2020 WEM Electricity Statement of Opportunities (ESOO) Draft Forecasts

Presented by Grace Liu, Senior Analyst, Reserve Capacity (WA), Joachim Tan, WA Forecasting Specialist and Magnus Hindsberger, Forecasting

2020 WEM ESOO Development Updates

Presented by Grace Liu, Senior Analyst, Reserve Capacity (WA)

Agenda

1. Purpose.
2. Expected Unserved Energy Assessment.
3. Delivery Timeline.

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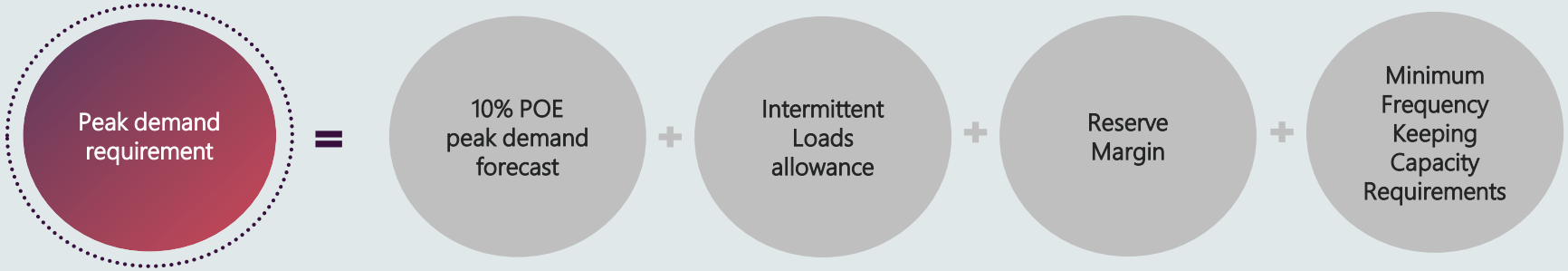
Purpose

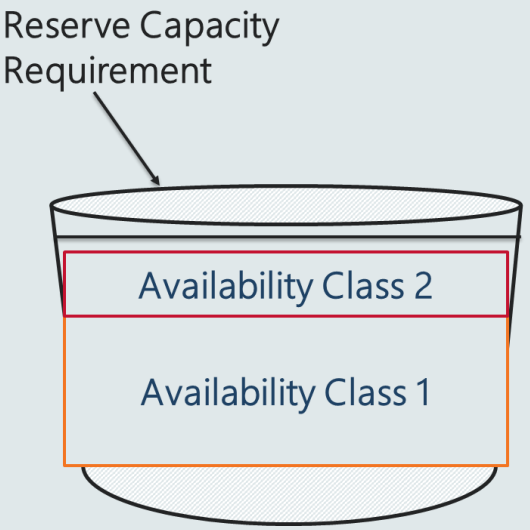
- The 2020 WEM ESOO sets the Reserve Capacity Requirement (RCR) for the 2022-23 Capacity Year based on the Long Term Projected Assessment of System Adequacy (PASA) (2020-21 to 2029-30).
- The Long Term PASA study ensures sufficient capacity is available in the South West interconnected system (SWIS) to meet:
  - Peak demand requirement:



  - Expected unserved energy requirement: annual EUE ≤ 0.002% of annual energy consumption.

Expected unserved energy assessment

AEMO engaged a consultant to assess the expected unserved energy based on inputs below:



- Facility capacity and outage information collected through the information request process.
- Behind the meter photovoltaic (PV) and battery storage, and electric vehicle forecasts.
- Energy consumption forecasts.
- Peak demand forecasts.

The assessment ensures that the RCR is set at a level sufficient to meet the expected unserved energy requirement and determines the minimum capacity required to be provided by generation capacity (Availability Class 1).

Project Timeline

- April 2020
  - Economic and population growth forecasts.
  - Behind the meter photovoltaic (PV) and battery storage, and electric vehicle forecasts.
  - Operational consumption and demand forecasts.
- May 2020:
  - Expected unserved energy assessment.
    - RCR for the 2022-23 Capacity Year.
    - Demand Side Management Reserve Capacity Price for the 2020-21 Capacity Year.
- June 2020:
  - Board approval for publication of the report.
  - Publication of the report by 17 June.
- August 2020:
  - WAECF presentation of the 2020 WEM ESOO key findings.

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2020 Draft WEM Energy and Maximum Demand forecasts

Summary of Draft Forecasts for the upcoming 2020 WEM ESOO

Presented by Joachim Tan and Magnus Hindsberger, Forecasting

Purpose

The purpose of this presentation is to:

- Present the Draft WEM annual electricity consumption and maximum demand forecasts
- Outline the insights and components of the WEM forecasts.

Approach

AEMO applied WEM characteristics to the NEM forecasting methodology to project annual WEM electricity consumption and maximum demand.

AEMO's demand forecasting methodology applies a sectoral consumption approach, with drivers including:

- Future economic growth
- WEM connections
- Baseload, heating and cooling consumption trends
- Energy efficiency (EE)
- Future Prices
- Distributed Energy Resources (DER).
- Large-industrial loads (LIL)
- Small-to-medium enterprises (SME)

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2020 WEM scenarios

2020 WEM ESOO Scenarios

3 scenarios:

- Slow Change — Low demand growth
- Central — Expected demand growth
- Step Change — High demand growth

Note: The scenarios outlined are consistent with WEM Rules 4.5.10(a).

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Scenario specifications

Scenarios	Neutral	Slow Change	Step Change
Economic Growth	Neutral	Weak	Strong
Population Outlook	Neutral	Weak	Strong
Rooftop PV uptake	Neutral	Neutral	Neutral
Battery Storage uptake	Neutral	Neutral	Neutral
Electric Vehicle uptake	Neutral	Weak	Strong
Emissions reduction trajectory	28% 2005-2030 70% 2016-2050	28% 2005-2030 70% 2016-2050	52% 2005-2030 90% 2016-2050
Federal Large-scale Renewable Energy Target (LRET)	Yes	Yes	Yes
Energy Efficiency Improvements	Neutral	Weak	Strong
Variable renewable energy (wind and utility-scale PV) cost reductions	Neutral	Weak	Neutral
Storage (pumped hydro, battery and solar) cost reductions	Neutral	Neutral	Strong

https://www.aemo.com.au/-/media/Files/Electricity/WEM/Planning_and_Forecasting/ESOO/2018/AEMO-WA-Elec-Forecast-Methodology--Issues-Paper-final.pdf

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Forecasting the impacts of Covid-19

Covid-19 is changing the way in which we consume energy by:

- Altering our working environment and daily lives
- Affecting the operability and sustainability of many businesses, particularly small and medium enterprises (SME)
- Yet limited impact (thus far) to large industrial loads (LIL) consumption trends, although increased operational difficulties to maintain production

AEMO has updated the ESOO forecasts for preliminary Covid-19 impacts. These components include:

- Future economic projections
- Energy efficiency projections
- Distributed energy resource projections
- SME projections
- LIL projections

Economic forecast update: Covid-19

- AEMO engaged BIS Oxford Economics to provide the long term economic outlook for Australia. AEMO continues to work closely with BIS Oxford Economics to capture the range of potential impacts of Covid-19.

- While social restriction policies appear to be having a positive impact on 'flattening the curve', the timing and magnitude of the economic impacts associated with Covid-19 are highly uncertain.

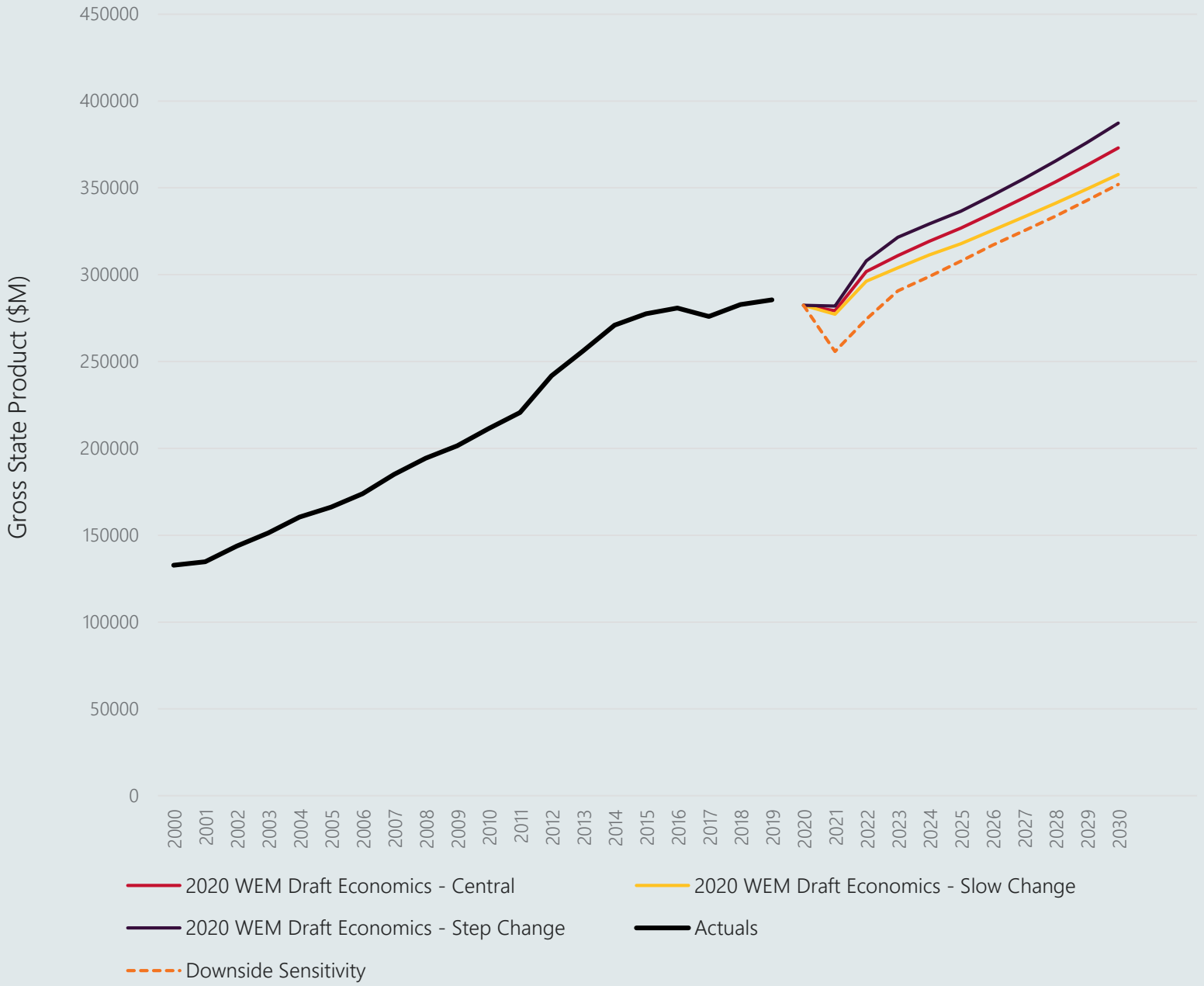
- Key impacted sectors include:
  - Services sector – tourism, education
  - Supply chain disruptions, particularly manufacturing bottlenecks
  - Energy and fuel – particularly LNG and oil markets
  - Equity markets – sharp corrections will influence the ongoing availability of capital to invest in recovery, and may influence fiscal response

- AEMO's forecasts may evolve from Draft to Final as more information becomes available, and we continue to examine the domestic and international effects of social restrictions.

WA Gross State Product Forecasts

Economic forecasts are prepared by BIS Oxford Economics, considering the scale of the Covid-19 pandemic on the WA economy.

A downside sensitivity exists with stronger social restrictions leading to much deeper economic decline. AEMO continues to consider the appropriateness of the near term risks on the longer term forecasts.



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Draft 2020 WEM Annual Consumption Forecasts

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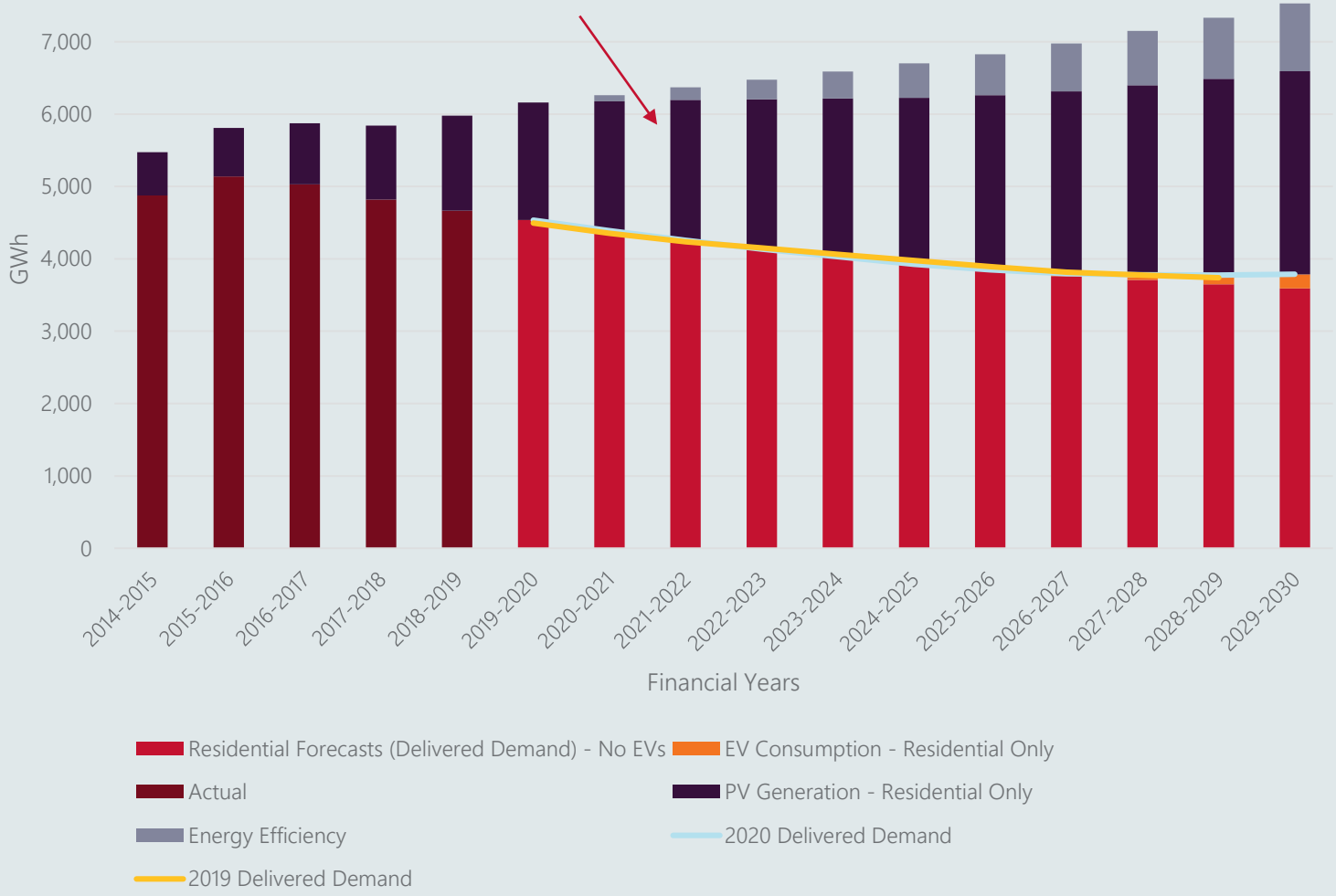
AEMO's Underlying and Delivered Residential Forecast (GWh) – Central

Financial Years

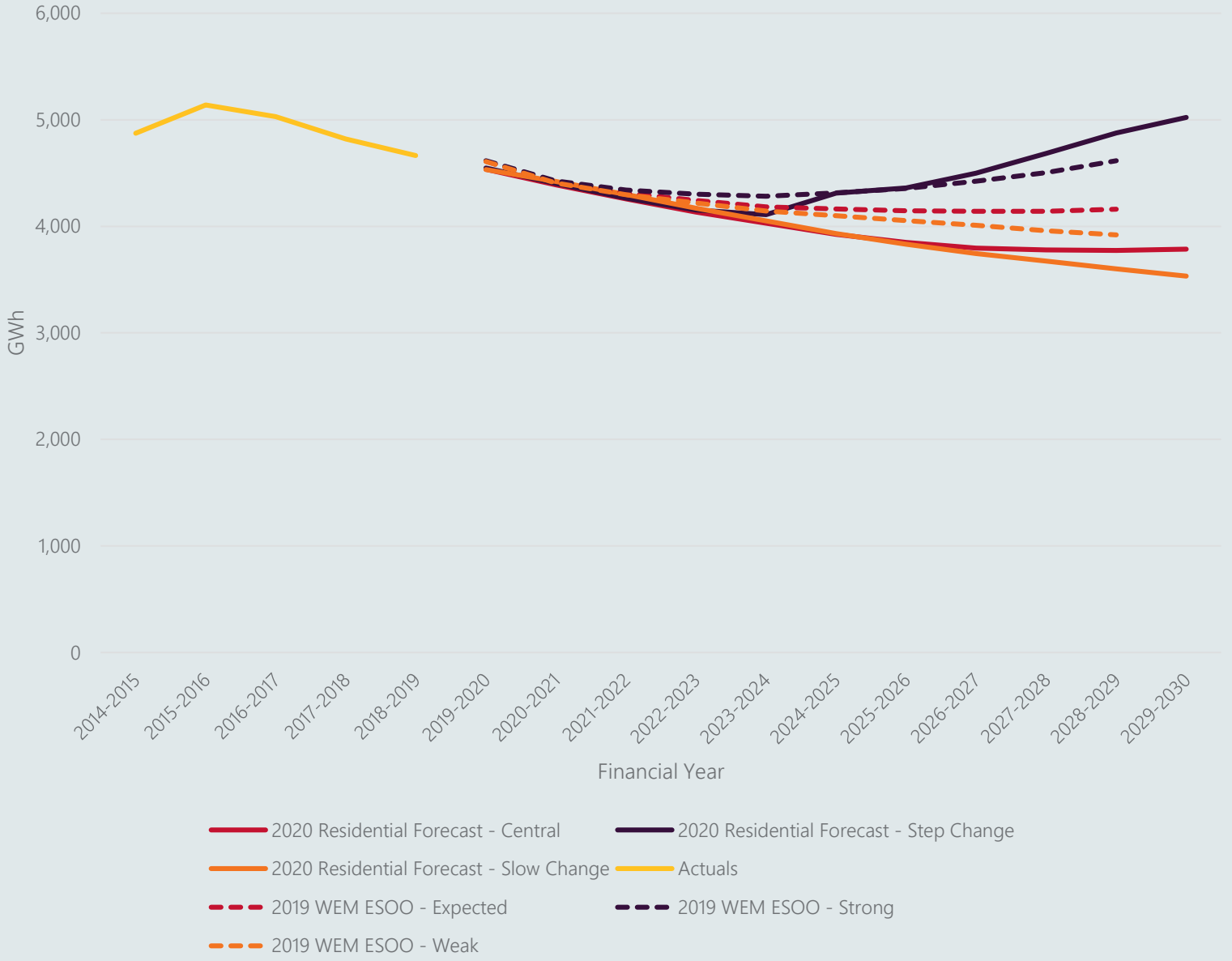
While underlying residential electricity demand (grid and non-grid delivered) continues to grow in the next 10 years due to increases in residential connections, electricity demand delivered by the grid continues to fall, due to continued growth in PV and Energy Efficiency. The emergency of electric vehicles (EVs) is forecast to increase residential consumption in the longer term.

Residential consumption (including EVs) is now expected to fall from approximately 4,536 GWh to 3,787 GWh by the end of the forecast period.



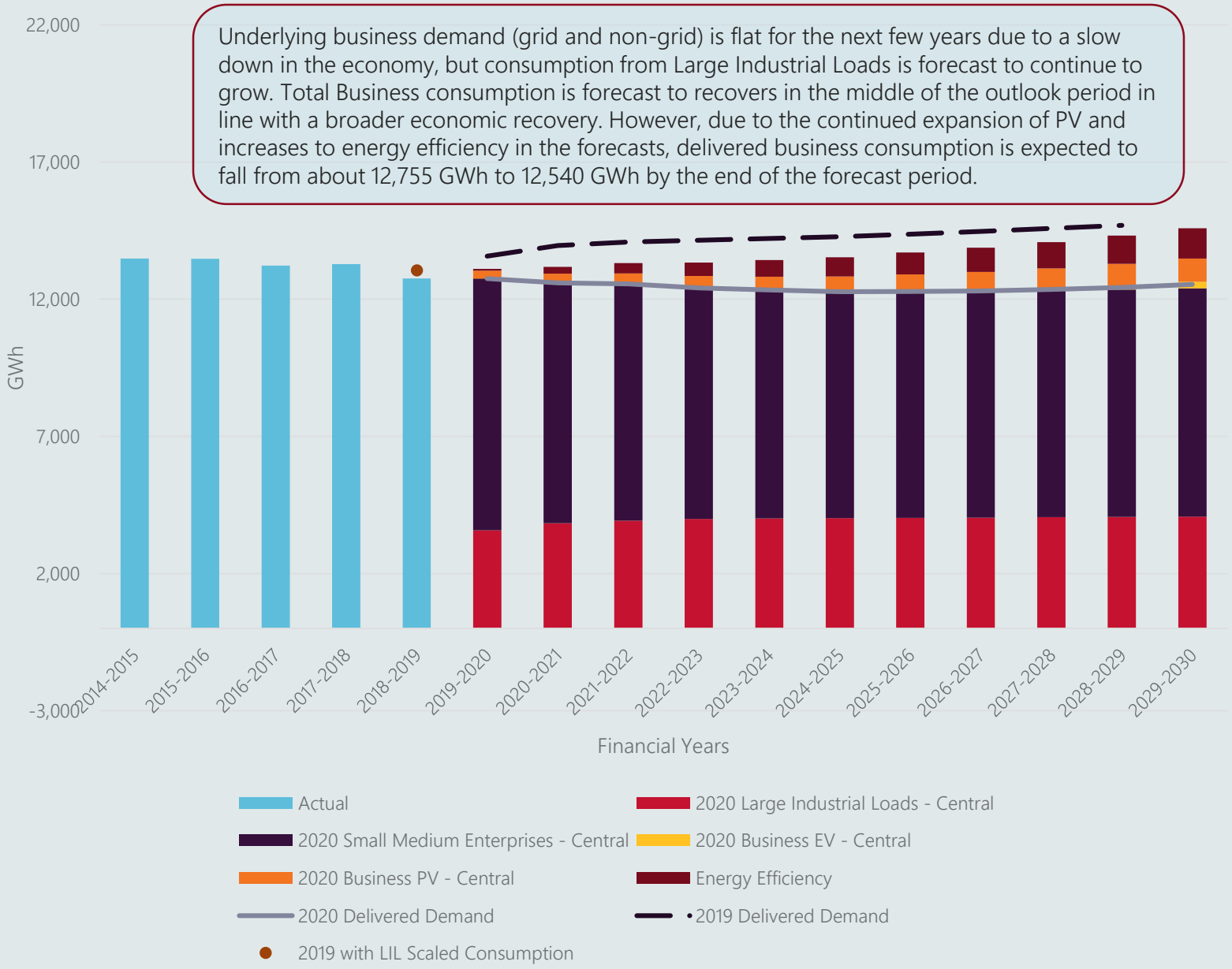
Comparing against 2019 WEM ESOO Residential Forecast – incl. EV – All scenarios

Financial Years



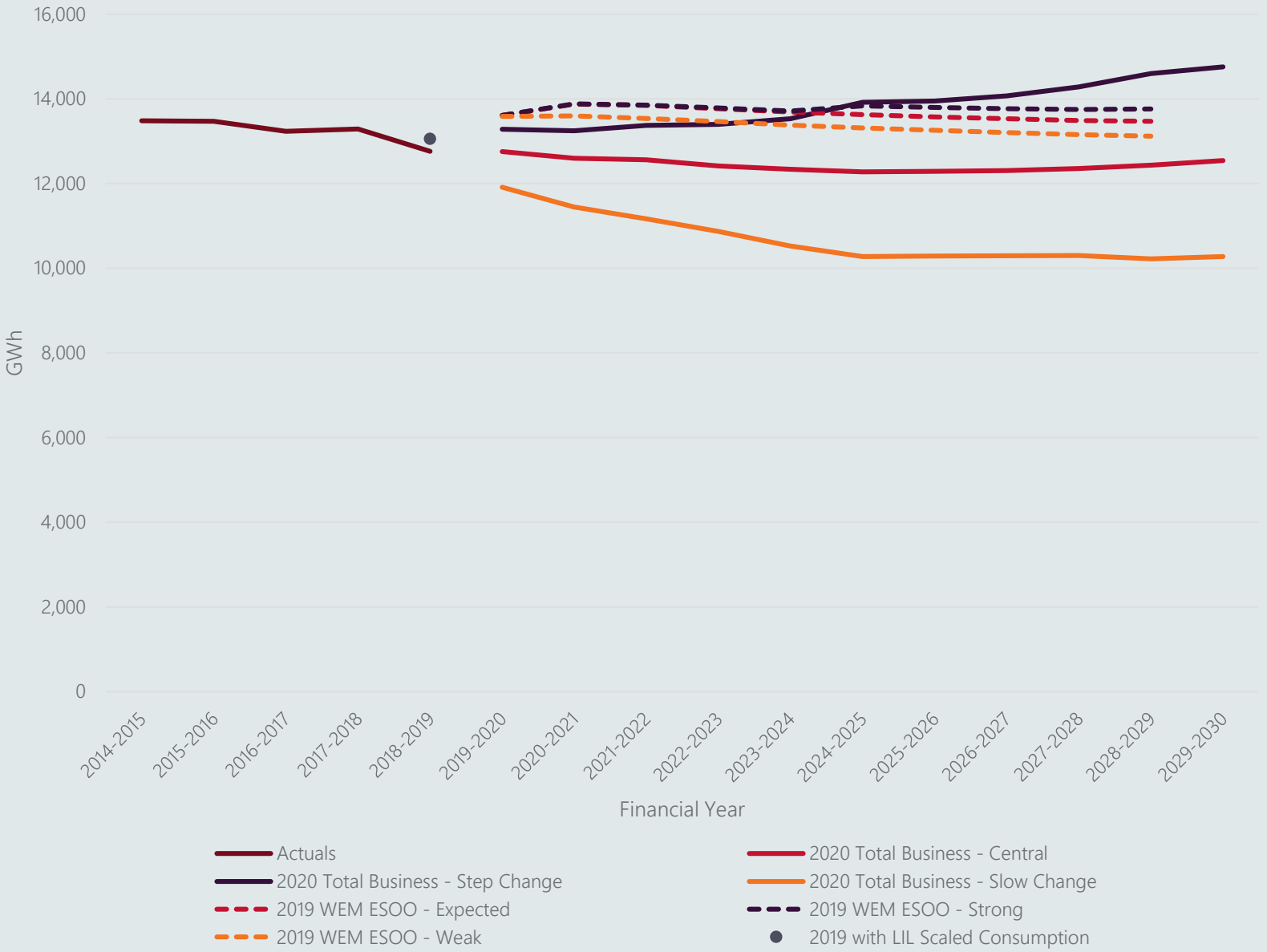
AEMO's Business Forecast – Central

Financial Years



Comparing against 2019 WEM ESOO Business Forecast – incl. EV – All scenarios

Financial Years



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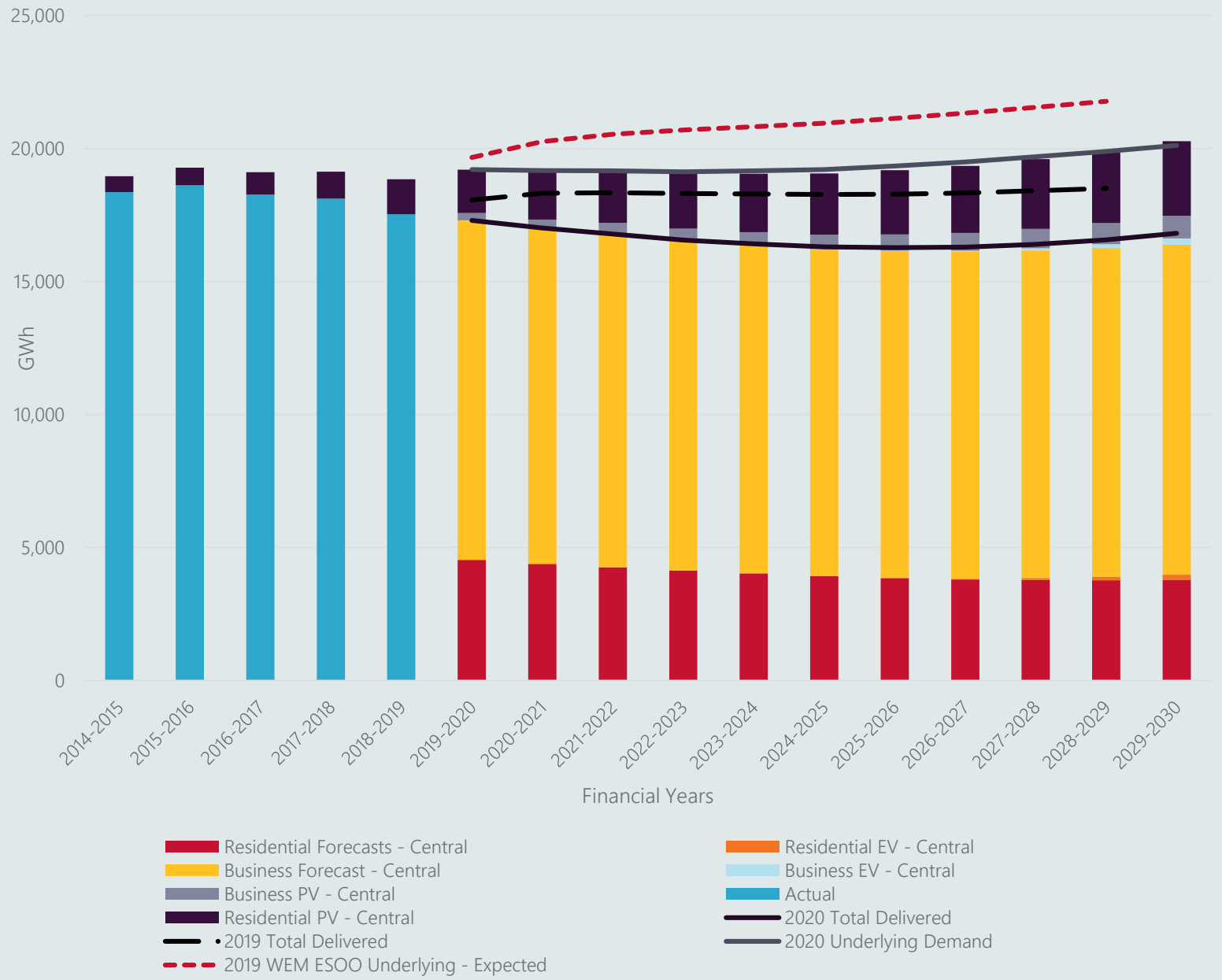
Comparison AEMO's Underlying and Delivered with 2019 ESOO – Central

Financial Years



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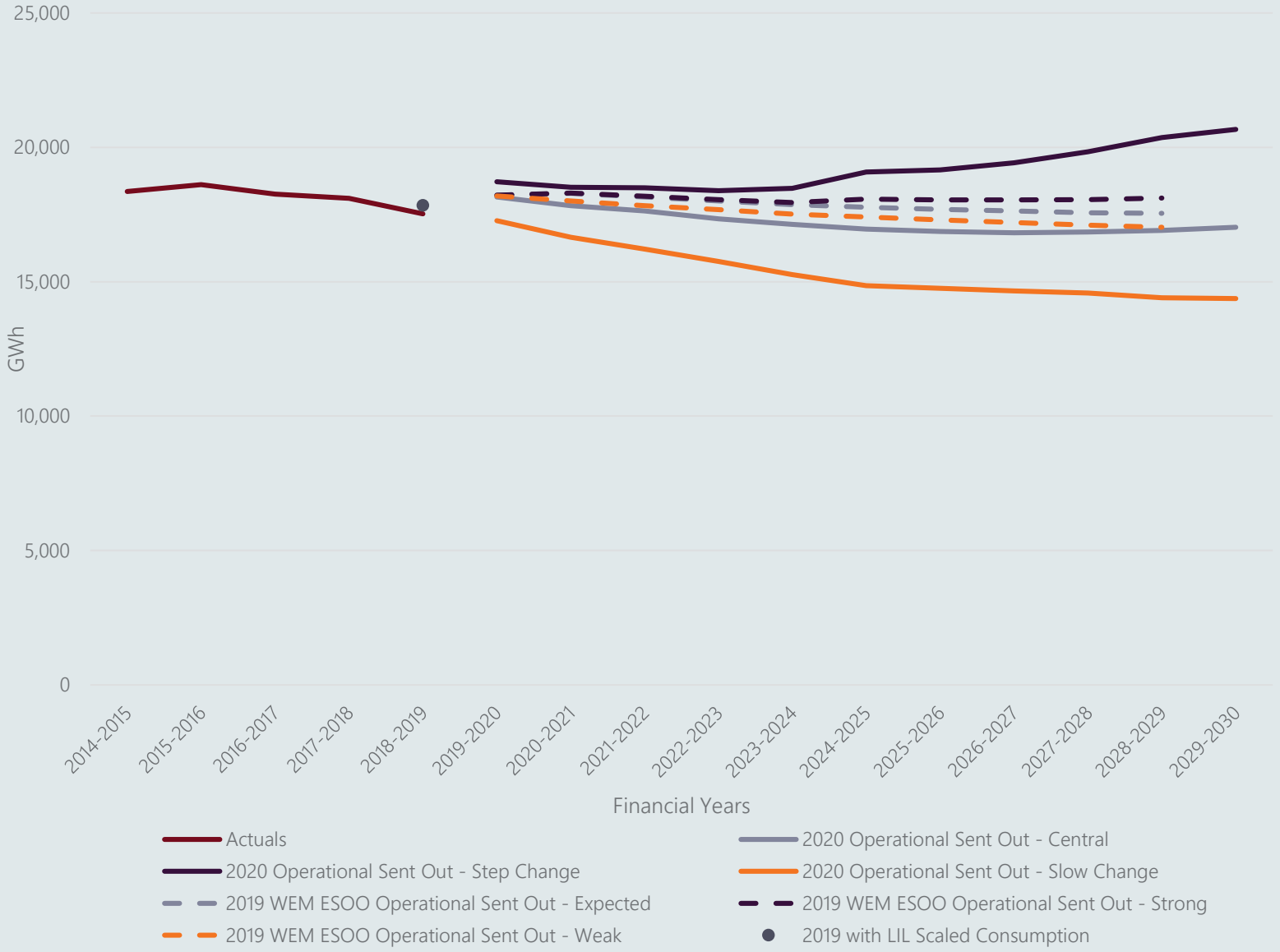
Operational Sent Out Comparison with 2019 WEM ESOO



Financial Years

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Draft 2020 WEM Maximum and Minimum Demand Forecasts

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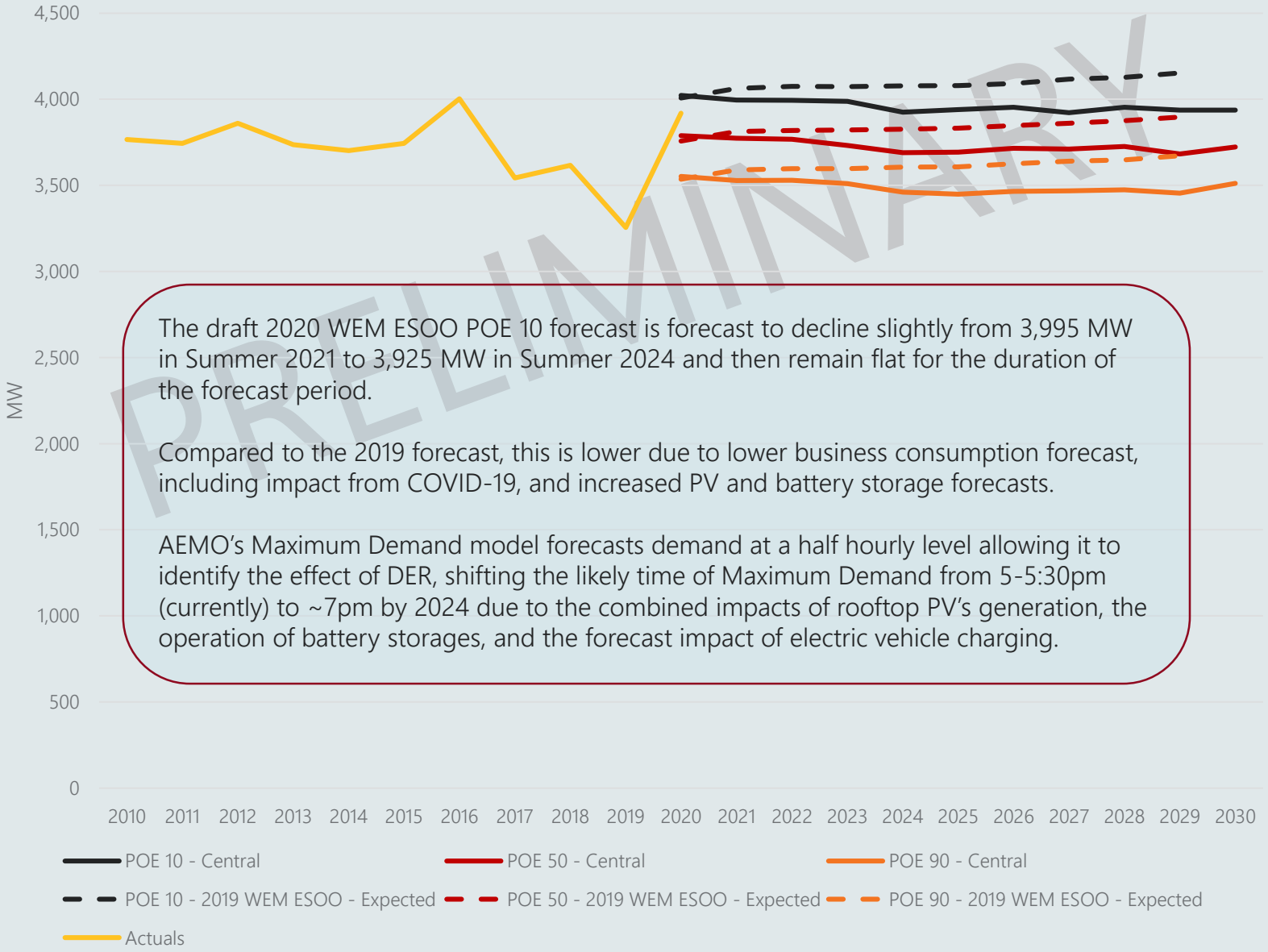
Maximum Demand – Operational

Summer season



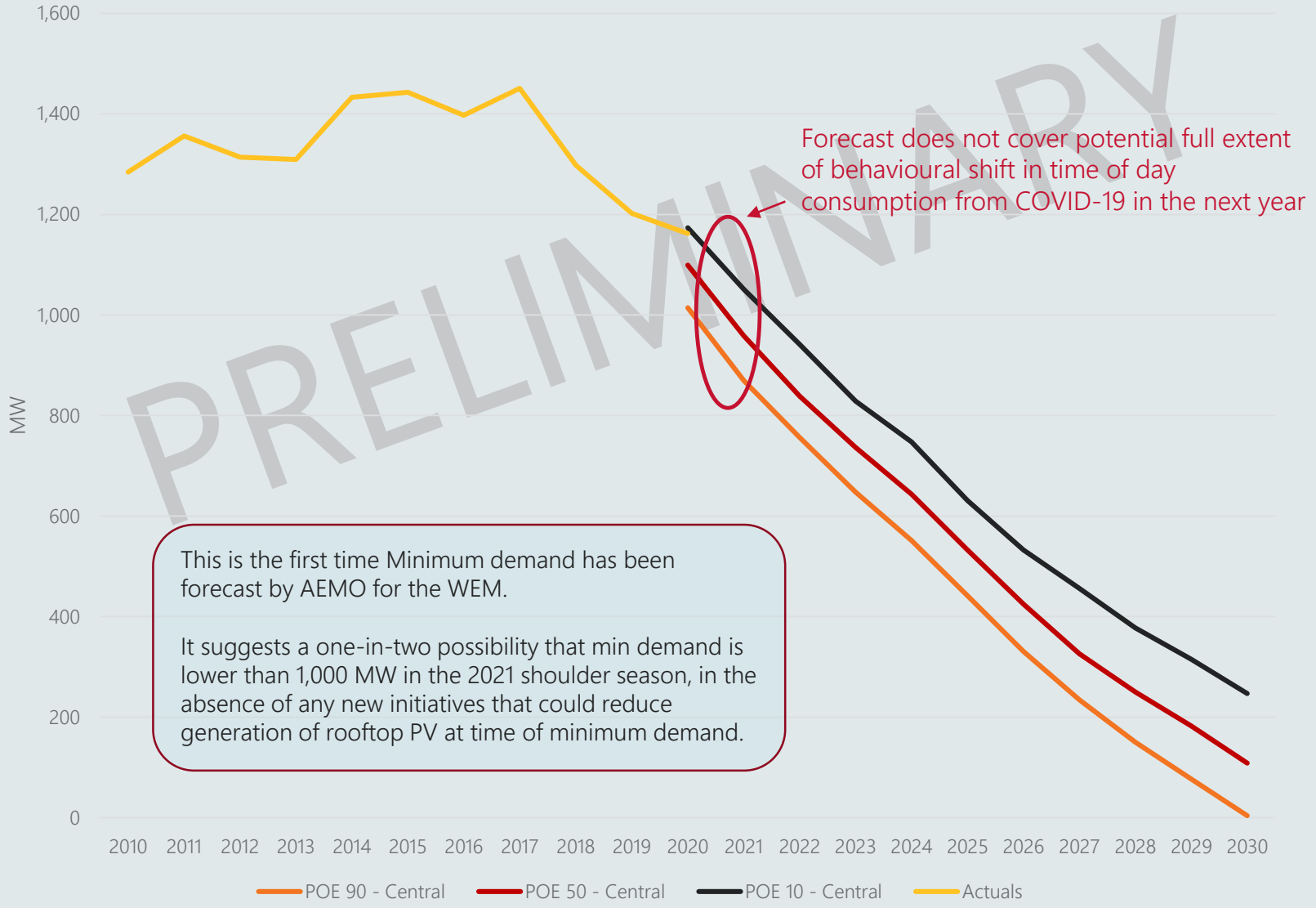
The draft 2020 WEM ESOO POE 10 forecast is forecast to decline slightly from 3,995 MW in Summer 2021 to 3,925 MW in Summer 2024 and then remain flat for the duration of the forecast period.

Compared to the 2019 forecast, this is lower due to lower business consumption forecast, including impact from COVID-19, and increased PV and battery storage forecasts.

AEMO's Maximum Demand model forecasts demand at a half hourly level allowing it to identify the effect of DER, shifting the likely time of Maximum Demand from 5-5:30pm (currently) to ~7pm by 2024 due to the combined impacts of rooftop PV's generation, the operation of battery storages, and the forecast impact of electric vehicle charging.

Minimum Demand – Operational

Shoulder season



Questions ?

energy.forecasting@aemo.com.au

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Background information: Forecast Inputs

Spread of drivers for each scenario

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WEM Connections Forecast

WEM connections are modelled by splicing ABS Household projections with the NMI growth rate. After 4 years, it is smoothed to ABS long-term household forecasts.

- ABS Population projections Cat 3222.0 applied in the model is the 22 Nov 2018 version.

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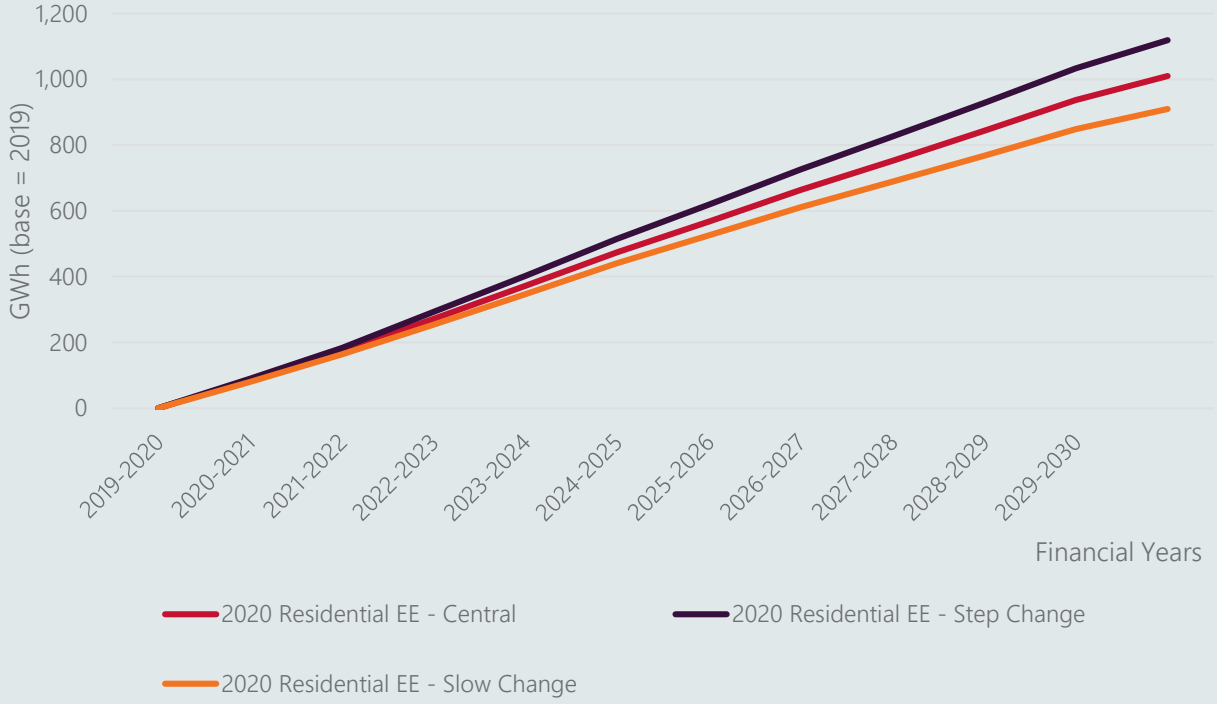
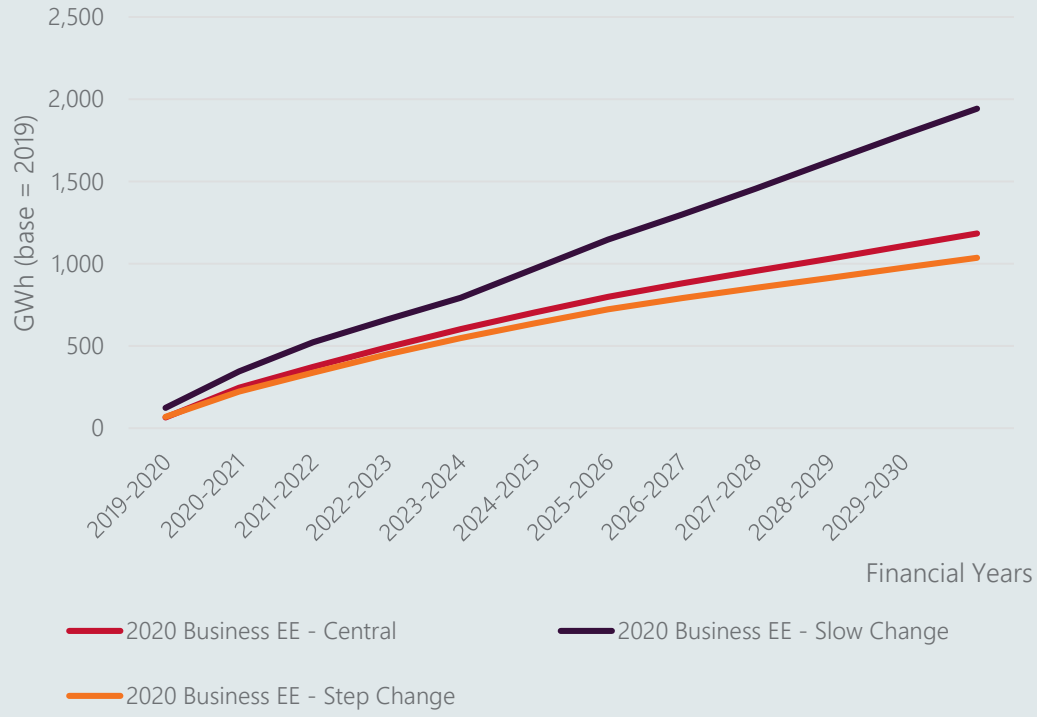
Energy Efficiency projections





Energy Efficiency impacts are forecast separately for the Residential and Business sectors where:

- Business energy efficiency influenced by government programs targeted at the business market and cyclical patterns of GSP.
- Residential efficiency, on the other hand, increasingly occurs as residential customers implement new measures to improve energy efficiency.

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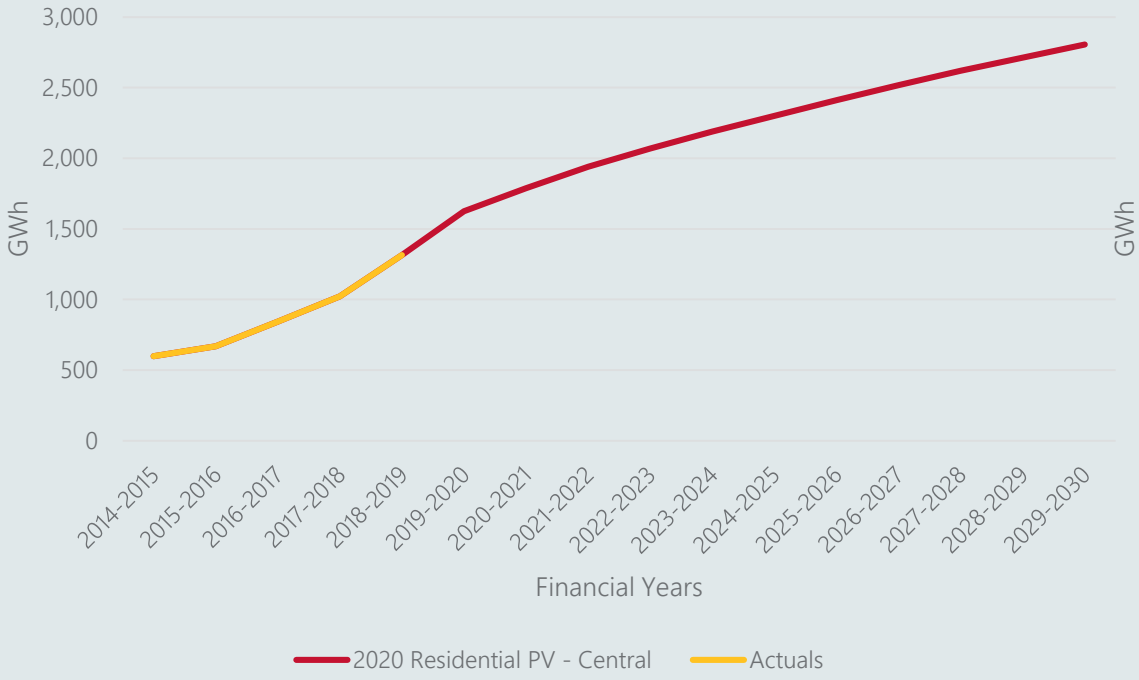
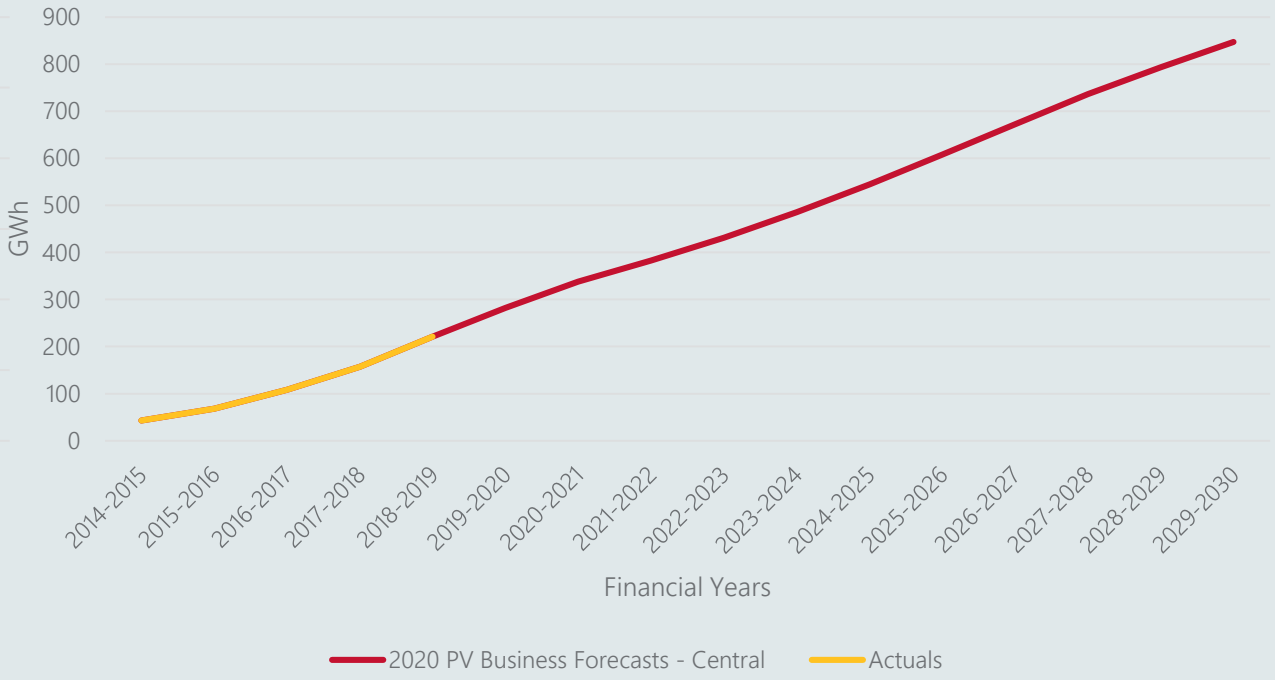
DER projections: PV





- AEMO develops PV forecasts using Consultant forecasts of PV uptake
- PV generation of installed PV is forecast using solar generation data from Solcast.
- PV output assumes degradation rate of 0.6% per annum.

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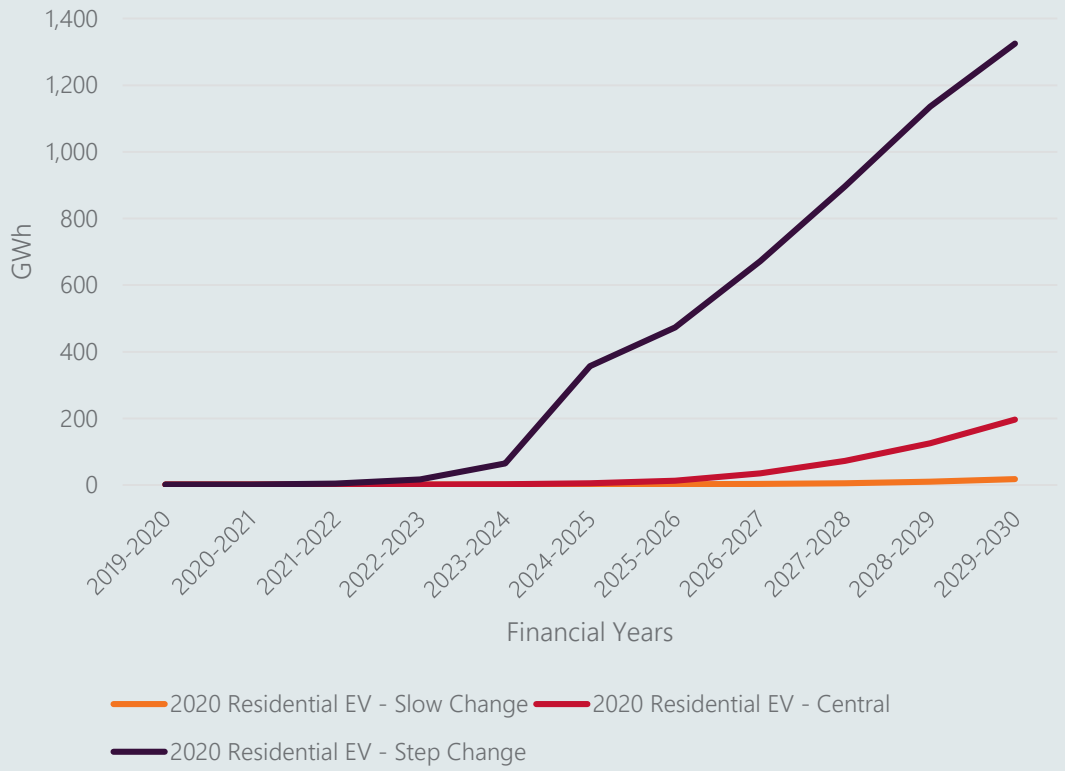
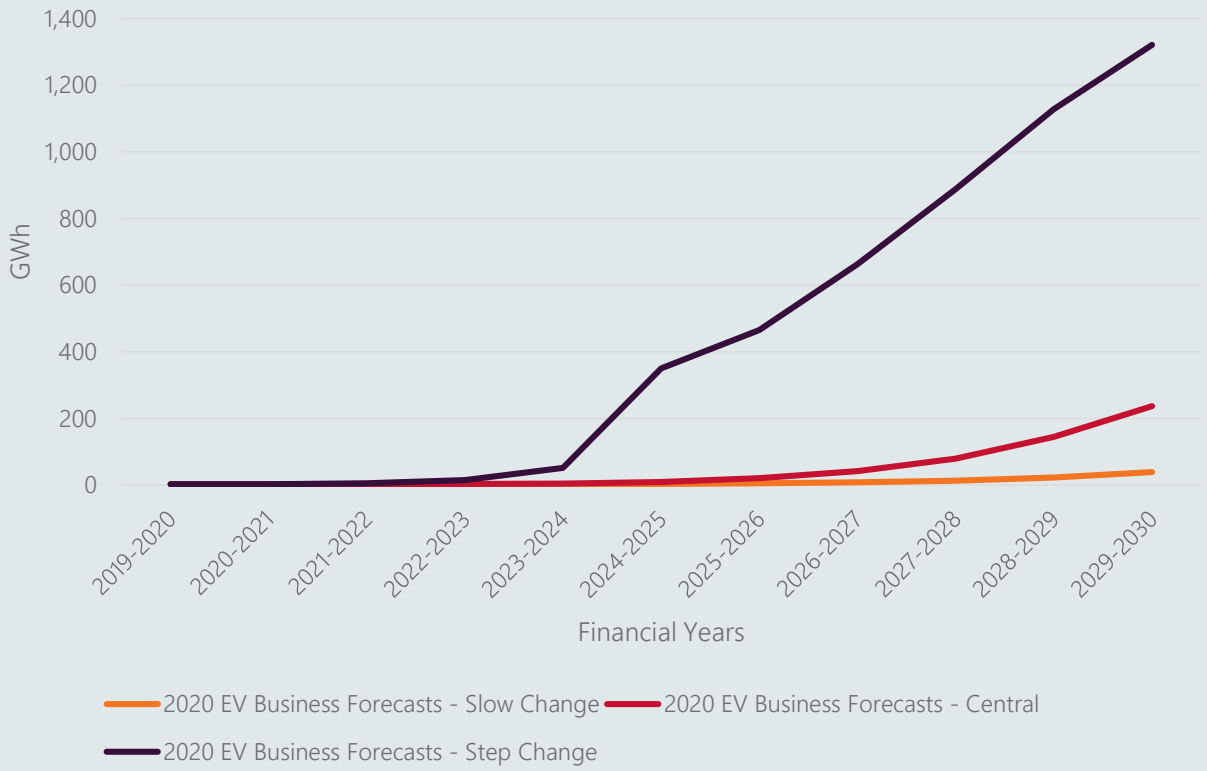
EV projections : by scenario





- Central scenario assumes cost parity with internal combustion engine vehicles in the late 2020s
- Long term fleet share forecast: 35% for EV's (rapid growth in EV adoption) and 4% fleet share for fuel cell vehicles
- The Step change scenario assumes that all vehicles will be EVs by 2050.

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