Renewable energy integration into Tasmania

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Network Planning – TasNetworks Pty Ltd

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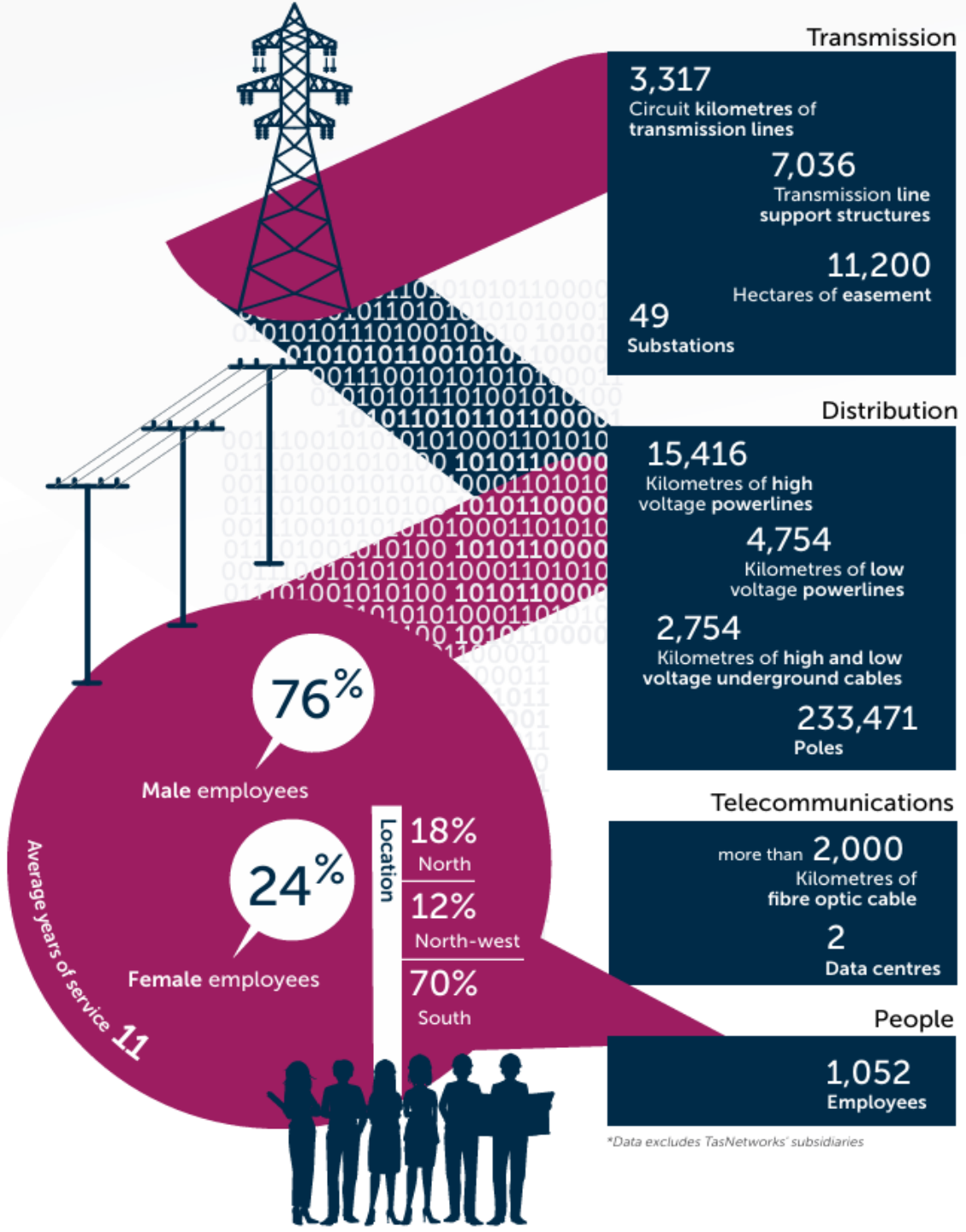
About TasNetworks

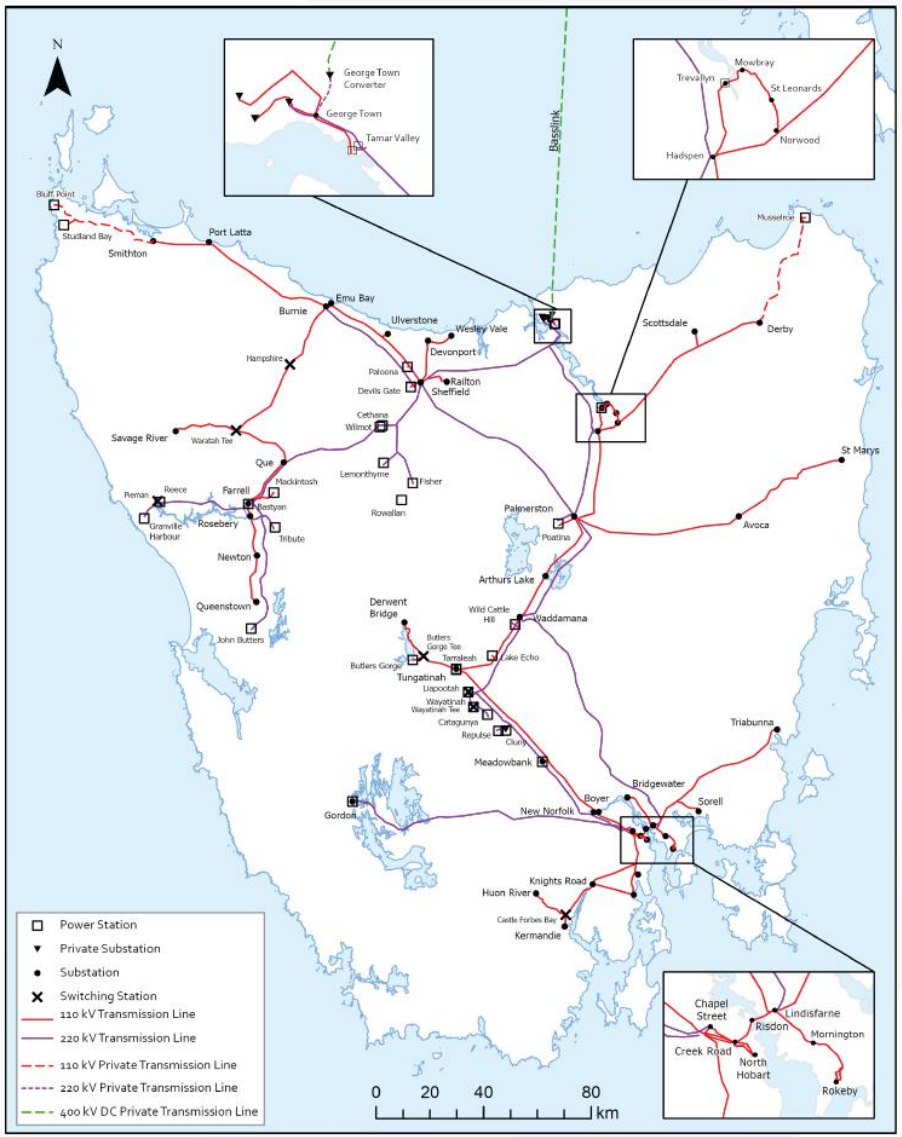
We own, operate, and maintain the electricity transmission and distribution networks in Tasmania.

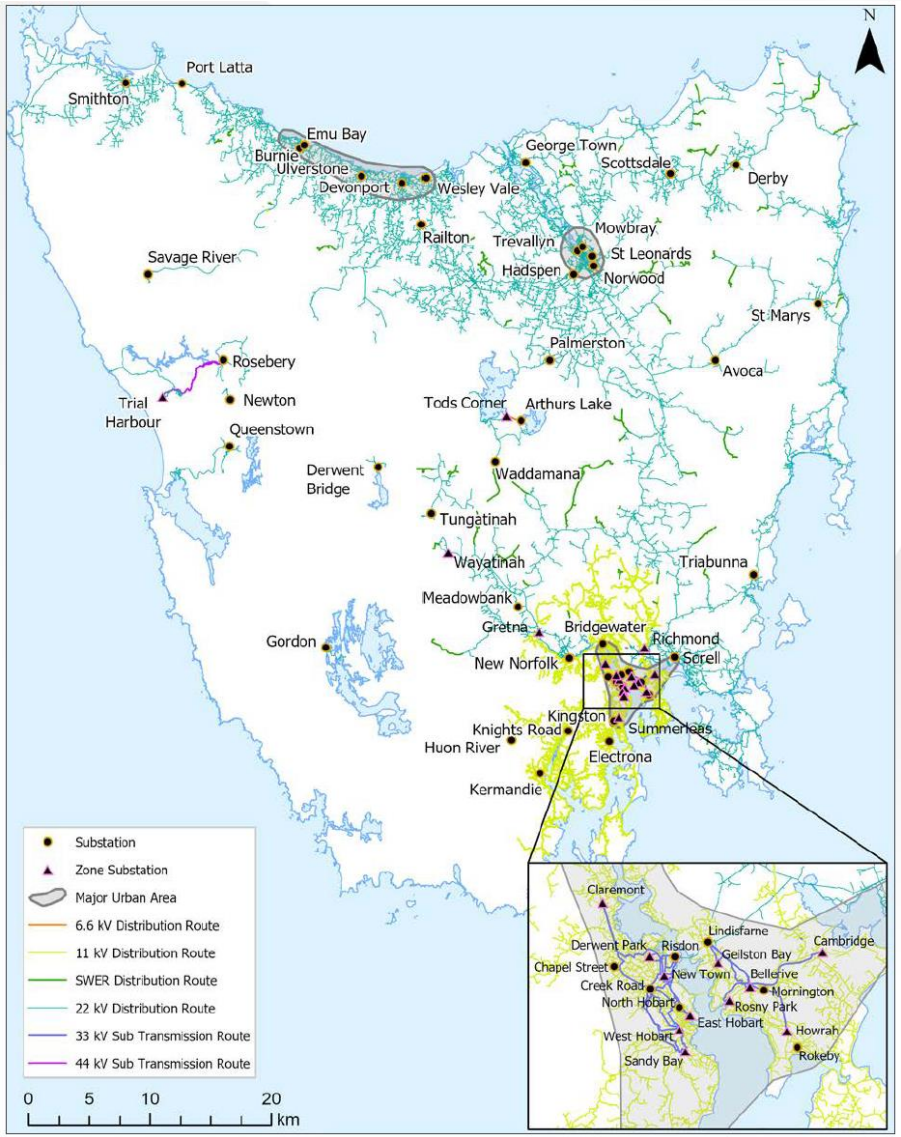
We have 300,000 residential, business, commercial, and industrial customers, and are committed to working with our community to make a meaningful difference to the lives of Tasmanians – through and beyond the delivery of electricity and telecommunication services.

As Tasmania's provider of electricity transmission and distribution services, we are committed to providing our customers with affordable and reliable electricity, while helping Australia transition to cleaner energy sources.



TasNetworks transmission and distribution networks





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TasNetworks Network Planning

- Perform the requirements of the National Electricity Rules (The Rules) as the jurisdictional planning body for Tasmania
- Engage with stakeholders on network plans for long and short-term planning horizons
- Identify network capacity and reliability limitations and seek alternate solutions to address (or defer) them
- Present opportunities for new network connections (load and generation)
- Develop the Annual Planning Report on a yearly basis
- Connection studies for new customer connections

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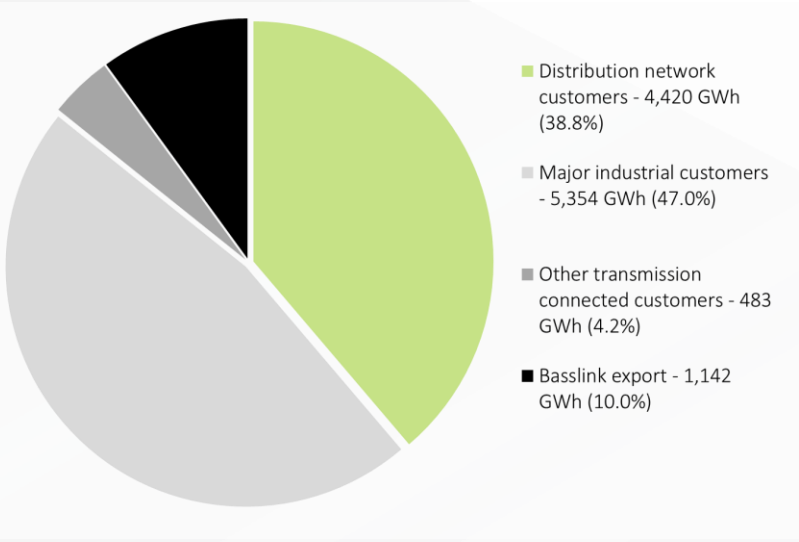
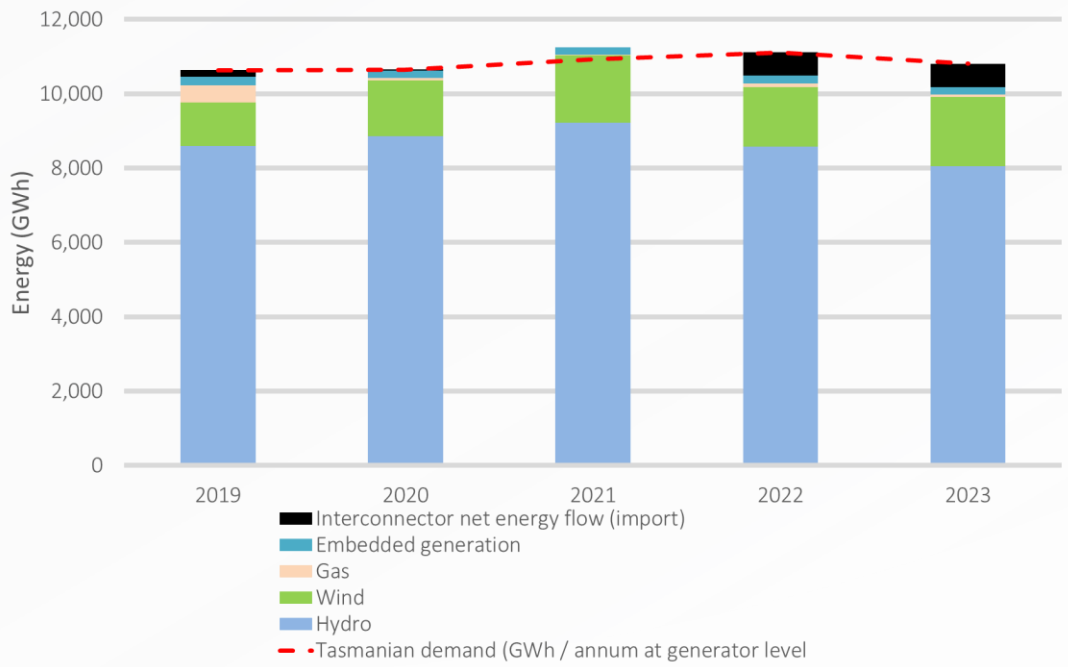
Demand and Supply



Relative transmission network use in 2023



Collectively, transmission-connected customers—dominated by four major industrial customers—used 51 per cent of the total energy flow delivered through the transmission network.

Tasmania currently maintains a state of "energy neutrality", whereby the on-island generation was sufficient to meet or exceed Tasmania's annual energy requirements.

In 2023, Tasmania continued to see some periods of constrained generation, with a proportion of Basslink imports required to supply the State's energy requirements – approximately 6%.

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Tasmanian Renewable Energy Target (TRET)

- TRET legislates the delivery of 200% of Tasmania's 2020 baseline of 10,500 GWh of renewable generation per year, by the end of 2040
- The 2040 target is therefore 21,000 GWh, with an interim target of 15,750 GWh by the end of 2030 (150%)
- Tasmania has the key advantage of significant renewable hydropower capacity for firming variable renewable energy sources.
- To achieve the TRET of 21,000 GWh by 2040 using Tasmania's world leading wind resources, will require up to 3,000 MW of new installed wind capacity.
- This requirement will change if other renewable energy sources (solar-photovoltaic, ocean, biomass, geothermal) are also developed.
- Rooftop solar contributes toward TRET

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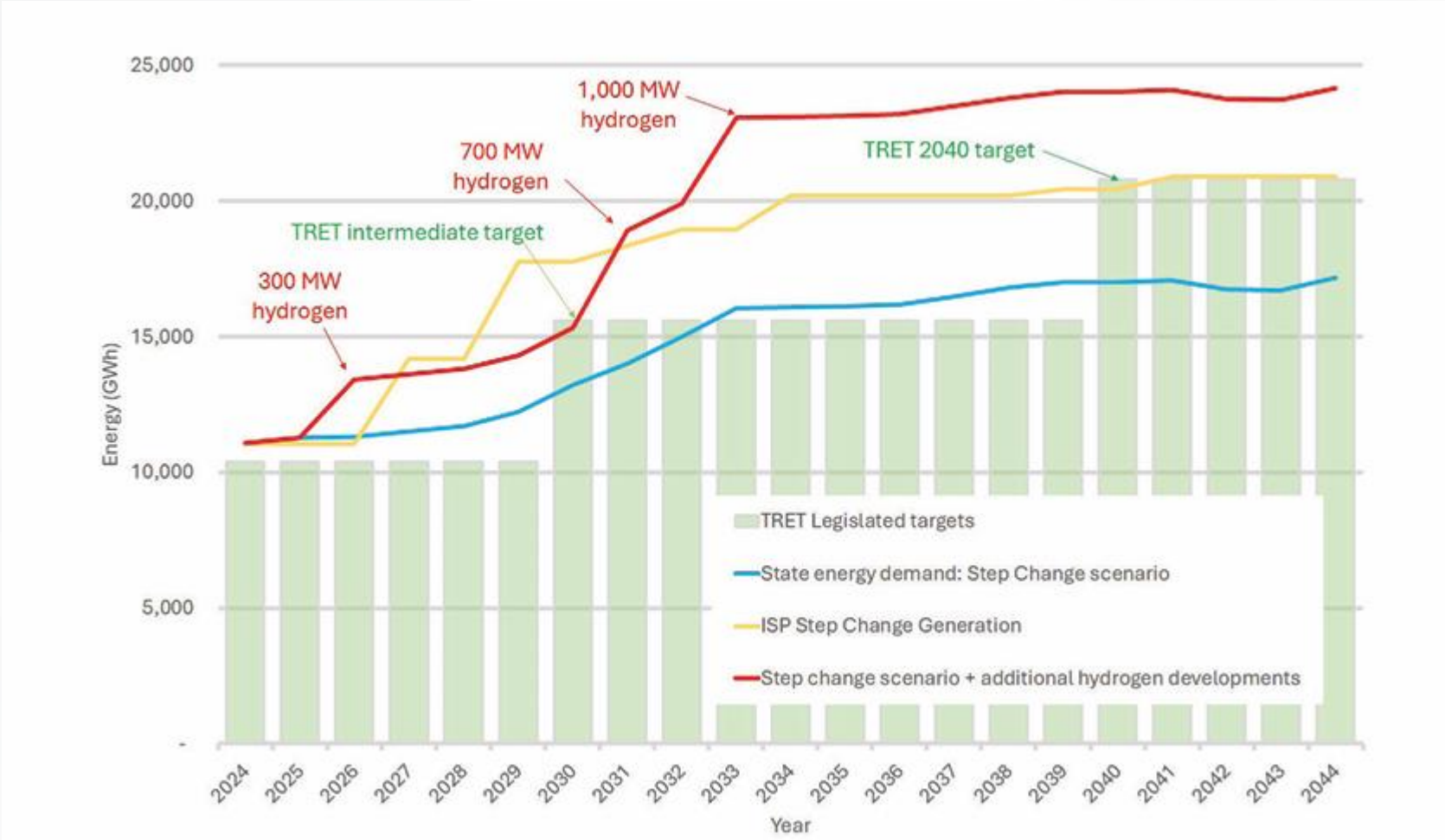
Energy forecast scenarios



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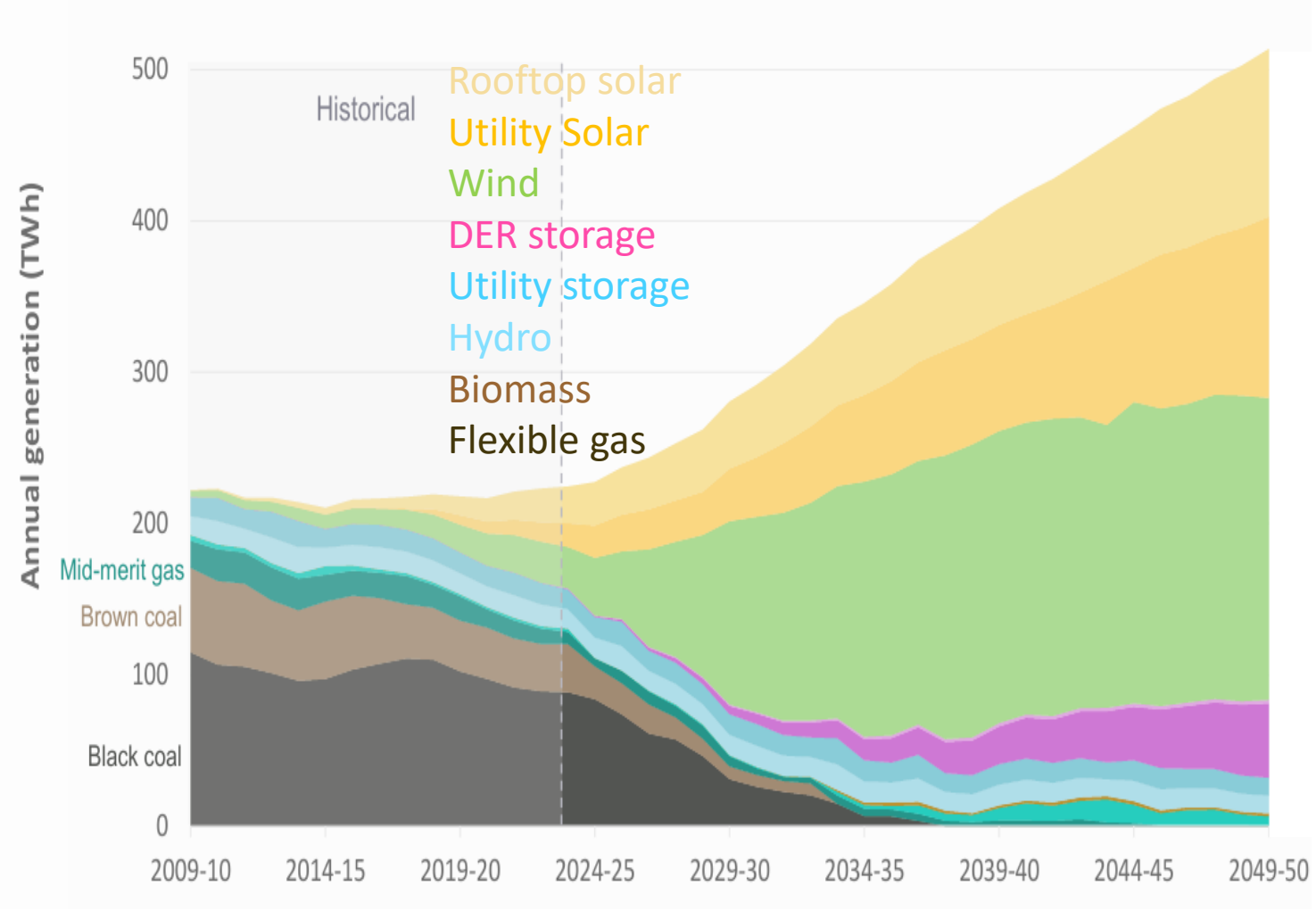
Emerging network challenges/opportunities

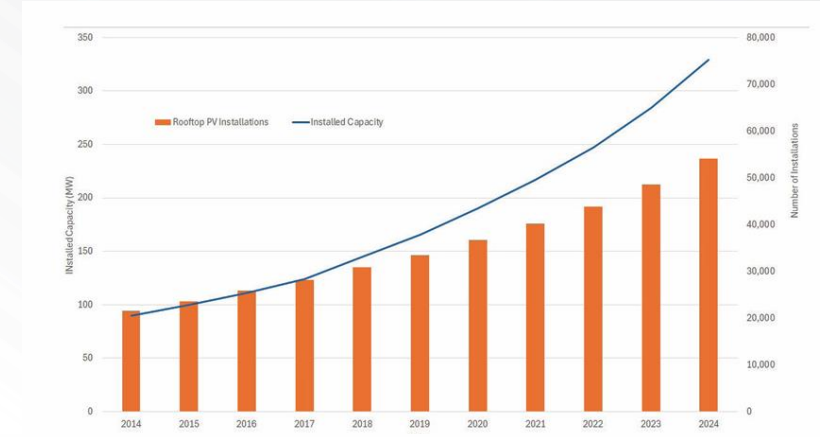
- Distributed Energy Resources (DER) – rooftop solar, mini-hydro, residential batteries etc.
- Large-scale hydrogen integration
- Large-scale wind integration
- Data centre and large BESS developments
- New interconnector and associated transmission developments
- Pumped Hydro Energy Storage (PHES) schemes
- Community batteries
- Electric Vehicle (EV) uptake
- Increased visibility of the LV network – more issues to fix
- Bi-directional energy flow in HV/LV models
- Demand forecasting changes (e.g. EV uptake)
- Regulatory landscape
- More accurate network models

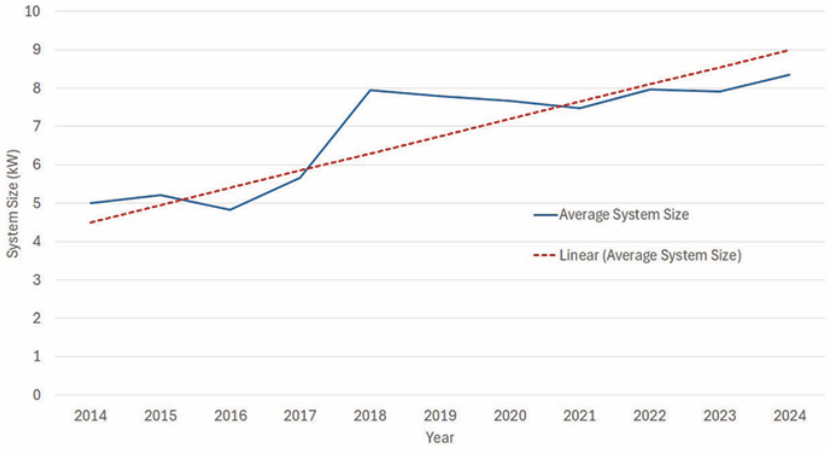
Source: 2024 NEM ESOO

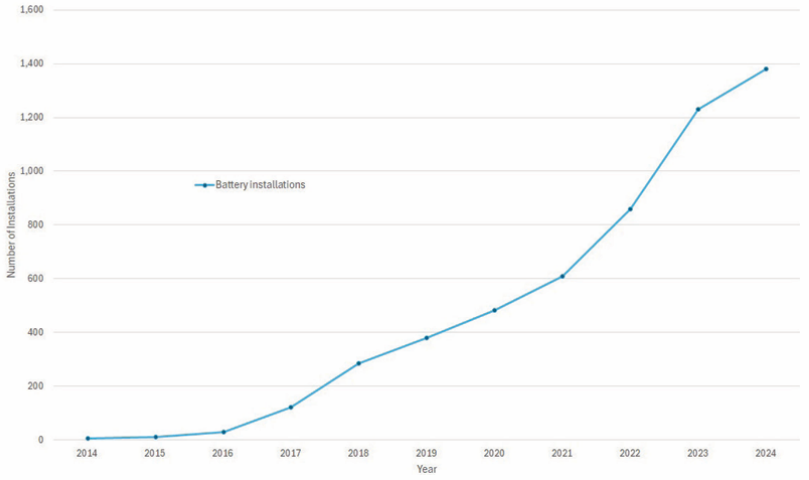


Solar Challenges

- Network topology traditionally designed to deliver power in “one direction”
- Peak solar generation occurs at around midday, while maximum demand in occurs in mornings and evenings
- Number of solar applications increasing by approximately 25% per year
- Saturation levels being reached in some areas
- Costs of network augmentation
- Compliance to overarching planning requirements
- Disconnection of large amounts of solar can cause/exacerbate frequency excursions on the power system during low frequency disturbance event
- Larger embedded generation applications (approx. 5 MVA) are increasing significantly year on year.







How can we accommodate more solar?

- Traditional network augmentation (upgrade transformers and conductors). Can be costly for customers (I.e. if no shared benefit)
- Changes to inverters (dynamic voltage/frequency, reactive power, curtailment). New amendments (August 2025) to introduce gen limit control, region-specific voltage and frequency response.
- Energy storage systems – batteries
- Advanced monitoring and control (real time monitoring, smart meter data)
- Flexible demand and load shifting (demand response programs and tariff incentives)
- Community batteries, microgrids
- V2G has strong potential to facilitate greater solar uptake
- Smart meters are helping improve situational awareness

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Electric vehicles in Tasmania - snapshot

- Battery Electric Buses (BEB) and Hydrogen Electric Buses (HEB) are currently being trialled in Launceston and Hobart
- Approximately 4,000 (passenger) EVs registered in Tas
  - Mostly cars/wagons, with a small proportion of motorcycles
- >100 public charging stations across the state:
  - 3 x superfast chargers 350 kW
  - 31 x mid-range greater than 25 kW to less than 350 kW
  - 64 x 25 kW chargers
  - Mostly DC chargers (some AC chargers)
  - Many more new sites currently under review
- 80-90% charging completed at home, mostly 3.5 kW chargers
- 2-3 hours of charging @home meets most avg daily needs

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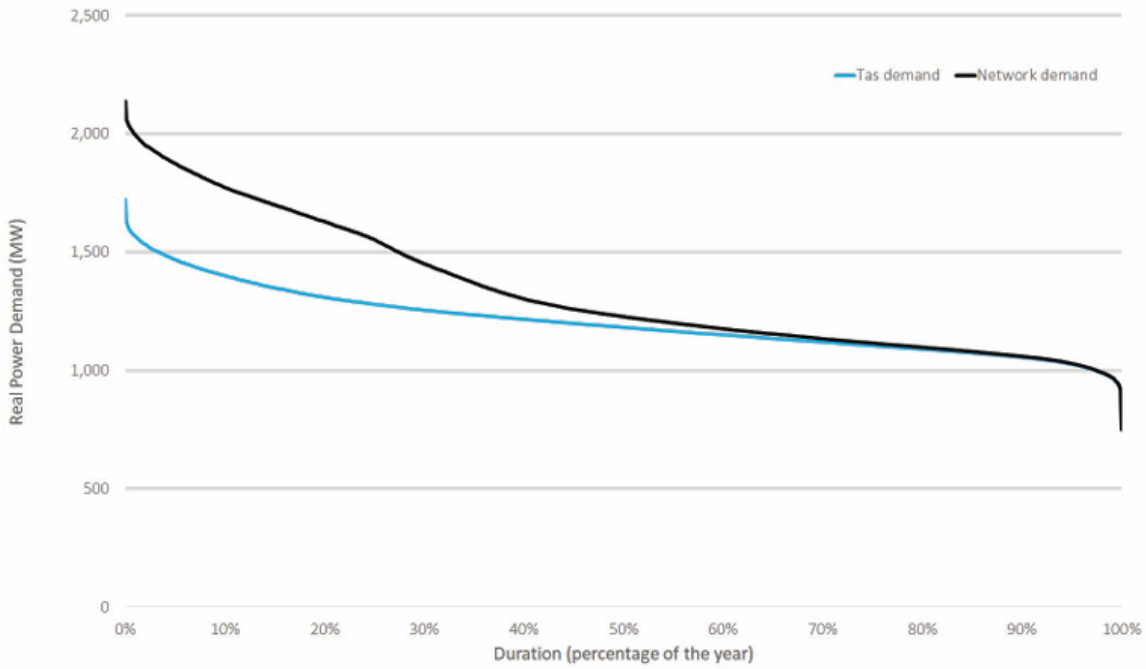
New and emerging opportunities

- New industry
  - Hydrogen hub up to 1,000 MW
  - Existing Major Industrial expansion/diversification
  - Data centres
  - De-gasification -> electrification
- Renewable Energy Zone developments
  - Central Highlands wind – up to 1,500 MW by 2030 (among best wind resources in Australia)
- New technology
  - Network Innovation
  - Non-network solutions
  - Larger-scale batteries



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Some potential renewable energy developments being considered…

- 232 MW wind farm, George Town
- 288 MW wind farm, west coast
- 288 MW solar farm, midlands
- 288 MW solar farm, George Town
- 300 MW hydrogen load, George Town
- 1.5 GW combined wind interest, central highlands
- 1.6 GW combined wind interest, north west
- 2.4 GW offshore wind, Bass Strait

The proposed generation developments and forecast large-scale hydrogen will more than double the energy transmitted through the network, with network maximum demand forecast to increase 250% over the next 20 years.

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