



Transmission Pricing Methodology

Consultation on proposed TPM

October to December 2021

Stakeholder Regional Events, November 2021

Tēnā koutou katoa

Time: 5mins

Our purpose today

To present, at a high level, key components of the proposed TPM

To allow stakeholders to question & clarify – to assist making your submissions complete and the highest value

Discussion at this stakeholder event does not replace your written submissions

- Housekeeping & social distancing
- We're going to talk through specific themes with allotted times
- We welcome all feedback and questions, theme by theme
 - For online sessions, use the chat function
 - For in person sessions, please raise your (real) hand
- We'll use a parking lot – revisit at end
- Transpower staff are attending these Authority-led regional workshops to provide technical support if stakeholders have questions at a level of detail that Transpower's staff are best-placed to respond.



Agenda and overview

Agenda

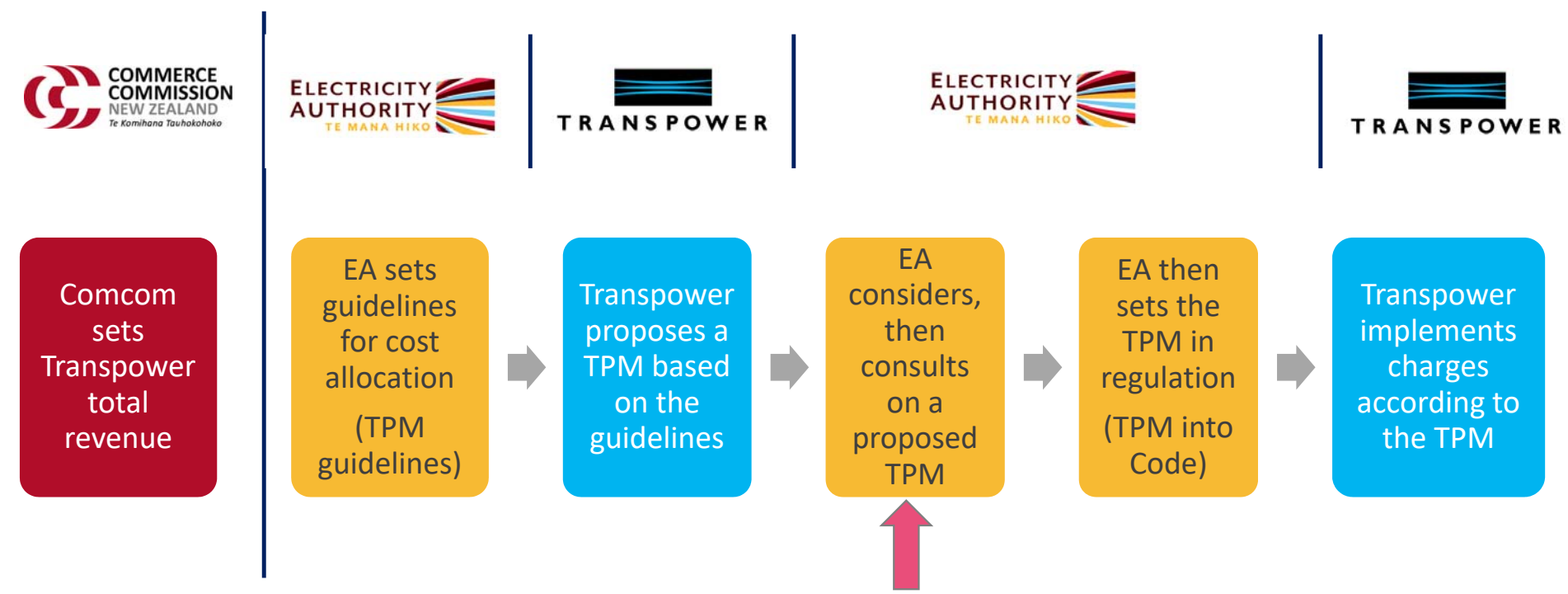
1. Overview
2. Key topics
 - Benefit based charges
 - Residual charge, incl battery storage
 - Connection charge, incl first mover disadvantage
3. Indicative pricing
4. The CBA
5. Consultation dates and anticipated next steps
6. Parking lot
7. Optional extra topics:
 - Adjustments
 - Prudent discount policy
 - No transitional congestion charge



Overview

5-10 mins

TPM development process



We are here now



The Authority's
statutory objective

To promote **competition** in
reliable supply by
and the **efficient operation** of
the electricity industry
for the **long-term benefit of**
consumers



What's wrong with the current TPM

The current TPM is unsustainable, and it is widely acknowledged that the way costs are allocated needs to change - it does not fully support efficient investment and use of the grid.

- Transmission prices don't reflect the cost of delivering electricity to consumers & the benefits they receive from transmission investments
- Unwanted current outcomes:
 - Reduced consumption at peak times, even when no congestion
 - Cost shifting
 - Charge volatility
 - Incentive to seek over-investment in transmissions (as costs are socialised)
 - South Island tax on generation
- Some are paying relatively more while others are paying relatively less, when considering the benefit each party gets from the transmission grid
- The consequences of these problems will get worse as New Zealand electrifies as part of its transition to a low-emissions economy



The new TPM will support..

The new TPM will realise long term benefits for consumers

and

support climate policy, renewable energy policy

The proposed TPM will:

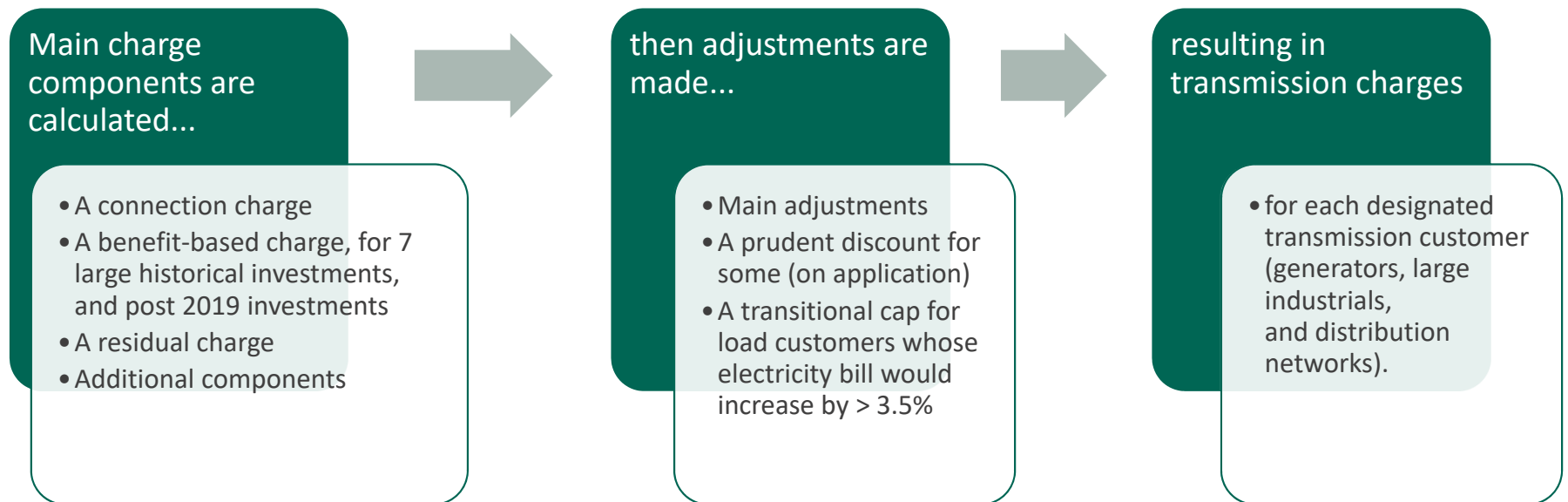
- **Remove distortions** that drive poor outcomes
- **Reduce the cost of electricity at peak times** when consumers value it most, **bring forward investment in cheaper renewable generation**
- **Increase scrutiny** of proposed transmission investments, so encourage more efficient investment in transmission by ensuring those who benefit from grid assets pay for them

This will enable:

- **The right investment (in the right place at the right time)** in renewable generation and electrification of process heat
- **Transmission to play its part towards an efficient and reliable electricity system** in the future - contribute to a low emissions transition being on the least cost pathway



How the proposed TPM fits together



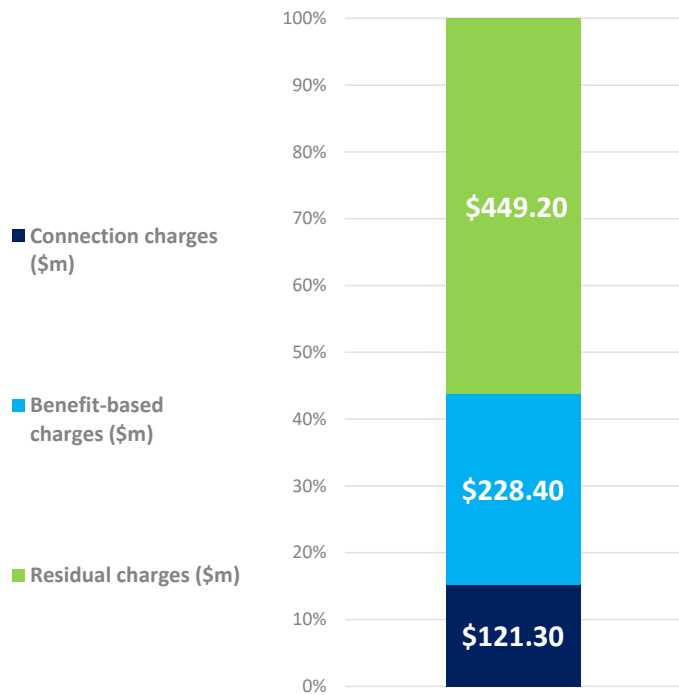
Key topics

15 minutes

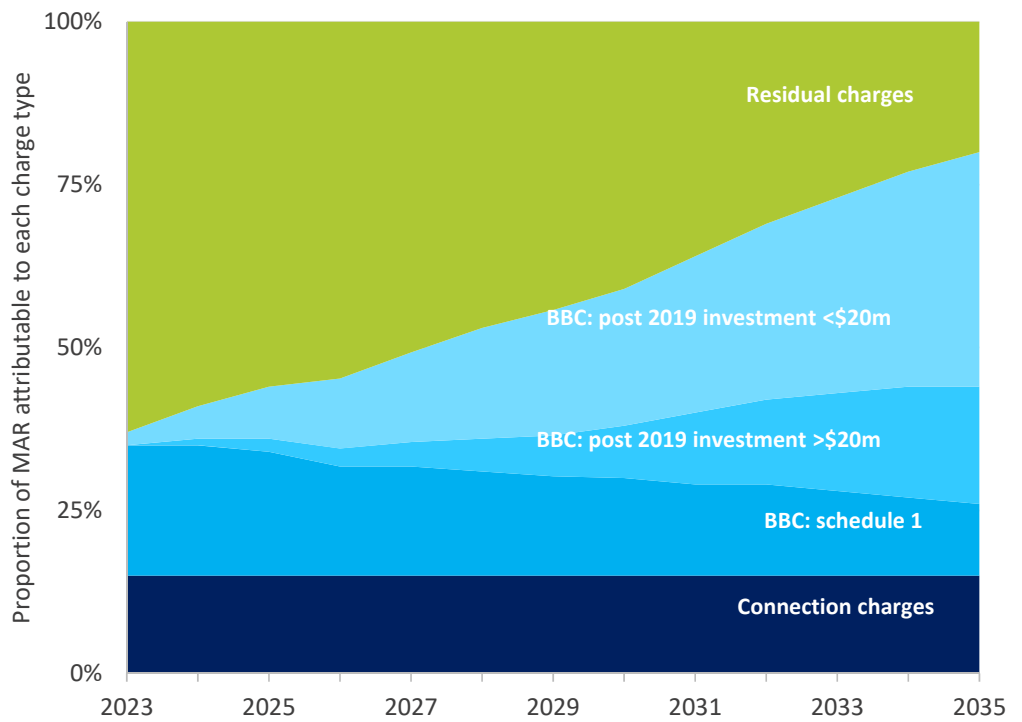
- **Benefit-based charges**
- Residual charge, incl battery storage
- Connection charge, incl first mover disadvantage

Benefit-based charges – in 2021/22 and longer term

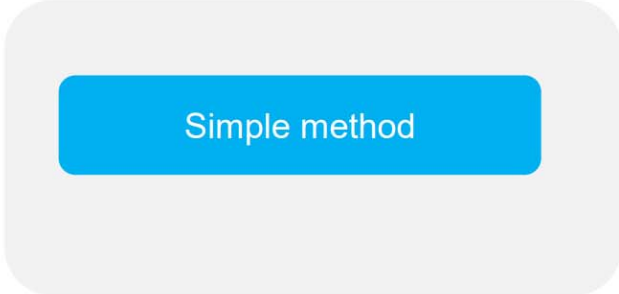
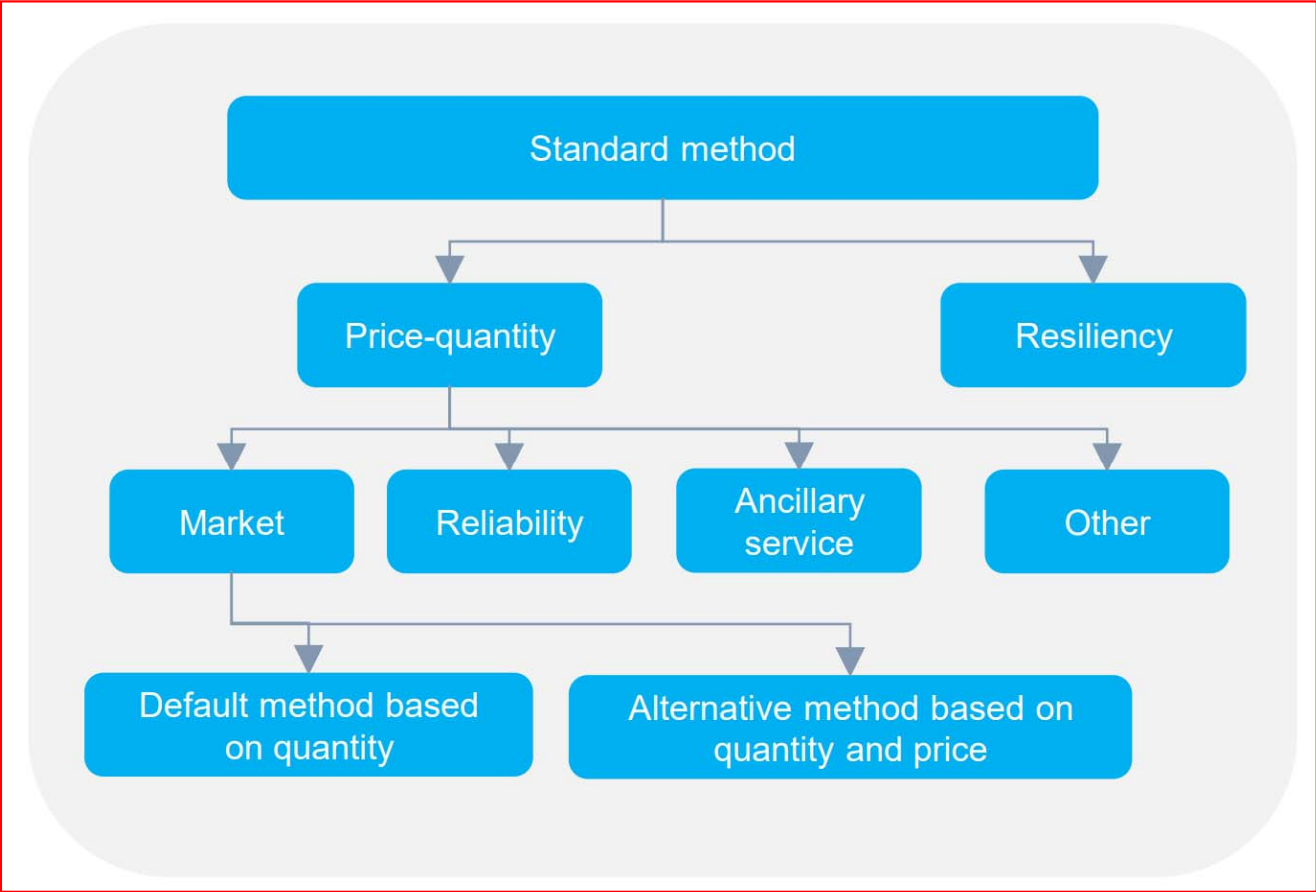
Transpower’s MAR, across the charge types:



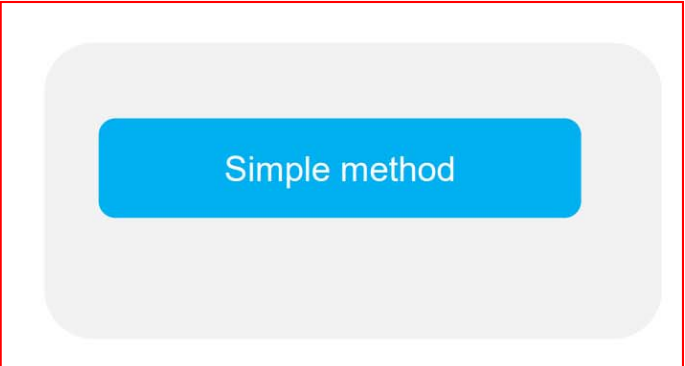
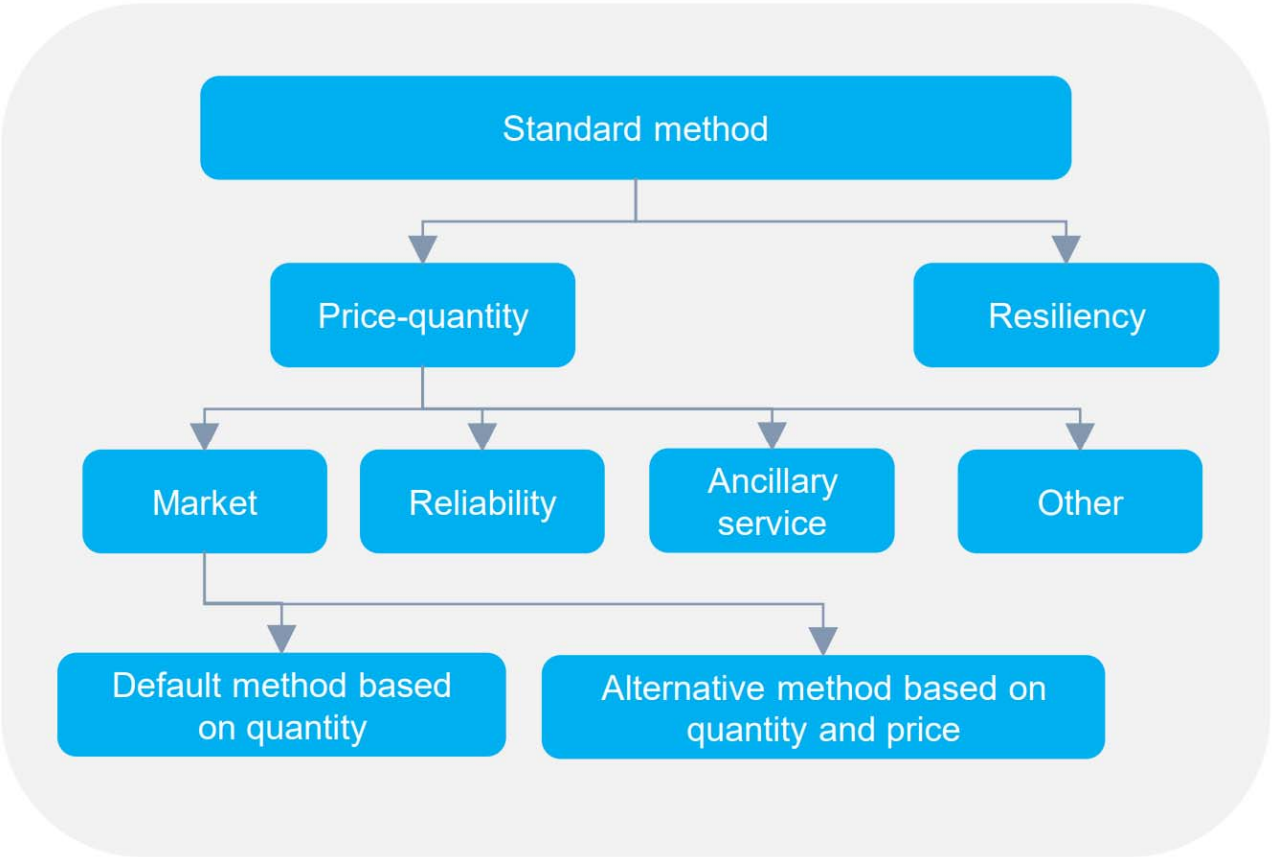
The proportion of each charge type, over time:



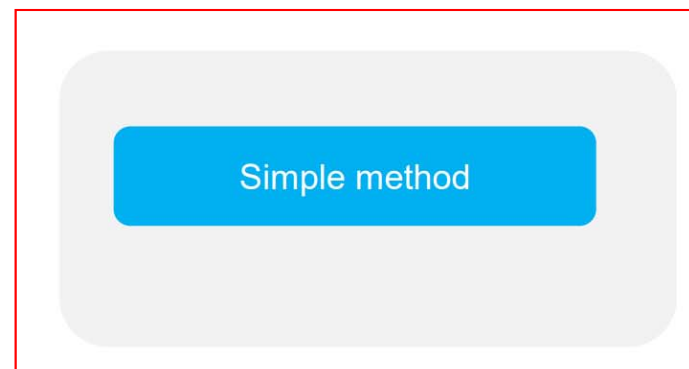
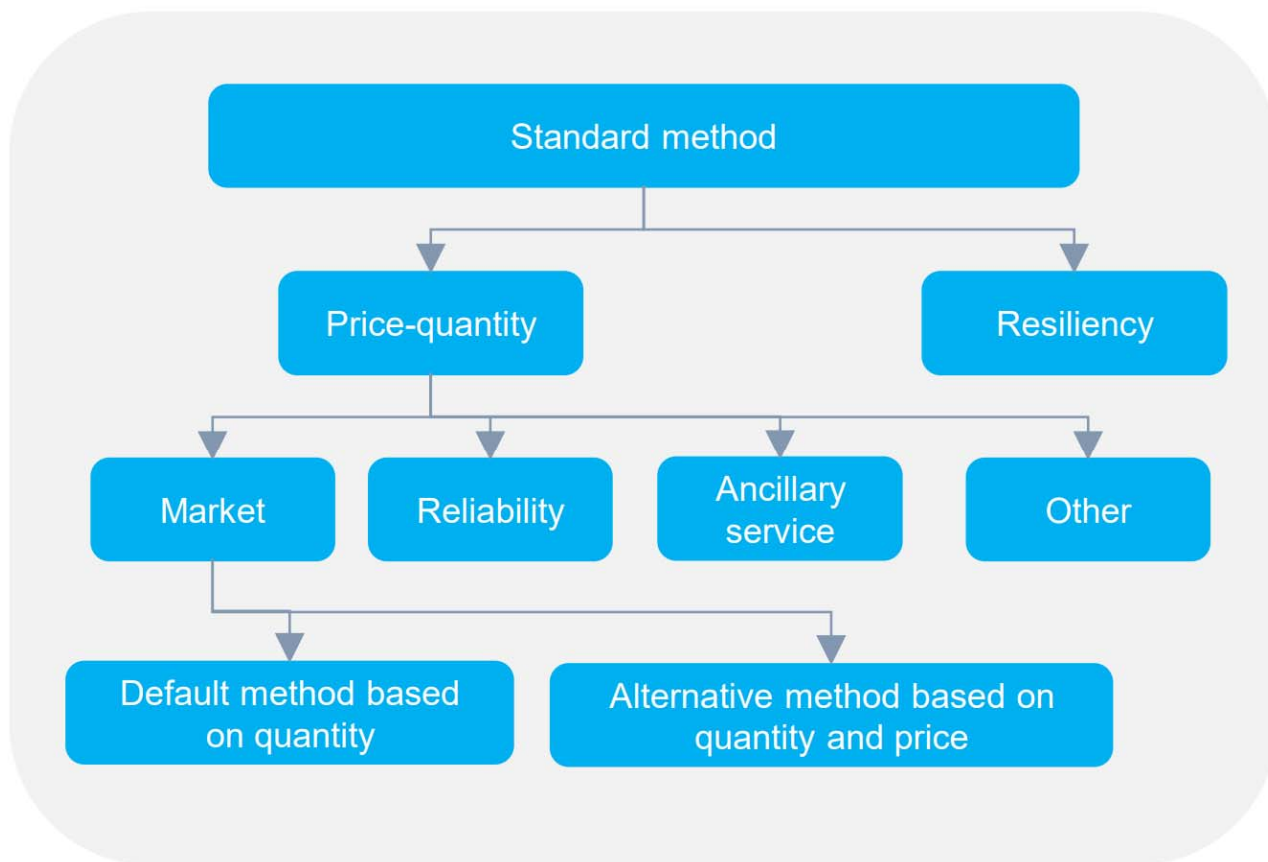
Benefit-based charges – allocation



Benefit-based charges – allocation



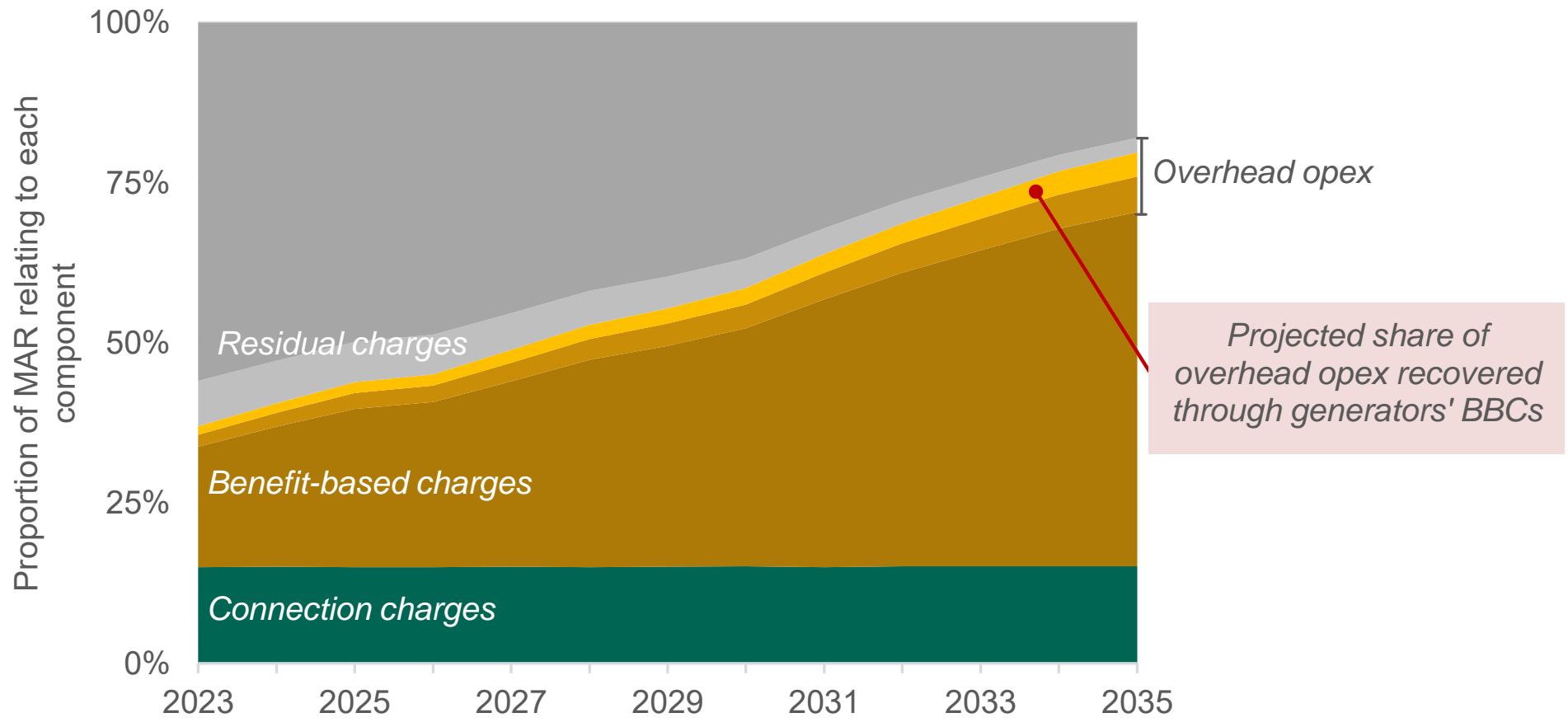
Benefit-based charges – allocation



Load:generation weighting:

- Impact increases over time
- Approximately 50:50 initially
- 5-yearly review

Benefit based charges – covered costs



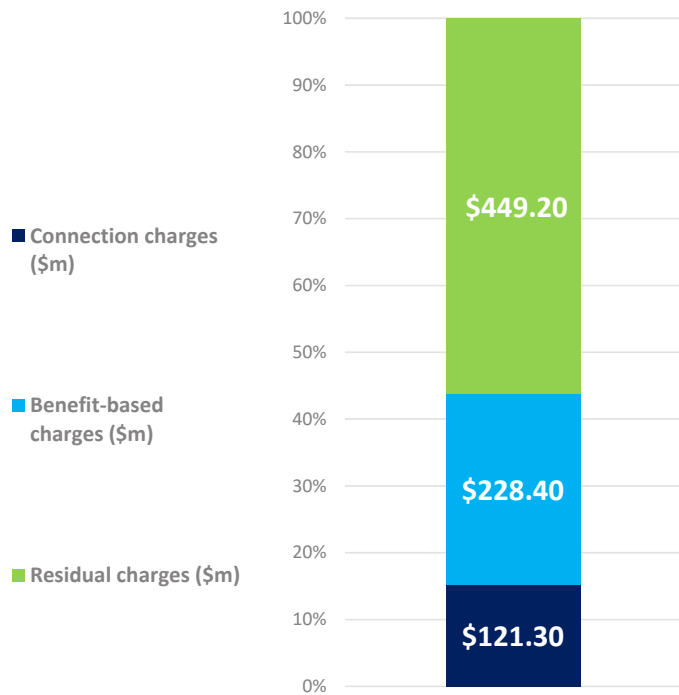
Key topics

10 minutes

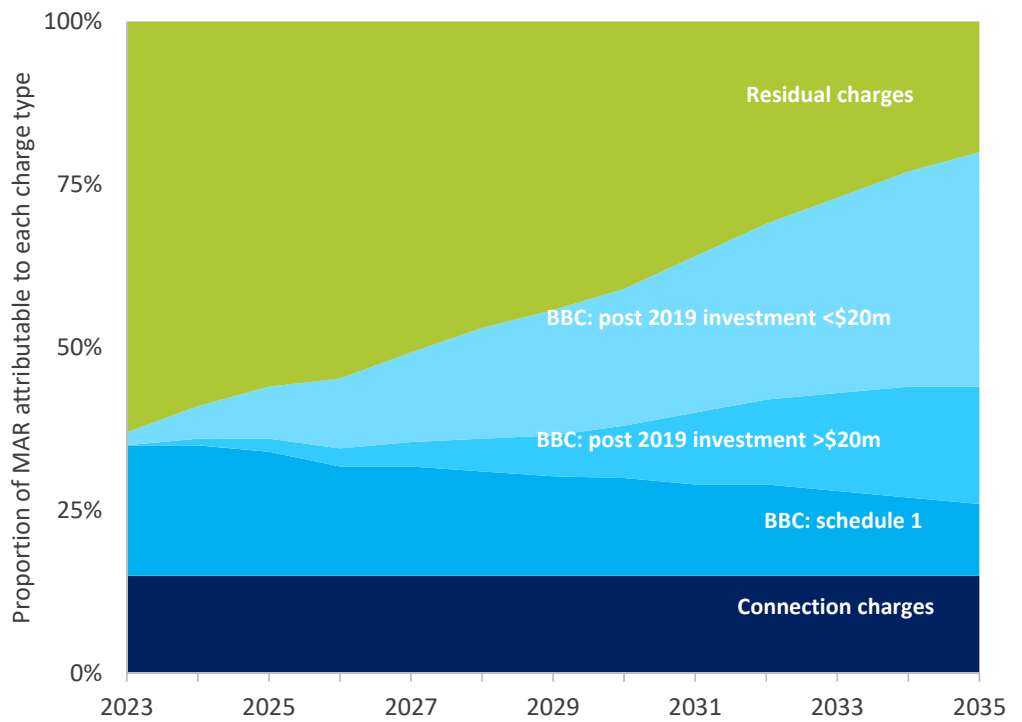
- Benefit based charges
- **Residual charge, incl battery storage**
- Connection charge, incl first mover disadvantage

Residual charge – in 2021/22 and longer term

Transpower’s MAR, across the charge types:



The proportion of each charge type, over time:

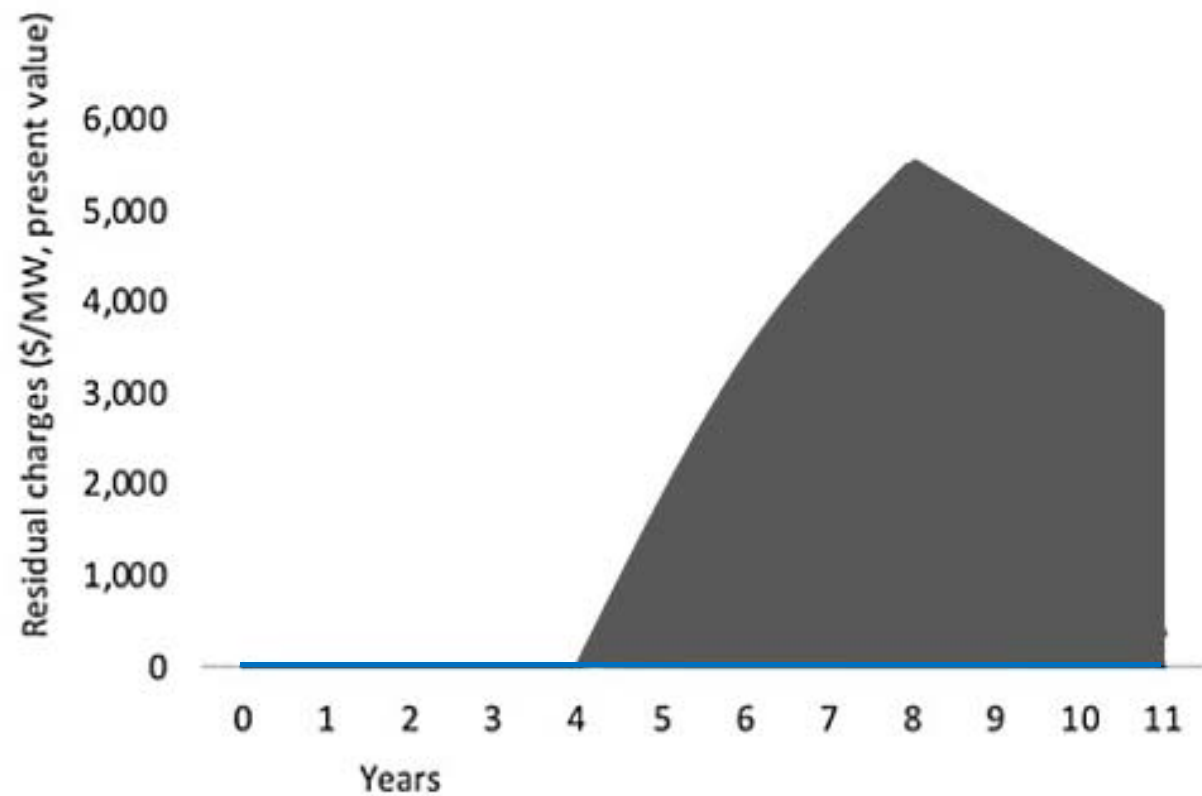


Residual charge

5 minutes

Deliberately non distortionary

- allocations update with a lag...
- ...and gradually ramp up
- new entrants as well as existing

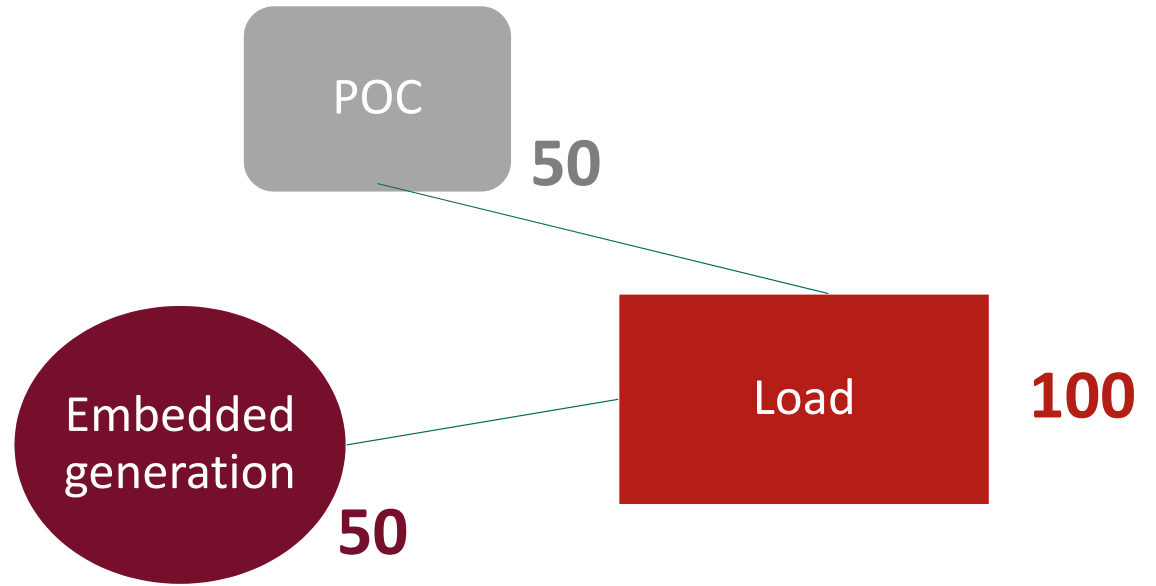


Residual charge

5 minutes

Deliberately non distortionary

- Gross energy: includes all energy
- not just grid offtake
- grid-connected generators with load will pay

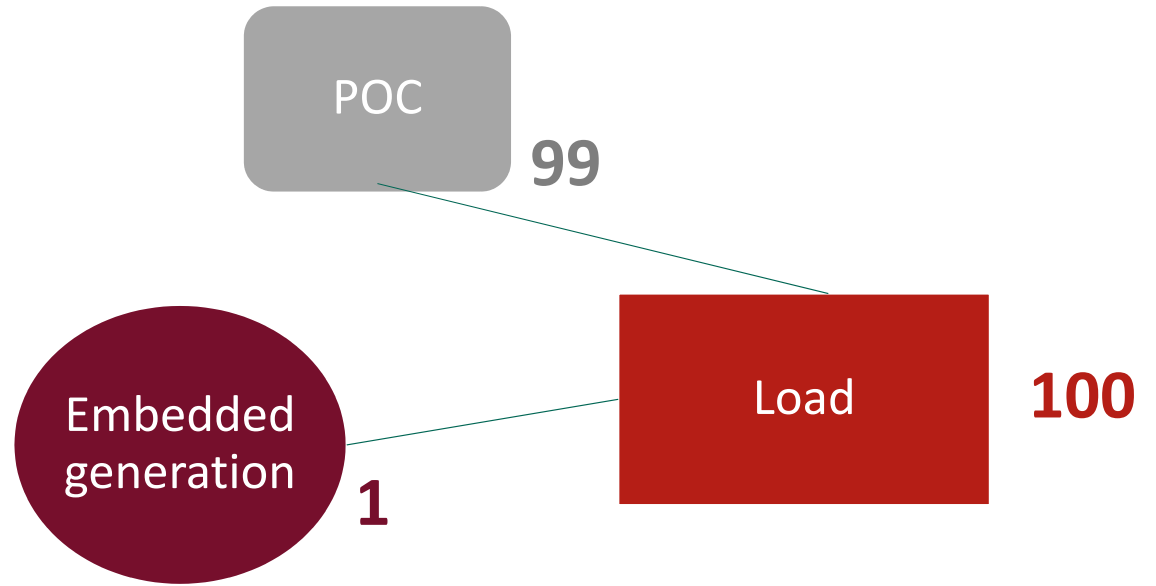


Residual charge

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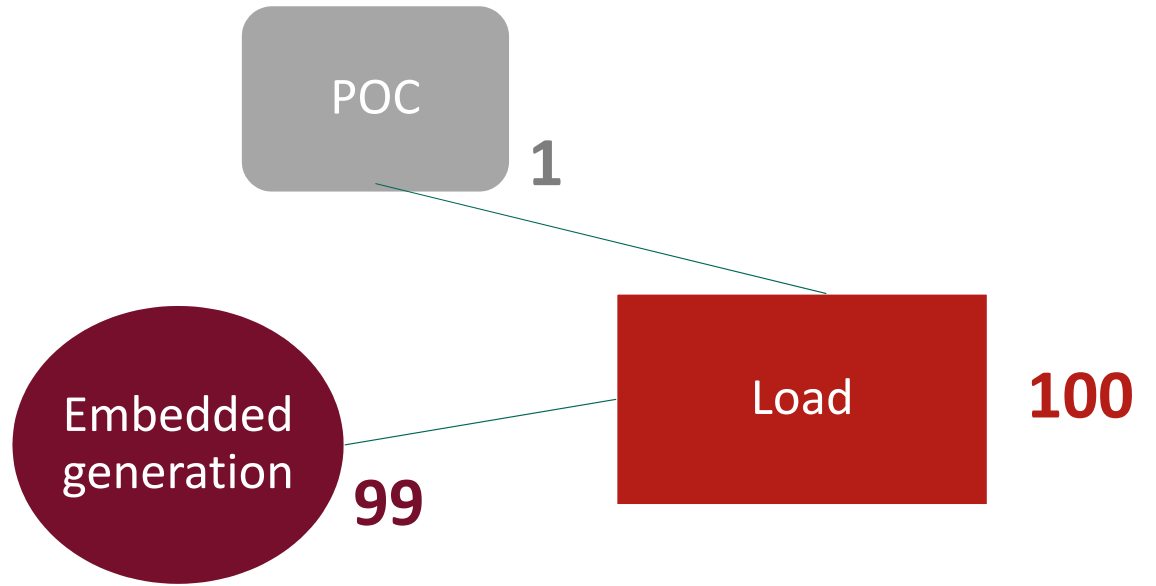


Residual charge

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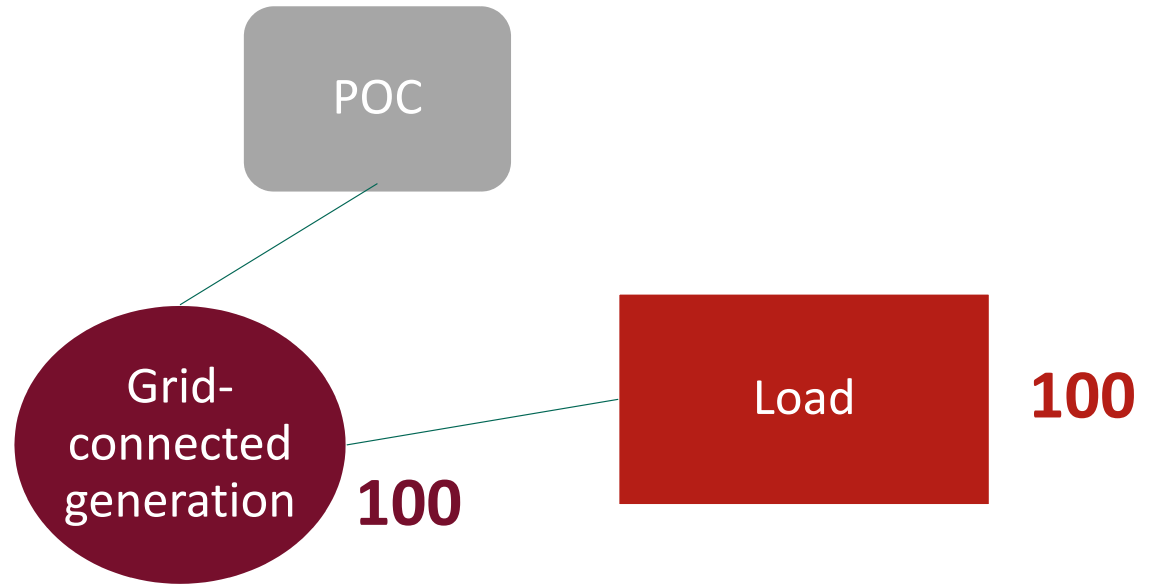


Residual charge

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Deliberately non distortionary

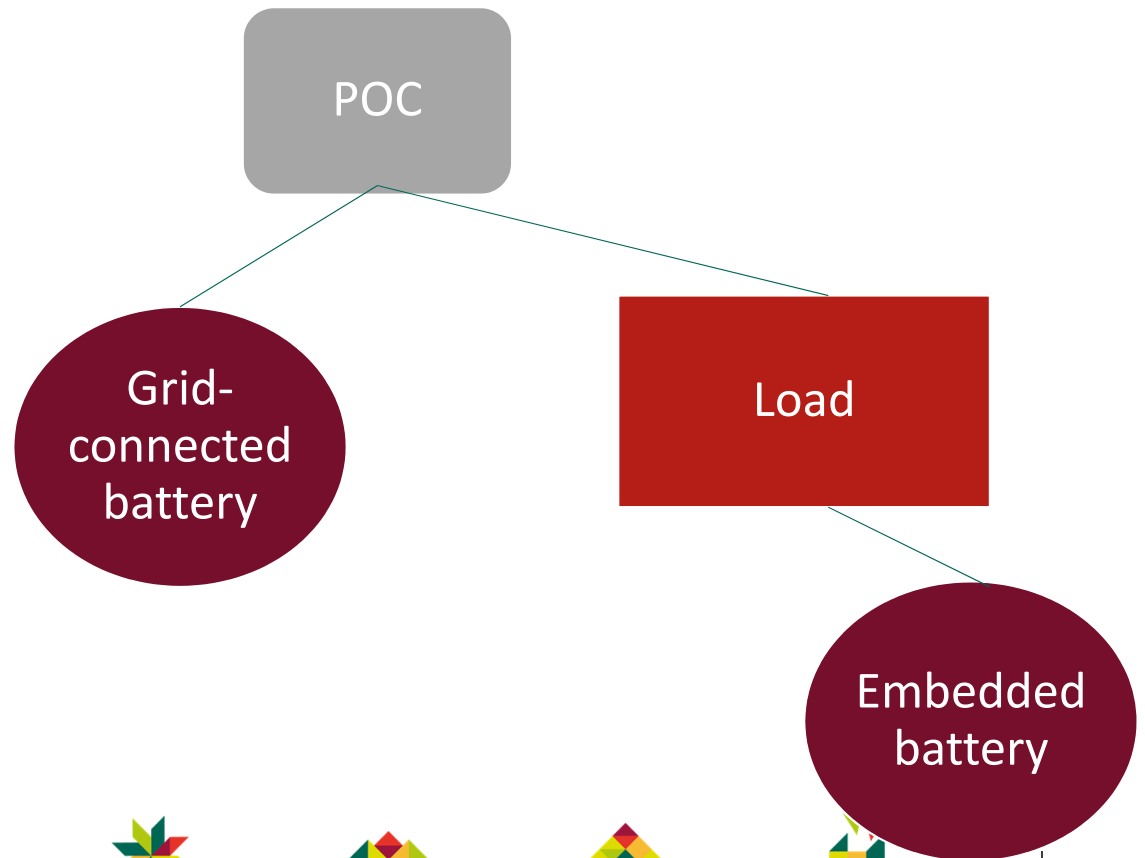
- Gross energy: includes all energy
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How the residual charge applies to battery storage

10 minutes

- Policy issue – Authority led
- Broad definition of storage
- Applies to embedded storage and grid-connected

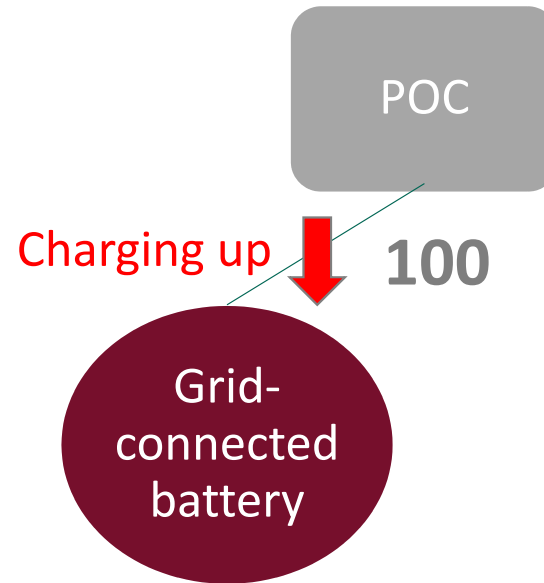


How the residual charge applies to battery storage

10 minutes

Problem (if not addressed):

- Batteries charged in full when charging up

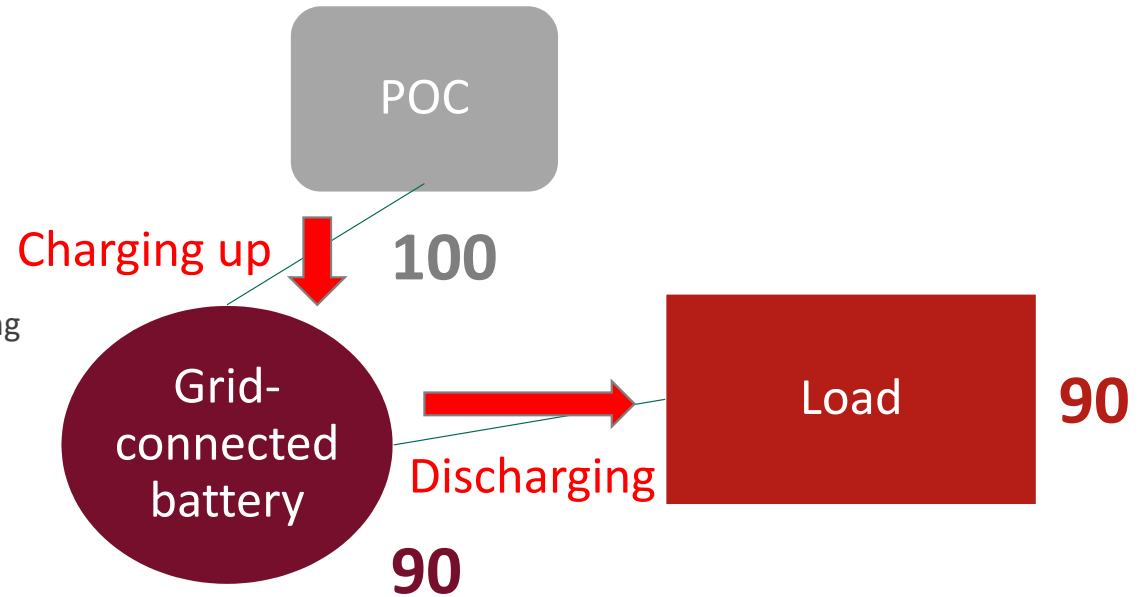


How the residual charge applies to battery storage

10 minutes

Problem (if not addressed):

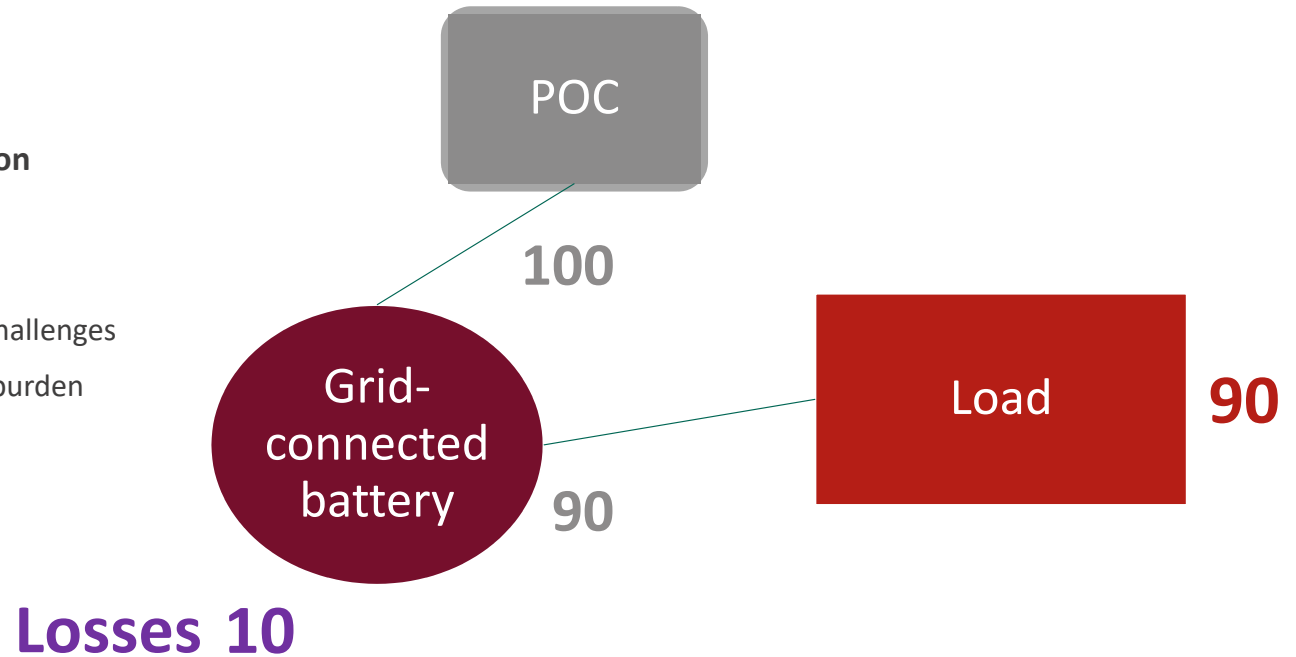
- Batteries charged in full when charging up
- Same energy charged for again when discharging



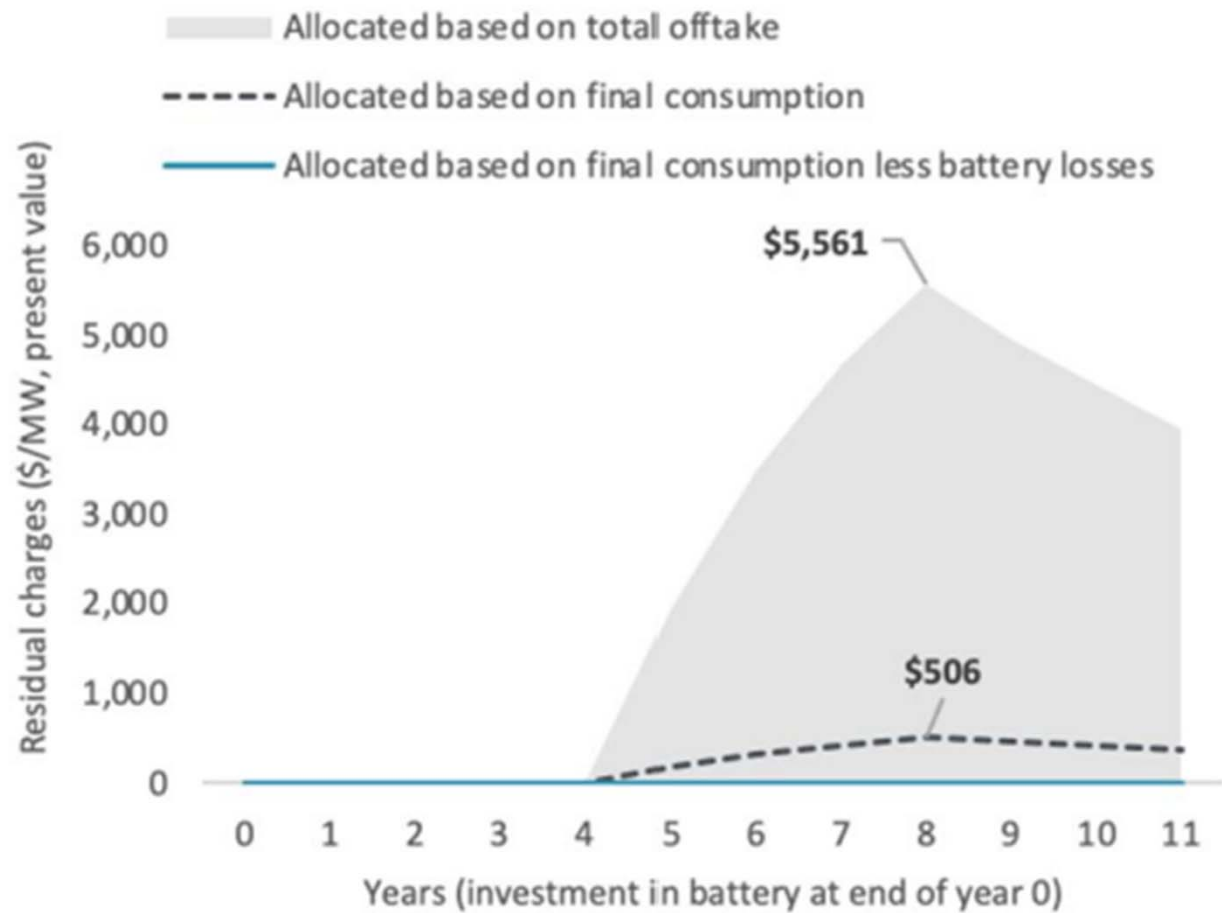
How the residual charge applies to battery storage

10 minutes

- Allocation based on final consumption
 - reduces competitive disadvantage
 - addresses the double counting issue
 - does not create new scale-neutrality challenges
 - would create a smaller measurement burden



Worked example of options for application of residual charge



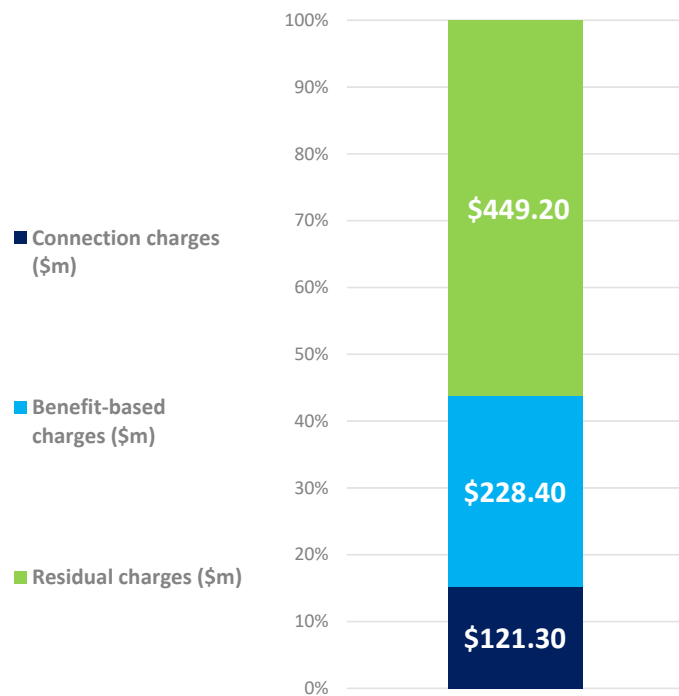
Key topics

2 + 15 minutes

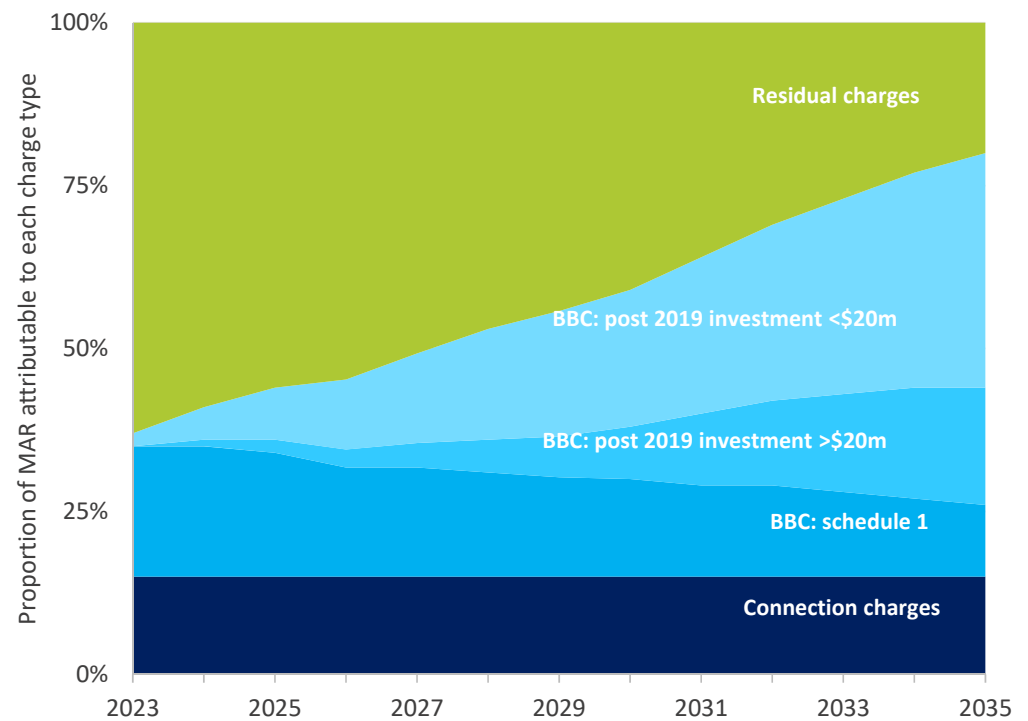
- Benefit based charges
- Residual charge, incl battery storage
- **Connection charge, incl first mover disadvantage**

Connection charge – in 2021/22 and longer term

Transpower’s MAR, across the charge types:



The proportion of each charge type, over time:



The first mover disadvantage (FMD)

15 minutes

- Type 1 FMD

- Type 2 FMD

How to allocate costs relating to anticipatory connection capacity?



The first mover disadvantage (FMD)

15 minutes

How to allocate costs relating to anticipatory connection capacity?

- **Type 1 FMD: 'free riders' on connection investments**
 - Problem: later customers don't contribute
 - Proposal: financial contribution 'funded asset component' and rebate
- **Type 2 FMD**



The first mover disadvantage (FMD)

15 minutes

How to allocate costs relating to anticipatory connection capacity?

- **Type 1 FMD: ‘free riders’ on connection investments**
 - Problem: later customers don’t contribute
 - Proposal: financial contribution ‘funded asset component’ and rebate
- **Type 2 FMD: connection investments with anticipatory capacity**
 - Problem: connection investments may be discouraged / undersized
 - Proposal: allocate extra costs to wider benefiting parties (BB simple method)
 - Alternative: “pool and share” across all connected parties (Transpower)
 - Alternative: temporary socialisation
 - Alternative: very large anticipatory investments not covered – eg for REZs

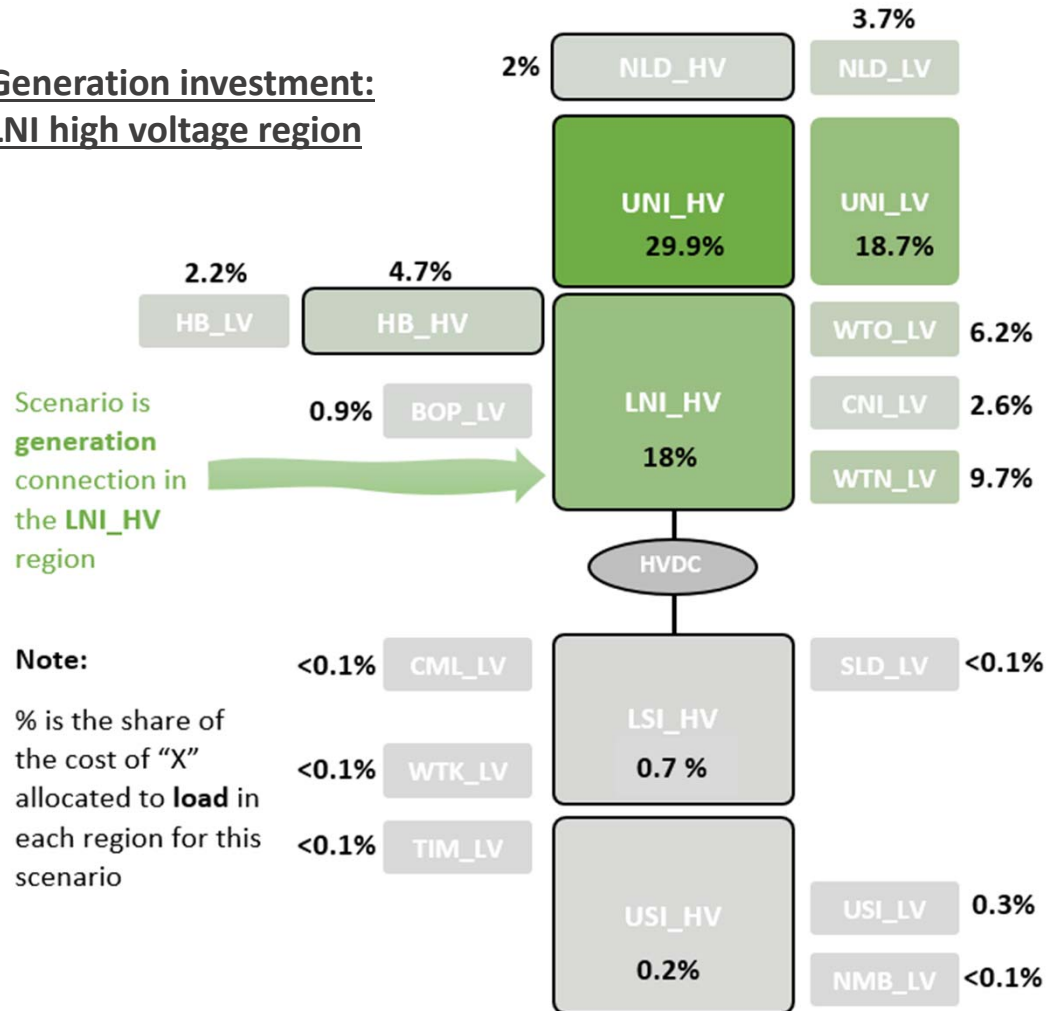


The first mover disadvantage (FMD)

15 minutes

How to allocate costs relating to anticipatory connection capacity?

Generation investment: LNI high voltage region



Indicative pricing

5-10 mins



Indicative pricing

Transpower has calculated indicative charges to reflect its June 2021 proposed TPM.

Final prices under a new TPM will be different again.

- Transpower has calculated indicative charges to reflect its June 2021 proposed TPM.
- These prices are different to those calculated by the Authority a year ago.
- A difference is expected:
 - the 2020 pricing was an estimate based on the guidelines alone. Transpower’s new indicative pricing reflects its detailed proposed TPM
 - More recent data is used, including changes relating to overhead operating expenditure
 - 2021 pricing includes connection charges
 - 2021 pricing does not include estimated loss and constraint excess (LCE) rebates that are paid to all transmission customers
 - A higher proportion of costs – overheads – are being allocated via the benefit-based charge (which flows to all customers, so including generators) in the 2021 pricing
 - No prudent discounts (yet)
 - The application of the price cap across individual customers has also been updated since the 2020 calculations.
- A rebalancing: the total annual revenue cap is set, the new TPM allocated this differently across customers. Some will face increases, others will see reductions.





TRANSPower

Indicative prices by customer (table)

Customer name	Ranking	Indicative prices	% of total charges	% of total charges (cum)	Connection charges	Benefit-based charges	Residual charges	Transitional cap adjustments	Customer name	Ranking	Indicative prices	% of total charges	% of total charges (cum)	Connection charges	Benefit-based charges	Residual charges	Transitional cap adjustments
Vector Limited	1	179.9	22.5%	22.5%	13.2	55.7	108.2	2.9	Norske Skog Tasman Limited	31	3.8	0.5%	96.5%	1.2	0.5	6.4	(4.2)
Powerco Limited	2	81.3	10.2%	32.7%	16.0	10.9	53.2	1.1	KiwiRail Holdings Limited	32	3.5	0.4%	96.9%	2.0	0.3	2.2	(0.9)
Meridian Energy Limited	3	66.6	8.3%	41.0%	16.6	47.8	1.4	0.9	Winstone Pulp International	33	3.5	0.4%	97.4%	1.1	0.5	1.9	0.0
Orion New Zealand Limited	4	53.5	6.7%	47.7%	4.1	8.9	39.7	0.9	Nga Awa Purua Joint Venture	34	2.5	0.3%	97.7%	0.4	1.7	0.3	0.0
Wellington Electricity Lines Limited	5	46.3	5.8%	53.5%	8.2	7.6	29.8	0.7	Centralines Limited	35	2.2	0.3%	98.0%	0.8	0.4	1.1	0.0
NZ Aluminium Smelters Limited	6	44.7	5.6%	59.1%	1.3	12.4	30.3	0.8	Trustpower Limited	36	2.0	0.2%	98.2%	0.8	1.1	0.0	0.0
Contact Energy Limited	7	29.8	3.7%	62.9%	4.2	23.8	1.4	0.4	Scanpower Limited	37	1.7	0.2%	98.4%	0.6	0.3	0.8	0.0
Unison Networks Limited	8	27.0	3.4%	66.2%	5.6	2.2	18.8	0.4	Bulle Electricity Ltd	38	1.6	0.2%	98.6%	0.5	0.1	1.0	0.0
Aurora Energy Limited	9	25.4	3.2%	69.4%	4.3	2.7	18.1	0.4	Ngatamariki Geothermal Ltd	39	1.4	0.2%	98.8%	0.3	1.0	0.0	0.0
Powernet Ltd	10	22.3	2.8%	72.2%	3.8	2.9	15.3	0.3	OMV New Zealand Production Ltd	40	1.1	0.1%	98.9%	0.3	0.2	0.6	0.0
WEL Networks Limited	11	20.0	2.5%	74.7%	1.7	2.7	15.3	0.3	Todd Generation Taranaki Limited	41	1.0	0.1%	99.1%	0.1	0.8	0.1	0.0
Northpower Limited	12	18.3	2.3%	77.0%	2.5	6.5	9.0	0.3	Nelson Electricity Ltd	42	0.9	0.1%	99.2%	0.1	0.1	0.7	0.0
Genesis Energy Ltd	13	14.5	1.8%	78.8%	5.0	8.7	0.7	0.1	Whareroa Cogeneration Limited	43	0.9	0.1%	99.3%	0.2	0.1	1.6	(0.9)
Alpine Energy Ltd	14	12.6	1.6%	80.4%	2.6	1.6	8.2	0.2	Methanex New Zealand Ltd	44	0.9	0.1%	99.4%	0.2	0.1	0.5	0.0
Mainpower New Zealand Limited	15	12.1	1.5%	81.9%	2.9	1.6	7.5	0.2	Daiken Southland Limited	45	0.8	0.1%	99.5%	0.2	0.2	0.5	0.0
Mercury NZ Limited	16	12.1	1.5%	83.4%	3.5	6.7	1.8	0.1	Nova Energy Limited	46	0.7	0.1%	99.6%	0.3	0.1	0.4	0.0
Counties Power Ltd	17	11.3	1.4%	84.8%	1.0	3.5	6.7	0.2	Beach Energy Resources NZ (Holdings) Ltd	47	0.7	0.1%	99.7%	0.1	0.2	0.5	0.0
Network Tasman Limited	18	10.7	1.3%	86.2%	1.5	1.4	7.7	0.2	MEL (West Wind) Limited	48	0.6	0.1%	99.8%	0.1	0.4	0.1	0.0
EA Networks	19	10.7	1.3%	87.5%	0.3	1.0	9.2	0.2	Mercury SPV Limited	49	0.6	0.1%	99.8%	0.1	0.4	0.1	0.0
New Zealand Steel Limited	20	10.0	1.2%	88.8%	2.3	2.7	8.8	(3.8)	Waveley Wind Farm	50	0.4	0.0%	99.9%	0.1	0.2	0.1	0.0
Electra Limited	21	9.0	1.1%	89.9%	1.6	1.5	5.8	0.1	Tararua Wind Power	51	0.3	0.0%	99.9%	0.1	0.2	0.1	0.0
Horizon Energy Distribution Ltd	22	7.7	1.0%	90.8%	2.4	0.4	4.8	0.1	MEL (Te Apitī) Limited	52	0.3	0.0%	99.9%	0.1	0.2	0.0	0.0
Waipa Networks Limited	23	6.3	0.8%	91.6%	1.2	1.2	3.9	0.1	Southern Generation GP Limited	53	0.2	0.0%	100.0%	0.2	0.0	-	-
The Lines Company Ltd	24	6.1	0.8%	92.4%	1.4	0.7	3.9	0.1	Southdown Cogeneration Ltd	54	0.2	0.0%	100.0%	0.0	0.0	0.1	0.0
Top Energy Ltd	25	5.9	0.7%	93.1%	1.0	1.2	3.6	0.1	Southpark Utilities Limited	55	0.0	0.0%	100.0%	0.0	0.0	0.0	0.0
Marlborough Lines Limited	26	5.4	0.7%	93.8%	0.6	1.0	3.8	0.1	GTL Energy New Zealand Ltd	56	0.0	0.0%	100.0%	0.0	0.0	0.0	(0.0)
Network Waikato Limited	27	5.3	0.7%	94.5%	0.9	0.7	3.6	0.1	Total		796.9			121.3	228.4	449.2	0.0
Pan Pac Forest Product Limited	28	4.2	0.5%	95.0%	1.0	0.8	4.1	(1.7)	Lines Business	1	591.5	74.0%	74.0%	79.7	117.4	385.5	8.9
Westpower Limited	29	4.1	0.5%	95.5%	0.7	0.2	3.1	0.1	Generator	2	133.1	16.7%	90.7%	31.8	93.2	6.5	1.7
Eastland Network Limited	30	4.0	0.5%	96.0%	0.3	0.6	3.1	0.1	Direct Connect	3	74.2	9.3%	100.0%	9.8	17.8	57.2	-10.6
									Total		796.9			121.3	228.4	449.2	-

Indicative pricing

Transpower's new indicative pricing rebalances across customer groups: 33% higher prices for generators, 3% higher for direct connect industrial consumers and 6% lower for lines businesses (than signalled under the Authority's 2020 pricing).

- There are relatively small shifts in the shares of charges between the four regions; consumers in the Upper North Island will tend to pay for a larger share
- In the local networks that would pay more as a result of the proposed TPM, on average annual household electricity bills for the year would increase by \$14. In the local networks that would pay less, on average household electricity bills would be around \$19 lower (averages)
- A 3.5% price cap (after inflation and volume growth). No local networks reach the cap
- A number of direct connect industrial customers would be protected by the cap. Their charges rise significantly - to date these have generally paid relatively low transmission charges compared with their size and their benefits from the grid
- The benefit-based charges and removal of the HVDC charge means North Island generators would pay a larger share of total transmission charges (and South Island generators a lower share)
- Over time, the impact of the proposed new TPM would become more noticeable, as Transpower makes more benefit-based investments in the grid to accommodate increased generation and demand as a result of the electrification of industrial processes and transport.

The CBA

5-10 minutes

Modelling approach

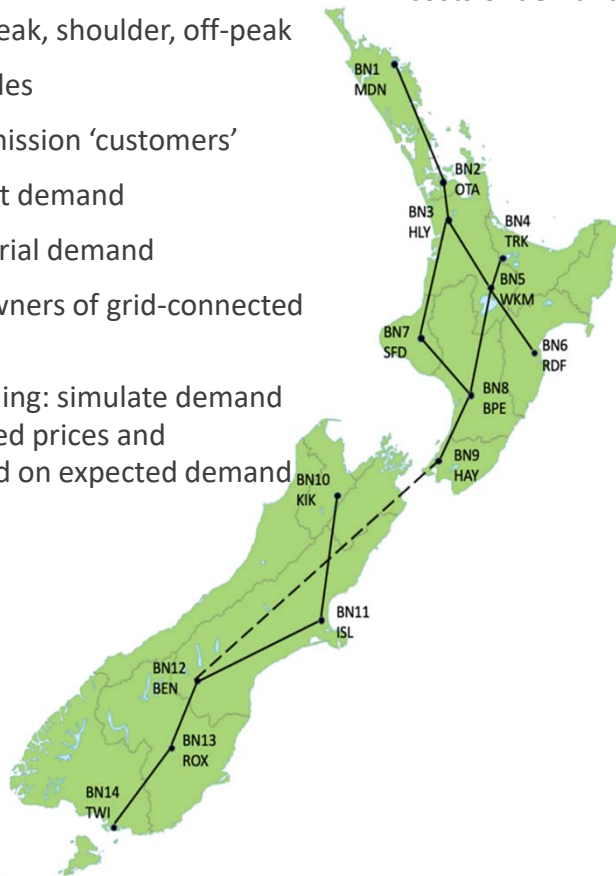
3 times of use: peak, shoulder, off-peak

14 backbone nodes

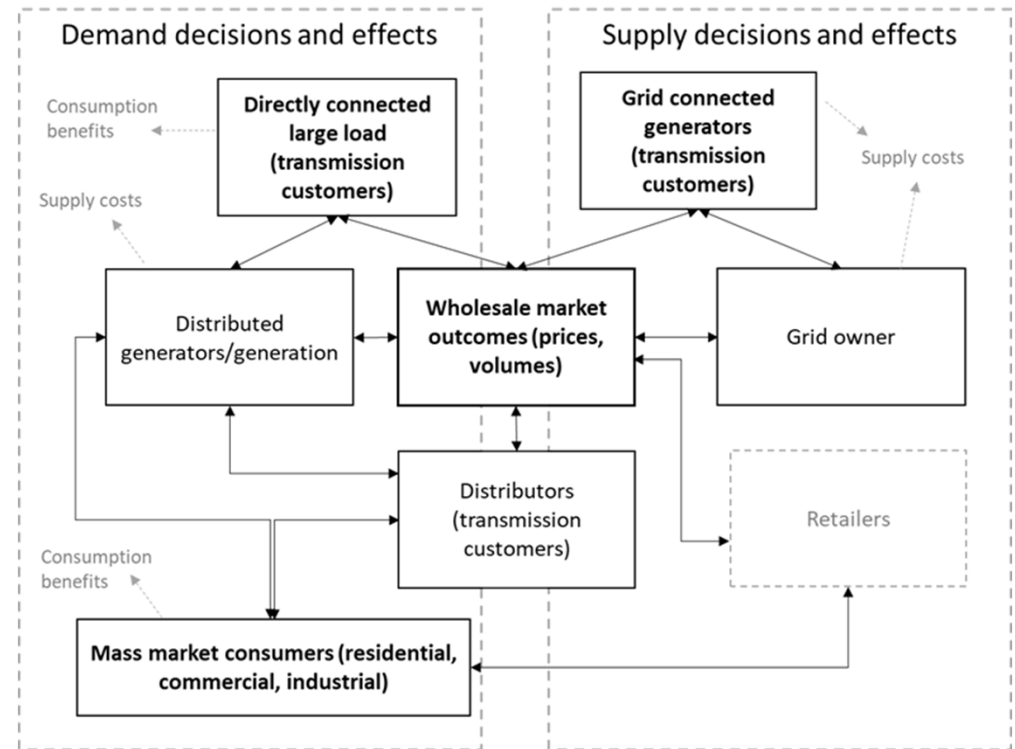
3 types of transmission 'customers'

- 1) Mass-market demand
- 2) Large industrial demand
- 3) Investors/owners of grid-connected generation

Recursive modelling: simulate demand based on expected prices and investment based on expected demand and prices.



Primary component is a grid use model, modelling effects of changes in transmission charges on costs of demand and supply in the wholesale market and behaviour of transmission customers.



Benefits to consumers

- Significant benefits to New Zealand:
 - Reduce the cost of consuming electricity at times when consumers value it the most
 - Better signals of the cost of using the grid support the right investments being made at the right time and in the right places
 - Better position New Zealand for increased electrification by ensuring the best use of existing and future infrastructure.
- \$1.25 billion:
 - Deliver New Zealand consumers a net quantified benefit of \$1.25b over the next 28 years, within a range of \$0.4b - \$2.9b.
 - Generators benefit as well – this is not a wealth transfer
 - This estimate excludes unquantified benefits, which would be net positive and material.
 - A key driver of these benefits is that better transmission pricing signals will result in New Zealanders being able to access new cheaper renewable generation earlier.



CBA results

Table 13 Summary of cost benefit analysis results

\$2018 million in present values.

Weighted mean \$m	Central
Gross change in consumer welfare	2,303
Less transfers (lower interconnection costs)	-1,205
Net change in consumer welfare	1,098
Less inefficient battery investment	55
More efficient investment, scrutiny, certainty	179
Transmission benefits brought forward	243
Transmission cost brought forward	-281
Other costs	-42
Net benefit	\$1,253 (\$365 - \$2,918)

Consultation dates and anticipated next steps

2 minutes

Consultation dates

2 minutes

- Will carefully consider subs and cross subs
- Working towards a decision in first half of 2022. Depends on submissions
- Aiming for an April 2023 implementation date

Dates for this consultation process

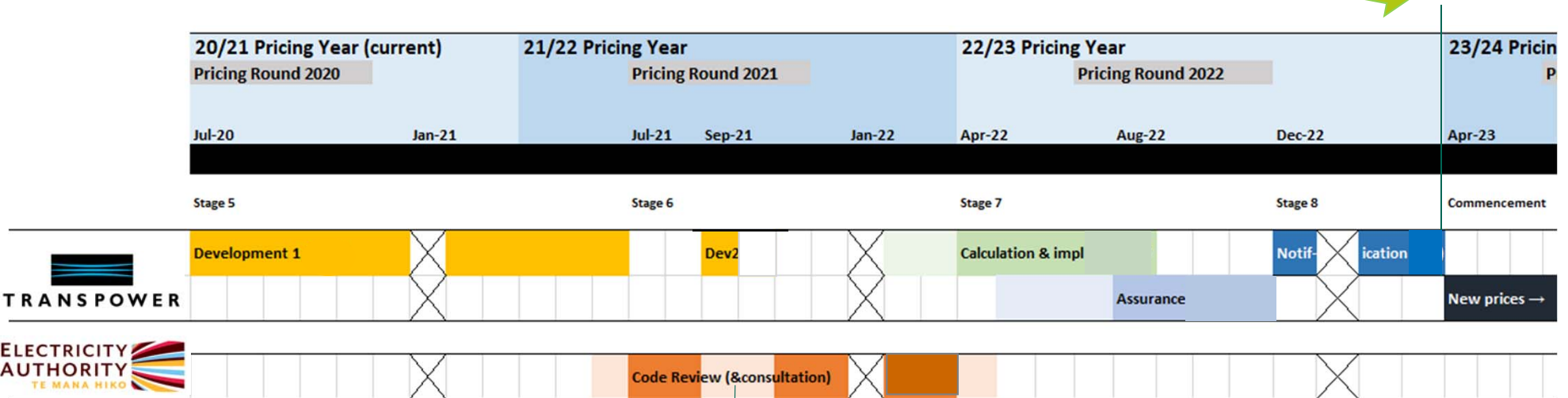
- Submissions close 2 December 2021
- Cross submissions close 23 December 2021



Consultation – open until 2 December, then cross submissions to 23 December

2 minutes

The process - to an April 2023 anticipated start date



Consultation October-December 2021



We are here now