Study tour insights report

Adelaide, Australia
18-22 March 2024

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Executive summary

A contingent of 40 people completed the inaugural Electricity Networks Aotearoa (ENA) study tour from 18-22 March 2024 in Adelaide, Australia. The delegation was made up of lines company Chairs, CEs and GMs and staff from ENA. Survey feedback indicated that the study tour was a valuable and welcomed initiative.

The tour involved meetings with:

- Australian Renewable Energy Agency
- Australian Energy Regulator
- Australian Energy Market Commission
- South Australian Power Networks
- ENZEN
- Ausgrid
- South Australian Energy Minister

The study tour also included two days at the 2024 Energy Networks Conference. Jason Franklin, ENA Board member and Chief Executive of PowerNet, provided a New Zealand perspective on a plenary panel at the conference.

Some of the key insights from the study tour are:

- Less pilots and more deployment – somewhere, someone around the world has probably already done what you need. Find it, adapt it, and get on with it.
- Social licence is critical – we need to listen, involve, and start talking with (not to) consumers, and stop talking to ourselves.
- We need to work together – with the goal of increasing network efficiency for the long-term benefit of consumers, EDBs and their shareholders.
- Workforce – we heard that some field staff in Australia can earn $180k per annum with overtime, and control room managers there can earn $250k per annum – and they are coming for our talent.
- Our future is data – we will not be in the business of poles and cables; data and its collection and management are our future.

ENA plans to hold a study tour every second year. So, 2026 will be the next opportunity for EDB staff to get involved.

Introduction

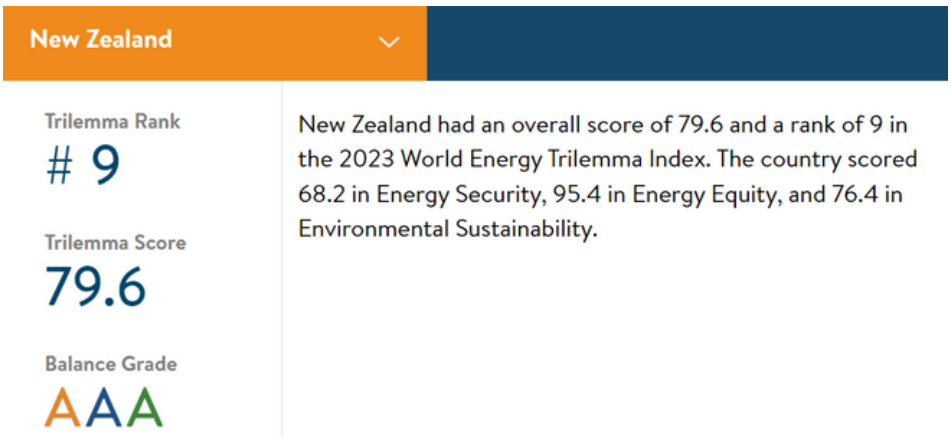
Electricity is an important part of how New Zealanders live, work and play. It helps to power our businesses; it keeps the lights on in schools and hospitals and it charges our mobile phones to keep people connected.

New Zealand has been ranked in the top 10 in the World Energy Council's energy trilemma index since 2015. We are now ranked 9th out of 99 countries, suggesting that New Zealand's energy system is performing well to balance the trilemma outcomes of security, environmental performance, and affordability.

The electricity sector has the potential to improve this ranking by playing a major role in decarbonising the wider energy sector. According to the BCG report The Future is Electric, delivering this would require investment of $42 billion in the 2020s, and specifically for electricity distributors, $22 billion of this is needed to prepare networks for rapid electrification and distributed generation.

To achieve this transition — and enable people to use more electricity instead of fossil-fuels — we need a new way of working because business as usual is no longer fit for purpose. The electricity sector, including distribution networks, are at a critical tipping point. Decisions made by the Government and regulators today, and over the next 12 to 18 months, will lock in the agenda for the sector until 2035. Therefore, it is important that the regulatory and policy settings are fit for purpose, otherwise New Zealand will not meet its climate change commitments.

Electricity Networks Aotearoa, and some of our members, went to Australia to see how New Zealand is stacking up, and what we can learn from our neighbours. This report shares some of the insights we gained from that valuable study tour.



This image is taken from the World Energy Trilemma online tool

A very brief overview of the Australian electricity sector

The National Electricity Market was created in 1995 following the formal adoption of a national competition policy by the Council of Australian Governments. Full operation started in December 1998. It operates on 40,000 kilometres of transmission lines and cables connecting Queensland, New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania. Due to the country's large size and location of its population, Northern Territory is subject to the same regulatory arrangements, but not subject to the wholesale market, and Western Australia isn't connected to the National Electricity Market and have their own electricity systems and separate regulatory arrangements.

The Australian Energy Market Commission develops and maintains the Australian National Electricity Rules, which have the force of law in the states and territories to which they apply. The Rules are enforced by the Australian Energy Regulator. The day-to-day management of the National Electricity Market is performed by the Australian Energy Market Operator. According to the Australian Energy Market Operator, there are over 300 market generators, transmission network service providers, distribution network service providers and retailers participating in the National Electricity Market.

The table below summaries the changes in generation output from Q4 2022 to Q4 2023 by time of day and fuel type, which is a different generation profile from New Zealand.

Table: National Electricity Market supply mix contribution by fuel type

Quarter	Black coal	Brown coal	Gas	Wind	Grid solar	Distributed PV	Hydro	Battery	Other
Q4 2022	40.6%	14.8%	4.0%	12.7%	7.2%	12.9%	7.4%	0.1%	0.15%
Q4 2023	39.1%	14.1%	3.6%	13.4%	8.6%	14.6%	6.3%	0.2%	0.19%
Change	-1.5%	-0.8%	-0.4%	0.7%	1.4%	1.7%	-1.2%	0.1%	0.04%

This graph was taken from the Quarterly Energy Dynamics Q4 2023 report from the Australian Energy Market Operator

Specifically, about Australian networks[1]

The Australian electricity network extends about 918,000 km and manages more than 11 million electricity customer connections. The electricity network businesses are held in public and private ownership:

- 100% privately owned electricity networks: Victoria, South Australia.
- 100% government owned electricity networks: Tasmania, Western Australia, Northern Territory and Queensland.
- In NSW, one electricity network is privately owned, two are 50.4% privately owned and one is fully government owned.
- The Australian Capital Territory's electricity network is a joint public and privately owned entity.

Australian network regulation

Energy networks are natural monopolies subject to strict economic regulation. In most cases, they are governed by the National Electricity Rules which are made by the Australian Energy Market Commission under the National Electricity Laws. The revenue most electricity networks are allowed to earn (and therefore the prices they charge) is governed by the Australian Energy Regulator and is set every five years. Western Australia has a similar structure regulated by its Economic Regulation Authority.

This is known as incentive-based regulation, because if businesses are able to make efficiencies and reduce costs below their allowed revenue, they can keep the savings for a period of time. Consumers benefit from this, because the regulator then uses the new information gained in one period to set tougher benchmarks and lower allowed revenues for the next. Thus, the savings made by the businesses put downward pressure on consumer prices.

Australian network prices

Network prices vary between regions and pay for a range of services designed to ensure the safe and reliable supply of energy to households and businesses. The other components of bills are wholesale costs, retail charges and environmental costs. The services networks provide include maintenance of thousands of kilometres of poles and wires, vegetation management, emergency response, system management to ensure safety, new connections and integration of solar and storage into the grid. Electricity network prices have been falling across the country. Since 2015, average electricity network prices are down more than 14%.

1: source - ENAustralia - https://www.energynetworks.com.au/

What we heard

Following is a summary of the key insights we gained from the study tour by topic. You can see the tour programme at the end of this report.

Regulation

- Regulatory burnout and frustration — with ever-increasing regulatory movements — is not unique to New Zealand. Australian distribution networks are experiencing and expressing the same concern with their regulators.
- While the New Zealand DPP is burdensome and a drain on EDB resources, the Australian propose and response model is much heavier handed and less flexible.
- The wider National Electricity Objective, which incorporates reducing Australia's greenhouse gas emissions, allows decarbonisation to be treated on an equal footing with prudency and efficiency within the regulatory decision-making process.
- Customer engagement is seen as a core function of providing distribution line services and is therefore included in regulatory opex allowances. The level of EDB customer engagement in Australia is materially higher than in New Zealand. Customer engagement and consultation are assessed as part of the regulatory determinations of the Australian Energy Regulator.
- Financing concerns are front and centre for the transmission sector in Australia given the forecast doubling of transmission service providers' regulated asset bases within the next regulatory period. The Australian Energy Market Commission has just published a decision to explicitly include a financial test in the transmission regulatory regime.
- Government, at both the state and federal level, are providing concessional finance to transmission service providers to fund the rapid expansion of the networks. Regulators are grappling with how this funding is to be treated within the regulatory framework.
- Regulators and governments are generally comfortable with the transition costs. Recently, the Australian Energy Regulator has approved the cost of decommissioning gas connections to be socialised, thereby removing a barrier to electrification.

What we heard

Energy policy settings

- A key theme was that the lack of a clear and consistent national narrative for the energy sector has caused delays and missed opportunities. A long period of mis-aligned energy policy between the states and federal government has led to confused or delayed action on the energy transition. The sentiment seems to be that this period is now over, the direction of travel is clear, and the energy sector can just 'get on with it.' There seems to be some relief associated with this view.
- The current approach is a 'race to the top' of renewables.
- Hydrogen is much more accepted as an alternative to fossil fuels (at least in South Australia) than is currently the case in New Zealand, where there is still a fair degree of scepticism.
- An overabundance of electricity supply from rooftop solar PV in South Australia during periods of otherwise low demand makes energy-intensive processes, such as hydrogen electrolysation, water desalination, etc, much more economically viable than they would currently be in New Zealand.
- Much like the UK, the Australian federal government has been willing to, over a significant period of time, invest considerable amounts of crown funding into renewable energy innovation. This funding pool is set to increase, particularly to support innovations associated with green hydrogen.

Social licence and community engagement

- South Australia Power Networks appear to have pulled off the trick of introducing direct control/management of consumer PV export without generating an antagonistic counter-lobby from PV owners or installers/suppliers. Given the adverse reaction from the solar PV sector in New Zealand, to relatively minor attempts to change the status quo (e.g. updating references to AS/NZS 4777.3 in Code and regulation), this is remarkable.
- EDBs in Australia are looking to get to the heart of what customers need, rather than just thinking of them as end users.

What we heard

Connections and storage

- Australia seems to have embraced Battery Energy Storage Systems (BESS), at both household and grid levels, at a much greater rate than New Zealand. This has no doubt been driven by necessity, given the over-abundance of cheap solar PV electricity that needs to be stored during the day.
- Much like New Zealand, some Australian EDBs are conducting trials of Remote Area Power Supplies, very similar in configuration to the Base Power systems (and others) available in New Zealand. As in New Zealand, these are primarily being used to serve very remote rural customers, with a view to being able to withdraw the lines service in due course.
- Australian EDBs also appear to have similar concerns regarding the resilience and security of supply for remote communities, driven by the effects of climate change. There were case studies of microgrids installed in these communities using a combination of rooftop solar PV, subsidised residential BESS, and diesel generation as back-up for when these micro-grids operate in an islanded mode. (Islanded mode meaning where a microgrid is disconnected from the main utility but remains energised and continues to supply local loads.)

Electric vehicles

- Australia (by their own admission) are probably 2-3 years behind New Zealand in terms of the uptake of EVs and associated EV charging infrastructure. They will, no doubt, catch-up quickly.
- Talking with Australian EDBs and some of the regulators, it seems that some of the claims made by charging point operators in New Zealand about the speed and ease of connection for public EV charging sites in Australia, is not as straight forward as they suggest.
- Australia, as a more heavily urbanised nation than New Zealand, has a much greater stock of housing (especially inner-city apartments) that do not have off-street parking facilities. As such, they are likely to rely much more on public EV charging infrastructure to support the electrification of their light vehicle fleet.
- As noted above, hydrogen is much more accepted as a key replacement for fossil fuels in Australia. As such, they may well look to hydrogen as the fuel source to enable the decarbonisation of their heavy goods/logistics fleets rather than electricity. This is made more likely by the sheer distances involved and the scope and scale of heavy and extractive industries in Australia.

What we heard

Pricing and affordability

- There is a growing recognition that the benefits and burden of the transition needs to be balanced/shared fairly.

Role of networks in the transition to electrify

- The significant prevalence of rooftop solar PV, driven by generous government subsidises, has made the management of the electricity distribution networks more challenging and also more critical in meeting renewable electricity targets.

This photo was taken at the South Australia Power Networks Innovation Centre. With 1 in 3 homes in SA having a rooftop solar PV installation, and electricity prices regularly very low – and at times even negative values – SAPN has had huge challenges to manage on their network. Their innovative approach to introducing dynamic flexible connections to some of their solar PV customers is a real-world example of the advanced network management techniques that ENA's Future Networks Forum is investigating.

Insights and opportunities

- Significant and sustained funding streams for innovation in the energy sector have delivered benefits for Australian energy consumers and society as a whole.
- New Zealand's approaches to supporting remote and vulnerable customer communities (via Remote Area Power Supply and microgrids, etc) are consistent with the trials being run in Australia and are driven by largely the same risks. There is potential for shared learnings on this topic, specifically between the two jurisdictions.
- There is an opportunity to support the roll-out of public EV charging by mapping the range of EV journeys, and this is something ENA is scoping, based on a similar piece of research undertaken in Australia.

The ENA study tour spent two days at the insightful Energy Networks Australia Conference. A highlight was seeing ENA Board member, and PowerNet CE, Jason Franklin talking on the 'whole of system' plenary panel. It was a great chance to share the progress and challenges in the New Zealand energy sector.

Conclusion – what should the regulatory policy priorities be for New Zealand

- ENA should continue to advocate for improved and sustained innovation funding arrangements in or outside of the existing economic regulation of EDBs.
- There are lessons to be learned for the rapid development and deployment of dynamic operating envelopes (with associated policies and enabling technologies) in the South Australian context. How can the New Zealand distribution sector develop comparable 'next gen' solutions to some of the challenges we are anticipating (e.g. mass adoption of EVs) without waiting for some crisis to arrive?
- By comparison with Australia, the New Zealand political and regulatory context around energy is relatively straightforward and uncomplicated. We should embrace – rather than rail against – this simplicity and certainty to deliver positive outcomes for EDBs and their customers and owners.
- While not directly a matter for EDBs, New Zealand's blessing of large hydro generation facilities puts us in a desirable position with respect to incorporating more intermittent sources of renewable generation (e.g. wind and grid-scale solar) into the generation mix. As an energy sector, we should exploit this advantage to the maximum extent possible.

The study tour programme

2024 was ENA's inaugural study tour. This is what the week in Adelaide looked like:

Monday 18 March

- Meeting with Australian Renewable Energy Agency – Knowledge Sharing Manager, Project Delivery and Principal Policy Advisor, Project Delivery.

Tuesday 19 March

- Meeting with the Australian Energy Regulator and the Australian Energy Market Commission – Executive GM Networks (AER) and Executive General Manager Networks and Technical (AEMC) and representatives from their respective teams.
- Parliament lunch with South Australian Energy Minister, Tom Koutsantonis and SA Power Networks Chief Executive.
- SA Power Networks – Innovation Centre Tour

Wednesday 20 March

- ENZEN breakfast meeting
- 2024 Energy Networks Conference

Thursday 21 March

- 2024 Energy Networks Conference

Friday 22 March

- Meeting with Ausgrid – Programme Director of Climate Resilience, Head of DSO, Head of Strategy, Head of EV Charging Development and Head of Distributed Energy Storage.

Who is Electricity Networks Aotearoa?

Electricity Networks Aotearoa (ENA) represents all of the electricity distribution businesses (EDBs) in New Zealand that provide local and regional electricity networks. EDBs employ 10,000 people, deliver electricity to more than two million homes and businesses, and are expected to spend $22 billion over the next six years to ensure that New Zealand has reliable, resilient and secure electricity to enable decarbonisation.

You can find out more about us in our strategic plan or visit ena.org.nz

Electricity Distribution Businesses in New Zealand

This map of the New Zealand electricity distribution businesses belongs to the Commerce Commission