



Submission on NSW Energy Security Target and Safeguard

Consultation paper 6 May 2020

By Matt Mushalik (MEng)

Reference:

Have your say on the Energy Security Target and Safeguard

<https://www.surveymonkey.com/r/CPNYRBR>

Introduction

I am author of the website <http://crudeoilpeak.info/> with the objective to monitor crude oil production and fuel supplies. I have become interested in power supplies as it is generally assumed that the use of oil will be replaced by e.g. electrifying land-transport. A back-of-the-envelope calculation shows that in order to replace all petrol/diesel cars by EVs in Australia this would require around 3,000 MW running 24/7. I have therefore also researched into the limitations of providing electricity and written 14 posts (links in Annex) on following topics:

4/2/2020 Bush fires cause load shedding in NSW January 2020

5/2/2019 NSW coal fired power plants generation in late January 2019

29/1/2019 Victoria became power importer in January 2019 heatwave

23/1/2019 Victoria's 600 MW brown coal plant outage leads to price spike but system survives

21/1/2019 NSW power imports in January 2019 heatwave exceed 2 GW, drive up electricity prices

4/8/2018 Victoria brown coal power plant lost 1,600 MW over 4 hrs

20/7/2018 Sydney go on your rooftops and save power for 3 million new immigrants

16/3/2018 NSW coal power maxed out in hot summer (part 2)

14/3/2018 NSW coal power maxed out in hot summer (part 1)

11/3/2018 Australia's east coast solar generation is replacing coal by only 2% in late summer

13/1/2018 Energy guzzling NSW had to import up to 1,700 MW on 7 Jan 2018

14 Feb 2017 NSW's privatized giveaway coal plant causes load shedding in extreme weather

10 Feb 2017 NSW running low on contingency reserves during hot days

28/1/2017 Power Supply in Australia's New South Wales: how will it cope in coming heatwave?

Response to questions

Question: Are AEMO's maximum demand forecasts appropriate for use in determining the Energy Security Target?

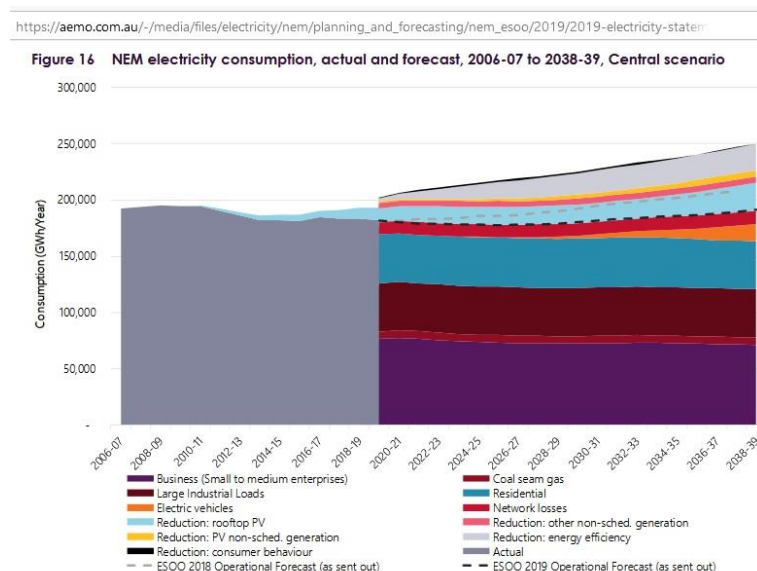
Response: No. Procedures for estimating and regularly updating have to be improved

AEMO's demand forecasts are here:

<https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/nem-electricity-demand-forecasts>

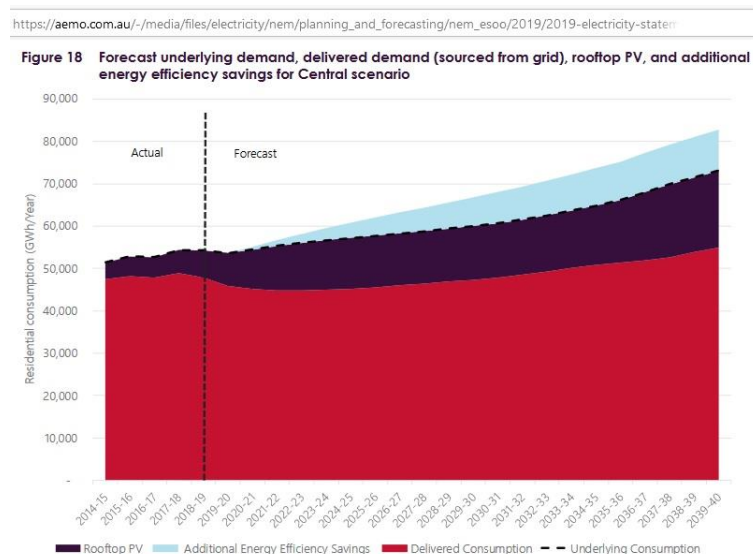
The most recent document is the ESOO 2019 (23/8/2019)

https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2019/2019-electricity-statement-of-opportunities.pdf?la=en



This graph is on a high aggregate level

It cannot be easily verified and updated on a State level when electricity consuming projects are planned and approved.



Equally, there is no residential forecast on State level although the climatic conditions and growth prospects are quite different

Table 4 Forecast summer maximum operational demand (sent out) by region, Central scenario (MW)

	New South Wales		Queensland		South Australia		Tasmania		Victoria	
	10% POE	50% POE	10% POE	50% POE	10% POE	50% POE	10% POE	50% POE	10% POE	50% POE
2019-20	14,293	13,291	9,643	9,355	3,193	2,950	1,431	1,370	9,967	8,837
2023-24	14,231	13,146	9,796	9,572	3,224	2,992	1,436	1,376	9,600	8,574
2028-29	14,368	13,169	9,987	9,799	3,224	2,994	1,416	1,355	9,589	8,504
2038-39	15,478	14,078	10,498	10,335	3,361	3,102	1,414	1,356	9,893	8,889

These are the only numbers available on State level. The NSW planning department continuously makes decisions which have an impact on electricity demand. For example, is the demand from the Western Sydney Airport included in the above table? All the metro lines? Their economic viability in turn is based on hundreds of new apartment towers.



Sydney's Metro West implies that around 500 Opal sized towers are built around its stations. The numbers are from my article:

11/3/2019 Sydney's Immigration Metros (Part 1)

<http://crudeoilpeak.info/sydneys-immigration-metros-part-1>

These flats will have little to no possibilities to install the assumed number of PV panels.

The Greater Sydney Commission is approving one apartment block after another without checking power supplies. I attended 2 GSC panel meetings in Rydalmere under 2 different chairs. I raised this issue twice during these public consultation events. The panels were

completely disinterested. When I showed a picture of a burnt-out substation in Hornsby, the chair looked away.



Has the power demand from the Parramatta development been included in AEMO's forecast? This is not easily replicable and transparent in AEMO's estimates

From <https://www.investparramatta.com.au>

The Parramatta Council has done this calculation:

Peak demand to increase by 100 MW

From Appendix 13 - Sustainability and Infrastructure Study, page

19

parramatta.nsw.gov.au/_data/assets/pdf_file/0004/179878/Appendix_13_Sustainability_and_Infrastructure_Study.pdf

IMPLICATIONS OF PARRAMATTA CBD GROWTH

PEAK DAY ELECTRICITY DEMAND (MW)

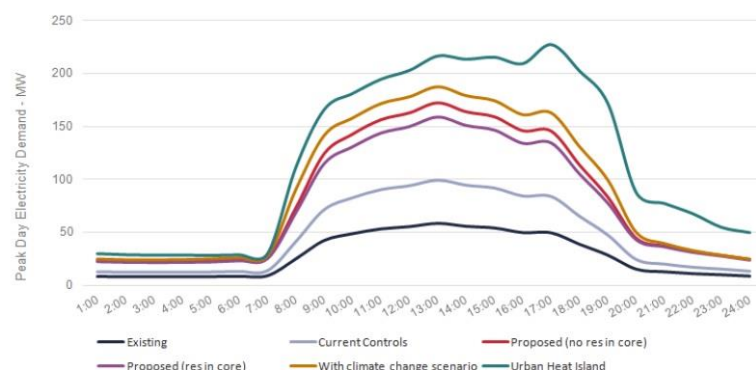


Figure 20: Expected peak day electricity demand profile under each planning scenario as well as under various climate change scenarios.

ELECTRICITY DEMAND (MWH PER YEAR)

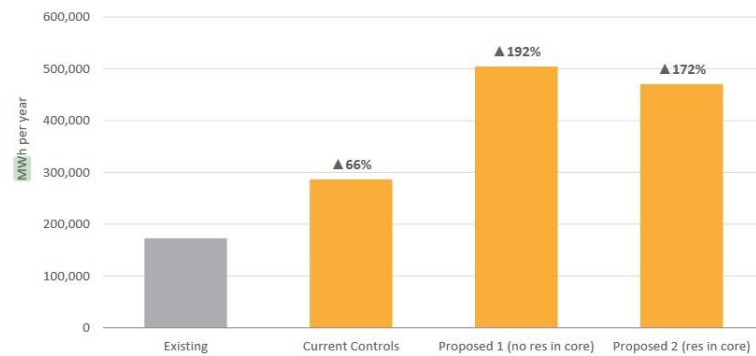


Figure 19: Expected electricity demand under each planning scenario (in comparison to existing demands)

<https://www.cityofparramatta.nsw.gov.au/sites/council/files/inline-files/pdf%2017%20-%20Sustainability%20and%20Infrastructure%20Study.pdf>

Another example is Macquarie Park. This is from an Ausgrid report:

Addressing increased customer demand requirements in the Macquarie Park area

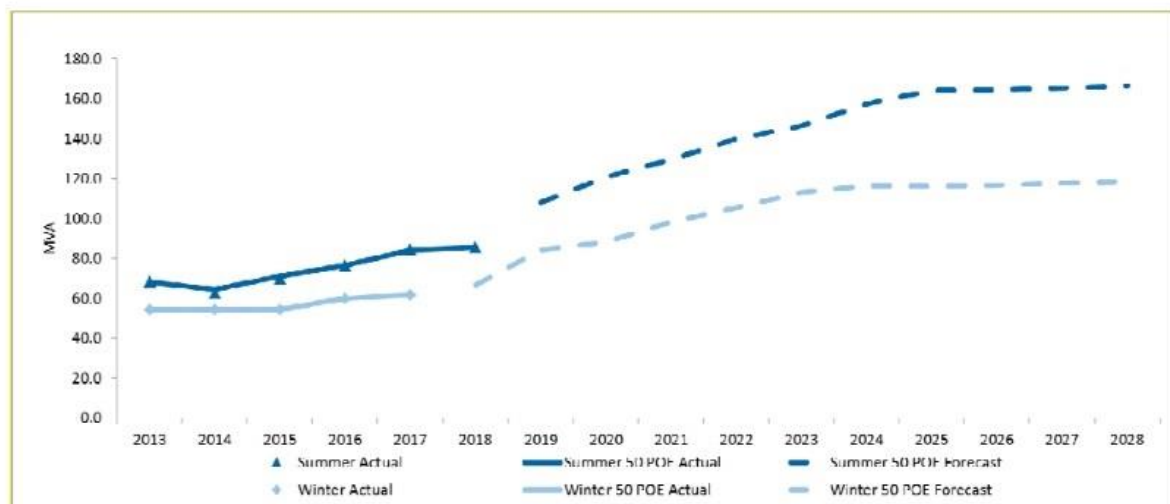
NOTICE ON SCREENING FOR NON-NETWORK OPTIONS REPORT

AUGUST 2018

Two of these customers have progressed with formal connection applications and confirmed their load requirements and expected connection dates. In particular, these two customers are requesting approximately 91MVA by 2021/22. In addition, there is a prospective third customer with a load requirement ramping steadily from 2021 with an ultimate load of 46MVA.

<https://www.ausgrid.com.au/-/media/Documents/Regulation/reg-investment-test/NNNO-Macquarie-Park-Area.pdf>

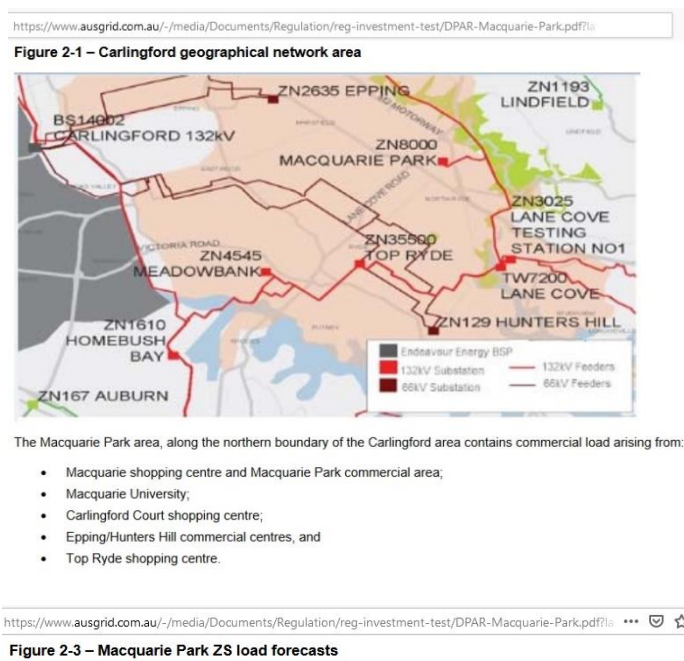
Figure 1 – Demand forecast at Macquarie Park zone substation



2.1 Load forecast

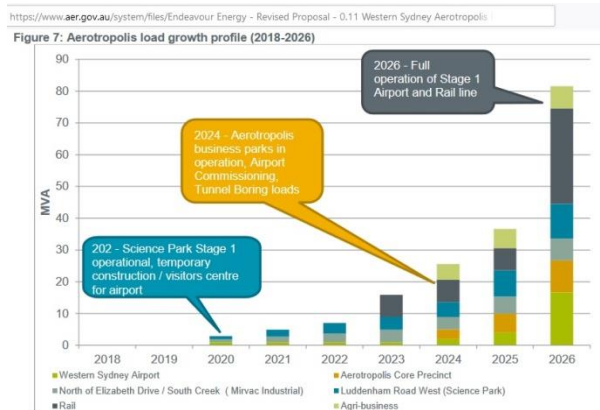
Figure 1 shows the historical actual demand, the 50% Probability of Exceedance level (50 POE) weather corrected historical actual demand and the 50 POE forecast demand for both winter and summer for Macquarie Park zone substation. The Macquarie Park zone substation has a total capacity of 171.5 MVA and a firm capacity of 114.3 MVA. In 2017/18, the maximum demand on zone substation was 85.5 MVA at 2:00pm AEDT on 22 January 2018. The weather corrected demand at the 50 POE level was 85.5 MVA. The power factor at the time of winter maximum demand was 0.97. Maximum demand has typically occurred in summer in past years. In the summer season, the maximum demand typically occurs between 1:15pm and 4:15pm AEDT. The 50 POE forecast 7 year compound annual growth rate (CAGR) to 2024/25 for maximum demand is 9.8% for summer and 9.5% for winter. As shown in Figure 1 below, maximum demand is forecast to reach 140 MVA by 2022 and 165 MVA by 2026; driven substantially by load to supply new large scale customer load.

<https://www.ausgrid.com.au/-/media/Documents/Regulation/reg-investment-test/NNNO-Macquarie-Park-Area.pdf>



<https://www.ausgrid.com.au/-/media/Documents/Regulation/reg-investment-test/DPAR-Macquarie-Park.pdf>

WSA – Aerotropolis



Endeavour Energy has calculated 80 MW in 2026. The problem now is of course how many airlines will survive COVID 19 to use this airport. From my website:

How the first phase of peak oil brought Virgin Australia into minus after 2008

<http://crudeoilpeak.info/how-the-first-phase-of-peak-oil-brought-virgin-australia-into-minus-after-2008>

The government does not seem to have made any review and continues with earthworks

BASIX completely outdated

BASIX still allows black/grey roof tiles, black driveways and dark bricks. They create heat islands and drive up air conditioning and therefore electricity demand in summer.



Recent housing estate in Eastwood (old brick-yard): new heat islands



Black drive-way and dark-grey roof tiles should be prohibited in BASIX. Councils should be strict in disallowing them.



Greater Sydney Commission

Following documents have not done any calculations on electricity consumption (in GWh or MW):

November 2019 A City Supported by Infrastructure (GPOP)

https://gsc-public-1.s3.amazonaws.com/s3fs-public/gpop_pic_-_a_city_supported_by_infrastructure_web.pdf

One would have thought that infrastructure would include power supplies. The only reference to power is to the Powerhouse Museum.

GREATER SYDNEY REGION PLAN

March 2018 A Metropolis of Three Cities

<https://gsc-public-1.s3-ap-southeast-2.amazonaws.com/greater-sydney-region-plan-0618.pdf?pMbPYxwen5IHg4GSB6td4yKiKVogFi4c>

Recommendation:

A procedure should be established which ensures that power demand from town planning decisions and AEMO's estimating are being matched on a continuing basis.

(a) all Development Applications for major projects should include calculations on electricity consumption (in MWh) annually and demand (MW) over the course of the day and by season

(b) Councils should keep an updated inventory of the data obtained under (a)

(c) the department under the Minister for Energy should regularly compile a Sydney wide inventory from (b)

(d) The data should be forwarded to AEMO

I cannot understand the disinterest of the Greater Sydney Commission in energy issues but I think that an investigation into electricity demand of projects could delay or even interrupt the panels' wave-through assignment and mindset. The panels may also not have the professional qualifications. One panel member said in a meeting on an Epping high-rise project at the railway station: "I want to see a green light". That was his only interest in electricity.

Given this situation I doubt the GSC can play any role in the above monitoring and estimating.

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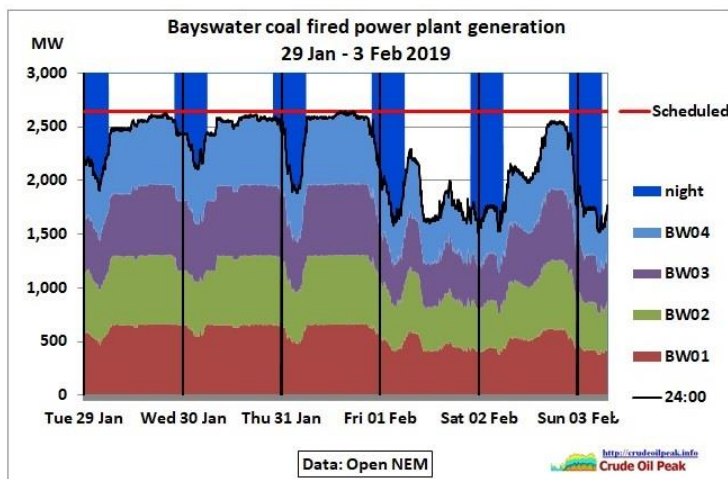
ANNEX

4/2/2020 Bush fires cause load shedding in NSW January 2020



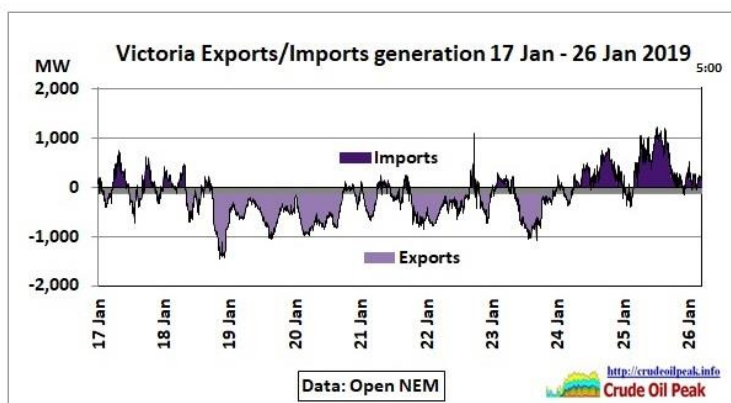
<http://crudeoilpeak.info/bush-fires-cause-load-shedding-in-new-south-wales-january-2020>

5/2/2019 NSW coal fired power plants generation in late January 2019



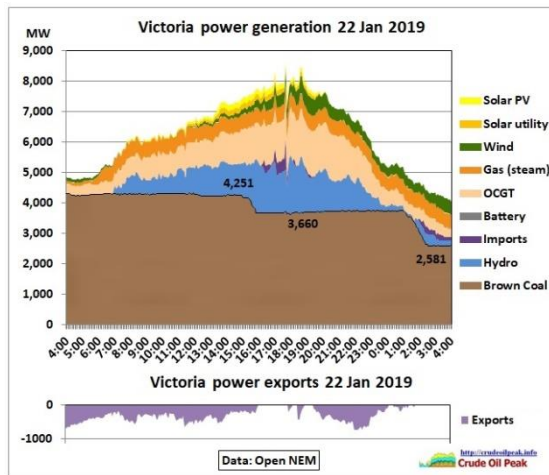
<http://crudeoilpeak.info/nsw-coal-fired-power-plants-generation-in-late-january-2019>

29/1/2019 Victoria became power importer in January 2019 heatwave



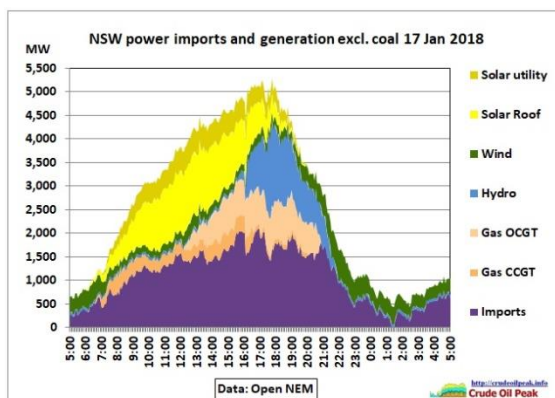
<http://crudeoilpeak.info/victoria-became-power-importer-in-january-2019-heatwave>

23/1/2019 Victoria's 600 MW brown coal plant outage leads to price spike but system survives



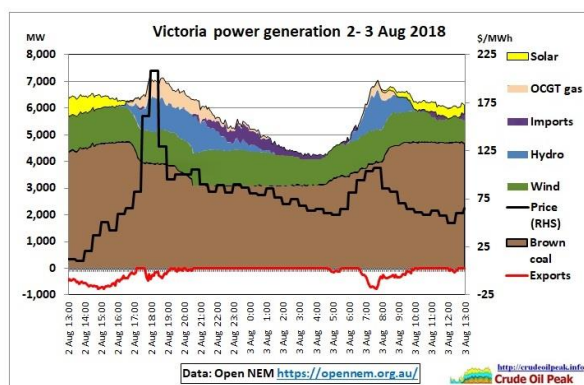
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21/1/2019 NSW power imports in January 2019 heatwave exceed 2 GW, drive up electricity prices



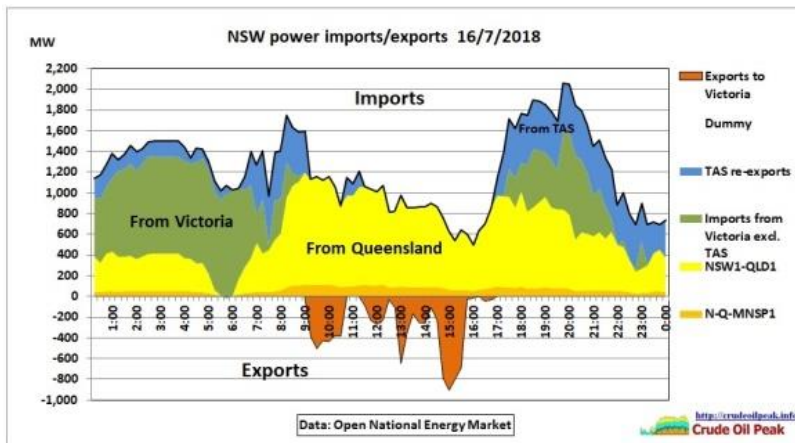
<http://crudeoilpeak.info/nsw-power-imports-in-january-2019-heatwave-exceed-2-gw-drive-up-electricity-prices>

4/8/2018 Victoria brown coal power plant lost 1,600 MW over 4 hrs



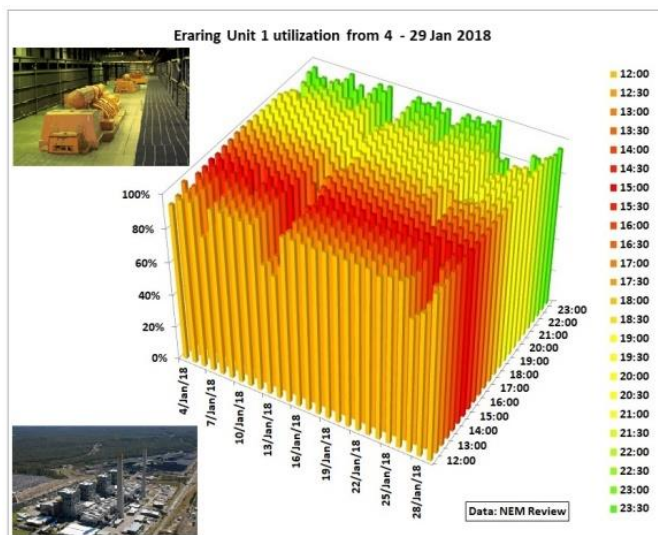
<http://crudeoilpeak.info/victoria-brown-coal-power-plant-lost-1600-mw-over-4-hrs>

20/7/2018 Sydney go on your rooftops and save power for 3 million new immigrants



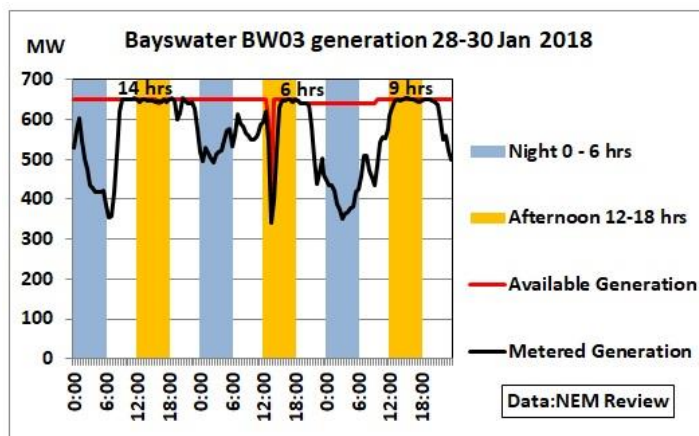
<http://crudeoilpeak.info/sydney-go-on-your-rooftops-and-save-power-for-3-million-new-immigrants>

16/3/2018 NSW coal power maxed out in hot summer (part 2)



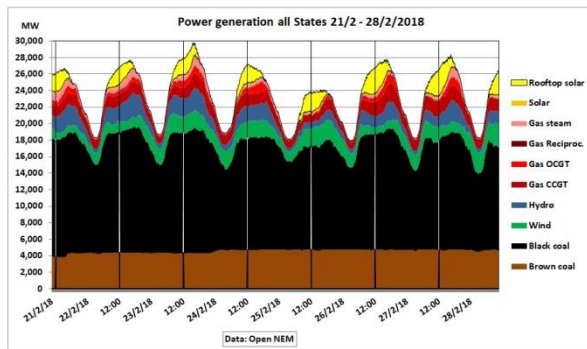
<http://crudeoilpeak.info/nsw-coal-power-maxed-out-in-hot-summer-part-2>

14/3/2018 NSW coal power maxed out in hot summer (part 1)



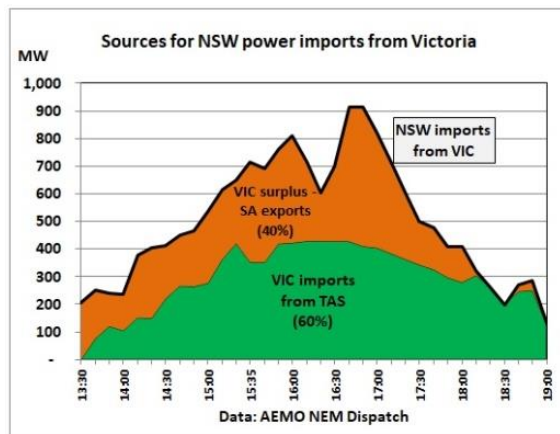
<http://crudeoilpeak.info/nsw-coal-power-maxed-out-in-hot-summer-part-1>

11/3/2018 Australia's east coast solar generation is replacing coal by only 2% in late summer



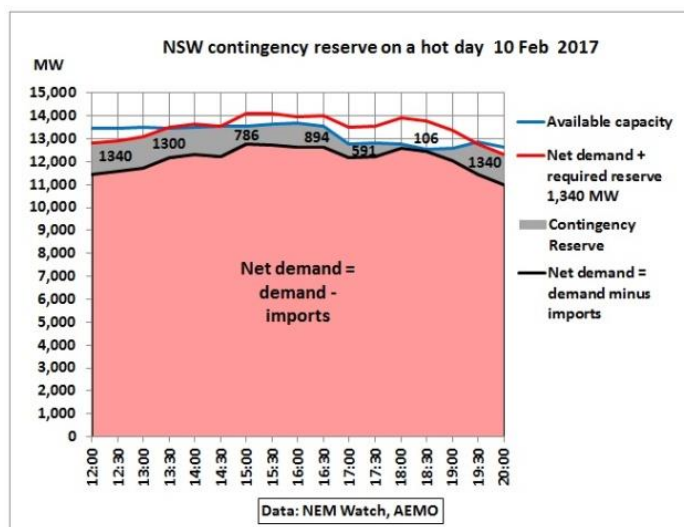
<http://crudeoilpeak.info/australias-east-coast-solar-generation-is-replacing-coal-by-only-2-in-late-summer>

13/1/2018 Energy guzzling NSW had to import up to 1,700 MW on 7 Jan 2018



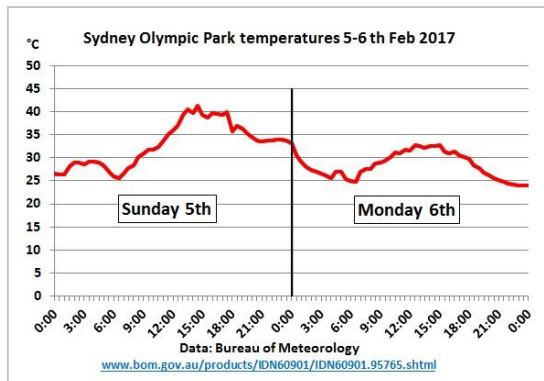
<http://crudeoilpeak.info/energy-guzzling-nsw-had-to-import-up-to-1700-mw-on-7-jan-2018>

14 Feb 2017 NSW's privatized giveaway coal plant causes load shedding in extreme weather



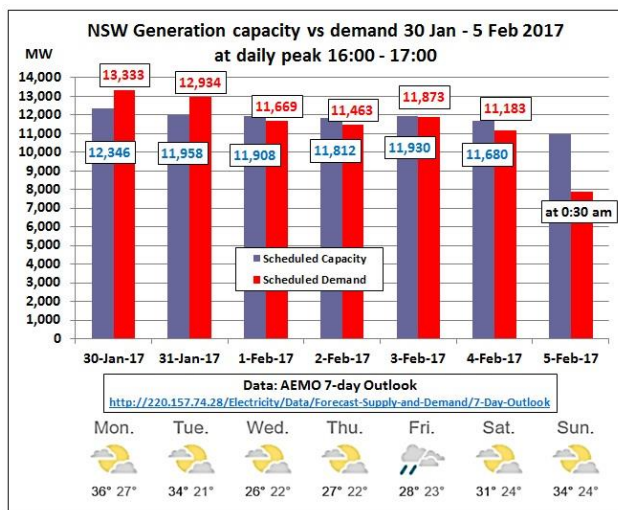
<http://crudeoilpeak.info/nsws-privatized-giveaway-coal-plant-causes-load-shedding-in-extreme-weather>

10 Feb 2017 NSW running low on contingency reserves during hot days



<http://crudeoilpeak.info/nsw-running-low-on-contingency-reserves-during-hot-days>

28/1/2017 Power Supply in Australia's New South Wales: how will it cope in coming heatwave?



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