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Aurizon Network Response to P2025 Market Design Consultation Paper

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To the ESB Panel,

Aurizon Network welcomes the opportunity to respond to the Energy Security Board's Post 2025 Market Design Consultation Paper (the **Consultation Paper**).

Aurizon owns and operates the regulated open access Central Queensland Coal Network (**CQCN**). Approximately 2,000 kilometres of the CQCN is electrified allowing trains to use electricity or diesel fuel as their source of traction power. This electric traction network represents a significant proportion of Queensland's regional and total energy demand and provides a critical supply chain link for Queensland's quality metallurgical and thermal coal exports.

Transmission and wholesale electricity costs together with energy security and reliability are critical to the future competitiveness of electric traction. Our customers have a technically feasible and readily accessible alternative to electric trains in the form of diesel locomotives. If customers decided to substitute electric trains for diesel, this would result in a significant reduction in electricity demand in regional Queensland.

Aurizon recently released its Climate Strategy and Action Plan (**CSAP**) to achieve net-zero operational emissions by 2050¹. The CSAP recognises the role that the CQCN overhead power system will have in the decarbonisation of transport supply chains and the achievement of our emission reduction objective. In addition, Green House Gas emissions associated with our operations form part of the Scope 3 emissions of our customers. Aurizon Network acknowledges that we have an opportunity to work collaboratively with our customers to reduce their Scope 3 emissions and continue decarbonising the transport supply chain.

As one of the largest individual energy consumers in Queensland, and as the operators of the only privately owned, electric heavy haulage electric traction rail network in Australia (the CQCN), our business is making investments to improve the competitive position of electric traction.

¹ Aurizon (2020) Climate Strategy and Action Plan: Delivering a Sustainable Future. Available at https://www.aurizon.com.au/-/media/aurizon-media-library/sustainability/overview/sustainability-report-2020/climate-strategy-and-action-plan_web-version.pdf

Central Queensland's electric locomotive fleet uses 1% of the state's total electricity consumption. Annually, this equates to a saving of approximately 100 million litres of diesel, or 13-35kt CO₂ emissions, when compared to the equivalent operation of diesel locomotives and assist our customers reduce their own scope 3 emissions.

We recognise cost-effective decarbonisation of the freight sector will require increased electrification of transport networks. As the proportion of renewable energy generation in Queensland's electricity grid increases in line with government targets, our electrified network in Central Queensland will continue to decarbonise. In recognition of this, our Tracking Towards Net-Zero Operational Emissions initiatives emphasise the need to ensure that we can continue to leverage existing capabilities and assets, such as our electrified rail network, as we decarbonise our operational emissions.

While we are committed to decarbonising our own operations, our focus also remains on maintaining cost effectiveness and improving our operational performance and efficiency for our customers. For Aurizon Network, at this stage, Aurizon is exploring cost-effective renewable energy opportunities to augment supply to Aurizon Network's electrified rail infrastructure. Importantly, affordable wholesale and network electricity costs are also necessary to incentivise third party operators to choose electric traction as the preferred locomotive choice.

The ESB's Post 2025 Market Design reforms will play a critical role in improving the affordability and the reliability of electric traction services to promote these objectives. While the Consultation Paper identifies the key risks and issues from the perspective of consumers as a collective there are risks to large regional directly connected load customers that are not identified in respect of:

- Changes to the Regional Reference Price in the Transmission Access Reforms; and
- Changes to transmission network flows and network investment associated with changes in the generation mix and locality.

The latter is a significant uncertainty and risk to directly connected load customers in Central Queensland associated with unplanned retirement of thermal plant and any subsequent temporal regional supply and demand imbalances.

Transmission Access Reforms

Aurizon Network broadly supports the efficiency objectives that underpins key elements of the Australian Energy Market Commission (**AEMC**) draft model for transmission access reform. As consumers are ultimately required to fund investment in transmission networks the key objective of the access reforms should be to promote the most efficient generation investment which seeks to maximise utilisation of the existing transmission network infrastructure and optimise investment in new transmission assets. The ESB's expressed concerns on the cost of major transmission investment projects reinforces the importance of promoting this objective.

The draft model proposes that large load customers should continue to face the regional reference price (**RRP**) rather than the location marginal price. Aurizon Network supports this position as load customers are unlikely to be responsive to locational prices in a way which would influence locational decisions. This would also expose customers to additional price risks and complexity in managing exposures to network congestion that is outside of their control.

In addition, the RRP would no longer be represented by a single node on the network but will be determined as the Volume Weighted Average Price (**VWAP**) of all locational prices, inclusive of dynamic losses.

What remains unclear from the proposed model is, if and, how loss factors (**LFs**) will continue to apply to the VWAP for individual connection points for large load customers. Aurizon Network notes that the AEMC's recent consideration of a rule change proposal for loss factors determined that the current marginal loss factor (**MLF**) arrangements should continue but the matter would be considered further through the COGATI review.

However, the draft model predominantly addresses the supply side impacts of the market reforms and largely defers consideration of demand side impacts.

Some important questions need to be considered including:

- If loss factors are not to be applied to the VWAP for non-scheduled load (i.e. the implied LF for all connection points is 1) then:
 - What transitional arrangements should be implemented to glide the LFs from MLFs which vary substantially from the regional median MLF to that median MLF and over what period? Should the transitional period be commensurate with the transition period of grandfathered Financial Transmission Rights (**FTRs**)?
 - What impact will the removal of the locational price signal provided by LFs have on energy market demand? For large directly connected load customers do the locational price signals in the locational component of Transmission Use of System (**TUOS**) charges replicate or achieve the intended locational price objectives on the demand side?
- If loss factors are to be applied to the VWAP to establish the wholesale energy price for individual non-scheduled load connection points then:
 - Should the dynamic losses applied to locational price be removed in determining the VWAP?
 - Should the LF be the marginal or average loss factor and how frequently should it be updated (i.e. dynamically, quarterly or annual)?
 - If the LF for VWAP differs from the dynamic loss factors for locational prices what implications does this have for revenue adequacy for FTRs?

Aurizon Network recommends that these matters be included in the design of the access reform model to provide certainty to non-scheduled load on the impacts of the proposed access reforms. Similarly, it may also be necessary to review the role and objectives of locational price signals to non-scheduled load given changes in network flow are being largely driven by the transformation of the generation market. The current transmission pricing methodologies are largely based on providing location price signals to customers under the historical network configurations and large thermal plants.

Furthermore, the benefits from the draft model quantified by NERA are largely market benefits, including competition benefits with wealth transfers from generators to consumers. It will be important for assessment of future transmission investment that these benefits are not duplicated in the market benefits for RIT-T assessments. As consumers assume the risks that the market benefits included in RIT-T assessments to support investment proposals will not materialise greater scrutiny will need to be undertaken on the robustness of those market benefits.

As transmission network investment will be substantially influenced by changes in the generation market future RIT-T assessments will increasingly be dependent on the quantum of market benefits. In this regard, the ESB should, as posited in the Consultation Paper, implement an

alternate model of direct generator investment in the transmission network and for ex-post evaluation of market benefits that would then allow for their inclusion in the shared transmission network cost base.

Thermal Plant Retirement

The Consultation Paper notes issues associated with the unplanned or unexpected exit of the thermal capacity from the market. Specifically, the ESB notes:

The uncertainty around timing of plant exit coupled with the risk of unexpected or unplanned exit may lead to investment uncertainty for both new generation investors, as well as uncertainty for AEMO as integrated system planner. It may also create risks of significant market and price volatility as investment lead times for new generation or essential system services can be significant.

The exit of generation is not in itself a problem. The challenge now is that the block nature of the tranches of capacity departing the grid may create gaps in dispatchable capacity (and erode available reserves), and departure of the essential services that are currently required to support the system.

Aurizon Network notes that the unplanned exit of thermal plant and lack of coordination of replacement locational capacity may also materially affect zonal supply and demand balances. This could trigger the need for substantial transmission investment and redistribute network costs between zones as the electrical flow on the network materially changes in response to those imbalances.

The following figure shows that thermal plant in Queensland is currently concentrated in South East and Central Queensland. The Gladstone and Central Queensland region thermal capacity represents 57.4% of total Queensland thermal capacity and 28.4% of total Queensland’s existing generation capacity. Therefore, the region is also currently a net energy exporter. This means that non-scheduled directly connected load customers in this region have low electrical distances. Under cost reflective transmission network pricing the locational price component of TUOS charges also represents a limited use of transmission infrastructure.

Figure 1. Queensland Thermal Plant Capacities

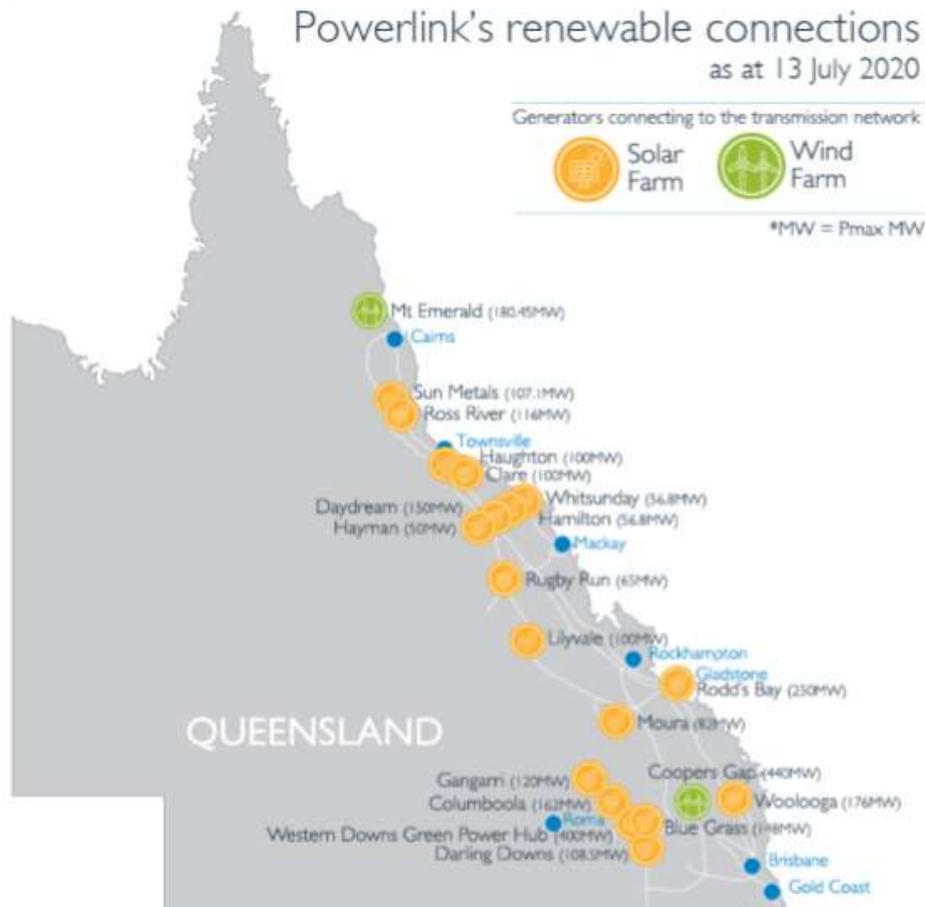


	Thermal Plant	Capacity (MW)
Central Queensland	Callide B	700
	Callide C	840
	Gladstone	1,680
	Stanwell	1,447
	Subtotal	4,667
South-east Queensland	Kogan Creek	744
	Millmerran	852
	Tarong	1,415
	Tarong North	450
	Subtotal	3,461
Total Thermal Capacity		8,128
<i>Total Generation Capacity</i>		<i>16,442</i>

The uncertainties associated with the unplanned or unexpected closure or reduction in thermal capacity in the Central Queensland region may reduce the incentives for coordinated investment in generation within Central Queensland. In other words, the sudden and unplanned reduction in generation capacity in the region may exceed the investment in replacement capacity.

The Queensland Government estimates that there is approximately 2.99GW of solar plant proposed in Central Queensland². However, Powerlink notes that only 332 MW of this capacity has entered into connection agreements³. This can be contrasted with the significant capacity installed or proposed in North and South Queensland.

Figure 2. Powerlink Renewable Connections



A material change in network flows associated with evolution in the generation mix could materially alter the locational prices for non-scheduled directly connected load customers in Central Queensland due to increased use of transmission infrastructure that is unrelated to changes in their own demand or consumption patterns. It is unclear from the Consultation Paper how the access reforms will coordinate the investment in generation to replace thermal plant as it retires and the implications for TUOS pricing associated with the loss of large tranches of capacity at a regional level. Given the scale of thermal plant capacity, the Integrated System Plan needs to consider levelling temporal variations in regional supply and demand balances as thermal capacity exits the market.

² Queensland Government (2020) <https://maps.dnrm.qld.gov.au/electricity-generation-map/> Accessed: 15 October 2020.

³ Powerlink (2020) Draft 2023-27 Revenue Proposal, p 9. <https://www.powerlink.com.au/sites/default/files/2020-09/2023-27%20Draft%20Revenue%20Proposal.pdf> Accessed: 15 October 2020.

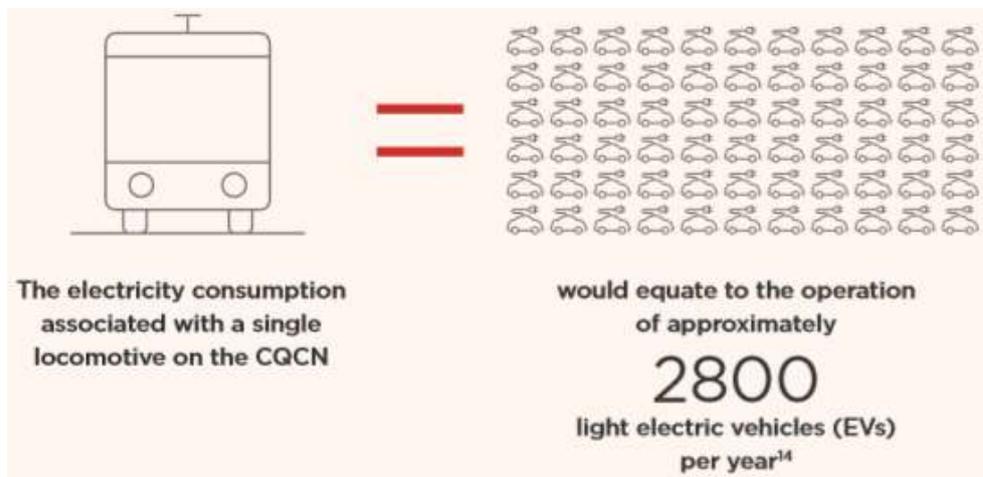
Aurizon Network therefore supports the ESB in developing measures to improve the certainty regarding the timing of thermal plant closure. In particular, the access pricing reforms and the cessation of transitional FTRs may significantly change the economics of thermal plants. However, further considerations should be given to the incentives to coordinate locational investment in replacement plant to promote improved alignment of regional supply and demand and avoid consequential inefficient transmission network augmentations.

In the absence of coordinated investment with thermal plant retirement non-scheduled direct load customers in Central Queensland could be subject to higher electricity costs associated with:

- An inefficient increase in the shared transmission network cost base:
- A progressive increased allocation of the shared transmission network cost base in locational TUOS (subject to side constraints) from the increased use of transmission network infrastructure; and
- An increase in loss factors, where applied, from an increase in electric distance.

These outcomes would adversely affect the affordability of Aurizon Network’s electric traction services and reduce the incentives for Aurizon Network’s customers to operate electric traction in preference to diesel powered locomotive alternatives. In this regard, the reduction in demand for a single electric traction locomotive from the CQCN would require an equivalent of 2800 light electric vehicles to achieve a comparable level of transport decarbonisation⁴.

Figure 3. Electric Locomotive Electricity Consumption Equivalence



The issue of affordability being given sufficient prominence in the market design process was also emphasised by the Chair of the ACCC stating in a recent speech⁵:

Building new transmission must factor in the increased costs that are then passed to consumers. There are real concerns that again affordability is being given inadequate weight in our electricity market policy discussions.

⁴ Aurizon (2020) Climate Strategy and Action Plan: Delivering a Sustainable Future, p.9

⁵ Sims, R. (2020) Speech to Australian Financial Review National Infrastructure Summit: Infrastructure beyond the crisis, 15 October, <https://www.accc.gov.au/speech/competition-issues-in-infrastructure-and-changes-since-covid-19>

Therefore, Aurizon Network recommends that the post 2025 market design review be expanded to consider not just the risks to consumers from the proposed market design but how the market design may impact different customer groups.

Should you have any questions in relation to this submission please contact Dean Gannaway via email at dean.gannaway@aurizon.com.au.

Kind regards,

[Original Signed]

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