



Expanding NSW - Qld Transmission Transfer Capacity

QNI Stakeholder Webinar

Thursday 7 February



Presenter Introductions

TransGrid

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Agenda

1. Project overview
2. Modelling assumptions
3. Network options
4. Non-network options
5. Questions
6. Next steps – close of submissions 22 February 2019

Project overview

- The 2018 Integrated System Plan (ISP) identified the importance of stronger interconnection to support generation diversity and the long-term interests of consumers at the lowest cost.
- The transfer capacity of the Queensland – NSW interconnector (QNI) is currently highly utilised with increasing congestion between Queensland and New South Wales forecast.
- The ISP outlined two key transmission investments necessary to alleviate congestion:

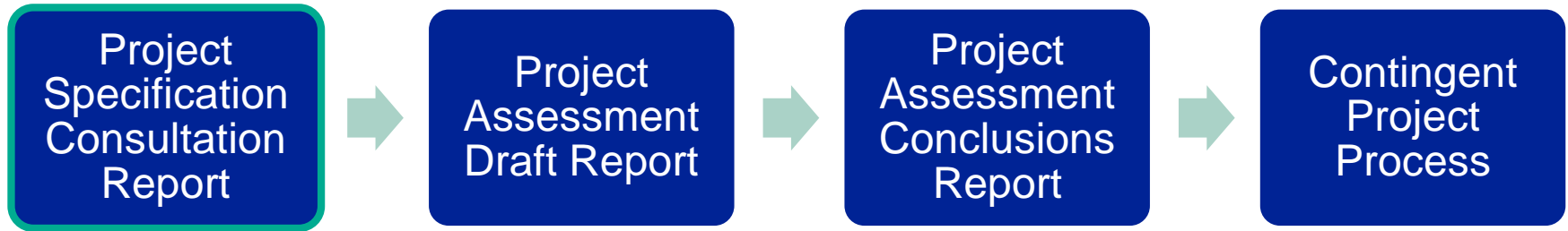
'Group 1' - Minor NSW to Qld upgrade

- Increase in transfer capacity 460 MW northwards and 190 MW southwards
- Indicative timing of 2020

'Group 2' - Medium NSW to Qld upgrade

- An additional increase in southwards transfer capacity of 378 MW
- Indicative timing of 2023

Regulatory process



Note:

- The Energy Security Board (ESB) submitted a Rule change request to AEMC to amend National Electricity Rules
- Does not change the RIT-T process itself (outlined above)
- Request is to allow post RIT-T processes to be run concurrently rather than sequentially
- Consultation paper released in January 2019

The 'identified need'

The identified need for this Regulatory Investment Test for Transmission (RIT-T) is to increase overall net market benefits in the National Electricity Market (NEM) through relieving existing and forecast congestion on the transmission interconnecting network between NSW and Qld.

The key sources of market benefit are expected to be:

- a reduced need for new gas fired generation in NSW once the Liddell Power Station retires;
- allowing more efficient generation sharing between NSW and Qld, including greater use of existing, relatively modern, coal-fired generation in Qld
- opening up additional high-quality geographical areas of the NEM for renewable energy development to meet the QRET; and
- assisting the nation to meet carbon emission and renewable energy targets at lowest long-run cost.

Addressing the need

- This also progresses the ISP's recommendations to increase the transfer capacity between NSW and Qld.
- As part of the RIT-T, TransGrid and Powerlink are considering and comparing a range of network and non-network options to meet the identified need (relieving congestion).
- Consultation with a wide range of stakeholders, including consumer advocates, customer representatives, and market participants is essential to identify a solution that provides most benefit to consumers.
- A project will proceed if clear market benefits are identified, it represents best value for customers, and is approved by the Australian Energy Regulator (AER).



Modelling assumptions

Modelling assumptions

	Fast change	Neutral with proportionate emissions reduction	Neutral with stronger emissions reduction	Slow change
Grid electricity consumption	Strong	Neutral	Neutral	Weak
Generation technology cost	Fast reduction for pumped hydro, batteries and solar thermal Neutral for others	Neutral	Neutral	Slow reduction for wind and solar Neutral for others
Coal and gas fuel cost	Strong	Neutral	Neutral	Weak
Emissions reduction policies	52% by 2030 90% by 2050	28% by 2030 70% by 2050	52% by 2030 90% by 2050	28% by 2030 70% by 2050
Transmission developments	As per ISP MarinusLink by 2033	As per ISP	As per ISP	As per ISP



Overview of network options

Option 1: Incremental upgrades to the existing network to increase transfer capacity

Option Description	Indicative total transfer capacity (MW)		Estimated capex (\$m)	Expected delivery time
	Northward	Southward		
Option 1A – Uprate Liddell to Tamworth Lines and install new dynamic reactive support at Tamworth and Dumaresq and shunt capacitor banks	770	1215	142	2 – 3 years
Option 1B – Uprate Liddell to Tamworth Lines only	535	1030	28	2 – 3 years
Option 1C - Install new dynamic reactive support at Tamworth and Dumaresq and shunt capacitor banks	595	1180	114	2 – 3 years
Option 1D – Sapphire substation cut into line 8C and a mid-point switching station between Dumaresq and Bulli Creek	535	1165	45	1 – 2 years*

*potentially 1-3 years based on easement acquisition, land and environmental approvals etc.

Option 2: new single-circuit line from NSW to Qld

Option Description	Indicative total transfer capacity (MW)		Estimated capex (\$m)	Expected delivery time
	Northward	Southward		
Option 2 – 330 kV single circuit between Braemar and Liddell	980	1865	885	3 – 4 years

Option 3: A new double-circuit line from NSW to Qld

Option Description	Indicative total transfer capacity (MW)		Estimated capex (\$m)	Expected delivery time
	Northward	Southward		
Option 3A – 330 kV double circuit between Bulli Creek and Armidale	770	1593	560	3 – 4 years
Option 3B – 330 kV double circuit line between Braemar and Liddell via Uralla (and establishment of a Uralla 330 kV substation)	1530	2160	1505	4 – 5 years
Option 3C – 330 kV double circuit line between Braemar and Uralla, 500 kV single circuits between Uralla and Wollar and between Uralla and Bayswater (and establishment of Uralla 500/330 kV substation)	1695	2540	2039	5 – 6 years

Option 4: High Voltage Direct Current (HVDC) options

Option Description	Indicative total transfer capacity (MW)		Estimated capex (\$m)	Expected delivery time
	Northward	Southward		
Option 4A – HVDC back-to-back	1195	1780	825	2 – 3 years
Option 4B – HVDC between Mudgeeraba and Lismore	765	1190	600	3 – 4 years
Option 4C – HVDC between Western Downs and Bayswater	2590	2990	2100	4 – 5 years

Option 5: A grid-connected battery system

Option Description	Indicative total transfer capacity (MW)		Estimated capex (\$m)	Expected delivery time
	Northward	Southward		
Option 5 - Battery energy storage system	1135	1635	1000	1-3 years



Non-network options

Non-network options

How non-network technologies can assist in delivering key market benefits:

- defer the need for further generation development in NSW or Qld;
- reduce load in NSW or Qld at peak demand times so as to reduce the need for peaking or other generators to be dispatched, or to provide a fast response in the event of contingencies, in order to relieve the current operational constraints on the interconnector; and
- open up additional high-quality geographical areas of the NEM for renewable investment, which will drive diversification of renewable energy and lower carbon emissions.

Non-network options

Non-network options for assisting with relieving existing and forecast congestion on the transmission network between NSW and Qld in line with the ISP findings need to address the identified need.

Examples of potential non-network solutions include:

- New firm generation in NSW
- Load response in NSW/Vic coupled with fast generation reduction in Qld

Options would be evaluated on whether they:

- Provide estimated net market benefits in line with those estimated for the credible network options; or
- Are able to be coupled with a network option to increase its estimated net market benefit overall.



Questions

Submissions

TransGrid and Powerlink welcome written submissions on this PSCR. Submissions are due on or before 22 February 2019.

- Submissions are particularly sought on the credible options presented and from potential proponents of non-network options that could meet the technical requirements set out in this PSCR.
- Submissions should be emailed to: **regulatory.consultation@transgrid.com.au**
- Submissions will be published on the TransGrid and Powerlink websites. If you do not wish for your submission to be made publicly available, please clearly specify this at the time of lodgement.