

Summer 2018-19 preliminary review

Review of maximum demand forecast to date

Overview

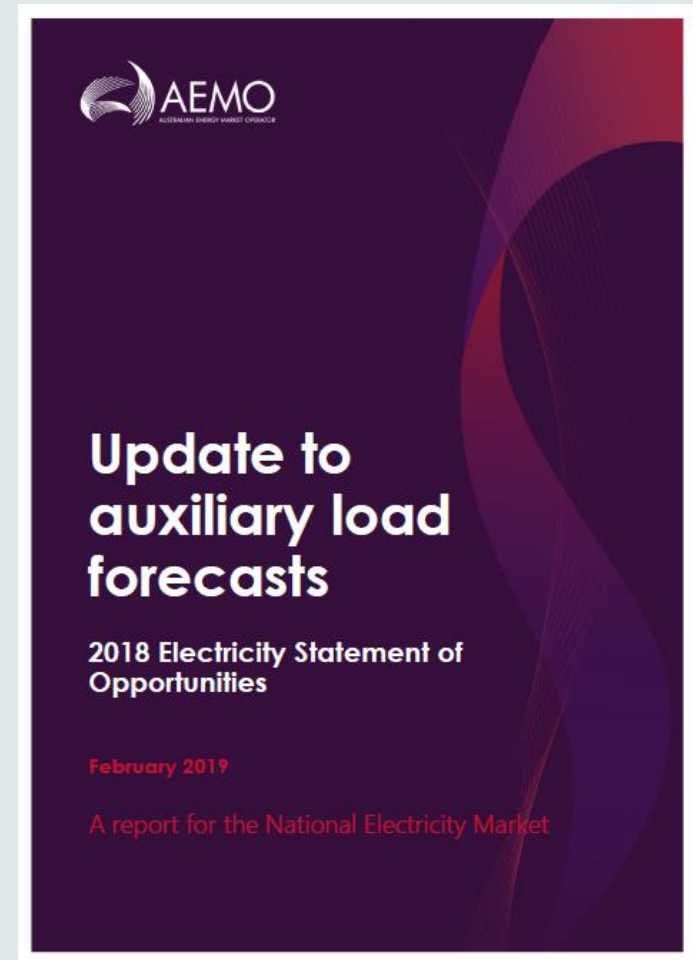
1. AEMO's updated 2018 ESOO forecast
2. What does 10% POE actually mean
3. Summer 2018-19 maximum demand review

Updated auxiliary load forecast for the 2018 ES00

- AEMO has published an update to the auxiliary load forecast used in the 2018 ES00.
- The update is available from AEMO's redesigned webpage for Electricity Demand forecasts:

<https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/NEM-Electricity-Demand-Forecasts>

- As AEMO's modelling is all based on sent-out demand, there is no update to any of AEMO's reliability modelling (ES00, EAAP and MT-PASA).



What is 10% POE?

- Many elements need to align to get to a 10% POE outcome



What is 10% POE?

For our ESOO maximum demand forecasts, the 10% POE forecast represent a forecast that only will be exceeded this year with a probability of 10%.

Extreme high demands, generally only occur when a number of conditions are all met:

- High temperature* on the day
- Following on the back of several days of high temperatures*
- This is happening a weekday
- This is not during the Christmas break (from Christmas to 1 week into January) or a public holiday
- No cool change late in the day

*above is a summer example, for winter max demand, this is driven by low temperatures.

What is 10% POE?

AEMO's maximum and minimum demand forecasts represents forecast demand in the absence of:

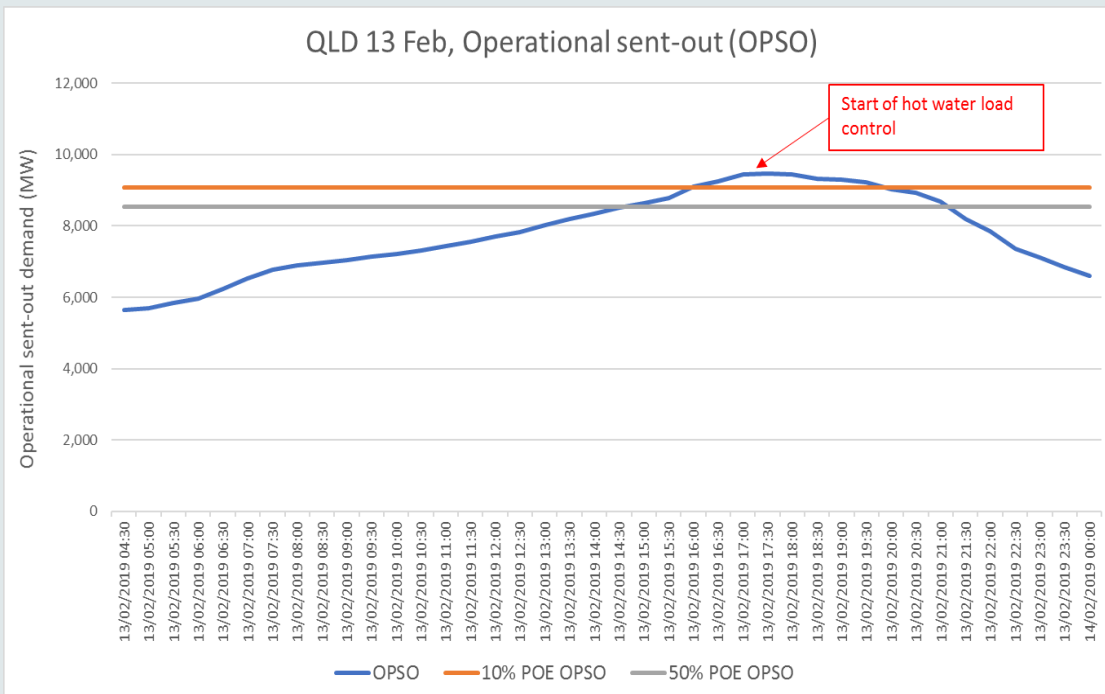
- Directed load shedding
- Network outages
- Mandatory restriction schemes in effect
- Call for voluntary reduction in demand
- Demand side participation (DSP) including any under RERT

It does account for daily operation of load control, such as timer controlled hot water, or ripple controlled hot water/pool pump loads.

Any load shedding or atypical reduction in demand should be added back to the actual demand (counterfactual) when comparing with the forecast.

Queensland max demand

- New record peak demand set Wednesday 13 February 2019.
- No load shedding, call for reductions and relatively low prices (~\$120/MWh) means no market driven DSP



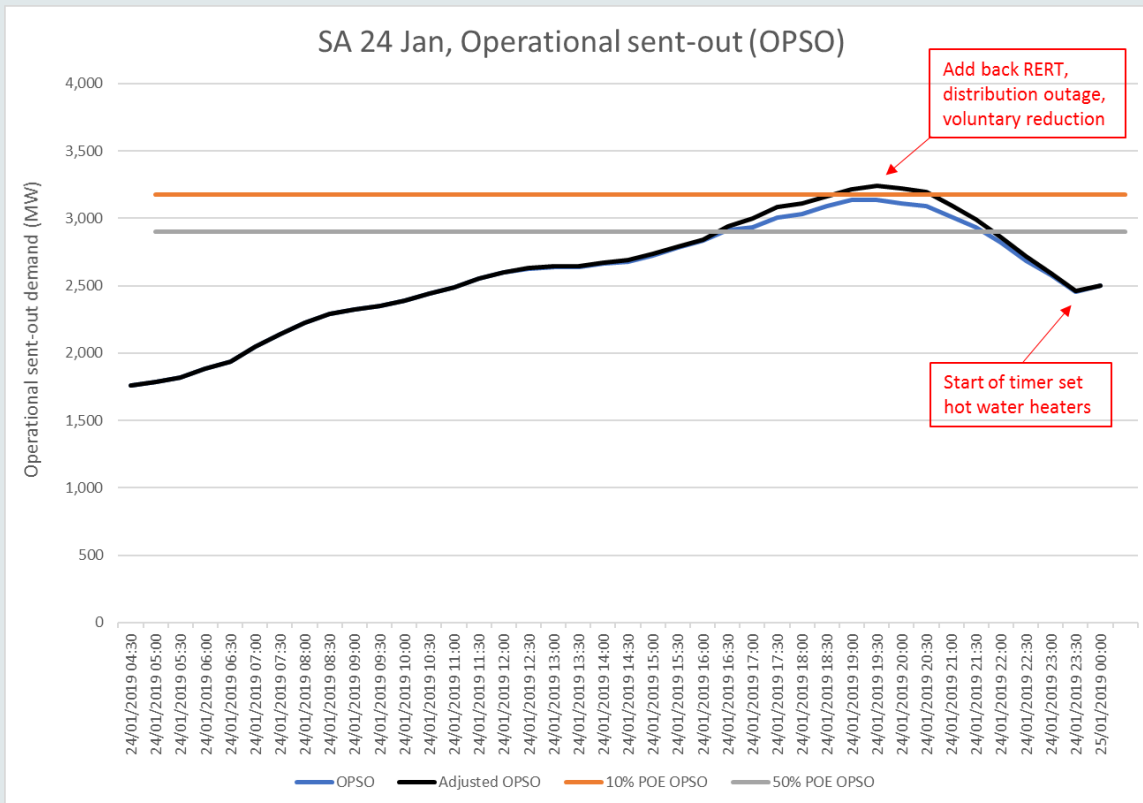
10% POE forecast
exceeded by 300 MW

**FORECAST TO
BE REVIEWED**

Factor	Check
Hot day	(+)
Extended period of hot weather	+
Weekday	+
Non-holiday	+
No cool-change before sunset	+

South Australian max demand

- Summer maximum demand to date was 24 January. Many weather records were broken, and the day generally ticked all boxes for an extreme outcome.



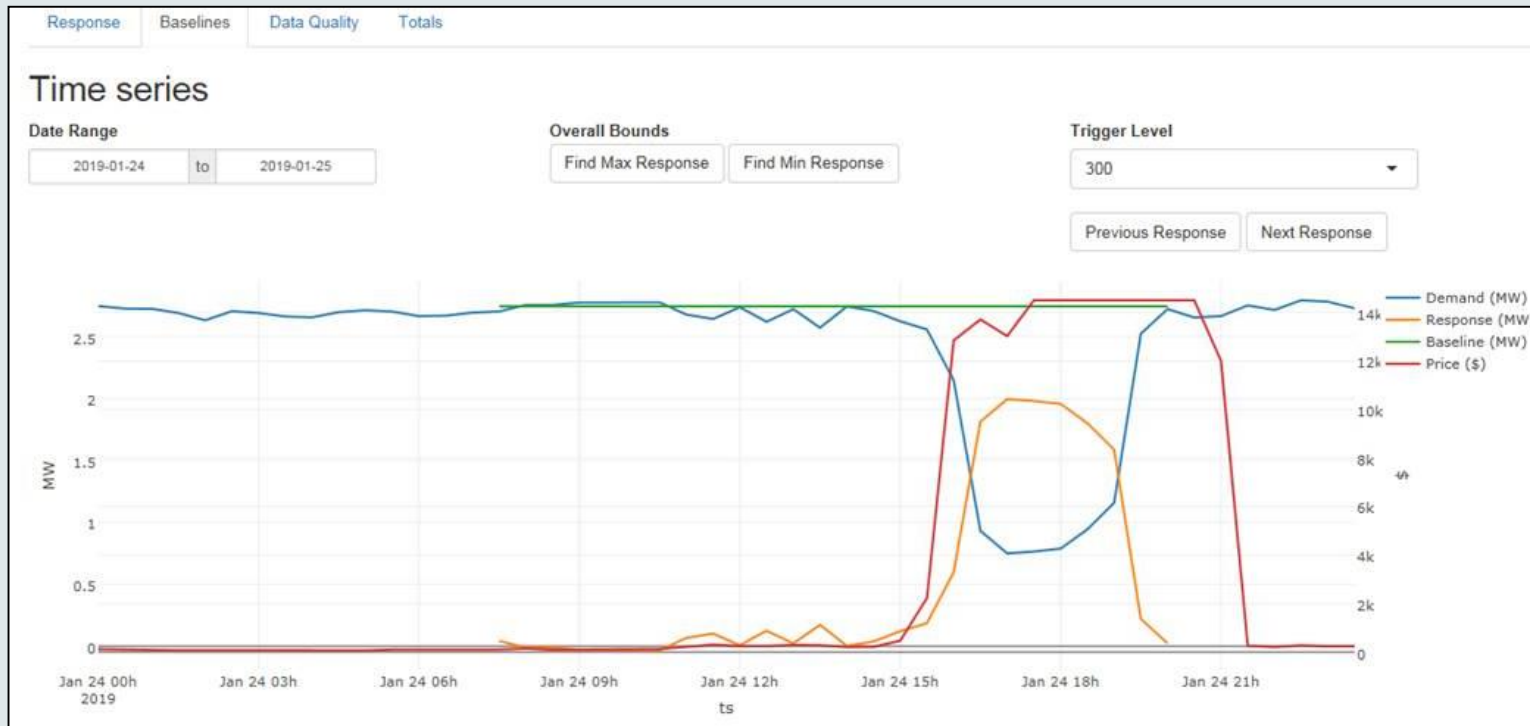
10% POE forecast exceeded by 75 MW

**FORECAST
WELL ALIGNED**

Factor	Check
Hot day	+
Extended period of hot weather	+
Weekday	+
Non-holiday	+
No cool-change before sunset	+

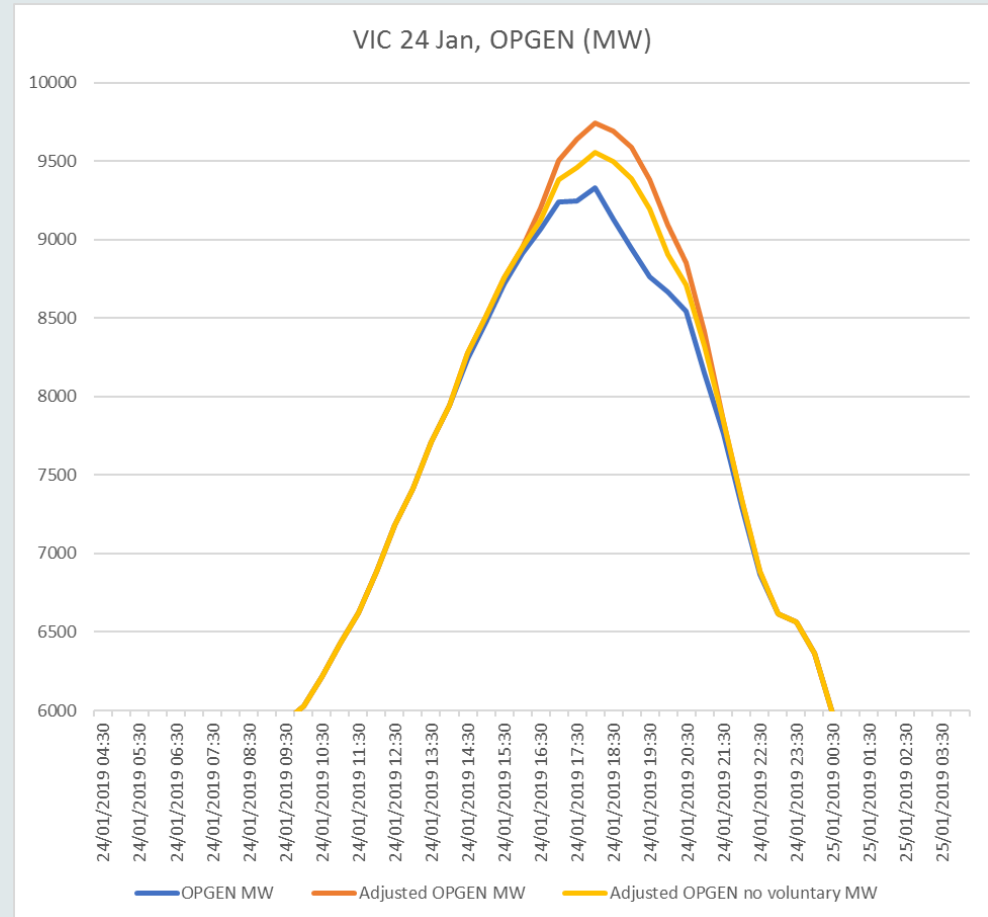
Market driven DSP – example in SA

- AEMO is updating its DSP tool to output regional time series of aggregated responses, made up of each individual sites' responses.
- Price responding DSP not yet added back to observed demand



Victorian max demand

- The situations on both Thursday 24 January and Friday 25 January were highly complex with a mix of load shedding, directions, RERT, DSP, and a voluntary call for reduction of consumption in the media from both AEMO and the state Premier.
- These reductions need to be added to make actuals comparable with forecast demand.
- Some of these adjustments are highly uncertain though.



Voluntary reduction – how much?

- AEMO's Demand Reduction Calculator can be used to estimate level of demand reduction, if a given percentage of consumers stops using various appliances for a specified period of the day.
- The percentage that responds to a call for reduction is highly uncertain though and depends on:
 - How many receive the message
 - How many that choose to act

Very few cases to learn from. Last time was February 2017 in New South Wales, where the reduction in demand was estimated to be 200 MW.

TV audience – ranking 24 January

Rank	Program	Viewers
1	Seven News	923,000
2	2019 Australian Open Day 11	831,000
3	Nine News	814,000
4	Seven News / Today Tonight	807,000
5	Nine News 6:30	793,000
6	I'm a celebrity - get me out of here	680,000
7	ABC News	621,000

Voluntary reduction – how much?

Load source	Target total load	Compliance Rate	Time Start (EST, half hour beginning)	Time End (EST, half hour beginning)
Residential Heating	0%	100%	09:00	14:30
Residential Cooling	25%	100%	09:00	14:30
Commercial Heating	0%	100%	09:00	14:30
Commercial Cooling	0%	100%	09:00	14:30
Residential appliances				
Lighting	20%	100%	09:00	14:30
Pool	0%	100%		
Cooking	0%	100%		
Washers & Dryers	30%	100%		
Dishwashers	30%	100%		
Fridge & Freezer	0%	100%		
Computers & IT	10%	100%		
Home Entertainment	10%	100%		
Stand By	0%	100%		

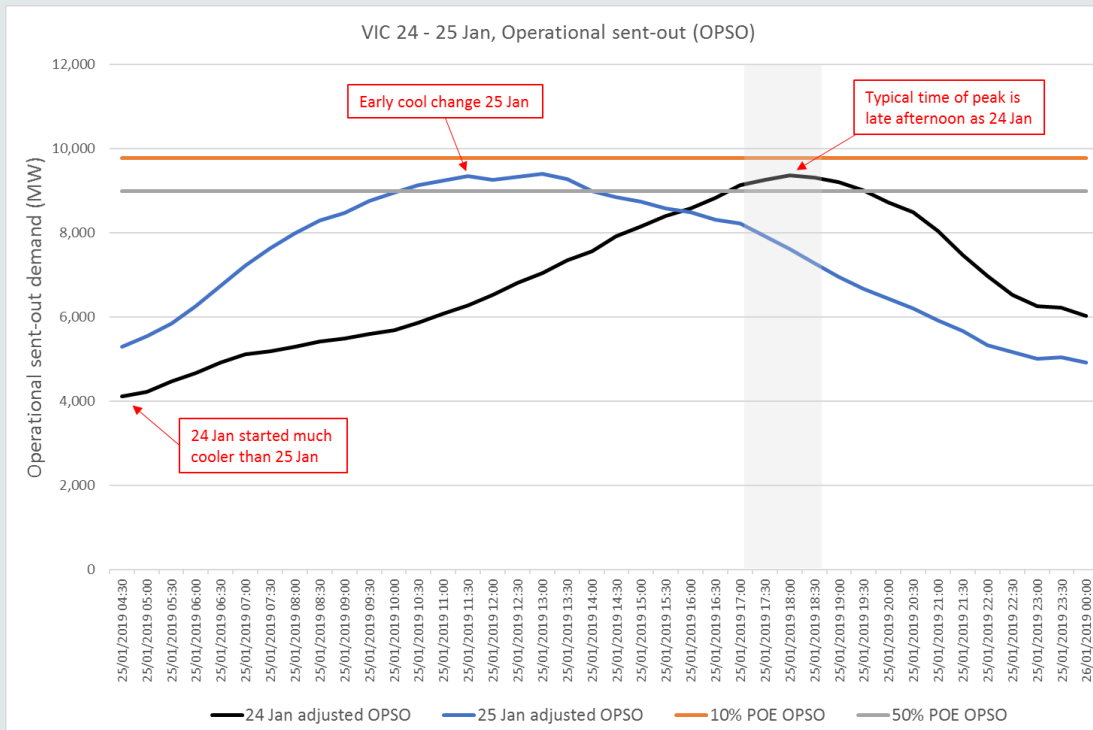
What impact would a 2°C reduction in thermostat setting have?

VIC response, 25 January 2019
residential appliances only



Victorian max demand

- Victoria had its maximum demand to date on either 24 or 25 January.
- Highly complex assessment as many adjustments are required to transform into equivalent number to the forecast



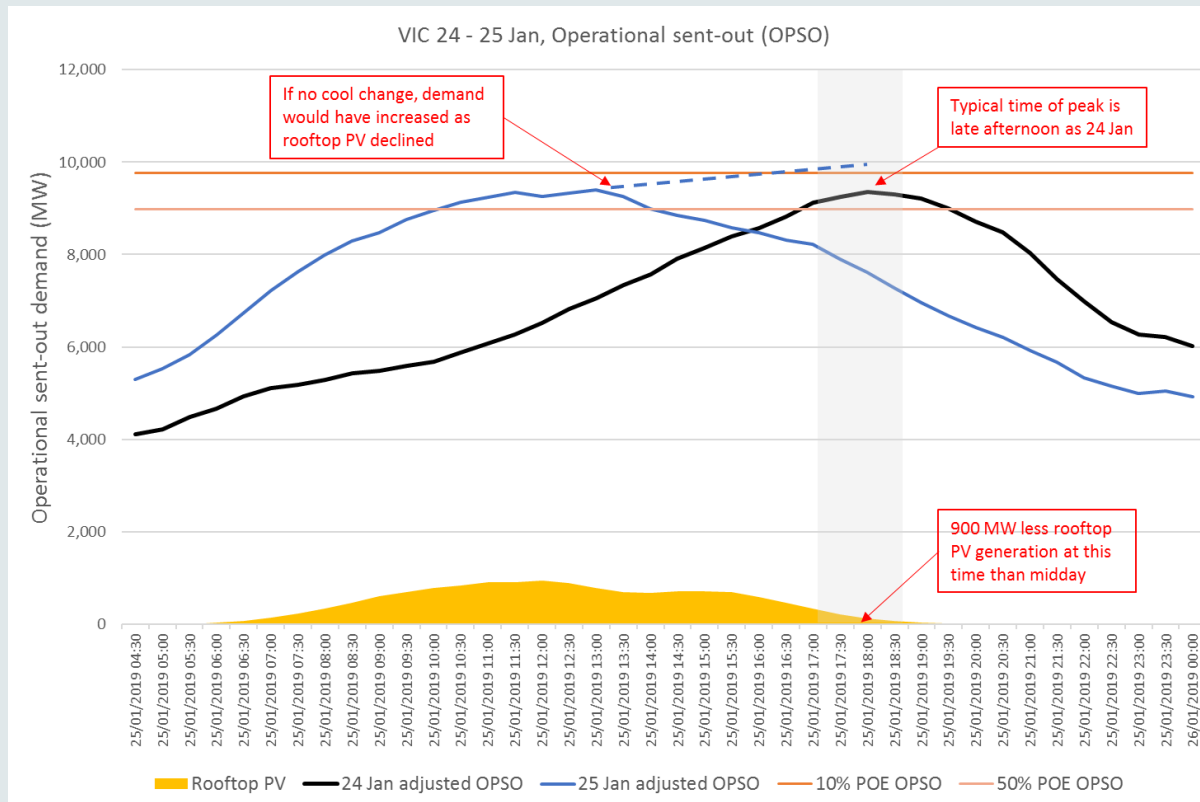
10% POE forecast likely to have been exceeded if no early cool change

**FORECAST
WELL ALIGNED**

Factor	24/1	25/1
Hot day	(+)	+
Extended period of hot weather	(+)	+
Weekday	+	+
Non-holiday	+	+
No cool-change before sunset	+	-

Victorian max demand

- Operational sent-out demand in Victoria potentially to have reached 10,000 MW if no cool change on 25 January.



Historical heatwaves in Victoria

In addition to the January heat event, Victoria has seen two severe heatwaves in the past 10 years; January/February 2009 and January 2014.

- In the 2009 event, Melbourne recorded three consecutive days over 43°C, while Mildura recorded 12 straight days over 40°C.
- The January 2014 heatwave event again broke heat records with Melbourne recording four consecutive days over 41°C and night time temperatures recording the third highest on record at 28.6°C.

Source: https://www.climatechange.vic.gov.au/_data/assets/pdf_file/0029/399440/Heatwaves_VulnerabilityAssessment_2018.pdf

In comparison, the recent 24-25 January heat event in Victoria was of a similar scale, with the temperature 25 January comparable to Black Saturday in February 2009, but higher humidity (dew point). The 2014 heat wave was similar in humidity but slightly cooler.

However, on 25 January – at the time of typical operational maximum demand (6pm) it was significantly cooler.

