Adaptation and Emergency Management in Energy

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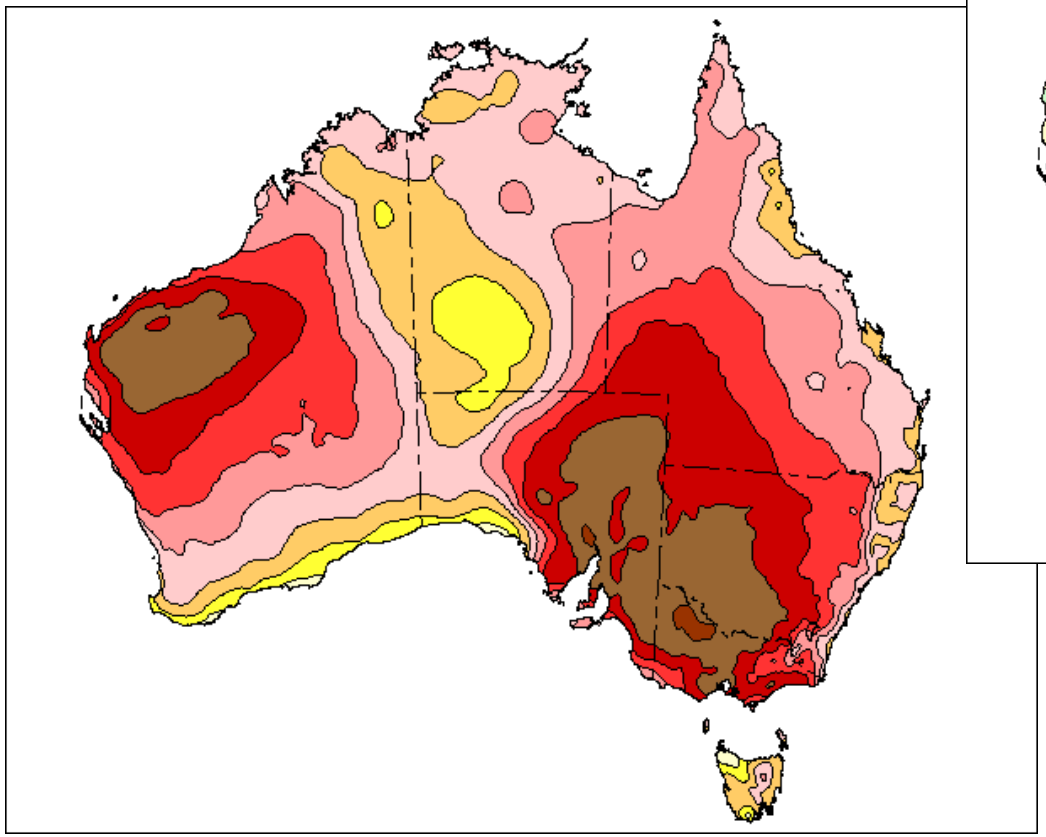
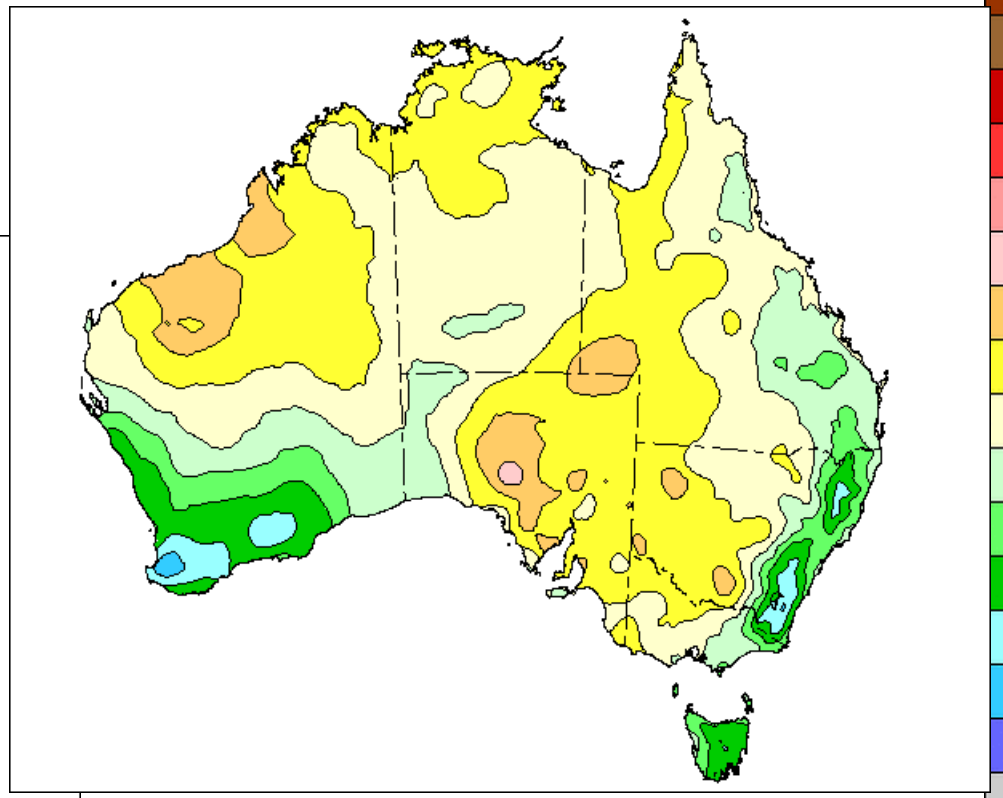
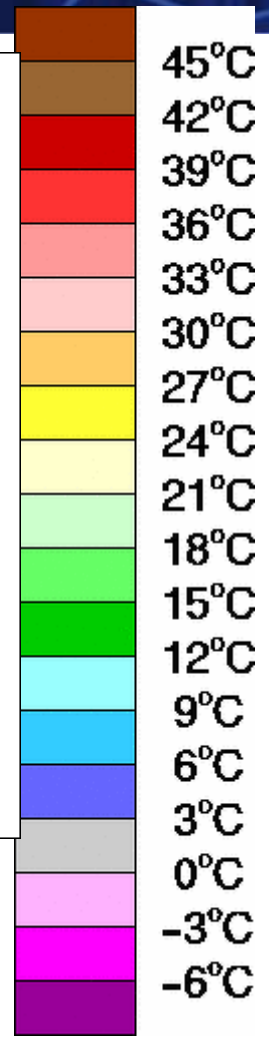
What if?







Source: Bureau of Meteorology Monthly Weather Review Australia, January 2014 (maximum and minimum temperatures 17 January 2017)

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What actually happened

THE AGE
Victoria

Go home now, Metro says as heat hits services

January 16, 2014

Commuters were warned of a difficult journey home, with scores of trains and trams predicted to fail as the temperature soared into the mid 40s.

Metro had urged commuters who could leave work early to do so. Melbourne's rail operator expects to have to take many of its trains out of service this afternoon as the extreme heat take its toll.

"Due to the ongoing extreme heat, Metro is urging all of our customers to leave the CBD as early as practicable," spokesman Daniel Hoare said.

"This afternoon's peak will present significant challenges for our train airconditioning units.

"There is no precedent for Melbourne's heat this week.

- "Due to the ongoing extreme heat, Metro is urging all of our customers to leave the CBD as early as practicable"
- "This afternoon's peak will present significant challenges for our train air-conditioning units."
- "There is no precedent for Melbourne's heat this week."
- "We are managing a very difficult situation and we urge all of those who can travel before the afternoon peak to please do so, where possible. We understand the heat is already making life difficult for all Melburnians and we thank you for your ongoing patience"

Source: http://www.theage.com.au/victoria/go-home-now-metro-says-as-heat-hits-services-20140116-30woz.html

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Electricity headlines

The blackouts during Australia's heatwave didn't happen by accident

Australia broke yet another heatwave record this week while thousands of people suffered from electricity blackouts

Meltdown as heatwave cripples state's power supply

January 15, 2014

Power cuts possible in Vic heatwave

BY PATRICK CARUANA | AAP | JANUARY 15, 2014 5:26PM

POWER may be cut from 100,000 Victorian homes and businesses as the state struggles through a severe heatwave.

The mercury peaked at more than 40 degrees throughout much of the state on Wednesday, the second day of an extended hot spell tipped to continue until Friday night.

Snapshot – electricity emergency roles and responsibilities

Australian Energy Market Operator (AEMO)

- Responsible for electricity system security in the National Electricity Market (NEM)
- Determines need for load shedding if there is an incident that threatens the technical integrity of the electricity system and demand must be reduced quickly
- Single Spokesman for significant localised distribution outages. Triggered when:
  - 2 or more distributors are significantly affected;
  - 100,000 customers affected across Melbourne; or
  - Large number of customers off >24 hrs

Minister for Energy and Resources

- Has powers under the *Electricity Industry Act 2000* to institute mandatory restrictions on consumption of energy for residential and business users
- Powers only available following a Governor in Council declaration on the satisfaction of specific criteria in legislation

Energy Sector Development Branch, DSDBI

- Liaise with AEMO and communicate information to the Minister for Energy and Resources
- Liaise with Cabinet and Legal Services in DSDBI to prepare Governor in Council papers and Ministerial orders if the Minister's powers are to be used
- Convene the Energy Industry Response Committee (ERIC) to coordinate communication between industry and government in the event of a major disruption

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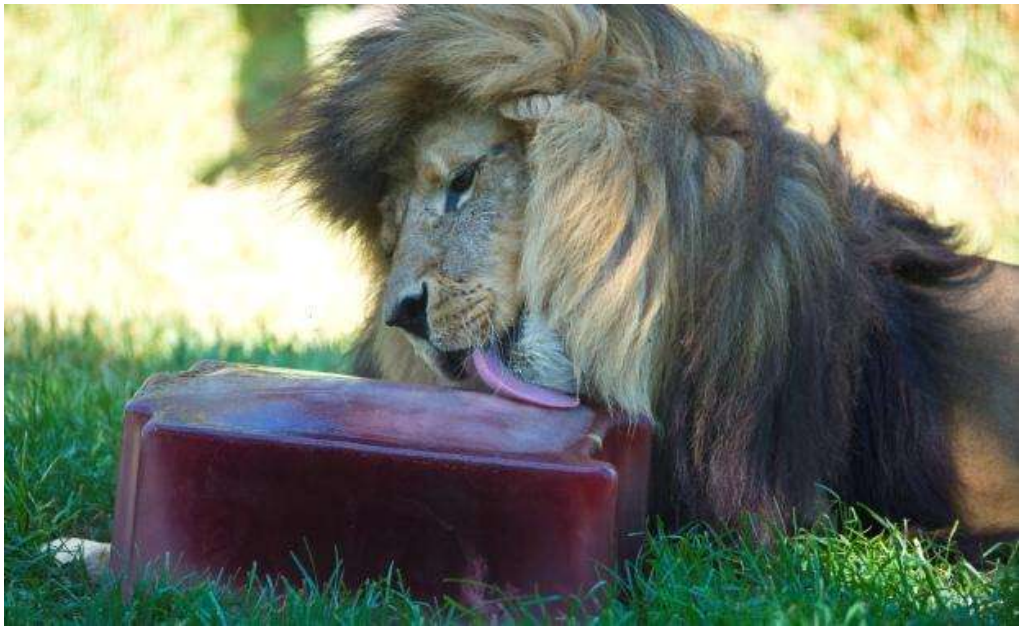
January 2014 heatwave

- First ever four-day period above 41°C *(14-17 Jan 2014).*
- Hottest four-day maximum average temperature on record *(14-17 Jan 2014).*
- Hottest maximum temperature four-day average: 43.1°C.



Source: http://www.zoo.org.au/news/cool-zoo

- Demand reached 10,307MW *(16 Jan 14:30 hrs).*

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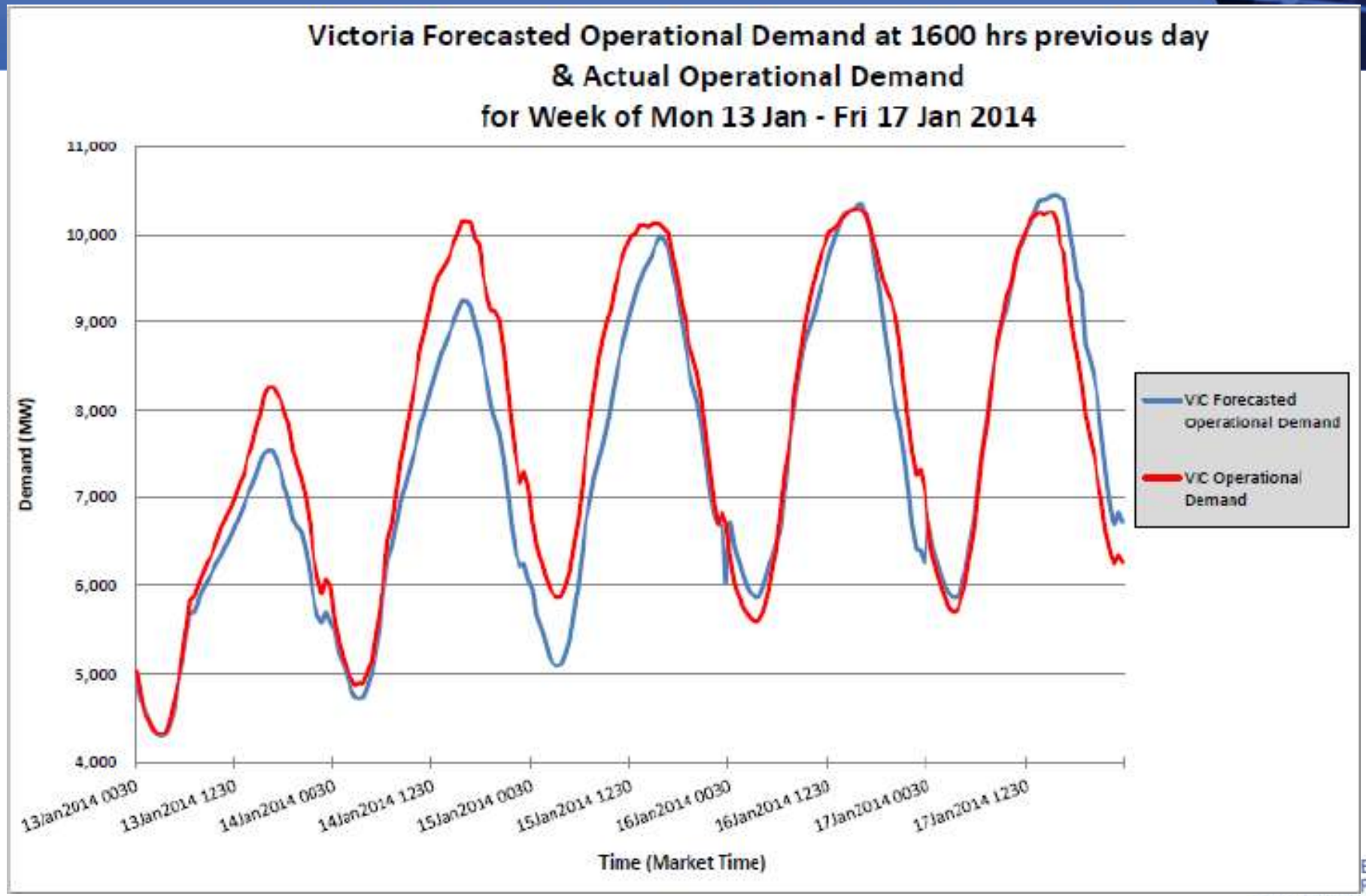
January 2014 heatwave



Source: AEMO, Heatwave 13-17 January 2014, 26 January 2014

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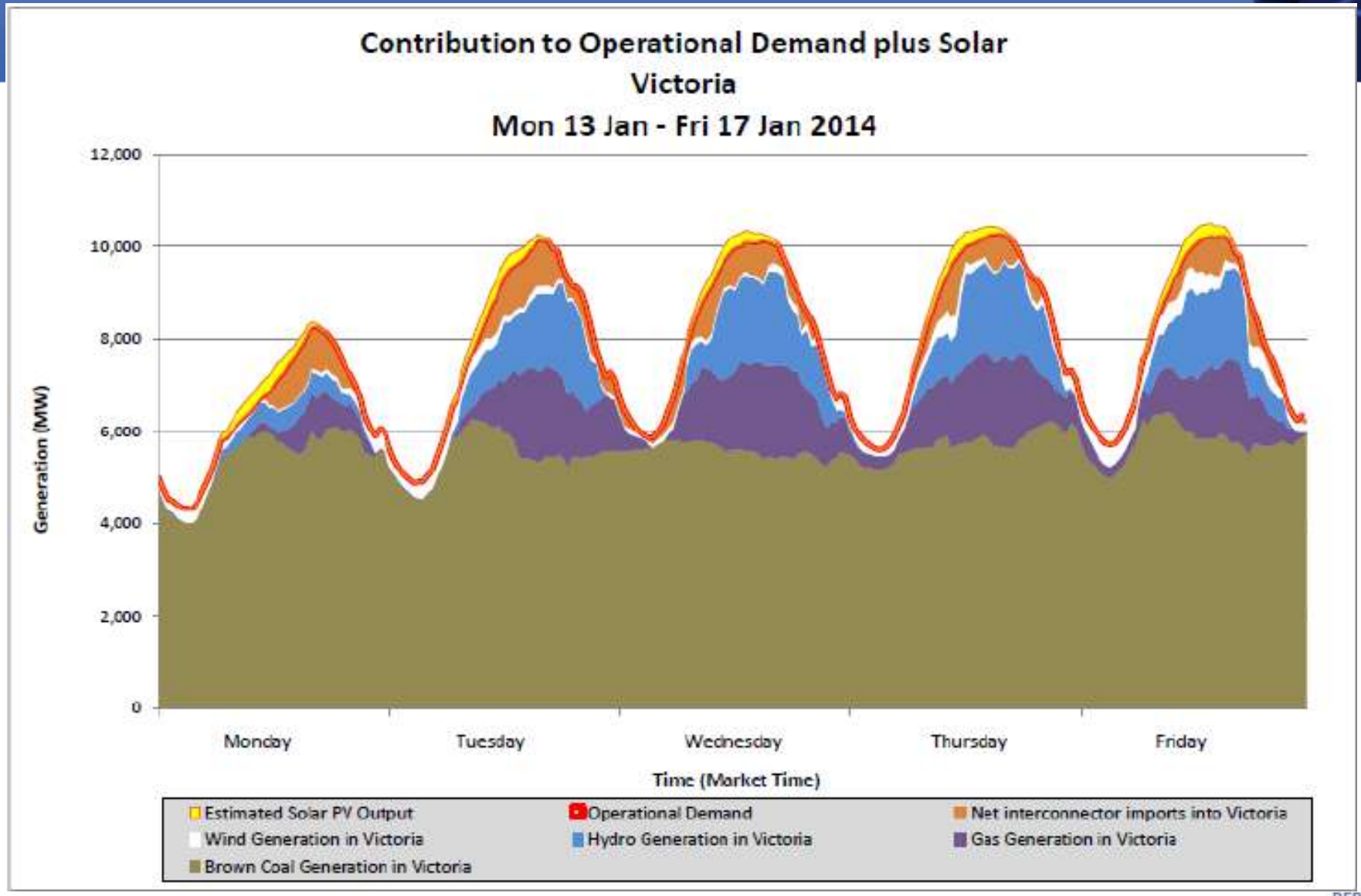
January 2014 heatwave



Source: AEMO, Heatwave 13-17 January 2014, 26 January 2014

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January 2014 heatwave

Loss of supply, but no load shedding

Asset	Outage duration	Cause	Implications
Loy Yang A3 (Vic)	14/1 13:45 to 16/1 08:45	Auxiliary supply problems	Loss of 560 MW
Loy Yang B1 and B2 (Vic)	14/1 to 17/1 inclusive	Cooling problems	Output reduced from 1120 MW to 680 MW
Torrens Island B3 (SA)	14/1 18:35 to 15/1 15:40	Boiler Issue	Loss of 200 MW
Basslink	14/1 18:04 to 14/1 19:02	Transformer Temperature protection at VIC end	Loss of up to 594 MW into VIC

What next?

Higher and more frequent peaks

- Two events in the past 5 years exceeded the planning standard of a 1 in 10 year peak event

Decreasing growth in overall demand

- 25% of the network is used for only 0.1% of the time, or around 8 hours a year

Source: Ferriers Focus, Scaling Power Peaks: A Challenge for Aussie Grid, Ferrier Hodgson, April 2013

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Flatten the peak

- Smart meters
- Flexible pricing
- Trials e.g. United Energy
- Other market innovations?