

# Market Evolution in Australia and Forecasting at AEMO

Session 7: High VRE Futures – How Are Markets Evolving

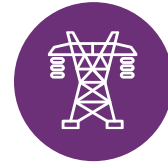


We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

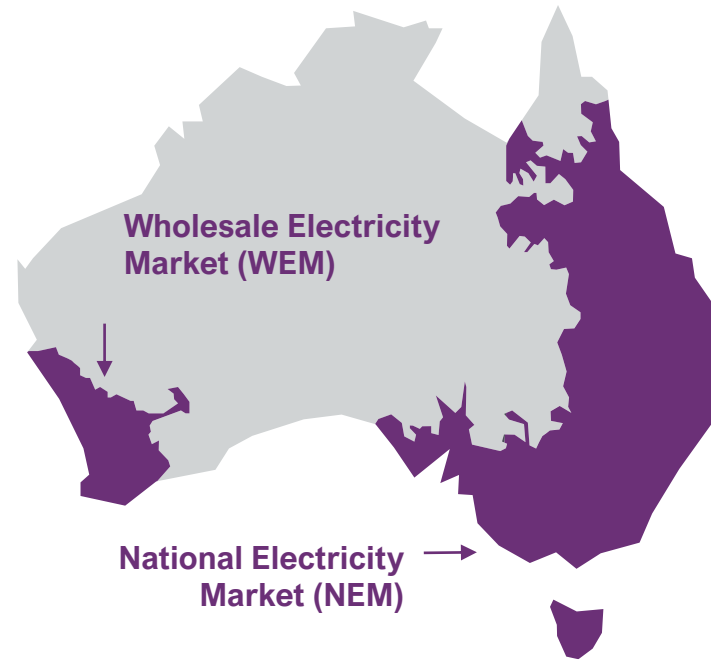
**We pay respect to their Elders past, present and emerging.**

# About AEMO

- AEMO is a member-based, not-for-profit organisation.
- AEMO is the independent energy market and system operator and system planner for the National Electricity Market (NEM) and the WA Wholesale Electricity Market (WEM).
- AEMO also operate retail and wholesale gas markets across south-eastern Australia and Victoria's gas pipeline grid.



## Electricity



## Gas



# Electricity Markets in Australia

## Wholesale Electricity Market (WEM)



Electricity

## National Electricity Market (NEM)



Capacity Market

18 TWh of consumption annually

1 million customers

6 GW of generation capacity

Maximum system demand of ~4 GW

7,800 km of lines (~4,900 miles)

Energy Only Market

200 TWh of consumption annually

10.7 million customers

65 GW of generation capacity

Maximum system demand of ~35 GW

40,000 km of lines (~25,000 miles)

**As Australia transitions  
towards weather-dependent  
power generation, system  
challenges and  
opportunities are emerging.**



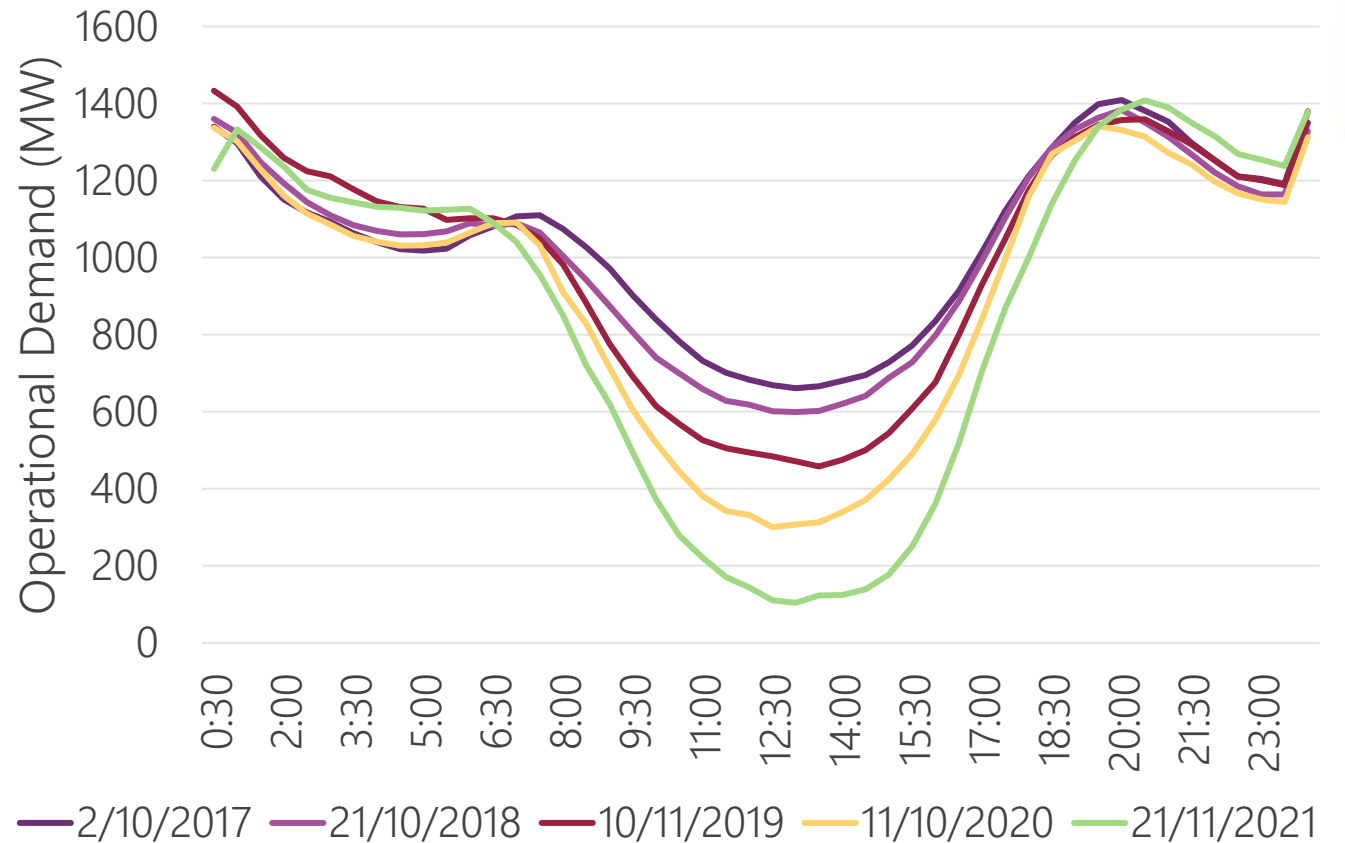
# Variability in Demand – A Forecasting Challenge

Growth in distribution connected capacity is impacting the shape and trend in Operational load.

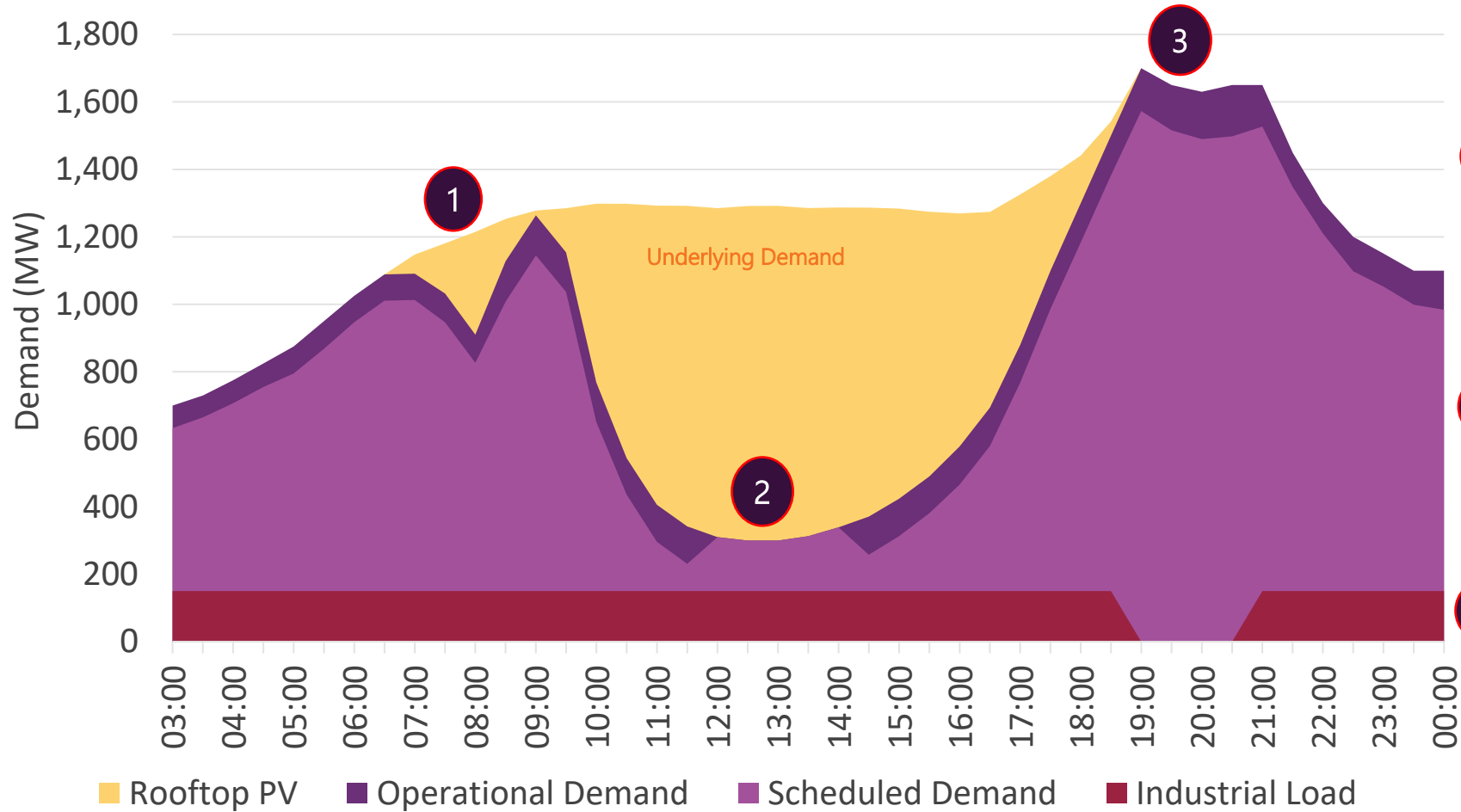
DPV is distributed, passive, and invisible.

15 GW of Distributed PV (DPV) capacity in the NEM.

Minimum Operational System Load records in South Australia since 2017.



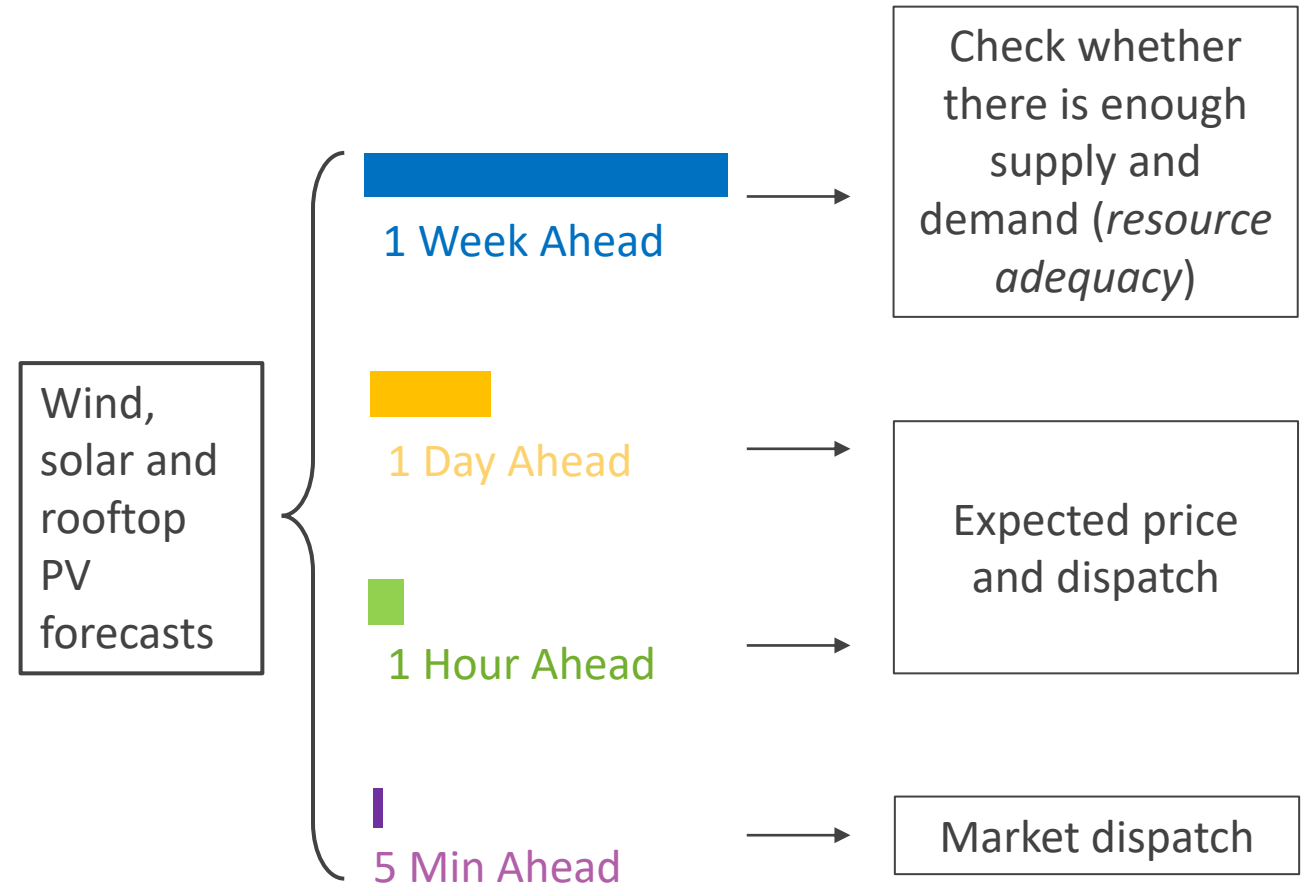
# Variability in Demand – Impacts on the Power System and Market



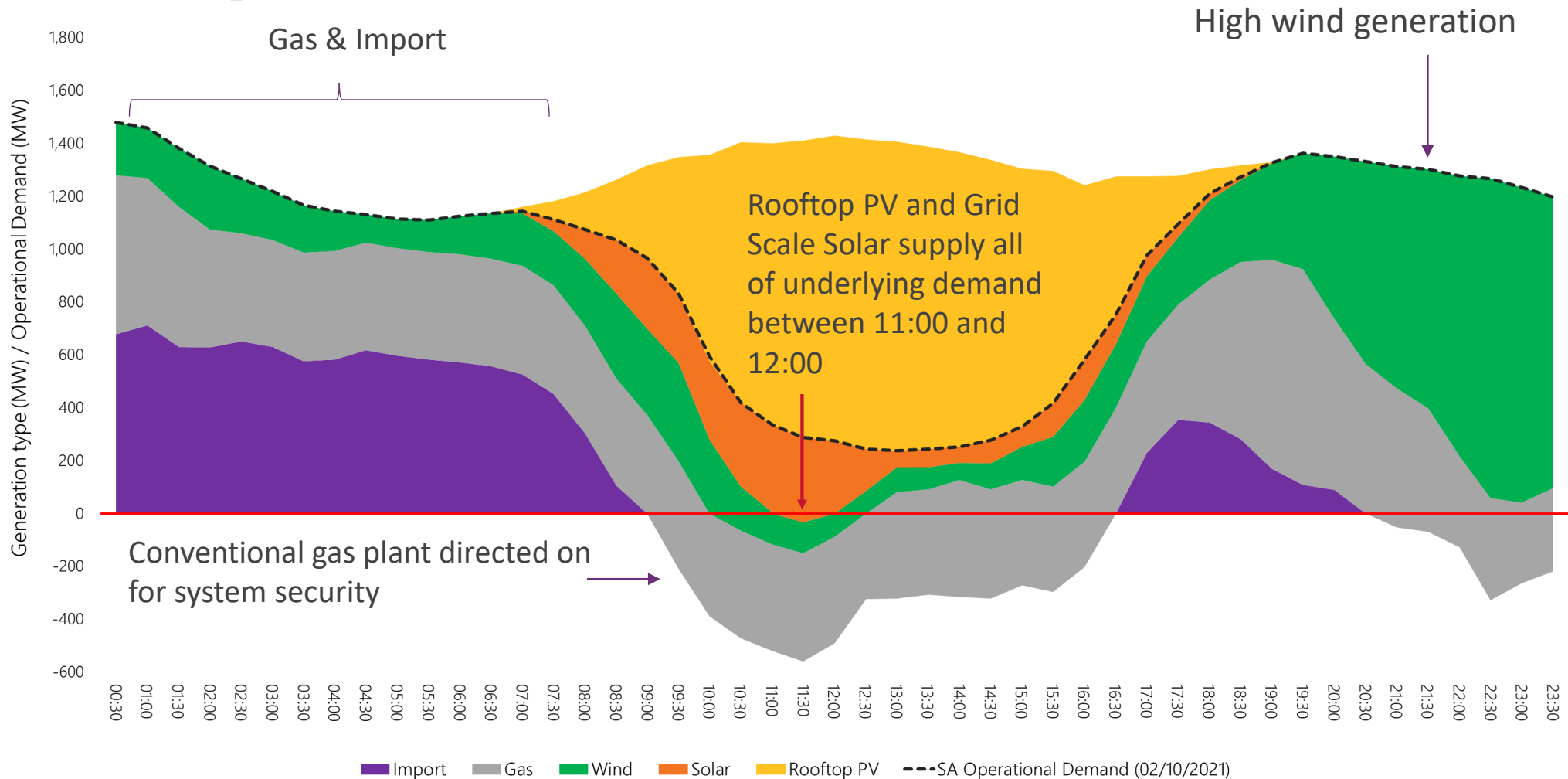
- 1 Cloud cover / PV variability**  
 Cloud cover results in rooftop PV variability and can be highly uncertain even within the day-ahead timeframe.
- 2 Market response**  
 Generation which may switch off during negative prices: non-scheduled participants.
- 3 Demand side response**  
 Load which may switch off during high prices.

# Variability of Supply – A Forecasting Challenge

- AEMO has seen a 5,800% increase in daily wind and solar forecasts since 2007.
- AEMO produces forecasts for >150 wind and solar generators.
- As intermittent generation capacity increases, so does weather variability and uncertainty.

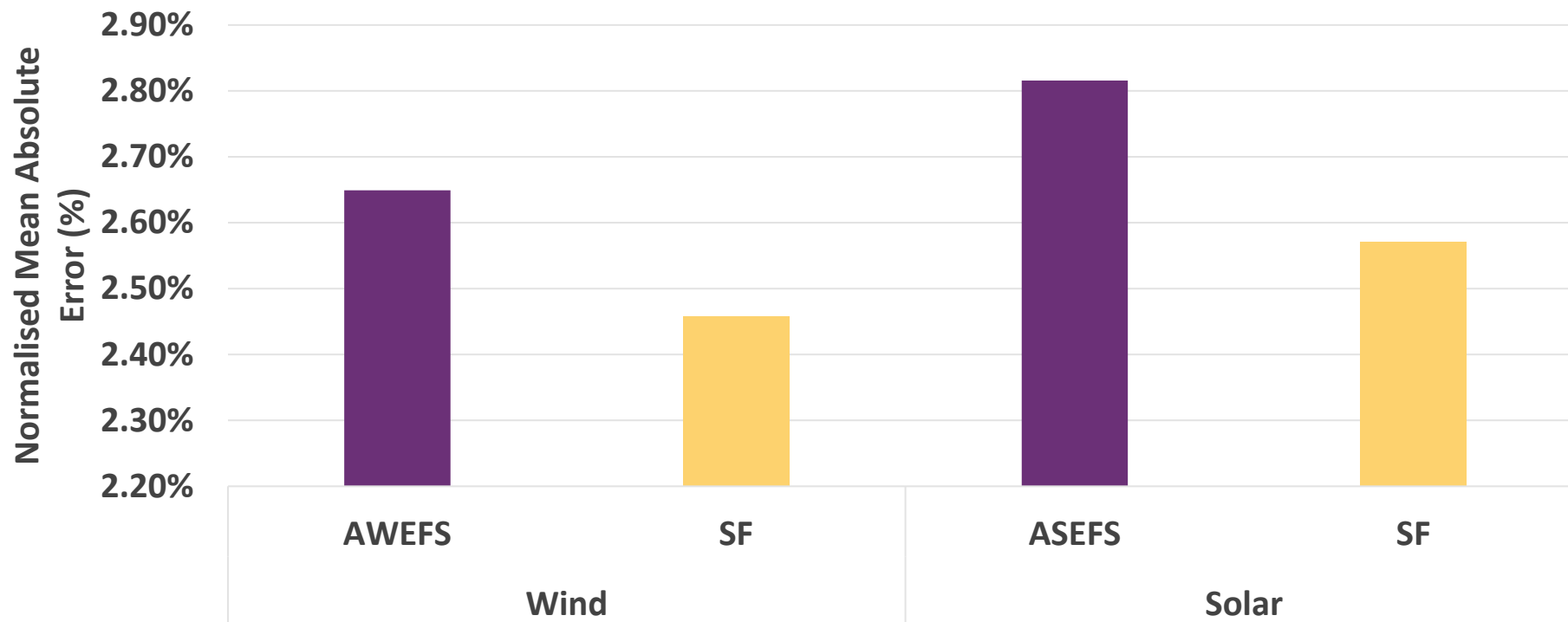


# Variability of Supply – Impacts on the Power System and Market



# Self-forecasting for solar and wind

- Self-forecasting program gave participants the ability to provide Dispatch forecasts for their wind and solar farms.
- Participants benefit by reducing generation forecast errors and the costs associated with those errors.



# Proposed changes to Market Design

## National Electricity Market (NEM)

- **Operating Reserves** – Market for the provision of reserves over the operational timeframe (30 minutes ahead) to ensure there are sufficient reserves to address increasing forecast uncertainty and system security.
- **Scheduled Lite** – Provide greater visibility to the system operator and wholesale market, and enable distribution connected resources to participate in the wholesale market.
- **PASA Replacement** – A comprehensive review of the Projected Assessment of System Adequacy (PASA) methodology to ensure it is fit for purpose moving forward.

# Questions?

