Transmission Pricing Methodology Consultation

Submission to the Electricity Authority

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Chris Osauskas
Technology & Strategy Manager
Buller Electricity Limited
P O Box 243
Westport 7866

Email: chris.osauskas@bullernetwork.co.nz

Executive Summary

The Electricity Authority has issued the consultation 'Proposed Transmission Pricing Methodology' and Buller Electricity Limited (BEL) appreciates the opportunity to make a submission.

BEL has been identified as being one of the transmission customers most negatively impacted by transmission charge increases as per the proposed Transmission pricing Methodology (TPM) indicative charge modelling which has been provided. The 2 primary factors which contribute to this outcome are:

- The discretionary reclassification of the 2 x 110kV Inangahua to Orowaiti transmission lines as Connection Assets
- A dual GXP grid connection arrangement at the ORO GXP which essentially results in the load at our single transmission connection location being inappropriately double counted for the Any Maximum Demand Residual (AMDR) assessment and Residual Charge allocation

BEL's submission provides detailed information related to the specific circumstances associated with these factors and our assessment/consideration of the key issues we have identified.

1. Classification of Connection Assets

The 2 x 110kV transmission lines which connect the Transpower Inangahua Substation (Location Code IGH) & BEL's Robertson St GXP Substation (Location Code ORO) have historically been classified as Connection Assets fully allocated to BEL as a transmission customer. In 2020 Transpower discovered these assets had historically been incorrectly classified as Connection Assets as they were in fact Interconnection Assets according to Node-Link Diagram rules detailed in the Code.

The reason for this incorrect classification was that Transpower had failed to identify the 3 Deviation Points which are circled in red on the Upper South Island portion of the Node-Link Diagram shown in Figure 1. It is noted that this diagram is the April 2021 version following the reclassification to Interconnection Assets. The presence of any one of these 3 Deviation Points circled in red results in

the entire IGH–ORO transmission lines switching from a Connection Asset to an Interconnection Asset classification.

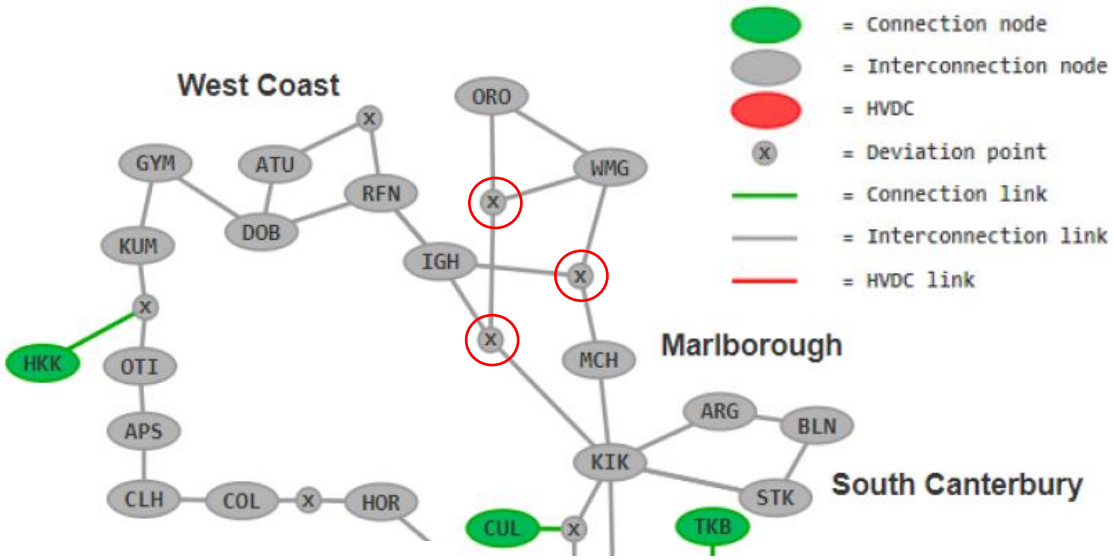


Figure 1 Upper South Island Node-Link Diagram April 2021 (Source – Transpower)

In the case of the IGH-ORO transmission lines the 3 Deviation Points exist due to circuits which have physical double-backs on shared towers or circuits which have share towers with circuits which connect to the wider interconnected grid e.g. the Kikiwa (Location Code KIK). This results in the Node-Link Diagram having additional loops, with any assets in a loop being Interconnection Assets rather than Connection Assets. The Code rules for determining the Node-Link Diagram essentially treat physical & electrical tee's in an equivalent manner with the Deviation Points circled in red all being physical tee's which having the typical arrangement shown in Figure 2.

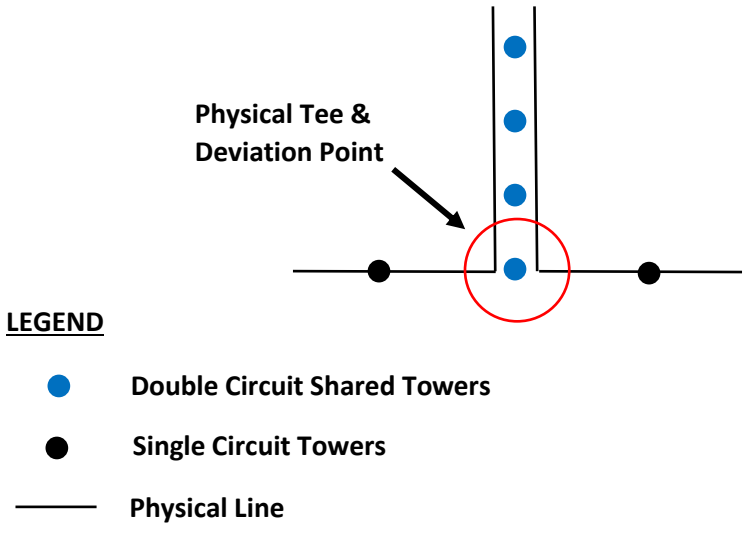


Figure 2 Typical Arrangement of a Physical Tee

Given that the IGH–ORO transmission lines are deemed to be most appropriately classified as Connection Assets rather than Interconnection Assets Transpower has recognised that in this case the existing algorithmic rules for determining the Node-Link Diagram do not result in the intended outcome. In order to correct this, it is proposed to include Part B Clause 25 in the TPM which allows for a discretionary override of the algorithmic rules:

> **1 Discretion to Classify and Reclassify as Connection**
> (1) Despite anything else in this **transmission pricing methodology**, **Transpower** may classify or (subject to subclause(2)) reclassify any **grid asset** that would otherwise be an **interconnection asset** as a **connection asset** if—
> (a) the **grid asset** directly or indirectly connects 1 or more **customers** to the rest of the interconnected **grid**; and
> (b) the **grid asset** does not provide material **transmission services** to any other **customers**; and
> (c) **Transpower** considers it is fair and reasonable in all the circumstances to classify or reclassify the **interconnection asset** as a **connection asset**.

While BEL accepts that it is the intent of the TPM to classify the IGH-ORO transmission lines as Connection Assets (so far as Connection Assets are currently defined) we are of the view that there are a number of wider issues which need to be considered prior to adopting the proposed discretionary reclassification mechanism, as detailed below:

Discretionary Clause

- The use of a discretionary clause to achieve the intended Connection Asset classification outcome is not an ideal situation, with a preferred option being the definition of more appropriate algorithm rules which require no discretionary adjustment/correction
- As far as BEL is aware the IGH-ORO transmission lines are currently the only existing Interconnection Assets to which this discretionary clause will be applied

Consideration of Material Impact

- Due to the approx. 40km length of the IGH-ORO transmission lines and BEL's overall small load (11MW maximum demand) the reclassification of the IGH-ORO assets will have a significant impact (potential doubling) of BEL's transmission charges
- The material impact of any discretionary reclassification on transmission customers should be a consideration in its application e.g. the ability of the customer to pay
- The transition away from the use of historic asset valuations for determining the asset component of connection charges has the potential to further increase these connection charges

Connection Asset Definition

- As part of a wider consideration of Interconnection & Connection Asset classification we consider that it would be appropriate that the Authority consider whether their existing definition is meeting the Authority's statutory objective in the most appropriate manner possible e.g. economic efficiency

- It is noted that the Authority has previously considered the implementation of a TPM which included 'Deeper Connection Assets' and it would appear that a complete & robust methodology for defining Connection Assets has not been developed to date

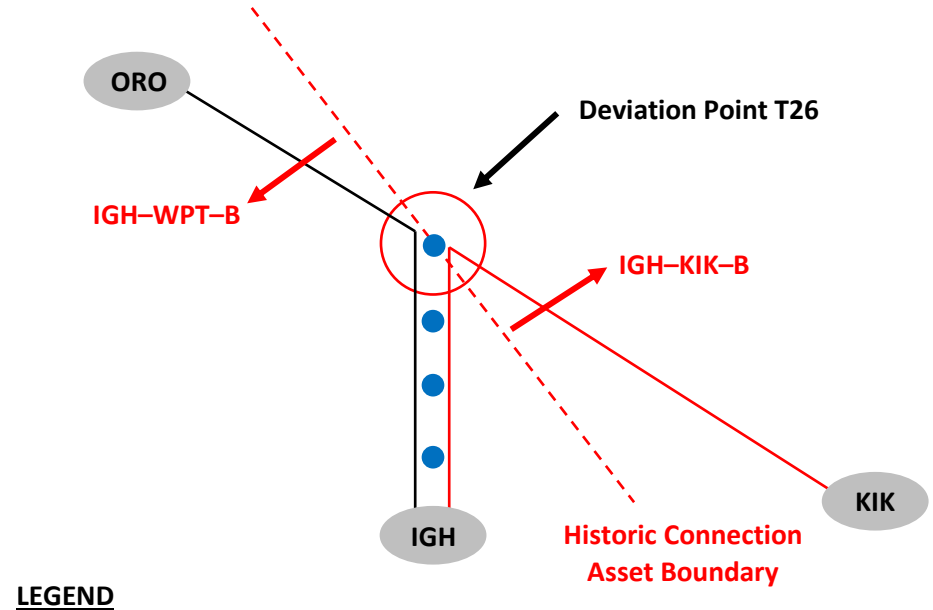
Assets Eligible for Reclassification as Connection Assets

- In the event that Transpower decides to make a discretionary reclassification of Connection Assets allocated to BEL this should exclude all or a part of the IGH–WPT–B physical transmission lines for the reason detailed below
- How transmission line assets are represented in the Node-Link Diagram and Transpower's pricing system does not necessarily reflect the electrical circuit connections or how the lines are used
- This is highlighted in Figure 3 which shows the configuration of the 110kV circuit built on the vertical double circuit 220kV towers between the locations KIK–IGH–ORO
- An additional 110kV circuit built on older horizontal single circuit towers is also exists but this is not shown in Figure 3
- The physical asset IGH–KIK–B connects KIK & T26 e.g. it ends at T26 not IGH
- The single electrical circuit related to IGH–KIK–B asset transfers from the physical asset IGH–KIK–B to the physical asset IGH–WPT–B at T26
- The dashed red line in Figure 3 demarcates the boundary between the Interconnection Assets and the Connection Assets as they have been historically allocated to BEL
- This Connection Asset boundary and allocation to BEL includes assets which form part of the KIK–IGH electrical circuit (solid red line in Figure 3)
- As this circuit provides transmission services to both BEL and Westpower when considered in its entirety the IGH–WPT–B asset does not meet Clause (1)(b) of the discretionary provision:

> (b) the **grid asset** does not provide material **transmission services** to any other **customers**; and

- Three options for a more appropriate boundary of the Connection Assets allocated to BEL are shown in Figure 4 as follows:
  - Option ①: Exclusion of all of the physical asset IGH–WPT–B
  - Option ②: Exclusion of all assets on the IGH/KIK side of T26
  - Option ③: Splitting of the IGH–WPT–B asset between IGH & T26 into connection & interconnection components

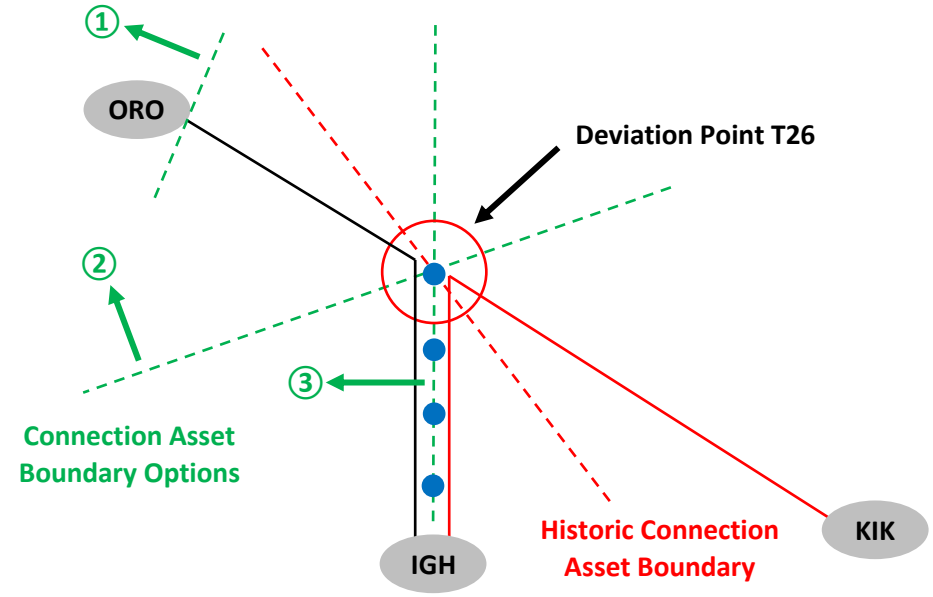
In summary we submit that the use or introduction of a discretionary power to override a definition or design default is contrary to the Authority's objectives, and all customers should be provided with long-term security by being able to have their charges determined in a fair and transparent manner.



LEGEND

- 26 x Shared Towers between IGH – T26
- 110kV Electrical Circuit which provides Connection Services
- 110kV Electrical Circuit which provides Transmission Services
- Node – Node-Link Diagram

Figure 3 Physical Asset Arrangement IGH–KIK–B, IGH–WPT–B & Historic Connection Asset Boundary



LEGEND (as per Figure 3)

Figure 4 Physical Asset Arrangement IGH–KIK–B, IGH–WPT–B & Alternative Connection Asset Boundary Options

2. AMD Assessment for Residual Charge Allocation

BEL takes supply from the transmission network at the Orowaiti (ORO) connection location on the southern outskirts of Westport. This connection location exists at the BEL owned and operated Robertson St GXP Substation which was established in 2004 as a strategic replacement for the Waimangaroa (WMG) GXP which existed at the time. BEL ownership of the GXP Substation necessitated the unusual connection arrangement (shown in Figure 5) consisting of 2 x GXPs (ORO1101 & ORO1102) at the same physical location. Two GXPs (nodes) are required to represent this configuration in the electricity market, with a similar situation existing at the Westpower owned & operated Reefton GXP Substation (RFN1101 & RFN1102).

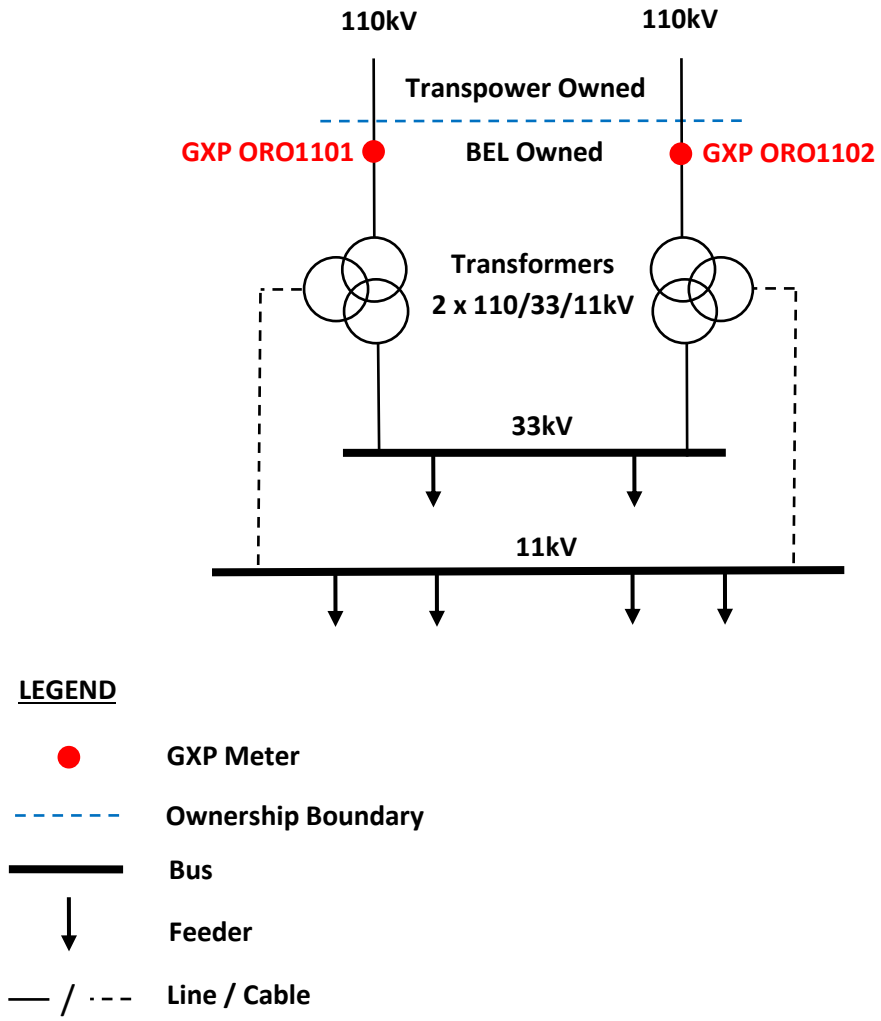


Figure 5 BEL Robertson St GXP Substation – (N-1) Security – 2 x GXP – Non-Aggregate Metering

While BEL has a network maximum demand of approx. 11MW our Anytime Maximum Demand (Residual) AMDR assessment has been determined to be 19.6MW as the AMD for ORO1101 & ORO1102 have been determined independently (non-coincident) and added together as the GXPs are considered to be different 'Points of Connection'.

As ORO1101 and ORO1102 are operated in parallel at any point in time (for reasons of Transpower or BEL planned/unplanned outages) all of BEL's load can/will at any time be supplied from either ORO1101 & ORO1102 as a part of normal N security operation. Given that these single GXP supply periods will not necessarily coincide with our peak network AMD of 11MW (occurring at mid-winter evening periods) our AMDR assessment is not double 11MW but rather at a slightly lower level (19.6MW across both GXPs).

While BEL is aware of the Authority's previous consideration & decision on the use of non-coincident AMDR different 'Points of Connection' we are of the view that this is inappropriate in the case of the ORO GXPs as these GXPs exist at the same connection location. Furthermore, it is clear to us that a very strong case exists for the use of a coincident AMDR at ORO where the ORO1101 & ORO1102 meters are aggregated prior to determining the AMDR.

Our argument for the use of a coincident AMDR at ORO is primarily based on the reasoning that Transpower & Distributor owned GXP substations should be treated in a consistent manner in determining AMDR for the initial cutover to the new TPM, and for the estimation of AMDR for connections built in the future. In a situation where a competitive market should exist for the establishment/ownership/operation of GXP assets these options should be treated consistently, fairly & equitability, with this outcome clearly not being achieved by the AMDR assessment process as it is currently proposed to be implemented.

The decision for BEL to invest in the building of the Robertson St GXP substation was made on the basis of providing a reliable supply to consumers at the lowest possible cost which clearly met the Authority's objectives, yet the proposed TPM AMDR assessment process contradicts this, the consequences of which will add substantial costs to consumers rather than the benefits determined in the investment case. BEL considers it to be a fair and reasonable expectation that the common transmission services provided to us in the future would not be materially impacted (in terms of reliability and charging) by whether or not our GXP substation was BEL or Transpower owned/operated. Furthermore, we are unsure as to how the large differential which exists between our peak network demand & AMDR (11MW vs 19.6MW) gives a reason to justify that our size and ability to pay Residual Charges is aligned with 19.6MW rather than 11MW.

Figures 6 & 7 are used to illustrate the difference in treatment between Transpower & Distributor GXP Substations having (N-1) security. For a Transpower owned GXP Substation (Figure 6) the GXP meters are aggregated with their being only one GXP node in the electricity market. Whether or not the system is operating in N security mode (for reasons of Transpower planned/unplanned outages) is not registered by the overall single GXP aggregated metering.

The Transpower owned GXP Substation is contrasted with the Distributor owned GXP Substation (Figure 7) where the identical N security mode (for reasons of Transpower planned/ unplanned outages) is registered by the GXP metering and the existing non-coincident AMDR assessment methodology.

A survey of the approx. 240 electricity market nodes indicates that only 16 combinations of location codes & voltages (a total of 32 nodes) are represented using more than GXP e.g. ORO1101 & ORO1102. Of these 16 cases it is unknown how many of these are actually GXPs/GIPs (customer connection points) rather than grid nodes. Given that majority of transmission customer connections will have greater than N security this confirms that aggregated GXP metering (as depicted in Figure 6) is the standard setup for GXPs.

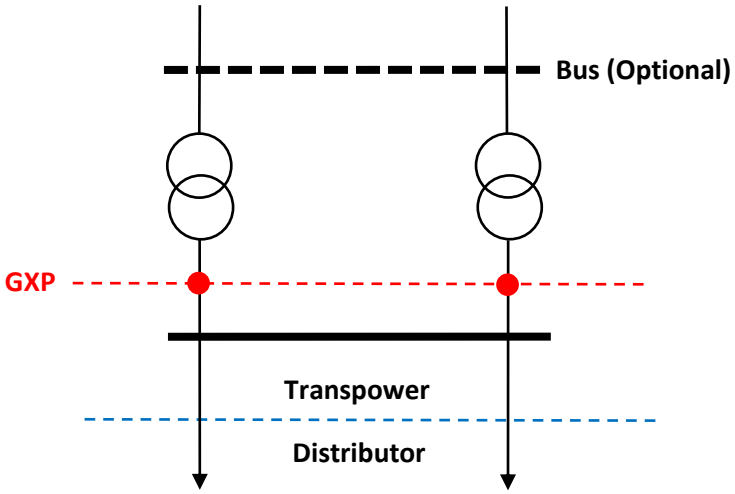


Figure 6 GXP Substation Transpower Owned – (N-1) Security – 1 x GXP – Aggregated Metering

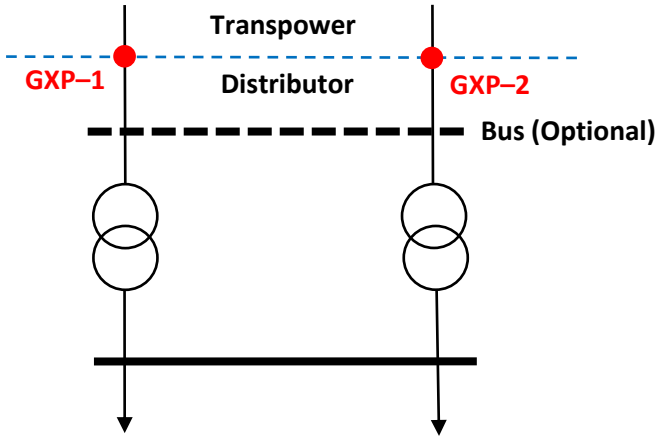


Figure 7 Distributor Owned GXP Substation – (N-1) Security – 2 x GXP – Non-Aggregated Metering

In summary BEL is of the view that that the existing treatment of the Robertson St Substation (ORO GXP) indicative charge modelling should not be the intent of the AMDR assessment and Residual Charge allocation processes as it is contrary to the Authority's objective of promoting competition for the delivery of a reliable supply in an economic and efficient manner.

A possible simple solution to ensure consistent treatment of Transpower & Distributor owned GXP Substations is to aggregate GXP metering with the same location code & voltage prior to AMDR assessment e.g. a coincident AMDR should be used, and adoption of this methodology would actively promote the Authority's competition objectives.

Given that there are a very limited number of GXPs with the same location code & voltage this change would not impact the AMDR assessment for the vast majority of Point of Connection. While there may be additional unintended consequences of this proposed change BEL has insufficient data and knowledge of the grid to be able to comment on this.