2023-27
POWERLINK QUEENSLAND REVENUE PROPOSAL

Appendix 16.03 – PUBLIC

Transmission Pricing Consultation Draft Positions Paper

POWERLINK QUEENSLAND

TRANSMISSION PRICING CONSULTATION

DRAFT POSITIONS

AUGUST 2020

Contents

Executive Summary

Powerlink initiated a pricing consultation in early 2019 to explore opportunities to improve the delivery of safe, cost effective and reliable electricity transmission services. It recognised the role that transmission pricing plays in addressing electricity affordability as well as adapting to the many ways the transmission network is used.

In July 2019, we released an initial Transmission Pricing Consultation Paper (Consultation Paper) that presented potential alternative pricing arrangements and proposed criteria to help guide our assessment. The Consultation Paper was a key mechanism to enable further discussion and engagement on how transmission pricing arrangements could be enhanced by:

- providing stronger signals to customers to encourage more efficient use of the network, driving lower future network costs; and
- enabling customers to reduce their costs by changing their utilisation of the network.

Engagement has covered a broad user base including our Customer Panel, Energy Queensland (Energex and Ergon Energy) including customers connected directly to distribution networks, other Transmission Network Service Providers (TNSPs) and customers directly connected to our transmission network. Discussions to date have been useful in shaping this Transmission Pricing Draft Positions Paper (Draft Positions Paper).

Powerlink understands that any change to pricing arrangements may ultimately result in some reallocation of costs and prices. Our customers commented that more information on the individual impacts to them and interactions with potential alternative pricing arrangements are required to allow for further meaningful input. In response to the feedback to date, this paper contains further information on four pricing alternatives. We seek views from customers and stakeholders on these.

This Draft Positions Paper seeks to balance the need for information to be suitable for the wider audience while being mindful of the confidential nature of individual customer information. To facilitate further engagement, the paper highlights key themes from input and discussions to date as well as an overview of the outcomes from detailed modelling of alternative pricing arrangements.

Detailed modelling of alternative potential pricing arrangements allows for potential customer impacts to be further understood and highlights how specific usage of the transmission network affects charges. Generally, from the options investigated many directly connected customers would potentially observe changes of within five percent higher or lower than current charges.

We anticipate that engagement subsequent to the release of this paper will allow for more tailored discussions with customers and stakeholders to explore the individual impacts and wider benefits of alternative pricing arrangements.

1 Purpose

The purpose of this Draft Positions Paper is to:

- seek input and guidance on the presented options for alternative pricing arrangements to allow for Final Positions to be developed;
- provide a high level summary of detailed analysis into the impacts of changes to pricing arrangements; and
- identify how changes to pricing arrangements can deliver better value and outcomes for our customers.

This consultation process will inform Powerlink's proposed Pricing Methodology for the next regulatory period, which is due to be lodged with the Australian Energy Regulator (AER) by January 2021. Any proposed changes to Powerlink's Pricing Methodology must be assessed and approved by the AER and can only take effect from the start of Powerlink's next regulatory period, from 1 July 2022 to 30 June 2027.

1.1 Submissions Process

Powerlink seeks feedback on matters raised and questions asked in this paper by close of business **25 September 2020**.

Feedback can be provided via email to pqpricing@powerlink.com.au

If you have any questions in the interim, please send them to the email address above or call Powerlink on (07) 3860 2111 and ask to speak with Ben Wu, Manager Pricing and Billing.

Powerlink is committed to an open and transparent engagement process. With this approach in mind, Powerlink intends to publish the submissions received on its website, unless the response is marked as 'confidential'.

1.2 Your Feedback

Powerlink is seeking views on the following questions:

1. Should Powerlink propose in its 2023-27 Pricing Methodology:
    a. a 60/40 split of locational/non-locational charges[1]; and/or
    b. having locational charges based on peak demand only?

    These arrangements can be put in place under the existing National Electricity Rules (the Rules).

2. Should Powerlink progress as part of a future Rule change:
    a. MVA charges; and/or
    b. changes to the side constraint mechanism?

1.3 Timeframes

Upon the conclusion of this consultation period and dependent on the feedback received, we will target release of a Final Positions Paper and marked-up version of our Proposed Pricing Methodology for the 2023-27 regulatory period in October 2020. The paper will summarise the

[1] Currently 50/50

views received over the course of the consultation and identify which, if any, alternative pricing arrangements will be progressed further. This is shown in the table below.

Indicative Timeframe	**Activity**
26 August 2020	Draft Positions Paper
August/September 2020	Engagement on Draft Positions Paper
October 2020	Final Pricing Outcomes Paper
October 2020	Consultation Paper for Proposed Pricing Methodology for next regulatory period(including mark-up of changes to Powerlink's current Pricing Methodology)

2 Engagement

2.1 What we have heard so far

Powerlink engaged on its Consultation Paper (July 2019) with our Customer Panel, directly connected customers including customers connected to distribution networks, other TNSPs and stakeholders.

Feedback on the Consultation Paper was limited as many customers indicated that they would prefer further detail regarding their individual impacts before providing comment. While most customers advised they were open to further discussion on potential changes to the transmission pricing arrangements, the table below notes the key themes from these discussions and how this feedback has been taken into account in this Draft Positions Paper.

Feedback	**Action**
General agreement with the pricing criteria, acknowledging its 'give and take' nature	Proposed pricing criteria will be used to understand the interaction with alternative pricing arrangements
Need more details about individual customer impacts prior to providing formal responses	Conducted modelling at an individual customer level on the four options to provide greater detail. Offered to engage with individual customers to discuss direct impacts.
Questioned the usefulness of enhancing demand based pricing signals in the current low growth environment	This paper provides further information on a range of options including alternatives to those which wholly impact demand signals
Acknowledge the complex nature of transmission pricing but prefer that the next consultation papers be as brief as possible	This paper is concise with information and modelling presented at a high level. We have offered to have detailed discussions with individual customers and stakeholders during the consultation period
Valued the nature of individual discussions and information could be tailored to how individual customers use the network	To balance the ongoing transparency of this consultation against the sensitive nature of individual customer impacts, we will engage with the wider audience and continue direct discussions with our directly connected customers
Acknowledge the principles behind increasing cost reflectivity noting that there are limitations to how far this can be progressed	The majority of options included in this paper advance cost reflectivity in a way which can be furthered in future.

3 Potential Alternative Pricing Arrangements

3.1 Introduction

Guided by discussions following the release of the Consultation Paper, we have modelled four alternative pricing options to understand the potential impacts on customers and assessed these against our pricing criteria.

Modelling compared the change in an individual customer's overall prescribed charges (or revenues) relative to the final published 2020/21 transmission prices. The graphs show the range of impacts as a result of the reallocation of prescribed charges between customers in both percentage and dollar terms. Impacts indicated show the highest and lowest, what 80 percent of transmission direct connect customers would observe as well as the average change to distribution networks. Movements observed by end users connected to distribution networks on average, once passed through, will be similar to those indicated for distribution networks. The modelled impact on an individual customer can be advised through direct engagement with us.

For each option, we have provided a simple, visual representation of our assessment against the three pricing criteria, namely equity, efficiency and stability. The location of the cross (X) provides an indication of where the option sits relative to the other criteria. Further details on the pricing criteria is provided in the Appendix.

Similarly, as two of the options discuss reactive power and the side constraint, the Appendix provides further technical information about what these mean.

3.2 Rebalancing the Locational and Non-Locational Split to 60/40

Summary

The costs of providing shared network services are currently split on a 50/50 basis between locational and non-locational charges. This allocation is consistent with the Rules[2], which require that the allocation between locational and non-locational charges be based on either:

- 50% to each component; or
- an alternative allocation based on a reasonable estimate of future network utilisation and the likely need for future transmission investment and has the objective of providing more efficient locational signals.

Locational charges reflect the costs to supply shared network services at each location within the transmission network.

In making the case for moving to an alternative allocation, we considered forecast future demand and utilisation (peak demand over average demand)[3] over a 10-year period, 2019/20 to 2028/29. Over this period, delivered demand is forecast to increase by three percent with an average 60 per cent utilisation of the transmission network. These metrics are key in informing future investment in the transmission network.

The increased weighting towards locational charges promotes efficient use of the transmission network by enhancing the link between peak demand, utilisation and the subsequent impact on locational charges.

[2] National Electricity Rules 6A.23.4(a)(2)
[3] Powerlink Transmission Annual Planning Report 2019

Our Consultation Paper outlined the potential for a range of splits. The modelled outcomes below provide information on a 60/40, locational/non-locational allocation. This change would strengthen locational price signals from the time of implementation and could be strengthened even further (for example, to 80/20) over time if customers considered this appropriate.

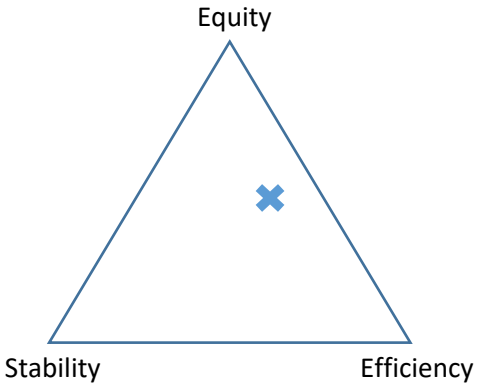
Current arrangements

Currently the Rules allow two methods for the allocation of locational and non-locational revenue being Cost Reflective Network Pricing (CRNP) and Modified Cost Reflective Network Pricing (MCRNP). Under CRNP, locational revenue is collected from each location on the transmission network based on the use of shared transmission assets, such as substations, lines and transformers. MCRNP allocates locational revenue based on the utilisation of assets, rather than a fixed percentage allocation.

Currently there are a mix of approaches across TNSPs.

Powerlink - QLD	TransGrid - NSW	ElectraNet - SA	AEMO - VIC	TasNetworks - TAS
CRNP (50/50)	MCNRP	MCRNP	CRNP (50/50)	MCRNP

Interaction with pricing criteria

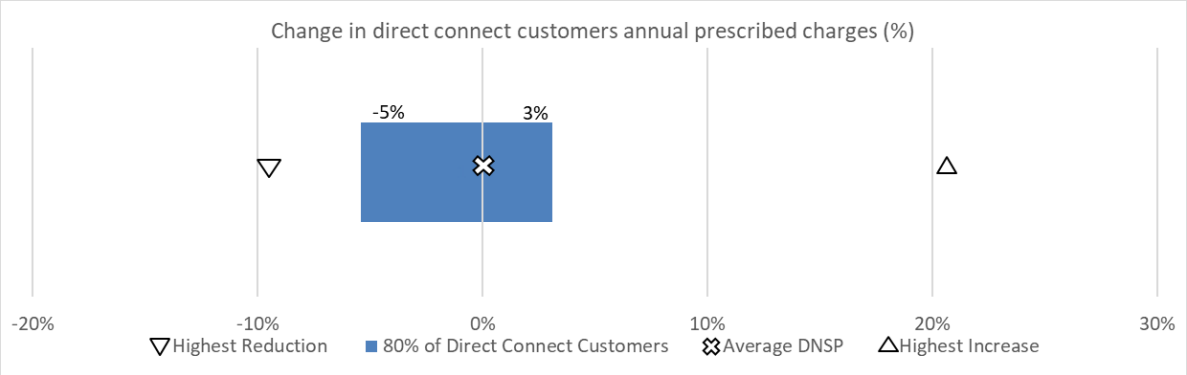


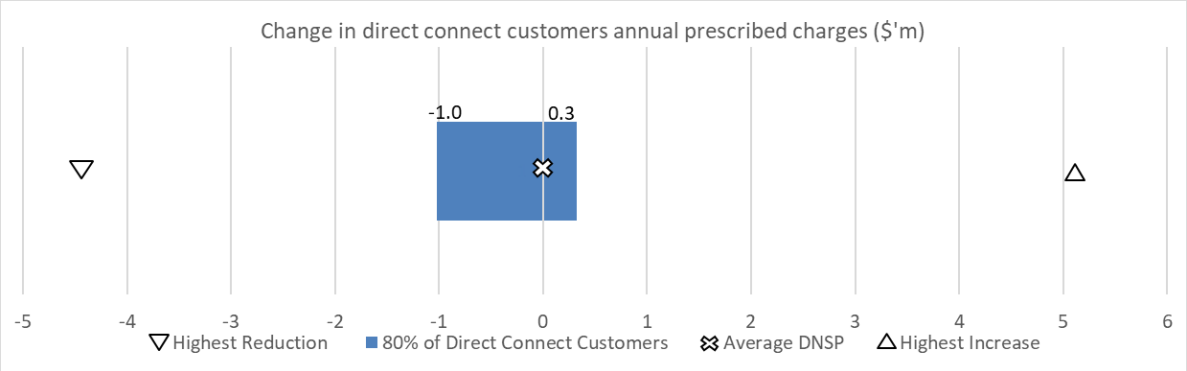
By increasing the emphasis on locational charges, the result is a higher weighting of charges that reflect the actual use of assets providing the transmission service.

In principle, a higher proportion of charges relating to actual network usage advances the efficiency and equity objectives at the cost of reduced stability. A 60/40 split is an initial step that will increase the cost reflectivity of transmission charges.

Customer Impacts

As a result of rebalancing, customers that have an relatively higher proportion of locational to non-locational charges will observe an increase in charges compared to those which have a lower locational proportion to non-locational charges. Charges for most directly connected customers will move between -5% and 3% or -$1.0m to $0.3m. In this option on average, charges to distribution connection points will increase by 0.4% or 0.3m. End users and customers connected to the distribution network can expect on average relatively similar movements in their transmission charge component once passed through. There will be variance in movement between individual distribution connection points.





3.3 Locational Charges Based on Peak Demand Only

Summary

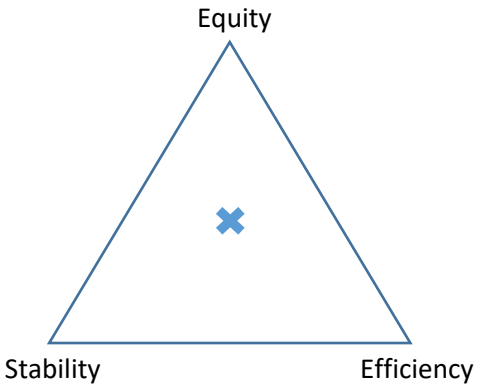
Powerlink's current structures for the collection of locational revenue are based on an even (50/50) split between peak demand (nominated or maximum contract demand) and average demand. However, locational revenue requirements are calculated on the basis of peak usage of the shared transmission network. This option would simplify locational charging arrangements by removing the average demand component from charging structures. This option does not change the principles for the calculation of locational revenue requirements.

Current arrangements

Each state has varying measures of peak demand used for charging. However, each generally relate to periods when system demand is highest.

Powerlink - QLD	TransGrid - NSW	ElectraNet-SA	AEMO - VIC	TasNetworks - TAS
Peak Demand and Average Demand or Contract Maximum Demand	Peak Demand or Contract Maximum Demand	Peak Demand or Contract Maximum Demand	Peak Demand or Contract Maximum Demand	Peak Demand or Contract Maximum Demand

Interaction with pricing criteria

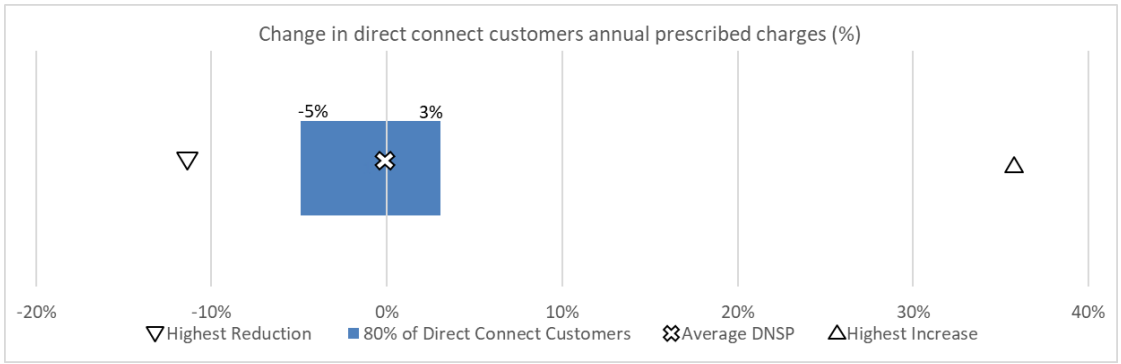


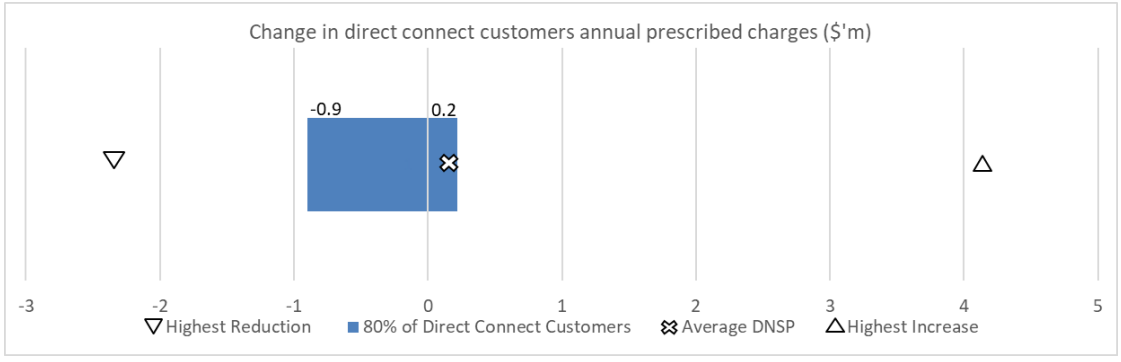
Overall, this option results in a balance between all criteria. It increases the efficiency of locational prices by aligning the charging structure with peak demand, which is a key driver of how locational revenues are determined. There will also be a clearer link between changes in peak demand and its impacts on locational revenue collections.

Without the average demand component driving volatility between monthly charges, stability is also improved. Stable transmission prices will, in turn, improve equity with lower under/over collections of revenue, which are ultimately carried forward and recovered over the wider customer base.

Customer Impacts

In this option the majority of directly connected customers would observe between a -5% and 3% or -$0.9 to $0.2m change. The range of impact is quite narrow for this option as the change only targets the locational charging structure, not the calculation methodology. The impact on outliers under this option is limited as a result of the 2 per cent per annum side constraint.





3.4 MVA Charging

Summary

MVA is a measurement of electricity that accounts for how loads use the transmission network. MVA is a key determinant of network investment as it represents the full measurement of power flow through electricity assets. For any given level of supply voltage, MVA is proportional to the current flow supplying the load.

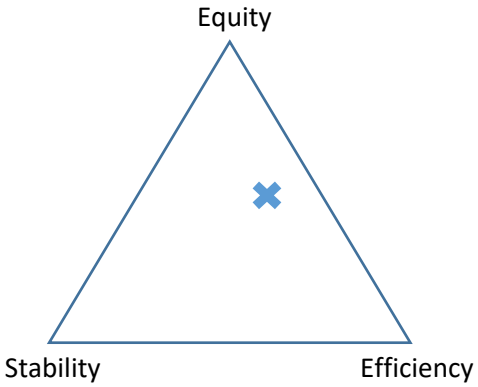
MVA charging enhances cost reflective principles by factoring in reactive power efficiencies of loads. Compared to real power, reactive power is not as easily transported over long distances, and requires additional investment. What this means is that, ultimately, loads that are more efficient will reduce additional demand on the network and the subsequent need for investment. A Rule change would be required to implement this approach.

The Appendix contains further information about reactive power.

Current arrangements

As MVA charging is not permitted under the current Rules, no TNSP applies it.

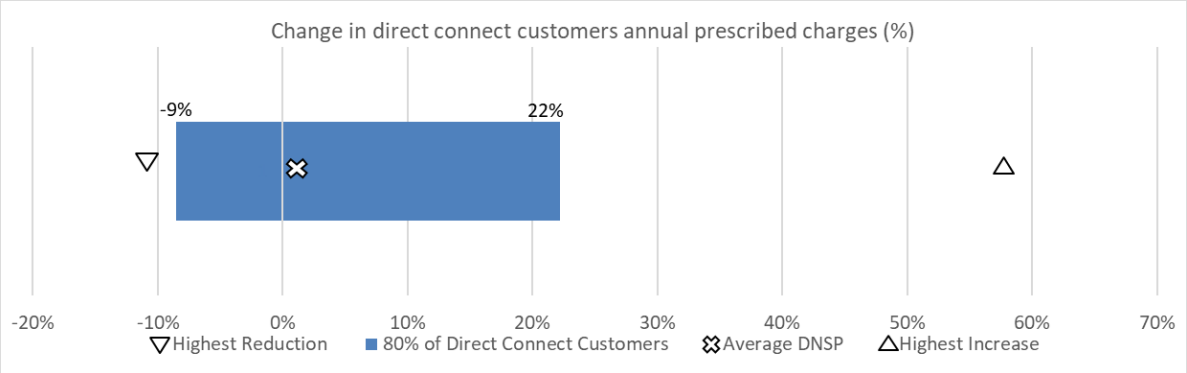
Interaction with pricing criteria

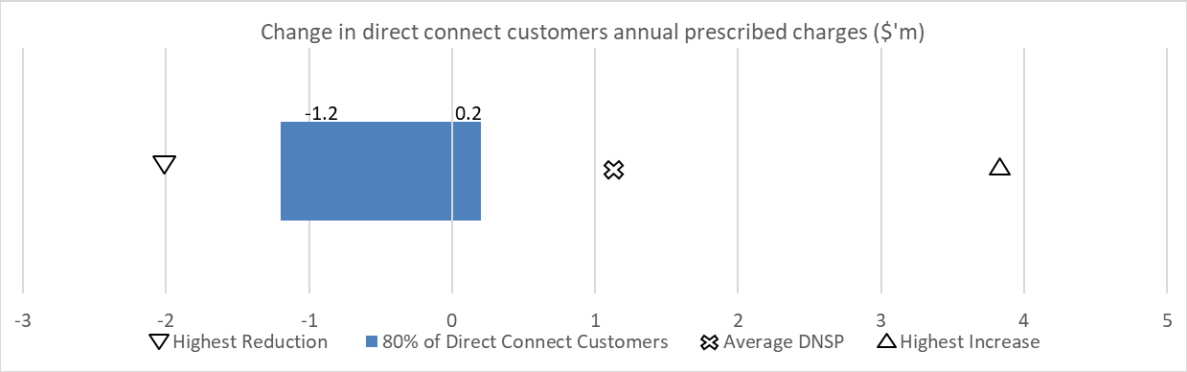


Primarily, the shift towards some form of MVA charging would promote equity in charging arrangements as charges would be able to capture each customer's reactive power requirements on the transmission network. With more loads that draw less reactive power, efficiency can be improved through reduced network investment requirements.

Customer Impacts

Directly connected customers that observe the most change under this option will be those that have reactive power requirements that are either significantly higher or lower than the average network user. The variety of ways in which customers actually use the transmission network will impact the wider customer base under this option, which are more spread out between -9% and 22% or $-1.2m to $0.2m.





3.5 Accounting for the Side Constraint

Summary

Currently, the Rules limit the rate of change of locational charges between years to within two percent of the load weighted average for the region (in our case, for Queensland). In practice, the side constraint mechanism protects users from price shocks in either direction relative to what the average customer base would observe. Over time due to a range of factors, the application of the side constraint results in customers paying more or less than the calculated locational revenue requirements. Any changes to the existing side constraint principles would require a Rule change.

All of the previous options advance the efficiency of transmission pricing through enhanced locational signals. Without changes to the side constraint mechanism, it will take some customers many years of stable pricing conditions for actual locational prices to align with the calculated price and intended pricing signal. This would also hold true for charges once established to adjust to reflect changes in customer behaviour. A more dynamic side constraint would help in this regard, improving the efficiencies of pricing signals.

We recognise that the side constraint was designed to protect customers from rapid changes in locational charges. However, for the purposes of this paper, we have modelled the impacts of its removal. Further exploration into the side constraint and its impacts would need to consider a range of options for 'resetting' the side constraint.

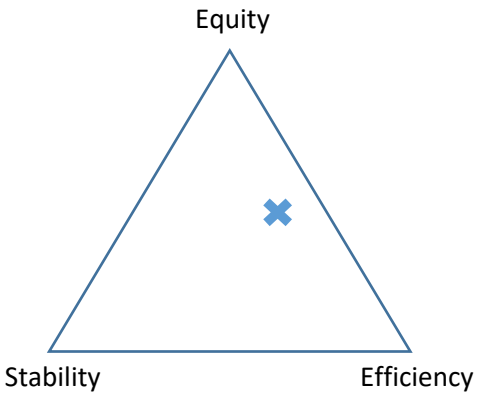
More information about the side constraint mechanism is included in the Appendix.

Current arrangements

All transmission networks currently apply the side constraint as described within the Rules.

Powerlink - QLD	TransGrid - NSW	ElectraNet-SA	AEMO - VIC	TasNetworks - TAS
State average +/- 2%	State average +/- 2%	State average +/- 2%	State average +/- 2%	State average +/- 2%

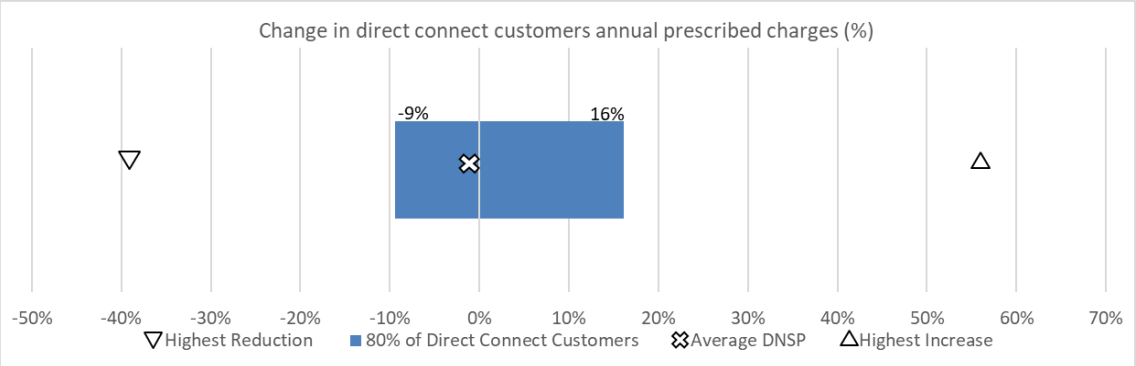
Interaction with pricing criteria

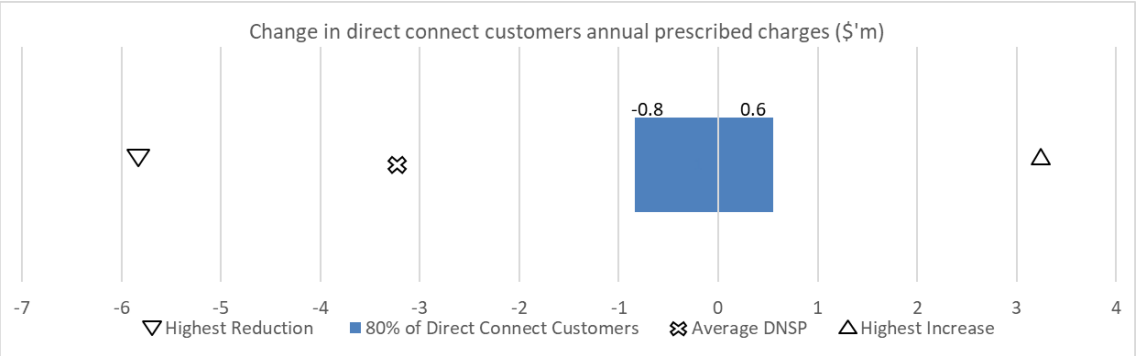


Depending on how relaxation of the side constraint occurs, we consider that it would result in increased efficiency of locational charges as this would allow more direct signals of the costs to supply each location on the transmission network. Such a change would also enhance the equity principle of prices that apply to network users would be based on the services provided.

Customer Impacts

With the removal of the side constraint, the majority of directly connected customers would observe changes in charges of between -9% to 16% or between -$0.8m to $0.6m. A transitional relaxation of the side constraint would help mitigate price shocks for those customers at the ends of the spectrum.





4 Appendix

4.1 Pricing Criteria

Our Consultation Paper proposed the following criteria to help guide the assessment and discussion of alternative pricing arrangements.

Proposed Pricing Criteria	Description
Equity and fairness	• *Equity* – transmission prices should apply to all network users based on the services provided to them • *Fairness* – transmission prices should be fairly applied and allow for transitional arrangements where network users face significant price impacts resulting from changes to pricing arrangements
Price stability and transparency	• *Price stability* – Transmission prices should be sufficiently stable to enable network users to make informed investment decisions with a level of confidence • *Transparency* – Transmission prices should be sufficiently transparent to enable network users to understand how prices are derived
Efficient price signals	• Transmission prices should provide *efficient signals* to inform network users about how their use of transmission services affects existing and future network investment and costs.

4.2 Side Constraint

What is the side constraint?

Once a locational transmission price is established for a region (for example, in Queensland) its rate of change each year is limited to the load weighted average of all connection points in Queensland plus or minus two per cent. This requirement as well as the process for varying from this limit are defined within the Rules[4].

How does this interact with the pricing impacts presented?

The rebalancing of locational charges and locational charges based on demand only options presented in particular, propose changes to the locational price calculated for all customers. The side constraint limitation on locational price movements and its impacts on the efficiency of locational price signals was investigated as part of the modelling process.

In the first two options noted above, generally the side constraint still allows for the impact of the change in locational price calculation and subsequent pricing signal to flow through to directly connected customers. For some specific customers, the side constraint will require the locational

[4] National Electricity Rules 6A.23.4(b)(2)

price to move in a different direction to the unconstrained price resulting in a larger gap between the calculated and ultimately charged locational price.

Due to these larger inefficiencies identified, the final pricing alternative (Alternatives to the side constraint) has been included to investigate options for managing the side constraint better. Further engagement with customers will allow for individual impacts due to the side constraint to be broken down.

4.3 Reactive Power

What is reactive power?

Electrical power comprises of two components, real power and reactive power (see diagram below). Together, both of these components form apparent power. Connection points to the transmission network require both of these components to operate. Reactive power, often referred to as imaginary power is a technical term that put simply is a secondary aspect of a load, which facilitates the flow of electricity.

When scaled up to transmission network levels the more commonly understood component, real power, is measured in megawatts (MW). Reactive power is measured in mega volt amps reactive (MVAr). Together these two components form mega volt-amper (MVA).

Why does reactive power matter?

A typical transmission connection point's apparent power (MVA) will sit between five to ten percent higher than its real power (MW) measurement due to its reactive power (MVAr) component (in the diagram below observe how the size of the apparent power is impacted by the size of reactive power). The design of a transmission network accounts for both the real and reactive power requirements of loads. Loads that are more efficient have lower reactive power requirements and as a result have lower overall utilisation of the transmission network. Measuring just the real power component of a load will not account for its entire use of transmission network assets.