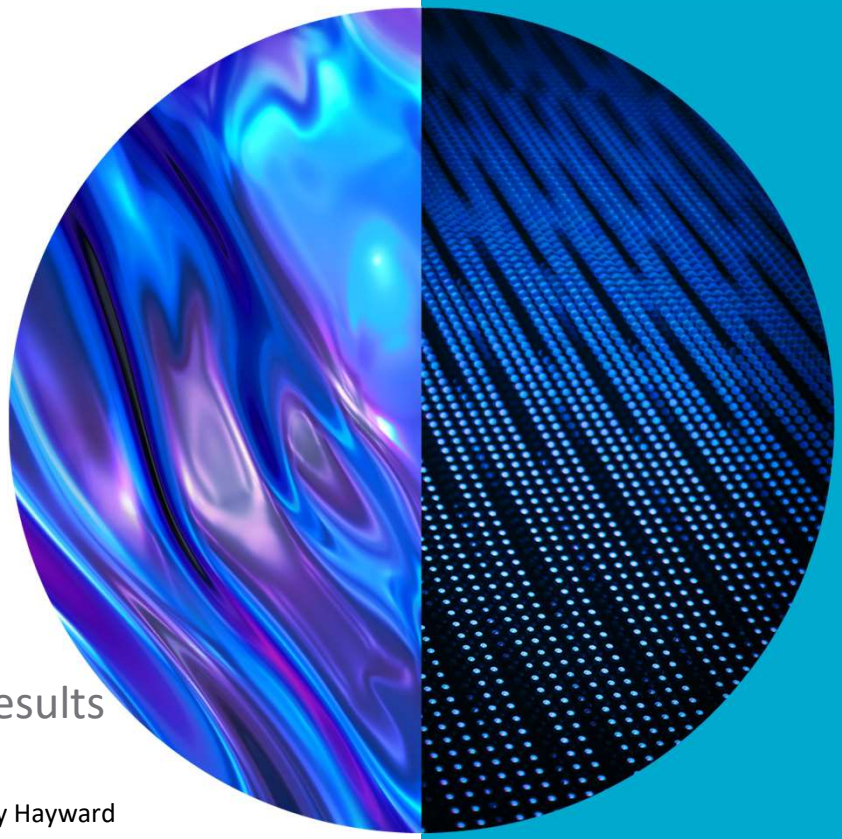


GenCost 2019-20

Preliminary results Q&A

Paul Graham and Jenny Hayward

31 January 2019

Australia's National Science Agency

Webinar process

- Presentation: 25 minutes
  - Overview of GenCost project and preliminary results

- Question and answer session: 35 minutes
  - Use the chat box function through the Webex interface to post questions
  - You can begin posting as we go through the presentation

GenCost project

Goal: Provide a consistent set of electricity generation cost and performance data projections.

End-users:

- Modellers
- Non-modellers
  - Indicator data to check intuitive logic of model inputs
  - Comparison data for general purposes

GenCost project

Approach:

- Updated annually through collaborative and open process
- Jointly funded by CSIRO and AEMO
- Effort focussed on the most relevant technologies
- Improvements and innovation funded at our discretion but with input from stakeholders and a working group consisting of CSIRO, AEMO, ARENA, AER and DoEE

GenCost project

Approach:

- Establish current costs through an engineering consultant (Aurecon in 2019-20)
- Apply a model called GALLM which simultaneously solves the future global technology mix and change in capital cost of technologies
- We'll provide more detail on this if it comes up in questions

Lessons learnt 2018

- Global climate scenarios alone are not sufficient to produce the expected diversity of technology cost outcomes
  - We asked stakeholders in August to help us design new scenarios exploring other drivers of technological change

- Many other smaller issues. E.g.
  - reduction of gas plant sizes
  - inclusion of more storage sizes
  - inclusion of offshore wind
  - disaggregation of SMR from nuclear category

GenCost project

Methodological changes

Implement new method for estimating balancing costs of renewables in LCOE calculations

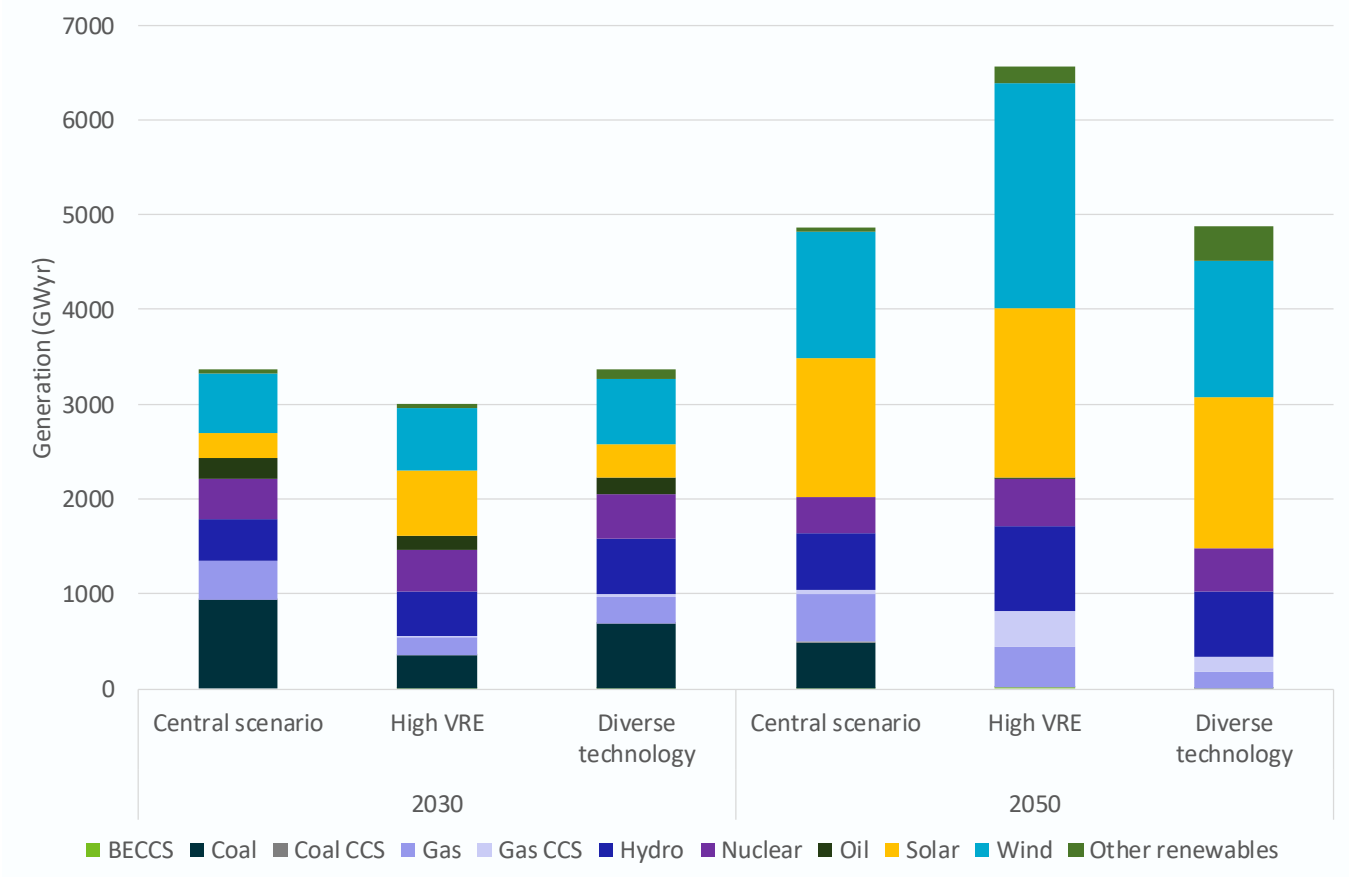
- Scheduled but progress is delayed
- When available, results will be reviewed by working group and other peers
- Published separately from 2019-20 GenCost report

- Development of an *easily updatable* cost estimate for selected demand management technology(ies)
  - No delivery schedule determined

Scenarios

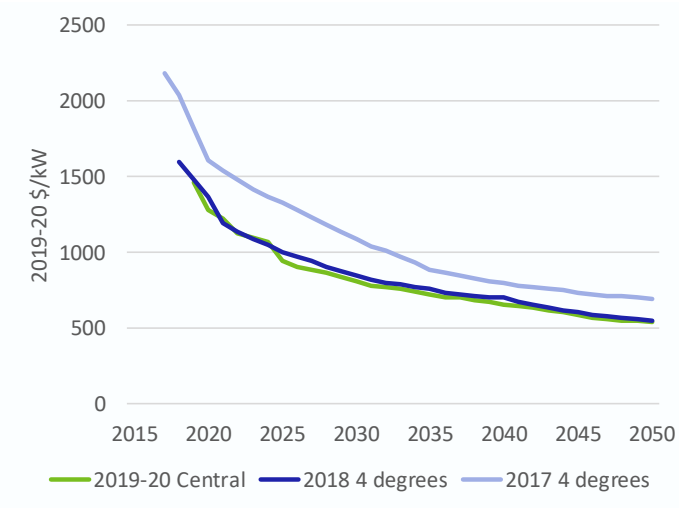
Key drivers	High VRE	Diverse technology	Central
CO2 pricing / climate policy	High (to encourage electrification) Consistent with 2 degrees world	High (to support non-VRE technology) Consistent with 2 degrees world	Moderate Consistent with 4 degrees world
RE targets, forced builds / accel. retirement	High (reflecting confidence in VRE)	RE policies go to no more than 50%	Current RE policies
Demand /electrification	High	Moderate	Moderate
Learning rates	Higher for longer in solar and batteries	Normal maturity path	Higher for longer in solar and batteries
Renewable resource & other renewable constraints	Unconstrained	More constrained than existing assumptions	Existing constraint assumptions
Constraints on stability and reliability of VRE	New low cost solutions	Conventional solutions but not needed	Conventional solutions
Hydrogen fuel price	High: Not needed, unconstrained domestic renewables	Low	Moderate
Decentralisation	Less constrained rooftop solar PV	Existing rooftop solar PV constraints	Existing rooftop solar PV constraints

Projected global technology mix

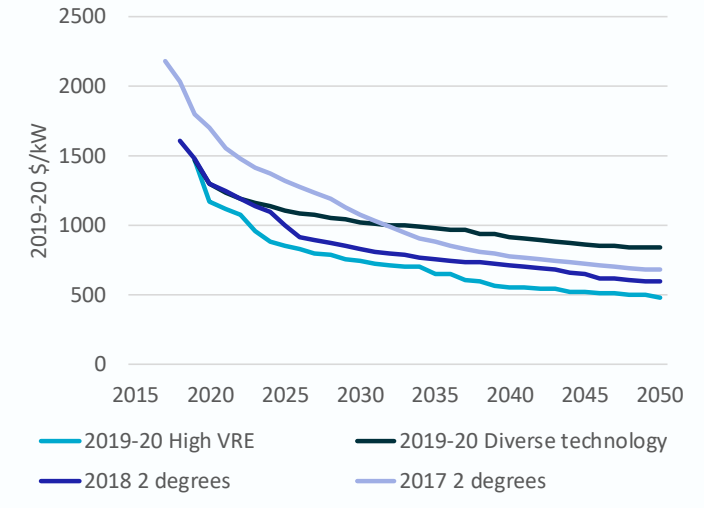


Capital cost: Large scale solar PV

4 degrees

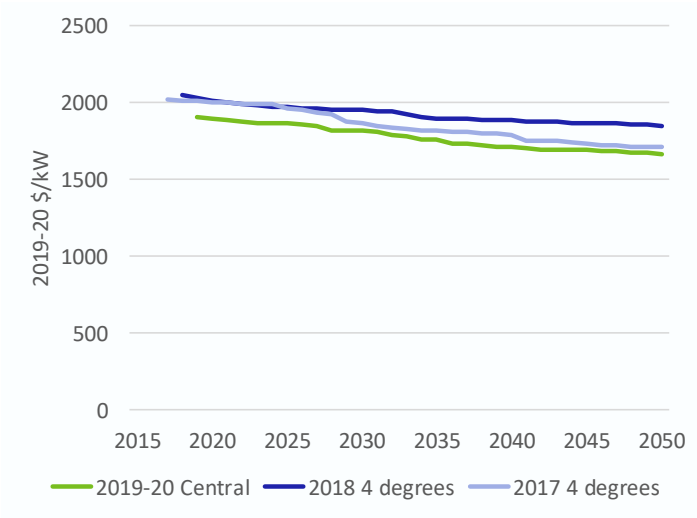


2 degrees

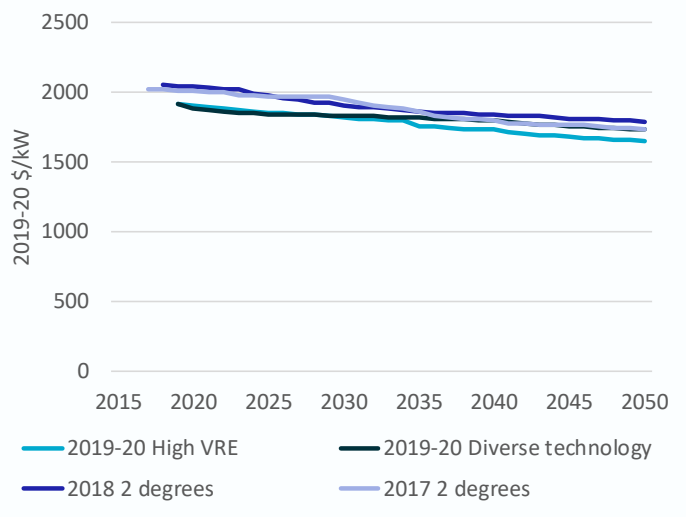


Capital cost: Onshore wind

4 degrees

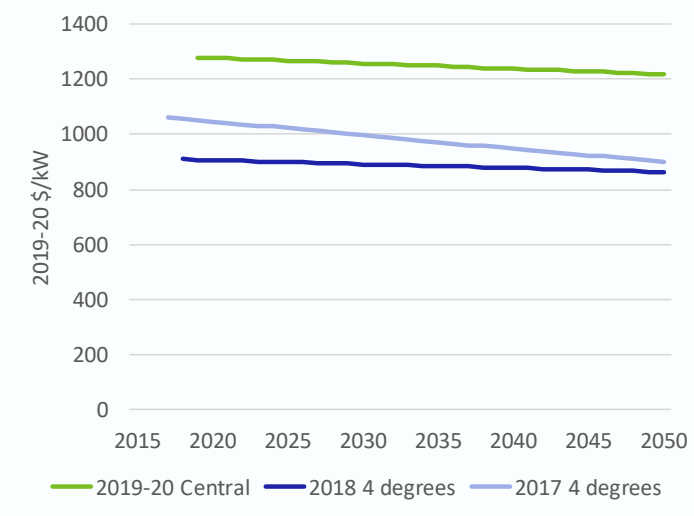


2 degrees

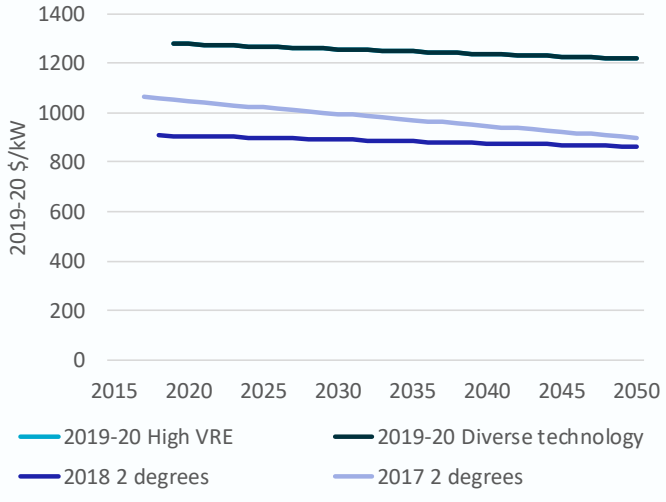


Capital cost: Open cycle gas

4 degrees

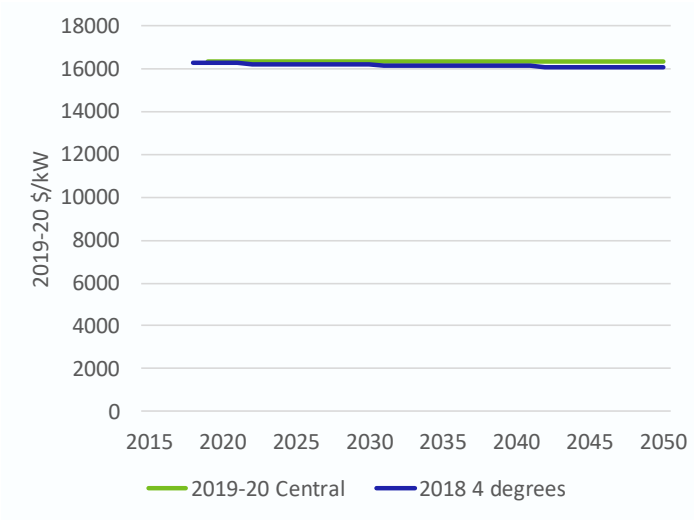


2 degrees

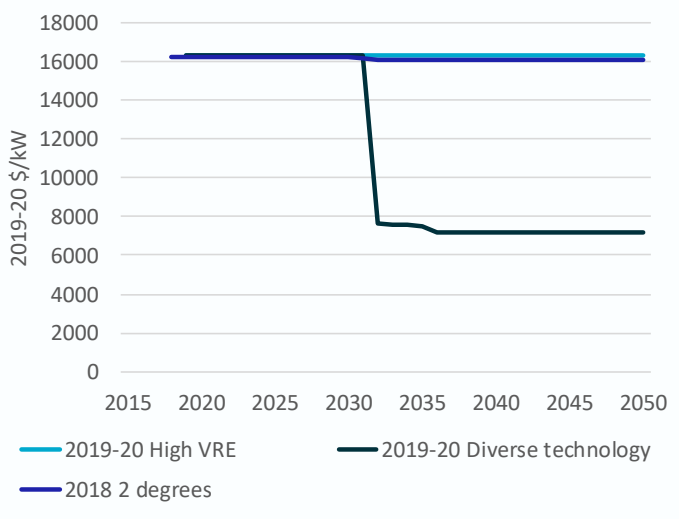


Capital cost: SMR

4 degrees

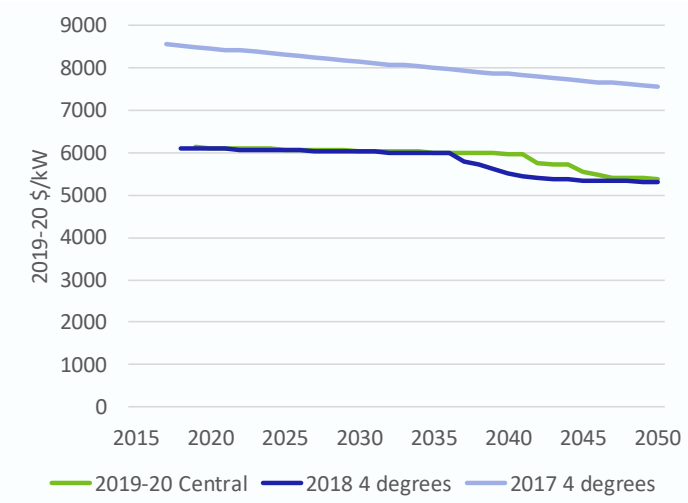


2 degrees

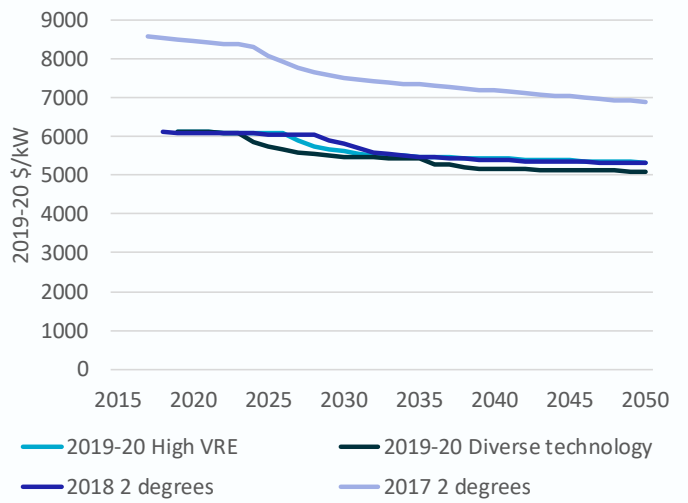


Capital cost: Black coal CCS

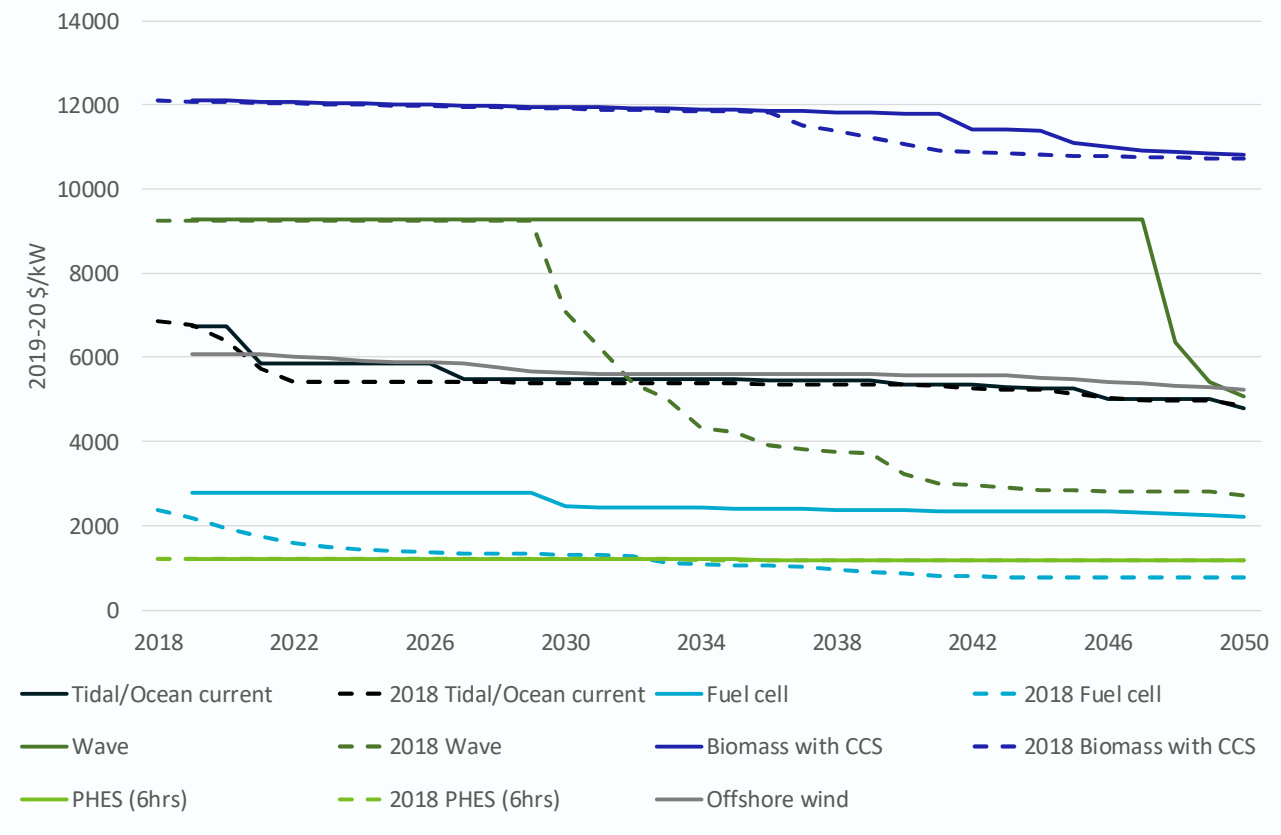
4 degrees



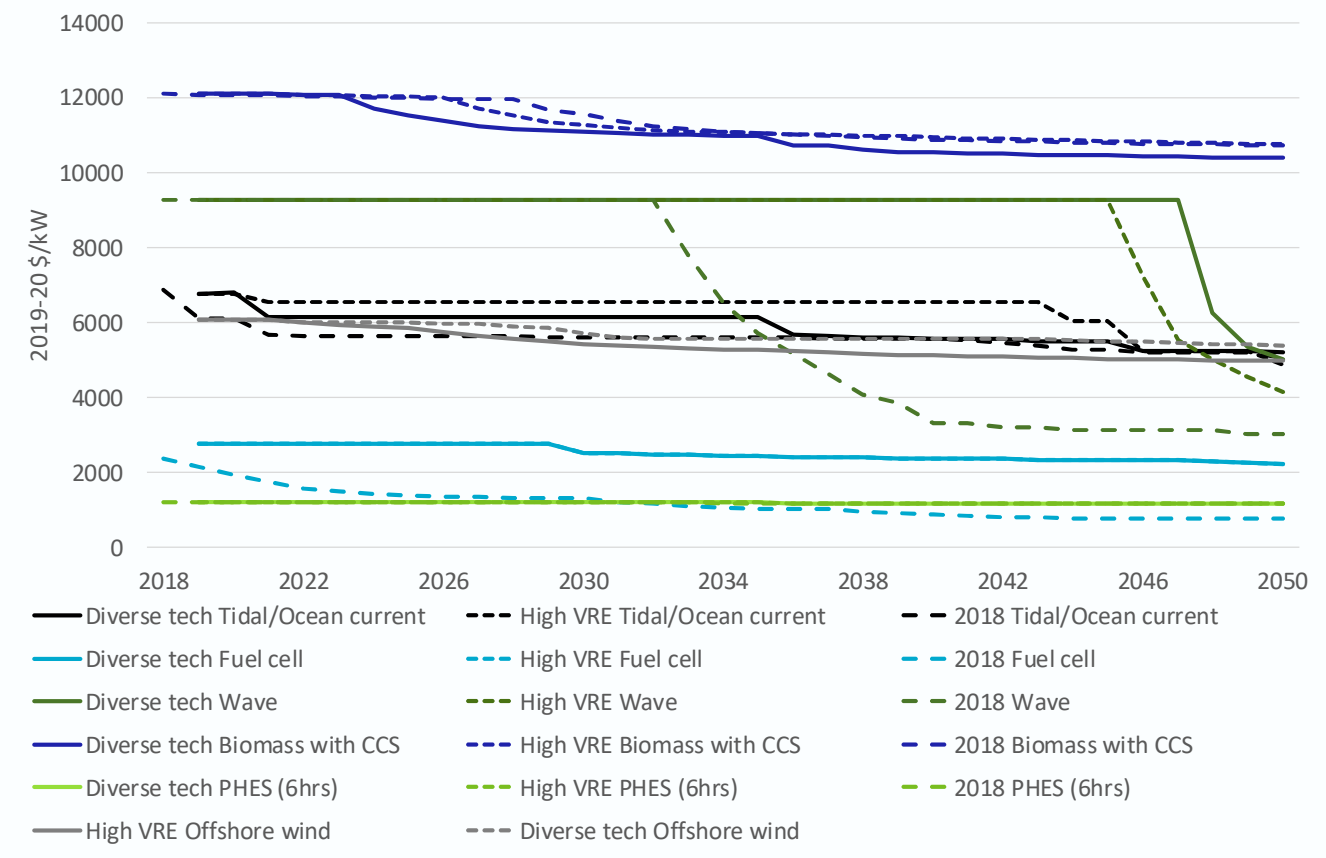
2 degrees



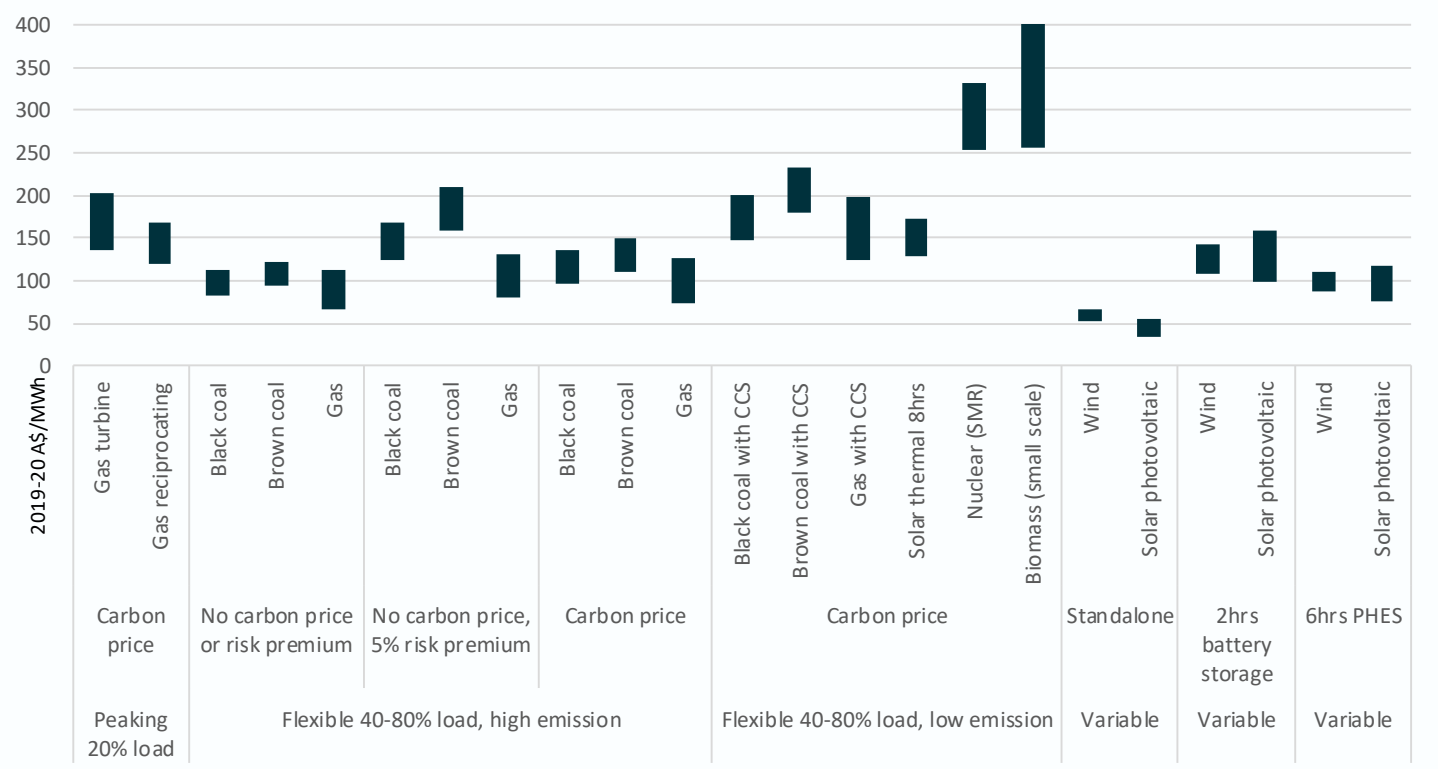
Capital cost: Developing tech.s 4 degrees



Capital cost: Developing tech.s 2 degrees



LCOE: 2020


400
350
300
250
200
150
100
50
0
2019-20 A$/MWh
Gas turbine
Gas reciprocating
Black coal
Brown coal
Gas
Black coal
Brown coal
Gas
Black coal
Brown coal
Gas
Black coal with CCS
Brown coal with CCS
Gas with CCS
Solar thermal 8hrs
Nuclear (SMR)
Biomass (small scale)
Wind
Solar photovoltaic
Wind
Solar photovoltaic
Wind
Solar photovoltaic
Carbon price
No carbon price or risk premium
No carbon price, 5% risk premium
Carbon price
Carbon price
Standalone
2hrs battery storage
6hrs PHES
Peaking 20% load
Flexible 40-80% load, high emission
Flexible 40-80% load, low emission
Variable
Variable
Variable

Question and Answer session

- Please post your questions to the Webex chatbox

Next steps

- The ISP 2020 submission period closes 7th February forecasting.planning@aemo.com.au
- We will review feedback received and incorporate changes in a final report to be published February/March
- To join the GenCost project mailing list: Send message title “Please add” to GenCost@csiro.au
- Also use the GenCost email to ask questions directly