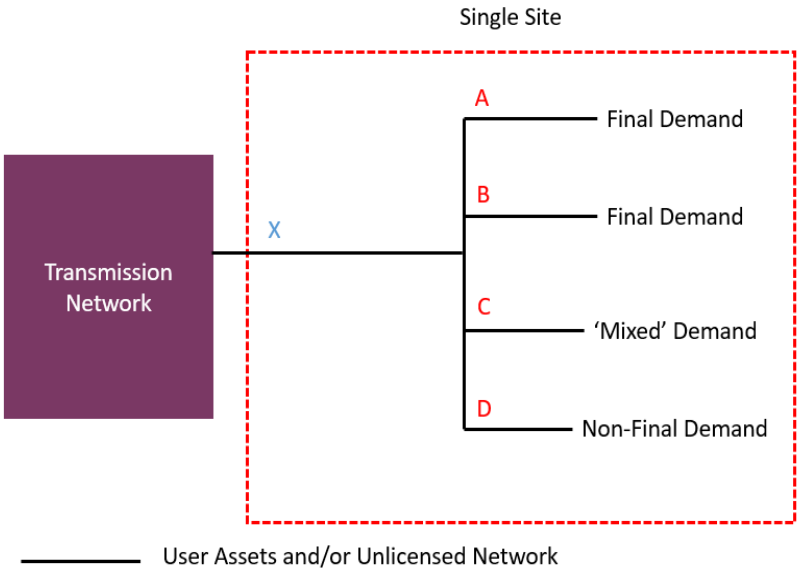


Demand figure used in the methodology will be any of the following based on meter configuration;

- X
- A + B + C +D

Would not expect a Declaration for this site.

Figure 5. Mixed Demand Site (Simple)



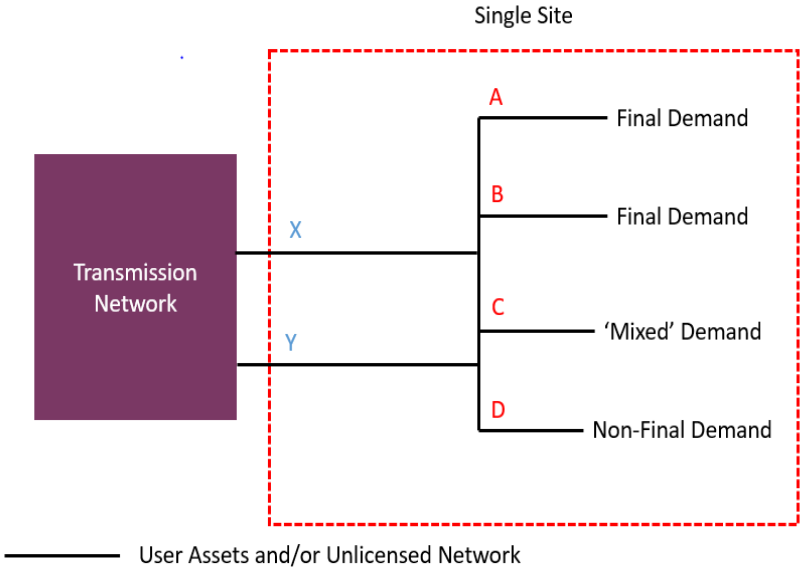
Demand figure used in the methodology will be any of the following based on meter configuration;

- X – D
- 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 6. Mixed Demand Site (Multi Feeder)



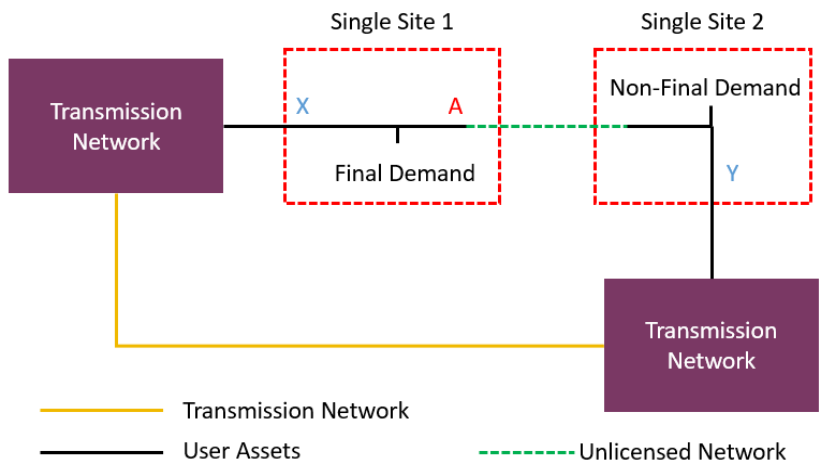
Demand figure used in the methodology will be any of the following based on meter configuration;

- (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 7. Interconnected Sites



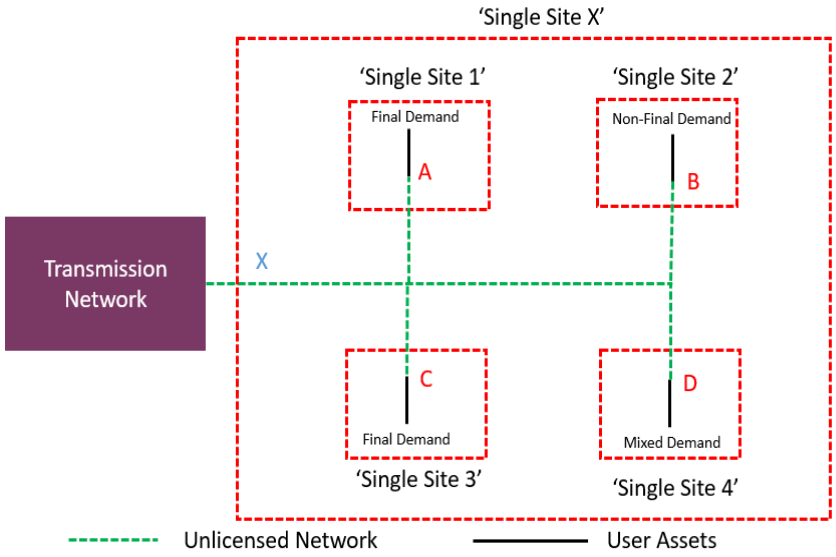
Demand figures used in the methodology will be;

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

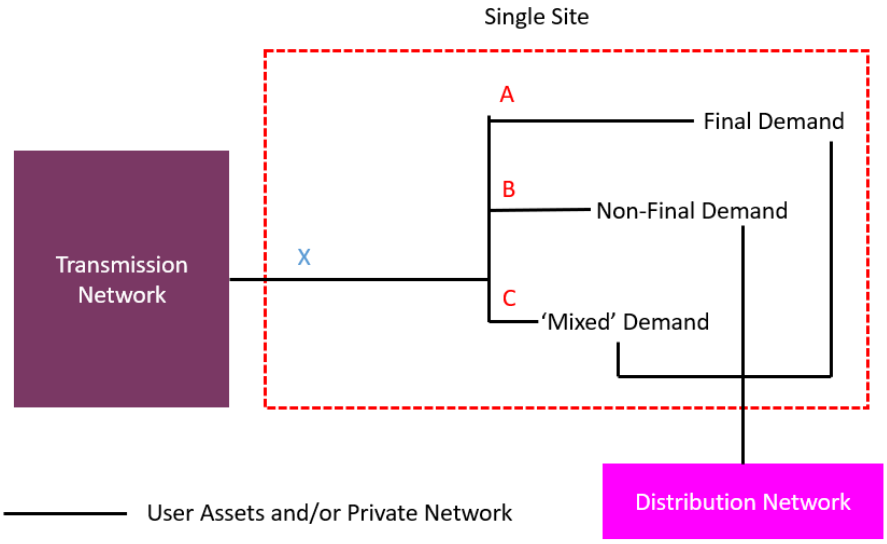


No special treatment proposed;

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 licensed networks

Figure 9. Multi Network Connection

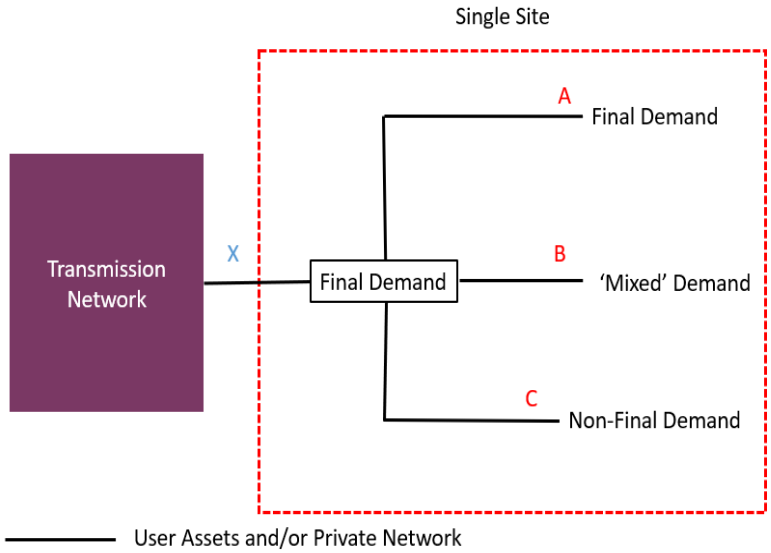


TNUoS charge as per scenario 1, i.e.

- 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 10. Final Demand with additional 'nested' demand



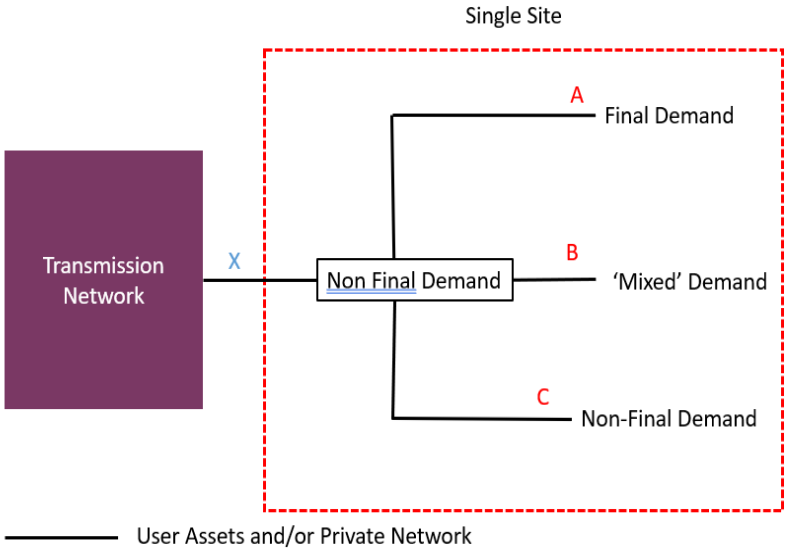
Assuming the 'boxed' Final Demand is only metered at point 'X'

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



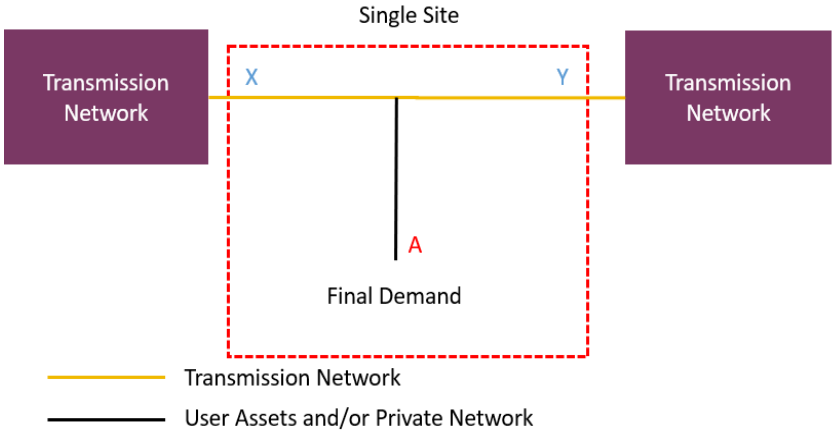
Assuming the 'boxed' Non Final Demand is only metered at point 'X'

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 12. Flow through site



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.

4. 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

Email: TNUoS.queries@nationalenergyso.com