

## Visualization and stakeholder communication

AU C5 Electricity Markets and Regulation  
PS2 – Q1, How are short, shallow, and  
frequent events distinguished from long, deep,  
and rare events and factored in the resource  
adequacy studies?

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# The Australian NEM has evolved to probabilistic assessment

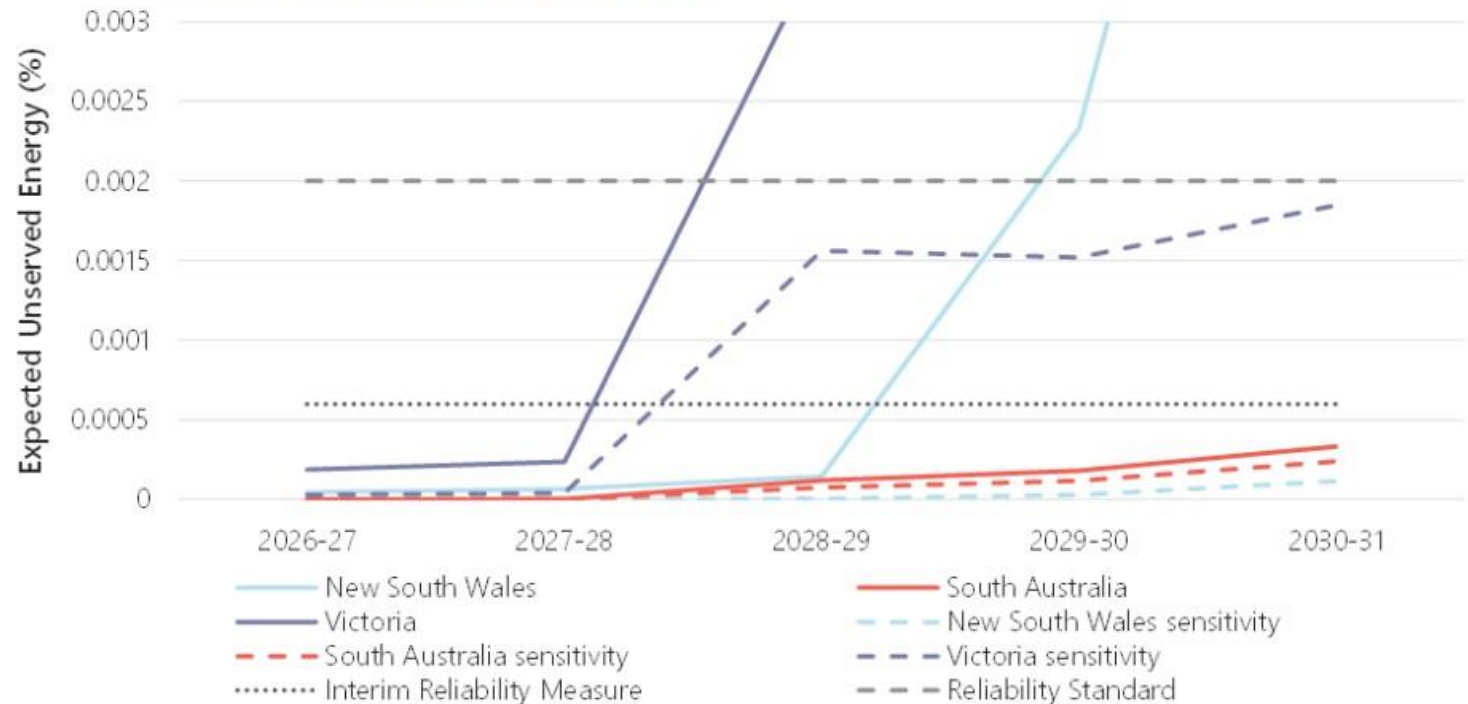
Application	Description
Short term projected assessment of system adequacy (STPASA)	7 days ahead projection of availability vs demand on 30-minute time resolution
Medium term projected assessment of system adequacy (MTPASA)	2 years ahead projection of availability vs demand on 30-minute time resolution
Energy Adequacy Assessment Projection (EAAP)	2 years ahead projection of energy availability considering hydro inflows, cooling water for thermal power stations and thermal fuel availability on 30-minute time resolution
Electricity Statement of Opportunities (ESOO)	10 years ahead projection of the risk of unserved energy considering multiple weather reference years for wind/solar generation and Monte Carlo simulation of unplanned generation outages on 30-minute time resolution
Integrated System Plan (ISP)	20 years ahead projection of an ideal, least cost generation and transmission network expansion plan, supplemented by power system studies to assess operability and security considerations
Gas Statement of Opportunities (GSOO)	The GSOO leverages the ESOO and ISP to combine projected demand for gas for power generation with projected demand for residential, commercial and industrial and LNG export industry. This gross demand projection is then assessed against production/supply and pipeline capacity

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# Transition is about coordinating retirement of existing generators and timing of new entrant generators and network developments

- Solid lines forecast expected USE in the absence of generation development
- Dotted lines forecast expected USE if advanced projects are commissioned

**Figure 23** Reliability impact of projects well advanced, but not yet meeting AEMO's commitment criteria, second five years (2026-27 to 2030-31)

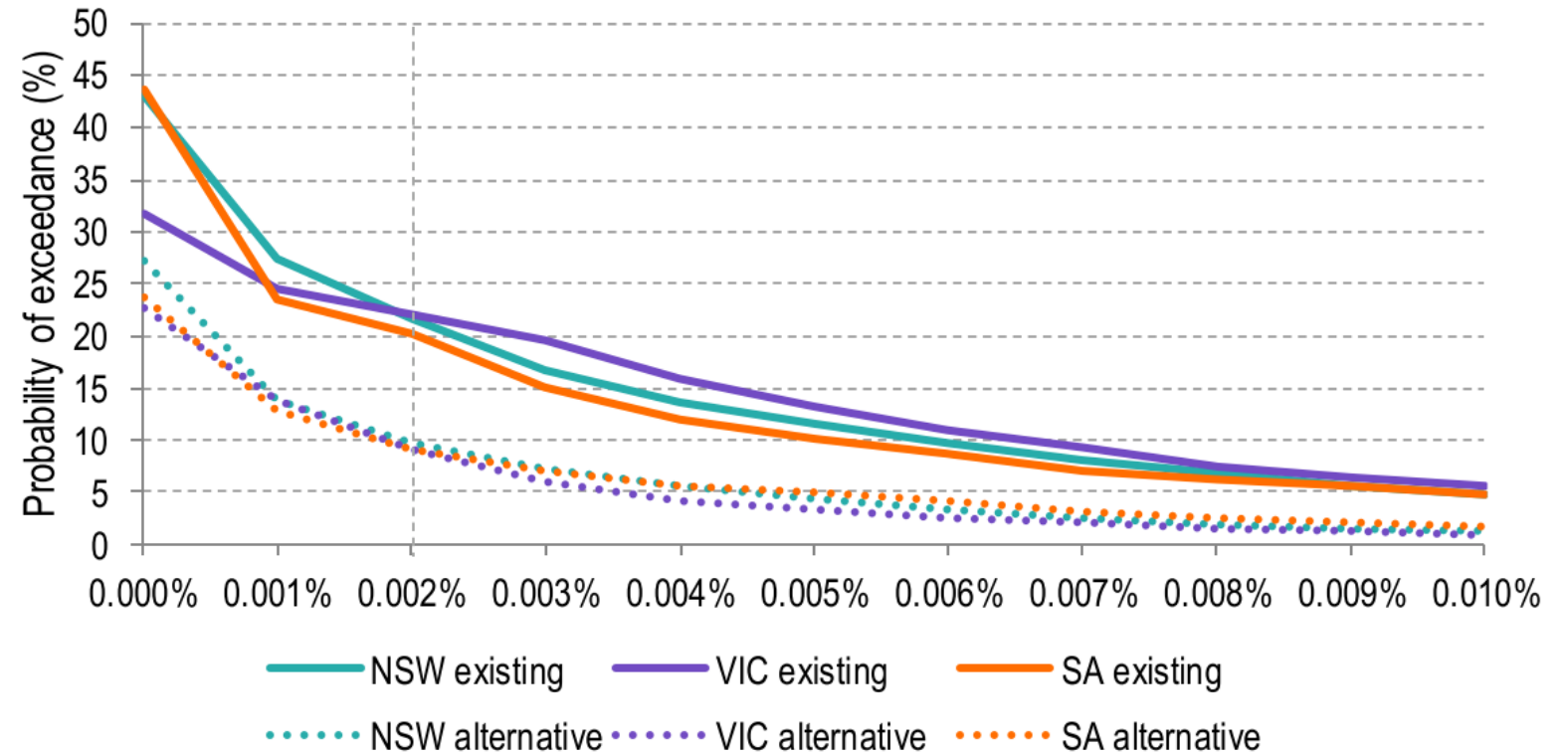


Source: AEMO 2021 Electricity Statement of Opportunities

# Unplanned outages of large generators, sometimes “sympathetic” multiple outages are by nature probabilistic

- Proposal interpreted the reliability standard to be at risk of breach 1 out of any 10 years, rather than on average
- Led to a tighter interim reserve measure being 0.0006% USE on average, being 0.002% on a “P10” basis

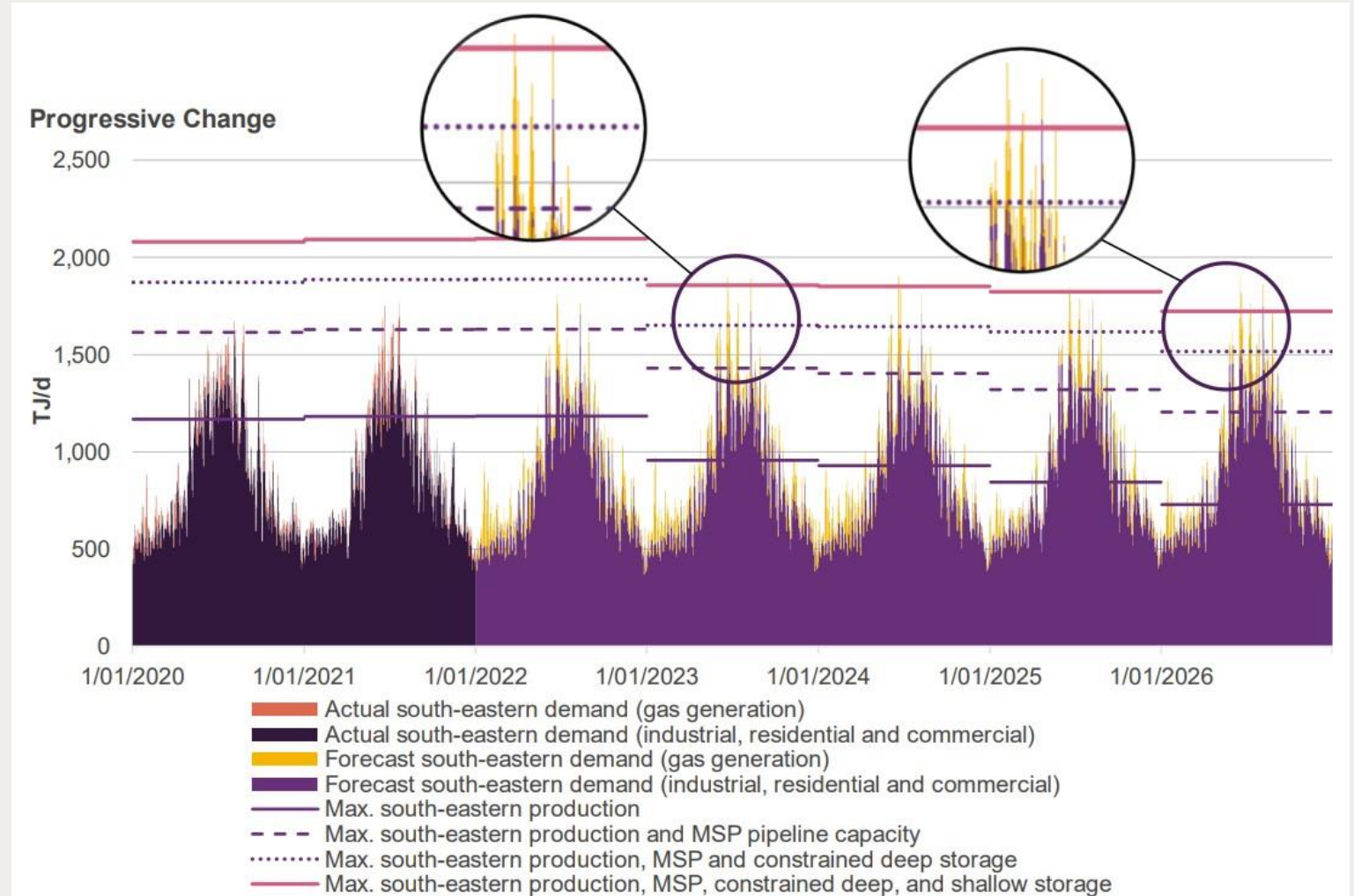
Figure 1: Probability of exceedance of expected annual USE (%) for all regions and each reliability standard



Source: 2020 Energy Security Board review of proposed Interim Reliability Measure

## Did somebody say Dunkelflaute?

- Based on generation dispatch modelling from the ISP and ES00, daily gas for power generation is calculated
- Outages of conventional generation combined with low wind/solar yield is forecast to result in potential gas supply and/or pipeline capacity shortfalls



Source: Gas Bulletin Board (GBB), GSOO surveys, and AEMO forecasts of one-in-20 and 2019 reference year weather patterns south-eastern demand.

Source: 2021 Australian Energy Market Operator Gas Statement of Opportunities

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