



AEMO's reliability outlook 2021



Summary information for participants, policy-makers and consumers from the 2021 Electricity Statement of Opportunities (ESOO) for the National Electricity Market (NEM).

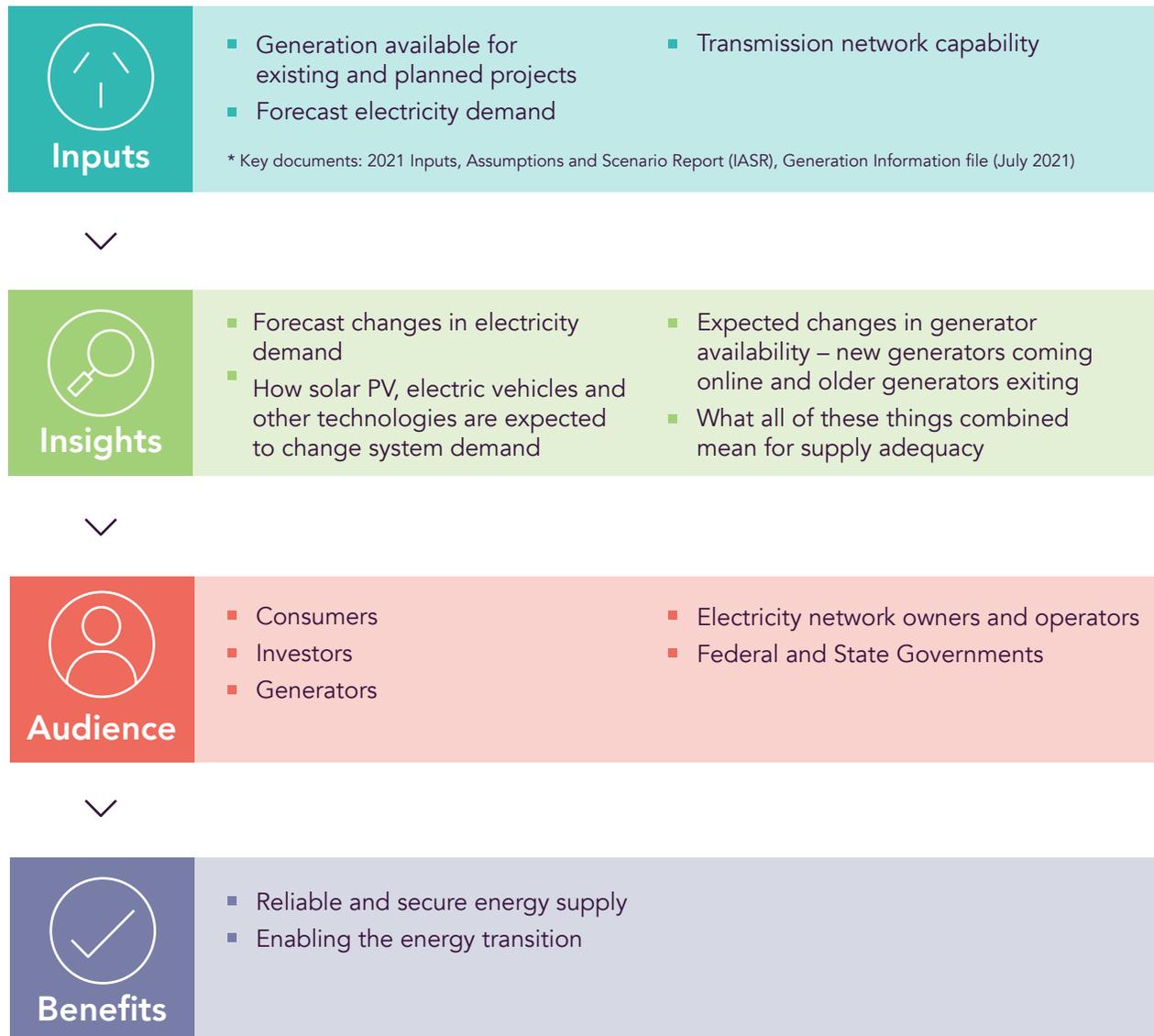
Opportunities to make sure electricity supply meets consumers' demand

What is the ESOO?

Every year, AEMO looks 10 years ahead to let markets and policy-makers know if we forecast any times where consumers may not get the electricity they need.

The report identifies opportunities to invest in solutions, so they can be ready in time and households and businesses don't experience supply shortages.

This report focuses on the National Electricity Market (NEM) and its five regions – New South Wales, Queensland, South Australia, Tasmania and Victoria.



Key insights for the next 10 years

1. Enough electricity to meet demand this summer

The picture is better than last year. Demand is expected to be a bit lower, and more supply will be available. The new supply includes battery storage that is “dispatchable”, meaning it can always be available when needed, as well as renewable generation.

Extreme events can affect supply, so AEMO (working with industry and governments) will have emergency reserves on standby to manage this risk.

2. New supply expected to meet demand

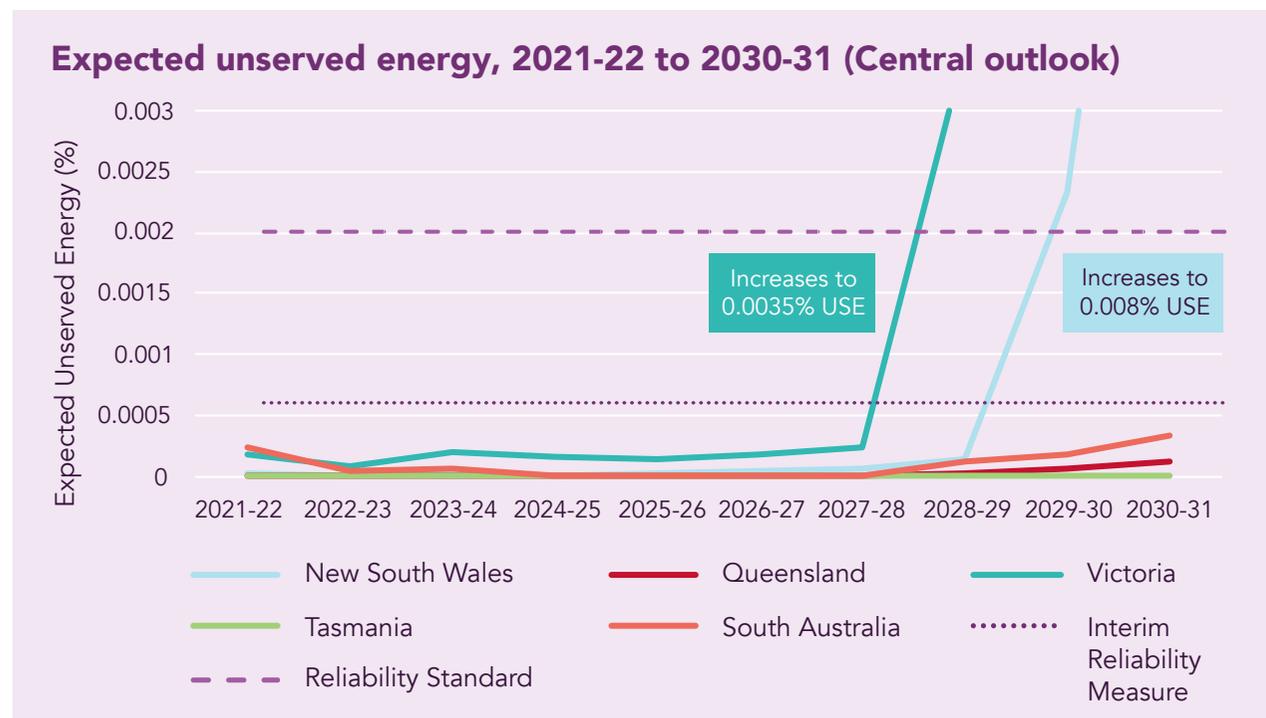
No reliability gaps are forecast for the next five years, primarily due to new generation and storage capacity, as well as transmission investment and reduced peak demand forecasts.

However, large coal generators are scheduled to retire in Victoria and NSW later in the decade. Demand is also forecast to rise, bucking a gradual decline over the past 10 years.

At that point, the NEM will need more generation, storage and transmission than is currently operating, but:

- The forecast gap is smaller than AEMO expected last year, as extra supply and transmission is now expected to be available.
- AEMO expects the combination of planned generation, storage, and transmission developments now underway (some already reaching final investment decision) can make up the gap.

Transmission is important to supply. For example, the Snowy 2.0 hydro project should be generating electricity by 2026, but that energy can only help meet the needs of NSW consumers when the network is able to transport it to them.



Extreme events can affect supply, so AEMO works with industry and governments to manage these risks.

Sometimes this involves having emergency reserves on standby.

Key insights for the next 10 years

3. Increasing risk of coal generation unavailability

This summer, a key risk to reliability remains the possible unavailability of Yallourn Power Station in the event of a catastrophic rainfall event.

Recent flooding in the Morwell River diversion through the mine created cracks in the mine wall, putting it at greater risk of flooding during future heavy rainfall events.

AEMO is working with the Victorian Government on options to mitigate risks to the power system.

More broadly, the risks of operating the NEM and relying on coal generation are quickly increasing.

First, coal (and gas) generation is being made unavailable by its owners, and retirement plans are being brought closer.

Since last year, owners of coal generators have announced that two power stations (Yallourn in

Victoria and part of Eraring in New South Wales) will retire several years earlier than had been planned.

In addition, one unit of Torrens Island B gas power station in South Australia has also been "mothballed", so won't be available unless it is restarted.

Second, coal generation is becoming less reliable.

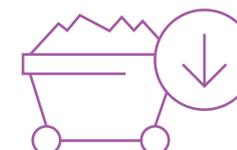
Generating units can stop operating unexpectedly, and can stay unavailable for some time.

Last summer, coal generation operated at historically low levels of reliability. Owners have said that some improvements will help with reliability over the next few years, though long term the trend of decreasing reliability as generators age will stay.

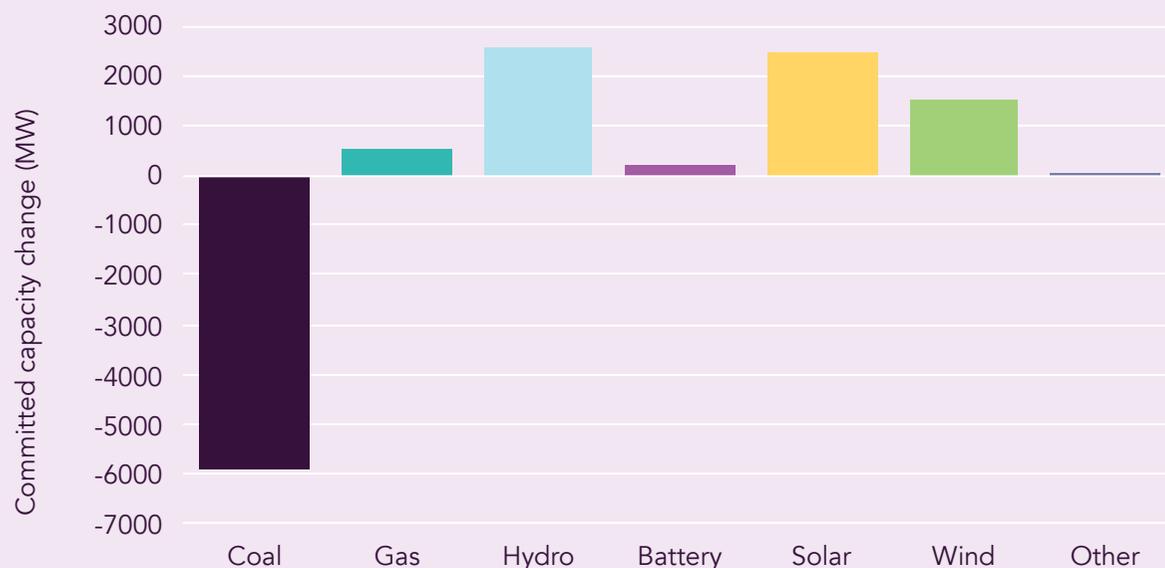


AEMO has to plan for the risk of more coal generation leaving the NEM earlier than expected. This ES00 includes a forecast-based on that possibility.

Listed closure dates can be found in our [generating unit expected closure year file](#).



NEM committed and existing generation capacity change 2020 to 2031 (excluding proposed projects)



Our [GenInfo](#) file provides the latest capacity data for existing, withdrawn, committed, and proposed generation projects in the NEM

Key insights for the next 10 years

4. Rooftop solar is transforming the grid

The continued investment in residential rooftop solar PV, now the largest generator in the NEM, is at times challenging the ability to provide secure and reliable electricity.

A further 8.9 gigawatts (GW) of commercial and residential solar PV is expected to be installed by 2025 in the mainland NEM states.

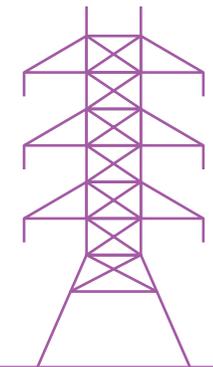
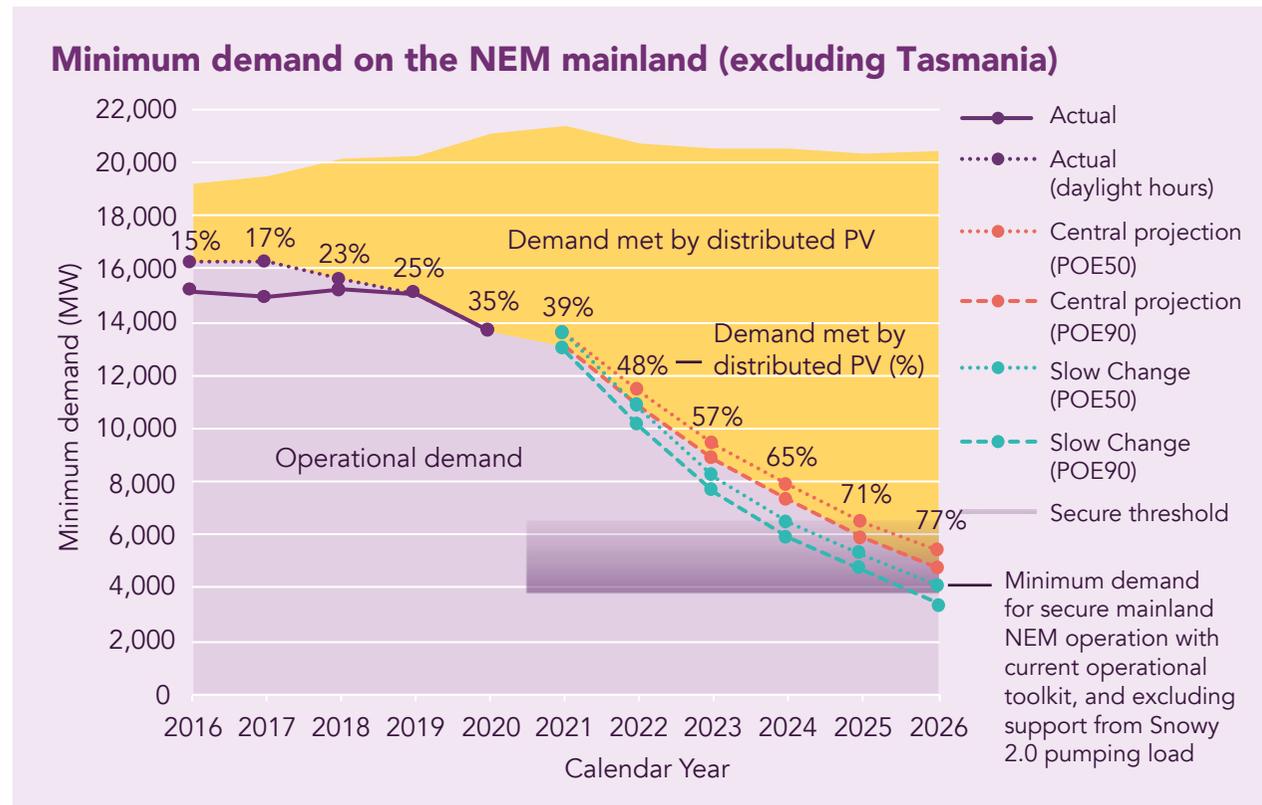
These systems alone could supply up to 77% of total electricity demand at times by 2026.

As a result, **minimum demand** across the NEM mainland is expected to drop to a record low of 4 to 6 GW by 2025, down from 15 GW in 2019.

AEMO is working with industry and consumer representatives to manage this transition. This includes the [Energy Security Board post-2025 reforms](#).

Millions of homes with generation, storage devices and other smart and flexible demand devices will all play an increasing role in ensuring an efficient, secure and affordable energy future.

The ESB reforms are also an important step towards enabling the power system to operate with up to 100% instantaneous renewable penetration.



Key insights for the next 10 years

5. Accelerating growth of renewables in the system

The NEM is continuing to see rapid growth in renewable resources, both:

- Large-scale wind, solar and batteries connecting to the grid, and
- “Distributed” renewables owned by consumers, like rooftop solar and storage.

This growth is not new, but it is only getting faster.

In less than five years, AEMO expects there will be enough resource potential to supply 100% of demand in the NEM at times.

That also means that at times of minimum demand, when consumers need the least energy from the grid, those levels of demand are getting lower and lower.

Why does it matter?

The power system and the NEM market weren't designed to operate with this much energy coming from sources that AEMO can't see and adjust at every minute of every day. It doesn't give AEMO the levers it needs to keep supply and demand balanced so the system is safe and secure.

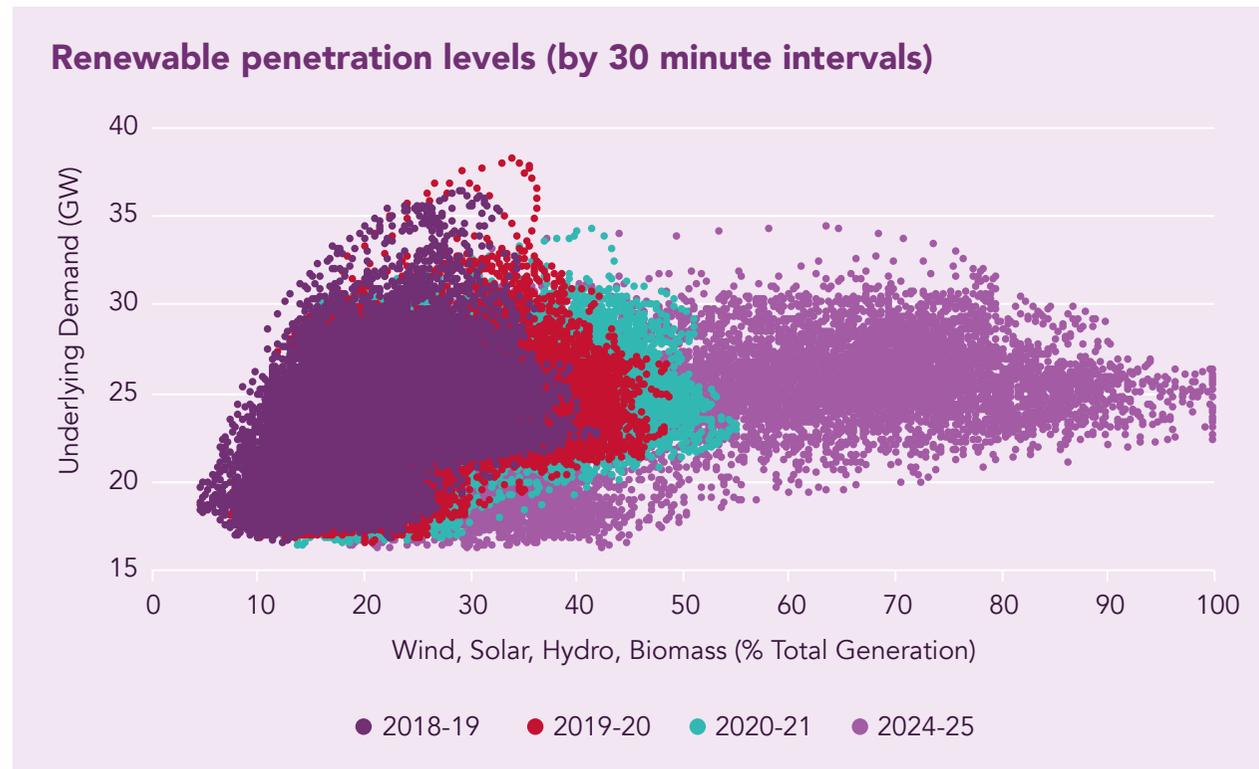
During periods of minimum demand, as consumers draw less and less electricity from the grid, it becomes technically and economically harder for thermal generators to keep operating. However, today the NEM needs the essential system services from these generators to operate.

AEMO has identified the threshold below which the system can't operate securely, and (in some scenarios) expects all NEM regions to go below the threshold in the next five years.

Across the power industry, we are collaborating on engineering solutions, including the [Engineering Framework](#), so the transition to high renewables is smooth and secure.

The shared goal is for businesses and households to take maximum advantage of:

- The low cost of power produced by renewables, on the grid and in consumers' own rooftop solar and storage, and
- Potentially, opportunities for households and businesses to support the secure operation of the power system and be rewarded for doing it.



Key insights for the next 10 years

6. Demand for electricity could increase a lot, very quickly

As households and businesses look at their energy options, and technology keeps advancing, demand for electricity may be significantly different in 10 years' time, reversing the observed gradual decline of the last 15 years.

The 2021 ESOO looks at two things that could change quickly and drive very different levels of demand:

- Electrification (consumers switching from other fuel sources to electricity), and
- Hydrogen taking off as a fuel option.

Electrification

As the power system harnesses renewables more fully and electricity supply becomes less costly and carbon-intensive, business and household consumers could look to switch from other fuels to electricity.

This could mean the electrification of anything from home appliances and heating, to electric vehicles, to major manufacturing and industrial processes.

Hydrogen

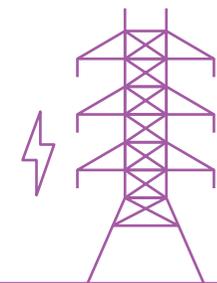
Later in this decade, hydrogen could also become an important fuel for Australia, domestically and for export.

If "green hydrogen" is produced using electrolyzers, processing it could add significant demand for electricity.

This demand could also help at times of minimum demand, by "soaking" up supply when consumers have more than enough for their own needs and can export energy.

The 2021 ESOO is the first time AEMO has studied the potential impacts of this change in detail.

Electrification by scenario to 2031



The size of the impact of these changes on demand for electricity is not yet certain. What we know is that if this extra demand is planned, and businesses and households are given incentives that help avoid making the highs and lows of demand more extreme, the changes could help make the power system easier to operate and better for consumers.



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