

CHAPTER II

Current, recently commissioned and committed network developments

II.1 Transmission network

II Current, recently commissioned and committed network developments

Key highlights

- During 2020/21, Powerlink's efforts have continued to be predominantly directed towards reinvestment in transmission lines and substations across Powerlink's network.
- Powerlink's investment program is focussed 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.
- A major project for Powerlink completed since publication of the 2020 Transmission Annual Planning Report (TAPR) has been the Callide A / Calvale 132kV transmission reinvestment which is critical to transporting power to the Central West area.
- Powerlink continues to support the development of all types of energy projects requiring connection to the transmission network in Queensland, with several connection works for variable renewable energy (VRE) generation completed during 2020/21.
- During 2020/21, Powerlink has completed five projects to connect new VRE and battery energy storage system (BESS) developments which are expected to add 958MW of potential generation capacity to the grid¹.

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 retired² since Powerlink's 2020 TAPR was published.

Table 11.1 lists new connection works commissioned since Powerlink's 2020 TAPR was published.

Table 11.2 lists new transmission connection works for generating systems which are committed and under construction at October 2021. 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 2021.

Table 11.4 lists network reinvestments commissioned since Powerlink's 2020 TAPR was published.

Table 11.5 lists network reinvestments which are committed at October 2021.

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 2021.

Table 11.7 lists asset retirement works at October 2021.

¹ Refer to Table 11.1.

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

Table II.1 Commissioned connection works since October 2020

Project (1)	Purpose	Zone	Date commissioned
Woolooga Energy Park Solar Farm	New solar farm (2)	Wide Bay	Quarter 3 2021
Gangarri Solar Farm	New solar farm	Surat	Quarter 4 2020
Columboola Solar Farm	New solar farm (2)	Surat	Quarter 2 2021
Wandoan South Battery	New Battery Energy Storage System (BESS)	Surat	Quarter 2 2021
Western Downs Green Power Hub Solar Farm	New solar farm (2)	Bulli	Quarter 3 2021

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) Powerlink's scope of works for this project has been completed. Remaining works associated with generation connection are being coordinated with the customer.

Table II.2 Committed and under construction connection works at October 2021

Project (1)	Purpose	Zone	Proposed commissioning date
Kaban Green Power Hub	New wind farm	Far North	Quarter 3 2022
Kidston Pumped Storage Hydro	New pumped hydro energy storage	Far North	Quarter 1 2024
Moura Solar Farm	New solar farm	Central West	Quarter 4 2021
Bluegrass Solar Farm	New solar farm	Surat	Quarter 4 2021
Edenvale Solar Farm	New solar farm	Bulli	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.3 Committed network developments at October 2021

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

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Table II.4 Commissioned network reinvestments since October 2020

Project	Purpose	Zone	Date commissioned
Dan Gleeson 132kV secondary systems replacement	Maintain supply reliability in the Ross zone	Ross	August 2020 (1)
Ingham South 132/66kV transformers replacement	Maintain supply reliability in the Ross zone	Ross	August 2021
Kemmis 132/66kV transformer replacement	Maintain supply reliability in the North zone	North	December 2020
Callide A / Calvale 132kV transmission reinvestment	Maintain supply reliability in the Central West zone (2)(3)	Central West	July 2021

Notes:

- (1) Formal notification of project commissioning coincided with the publication of the 2020 TAPR.
- (2) Project identified under the RIT-T transitional arrangements in place for committed projects between 18 September 2017 and 30 January 2018.
- (3) Approved works for this project were re-scoped as part of the Central West Queensland Strategy, previously named Callide A Substation replacement.

Table 11.5 Committed network reinvestments at October 2021

Project	Purpose	Zone	Proposed commissioning date
Woree secondary systems replacement	Maintain supply reliability in the Far North zone	Far North	October 2023
Woree SVC secondary systems replacement	Maintain supply reliability in the Far North zone	Far North	December 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 I	Maintain supply reliability in the Ross zone	Ross	October 2025
Ross 275kV primary plant replacement	Maintain supply reliability in the Ross zone	Ross	November 2024
Ross 132kV primary plant replacement	Maintain supply reliability in the Ross zone	Ross	December 2025
Line refit works on the 132kV transmission line between Eton tee and Alligator Creek Substation	Maintain supply reliability in the North zone (1)	North	June 2023
Mackay Substation replacement	Maintain supply reliability in the North zone (5)	North	November 2021
Strathmore 132kV secondary systems replacement	Maintain supply reliability in the North zone	North	November 2021
Strathmore 275/132kV transformer establishment	Maintain supply reliability in the North zone	North	May 2023
Nebo primary plant and secondary systems replacement	Maintain supply reliability in the North zone (5)	North	June 2024
Kemmis 132kV secondary systems replacement	Maintain supply reliability in the North zone	North	October 2024
Newlands primary plant replacement	Maintain supply reliability in the North zone	North	January 2026
Line refit works on the 132kV transmission line between Egans Hill and Rockhampton Substation	Maintain supply reliability in the Central West zone (5)	Central West	November 2021
Lilyvale 132/66kV transformers replacement	Maintain supply reliability in the Central West zone (5)	Central West	September 2024
Calvale and Callide B secondary systems replacement	Maintain supply reliability in the Central West zone (1)(3)(4)	Central West	December 2023
Moura Substation replacement	Maintain supply reliability in the Central West zone (2)	Central West	December 2021
Bouldercombe transformer replacement	Maintain supply reliability in the Central West zone	Central West	December 2021

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Table II.5 Committed network reinvestments at October 2021 (*continued*)

Project	Purpose	Zone	Proposed commissioning date
Blackwater 66kV CT & VT replacement	Maintain supply reliability in the Central West zone	Central West	December 2023
Blackwater 132kV transformers replacement	Maintain supply reliability in the Central West zone	Central West	December 2024
Dysart transformer replacement	Maintain supply reliability in the Central West zone (1)	Central West	June 2022
Lilyvale 275kV and 132kV primary plant replacement	Maintain supply reliability in the Central West zone (4)	Central West	November 2026
Bouldercombe primary plant replacement	Maintain supply reliability in the Central West zone	Central West	June 2023
Baralaba secondary systems replacement	Maintain supply reliability in the Central West zone	Central West	January 2023
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
Calliope River 275kV tower refit	Maintain supply reliability in the Gladstone zone	Gladstone	November 2021
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	September 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	November 2021
Gin Gin Substation rebuild	Maintain supply reliability in the Wide Bay zone (1)	Wide Bay	March 2022
Tarong secondary systems replacement	Maintain supply reliability in the South West zone (1) (4)	South West	December 2022
Ashgrove West Substation replacement	Maintain supply reliability in the Moreton zone (1)(4)	Moreton	June 2022
Belmont 275kV secondary systems replacement	Maintain supply reliability in the Moreton zone (4)	Moreton	November 2021
Abermain 110kV secondary systems replacement	Maintain supply reliability in the Moreton zone(4)	Moreton	May 2022
Palmwoods 275kV secondary systems replacement	Maintain supply reliability in the Moreton zone (4)	Moreton	October 2022
Line refit works on the 110kV transmission lines between South Pine and Upper Kedron	Maintain supply reliability in the Moreton zone	Moreton	July 2022

Table 11.5 Committed network reinvestments at October 2021 (*continued*)

Project	Purpose	Zone	Proposed commissioning date
Line refit works on the 110kV transmission lines between West Darra and Sumner	Maintain supply reliability in the Moreton zone	Moreton	February 2023
Line refit works on the 110kV transmission lines between Rocklea and Sumner	Maintain supply reliability in the Moreton zone	Moreton	March 2023
Swanbank E Secondary Systems Replacement	Maintain supply reliability in the Moreton zone	Moreton	July 2022
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) Major works were completed in October 2017. Minor works scheduling is being coordinated with Ergon Energy (Energex and Ergon Energy are part of the Energy Queensland Group).
- (3) The majority of Powerlink's staged works are anticipated for completion by summer 2020/21. Remaining works associated with generation connection will be coordinated with the customer.
- (4) Projects impacted by restrictions related to COVID-19. A number of projects have also been deferred 12+ months.

Table 11.6 Uncommitted network investments at October 2021

Project	Purpose	Zone	Proposed commissioning date
Cairns secondary systems replacement	Maintain supply reliability in the Far North zone (1)	Far North	December 2024
Kamerunga 132kV Substation replacement	Maintain supply reliability in the Far North zone (1)	Far North	December 2026
Broadsound 275kV bus reactor	Maintain voltages in the Central West zone (2)	Central West	June 2023
Mt England 275kV secondary systems replacement	Maintain supply reliability in the Moreton zone (1)	Moreton	October 2023

Notes:

- (1) Capital expenditure in relation to network asset replacement.
- (2) Capital expenditure in relation to the establishment of new network assets (augmentation).

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Table II.7 Asset retirement works at October 2021 (1)

Project	Purpose	Zone	Proposed retirement date
132kV transmission line retirement between Townsville South and Clare South substations	Removal of assets at the end of technical life in the North zone	North	June 2023
Belmont 275/110kV Transformer 2 decommissioning	Removal of asset at the end of technical life in the Moreton zone	Moreton	July 2022
Belmont 275/110kV Transformer 3 decommissioning	Removal of asset at the end of technical life in the Moreton zone	Moreton	February 2022
Mudgeeraba 275/110kV Transformer 3 retirement	Removal of asset at the end of technical life in the Gold Coast zone	Gold Coast	June 2022

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 2021



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