Gridlock – why insurers need to focus on the grid as Australia transitions to renewables

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Authors: **Edward Burrell** (Partner), **Bailey Neate** (Associate)

wotton kearney

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At a glance

- A successful Australian transition to renewable energy hinges on the national grid delivering and storing energy.
- There has been significant investment in energy storage Australia-wide, which will lead to valuable storage assets being commissioned over the next three decades.
- Storage investment will underpin every renewables project in the country and the entire energy market.
- Savvy players will manage the unique insurance risk by having a technical understanding of storage assets.

There has been increasing interest and investment in Australian renewable energy generation as the country transitions away from fossil fuels. The mainstream media continues to pour over trickled announcements about offshore wind farms and the political carnage from energy shortages across the eastern seaboard and beyond.

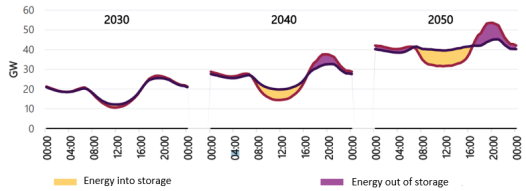
But renewable energy generation solutions are only half the story. They need to be backed by an infrastructure system that will distribute and store sufficient energy for supply to meet demand at all times.

A successful Australian transition to renewable energy hinges on developing infrastructure around the entire energy framework – the grid. This is a much less appealing topic for journalists, and gets a lot less media attention.

I feel the need, the need for … storage

Renewable energy generation is volatile – the sun isn't always shining and, in the words of David Bowie, "wild is the wind". An effective system deals with volatility by storing energy when supply exceeds demand, so energy is available when demand exceeds supply.

The Australian Energy Market Operator (AEMO) published the graphed energy profile of an average day in the coming decades, which we have amended to highlight the criticality of storage, as shown in the graph below.[1]



[1] *Figure 24, Average time of day profile – impact of co-ordinated DER and distributed storage, Step Change*. https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en, p 55.

By 2040, significant energy generated throughout the day must be stored (as shown by the yellow trough) to bolster supply during the peak from 7pm to 10pm.

The storage story

Australia must improve two types of storage to ensure a reliable energy system – 'firming capacity' and 'deep storage'.

Firming capacity

Firming capacity is flexibly stored energy that 'tops up' the grid as needed to smooth out the bumps in supply and demand. For example, at the end of an overcast day when little solar energy is available, firming capacity can be added to the grid when the population returns home from work/school and turns on their appliances.

AEMO predicts that the Australian market needs more than 60 GW of firming capacity by 2050. Currently, Australia has access to 43 GW of firming capacity – and 23 GW of it comes from coal-fired generation.[2] That leaves a 40 GW (66%) shortfall that needs to be filled by renewable firming capacity within the next two decades.

If the firming capacity shortfall is not addressed, the Australian market will face a difficult decision in choosing between an ongoing (and now unpopular) reliance on coal-fired generation or intermittent gaps and outages of supply. This debate is playing out in the press at the moment.

Deep storage

Deep storage is colloquially considered the 'heaviest' type of storage. It involves energy stored for more than 12 hours that is used during significant renewable energy generation droughts or seasonal changes.

Deep storage is central to an energy grid powered by renewables, as it protects consumers from the impacts of seasonal variations and climate change. Without deep storage, the energy system would struggle to cope with a rainy and dreary summer (low energy supply) followed by a cold winter (high energy demand).

By 2030, AEMO says that the Australian grid must be storing energy from summer through to autumn, so that there is sufficient energy available to meet winter heating.

This will become increasingly important towards 2050 as gas appliances are converted to electricity and demand increases.

Significant investment in storage

While energy generation seems to get most of the headlines, energy storage is just as critical for Australia's successful transition to renewables.

Battery storage technology is improving and costs are falling. There has been significant investment in energy storage Australia-wide, which will lead to the commissioning of valuable storage assets over the next three decades. For example, on 28 September 2022, the Commonwealth Bank announced that it is financing a 300 MW battery in the Riverina region of New South Wales and declared that "the Riverina battery is the first time a battery has been financed by commercial banks with a merchant tail".[3]

Pictured on the right – *The site of Tesla's big battery and Neoen's Hornsdale wind farm in South Australia* (source).

[2] https://aemo.com.au/-/media/files/major-publications/isp/2022/2022-documents/2022-integrated-system-plan-isp.pdf?la=en, p 51.
[3] https://www.commbank.com.au/articles/business/foresight/financing-batteries-supporting-australias-renewable-future.html

There are currently five grid-scale batteries operating in South Australia and Victoria, with a capacity of 260 MW. AEMO says that there is nearly 100 times that storage on the way, with 18,660 MW of big battery storage in the planning pipeline.[4]

Successful storage investment and rollout will underpin every renewable project in the country and the entire energy market.

The issues for insurers

Savvy players in the insurance market will demarcate between generation and storage when pricing energy-related risk. Losses and claims associated with storage assets will be very different to those associated with energy generation facilities. The quantum of covered losses is also likely to become increasingly significant due to:

- an increasing reliance on storage assets as coal-fired generators are switched off
- the need to "match" storage projects with the viability of renewables projects in the pipeline, and
- skill shortages and rising labour costs for repair works, and nascent components.

These factors are likely to have a long-lasting effect on profitability when insuring storage assets. That inevitably means that all eyes will be on the trifecta of coverage, premiums and deductibles.

We predict demand for bespoke wordings which parlay into the risks unique to storage assets. Leading asset owners and brokers seeking insurance are likely to get familiar with pre-placement risk engineering surveys, implementing any recommendations to reduce risk, and having detailed information on how their system is constructed and protected from key risks (including compliance with relevant standards and regulations).

Insurers will also need to see a push for more generous provisions in policies which entitle recoveries against contractors, which account for a significant proportion of claims in the renewables sector. Some of the common restrictions written into EPC and OEM agreements, which disentitle genuine subrogation opportunities, might start to look less attractive to insurers if some of these facilities start deteriorating quicker than expected. We can see technical underwriters demanding contractual terms that match up with the policy provisions.

[4] https://www.afr.com/companies/energy/energy-storage-a-game-changer-on-path-to-net-zero-by-2050-20211101-p5951i

Australian offices

Adelaide
Level 1, 25 Grenfell Street
Adelaide, SA 5000
T: +61 8 8473 8000

Brisbane
Level 23, 111 Eagle Street
Brisbane, QLD 4000
T: +61 7 3236 8700

Canberra
Suite 4.01, 17 Moore Street
Canberra, ACT 2601
T: +61 2 5114 2300

Melbourne
Level 15, 600 Bourke Street
Melbourne, VIC 3000
T: +61 3 9604 7900

Melbourne – Health
Level 36, Central Tower
360 Elizabeth Street, Melbourne, VIC 3000
T: +61 3 9604 7900

Perth
Level 49, 108 St Georges Terrace
Perth, WA 6000
T: +61 8 9222 6900

Sydney
Level 26, 85 Castlereagh Street
Sydney, NSW 2000
T: +61 2 8273 9900

New Zealand offices

Auckland
Level 18, Crombie Lockwood Tower
191 Queen Street, Auckland 1010
T: +64 9 377 1854

Wellington
Level 13, Harbour Tower
2 Hunter Street, Wellington 6011
T: +64 4 499 5589

www.wottonkearney.com.au

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Need to know more?

For more information, contact our authors, **Property, Energy + Infrastructure** specialists.

Edward Burrell
Partner, Sydney
T: +61 2 9064 1895
edward.burrell@wottonkearney.com.au

Bailey Neate
Associate, Sydney
T: +61 2 9071 1923
bailey.neate@wottonkearney.com.au

Get in touch with our specialists