



South Australian Electricity Report

Insights for Demand Management

3 December 2018

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Introduction

Key Insights

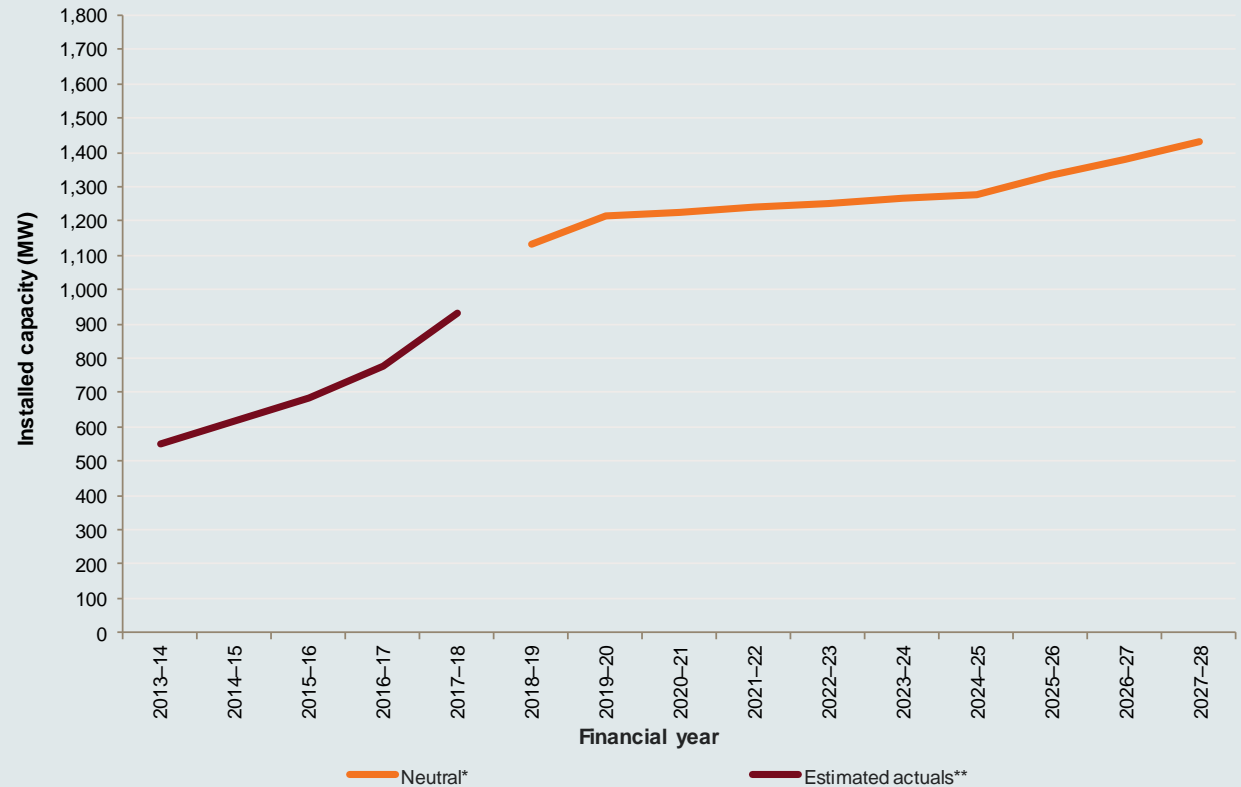
- South Australian Electricity Report available at: <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/South-Australian-Advisory-Functions>
- The dynamics of the power system in South Australia have changed significantly as ageing coal-fired generation assets have withdrawn; while wind, behind-the-meter rooftop photovoltaics (PV) generation, and battery storage have grown rapidly.
- The power system now needs to accommodate more dynamic and technologically diverse plant, including embedded resources that are geographically dispersed, to meet varying energy usage patterns that are vastly different to previous decades.
- The shape of operational demand is becoming increasingly peaky, and both demand and supply are exposed to the vagaries of weather, changing the nature and profile of supply scarcity risks.

Rooftop PV

Behind the Meter Generation

Rooftop PV

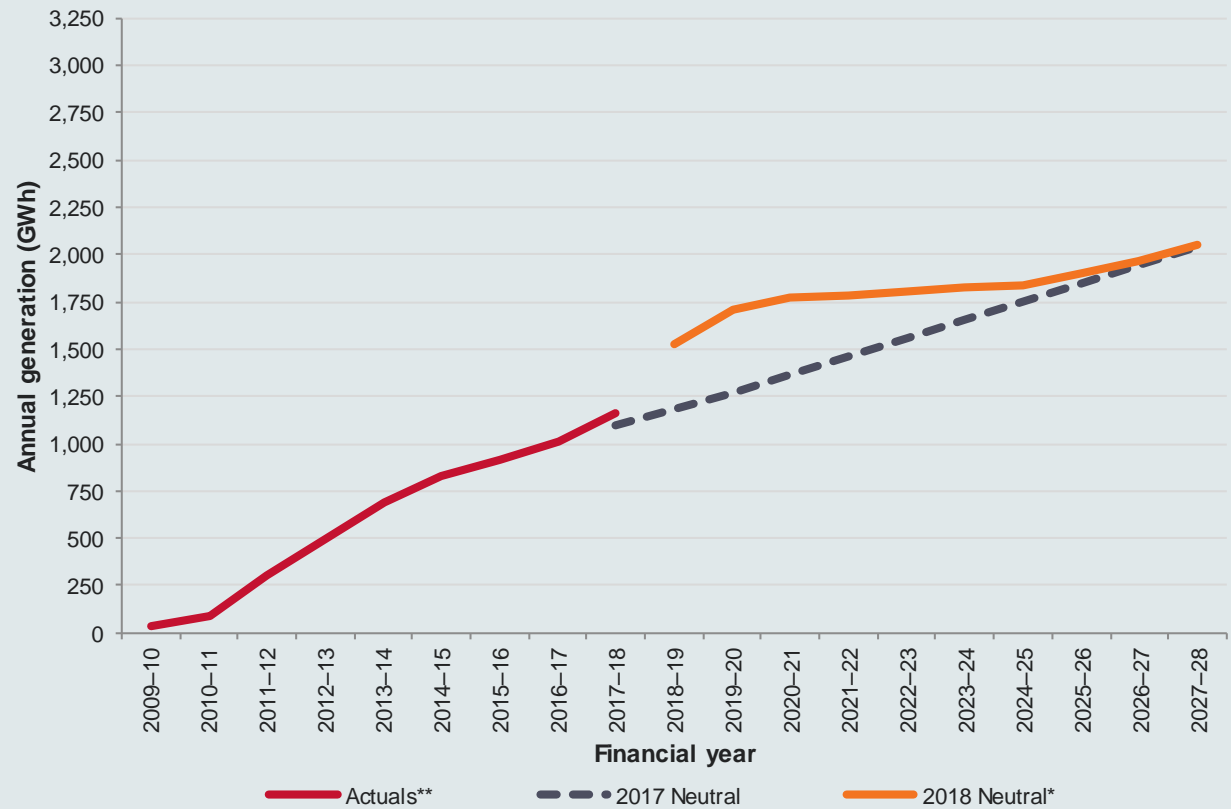
South Australian rooftop PV installed capacity forecast



- Rooftop PV systems continue to be installed at a very high rate. An additional 155 megawatts (MW) was estimated to have been installed in 2017-18 across business and residential sectors, bringing total estimated residential and business PV combined capacity in South Australia to 930 MW.
- The business sector saw stronger relative growth by a considerable margin in the past year.
- More than 32% of South Australian dwellings now have rooftop PV systems installed, the second highest level of penetration in Australia.
- Rooftop PV installed capacity is forecast to reach 1,432 MW in 2027-28.

Rooftop PV

South Australian rooftop PV generation forecasts



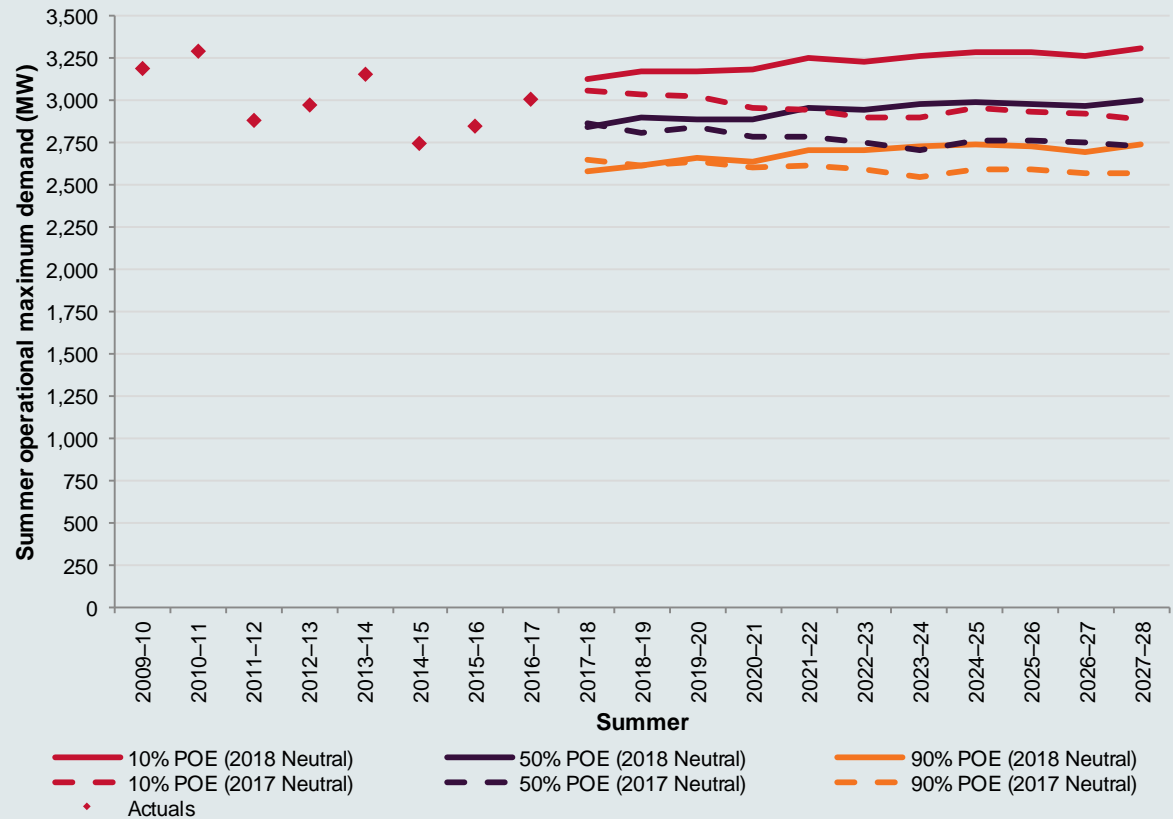
- Rooftop PV contributed an estimated 1,162 gigawatt hours (GWh) in the 2017-18 year.
- It is forecast to increase to 2,050 GWh by 2027-28, representing approximately 15% of annual underlying consumption.
- Over the next 10 years, South Australia is projected to have the highest ratio of rooftop PV generation to operational consumption of all NEM regions.

Operational Maximum Demand

Summer and Winter Forecasts

Maximum Demand

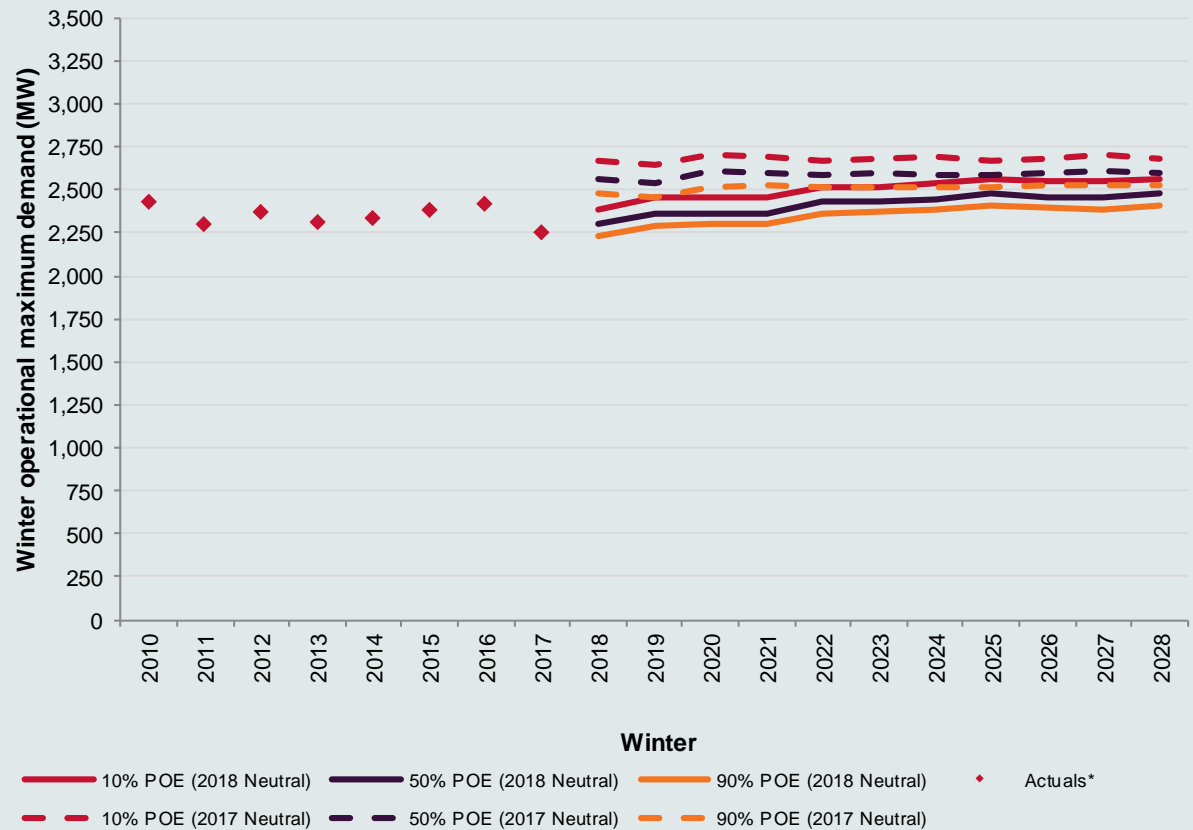
Summer operational maximum demand actual and forecast for South Australia (neutral sensitivity)



- Maximum operational demand will continue to be experienced in summer and is expected to be higher due to growth drivers for business load, as well as the expectation that maximum operational demand will peak too late in the day for additional rooftop PV to have a substantial impact offsetting growth in grid demand.

Maximum Demand

Winter operational maximum demand actual and forecast for South Australia (neutral sensitivity)



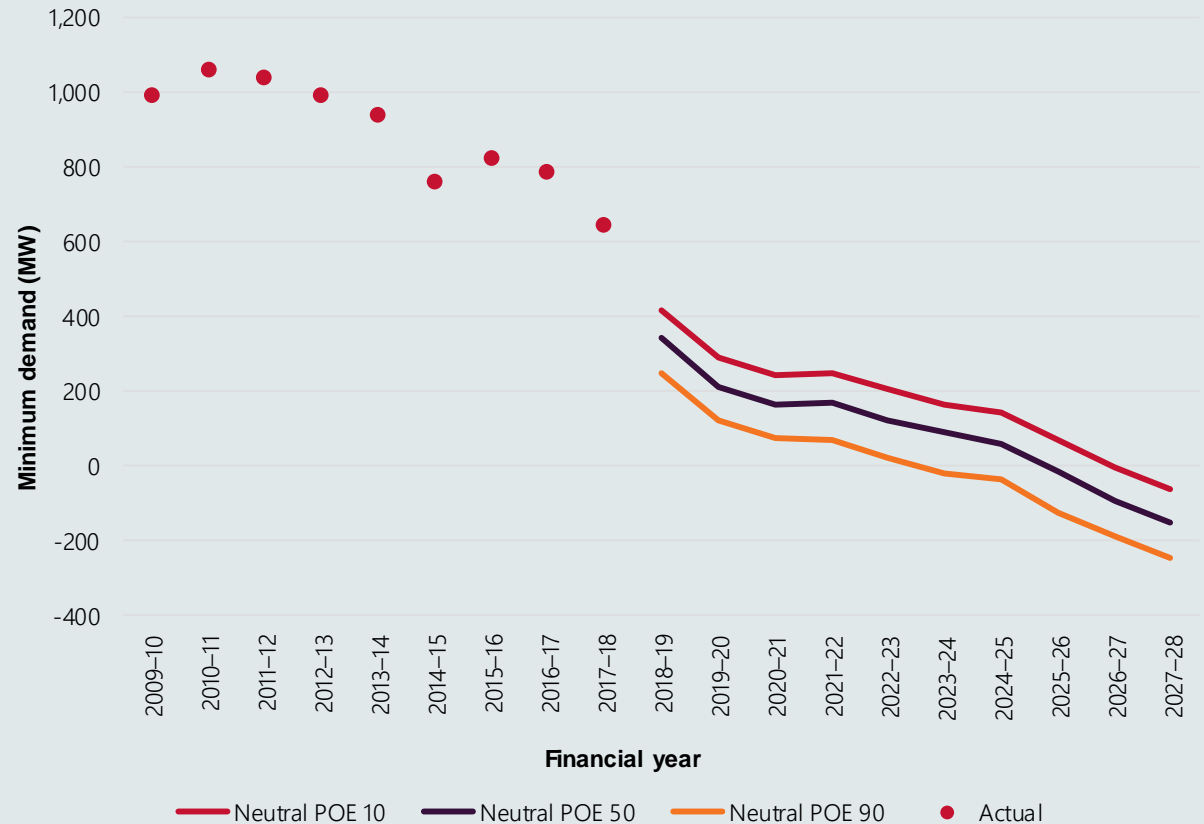
- The 2016 calendar year winter peak was driven by very cold temperatures, while 2017 had much milder weather. Calibrating the model with the latest year of data shifted the forecast values down in 2018.

Operational Minimum Demand

Financial Year Forecasts

Minimum Demand

Minimum demand actual and forecasts for South Australia (neutral sensitivity)



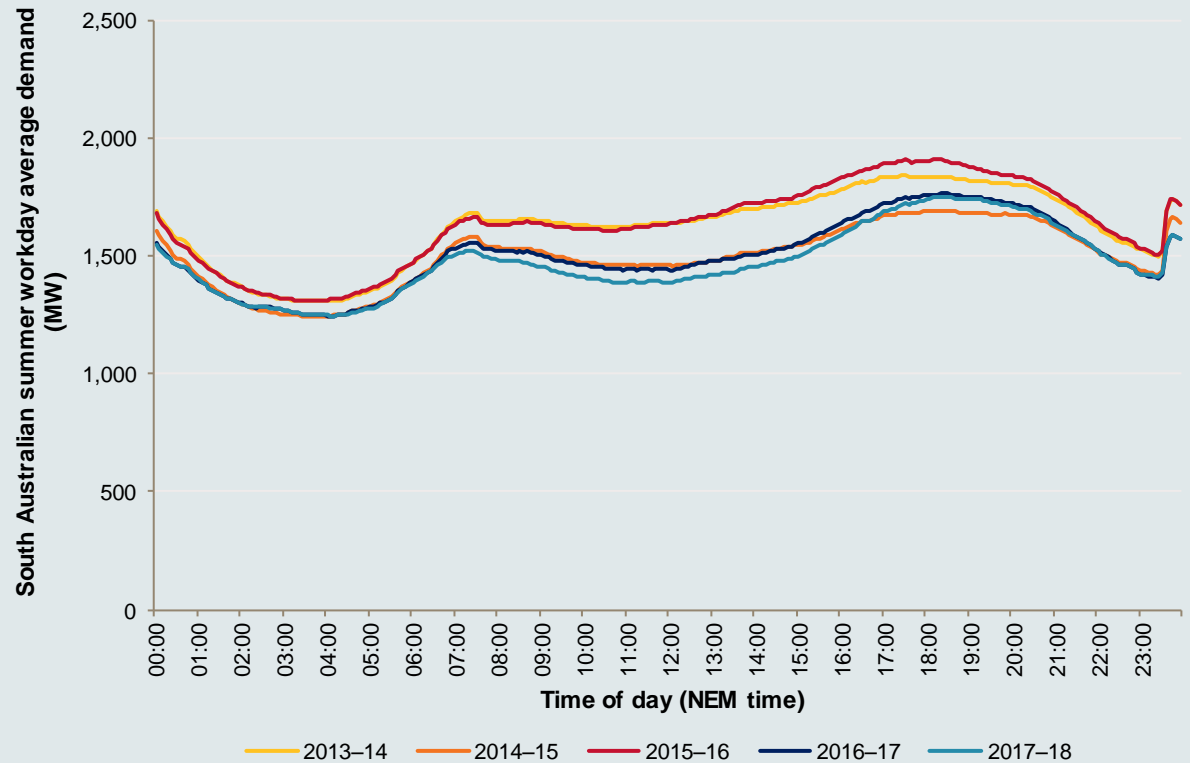
- AEMO forecasts negative minimum demand for the South Australian region under certain conditions by 2023-24.
- For 90% POE minimum demand days, continued uptake of rooftop PV is forecast to offset 100% of demand in South Australia during the middle of the day.

Demand Profiles

Summer and Winter Average Days

Demand Profiles

Summer workday average demand profiles

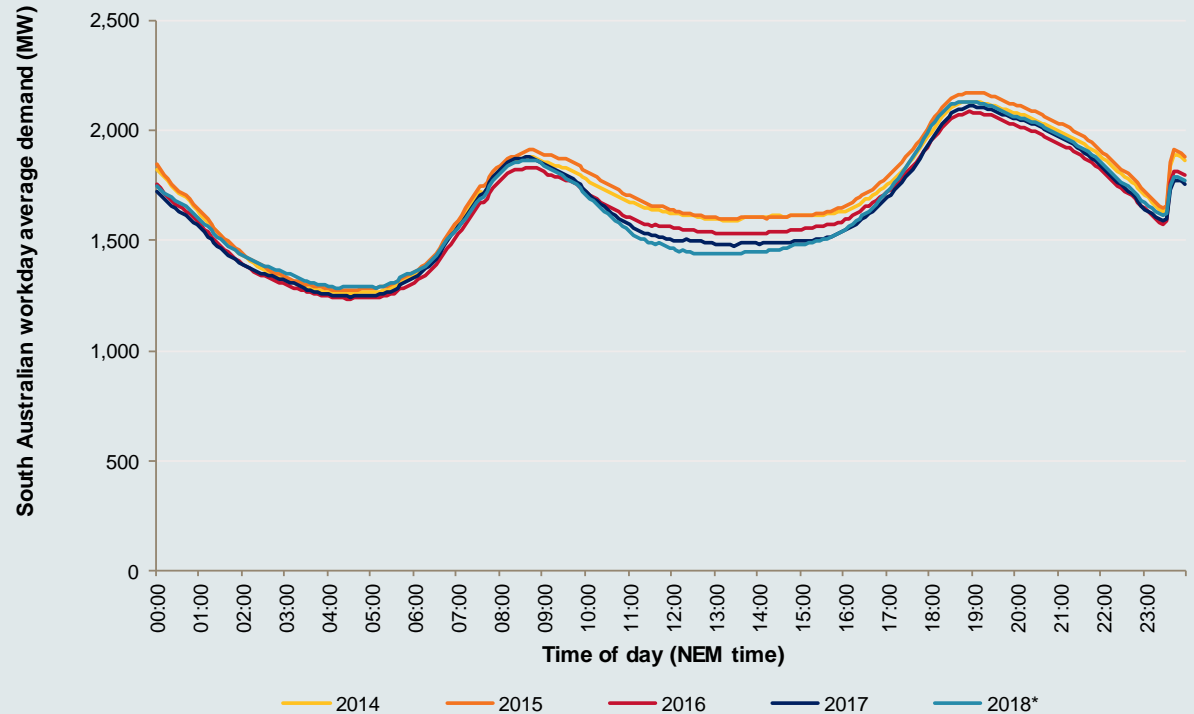


- Seasonal hot weather still plays a large role in shaping overall demand: In 2015-16, Adelaide experienced heatwaves and record-breaking daytime temperatures which led to a much higher average demand over the summer period than in the adjacent years.

Demand Profiles

Winter workday average demand profiles*

* Winter 2018 comprises only one month of data



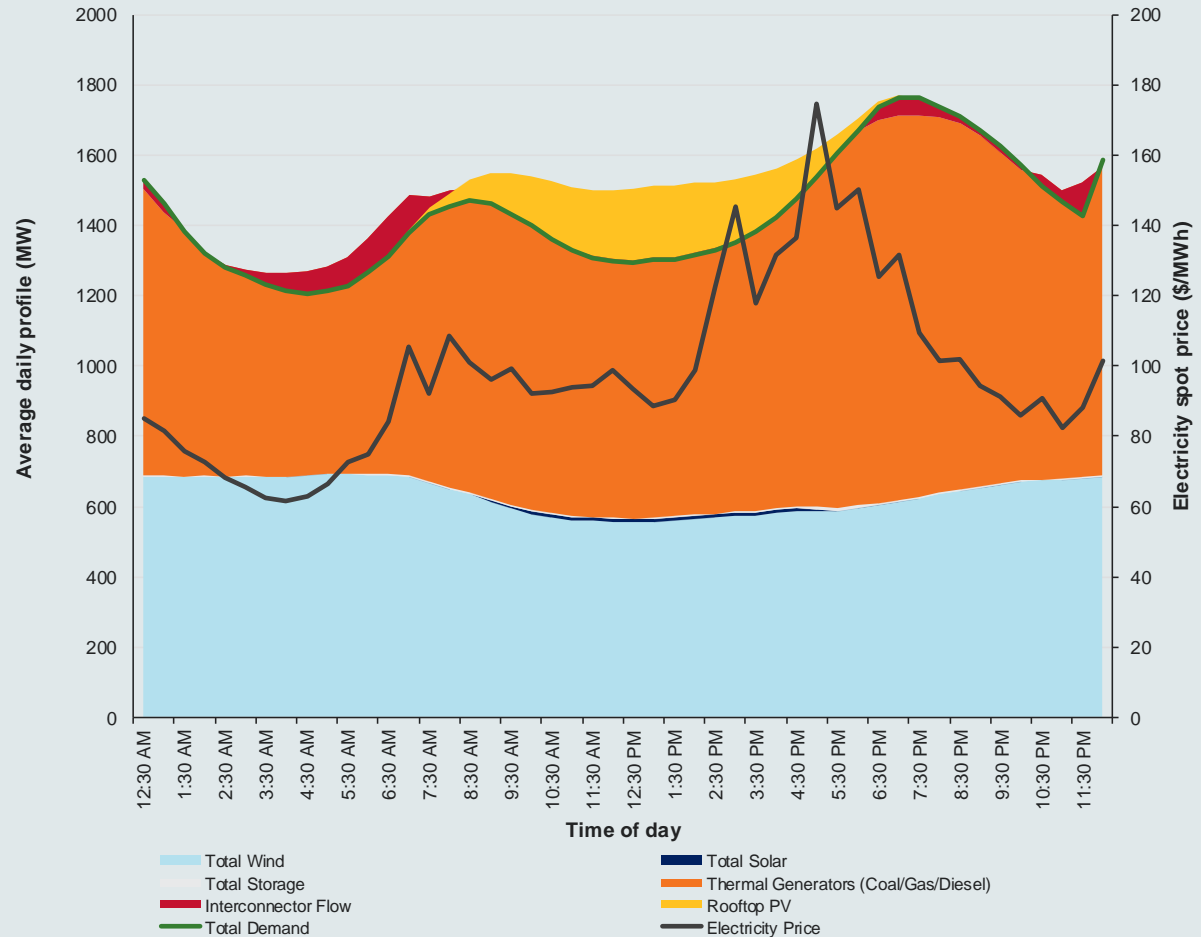
- In winter, a noticeable morning peak is followed by an evening peak, reflecting a combination of demand increases as the workday commences and ends.
- Reduced grid demand is observed in the daylight hours, due to the increased output of rooftop PV.
- Evening peaks can be attributed to continual demand from the grid, mainly for domestic heating.

Supply Profiles

Average Daily Profile

Supply Profiles

Average daily supply profile for South Australia: Representing the supply (in MW) for each 30-minute trading interval of a day, averaged over the 2017-18 financial year.



- Average wind output was slightly higher during the evening and early morning periods, complementing average rooftop PV generation, which produced most of its output between 8.00 am and 6.00 pm.
- Scheduled generation contributed the most to the daily profile, providing the requisite energy when necessitated by higher demand or when other generation sources were low.
- Interconnector imports mainly occurred in the off-peak periods when solar was not operational.

Virtual Power Plants (VPPs)

Virtual Power Plants

Incentives are expected to drive rapid uptake of VPPs in South Australia:
Up to 450 MW in next 3-4 years

VPP projects in South Australia	State	Systems / \$	Total capacity (Est. MW)	Timing
Reposit "Grid Credits/Impact" with Powershop/Diamond energy	ACT, VIC, NSW, SA, QLD	Confidential	n/a	Current
AGL VPP	SA	1000	5	By early 2019
Simply Energy (Incl. Tesla, Greensync)	SA	1200	5.2	By early 2019
Tesla (SA housing trust)	SA	1000 to 50,000	5, up to 250	Total by 2022
SA Govt Storage Subsidy Scheme	SA	40,000, \$100m	200	By 2022



Aligns with AEMO's proposed [VPP Demonstrations framework](#)

Wholesale Demand Response (WDR)

Wholesale Demand Response

AEMC assessing
three rule change
proposals

- Proposals would introduce new Demand Response Service Provider market participant category
- DRSP may be scheduled resources in future
- More competition = better outcomes for consumers