

Rethinking Transmission for Renewables

Clean Energy Summit

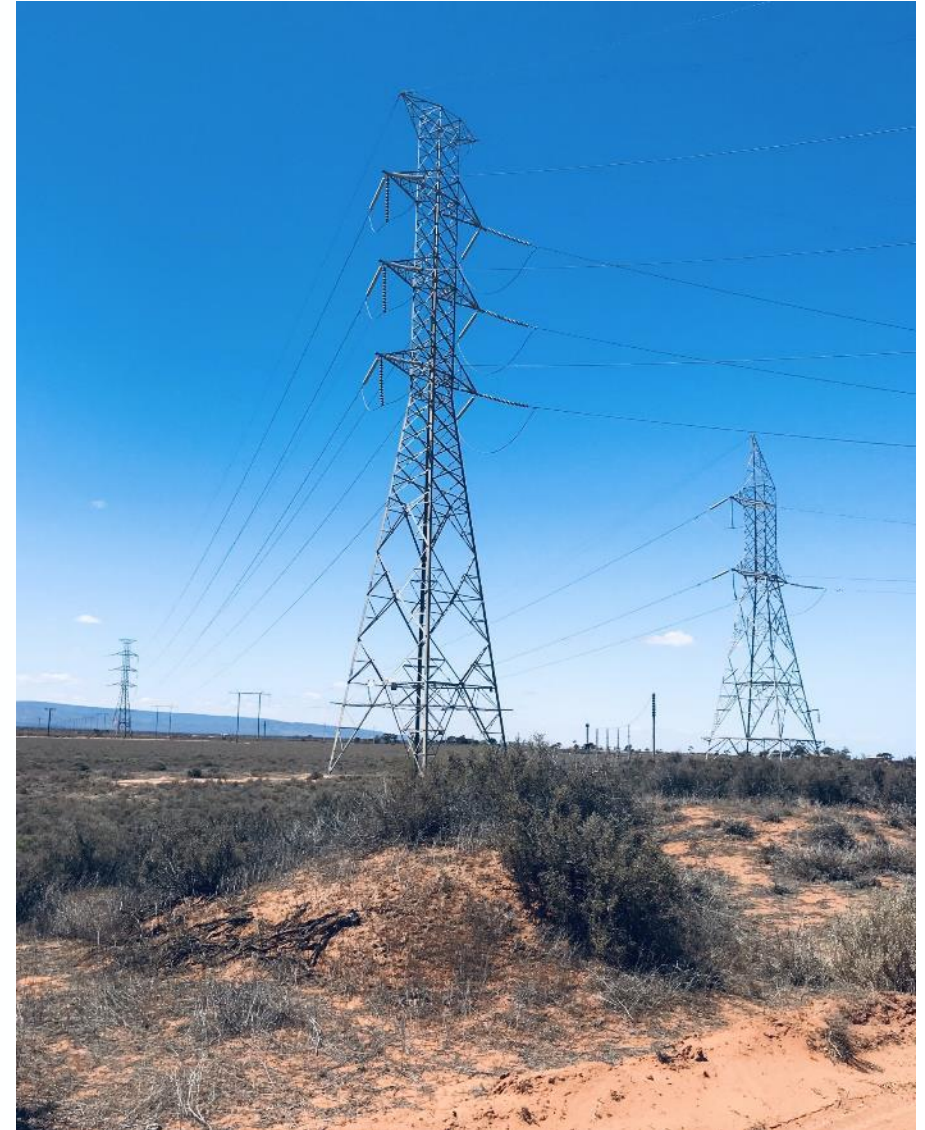
31 July 2019

Rainer Korte, Group Executive Asset Management

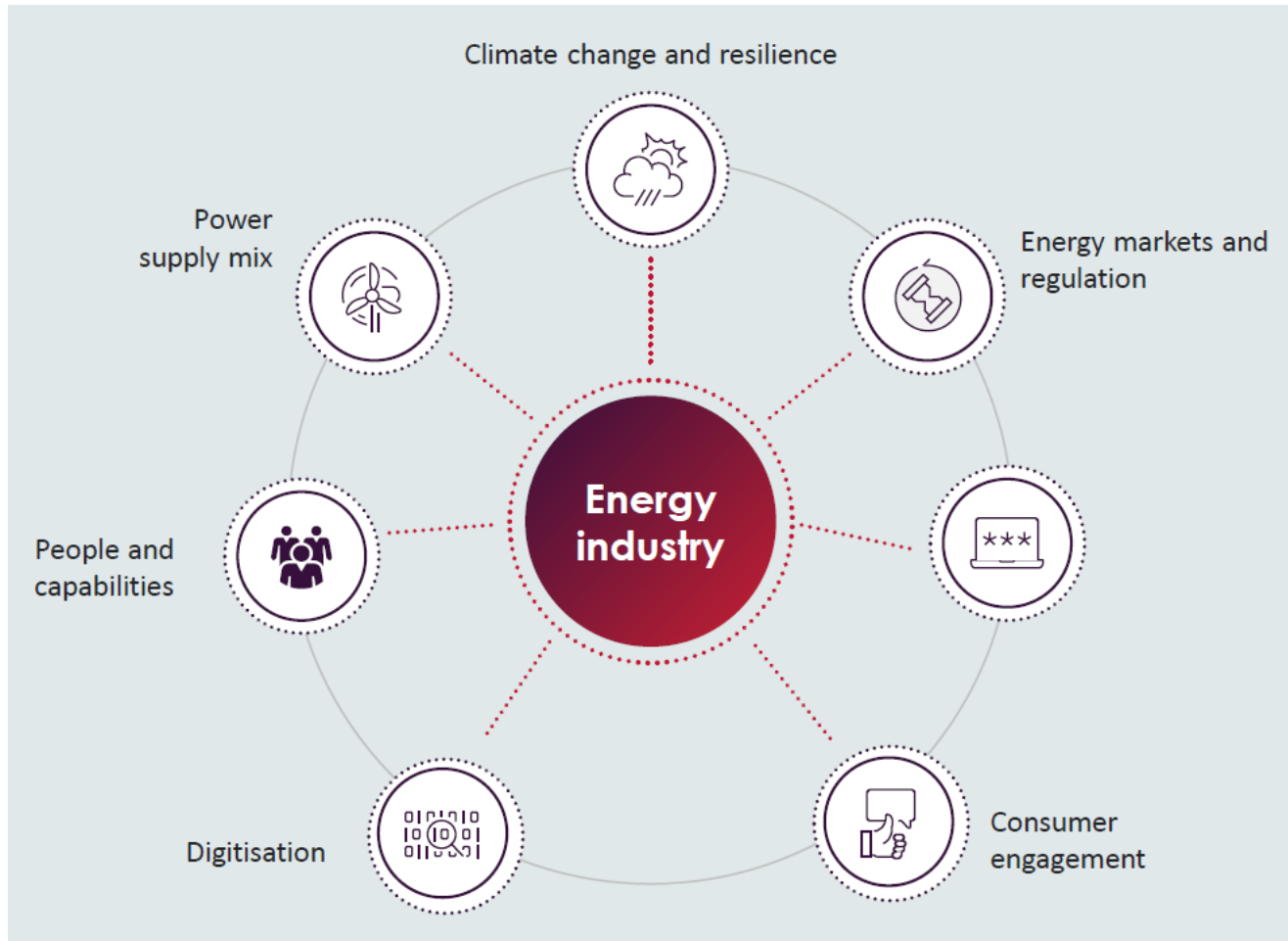


Outline

- National Electricity Market (NEM) context
- Implementing the AEMO Integrated System Plan
- Coordination of Generation and Transmission Investment (COGATI) review
- Connecting to the transmission grid
- ElectraNet major projects supporting energy transformation and renewables uptake



Australia's energy system is undergoing fundamental change



Source: Australian Energy Market Operator

- **Australian Energy Market Operator (AEMO)** released first **Integrated System Plan** in July 2018
- **Provides an integrated roadmap** for efficient development of the NEM
- **Maximises value to end customers** with the lowest cost, secure and reliable energy system capable of meeting emissions policy at acceptable risk
- **Utilises opportunities from existing and new technologies** including Distributed Energy Resources, large-scale generation, networks and coupled sectors such as gas and transport

National context

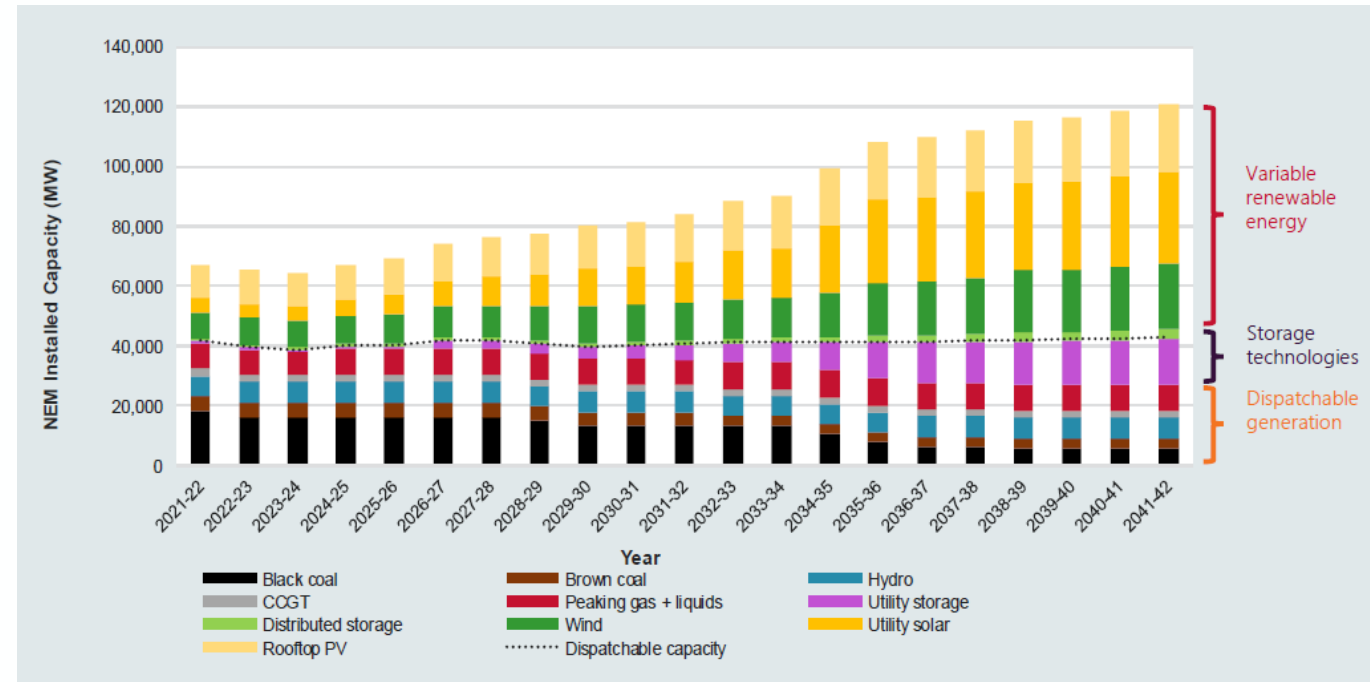
AEMO's Integrated System Plan:

- Coal-fired generation predicted to close over the next 10-20 years (e.g. Liddell Power Station in NSW is next to close with 1680 MW of capacity exiting in 2022)
- Energy expected to be replaced by growth in wind and solar (small and large scale)

To support this change need:

- Large amounts of energy storage
- Stronger transmission links between regions

Forecast NEM generation capacity to double in next 20 years

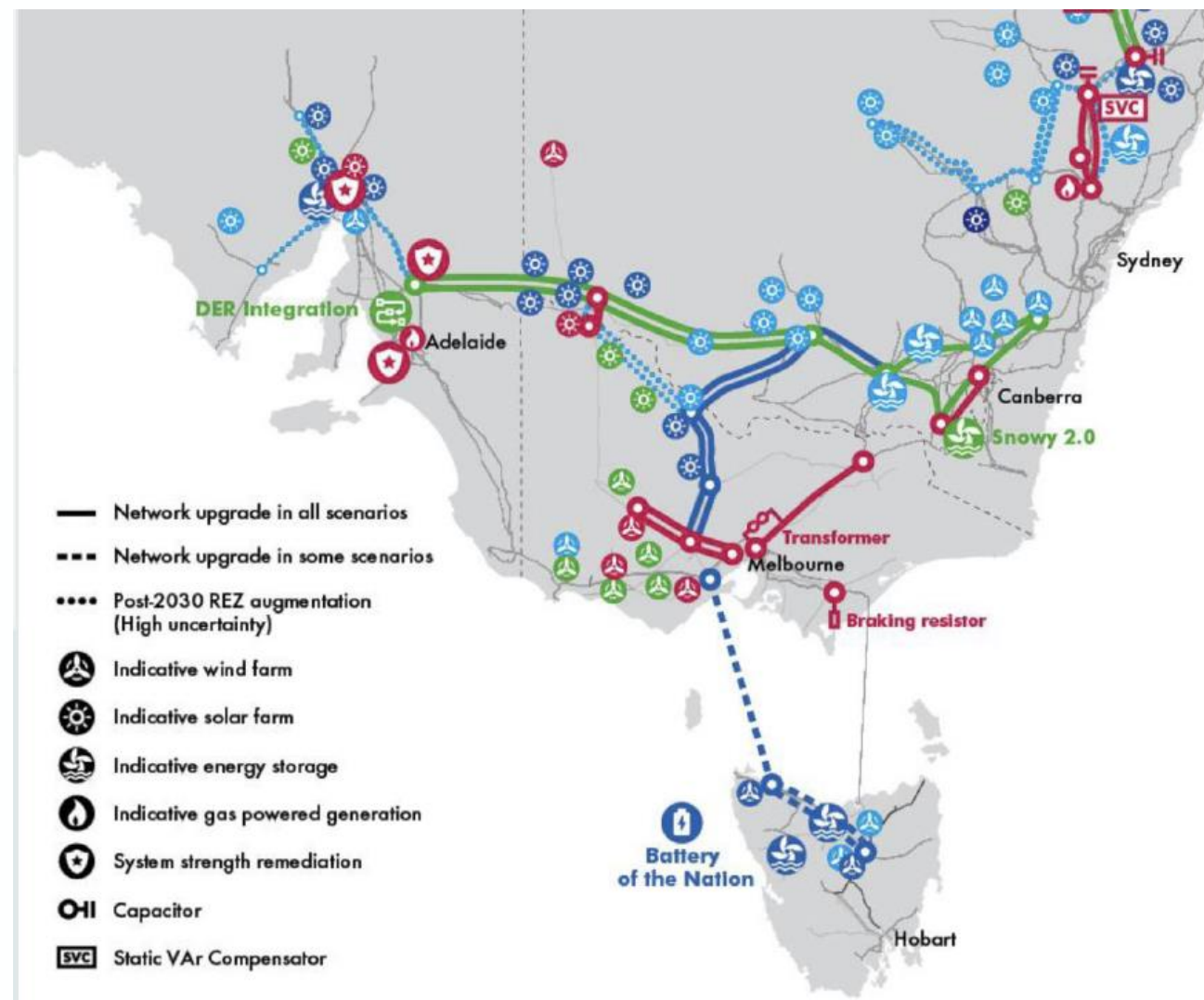


Source: Building power system resilience with pumped hydro energy storage, AEMO Insights paper, July 2019

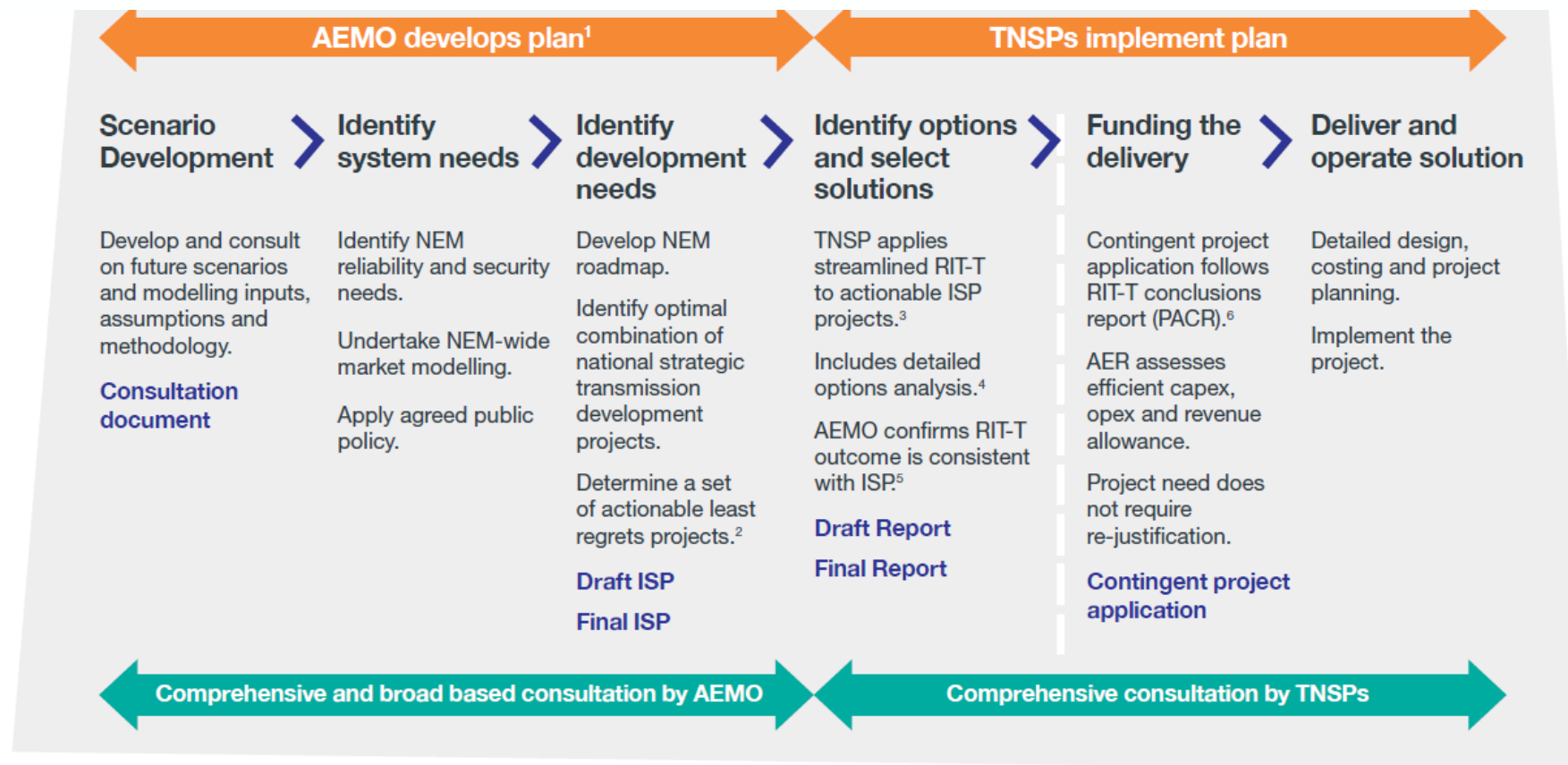
National strategic transmission investments

- GROUP 1** Near-term construction to maximise the economic use of existing resources
As soon as practicable
- GROUP 2** Developments in the medium term to enhance trade between regions, provide access to storage, and support extensive development of REZs
To mid-2020s (indicative)
- GROUP 3** Longer-term developments to support REZs and system reliability and security
To 2040 (indicative)
- To 2030
 - To 2035
 - To 2040

Source: AEMO Integrated System Plan, July 2018



Converting the ISP into action

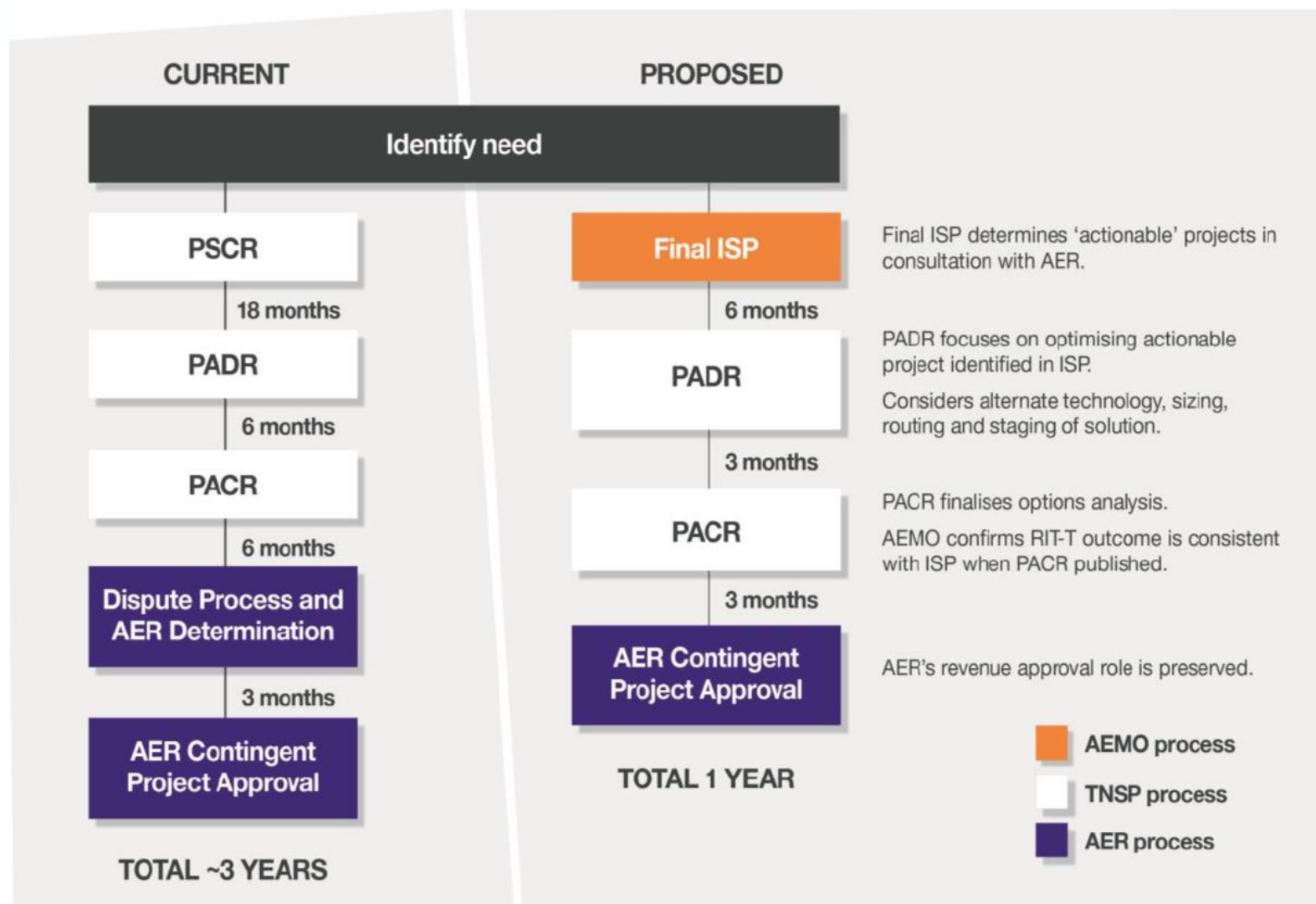


1. AEMO to develop ISP in consultation with TNSPs, customer and stakeholders. Two-step formal consultation process including first upfront consultation on future scenarios, modelling inputs, assumptions and methodology and second on a draft ISP. Objective is broad ownership and standing of ISP outcomes.
2. AEMO determines actionable projects (a subset of ISP identified projects that require TNSPs to apply RIT-T) in consultation with stakeholders including the AER
3. Identified need for RIT-T is defined by ISP resulting in a narrower range of options to be considered. Current need for PSCR is replaced by ISP consultation.
4. TNSP does detailed options analysis (technology, sizing, routing, staging etc.) and publishes PACR for consultation. PACR follows.
5. AEMO determines if RIT-T outcome is consistent with ISP prior to PACR publication. If confirmed then no need for current RIT-T dispute process.
6. Once RIT-T is concluded project need and economic case is confirmed. AER determination (clause 5.16.6 process) no longer required for actionable projects.

Source:

- ElectraNet submission to AEMC, October 2018
- Aligned with the Converting the Integrated System Plan into Action, Energy Security Board paper, May 2019 system wide planning model

Comparison of proposed and current investment processes



Legend:

- ISP AEMO Integrated System Plan
- RIT-T Regulatory Investment Test for Transmission
- PSCR Project Specification Consultation Report
- PADR Project Assessment Draft Report
- PACR Project Assessment Conclusions Report

AEMC COGATI access reform proposal – network view

1. Wholesale electricity pricing



Generators receive a dynamic regional price that better **reflects the marginal cost** of supplying electricity at their location in the network

Support locational margin pricing (LMP) in principle to improve:

- efficiency of dispatch
- transparency of congestion costs
- Dynamic losses and locational price signals for generators

2. Financial risk management



Generators are better able to **manage the risks of congestion** by purchasing a transmission hedge

Necessary if implement LMP to improve investment certainty for generators.

AEMO to auction hedges and manage settlements as an extension of the current interconnector settlements residue process.
Hedge proceeds to reduce customer charges

3. Transmission planning and operation



Transmission planning is **informed** by the purchase of transmission hedges, with the cost of transmission investment no longer solely recovered from consumers

Support the purchase of transmission hedges informing existing ISP and regional transmission planning processes but not directing investment – the latter has no international precedent

Connecting to the transmission grid

- Keen to explore opportunities to streamline/ improve the connection process
- TNSP has a responsibility to all network users and so the impacts of new connections require careful assessment
- This includes consideration of Generator Performance Standards (GPS) and Full Impact Assessments (FIA)



Customer connection advice

- Engage early with TNSP at prefeasibility stage
- Understand the different roles and responsibilities of the TNSP, AEMO and developer
- Understand plant modelling requirements and engage early with TNSP on model development
- Beware of risks associated with building assets or making project commitments prior to commencement of GPS approvals
- Understand the need for consistency in application of connection rules and processes
- Understand realistic timeframes for undertaking the relevant connection technical assessments
- Engage consultants based on experience as well as price

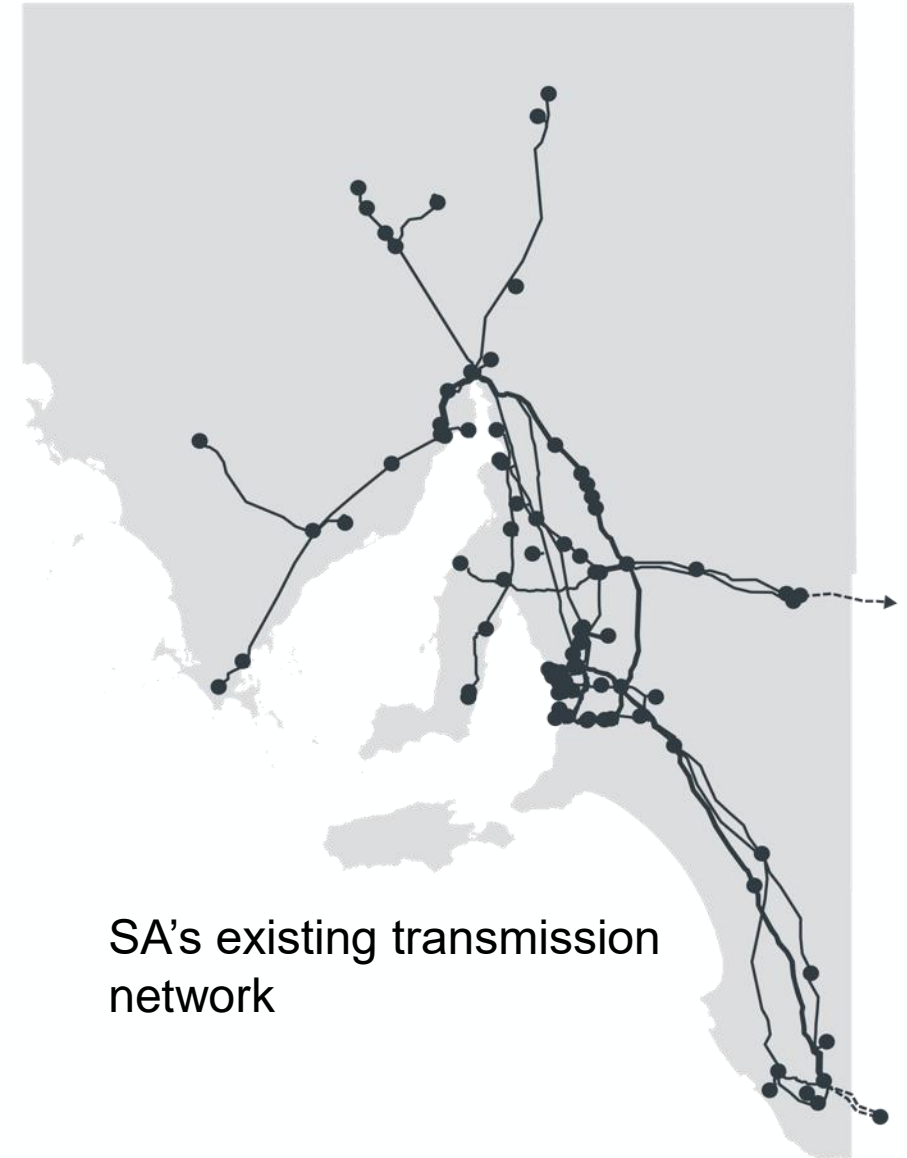


Any proponents looking for a grid connection please contact our Business Development team:

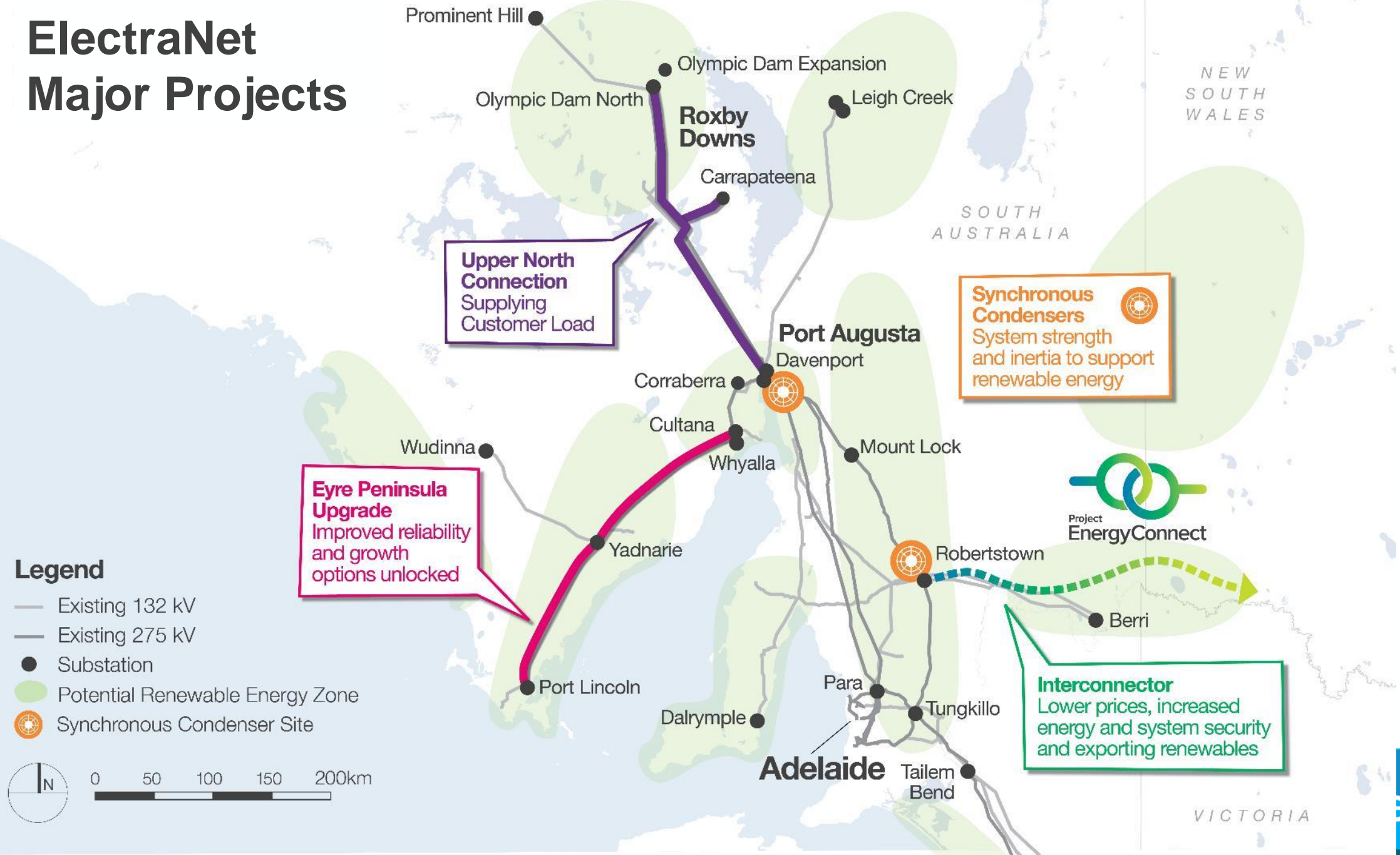
connection@electra.net.com.au

South Australian context

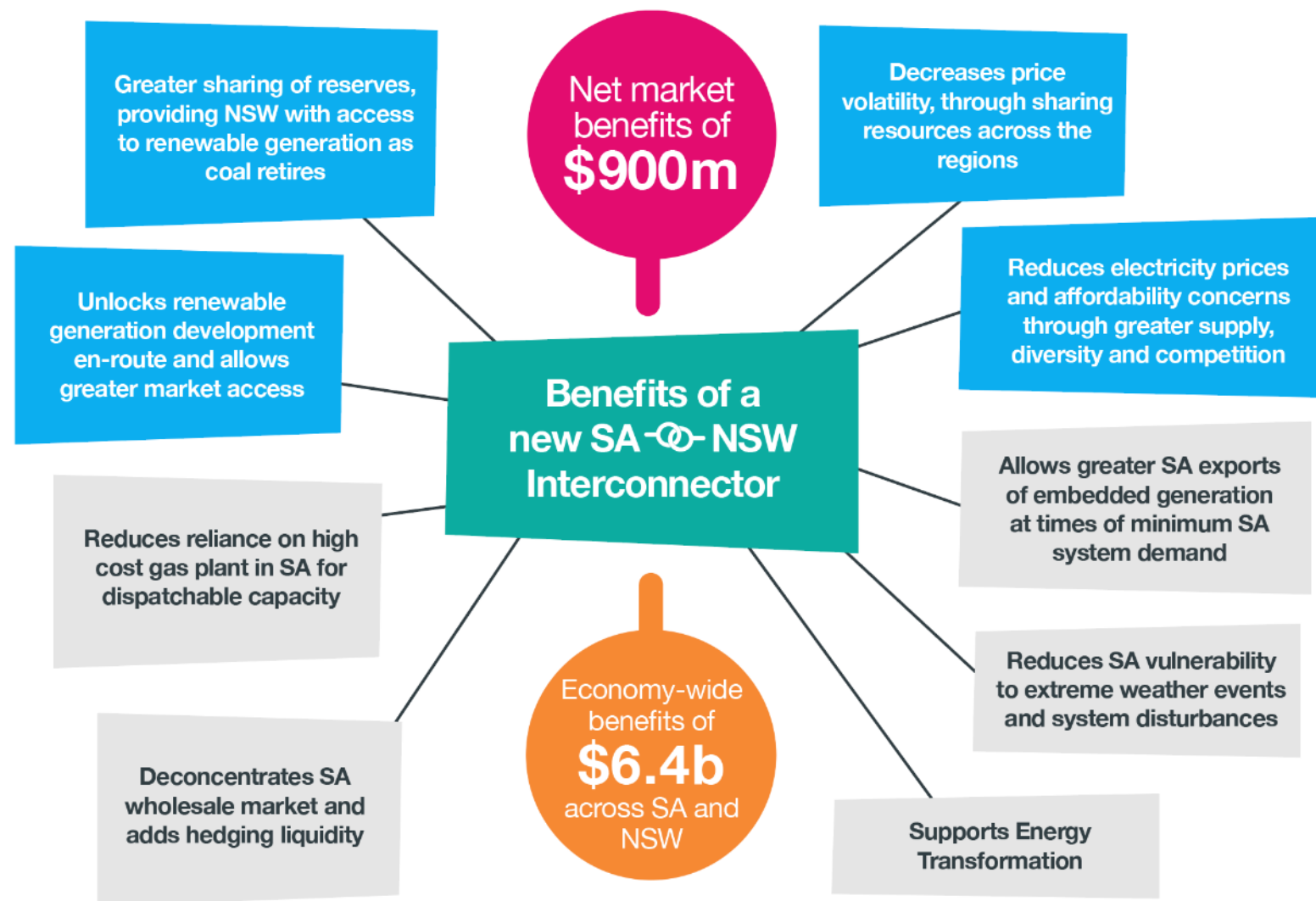
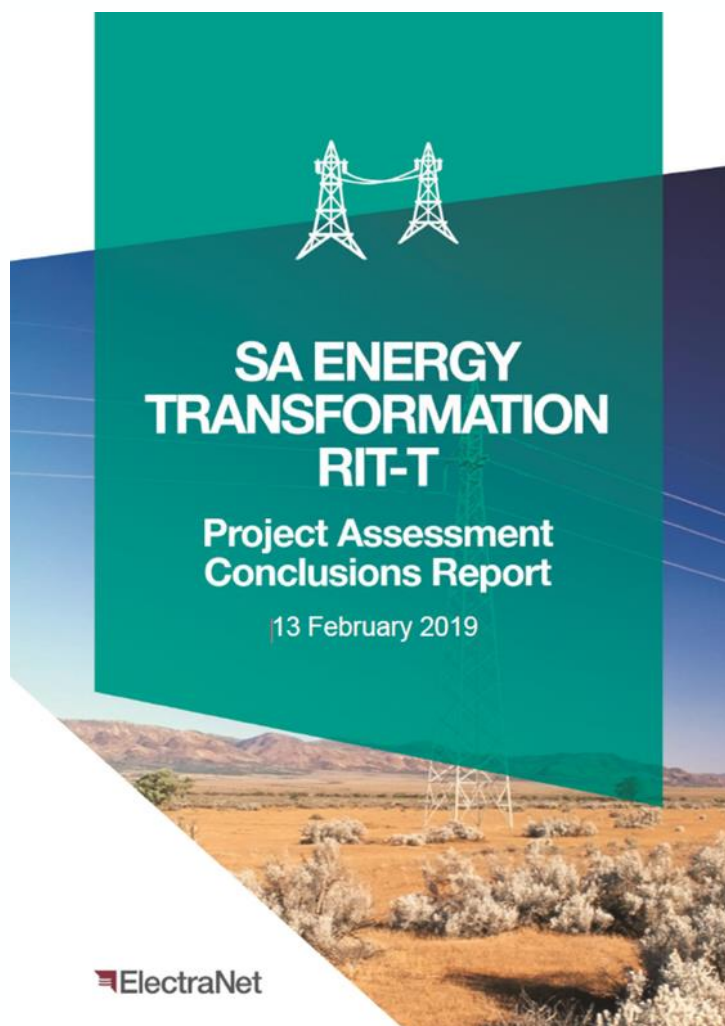
- SA has world leading levels of intermittent renewable energy relative to demand
- Shift to renewable energy has its challenges:
 - Reliance on high cost gas for dispatchable capacity in SA
 - Intermittent renewable generation = increased volatility of demand and supply
 - System security remediation measures required
 - Relatively high wholesale prices and reduced contract market liquidity
 - SA perceived as vulnerable to extreme weather events and disturbances (e.g. September 2016 blackout)



ElectraNet Major Projects

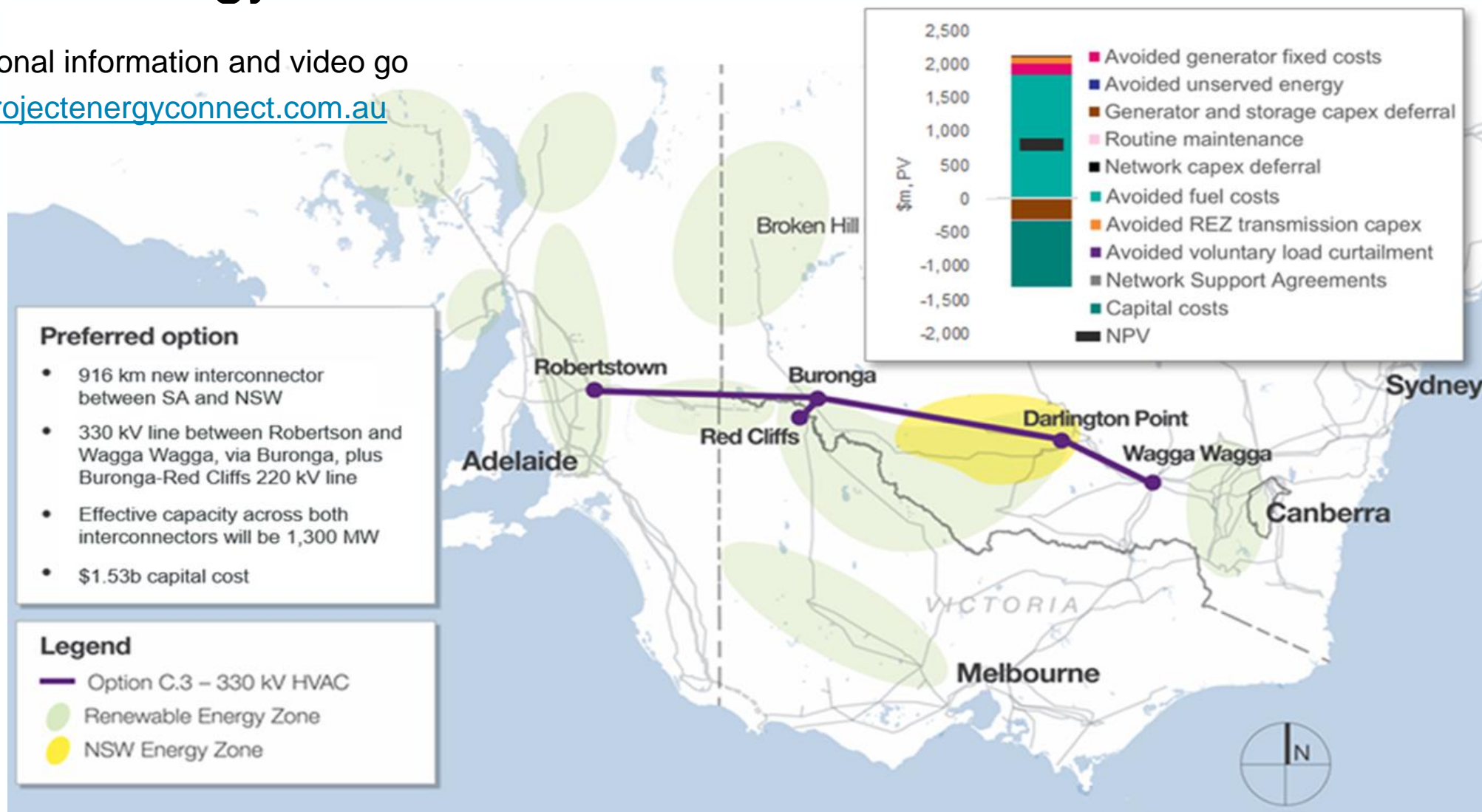


Project EnergyConnect



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For additional information and video go to www.projectenergyconnect.com.au



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