

Initial Report from the Energy Security Taskforce

Summary of findings and recommendations

Key findings

The Taskforce found that under normal conditions NSW is reasonably well placed in terms of energy reliability and security. We generally have enough supply to meet demand, through state-based generation and importation via interconnectors from interstate.

However, there are indications that when demand is very high – generally during prolonged hot weather – sometimes the reliability of generation supply and thus system reserves may not be as high as expected. This was the case on 10 February 2017 when a range of factors combined to leave NSW facing a power shortage.

There are a number of things that happen on hot days which can combine to create greater risk: demand is high; thermal generation plant may not be able to generate at full capacity with higher ambient temperatures than the normal ranges for which the plant is designed; there may be limits to generation not usually encountered (for example, environmental limits on cooling water discharge temperatures); wind farm output can be low on hot, still days; and demand is often highest late in the afternoon, just as solar photovoltaic capacity drops off.

The Taskforce has identified a number of emerging risks to electricity security and reliability in National Energy Market (NEM) as a whole, and NSW more specifically:

- the best available predictions about changes to extreme weather in a changing climate are clearly pointing to hotter summers – heatwaves are likely to become more frequent and last longer
- NSW is following the NEM-wide trend of increasing uptake of 'intermittent' variable renewable generation and the withdrawal of conventional 'firm' thermal plant – a major unknown is what combination of existing technologies (including storage technologies such as pumped hydro and batteries) and technology innovations will work best to manage the shift to providing secure and reliable electricity supply associated with intermittent power sources
- fuel availability for generators is a potential problem in possibly tightening domestic coal and gas markets
- with the closing of some generators, others may need to work harder to maintain adequate electricity supply, which may also decrease reliability of plant without adequate planning.

The Taskforce identified that there are comprehensive formal arrangements to deal with power outages on various scales, both for specific energy emergencies as well as other emergencies that have an impact on, or depend on, our energy system. The Taskforce has, however, found there is a need to improve and enhance processes and procedures for implementing these arrangements to ensure the state is well placed to respond to and recover from a major energy emergency.

The Taskforce recommended priority actions the NSW Government can take to shore up our electricity reliability and security ahead of next summer, including:

- through the Premier and Minister take a leadership role in the Council of Australian Governments (COAG) and COAG Energy Council on a national policy approach to climate change and the technology and market implications of these policies
- take measures to manage peak demand proactively, and through engaging community and industry support, with the Government to lead by example in this through development of a 'Code Warm' protocol
- if preventative measures fail and mandatory load-shedding is directed by the Australian Energy Market Operator, make sure the processes are optimised and effectively communicated
- improve links between emergency management and the energy system, and make sure provisions, procedures and communications are refined and well-practised – this includes considering cultural issues post leasing of parts of the system so that good processes are complemented by effective personal networks, as well as making sure that exercises to test that backup systems work are undertaken and truly test the system.

The Taskforce made seven formal recommendations in its Initial Report focussed on preparation for next summer. Its Final Report, due before the end of 2017, will address the longer-term resilience of the NSW electricity system.

Recommendation 1:

That the NSW Government, through the Premier and Minister, take a leadership role in COAG and the COAG Energy Council to encourage the states and Commonwealth to have a national policy approach to climate change and the integration of renewables within the National Electricity Market, to safeguard energy security and reliability.

Recommendation 2:

That in producing its revised Energy Adequacy Assessment Projections (EAAP) in May-June 2017, AEMO pay particular attention to the generator fuel positions so that the market can see in aggregate if there is sufficient fuel in the system and can anticipate major changes. If the system is tight, this will be visible to participants, policy makers and market agencies, and may incentivise additional fuel contracting or investment in new generation.

Recommendation 3:

That Government improve the speed and ease with which it can respond to an energy emergency, including revising legislative provisions where necessary.

Recommendation 4:

That Government improve the structural processes underpinning the management of energy emergencies in NSW and ensure a stronger link between energy management and emergency management.

Recommendation 5:

That Government improve procedures for operational communications during energy emergencies in NSW, including communication to the public, and ensure these procedures are well-practised.

Recommendation 6:

That Government support industry and the community to prepare for, manage, and mitigate risks during energy emergencies, including providing guidance on how to reduce demand effectively during peak periods.

Recommendation 7:

That Government establish a working group to develop new protocols for Government entities to reduce demand and increase behind-the-meter supply during periods of peak energy use ('Code Warm' protocol)

Events of 10 February 2017

There were concerns in the days leading up to and on 10 February that, due to the extreme heat, the state would face a supply shortage. This led to:

- AEMO issuing a series of market notices forecasting that supply may not be sufficient to meet the reliability standard on 10 February. The first of these forecast 'lack of reserve' notices was issued on 7 February at 3pm AEST. There was a series of additional notices issued through to 10 February
- the NSW Minister for Energy and Utilities calling on residents and businesses to curb their electricity consumption on 9 and 10 February.

On 10 February, electricity demand in NSW reached its highest level in six years (14,181 megawatts at 4.30pm AEST).

Peak demand coincided with several equipment failures and reduced generation, specifically:

- the forced outage of Tallawarra generator due to a fault in the gas turbine
- Colongra units unable to start due to low gas pressure in fuel supply lines
- a number of thermal generators reducing output or being unavailable
- little wind generation and reduced solar photovoltaic generation as is expected towards the end of the day.

These issues combined to overload the NSW interconnectors with Queensland and Victoria, creating an insecure operating state.

AEMO then directed TransGrid to shed load from the state's biggest industrial electricity user, Tomago Aluminium, at 4.58pm AEST. The NSW dispatch price was set to the market price cap (\$14,000/MWh) from 5.05pm AEST until 6.10pm AEST on 10 February.

At 5.06pm AEST, the power system returned to a secure operating state.

While Tomago was directed to shed load from its Hunter aluminium smelter, NSW avoided the need to direct distributors to interrupt electricity supply to homes and businesses across NSW.

