



## CHAPTER II

# Current, recently commissioned and committed network developments

### II.1 Transmission network

# II Current, recently commissioned and committed network developments

## Key highlights

- During 2021/22, Powerlink's delivery efforts have continued to be predominantly directed towards reinvestment in transmission lines and substations across Powerlink's network.
- Powerlink's investment program is focused on reducing the identified risks arising from assets reaching the end of technical service life and maintaining network resilience while continuing to deliver safe, reliable and cost efficient transmission services to our customers.
- Major projects completed since publication of the 2021 Transmission Annual Planning Report (TAPR), such as the line refit works on the 132kV transmission line between Egans Hill and Rockhampton substations, Mackay Substation replacement, Gin Gin Substation rebuild and Ashgrove West Substation replacement, continue to ensure the safe and reliable supply of electricity to townships, local communities, industry and businesses across Queensland.
- Powerlink continues to support the development of all types of energy projects requiring connection to the transmission network in Queensland, with connection works for 1,640MW of variable renewable energy (VRE) generation developments and a Battery energy storage system (BESS) underway at the time of 2022 TAPR publication.
- During 2021/22, Powerlink has completed four projects to connect new VRE developments which are expected to add 528MW of potential generation capacity to the grid<sup>1</sup>.

## II.1 Transmission network

Powerlink Queensland's network traverses 1,700km from north of Cairns to the New South Wales (NSW) border. The Queensland transmission network comprises transmission lines constructed and operated at 330kV, 275kV, 132kV and 110kV. The 275kV transmission network connects Cairns in the north to Mudgeeraba in the south, with 110kV and 132kV systems providing transmission in local zones and providing support to the 275kV network. A 330kV network connects the New South Wales (NSW) transmission network to Powerlink's 275kV network at Braemar and Middle Ridge substations.

A geographic representation of Powerlink's transmission network is shown in Figure 11.1.

There have been no transmission network developments commissioned (augmentation works) or network assets retired<sup>2</sup> since Powerlink's 2021 TAPR was published.

Table 11.1 lists connection works commissioned since Powerlink's 2021 TAPR was published.

Table 11.2 lists new transmission connection works for generating systems which are committed and under construction at October 2022. These connection projects resulted from agreement reached with relevant connected customers, generators or Distribution Network Service Providers (DNSPs) as applicable.

Table 11.3 list network developments which are committed at October 2022.

Table 11.4 lists network reinvestments commissioned since Powerlink's 2021 TAPR was published.

Table 11.5 lists network reinvestments which are committed at October 2022.

Table 11.6 lists network investments which have undergone the Regulatory Investment Test for Transmission (RIT-T) or similar process and are not fully committed at October 2022.

Table 11.7 lists asset retirement works at October 2022.

<sup>1</sup> Refer to [Table 11.1](#).

<sup>2</sup> Operational works, such as asset retirements, do not form part of Powerlink's capital expenditure budget.

**Table II.1** Commissioned connection works since October 2021

Project (1)	Purpose	Zone	Date commissioned
Kaban Green Power Hub	New Wind Farm	Far North	Quarter 3 2022
Moura Solar Farm	New Solar Farm	Central West	Quarter 4 2021
Bluegrass Solar Farm	New Solar Farm	Surat	Quarter 3 2022
Edenvale Solar Farm	New Solar Farm	Surat	Quarter 3 2022

Note:

- (1) When Powerlink constructs a new line or substation as a non-regulated customer connection (e.g. generator, renewable generator, mine or industrial development), the costs of acquiring easements, constructing and operating the transmission line and/or are paid for by the company making the connection request.

**Table II.2** Committed and under construction connection works at October 2022

Project (1)	Purpose	Zone	Proposed commissioning date
Kidston Pumped Storage Hydro	New pumped hydro energy storage	Ross	Quarter 2 2024
Clarke Creek Wind Farm	New Wind Farm	Central West	Quarter 3 2023
Bouldercombe BESS	New BESS	Gladstone	Quarter 2 2023
Wandoan Solar Farm	New Solar Farm	Surat	Quarter 4 2022

Notes:

- (1) When Powerlink constructs a new line or substation as a non-regulated customer connection (e.g. generator, renewable generator, mine or industrial development), the costs of acquiring easements, constructing and operating the transmission line and/or are paid for by the company making the connection request.
- (2) At the time of publication of the 2022 TAPR, Powerlink has signed an agreement for the construction of assets for the connection of the MacIntyre Wind Precinct proposed renewable development to the transmission network in south-west Queensland. Refer to Section 6.6.3.

**Table II.3** Committed network developments at October 2022

Project	Purpose	Zone	Proposed commissioning date
Establishment of a 3rd 275kV connection into Woree	Enable development of the Northern Queensland Renewable Energy Zone and increase supply reliability in the Far North zone	Far North	November 2023
Broadsound 275kV bus reactor	Maintain voltages in the Central West zone	Central West	August 2023

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**Table II.4** Commissioned network reinvestments since October 2021

Project	Purpose	Zone	Date commissioned
Life extension works on the 132kV transmission line between Barron Gorge and Kamerunga substations	Maintain supply reliability in the Far North zone	Far North	December 2021
Mackay Substation replacement	Maintain supply reliability in the North zone	North	November 2021
Bouldercombe transformer replacement	Maintain supply reliability in the Central West zone (3)	Central West	September 2021
Moura Substation replacement	Maintain supply reliability in the Central West zone (1)	Central West	December 2021
Line refit works on the 132kV transmission line between Egans Hill and Rockhampton substations	Maintain supply reliability in the Central West zone (2)	Central West	March 2022
Calliope River 275kV tower refit	Maintain supply reliability in the Gladstone zone	Gladstone	November 2021
Gin Gin Substation rebuild	Maintain supply reliability in the Wide Bay zone (4)	Wide Bay	November 2021
Ashgrove West Substation replacement	Maintain supply reliability in the Moreton zone (2)(3)(4)	Moreton	July 2021
Belmont 275kV secondary systems replacement	Maintain supply reliability in the Moreton zone (2)	Moreton	February 2022

Notes:

- (1) Major works were completed in October 2017. Minor works were coordinated with Energy Queensland (Energex and Ergon Energy are part of the Energy Queensland Group) and have now been completed.
- (2) Projects impacted by restrictions related to COVID-19.
- (3) Formal notification of project commissioning coincided with the publication of the 2021 TAPR.
- (4) Project identified under the RIT-T transitional arrangements in place for committed projects between 18 September 2017 and 30 January 2018.

**Table 11.5** Committed network reinvestments at October 2022

Project	Purpose	Zone	Proposed commissioning date
Woree SVC secondary systems replacement	Maintain supply reliability in the Far North zone	Far North	December 2023
Woree secondary systems replacement	Maintain supply reliability in the Far North zone	Far North	October 2024
Chalumbin secondary systems replacement	Maintain supply reliability in the Far North zone	Far North	October 2025
Cairns secondary systems replacement	Maintain supply reliability in the Far North zone	Far North	December 2027
Garbutt configuration change	Maintain supply reliability in the Ross zone	Ross	May 2023
Line refit works on the 132kV transmission line between Townsville South and Clare South substations	Maintain supply reliability in the Ross zone	Ross	November 2023
Townsville South 132kV primary plant replacement	Maintain supply reliability in the Ross zone	Ross	October 2025
Townsville South secondary systems replacement Stage 1	Maintain supply reliability in the Ross zone	Ross	October 2025
Ross 275/132kV transformers life extension	Maintain supply reliability in the Ross zone	Ross	October 2025
Ross 275kV primary plant replacement	Maintain supply reliability in the Ross zone	Ross	November 2025
Ross 132kV primary plant replacement	Maintain supply reliability in the Ross zone	Ross	November 2025
Line refit works on the 132kV transmission line between Eton tee and Alligator Creek substations	Maintain supply reliability in the North zone (1)	North	June 2023
Strathmore 132kV secondary systems replacement	Maintain supply reliability in the North zone	North	December 2023
Strathmore 275/132kV transformer establishment	Maintain supply reliability in the North zone	North	December 2023
Nebo primary plant and secondary systems replacement	Maintain supply reliability in the North zone (2)	North	June 2024
Nebo 132/11kV transformer replacements	Maintain supply reliability in the North zone	North	June 2024
Kemmis secondary systems replacement	Maintain supply reliability in the North zone	North	October 2024
Newlands 132kV primary plant replacement	Maintain supply reliability in the North zone	North	January 2026
Baralaba secondary systems replacement	Maintain supply reliability in the Central West zone	Central West	January 2023
Dysart 132/66kV transformers replacement	Maintain supply reliability in the Central West zone (1)	Central West	June 2023

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**Table 11.5** Committed network reinvestments at October 2022 (*continued*)

Project	Purpose	Zone	Proposed commissioning date
Bouldercombe primary plant replacement	Maintain supply reliability in the Central West zone	Central West	June 2023
Calvale and Callide B secondary systems replacement	Maintain supply reliability in the Central West zone (1) (2)(3)	Central West	December 2023
Blackwater 66kV CT and VT replacement	Maintain supply reliability in the Central West zone	Central West	December 2023
Blackwater 132/66kV transformers replacement	Maintain supply reliability in the Central West zone	Central West	December 2024
Lilyvale 132/66kV transformers replacement	Maintain supply reliability in the Central West zone (2)	Central West	October 2025
Lilyvale 275kV and 132kV primary plant replacement	Maintain supply reliability in the Central West zone (2)	Central West	November 2026
Wurdong secondary systems replacement	Maintain supply reliability in the Gladstone zone	Gladstone	December 2023
Boyne Island secondary systems replacement	Maintain supply reliability in the Gladstone zone	Gladstone	December 2023
Gladstone South secondary systems replacement	Maintain supply reliability in the Gladstone zone	Gladstone	May 2026
Egans Hill secondary systems replacement	Maintain supply reliability in the Gladstone zone	Gladstone	November 2024
QAL West secondary systems replacement	Maintain supply reliability in the Gladstone zone	Gladstone	May 2026
Line refit works on 275kV transmission line between Woolooga and Palmwoods	Maintain supply reliability in the Wide Bay zone (1)	Wide Bay	March 2023
Tarong secondary systems replacement	Maintain supply reliability in the South West zone (1) (2)	South West	December 2022
Abermain 110kV secondary systems replacement	Maintain supply reliability in the Moreton zone(2)	Moreton	September 2023
Palmwoods 275kV secondary systems replacement	Maintain supply reliability in the Moreton zone (2)	Moreton	December 2022
Line refit works on the 110kV transmission lines between South Pine and Upper Kedron	Maintain supply reliability in the Moreton zone	Moreton	July 2023
Line refit works on the 110kV transmission lines between West Darra and Sumner	Maintain supply reliability in the Moreton zone	Moreton	August 2023
Line refit works on the 110kV transmission lines between Rocklea and Sumner	Maintain supply reliability in the Moreton zone	Moreton	September 2023
Mt England 275kV secondary systems replacement	Maintain supply reliability in the Moreton zone	Moreton	August 2024

**Table 11.5** Committed network reinvestments at October 2022 (*continued*)

Project	Purpose	Zone	Proposed commissioning date
Mudgeeraba 275kV secondary systems replacement	Maintain supply reliability in the Gold Coast zone	Gold Coast	December 2024

Notes:

- (1) Project identified under the RIT-T transitional arrangements in place for committed projects between 18 September 2017 and 30 January 2018.
- (2) Projects impacted by restrictions related to COVID-19. A number of projects have also been deferred 12+ months.
- (3) The majority of Powerlink's staged works are anticipated for completion by summer 2023. Remaining works associated with generation connection will be coordinated with the customer.

**Table 11.6** Uncommitted network investments at October 2022

Project	Purpose	Zone	Proposed commissioning date
Line refit works on the 275kV transmission lines between Chalumbin and Woree substations (section between Davies Creek and Bayview Heights)	Maintain supply reliability to the Far North and Ross zones (1)	Far North	July 2025
Kamerunga 132kV Substation replacement	Maintain supply reliability in the Far North zone (1)(2)	Far North	December 2027
Innisfail secondary systems replacement	Maintain supply reliability in the Far North zone (1)	Far North	June 2028
Chinchilla 132kV Substation replacement	Maintain supply reliability in the South West zone (1)	South West	December 2025
Tarong 275/66kV transformers and selected primary plant replacement	Maintain supply reliability in the South West zone (1)	South West	December 2025
Redbank Plains 110/11kV transformers and selected primary plant replacement	Maintain supply reliability in the Moreton zone (1)	Moreton	October 2025

Notes:

- (1) Capital expenditure in relation to network asset replacement.
- (2) RIT-T has been completed. During detailed design and delivery planning it was identified that the staging required to deliver the works were not feasible and alternative options are being investigated. Further information will be available in the 2023 TAPR.

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**Table II.7** Asset retirement works at October 2022 (1)

Project	Purpose	Zone	Proposed retirement date
Cairns 132/22kV Transformer 4 retirement	Removal of asset at the end of technical life in the Far North zone	Far North	December 2027
132kV transmission line retirement between Townsville South and Clare South substations	Removal of assets at the end of technical life in the Ross zone	Ross	June 2028
Tarong 275/132kV transformers retirement	Removal of assets at the end of technical life in the South West zone	South West	June 2024
Belmont 275/110kV Transformer 2 decommissioning	Removal of asset at the end of technical life in the Moreton zone	Moreton	March 2023
Belmont 275/110kV Transformer 3 decommissioning	Removal of asset at the end of technical life in the Moreton zone	Moreton	December 2023
Mudgeeraba 275/110kV Transformer 3 retirement	Removal of asset at the end of technical life in the Gold Coast zone	Gold Coast	June 2025

Note:

(1) Operational works, such as asset retirements, do not form part of Powerlink's capital expenditure budget.



Figure 11.1 Existing Powerlink Queensland transmission network October 2022



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