AEMO's Renewable Integration Study

Adapting to increasing levels of distributed generation

NEM fast facts

35GW peak demand

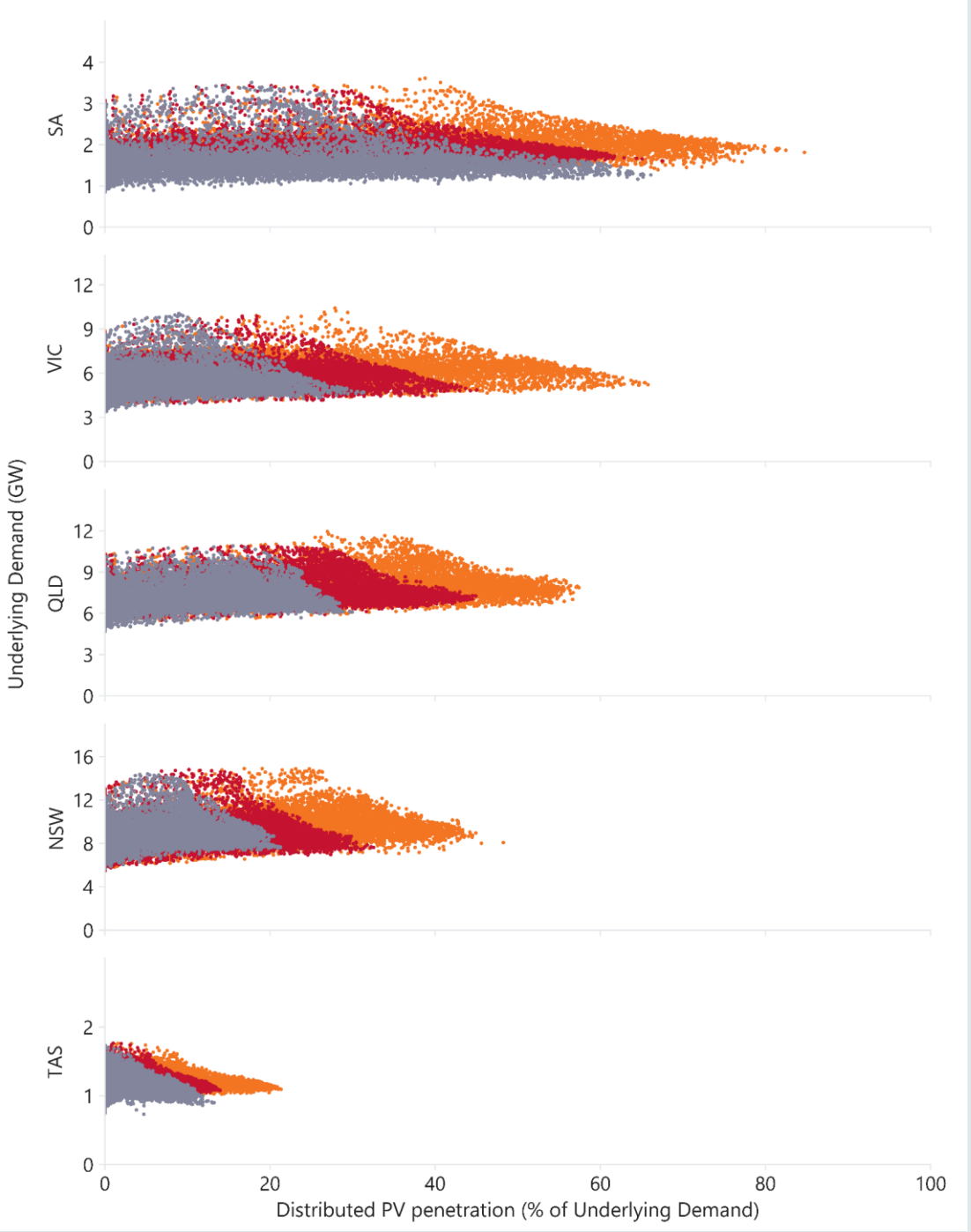
Network length of **~5000km**

Aging coal fleet providing **52%** of energy in 2019

8.3GW of DPV in 2019
Up to **18.7GW** of DPV by 2025

Increasing instantaneous penetrations of DPV out to 2025

- 2019 (Actuals)
- 2025 (ISP Central)
- 2025 (ISP Step Change)



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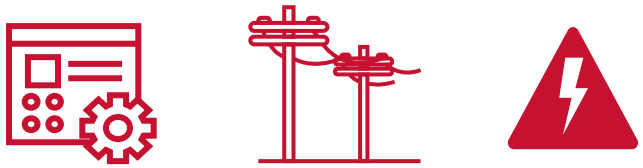
What are the operational challenges?



Performance during power system disturbances

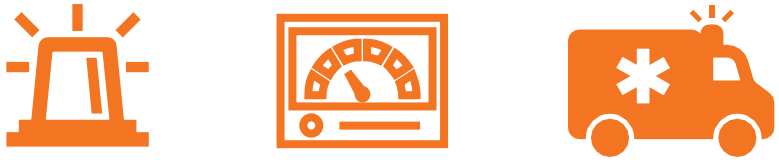
- Contingency risks associated with mass DPV disconnection

Ongoing reduction in operational demand

- Minimum synchronous generation requirements
- Stable load for emergency mechanisms
- Transmission network voltage control

Increasingly large source of variable generation

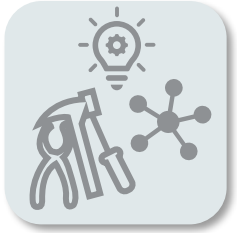
- Daily ramps associated with DPV generation
- Sub-regional ramps due to cloud movements



Increasing source of generation that cannot be curtailed

- Power system dispatchability
- Operational levers during extreme abnormal conditions

A combination of solutions needed



Market enablers for the **efficient optimisation of DPV generation with load and storage** behind the meter.

Measures to **improve visibility and predictability of DPV generation to enable optimisation** in the distribution network and bulk power system.

A suite of measures can assist with the optimised integration of DPV generation in the future power system.

DPV systems

- Better performance standards
- Active management
- Last resort curtailment

Load and storage

- Active management – ‘solar sink’
- Enablement for emergencies

System management

- Reserve availability for abnormal conditions
- Operational constraints on dispatch.

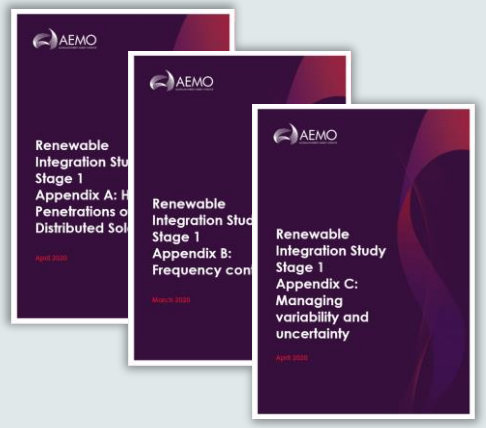
Network development

- Enable balancing across larger area
- Reduce likelihood of islanding

RIS Stage 1 Information

Report

Appendices



Webinars

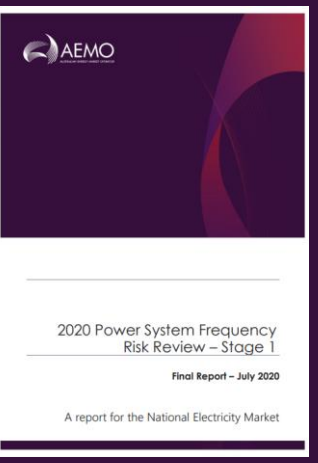
FAQs

Stakeholder Consultation Paper

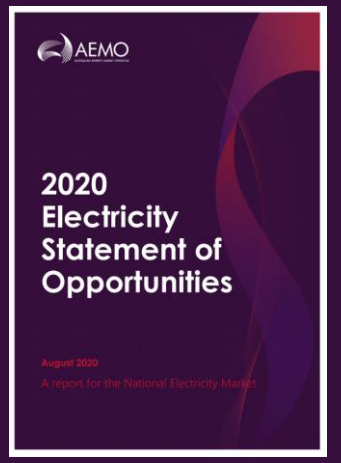
Available at: https://aemo.com.au/en/energy-systems/major-publications/renewable-integration-study-ris

Other recent analysis

https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/sa_advisory/2020/minimum-operational-demand-thresholds-in-south-australia-review.pdf?la=en



Appendix A, at: https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2020/psfrr/final-2020-power-system-frequency-risk-review-stage-1.pdf?la=en&hash=C1EA01AAC28C7DF0D4F69700B8FC439B



https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2020/2020-electricity-statement-of-opportunities.pdf?la=en&hash=85DC43733822F2B03B23518229C6F1B2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