TRANSPOWER

Guide to the new TPM

Transpower was tasked with developing and implementing a new Transmission Pricing Methodology (**TPM**) by the Electricity Authority (**Authority**).

Transpower submitted its proposed new TPM to the Authority in June 2021. The Authority made some changes to Transpower's proposal and then consulted on it. The Authority made further changes after viewing submissions and has now approved the new TPM.

The Authority has decided the new TPM will apply from 1 April 2023 (from pricing year (**PY**) 2023/24).

Contents

1 Purpose of this Guide

The purpose of this Guide is to provide a high-level description of the new TPM. Readers are encouraged to consult the new TPM on the Authority's website to fully understand its mechanics and how transmission charges will be calculated under it.

More information about the development of the new TPM, including full histories of the Authority's 2020 TPM Guidelines and Transpower's TPM proposal, and the Authority's final decision to approve the new TPM, can be found on the Authority's website and Transpower's website.

2 The TPM recovers Transpower's regulated revenue allowance

Under Part 4 of the Commerce Act, the Commerce Commission (**Commission**) determines the total revenue Transpower, as the owner and operator of the national grid, can recover each year through transmission charges. The way Transpower recovers its revenue from its customers (generators, distributors and consumers directly connected to the grid) is set out in the TPM.

The TPM is in Part 12 of the Electricity Industry Participation Code (**Code**).

3 New TPM Guidelines were introduced in 2020

The TPM must be consistent with the TPM Guidelines set by the Authority.

The Authority published new TPM Guidelines on 10 June 2020. The publication of the 2020 TPM Guidelines triggered Transpower's task of developing the proposed new TPM.

The 2020 TPM Guidelines require interconnection charges and HVDC charges to be replaced with:

- benefit-based charges (**BBCs**) – charges for new and some historic interconnection investments that are paid by load and generation customers who are expected to benefit from them; and
- residual charges – charges paid by load customers to recover residual revenue (total revenue less all other transmission charges) in a way intended to minimise distortions to customer decisions on investment and grid use.

The basis for connection charges is largely unchanged.

4 Transpower's role is to develop and implement the TPM

Transpower was required to develop a proposed new TPM in line with the 2020 TPM Guidelines and relevant sections of the Code by 30 June 2021.

The Authority accepted most of Transpower's TPM proposal, but made some specific, targeted changes. The Authority made further changes after it completed consultation on the proposed new TPM and has now approved the new TPM by deciding to incorporate it in the Code in place of the old TPM.

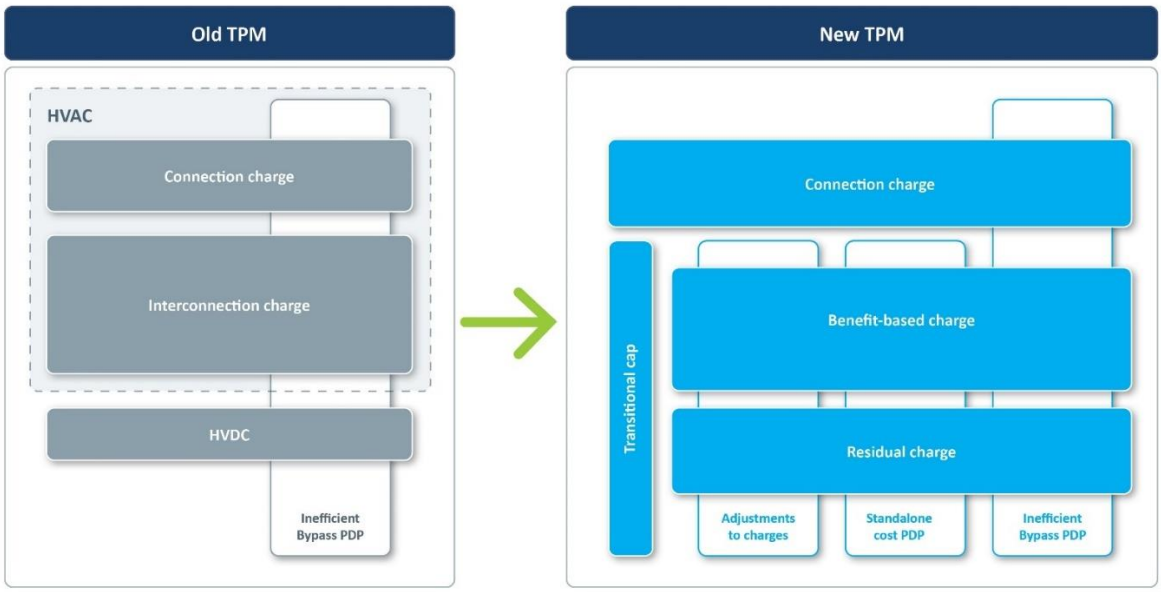
Transpower is now in the process of implementing the new TPM. The first transmission charges calculated under the new TPM will be for PY 2023/24.

5 Components of the new TPM

The new TPM has the following components:

- Connection charges
- BBCs for the following types of benefit-based investments (**BBIs**):
    - some historical (pre-July 2019) interconnection investments – allocations specified by the Authority in Schedule 1 of the 2020 TPM Guidelines, now in Appendix A of the new TPM with some changes
    - high-value (> $20m) post-July 2019 interconnection investments – allocations calculated by Transpower according to one of two standard methods (price-quantity and resiliency)
    - Low-value (≤ $20m) post-July 2019 interconnection investments – allocations calculated by Transpower according to a simple method
- Residual charges
- Provisions for adjusting transmission charges, being:
    - general adjustment provisions
    - reassignment provisions
    - a prudent discount policy
    - a transitional price cap

The following diagram shows the different components of the old TPM and the new one.



6 Connection charges

The new TPM retains most of features of connection charges under the old TPM. Connection charges for particular connection assets will continue to be paid by the customer or customers connected to them.

The new TPM has the following changes to the way connection charges are set:

- Removing the injection overhead component (currently paid by generators)
- Introducing an (underground) cable line type for calculating the maintenance component
- Mandatory updating of connection asset replacement costs at least every five years
- Allowing for customer contributions to connection asset maintenance and operating costs through investment agreements
- Addressing first mover disadvantage (**FMD**) for connection investments (see below)

6.1 Type 1 FMD for connection investments

Type 1 FMD arises if the first connecting customer pays for a connection asset under an investment agreement and continues to bear the full capital cost under that agreement even after other customers connect to the asset. This may cause customers to delay their connection to avoid being the first mover, potentially slowing investment in new renewable generation or the electrification of load.

Type 1 FMD is addressed using a funded asset component (**FAC**) mechanism. The mechanism works by collecting, via connection charges, a financial contribution to the capital cost of a connection asset funded by a first mover customer under an investment agreement from later connecting customers (the FAC) and rebating it to the first mover.

This approach uses connection charges to simulate a commercial outcome the first mover and later connecting customers might reasonably have agreed had they had the opportunity to do so at the time the first mover entered into the investment agreement.

6.2 Type 2 FMD for connection investments (anticipatory connection assets)

Type 2 FMD arises if early connected or connecting customer(s) carry the full cost of connection asset capacity in excess of their own requirements (anticipatory connection assets) until later connecting customers arrive. The anticipatory connection assets will have been built for future, uncertain customers. This creates uncertainty and cost for existing and first mover customers, and may discourage investment in efficient anticipatory connection assets or discourage the new connections the investment is intended to facilitate.

If Transpower invests in an anticipatory connection asset, the capital cost of it will be spread over a larger set of customers than just those connected to the asset until the anticipatory capacity is taken up by later connecting customers. Half of the capital cost will be pooled and recovered from all customers paying connection charges (which is to say all customers) in proportion to the replacement costs of the connection assets to which they are connected. The other half of the capital cost will be recovered through BBCs for a notional BBI, the beneficiaries of which will be determined using a modified form of the simple method for calculating BBI customer allocations (allocating to only injection customers (generation) or only offtake customers (load)).

This mechanism will only apply to new investments in anticipatory connection assets, i.e. those commissioned after 1 April 2023 (the commencement date of the new TPM).

7 Benefit-based charges

The costs of new and some historic interconnection investments (the BBIs) will be allocated to the beneficiaries of those investments through BBCs.

BBIs include investments in new interconnection assets or interconnection transmission alternatives and the replacement or refurbishment of existing ones.

The cost recovered through the BBCs for a BBI is referred to as the BBI's "covered cost", and includes the BBI's capital components (return of and on capital expenditure) and an allocation of Transpower's total operating costs (including overheads).

A BBI's covered cost is allocated between customers broadly in proportion to the positive net private benefit (**NPB**) each customer is expected to derive from the BBI. That is, the BBC paid by a customer must reflect the positive NPB that customer is expected to receive from the BBI (if any) relative to all other customers.

7.1 BBC allocations for historic BBIs – Authority allocations

The Authority calculated BBC allocations for seven historic (pre-July 2019) BBIs, which are listed in Schedule 1 of the 2020 TPM Guidelines. The new TPM carries these allocations into Appendix A, subject to some changes to account for customer changes since the 2020 TPM Guidelines were published.

The historic BBIs in Appendix A of the new TPM are

- Bunnythorpe-Haywards Reconductoring Project
- Pre-July 2019 investments in the HVDC link
- Lower South Island Renewables Project (other than the recent CUWLP investment, which is treated as a separate post-July 2019 BBI)
- Lower South Island Reliability Project
- North Island Grid Upgrade Project
- Upper North Island Dynamic Reactive Support Project
- Wairakei Ring Project

7.2 BBC allocations for new BBIs – standard and simple methods

The new TPM includes three methods for calculating expected NPB, and therefore BBC allocations, for new (post-July 2019) BBIs. There are two standard methods (the resiliency and price-quantity methods) and one simple method.

The two standard methods are used to calculate expected NPB and BBC allocations for new BBIs valued over $20m. The simple method is used to calculate expected NPB and BBC allocations for new BBIs valued at $20m or under. This aligns with the $20m base capex threshold set by the Commission, below which Transpower does not need to seek separate Commission approval for grid investments.

The resiliency method must be used where the primary purpose of the high-value BBI is to mitigate a risk of cascade failure or another high impact, low probability event resulting in unserved or unsupplied energy (referred to as a resiliency BBI).

The price-quantity method must be used for all high-value BBIs that are not resiliency BBIs. The price-quantity method calculates expected NPB based on price and quantity changes (with and without the BBI) in the wholesale markets for electricity and ancillary services and changes in reliability (unserved or unsupplied energy). Subject to certain limits, under the price-quantity method Transpower may also take into account other costs and benefits that arise outside electricity markets, such as aesthetic or safety improvements.

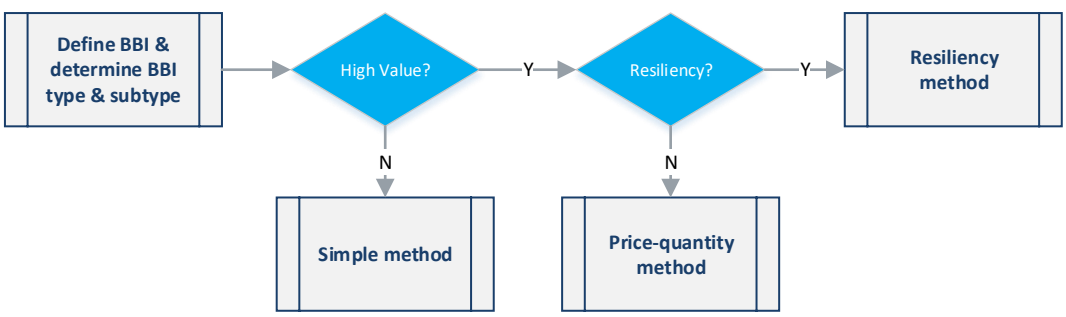
Both standard methods involve determining regional customer groups of beneficiaries (and, under the price-quantity method, the regional NPB for each regional customer group) and then calculating individual NPBs for the customers in those groups based on historical grid use, mostly grid offtake or injection. The individual NPBs with positive values are then used to calculate the BBC allocations for the relevant BBI.

The simple method uses a regional allocation model with regional allocation factors for generation and load to calculate regional NPB for each regional customer group. The regions and regional allocation factors are static – they apply to all low-value BBIs commissioned during a (usually) five-year simple method period, after which the regions and regional allocation factors are reset for assets commissioned in the next simple method period (the BBC allocations for previously

commissioned low-value BBIs do not change). The regions and regional allocation factors are calculated based on historical power flows before the start of the simple method period.

Under the simple method, as under the standard methods, individual NPBs for the customers in the regional customer groups are calculated based on historical grid use (grid offtake or injection), and the individual NPBs with positive values are then used to calculate the BBC allocations for the relevant BBI.

The new TPM requires that 67.5% of the covered cost of any low-value BBI is allocated to offtake customers (load) and 32.5% to injection customers (generation).



Determine BBC method for Interconnected Grid Investment

8 Residual charges

Residual charges recover Transpower's remaining revenue that is not recovered through other transmission charges. Residual charges are paid by load customers only, in proportion to their historic (or, for new load customers, estimated) maximum gross demand.

Gross load (demand and energy) captures the contribution of non-grid supply to loads, including from non-battery embedded generation. As a result, there may be instances where a customer who does not take electricity off the grid will nevertheless be a load customer and be liable to pay a residual charge on a gross load basis. Gross load excludes contributions from batteries when charging or discharging other than their storage losses.

In summary:

- The initial (baseline) allocations of residual charges are in proportion to load customers' maximum gross demand (kW) averaged across the four financial years (**FYs**) from FY 2014/15 to FY 2017/18, i.e. the period 1 July 2014 to 30 June 2018. For a load customer that did not exist on 1 July 2014, including a new load customer, Transpower estimates maximum gross demand based on the customer's assets and the assets connected to them being fully operational.
- Maximum gross demand is calculated or estimated per-trading period and by reference to coincident gross demand across all points of connection at a connection location (not non-coincident per point of connection).

- Transpower may reduce a load customer's initial allocation if there has been a large (≥ 10MW) and sustained reduction in the customer's maximum gross demand after the end of FY 2014/15 due to an event or circumstance beyond the customer's control.
- Load customers' initial allocations are adjusted annually based on changes in their lagged average gross energy usage (kWh) over the period of four financial years commencing eight financial years ago, e.g. for PY 2023/24 the relevant period is from FY 2015/16 to FY 2018/19.
- A recent or new load customer will not pay a residual charge until it has been connected to the grid for at least four financial years. The load customer's residual charge will then ramp up over the next four years and the adjustments based on lagged average gross energy usage will start after that.

9 Provisions for amending transmission charges

9.1 General adjustment mechanisms

The new TPM provides for some specific circumstances in which "step" adjustments to transmission charges must be made, such as when a customer enters or exits or if there is a substantial and sustained change in grid use.

9.2 Reassignment

The new TPM provides for a BBI to be "reassigned" if its forecast future loading is substantially less than the BBI's capacity, i.e. the BBI is deemed to be over-sized ex post. Reassignment takes effect as a reduction in the BBI's covered cost, so that all beneficiaries' of the BBI will pay lower BBCs. Reassignment shifts recovery of part of the BBI's covered cost from BBCs to residual charges, hence its name.

There are several conditions for reassignment, including that the BBI must have a current depreciated value of at least $5m (CPI-adjusted), the post-reassignment value of the BBI must be less than 80% of the BBI's current depreciated value and the circumstances justifying reassignment must be sustained. Reassignment is generally not available for BBIs that are less than 10 years old.

9.3 Prudent discount policy

The prudent discount policy in the new TPM provides for two types of prudent discount:

- An inefficient bypass prudent discount (**IBPD**) is intended to help ensure the TPM does not incentivise a customer to invest in an alternative project (such as alternative lines or new generation) that would allow the customer to reduce its own transmission charges by bypassing the grid but would be inefficient overall.

  An IBPD is granted if the alternative project:

  - would provide the same or substantially similar level of service as the bypassed part of the grid
  - is technically feasible (including from a consenting perspective)
  - is operationally feasible

- is consistent with good electricity industry practice (**GEIP**)
- is commercially viable for the customer

If an IBPD is granted, the customer's transmission charges are reduced to what they would be if the alternative project were built and the customer pays Transpower an annuity based on what the cost of the alternative project would be.

IBPDs were available under the old TPM.

- A stand-alone cost prudent discount (**SACPD**) is intended to help ensure the TPM does not result in a customer paying transmission charges that exceed the efficient stand-alone cost of the transmission services the individual customer receives.

  A SACPD is granted if there is an alternative project (such as alternative lines or new generation) that:

  - is an efficient stand-alone investment that would provide the same or substantially similar level of service as the customer receives from the grid
  - is technically feasible (but not necessarily from a consenting perspective)
  - is operationally feasible
  - is consistent with GEIP
  - is commercially viable for the customer

  If a SACPD is granted, the customer's connection charges, BBCs and residual charge are reduced to zero and the customer pays Transpower an annuity based on what the cost of the alternative project would be.

  SACPDs were not available under the old TPM.

The amount of a prudent discount (net of the annuity paid by the recipient) is recovered from other customers in proportion to their residual charges and the BBCs they pay for the BBIs to which the prudent discount relates. Prudent discount applications received within six months of Transpower publishing the application requirements and fees will, if successful, be back-dated to 1 April 2023, even if approved at a later date.

9.4 Transitional price cap

The new TPM contains a transitional cap on some components of transmission charges.

The cap applies to distributors' and grid-connected consumers' BBCs for the seven historic (pre-July 2019) BBIs and residual charges, and caps those charges relative to the distributor's or grid-connected consumer's interconnection and HVDC charges for PY 2019/20. This is not a cap on total transmission charges.

Broadly, the cap is set at 3.5% (in real terms i.e. adjusted for inflation) of the total cost of lines services and electricity paid by the grid-connected consumer or the distributor's customers during pricing year 2019. If the customer is a grid-connected consumer, the 3.5% cap increases by 2% each pricing year after PY 2024/25.

The cap potentially applies to each pricing year up to and including PY 2037/38, but is 'use it or lose it' at the individual customer level. If the cap does not constrain a customer's charges for a pricing year, the cap will not apply to the customer for any pricing year after that regardless of how the customer's transmission charges grow.

The total cap reduction for a pricing year is recovered from all customers in proportion to their annual BBCs for the seven historic BBIs and residual charges.

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