

THE MARKET FOR CSP IN AUSTRALIA

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ENERGY

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Australian Government

Geoscience Australia

APPLYING GEOSCIENCE TO AUSTRALIA'S
MOST IMPORTANT CHALLENGES

National Electricity Transmission Lines

Updated: 2014

Abstract:

The National Electricity Transmission Lines dataset presents the spatial location, in line format, of all known high voltage electricity transmission lines that make up the electricity transmission network within Australia.

For more information about this dataset please refer to the Product's Metadata Document.

Legend:

— National Electricity Transmission Lines

■ Australian Mainland



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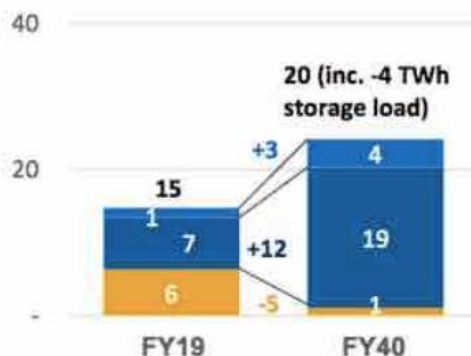
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Contact: clientservices@ga.gov.au

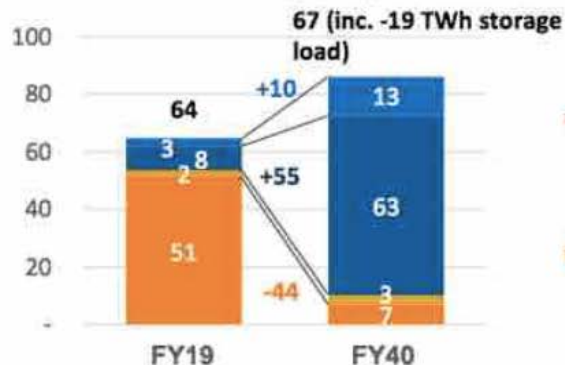


GENERATION MIX TO CHANGE SIGNIFICANTLY

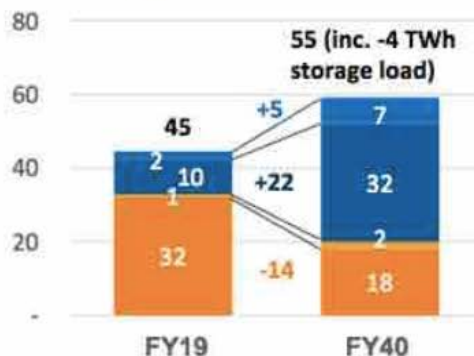
The AEMO ISP neutral scenario predicts significant changes in the generation mix in New South Wales, Victoria and South Australia between FY19 and FY40



New South Wales (TWh)



Victoria (TWh)



- Coal generation in NSW, VIC and SA reducing by 70% from 83 TWh in FY19 to 25 TWh in FY40
- Solar, wind and storage in NSW, VIC and SA increasing by 425% from 25 TWh in FY19 to 131 TWh in FY40
- Significant new investment in network connections, network augmentation and interconnection required to facilitate transition from coal to renewables

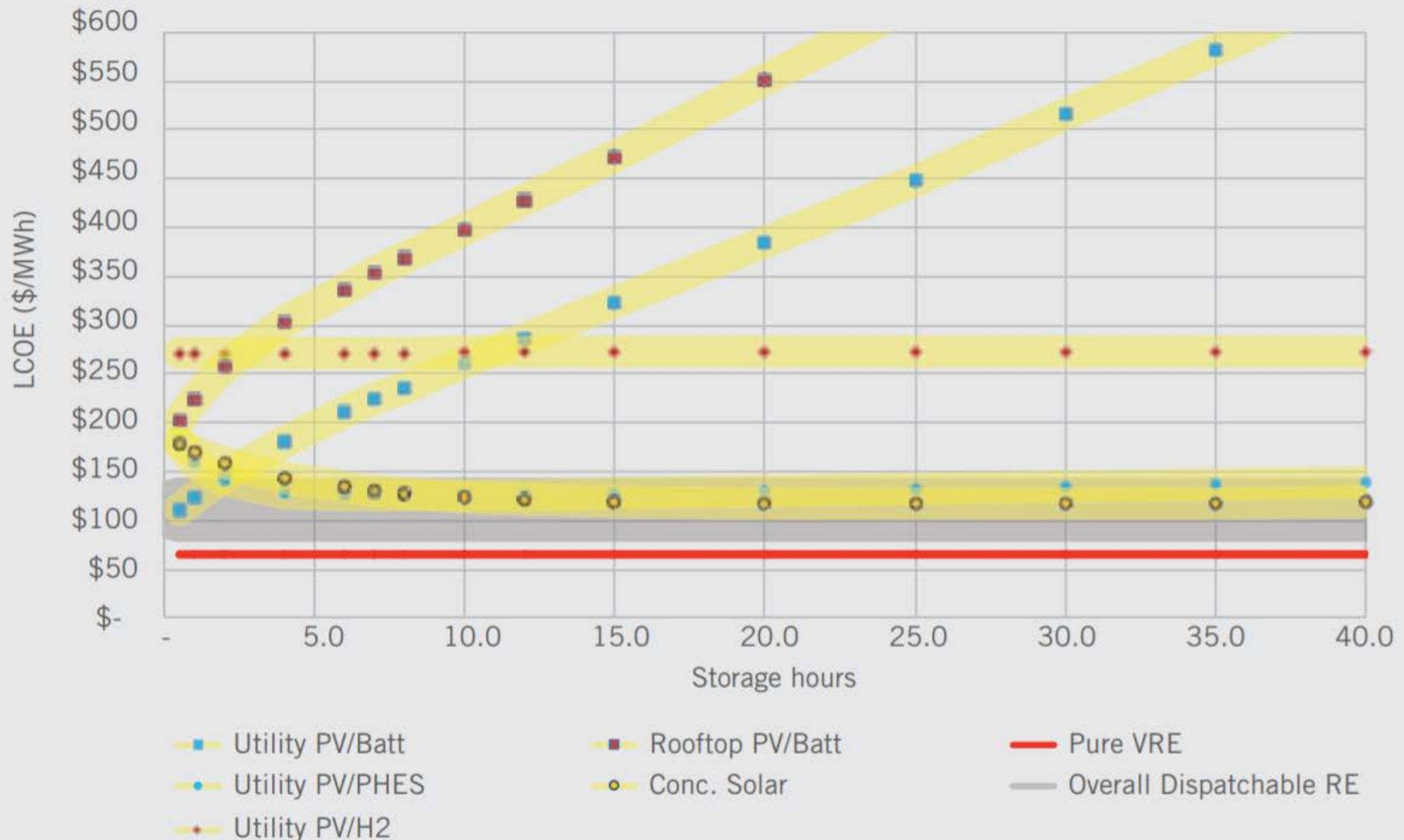
Total consumption net of storage load¹

- Rooftop solar and distributed storage
- Utility solar, wind, hydro and storage
- Gas/Liquids/Biomass
- Coal

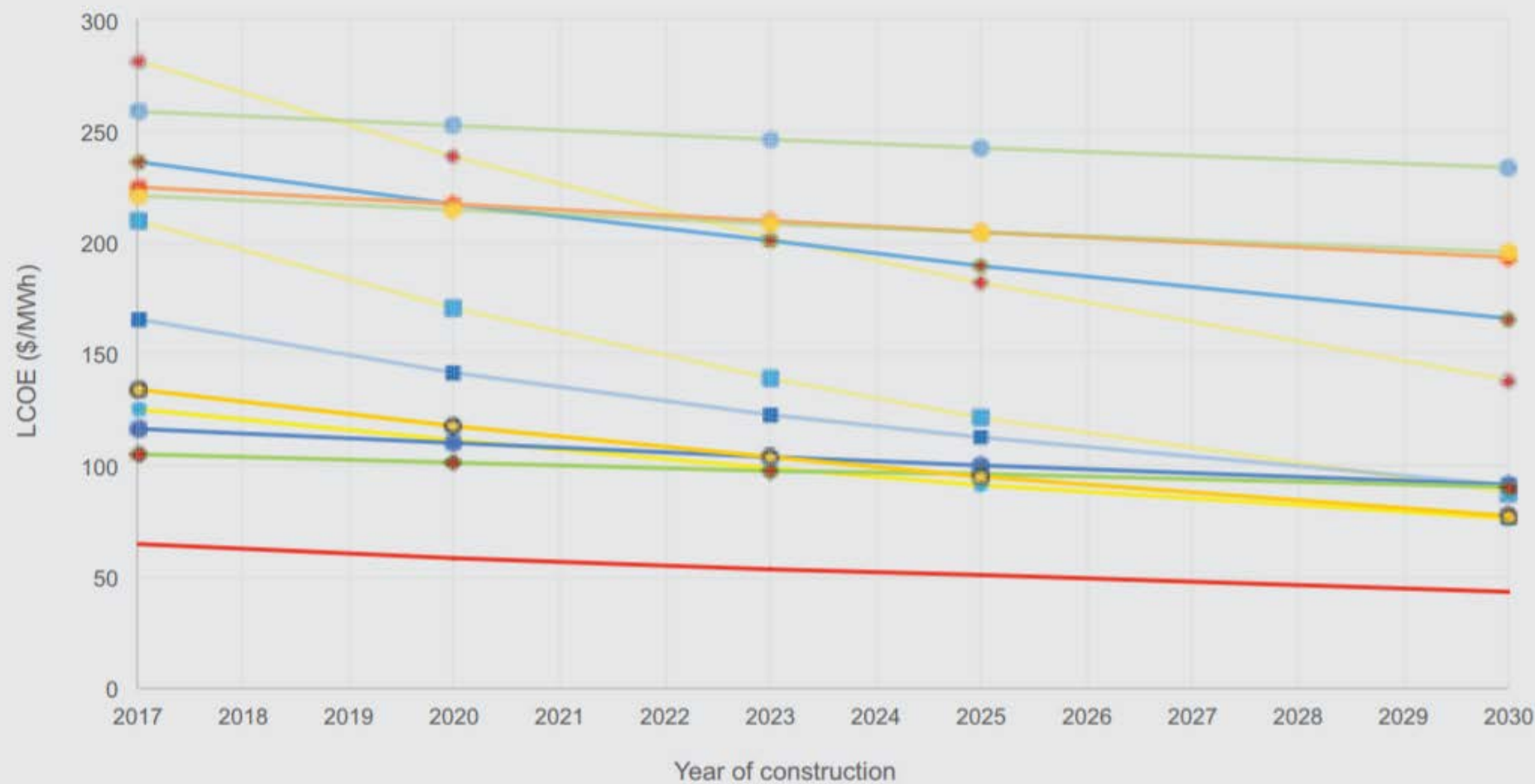
Zoom in (Ctrl+Plus)



SOLAR DRIVEN OPTIONS

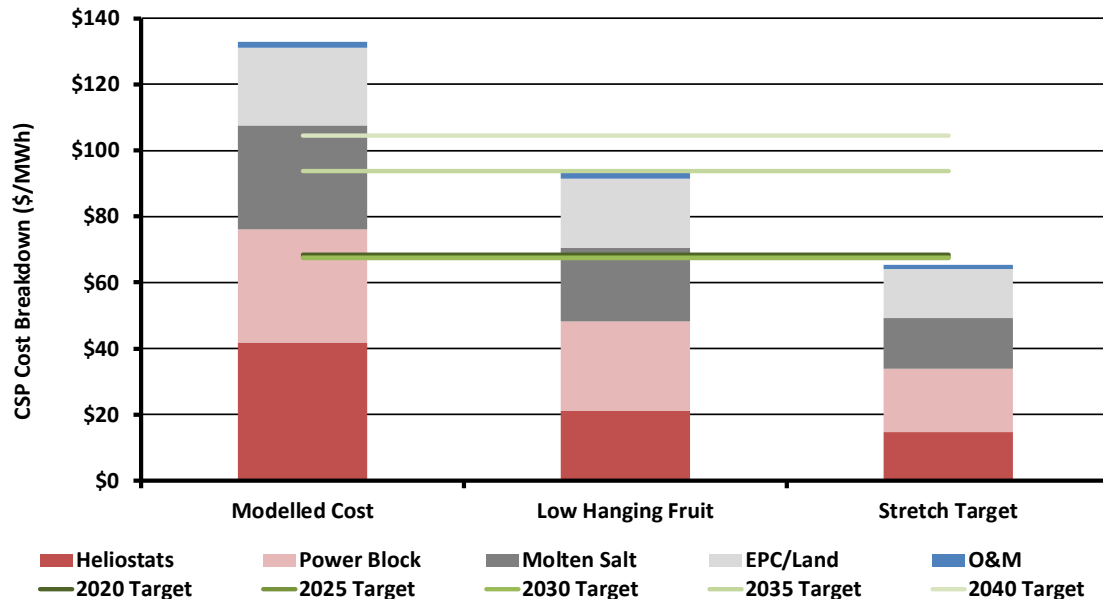


POTENTIAL EVOLUTION OF LCOEs



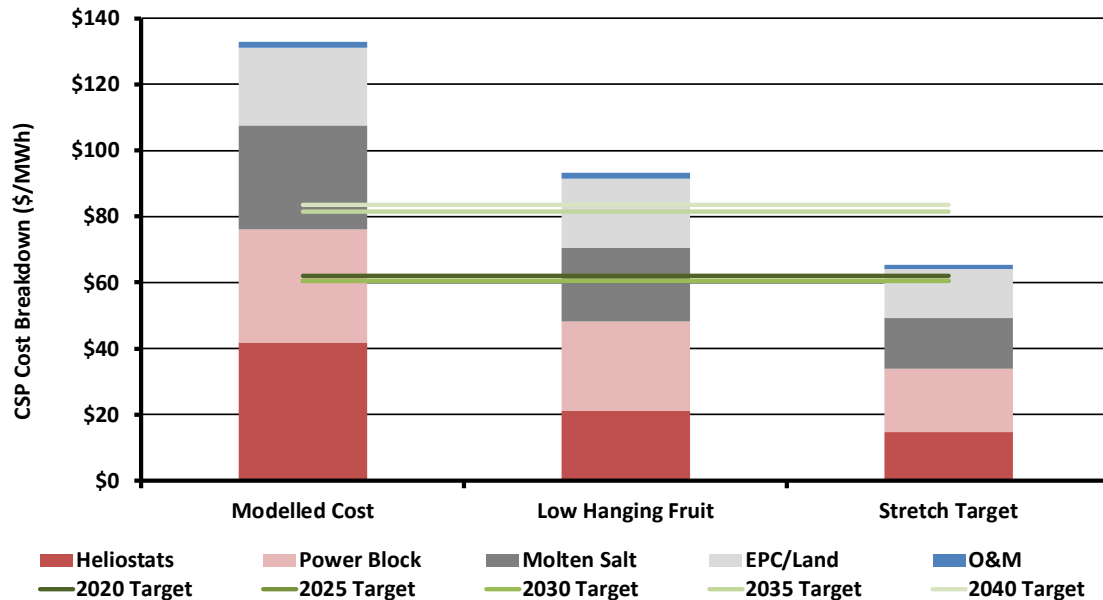
- Utility PV/Batt
- Utility PV/PHES
- Utility PV/H2
- Wind/Batt
- Wind/PHES
- Wind/H2
- HSA Geothermal
- Biomass+AD
- Dry Biomass \$2.5/GJ
- Dry Biomass \$5/GJ
- Conc. Solar
- EGS Geothermal
- Pure VRE

Key Model Outcome – Significant Uptake at 2-hour Dispatch



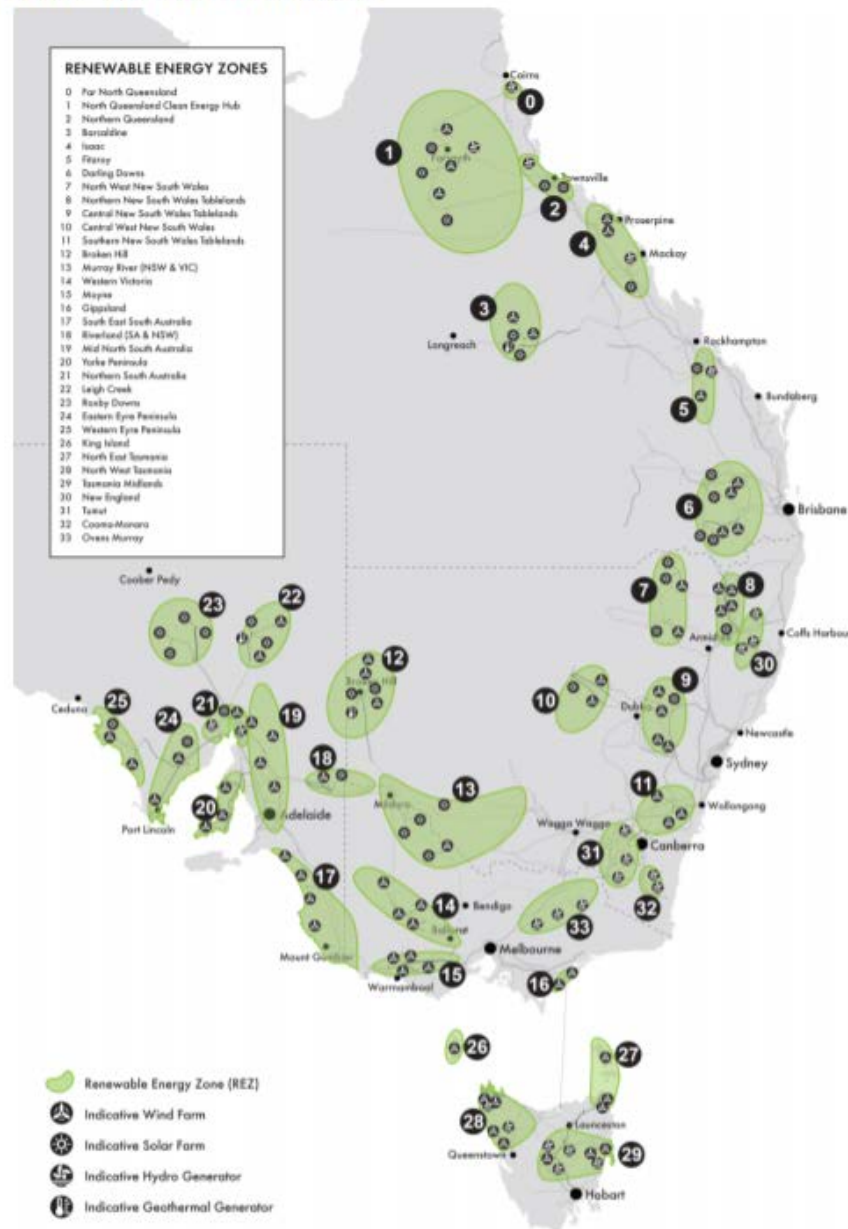
- Cost need to come down from \$135/MWh to \$70/MWh for significant uptake in 2025 and 2030 at 2-hour discharge
- The target for 2035 and 2040 is around \$100/MWh under the neutral scenario

Key Model Outcome – Significant Uptake at 5-hour Dispatch



- Cost need to come down from \$135/MWh to \$60/MWh for significant uptake in 2025 and 2030 at 5-hour discharge
- The target for 2035 and 2040 is around \$80/MWh under the neutral scenario

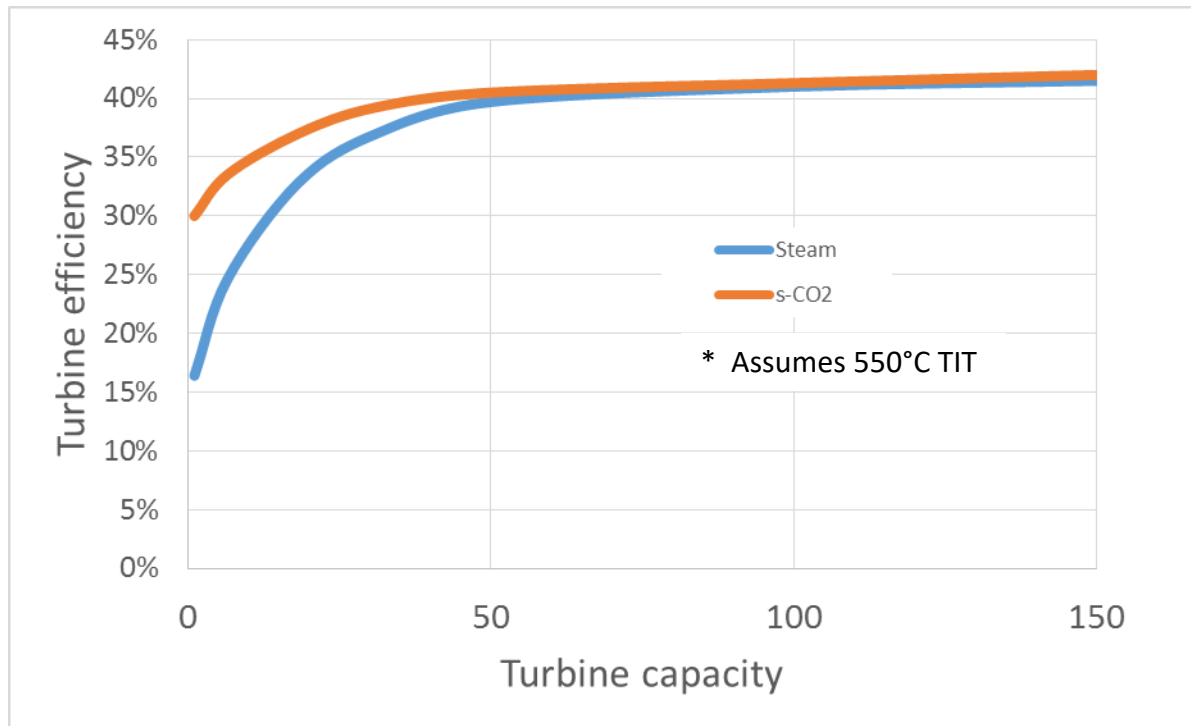
Figure 24 Renewable Energy Zone candidates



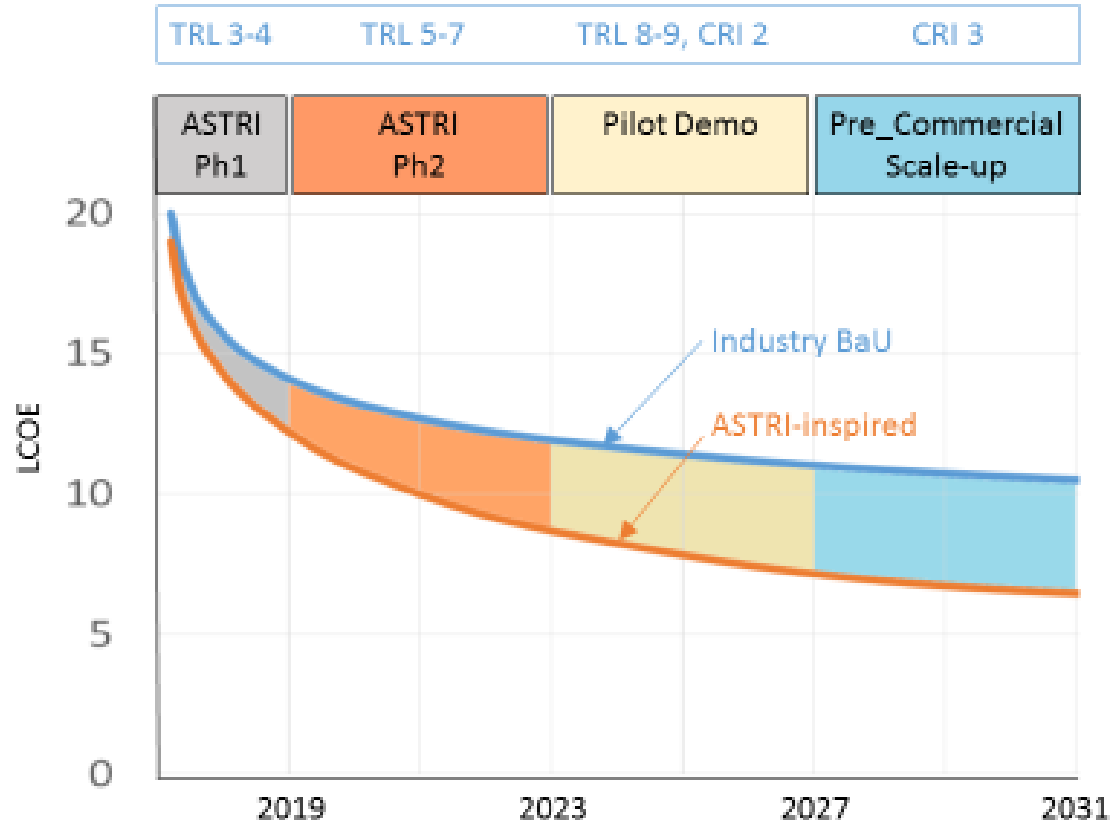
Renewable Energy Zones

- Optimisation of supporting transmission network and distribution to load centres
- Optimal development of investment needs for generation, transmission, system strength, and storage across multiple connecting parties.
- Realising benefits of scale for capital investment and, in particular, efficiently sizing any network development required

The impact of turbine capacity on efficiency at today's sub-critical steam temperatures



ASTRI's CSP Path to Market



Notes:

- Typical industry learning rate yields cost reductions without disruptive technology advances
- ASTRI's disruptive technology advances "add to" the industry learning rate
- The margin between the curves widens as ASTRI technology is "de-risked" and probability of technical success improves

Thank you

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