

Excess Capacity Test Model (ECTM) - Alternative Methodology

About

The ECTM is a demonstration model designed to illustrate an alternative methodology for reflecting excess capacity costs in the CDCM, it is not a final model intended to produce final results.

Intention

Under the current CDCM, tariffs are structured in three ways. Very crudely, these tariff structures can be thought of as representing the possibility of avoiding costs in network planning. Hence, the service cable costs which are unavoidable while a user remains connected to a network irrespective of their load or capacity (within the typical bounds of their service model) are fixed. Higher voltage network assets where loads are more diversified are considered to be entirely avoidable and are represented by unit rates. In between these two extremes, capacity charges represent the size of assets required to be reserve at or immediately above the level of connection. The underlying assumption may be considered to be that local network assets need to be sized for the scale of an individual user's peak demand, because the scope for diversity from other users at the point in the network is limited.

In the CDCM these capacity charges are calculated by assigning network level costs to customer types using fixed standing charge factors which vary according to the type of customer and connection voltage. This is how the capacity costs are limited to just those immediately local assets, and not those at a higher network level.

Under the alternative approach calculated using the ECTM, for excess capacity charges, new standing charge factors are introduced that apply an excess capacity charge for assets at higher network levels. Hence, under this approach rather than paying for the higher network assets via unit rates, for the excess capacity, these costs are reflected by a higher excess capacity cost. The cost reflectivity of the model overall is unaltered but the way in which those costs are reflected in tariffs is adjusted.

To avoid recovery of the cost for the same assets via both: excess capacity charges, and unit rates and other charge elements; an adjustment is made in the model to lower the unit volumes in proportion to the ratio of the total of excess and normal capacity to normal capacity. Through this mechanism, the adjusted volumes are lowered, resulting in higher unit rates charges as a result of a higher allocation of operating costs per kW (because the operating costs need to be recovered from a lower peak load).

Modelling

The modelling changes aim to maintain the current cost reflectivity of the CDCM model but to move costs that were previously reflected as unit charges to excess capacity charges.

This is achieved through a two-step process:

1. Enhanced standing charge factors are introduced which calculate a new higher differential excess capacity charge. The charge is higher than the normal capacity charge because the standing charge factors extend to higher voltage level assets.
2. Unit rates are adjusted downwards to reduce price signals by an amount equal to the extra revenue expected to be collected due to the new differential element of the excess

capacity charge. This ensures there is no overall impact on the level of costs reflected by forward looking charges in total.

The example model is based on the ENWL published 25-26 CDCM. No inputs have been changed, and in testing no model rebalancing (the process of multiple iteration across all charging models) has been undertaken.

Furthermore, there have been no adjustments relating to 500MW DRM assets to account form those instances where an excess surplus residual required application of a scaling factor to those asset values. As the changes will typical lower unit rates, the changes would be expected to result in models that have had the excess residual remedy applied returning to an error state, as the factor lowering 500MW DRM assets would no longer be sufficient.

Model changes in detail

Step 1: Adjustment of Volumes and System Peak Capacity

Table 104-B is adjusted so the level of volumes for each unit are adjusted down by a factor equal to $(Capacity / (Capacity + Excess Capacity))$. This is done for every tariff category.

Volume discounting									
Section 104-B: Aggregation of volumes									
Volumes for all the way tariffs are imported from the inputs, separately for each residual band.									
All the way volume forecast - No Residual									
Rate 1 units	MWh		31.48	-	45.70	1.10	-	302.95	
Rate 2 units	MWh		484.29	-	732.29	2.98	-	1,518.27	
Rate 3 units	MWh		4,417.37	-	13,318.92	11.00	-	4,305.11	
MPANs	MPANs		1,936.77	-	2,536.14	10.00	-	101.00	
Import capacity	kVA		-	-	-	157.95	-	14,349.06	
Exceeded capacity	kVA		-	-	-	11.30	-	1,250.49	
Reactive power units	MVarh		-	-	-	46.18	-	1,623.77	
All the way volume forecast - Residual Band 1									
Rate 1 units	MWh	836,398.52		30,542.96		45,890.26	1,937.70	36,015.44	
Rate 2 units	MWh	2,273,538.30		116,452.38		160,580.96	14,031.90	115,083.96	
Rate 3 units	MWh	3,843,228.75		151,707.89		241,213.80	23,211.23	203,558.13	
MPANs	MPANs	2,217,420.01		60,367.88		5,329.22	314.16	769.83	
Import capacity	kVA	-		-		286,588.70	37,806.36	218,416.09	
Exceeded capacity	kVA	-		-		20,500.58	3,714.49	8,370.64	
Reactive power units	MVarh	-		-		38,073.98	6,182.73	43,336.81	

Table 106-E on the “System peak demand” sheet is adjusted so the exceeded capacity level in the calculation is fixed at zero.

Load at system peak charged to standing charges									
This section calculates load subject to fixed and capacity charges As part of this, it also calculates the LV diversity factor in line with Paragraph 80									
Section 106-E: Adjustment of import and exceeded capacity									
This brings in import and exceeded capacity (in kVA), and converts it to MW									
Import capacity	kVA	-	-	-	-	1,503,431.31	716,723.77	1,856,252.73	
Exceeded capacity	kVA	-	-	-	-	-	-	-	
Import and exceeded capacity	kVA	-	-	-	-	1,503,431.31	716,723.77	1,856,252.73	
Adjusted import capacities and exceeded capacity	MW	-	-	-	-	1,428.26	680.89	1,765.44	

Step 2: Enhanced standing charge factors

Alternative standing charge factors are added to the “standing charge factors” sheet as below. The factors are set to 100% for all network levels for those customer types with excess capacity charges.

Standing charge factors Electricity North West Limited - v1.0 CDM charging model - Release for charge setting v10 - 2025/26 0 issues identified in checks on this sheet							
Click here to return to model map	Units	Constants	Non-Domestic Aggregated (Related MPAN)	LV Site Specific	LV Sub Site Specific	HV Site Specific	Unmetered Supplies
Standing charges factors adapted to use 132kV/HV, by network level Adjustments as described in Paragraph 75 and 76							
Transmission exit	%						
GSPs	%						
132kV	%	>	0%	100%	100%	100%	0%
132kV/EHV	%		0%	100%	100%	100%	0%
EHV	%		0%	100%	100%	100%	0%
EHV/HV	%		0%	100%	100%	100%	0%
132kV/HV	%	>	0%	100%	100%	100%	0%
HV	%		0%	100%	100%	100%	0%
HV/LV	%		0%	100%	100%	100%	0%
LV circuits	%		100%	100%			0%
LV customers	%						
HV customers	%						

Figure 1 New enhanced standing charge factors to be used for excess capacity calculation

In the “Capacity charges” sheet these factors are fed in and used in the excess capacity calculation in place of the ‘normal’ standing charge factors which creates a differential charge in comparison to the standard capacity charge. Example below:

Capacity charges Electricity North West Limited - v1.0 CDM charging model - Release for charge setting v10 - 2025/26 <i>0 issues identified in checks on this sheet</i>										
Click here to return to model map	Units	Constants	Domestic Aggregated or CT	Domestic Aggregated (Related MPAN)	Non-Domestic Aggregated or CT	Non-Domestic Aggregated (Related)	LV Site Specific	LV Sub Site Specific	HV Site Specific	Unmetered Supplies
HV customers	p/kVA/day									
Section 112-E: Exceeded capacity charges for eligible customers, by network level			>							
Asset costs										
Transmission exit	p/kVA/day									
GSPs	p/kVA/day		-	-	-	-	4.13	3.34	3.88	-
132kV	p/kVA/day		-	-	-	-	1.63	1.56	1.53	-
132kV/EHV	p/kVA/day		-	-	-	-	3.78	3.61	3.55	-
EHV	p/kVA/day		-	-	-	-	2.38	2.28	2.24	-
EHV/HV	p/kVA/day		-	-	-	-	-	-	-	-
132kV/HV	p/kVA/day		-	-	-	-	3.69	3.52	3.46	-
HV	p/kVA/day		-	-	-	-	3.35	3.19	-	-
HV/LV	p/kVA/day		-	-	-	-	1.65	-	-	-
LV circuits	p/kVA/day									
LV customers	p/kVA/day									
HV customers	p/kVA/day									
Other operating costs										
Transmission exit	p/kVA/day		-	-	-	-	-	-	-	-
GSPs	p/kVA/day		-	-	-	-	-	-	-	-
132kV	p/kVA/day		-	-	-	-	1.83	1.81	1.78	-
132kV/EHV	p/kVA/day		-	-	-	-	0.75	0.71	0.70	-
EHV	p/kVA/day		-	-	-	-	1.73	1.65	1.63	-
EHV/HV	p/kVA/day		-	-	-	-	1.09	1.04	1.03	-
132kV/HV	p/kVA/day		-	-	-	-	-	-	-	-
HV	p/kVA/day		-	-	-	-	1.69	1.61	1.59	-
HV/LV	p/kVA/day		-	-	-	-	1.53	1.46	-	-
LV circuits	p/kVA/day		-	-	-	-	0.76	-	-	-
LV customers	p/kVA/day									
HV customers	p/kVA/day									

Figure 2 Calculation of excess capacity charges

Excess capacity tariffs in this example are around triple those of standard capacity charges for LV Site Specific customers, and around double for HV Site Specific customers. As the charge is generated by applying higher voltage network asset costs to the charges it is as expected that the charge differential would be lower for higher voltage connected customers.

Economic justification and observations

This model produces results broadly in line with the original test model with some variations.

The aims is to produce a set of forward looking charges excluding the impact of excess capacity charges, and then introducing the excess capacity charges as an additional forward looking charge before the final step of revenue matching.

The ECTM CDCM model (alternative methodology) is a 'rough draft' designed to provide representative outputs and as a test of the principles involved. It is likely that the final modelling will be done differently and will depend on the final agreed legal text.