Power System Update

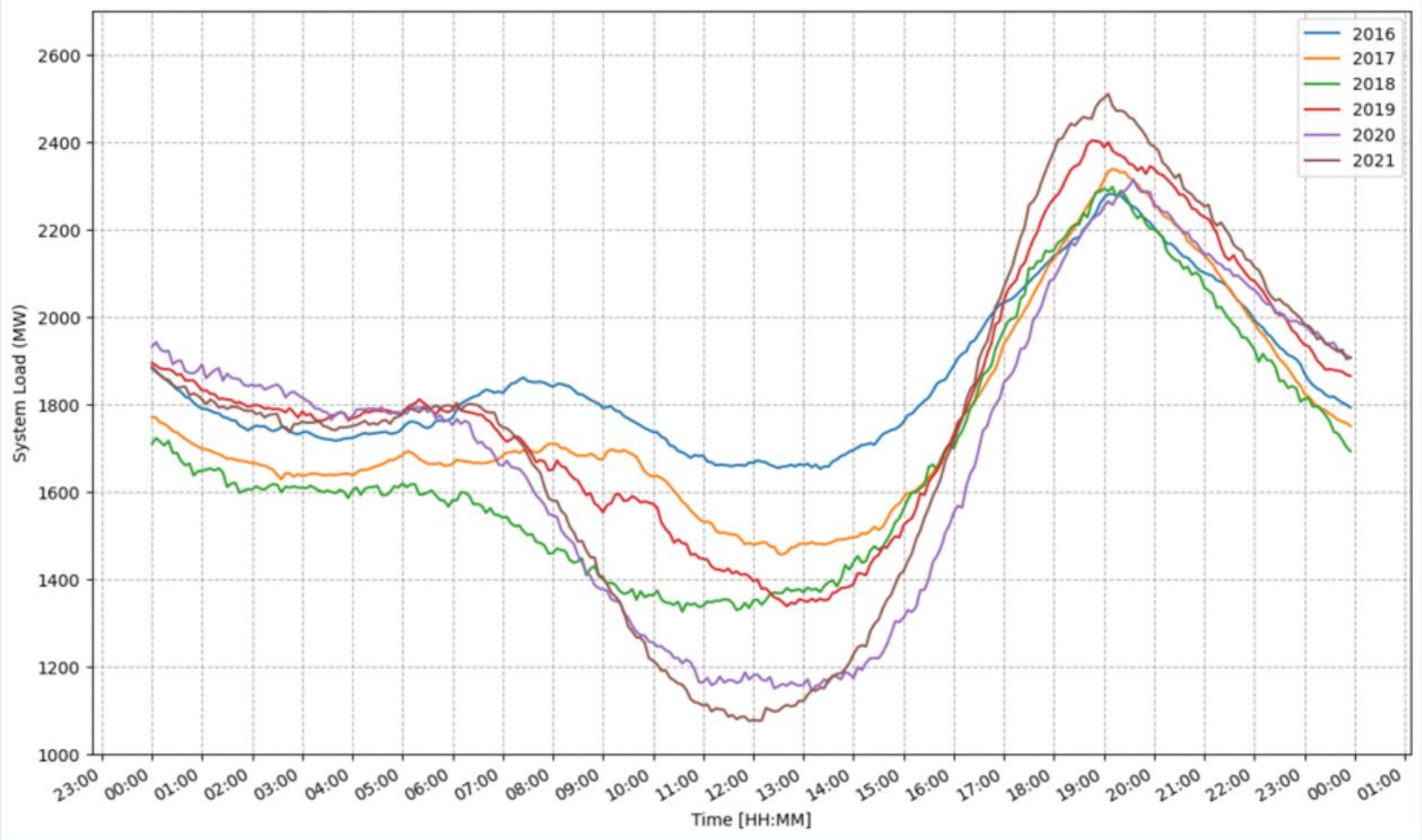
Presented to WA Electricity Consultative Forum

14 April 2021

Operational Challenges around Minimum Demand

How the record minimum demand day on Sunday 14/03/2021 compares with previous year records.

Weather remains a key factor. Warm weather such as over the Easter weekend, resulted in it being a non event.



AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Operational Challenges around Minimum Demand

Challenge	Impacts	Initial Mitigations	Ongoing analysis
Ramping requirements	Deep duck curve effects lead to higher ramping requirements from daytime trough to evening peak.	Operational planning to ensure flexible generating plant (e.g. gas turbines) are not on outage and available	Analysis to ensure capability of online fleet is adequate to meet expected ramps going forward.
Unintended distributed PV (DPV) tripping in response to system disturbances	A portion of DPV cannot ride through power system disturbances and disconnect leading to a sudden loss of net generation. This poses a system security risk when coupled with generation contingencies.	AEMO provision additional reserves during periods of high risk exposure, i.e. when DPV tripping in conjunction with a loss of generation is credible.	Building on work done in the NEM, refinement of amount of DPV and load tripping following network faults, with net generation shortfall. Determining most appropriate solution to this going forward.
Decommitment of large synchronous generators	Reduction in inertia, system strength, and frequency and voltage control capability.	AEMO use a real-time control room tool to manage frequency stability risks.	Determination of minimum synchronous generators which need to be online to meet system security requirements.
Voltage management	Lightly loaded lines and high levels of DPV output cause over-voltages at transmission level.	Western Power have committed to installing 490 MVAr of reactors by the end of 2021 (with ~300 MVAr already installed)	Regular operational review and longer term requirements included in Western Power planning process.
Erosion of Under-Frequency Load Shedding (UFLS) levels	Quantity of load available for UFLS is reduced due to backfeeding substations and feeders with high DPV output.	AEMO worked with Western Power to shift backfeeding and high DPV feeders to later UFLS stages so that Stage 1 and 2 UFLS are less compromised.	Work being done under DER Roadmap action 10 is reviewing the current UFLS scheme and identifying what needs to be done to ensure an appropriate outcome going forward.
System Restart	Load may not be available at the substations along the preferred restoration path.	System Restart plan was revised to include a pathway with adequate load to restart the system even in the middle of the day.	Reviewing options to ensure a restart path is available considering increasing PV penetration and how this can be managed going forward.