Energy Transformation Taskforce

Whole of System Plan

Information Sheet

August 2020

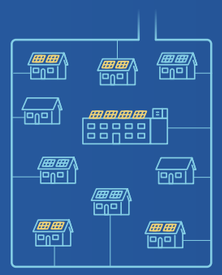
Highlights

The key findings and observations for the SWIS over the 20-year study period

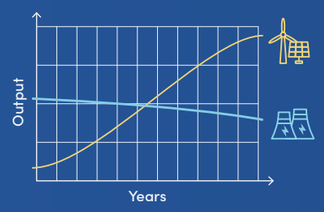
Western Australia is embracing renewable generation for a brighter energy future

The SWIS already has a strong mix of renewables, comprising 34% of installed capacity at the beginning of the modelling period

Under all four modelling scenarios, over 70% of generation capacity is renewable by 2040



Rooftop PV will continue to displace other forms of generation, most significantly coal and large-scale solar



Coal-fired generation declines under all scenarios, and partially exits the market in the mid-2020s in the lower demand scenarios

Growth in renewables reduces emissions over the study period, despite the overall increase in end-user demand

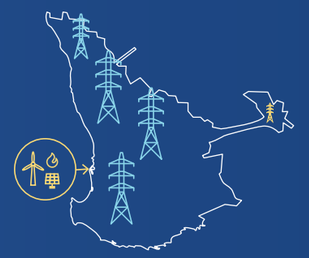
New market design creates opportunities to better meet power system needs

Growth in intermittent generation is supported by firming from storage and gas facilities

There is opportunity for storage and renewables to provide ESS

As new ESS and capacity mechanisms are embedded, revenue streams for generation and storage will become more diverse

Maximising the value of existing transmission network infrastructure in the SWIS



New generation connections are best located in the South West transmission network zone to utilise existing network capacity and add generation diversity

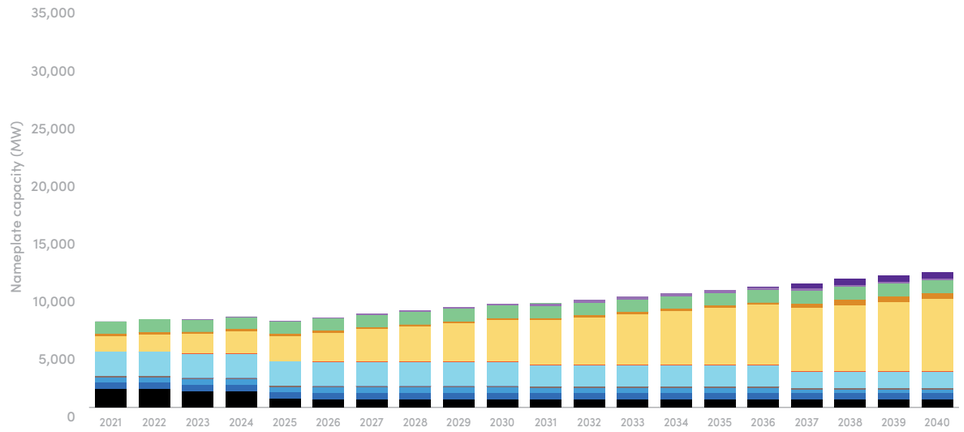
Little or no transmission network augmentation is required in the near future

SWIS capacity mix

The charts below show the modelled capacity mix for each scenario from 2020 to 2040. Rooftop PV uptake is an input assumption. Renewables (wind and solar) are selected ahead of thermal generation as part of the lowest cost capacity mix. Emissions intensity decreases in all scenarios.

Cast Away

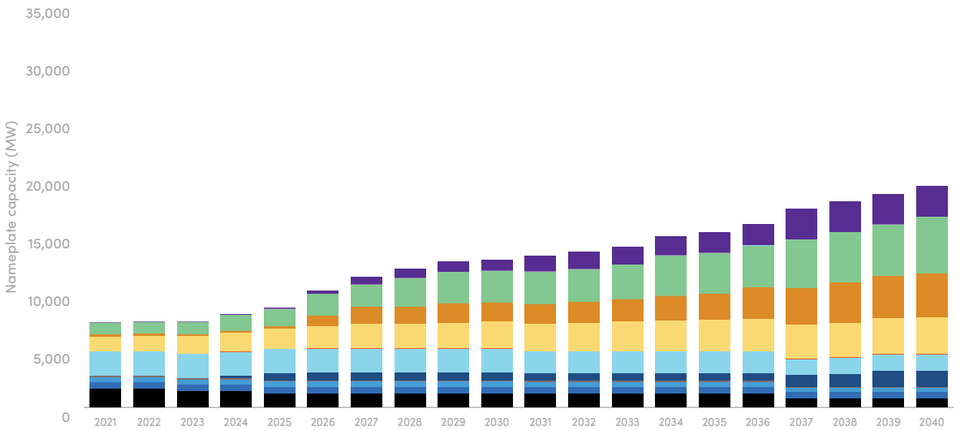
Muted economic growth coupled with greater decentralisation



- Operational demand is the lowest of all scenarios
- Wind is the only new large-scale capacity required before 2030 (60 MW)
- No new large-scale solar required until after 2030 as it is crowded out by rooftop PV
- 500 MW coal-fired generation is displaced by cleaner, cheaper capacity by 2025
- Storage plays a role in the ESS market
- No network augmentation is required
- Emissions reduce steadily over the study period, declining by 41% by 2040

Techtopia

Technological change flattens the increasing energy demand profile



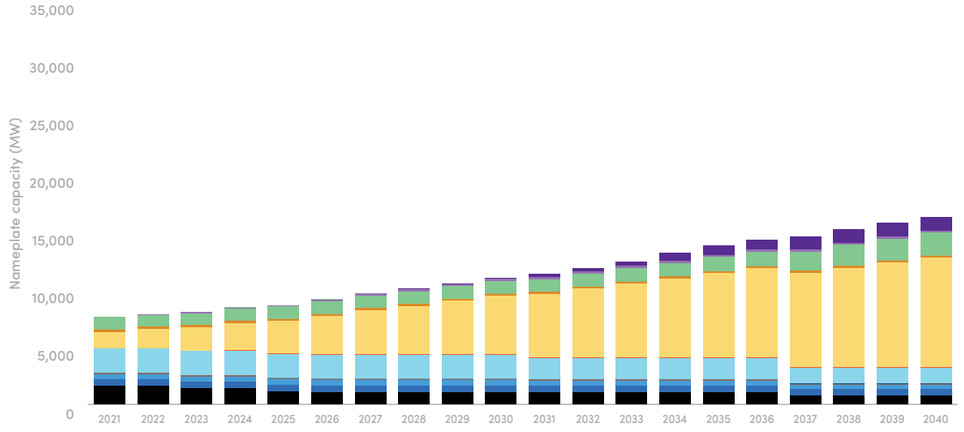
- Operational demand increases, rooftop PV uptake is lower than other scenarios
- 3,196 MW of new large-scale renewable generation (wind and large-scale solar) required by 2030
- 667 MW of flexible gas capacity is connected by 2030 to meet demand and aid firming
- No economic exit of coal-fired generation
- Storage plays a role in the ESS market and as a substitute for network augmentation towards end of study period
- Some network augmentation is required, initially to the Eastern Goldfields
- Emissions remain steady, but fall by 13% by the end of the period as thermal generation retires

Legend

Wind · Waste to energy · Solar PV · Rooftop PV · OCGT · Flexible gas
DSM · Diesel engine · Cogeneration · CCGT · Black coal · Battery – 4 hours · Battery – 2 hours

Groundhog Day

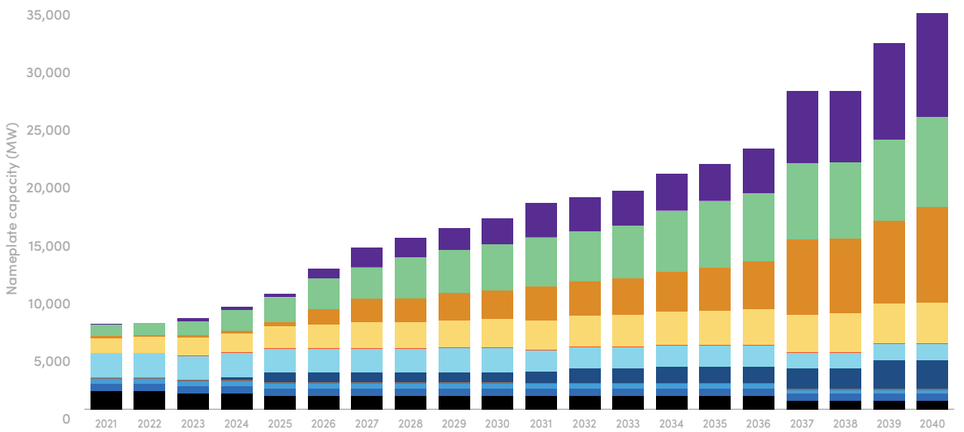
Distributed energy resources thrive, but reliance on the network remains high



- Operational demand low, highest uptake of rooftop PV
- Wind is the only new large-scale capacity required before 2030 (80 MW)
- No new large-scale solar required as it is crowded out by rooftop PV
- 132 MW coal-fired generation is displaced by cleaner, cheaper capacity by 2025
- Greater requirement for storage than Cast Away, primarily for ESS market
- No network augmentation is required
- Emissions reduce steadily over the study period, declining by 29% by 2040

Double Bubble

Ongoing strong economy results in largest growth in demand



- Operational demand is huge, additional renewable and gas-fired capacity is required immediately
- 5,264 MW of new large-scale renewable generation (wind and large-scale solar) required by 2030
- 867 MW of new flexible gas capacity is connected by 2030 to meet demand and aid firming
- No economic exit of coal-fired generation
- Storage is critical in ESS and energy markets and to offset need for some network augmentations
- Network augmentation to Eastern Goldfields required by 2025, and from the Metro through to the Mid West by 2030
- Emissions initially increase, but fall by 17% by the end of the period as thermal generation retires

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