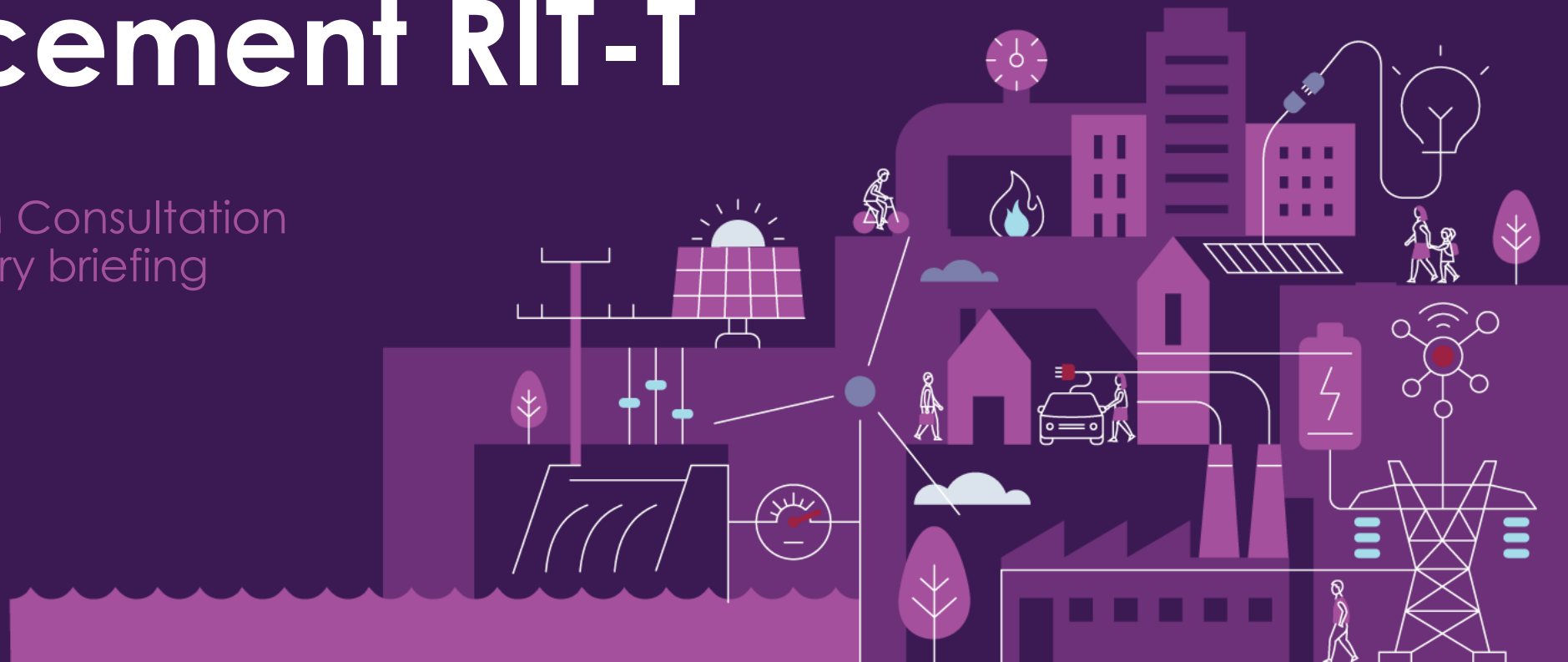
Eastern Victoria Grid Reinforcement RIT-T

Project Specification Consultation Report (PSCR) industry briefing

November 2024



We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country, and hope that our work can benefit both people and Country.

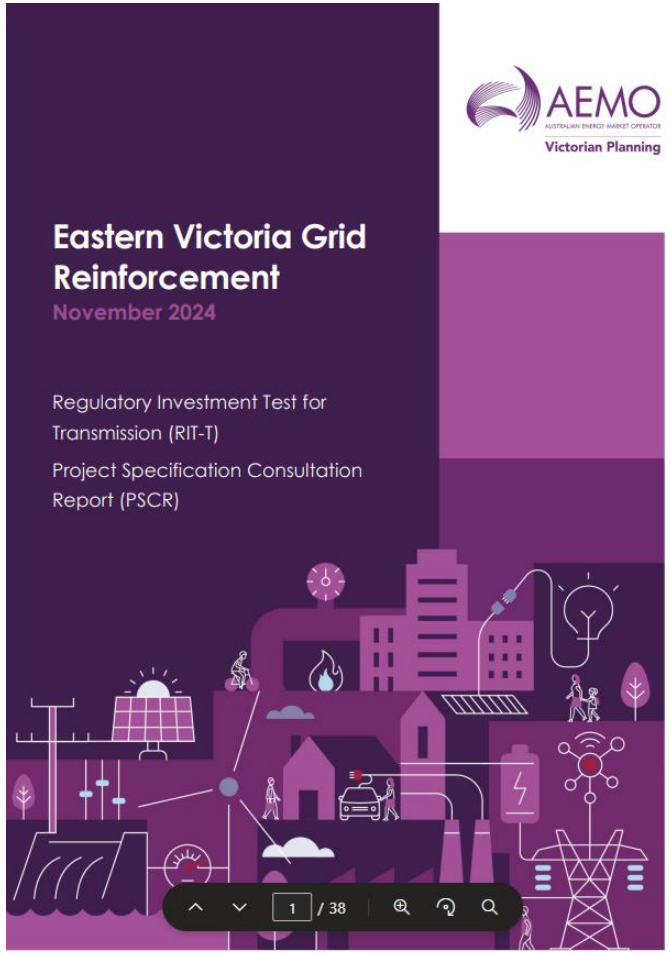
'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have launched its first Reconciliation Action Plan in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation – a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Read our RAP

Objective

The purpose of this webinar is to summarise the Project Specification Consultation Report, with time for questions and discussion.



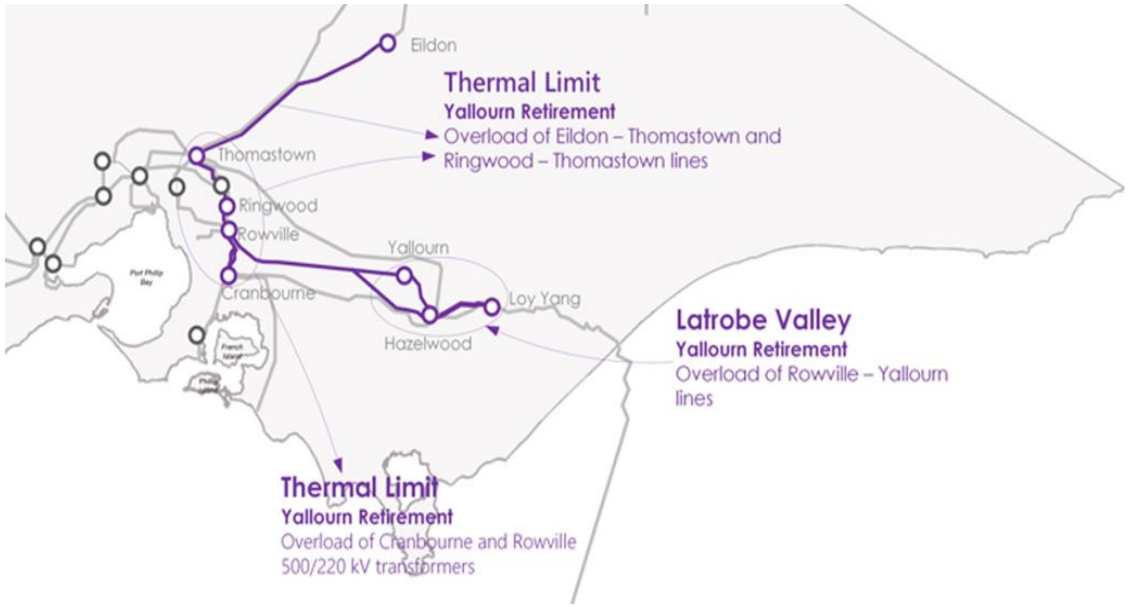
The report is available here

Agenda

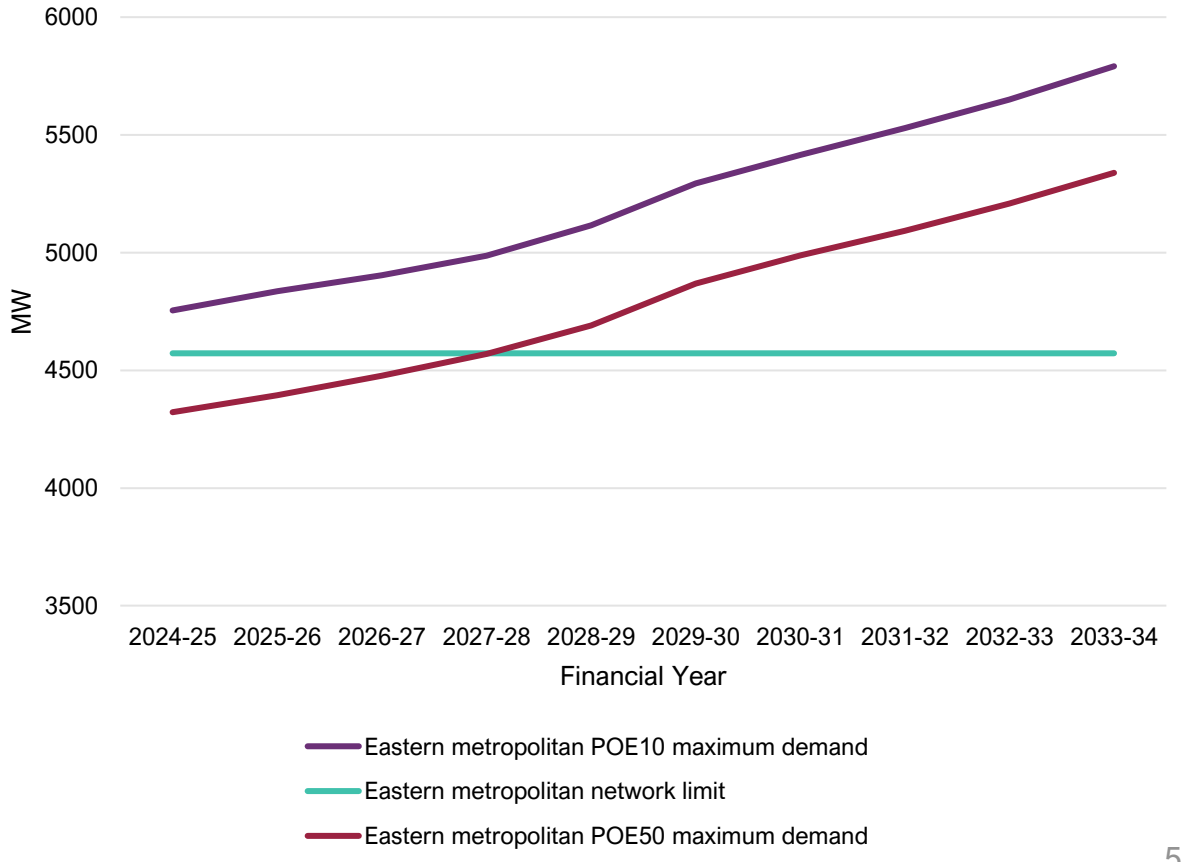
1. Identified need
2. Assumptions
3. Credible network options
4. Indicative construction time for network options
5. Network options considered but not progressed
6. Requirements for non-network options
7. Materiality of market benefits
8. Overview of proposed assessment approach
9. Next steps
10. Q&A – *feel free to put your questions in the chat at any time during the meeting*

Identified need

- Rowville 500/220 kV A1 Transformer loading is forecast to exceed its system normal (N) continuous rating in summer 2028-29.
- Eildon – Thomastown 220 kV line loading is forecast to exceed its system normal (N) continuous rating in summer 2028-29.
- For contingent loss of the Rowville 500/220 kV A1 transformer:
  - Ringwood – Thomastown 220 kV line loading is forecast to exceed its short-term rating in summer 2024-25; and
  - Rowville – Yallourn 220 kV lines' loadings are forecast to exceed their short-term ratings in summer 2028-29.



Eastern metropolitan Melbourne approximate network capacity vs forecast maximum demand



Assumptions

Power system study assumptions	
Parameter	**Assumption**
Temperature ratings	45 degree
Demand forecast	2023 ESOO POE10 demand forecast
Connection point forecast	January 2024 AEMO connection point forecasts
Transmission augmentations	July 2023 update on AEMO's NEM Transmission Augmentation Information web page Modified parallel mode switching configuration in at Hazelwood Power station
Generation projects	July 2023 update on AEMO's Generation Information web page
Terminal stations included in eastern metropolitan Melbourne area	Brunswick, Cranbourne, East Rowville, Heatherton, Malvern, South Morang, Springvale, Richmond, Ringwood, Rowville, Templestowe, Thomastown and Tyabb
Dispatch assumptions	Grid-scale solar – Offline Wind farms - Online with output up to 50% of maximum capacity BESSs - Online with output at 50% capacity Thermal - Online with output up to maximum rated capacity Interconnectors - Set to be consistent with the FY2022-23 historical year 10% POE demand and adjusted if necessary to accommodate additional capacity

Expected unserved energy assumptions (EUSE)			
Parameter	**Low**	**Central**	**High**
Weighting	30.4%	39.2%	30.4%
Demand forecast	Zero EUSE is assumed for low demand conditions	POE50	POE10

Credible network options

- Total capital costs are expected to be $121 million for Option 1, and $122.9 million for Option 2

Element/s of identified need	Option 1 component	Option 2 component	Cost estimate ($ million, real 2024)
Eildon – Thomastown 220 kV line will exceed N (continuous) rating	Bring forward VNI West Eildon – Thomastown 220 kV works	Bring forward VNI West Eildon – Thomastown 220 kV works	3.5 for both options
Rowville A1 Transformer will exceed N (continuous) rating Contingency loss of Rowville A1 transformer means that Ringwood – Thomastown and Rowville – Yallourn 220kV lines will exceed their short term rating	Install third 500 kV/220 kV transformer at Rowville to provide backup to the existing Rowville 500/220 kV A1 transformer and supply to the Rowville No. 3-4 220kV bus group	Transfer the Rowville 500/220 kV A2 transformer from the Rowville No. 1-2 220 kV bus group to the Rowville No. 3-4 220 kV bus group, to provide backup to the 500/220 kV A1 transformer. Install a second 500/220kV transformer at Cranbourne to provide backup to the existing Cranbourne 500/220 A1 transformer and supply to the Rowville No. 1-2 220 kV bus group.	76.4 for both options
Fault level mitigation	Equipment replacements at stations that have fault level exceedances – expected to be Keilor and Rowville 220 kV buses and Templestowe and Thomastown 66 kV buses	Equipment replacements at stations that have fault level exceedances – expected to be Rowville, South Morang and Thomastown 220 kV buses	41.1 for Option 1 43.0 for Option 2

Indicative construction time for network options

- The table below sets out the estimated construction time and earliest possible commissioning date for each option based on AVP's observations and experience in similar projects.

Task description	New transformer	Fault mitigation works	VNI West project components which address Eildon-Thomastown 220kV line limitations
Regulatory investment test process	Q4-2024 to Q3-2025	Q4-2024 to Q3-2025	Q4-2024 to Q3-2025
Contract negotiation	Q4-2025 to Q4-2026	Q4-2025 to Q4-2026	Q4-2025 to Q1-2026
Design, approvals and long lead procurement	Q1-2027 to Q2-2029	Q1-2027 to Q4-2028	Q1-2026 to Q2-2027
Construction	Q2-2029 to Q2-2030	Q1-2029 to Q3-2029	Q2-2027 to Q1-2028
Commissioning	Q3-2030 to Q2-2031	Q4-2029 to Q2-2030	Q1-2028 to Q2-2028

Network options considered but not progressed

Option description	Reason not progressed
Complete Option 1 or Option 2 with a different size transformer	Would result in decreased utilisation of new or old transformers
Install extra 500/220kV transformer at Rowville on hot standby to switch in for the loss of either transformer	Cannot resolve system normal rating limitations on Rowville A1 500/220 kV transformer
Install a second Rowville-Thomastown circuit (making it double circuit line)	Cannot meet identified need on its own and does not add enough additional benefits to justify additional cost of including it with Option 1 or Option 2
New 500 kV terminal station at Templestowe or Ringwood	Not commercially feasible due to additional cost
Tie 220 kV Rowville No. 1-2 and No. 3-4 buses	Would result in fault current exceeding NER planning limits
Install two additional 500/220 transformers	Only marginal increase in network capacity for cost
New 220 kV line between Hazelwood and Yallourn	Reduced the impedance of the 220 kV corridor resulting in a lower transfer capacity from Latrobe to Melbourne

Requirements for non-network options

- Table below summarises the size, operating profile and timing requirements for non-network solutions connected at the Rowville No. 3-4 220 kV bus group, which is the optimal location for a non-network solution.
- Other suitable locations include, but not limited to, Ringwood, Templestowe, Malvern, Springvale, or Heatherton terminal stations

Financial Year	Size (MW)	Time of day	Period of availability	Maximum consecutive hours of dispatch
2024-25	70	Evening Peak	December to February	1
2025-26	100	Evening peak	December to February	2.5
2026-27	120	Evening peak	December to February	3
2027-28	140	Evening peak	December to February	3.5
2028-29	350	Evening peak	December to February	4
2029-30	400	Evening peak	December to February	4.5
2030-31	550	Evening peak	December to February	4.5
2031-32	650	Evening peak	December to February	4.5
2032-33	800	Evening peak	December to February	5.5
2033-34	950	Evening peak	December to February	5.5

Materiality of market benefits

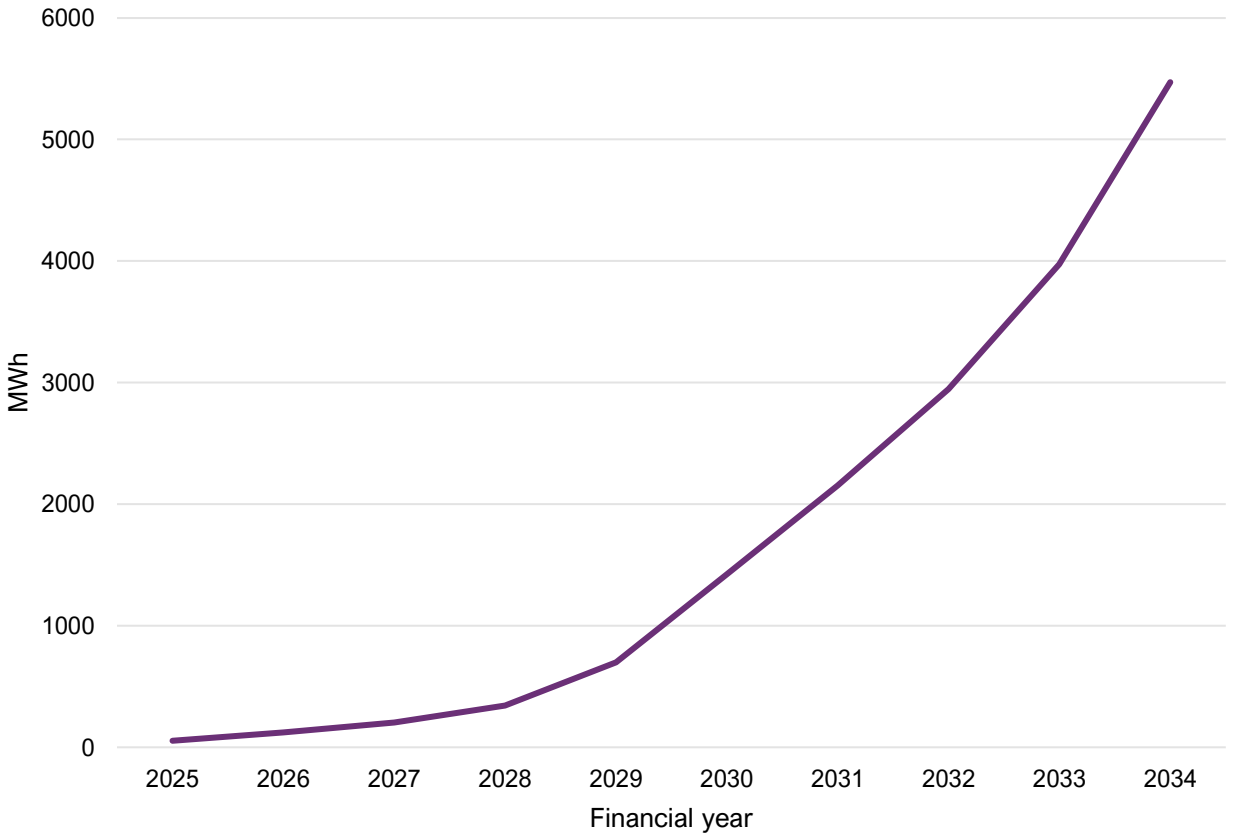
Classes of market benefits that may to be material:

- Changes in fuel consumption arising through different patterns of generation dispatch
- Changes in Australian greenhouse gas emissions
- Changes in voluntary load curtailment
- Changes in costs for parties other than AVP

Classes of market benefits not likely to be material:

- Differences in timing of expenditure
- Changes in network losses
- Option value
- Changes in ancillary services costs
- Competition benefits

Indicative estimate of expected unserved energy under the base case



Overview of proposed assessment approach

- If any wholesale electricity market benefits are expected to be materially different between options AVP intends to use the ISP scenarios and associated weightings
- If modelling each ISP scenario is determined to be disproportionate, then AVP will adopt reasonable scenarios that vary based on the demand forecast (see table below for demand breakdown)
- AVP intends to conduct sensitivity analysis to test other key parameters, including option costs, discount rate and the value of customer reliability

Parameter	Low	Central	High
Weighting	30.4%	39.2%	30.4%
Demand forecast	Zero EUSE is assumed for low demand conditions	POE50	POE10
Assessment period	10 years		
ISP scenario	Step change (central scenario)		
Discount rate	7%		
VCR	$48,152/MWh		
Network capital cost	Base estimate - class 5A (+/- 30% accuracy) estimates for the PADR using AEMO's latest TCD		
Annual operating and maintenance costs	Base estimate - 1% of total capex for network components		

Next Steps

Task	Deliverable date
PSCR publication	13 November 2024
PSCR consultation period start	13 November 2024
PSCR Webinar	28 November 2024
PSCR consultation period end	7 February 2025
PADR publication	TBA

All submissions will be considered in the full options analysis for the PADR.
Email submissions to AVP_RIT-T@aemo.com.au on or before Friday 7 February 2025.
Use subject title '*Eastern Victoria Grid Reinforcement PSCR*' and clearly state if your submission is confidential.

Question & Answers

AUSTRALIAN ENERGY MARKET OPERATOR

For more information visit

aemo.com.au