Australia's National Science Agency

CSIRO solar PV and battery projections

Methodology and preliminary results

Paul Graham | 28 September 2022

Projection method and assumptions

Short and long term models

Short term

Solar PV (all): August 2022 to December 2023

Batteries (all): January 2022 to December 2023

Regression analysis

Long term

Batteries (all) and solar PV less than 100kW: 2024 to 2050s

Consumer technology adoption model

Solar PV greater than 100kW and less than 30MW: 2024 to 2050s

Rate of return model

Key developments since 2021

- Supply chain constraints impacting short term prospects
- Recent slowdown has affected the solar PV trend
  - However, higher electricity prices means that the slow down could turn into a fast recovery. A good argument for using regression rather than trying to read the changing market in the short term
- There is limited evidence to support implementing fast battery growth, based on continued historical slow growth. Consequently, long term battery projections have fallen.
- Census 2021 – home ownership has held up stronger than expected on average but weaker for the younger aged. The share of separate dwellings has fallen faster than expected. This slightly reduces the potential for rooftop solar and batteries.

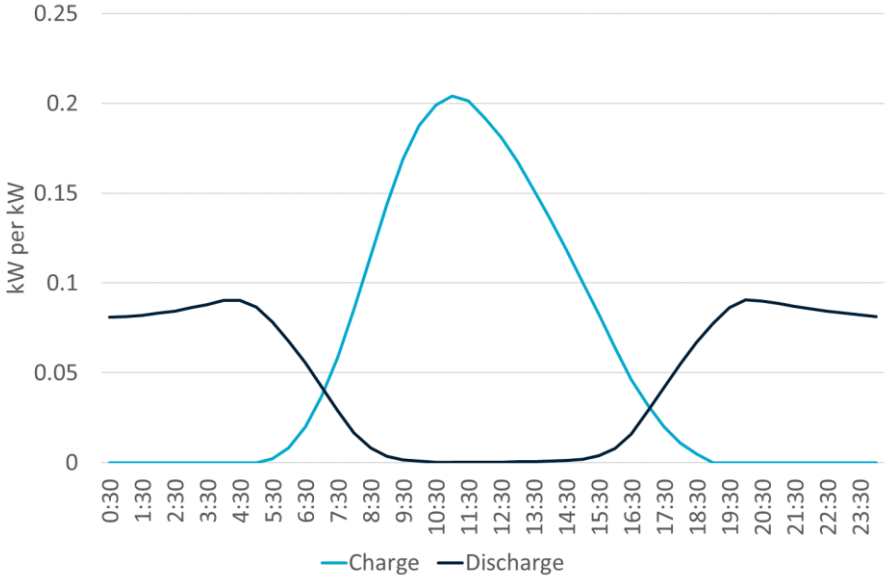
Key assumptions – no significant change

	Maximum solar PV share(+/-25%)*		Battery operation (by 2050)					
	Residential	Business	Residential			Business		
IASR 2023			Solar shift	TOU	VPP	Solar shift	TOU	VPP
Progressive change	39%	18%	76%	2%	23%	14%	56%	30%
Exploring alternatives	44%	22%	44%	4%	53%	6%	24%	70%
Step change	50%	26%	36%	4%	60%	4%	16%	80%
Hydrogen export	61%	35%	32%	4%	64%	3%	12%	85%
ESOO 2021								
Slow Growth	42%	17%	76%	2%	23%	14%	56%	30%
Progressive change	45%	20%	44%	4%	53%	6%	24%	70%
Step change	50%	24%	36%	4%	60%	4%	16%	80%
Hydrogen superpower	61%	34%	32%	4%	64%	3%	12%	85%

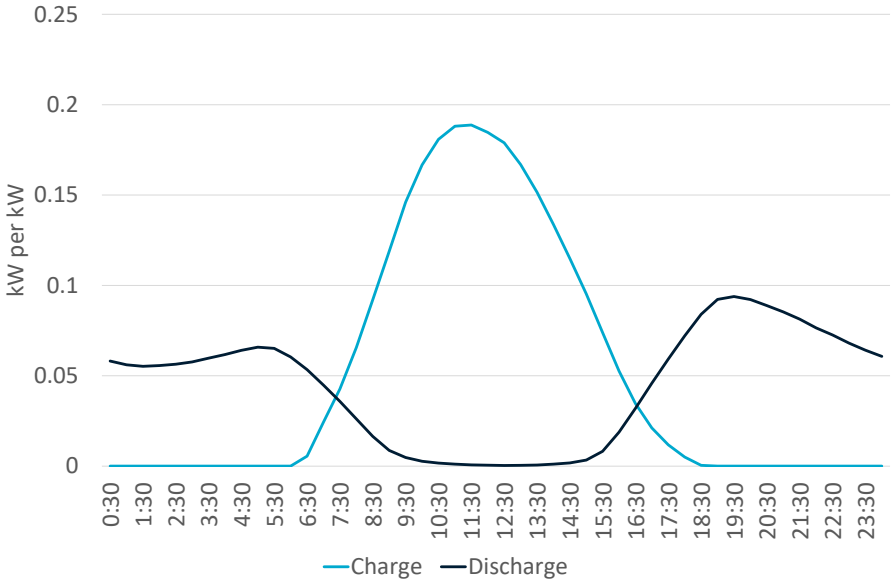
*Average saturation point of the rooftop solar adoption curve logistic function which is allowed to vary by +/-25% depending on demographic factors in each postcode region

Residential battery solar shift profile (flat tariff, QLD)

Summer average

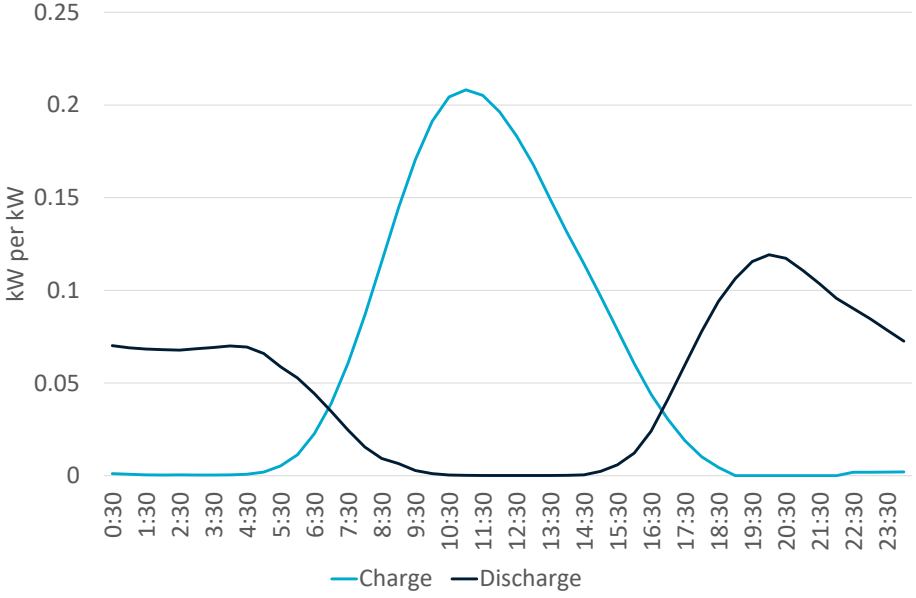


Winter average

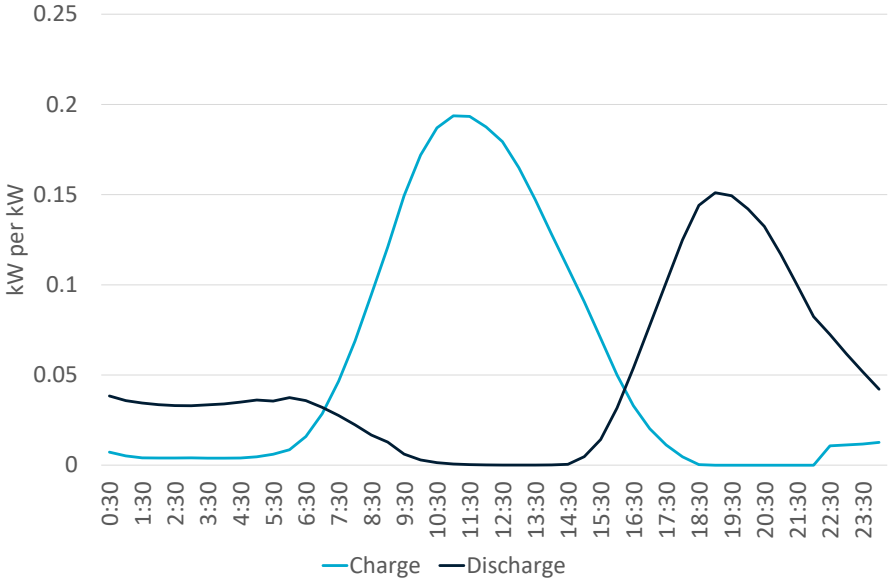


Residential battery TOU tariff profile (QLD)

Summer average

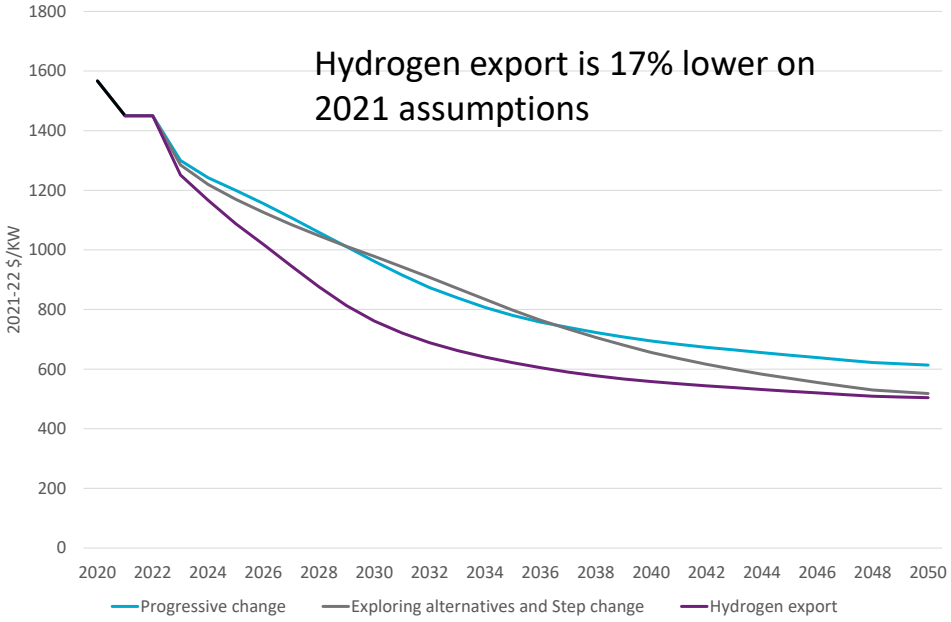


Winter average

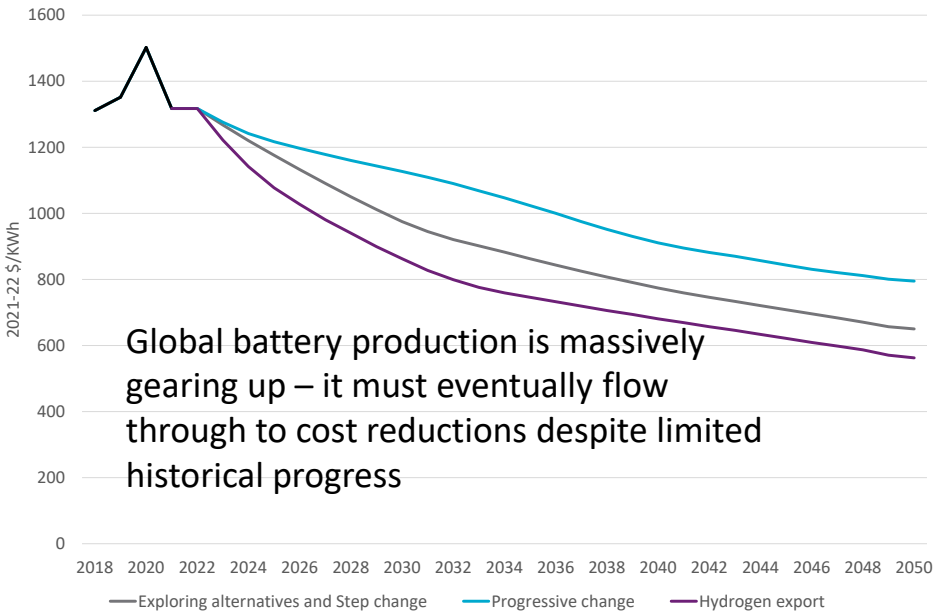


Technology cost assumptions

Rooftop solar PV



Small-scale batteries

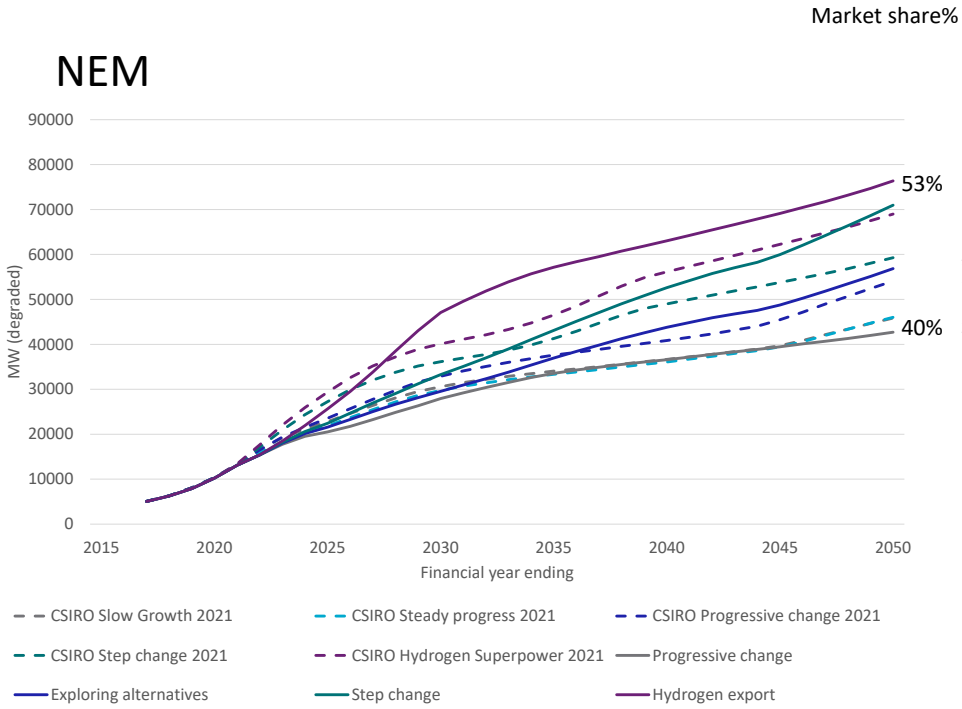


Source: GenCost 2021-22. Flat real costs in 2023 mean a nominal increase is assumed (inflation was 6.1% in 2021-22). Actuals in black.

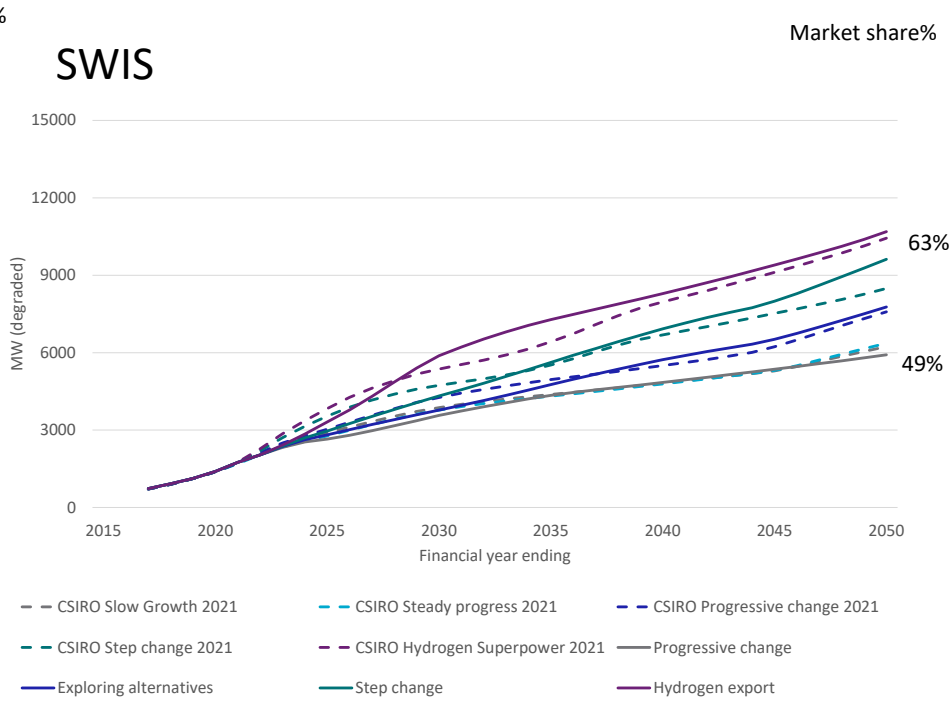
Results

Solar PV capacity: capacity projections

NEM

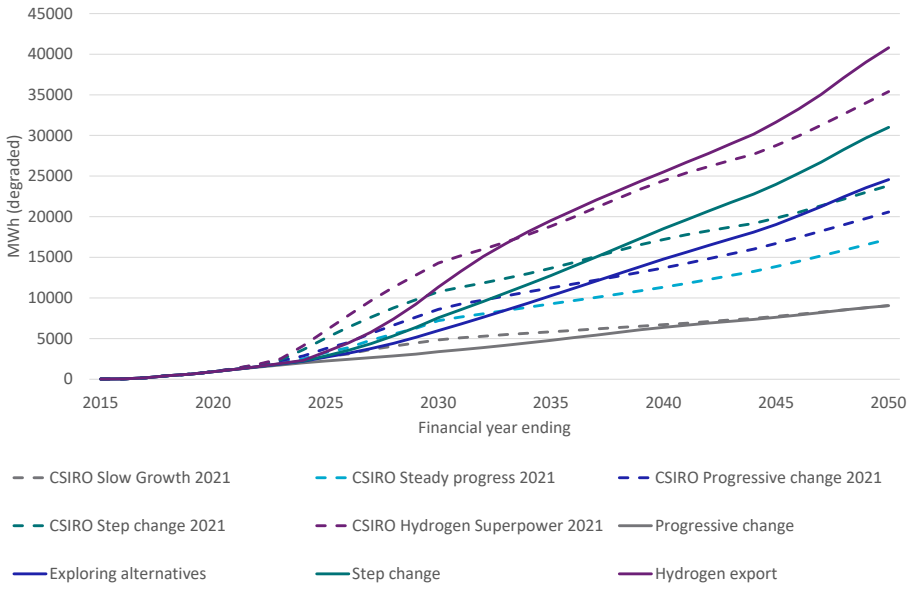


SWIS

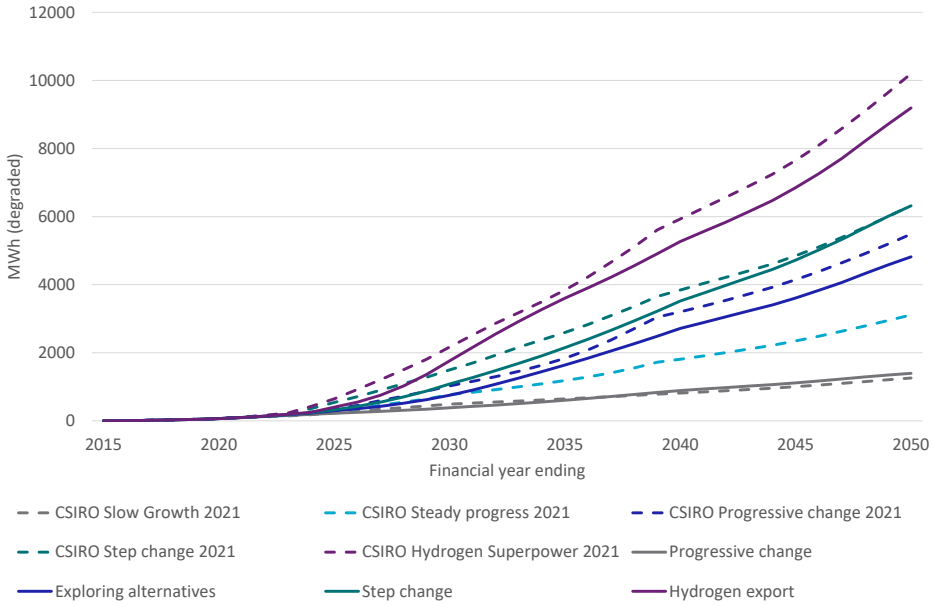


Battery capacity: capacity projections

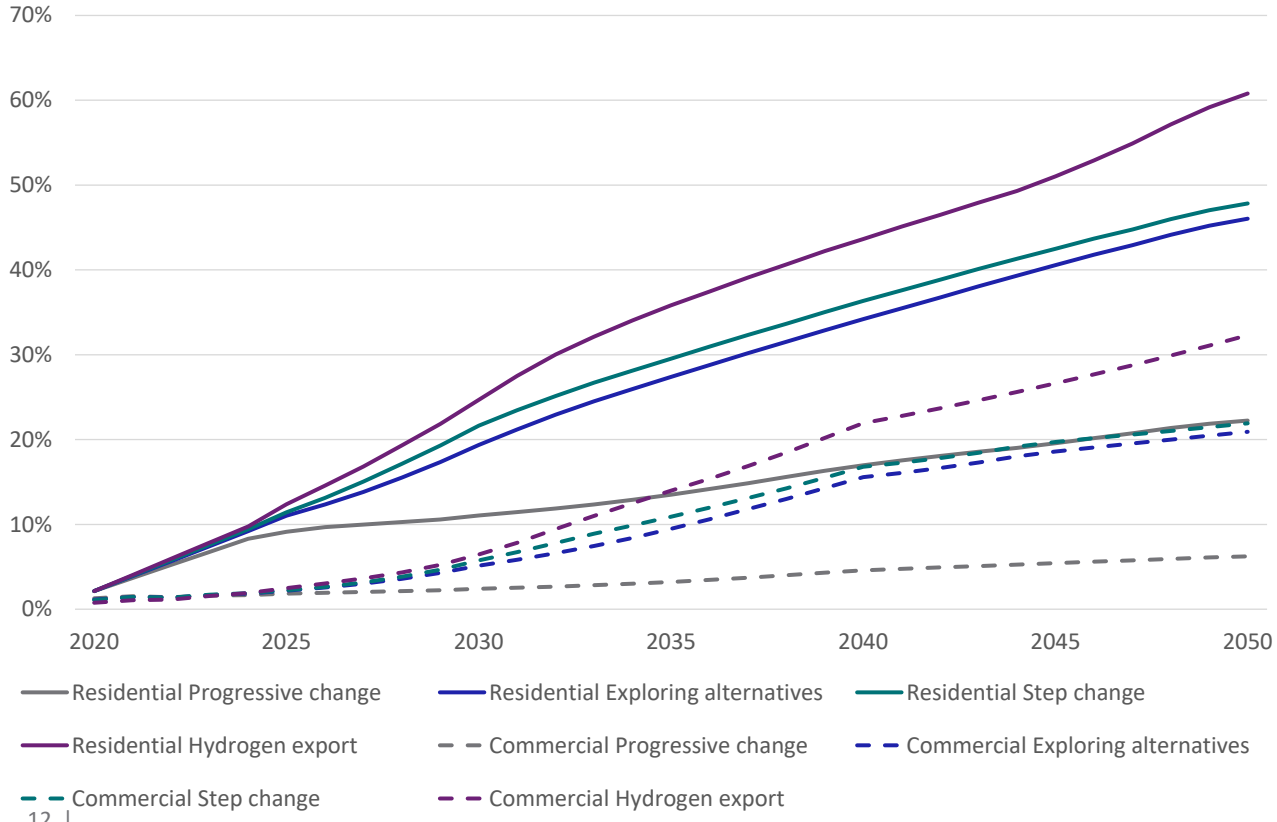
NEM



SWIS



National share of PVs with battery installed, by customer type



Projected stationary battery ownership is a maximum of 60% PV owners or 32% of households.

This is not expected to crowd out use of vehicle batteries by other households.

Thank you

Energy
Paul Graham
Chief Economist Energy

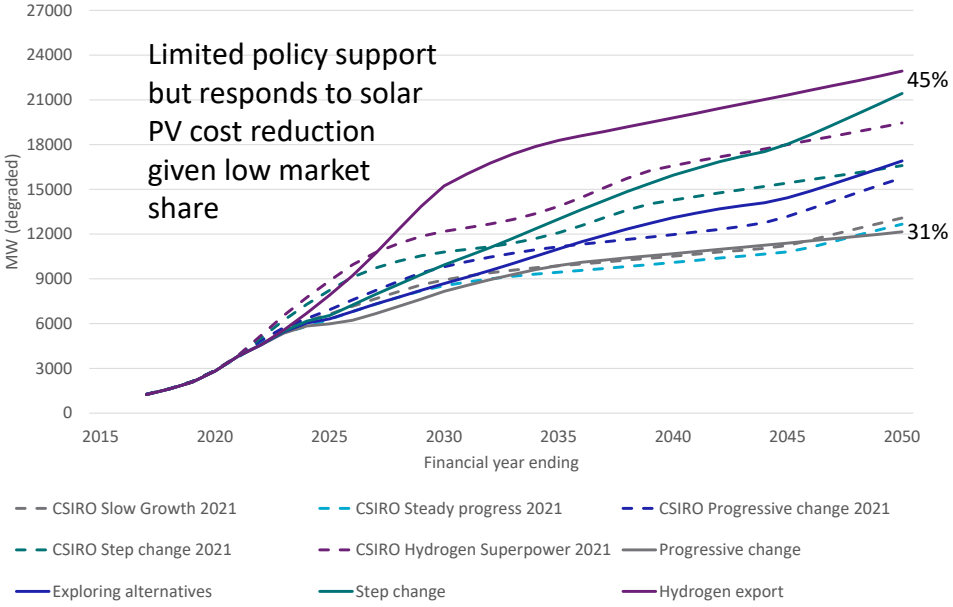
+61 2 4960 6061
paul.graham@csiro.au

State results appendix

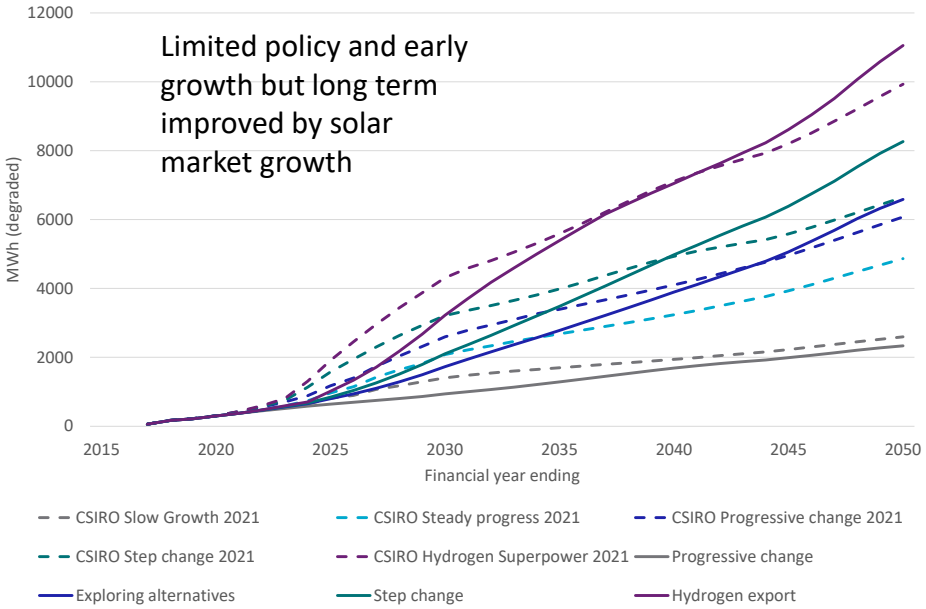
NSW

Market share%

Solar PV capacity



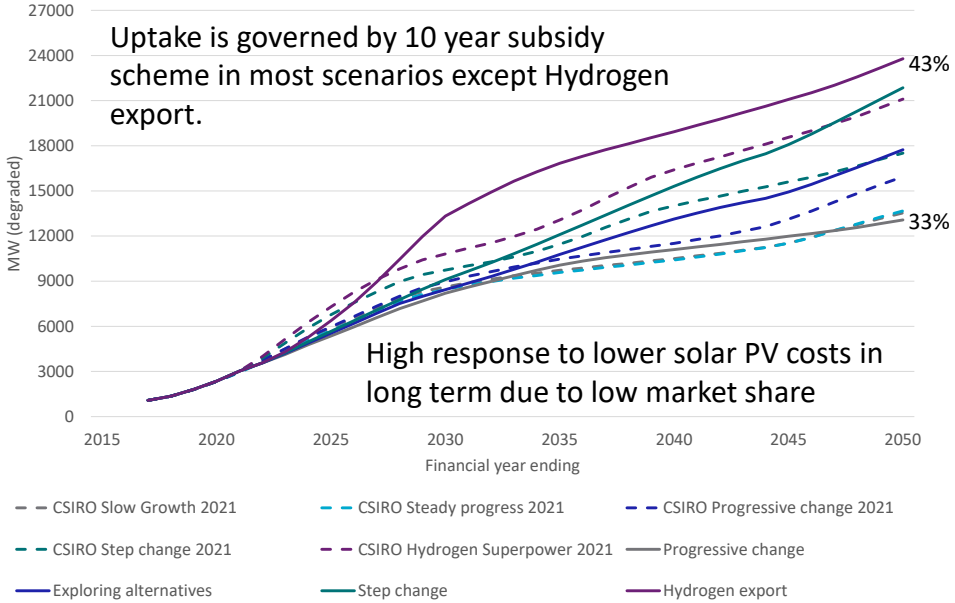
Battery capacity



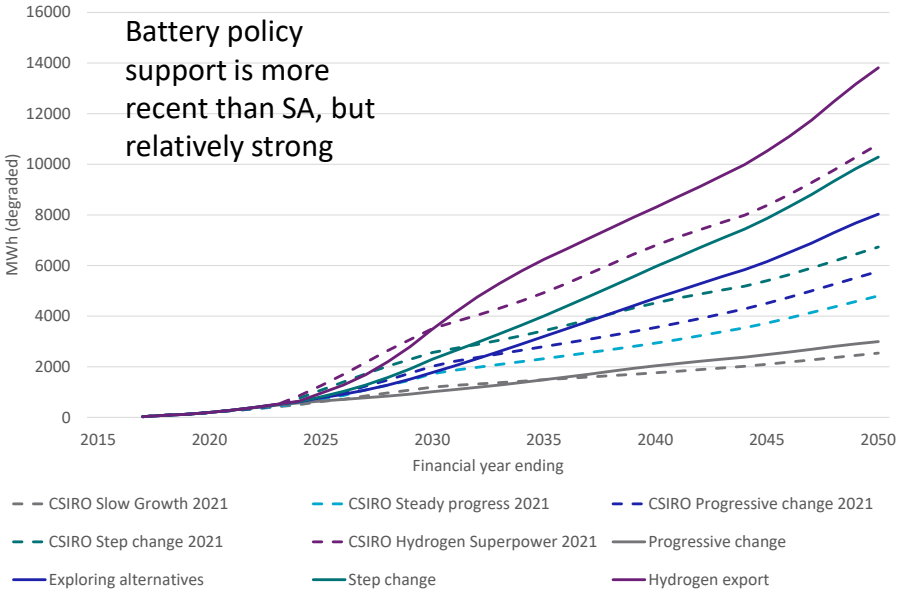
VIC

Market share%

Solar PV capacity



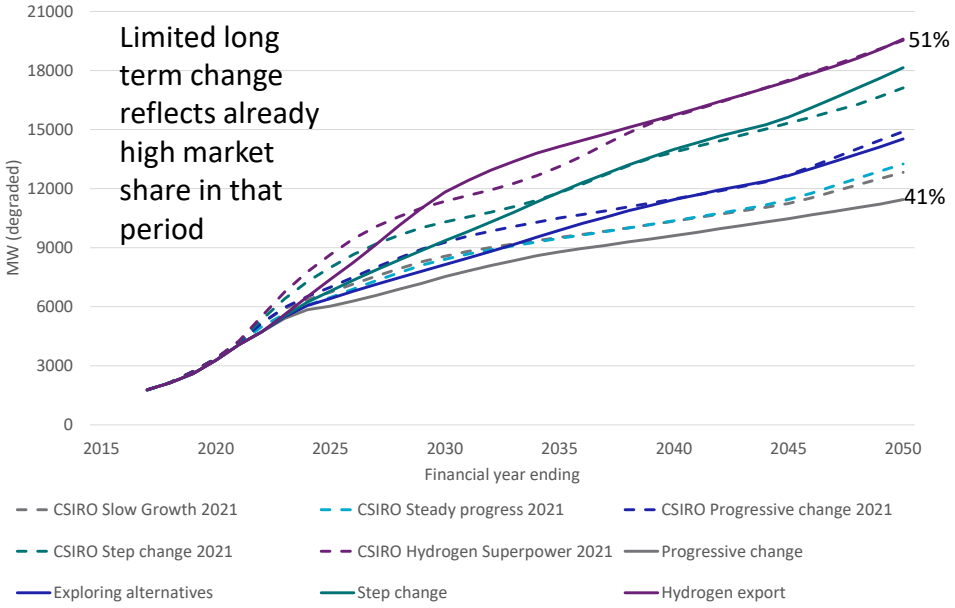
Battery capacity



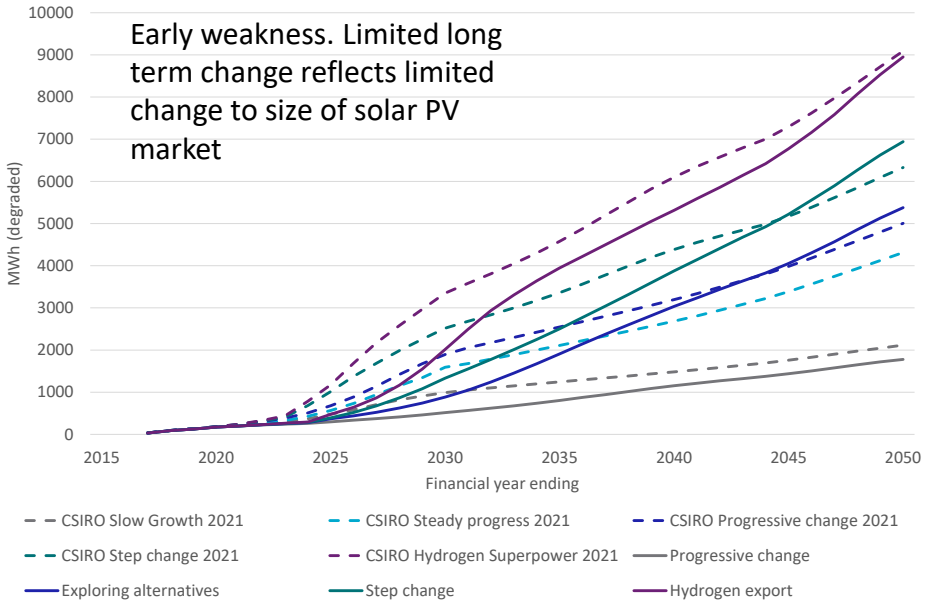
QLD

Market share%

Solar PV capacity



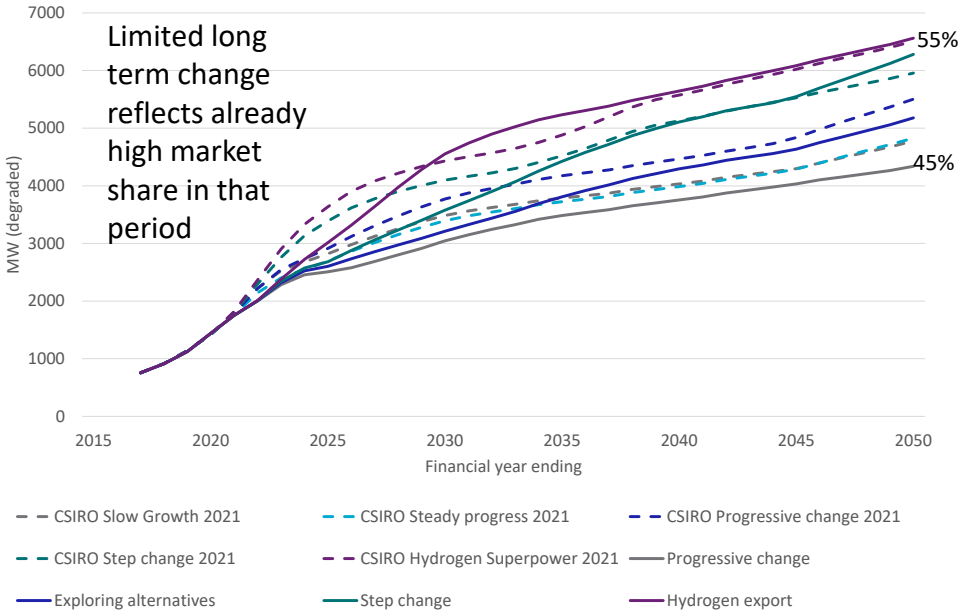
Battery capacity



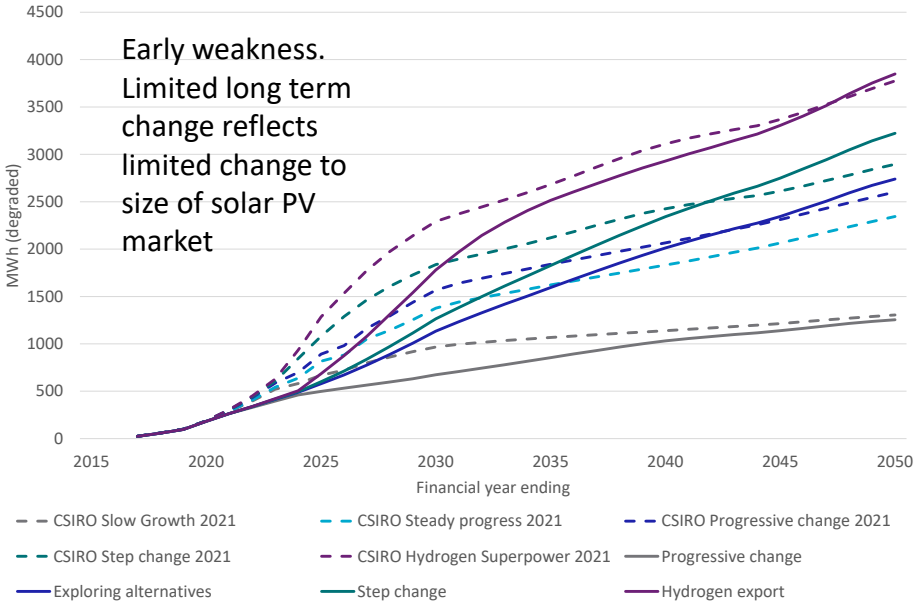
SA

Market share%

Solar PV capacity



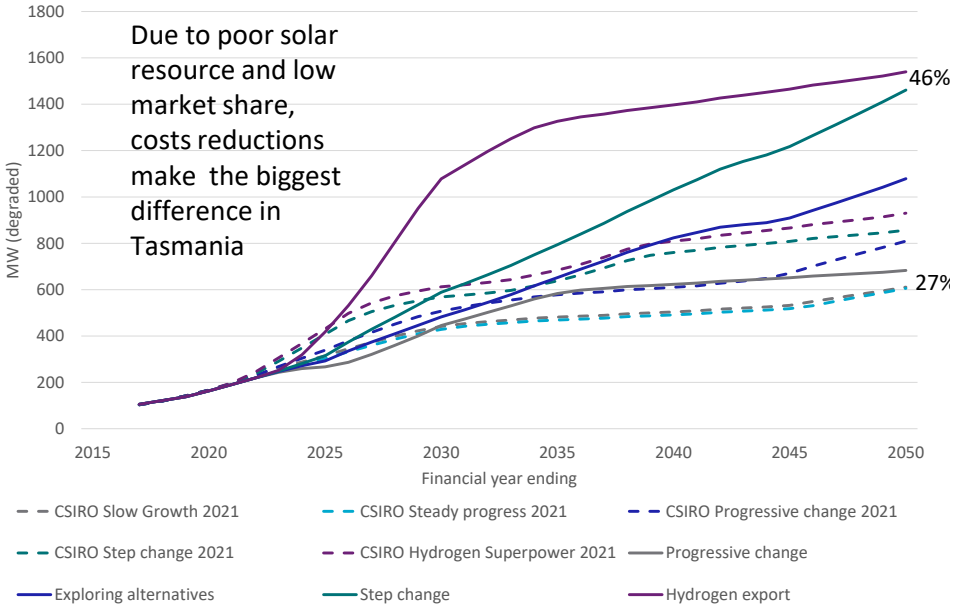
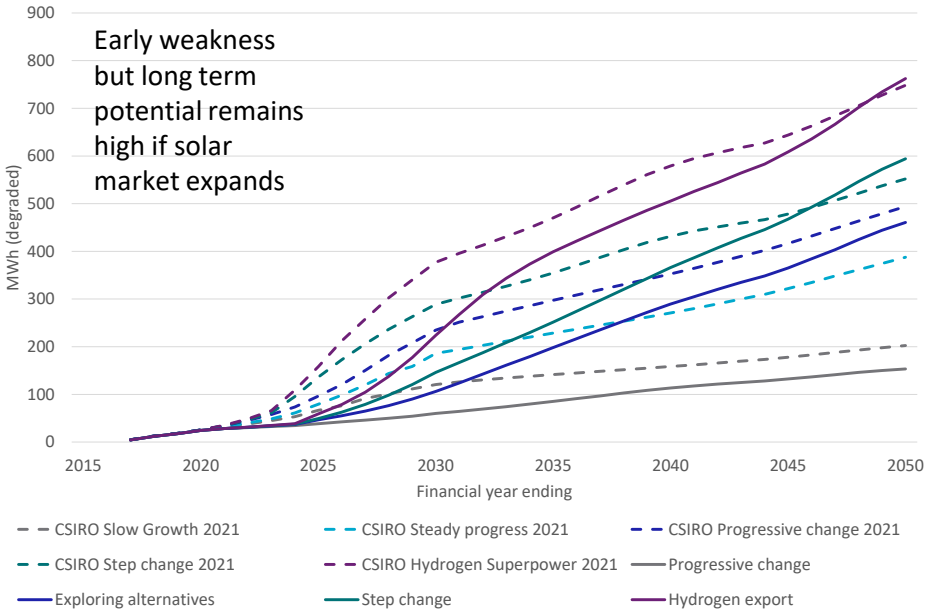
Battery capacity



TAS

Market share%

Solar PV capacity



Battery capacity