



Transmission Annual Planning Report 2023

Stewart Bell
Executive General Manager
Network and Business Development

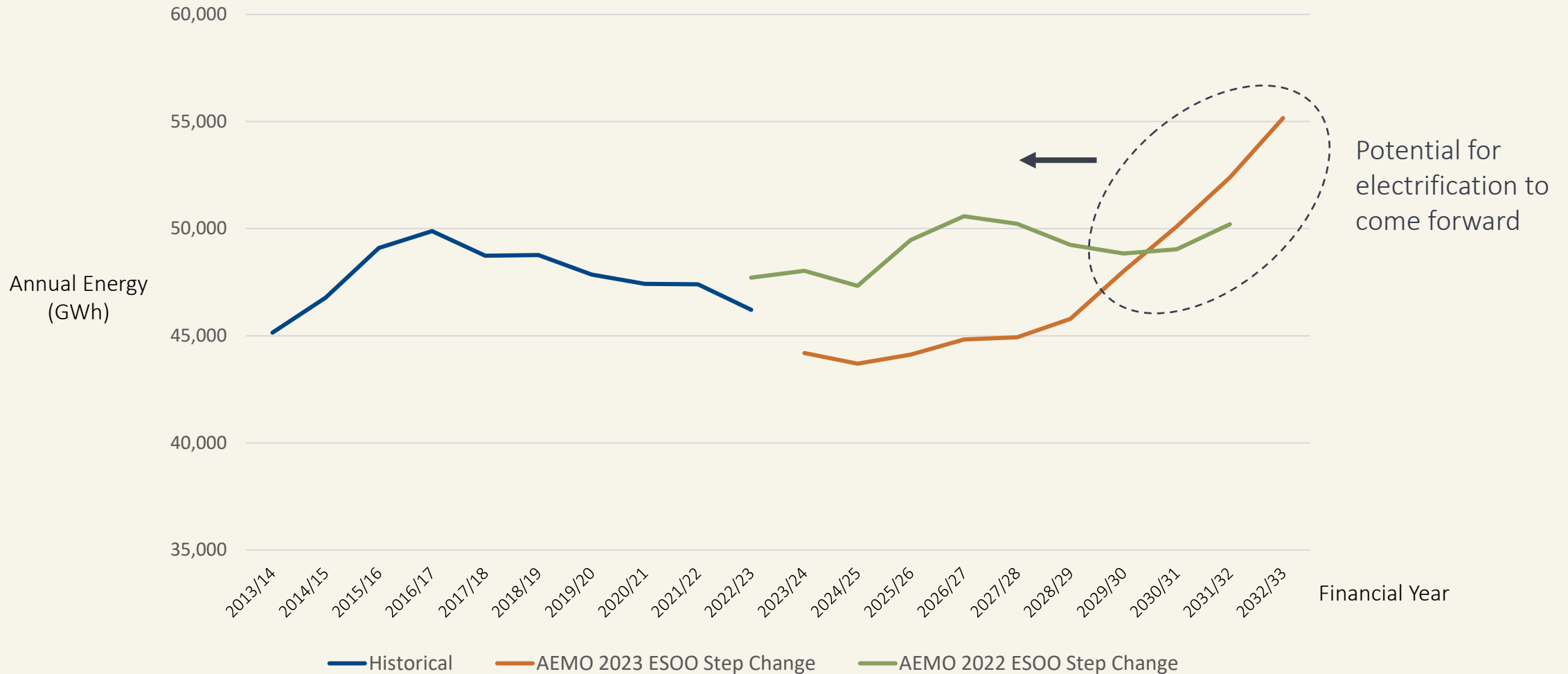


Guiding the market

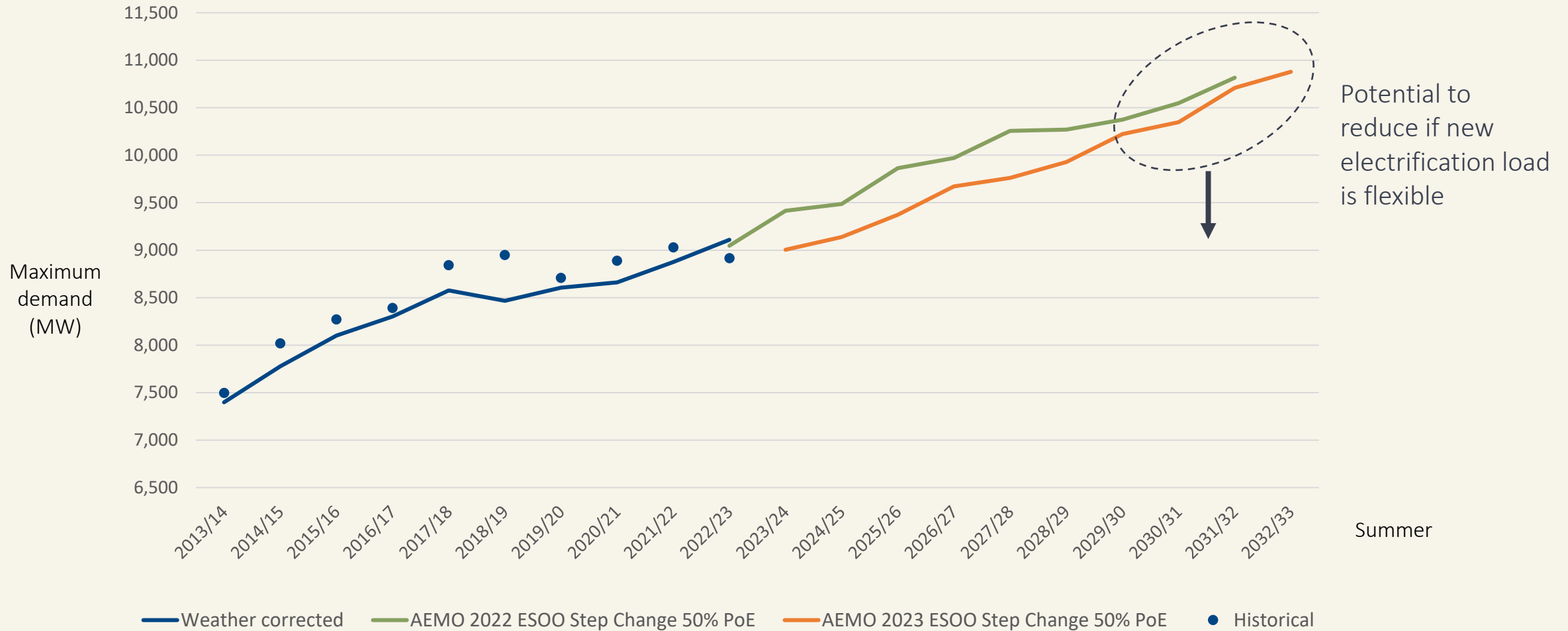
- Playing an active role in shaping the future power system and strategically planning the transmission network to enable 80% renewables by 2035
- Continuing to work closely with the Queensland Government in actioning the Queensland Energy and Jobs Plan (QEJP) and the establishment of Renewable Energy Zones (REZ)
- Working closely with load and generator developers to facilitate cost effective connections
- Engaging with local communities who are front and centre in Powerlink's planning and decision-making
- Ongoing collaboration with AEMO in the development of the Integrated System Plan (ISP) and the provision of System Security Services



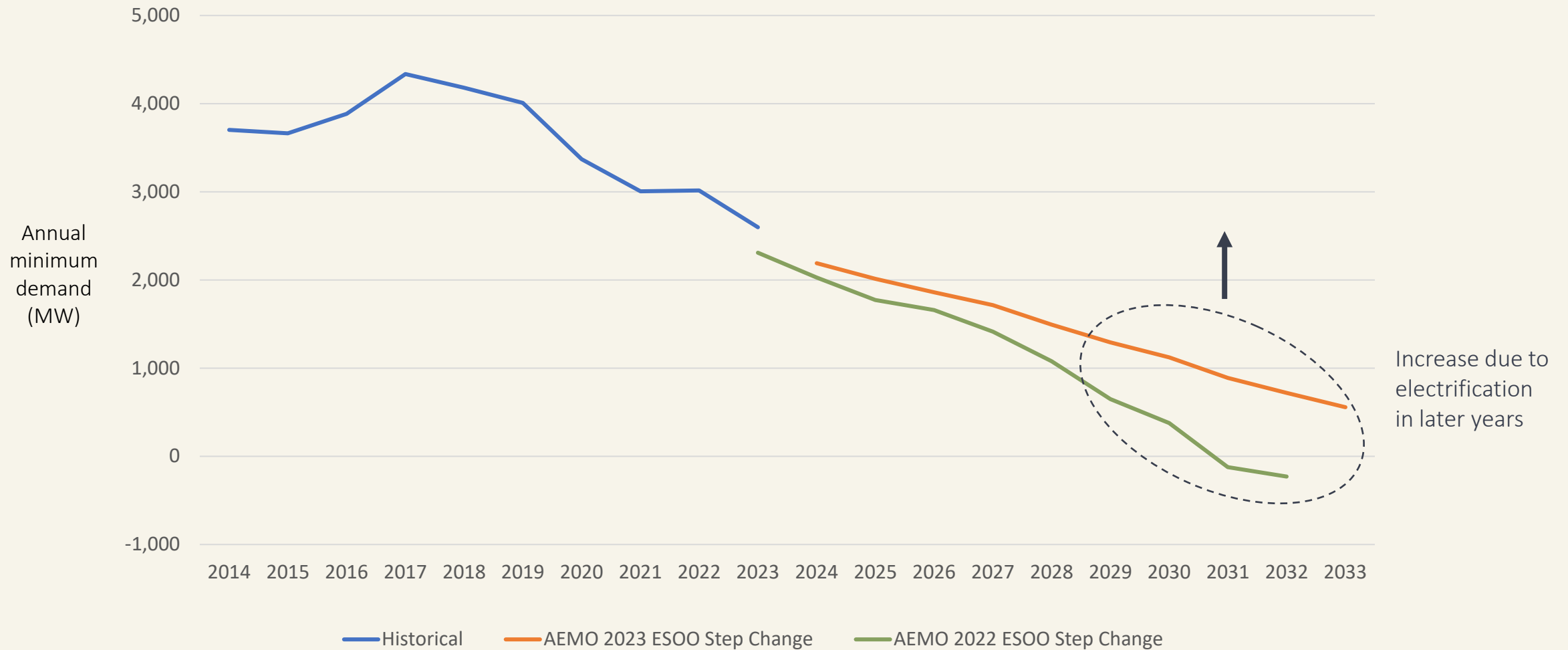
Queensland energy forecast



Queensland maximum demand forecast



Queensland minimum demand forecast



Asset Reinvestment Review

- Review focused on approach to transmission line reinvestments
- Identified improvements in the bundling approach across modelled projects to benefit future reinvestment decisions
- Working Group members included members from:
 - Customer Panel
 - Consumer Challenge Panel
 - Australian Energy Regulator
 - Powerlink subject matter experts

CASE STUDY: Refit of Ross to Chalumbin 275kV transmission line

Bundling approach	Net present cost	Variance to base case cost
Single intervention ¹	\$24.8m ²	\$0m
Two bundled interventions	\$23.4m	(\$1.4m)
Three bundled interventions	\$23.2m	(\$1.6m)
Annual interventions	\$36.4m	\$11.6m

¹ Base case

² Base case cost

Project update

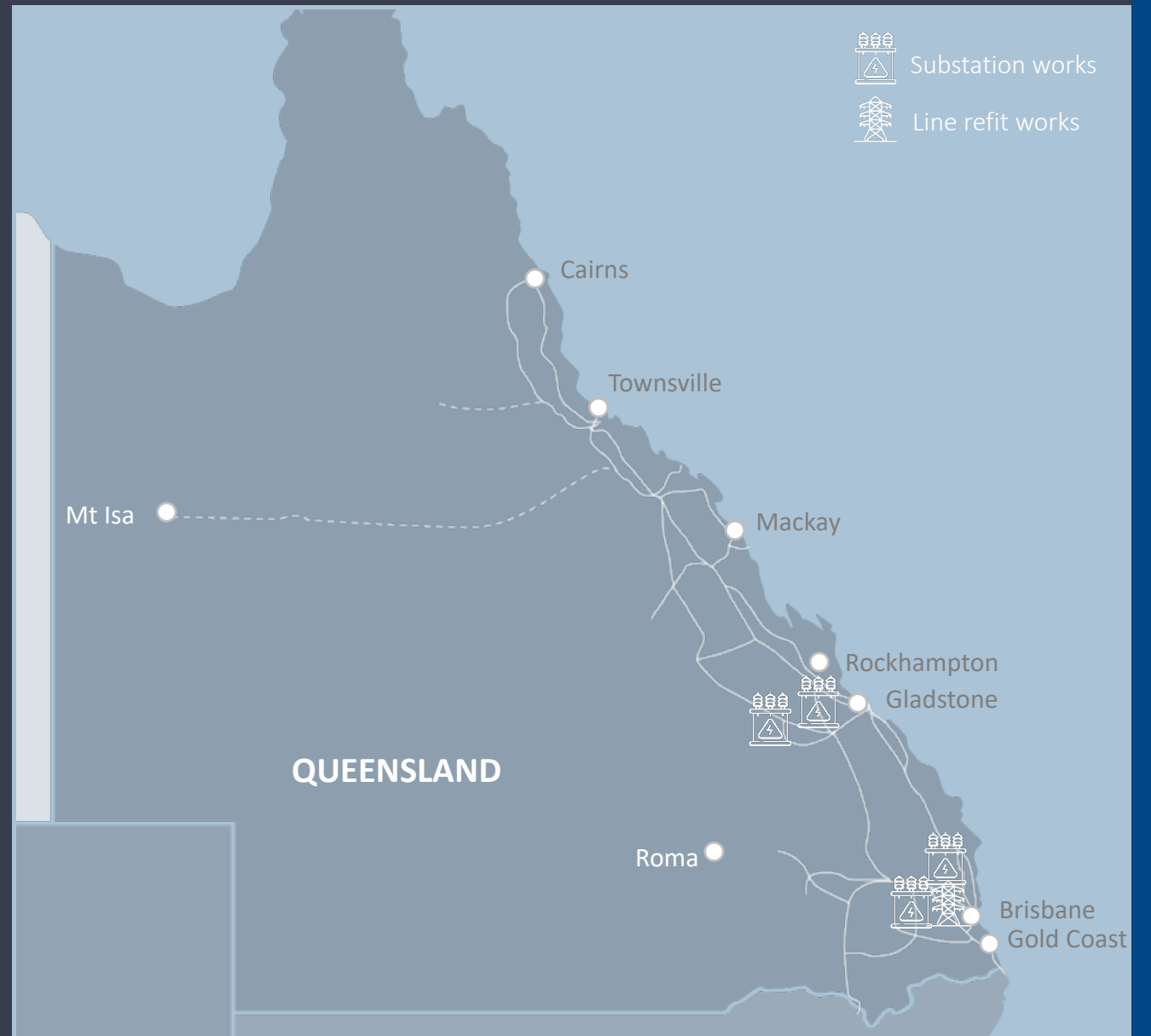
Completed in the last 12 months

Substation works:

- Baralaba secondary systems
- Bouldercombe primary plant
- Palmwoods secondary systems
- Tarong secondary systems

Line refit works:

- Between South Pine and Upper Kedron



Project update

Currently underway

Augmentation works:

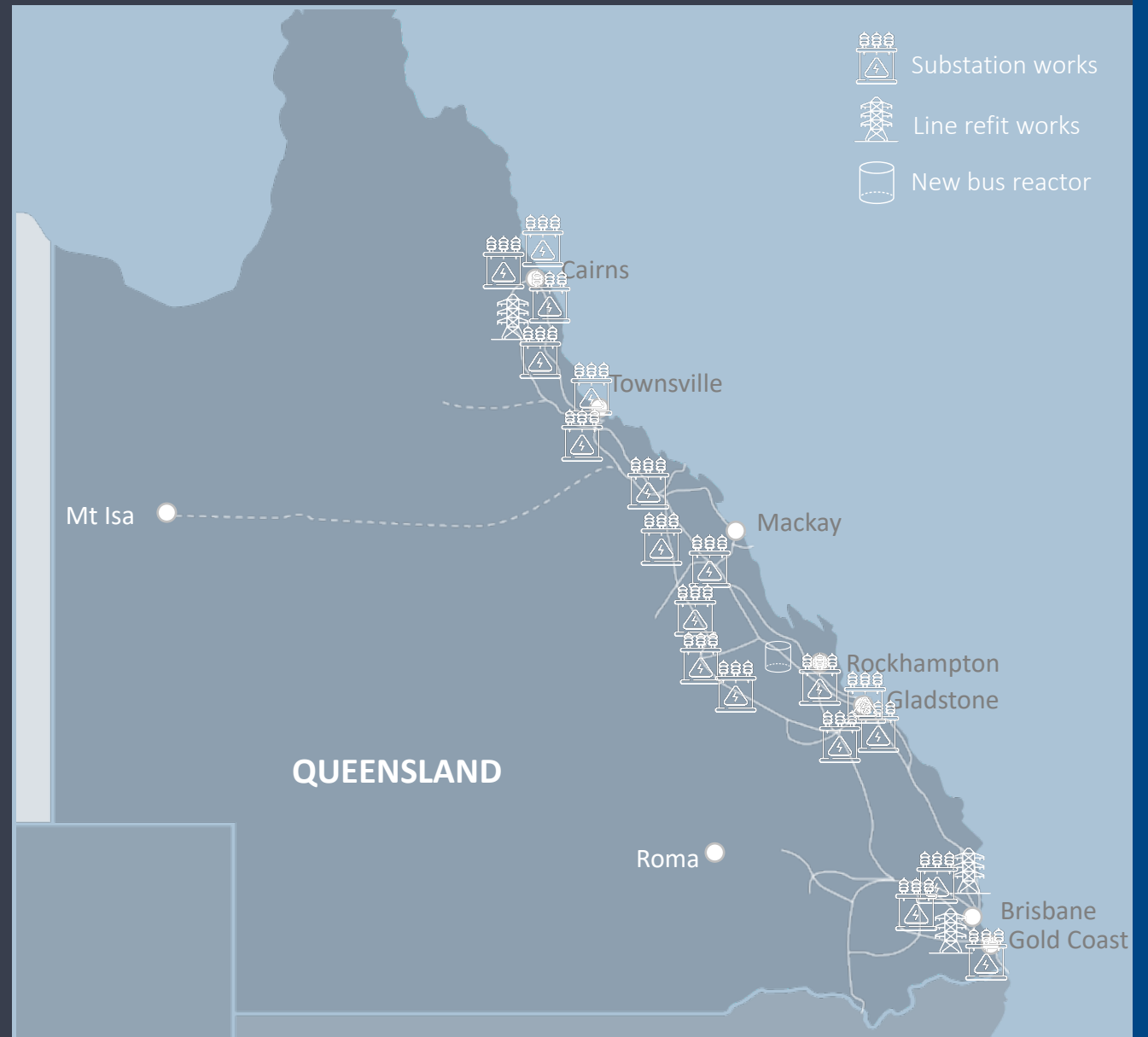
- Broadsound bus reactor

Line refit works:

- Chalumbin and Woree (between Davies Creek and Bayview Heights)
- Between Woolooga and Palmwoods
- Between West Darra, Sumner and Rocklea

Statewide secondary systems replacements:

- **North:** Woree, Chalumbin, Cairns, Townsville, Ross, Strathmore, Nebo, Kemmis, Newlands
- **Central:** Dysart, Calvale, Blackwater, Lilyvale, Wurdong, Egans Hill, Gladstone
- **South:** Abermain, Mt England, Mudgeeraba



Queensland SuperGrid

Transmission backbone to enable large-scale efficient transportation of renewable energy and storage across the State



01

STAGE 1

Borumba Pumped Hydro Connections

02

STAGE 2

Central Queensland Connection

03

STAGE 3

Pioneer Burdekin Pumped Hydro
North Queensland Connection





04

STAGE 4

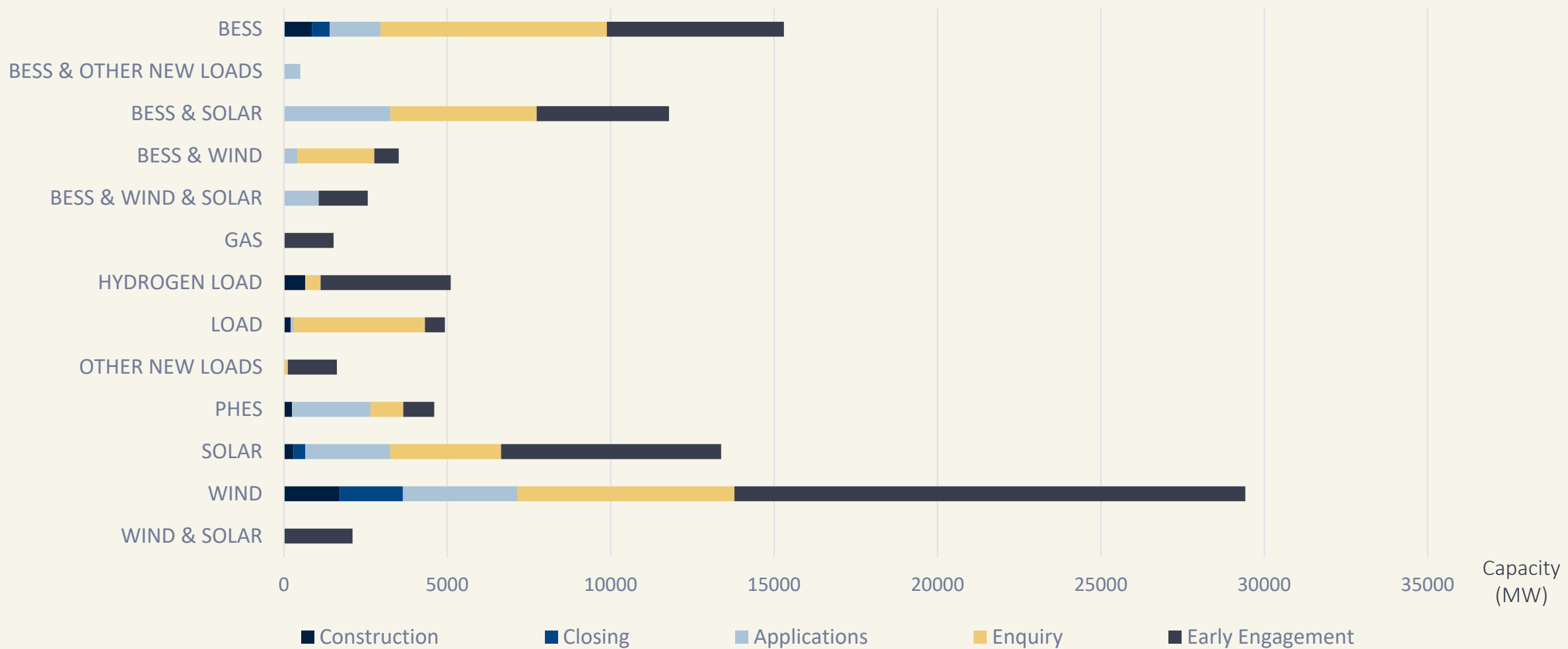
Townsville to Hughenden Connection

Queensland Renewable Energy Zones



	 In-flight	 Phase 1 (NOW – 2024)	 Phase 2 (2024 – 2028)	 Phase 3 (POST 2028)
North	500	500	5,100	5,100
Central	0	4,600	8,200	8,200
South	4,000	4,000	9,200	11,600
Total	4,500 MW	9,100 MW	~ 23 GW	~ 25 GW

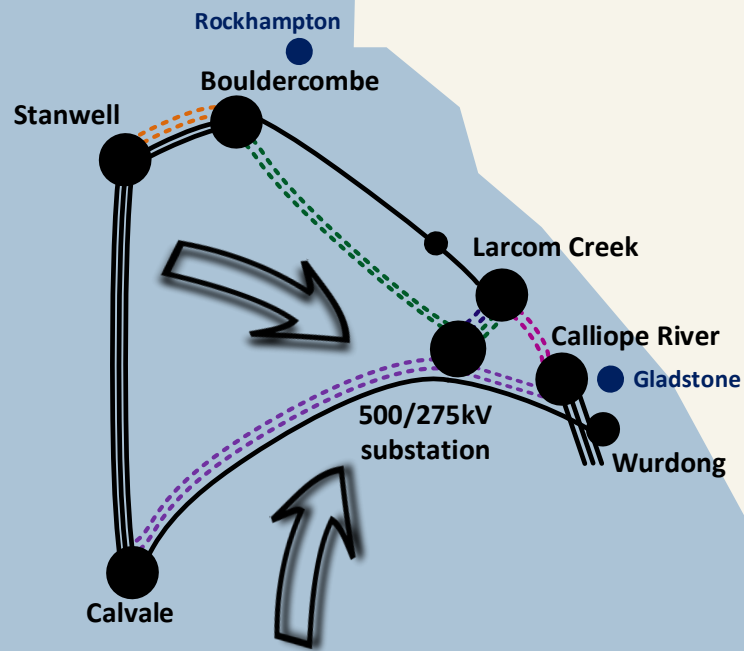
Queensland connection pipeline



Enabling Supply to Central Queensland

10GW of new loads and electrification in Central Queensland by 2035

High-Capacity Transmission Development Plan:



Stage 1

Calvale to Calliope River

Stage 2

Bouldercombe to Larcom Creek

Stage 3

Calliope River to Larcom Creek

Stage 4

Stanwell to Bouldercombe

Stage 5

500/275kV substation establishment

Growing non-network solutions

2022-2023

Non-network solution with CleanCo to address the immediate absorbing reactive gap in South East Queensland.



2023-2024

Install a network reactor and CleanCo network support agreement followed by incremental Battery Energy Storage System network support agreements to support longer term voltage control in South East Queensland.



Building an efficient transmission network through optimisation



Increasing capacity

- Improve Frequency Control Ancillary Services (FCAS)
- Dynamic line ratings
- High temperature conductors
- Static compensators
- Phase shifting transformers



Customer value through efficiency

- Intelligent digital substation
- In-panel replacements
- Reinvestment approach

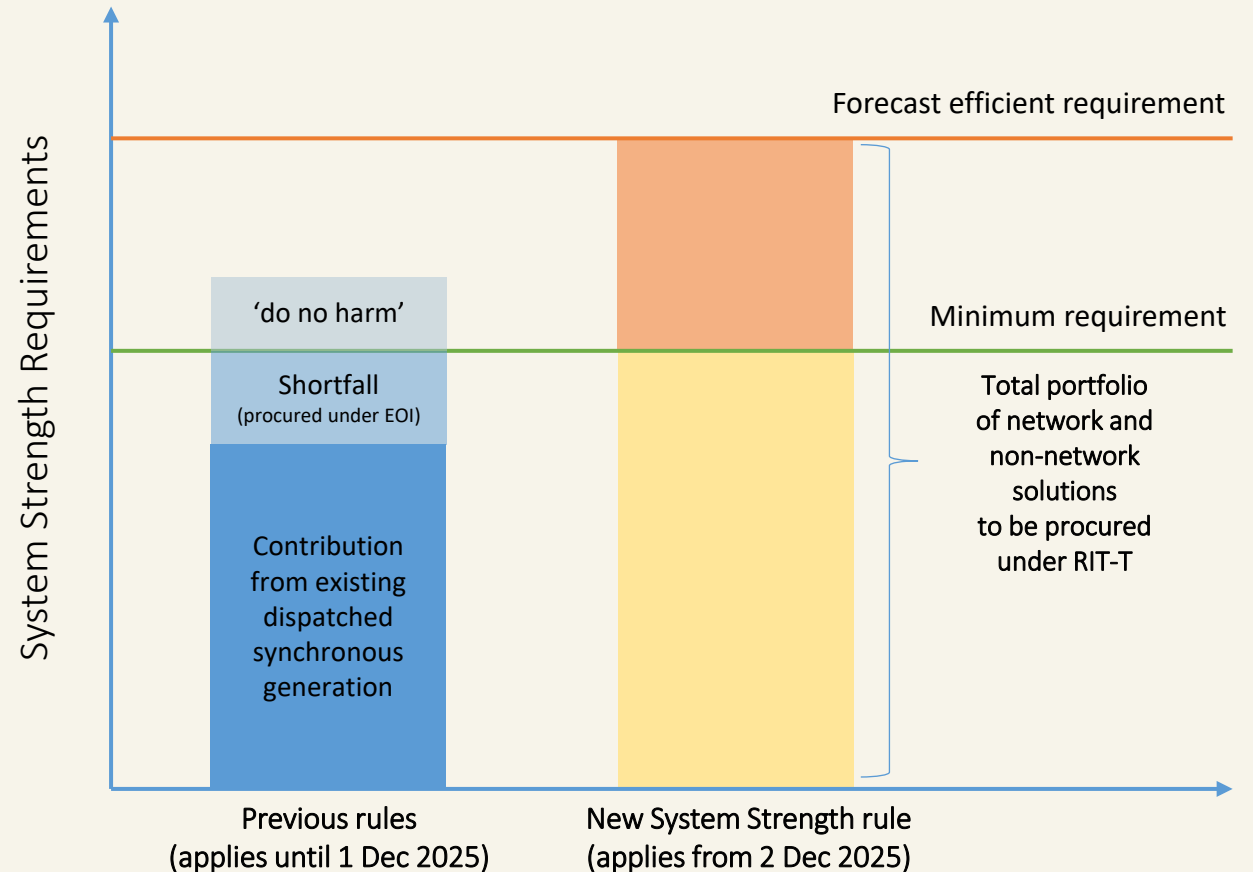


WAMPAC (Wide Area Monitoring Protection & Control)

- Outage planning
- Virtual transmission
- Runback schemes

System Strength Services

- Powerlink is seeking a portfolio of services that meet the forecast requirements from December 2025
- It is expected that non-network solutions will materially contribute to the portfolio of system strength solutions, such as:
 - synchronous generation plant
 - synchronous condensers
 - pumped hydro energy solutions
 - grid-forming batteries and/or
 - other technologies that can support stable voltage waveforms



Update on System Strength

- Targeting a lower System Strength Unit Price (SSUP)
- We are actively engaging with the market and industry bodies
- System strength environment has changed significantly and many of the drivers for a centralized approach no longer hold
 - Synchronous condenser the main solution
 - 3+ years to implement
 - Economies of scale
- Please speak with the Powerlink team to explore options for your system strength needs



Transmission Annual Planning Report Panel



**Enrique
Montiel**

Principal Engineer
Network Planning



**Nathaniel
Dunnett**

Manager
Portfolio Planning



**Peta
Starkey**

Senior
Market Specialist



**Sachin
Goyal**

Manager Power System
Performance and Connection