

Developing the Northern Queensland Renewable Energy Zone

FINAL REPORT AND DETERMINATION

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Please direct enquiries to:

Roger Smith

Manager, Network and Alternate Solutions
Network and Business Development Division
Powerlink Queensland

Telephone: (+61 7) 3860 2328

Email: networkassessments@powerlink.com.au

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Executive Summary

Powerlink Queensland (Powerlink) is a Transmission Network Service Provider (TNSP) in the National Electricity Market (NEM) that owns, develops, operates and maintains Queensland's high-voltage electricity transmission network.

The publication of this Final Report and Determination (Final Report) concludes the funded augmentation consultation process undertaken by Powerlink in accordance with the requirements of the criteria and procedures set out in Sections 5.18 and 8.9 of the National Electricity Rules.

Initiating a path to Queensland's energy future

Our energy system is rapidly transforming, underpinned by much greater levels of Variable Renewable Energy (VRE) generation which continues to grow as technologies evolve and the uptake of distributed renewable energy resources such as rooftop solar increases.

As Queensland is rich in a diverse range of renewable resources – solar, wind, geothermal, biomass and hydro, it is an attractive location for large-scale VRE generation development projects, creating considerable interest from all over the world. This provides an opportunity for the efficient and coordinated development of renewable energy sources and associated electricity infrastructure in specified geographic areas known as Renewable Energy Zones (REZ).

In August 2020, the Queensland Government committed \$145 million to establish three REZ in Queensland. The Queensland Renewable Energy Zones (QREZ) will be located in Northern (which includes the Far North Queensland region), Central and Southern Queensland. This coordinated approach will safeguard Queensland's future by addressing energy transformation, deliver a reliable, secure and affordable energy supply to Queenslanders and support the Queensland Government's target of 50% renewable energy by 2030.

It was further announced in May 2021 that the Queensland Government would direct \$40 million of this committed funding in transmission line infrastructure to establish the Northern QREZ, with Neoen's Kaban Wind Farm identified as the foundational proponent. Powerlink has also committed \$5 million of regulated capital investment to the establishment of the QREZ, the benefits of which exceed Powerlink's commitment.

Developing the Northern QREZ Consultation

Powerlink commenced the first stage of the Developing the Northern Queensland Renewable Energy Zone funded augmentation consultation process in June 2021, issuing a Notice of Consultation (Notice) and Consultation Paper to the Australian Energy Market Operator (AEMO), Registered Participants and interested parties (Consulted Persons). Submissions closed on 6 August 2021.

The matter for consultation was to call for submissions in relation to the proposed augmentation to develop a Renewable Energy Zone in North Queensland and to seek feedback on whether there were any other matters which could reasonably be considered as part of the development of the Northern QREZ.

After an assessment of the submissions received and subsequent meetings with Consulted Persons, Powerlink commenced Stage 2, issuing the Draft Report and Determination (Draft Report) in late August 2021. Submissions to the Draft Report closed on 13 September 2021.

This Final Report is the third and final stage of the funded augmentation process.

Proposed transmission network augmentation works to establish the Northern QREZ

The proposed augmentation to develop the Northern QREZ is to establish a third 275kV connection into Woree Substation, with all associated works to commence Quarter 4 2021 and to be completed by November 2023. The scope of work includes:

- conversion of one side of the coastal 132kV double circuit transmission line to permanently operate at 275kV as the third transmission line between Ross and Woree substations with an associated line reactor at the Woree Substation end
- establishment of a 275kV bus at Woree Substation
- construction of a 275kV bay at Ross Substation and
- installation of a 275/132kV transformer at Tully Substation.

Engagement with Powerlink's Customer Panel

Powerlink works collaboratively with its Customer Panel who were made aware of the commencement of this consultation. As this is the first time a funded augmentation has been undertaken, Powerlink took the opportunity to discuss and clarify any questions with regard to consultation process.

Submissions received

Four submissions were received in response to the Notice and Consultation Paper (Stage 1), one of which was confidential.

All submissions received were supportive of the development of the Northern QREZ. More detailed discussion on the submissions and matters raised is noted within this Final Report.

The three non-confidential submissions from Bioenergy Australia, CS Energy and SolarCitizens, have been made available on Powerlink's website.

While no meetings were specifically requested by Consulted Persons as part of the consultation process, in order to provide context and enable meaningful conversations given their submissions, Powerlink held meetings with:

- SolarCitizens on 30 July 2021
- a confidential party on 18 August 2021.

Powerlink did not receive any submissions in response to the publication of the draft Final Report and Determination (Draft Report, Stage 2) which closed on 13 September 2021.

Conclusion

Based on the submissions received and consequent meetings with Consulted Persons during the consultation process, Powerlink has assessed that there are not any other matters which require consideration as part of the development of the proposed Northern QREZ.

Final determination

Given the technical and economic analysis undertaken and the positive and supportive nature of the submissions received and meetings undertaken during the consultation process, Powerlink considers that the proposed transmission network augmentation to increase the hosting capacity in North Queensland will provide an opportunity for the efficient and coordinated development of renewable energy sources in the region. In turn, this will encourage future growth in industry and employment and support local communities.

The development of the Northern QREZ will also provide a reliable, secure and affordable energy supply to Queenslanders while supporting the Queensland Government's target of 50% renewable energy by 2030.

Powerlink's draft determination, to enable the development of the Northern QREZ by establishing a third 275kV connection into Woree Substation by November 2023, has been adopted without change as the final determination.

1. Purpose and scope

Powerlink Queensland (Powerlink) is a Transmission Network Service Provider (TNSP) in the National Electricity Market (NEM) that owns, develops, operates and maintains Queensland's high-voltage electricity transmission network.

A funded augmentation is defined in the National Electricity Rules (Rules) as a transmission network augmentation for which the Transmission Network Service Provider (TNSP) is not entitled to receive regulated revenue. Given the proposed development of a Northern Queensland Renewable Energy Zone falls into this category as it is primarily funded by the Queensland Government, Powerlink is required to and welcomes the opportunity to undertake a public consultation which has been conducted in accordance with the criteria and procedures set out in Sections 5.18 and 8.9 of the Rules.

This consultation falls outside the bounds of the Regulatory Investment Test for Transmission (RIT-T) due to the external nature of the funding provided which will facilitate non-regulated opportunities and developments in Far North Queensland. This, in turn, will support the broader community in the region. Unlike the RIT-T, a funded augmentation consultation does not require a cost-benefit analysis to justify the project nor does it seek non-network or alternate solutions to replace or defer the proposed augmentation given the funding source¹.

This Final Report and Determination (Final Report) concludes the funded augmentation consultation process undertaken by Powerlink in accordance with the requirements of the criteria and procedures set out in Sections 5.18 and 8.9 of the National Electricity Rules (the Rules).

2. Introduction

Our energy system is rapidly transforming, underpinned by much greater levels of Variable Renewable Energy (VRE) generation which continues to grow as technologies evolve and the uptake of distributed renewable energy resources such as rooftop solar increases.

Queensland is rich in a diverse range of renewable resources – solar, wind, geothermal, biomass and hydro. This makes Queensland an attractive location for large-scale VRE generation development projects, creating considerable interest from all over the world. A more coordinated approach to the development of generation and transmission is the logical next step to more efficiently and economically address the challenge of energy transformation.

2.1 Renewable Energy Zones, a path to the energy future

The Rules describe a Renewable Energy Zone (REZ) as a geographic area proposed for the efficient development of renewable energy sources and associated electricity infrastructure². REZ development may involve expanding the transmission network into a REZ or augmenting the capacity of an existing transmission line to increase hosting capacity. This would then facilitate the connection of multiple VRE projects to the transmission network or enable the development of connection hubs to more economically support clusters of VRE projects through economies of scale.

Identifying optimal locations for potential REZ³ requires consideration of a range of criteria including:

- energy source potential
- infrastructure availability and access
- stakeholder and local authority support
- environmental suitability and
- economic and community benefits.

In addition, REZ are likely to be more cost effective than the creation of multiple connection paths to the transmission network as infrastructure sharing reduces the need for asset duplication.

Identifying REZ to establish priority areas for the development of VRE projects will enable transmission networks to better meet the needs and expectations of customers now and into the future.

¹ To enable the technical integration of the proposed QREZ into the transmission network, Powerlink has committed to \$5 million of capital works, which fall beneath the RIT-T cost threshold of \$6 million. The proposed regulated capital expenditure has been assessed as prudent given that the market benefits exceed the proposed expenditure.

² The Rules Version 166, 3 June 2021 page 540.

³ Although the REZ concept is aimed at identifying priority areas for development, it is not intended to preclude the development of VRE projects outside the targeted zones.

2.2 Queensland's strategy for developing Renewable Energy Zones

In August 2020 the Queensland Government committed \$145 million to establish three REZs in Queensland due to the availability of high quality renewable resources in those regions. The Queensland Renewable Energy Zones (QREZ) will be located in Northern (which includes the Far North Queensland region), Central and Southern Queensland.

Given the quality of wind resources available in Far North Queensland, resulting in high investor interest in the region, a Northern QREZ will encourage economic growth and ultimately assist in putting downward pressure on electricity prices. The strategic development of the proposed Northern QREZ provides an opportunity to optimise and coordinate investment in transmission and generation infrastructure in such a way as to support both industry and local communities in the region.

Moving forward, this strategic and coordinated approach to the development of QREZ will realise previously unidentified synergies between transmission and generation investment in Queensland. In turn, this will ensure a reliable, secure and affordable energy supply to Queenslanders while supporting the Queensland Government's target of 50% renewable energy by 2030.

3. Safeguarding Queensland's future by unlocking renewable energy potential

Powerlink has been working with the Queensland Government on strategies to identify opportunities to unlock renewable energy potential in Queensland. This is expected to facilitate a more diverse generation profile and lower the cost of connecting new VRE projects in the State. Development of the strategy included consideration of the existing transmission network topography in Far North Queensland, particularly the coastal 132kV double circuit transmission line between Ross and Woree substations which, with modification, has the potential to enable more hosting capacity for renewable generation.

In [May 2021](#) it was announced that the Queensland Government would direct \$40 million of the committed funding in transmission line infrastructure to establish a QREZ in North Queensland, with Neoen's Kaban Wind Farm identified as the foundational proponent. Powerlink has also committed approximately \$5 million of regulated capital investment to the establishment of the QREZ, the benefits of which exceed Powerlink's commitment.

The proposed transmission augmentation works are to energise one side of the existing 132kV coastal double circuit transmission line, originally constructed to accommodate transmission at 275kV. This results in the establishment of a third 275kV transmission line into Woree.

This coordinated approach to transmission and generation infrastructure development will:

- safeguard Queensland's future by addressing energy transformation
- deliver a reliable, secure and affordable energy supply to Queenslanders and
- support the Queensland Government's target of 50% renewable energy by 2030.

There are widespread benefits expected from the proposed coastal 275kV circuit upgrade including:

- releasing restricted operation of future generation
- increasing the generator hosting capacity by up to 500MW, opening up the Far North Queensland region for further investment⁴
- improving reliability to the Cairns area
- safeguarding Far North Queensland's electricity supply from the impacts of cyclonic conditions and
- enabling outages on the existing 275kV transmission lines north of the Ross Substation.

⁴ Without the coastal 275kV circuit upgrade future VRE generators (post Kaban Wind Farm) need additional investment in remediation to be compliant with their Generator performance Standards. These capital costs will significantly exceed the capital works that Powerlink is required to undertake as part of this upgrade.

4. Matter for consultation

The matter for consultation is to call for submissions in relation to the proposed augmentation to develop a Renewable Energy Zone in North Queensland and to seek feedback on whether there are any other matters which could reasonably be considered as part of the development of the Northern QREZ.

5. Developing the Northern QREZ consultation process

In June 2021, Powerlink Queensland (Powerlink) issued a Notice of Consultation “Developing the Northern Queensland Renewable Energy Zone” and Consultation Paper to the Australian Energy Market Operator (AEMO), Registered Participants and interested parties (Consulted Persons) commencing the first stage of consultation. Submissions closed on 6 August 2021.

After an assessment of the submissions received and subsequent meetings with Consulted Persons, Powerlink commenced Stage 2 of the consultation process, issuing the Draft Report and Determination (Draft Report) in late August 2021. Submissions to the Draft Report closed on 13 September 2021.

This Final Report is the third and final stage of the funded augmentation process which has been undertaken in accordance with the Rules consultation procedures⁵ (refer to Appendix A).

6. Engaging with our stakeholders and customers

As the Jurisdictional Planning Body responsible for transmission network planning in Queensland, Powerlink recognises the importance of engaging with a diverse range of customers and stakeholders who have the potential to affect, or be affected by, Powerlink activities and/or investments. In particular, Powerlink works collaboratively with its Customer Panel in the normal course of business.

Powerlink’s Customer Panel provides a face-to-face opportunity for customers and consumer representative bodies to give their input and feedback about Powerlink’s strategic direction, decision making, processes and methodologies. It also provides Powerlink with a valuable avenue to keep customers and stakeholders better informed, and to receive feedback about topics of relevance. As this is the first time a funded augmentation has been undertaken, Powerlink took the opportunity to discuss and clarify any questions with regard to the consultation process.

7. Submissions received

During the first stage of consultation, four submissions were received in response to the Notice and Consultation Paper, one of which was confidential. All non-confidential submissions are available on Powerlink’s website.

Powerlink did not receive any submissions in response to the draft Final Report during the second stage of consultation, which closed on 13 September 2021.

7.1 Summary of submissions received

Bioenergy Australia

Bioenergy Australia’s submission is very supportive of the development of the Northern QREZ and other renewable energy zones in Queensland to facilitate the development of bioenergy, given the State’s considerable bioenergy resources.

Bioenergy Australia’s submission discusses the environmental, economic and regional opportunities and benefits anticipated as a result of the development of biofuelled electricity generation in Queensland and more broadly nationally. The submission also explores the existing barriers and the policy instruments which Bioenergy Australia consider will activate the development of bioenergy.

Powerlink supports the development of all types of energy projects requiring connection to the transmission network in Queensland and welcomes the support for the development of the Northern QREZ offered in Bioenergy Australia’s submission. Given the broader context of the matters discussed in the submission, in particular the development of a Commonwealth Bioenergy Roadmap, Powerlink has strongly encouraged Bioenergy Australia to also lodge a submission with the Queensland Government as part of its public consultation on Queensland Renewable Energy Zones.

⁵ Refer to Section 8.9 of the Rules.

CS Energy

CS Energy supports the proposed transmission augmentation and recognizes the opportunities it provides in terms of unlocking the potential for new generation in the region as well as improving reliability of supply and increasing network resilience to Cairns and the surrounding communities.

CS Energy, a government owned corporation, supports the approach to the development of REZs 'with the onus on individual assets to fund connection to the network and remaining technology agnostic' noting that 'any learnings should be mirrored' in other QREZs. In addition, given that some regulated funding is associated with the development of the Northern QREZ, CS Energy encouraged transparency in the funded augmentation process.

As mentioned, Powerlink continues to support the development of all types of energy projects requiring connection to the transmission network in Queensland, including VRE projects. While the development of REZ increases the commercial attractiveness for new generation to connect in certain areas, the Rules set out the obligations, connection and access process and charging mechanism⁶ which ensures that network connections costs are borne by the connecting party, protecting the interests of electricity consumers.

Powerlink welcomes the comment regarding the importance of transparency in this public consultation process and Section 8 provides additional information on the regulated funding component of the Northern QREZ.

SolarCitizens

SolarCitizens support the development of a Northern QREZ, although expressed concern that the proposed increase in capacity may not be sufficient to meet the anticipated growing demand in North Queensland.

On 30 July 2021 Powerlink met with SolarCitizens to discuss:

- the approach to the development of a Northern QREZ
- to clarify and share Powerlink's technical knowledge about the anticipated hosting capacity resulting from the proposed augmentation works set out in this consultation and
- how the proposed augmentation relates to the 2020 ISP future projects.

Powerlink explained the benefits of this investment in that it:

- utilises the latent capacity of the existing transmission network to increase hosting capacity and provides additional reliability of supply to Cairns
- has a relatively short implementation timeframe, and does not preclude additional investments to further increase capacity where justified
- allows for the connection of a foundational proponent.

Powerlink welcomed the opportunity to respond to questions and explain various elements of the investment while obtaining valuable customers' perspectives.

Confidential submission

Powerlink received a further supportive and confidential submission for the development of renewable energy resources in the Northern QREZ. Powerlink also held a meeting with the submitter to provide context to the consultation process and planning processes more broadly.

8. Description of the Northern Renewable Energy Zone

The proposed augmentation to develop the Northern QREZ (Refer to Figure 1) is to establish a third 275kV connection into Woree Substation, with all associated works to commence Quarter 4 2021 and to be completed by November 2023. The scope of work includes:

- conversion of one side of the coastal 132kV double circuit transmission line to permanently operate at 275kV as the third transmission line between Ross Woree
- construction of a 275kV bay at Ross Substation
- installation of a 275/132kV transformer at Tully Substation
- installation of a 275kV busbar at Woree Substation with associated bays and a line reactor.

⁶ Refer to Chapter 5 Part B and Chapter 6A of the Rules.

The regulated capital cost of these works is estimated at approximately \$5 million. This falls beneath the RIT-T cost threshold of \$6 million. Powerlink has assessed the cost in accordance with its obligations under the Rules that all proposed augmentations provide a net economic benefit to all those who produce, consume and transport electricity in the market⁷.

Without the 275kV upgrade, future VRE generators (post Kaban Wind Farm) will require additional investment in remediation to be compliant with Generator Performance Standards. In this context, the proposed capital expenditure has been assessed as prudent given that the benefits to the electricity market (as a whole) significantly exceed the cost of the capital works that Powerlink is required to undertake as part of this upgrade. Further, the market benefits associated with reduced network losses and improved reliability of supply to Cairns⁸ are expected to result in additional benefits. Collectively, these will deliver positive long term benefits to electricity consumers.

Figure 1 Northern Queensland Renewable Energy Zone

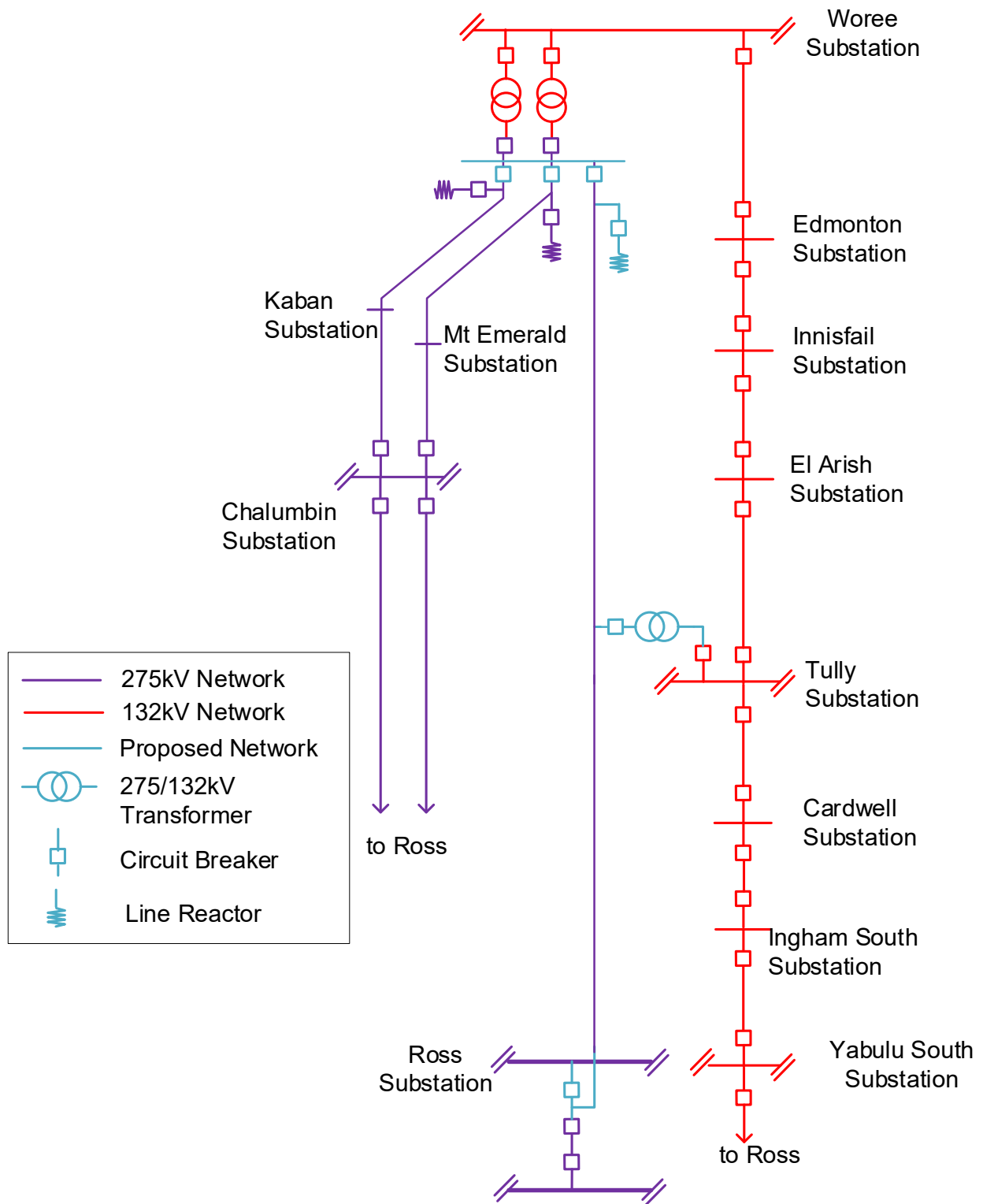


⁷ Refer to the Rules Clause 5.12.1(b)(4).

⁸ Especially during severe storm activity where double circuit outages may occur and cyclone events.

The proposed transmission network topography is shown in Figure 2.

Figure 2 Proposed transmission network topography



9. Final determination

Given the technical and economic analysis undertaken and the positive and supportive nature of the submissions received and meetings undertaken as part of the consultation, Powerlink considers that the proposed transmission network augmentation to increase the hosting capacity in North Queensland will provide an opportunity for the efficient and coordinated development of renewable energy sources in the region. In turn, this will encourage future growth in industry and employment and support local communities.

The development of the Northern QREZ will also provide a reliable, secure and affordable energy supply to Queenslanders while supporting the Queensland Government's target of 50% renewable energy by 2030.

Powerlink's draft determination, to enable the development of the Northern QREZ by establishing a third 275kV connection into Woree Substation by November 2023, has been adopted without change as the final determination.

Powerlink will now proceed with the necessary processes to implement this final determination, with works to commence in Quarter 4 2021.

Appendix A The funded augmentation process

Figure A1: Funded augmentation consultation process



Appendix B Funded augmentation technical requirements

The proposed augmentation maintains existing compliance obligations

Powerlink considers the proposed augmentation does not result in non-compliance with obligations in relation to other Transmission Network Users under the Rules⁹. It is expected the Northern QREZ will deliver positive benefits to Transmission Network Users¹⁰ and the broader community by facilitating the development of high quality renewable energy resources and drive economic growth in the region.

Assessment of internetwork impacts

Powerlink considers the proposed augmentation is not likely to have a material internetwork impact¹¹ based on AEMO's criteria¹² and discussion with TransGrid. As a result, an augmentation technical report from AEMO was not required as part of the First Stage of Consultation¹³.

Appendix C Summary of the consultation process

Table 1: Summary of the consultation process	Date
Publication of Notice of Consultation and Consultation Paper	28 June 2021
Closing date for submissions in response to the Notice and Consultation Paper	6 August 2021
Publication of Draft Report	26 August 2021
Close date for submissions in response to the Draft Report	13 September 2021
Publication of Final Report	17 September 2021

⁹ Clause 5.18(b)(2) of the Rules.

¹⁰ Refers to those parties such as customers, generators and Network Service Providers directly connected to the transmission network, defined in Chapter 10 (Glossary) in the Rules.

¹¹ Clause 5.18(b)(3) of the Rules.

¹² Section 5.7.7 of the Rules.

¹³ Clause 5.18(b)(3) of the Rules.

Contact us

Registered office 33 Harold St Virginia
Queensland 4014 Australia
ABN 82 078 849 233

Postal address GPO Box 1193 Virginia
Queensland 4014 Australia

Telephone (+617) 3860 2111
(during business hours)

Website www.powerlink.com.au

Social media    

