East Coast GSOO 2020 Consumption Forecast Update

Forecasting

Agenda

1. Outline of the approach for the Australian East Coast gas consumption forecasts to be used for the 2020 Gas Statement of Opportunities (GSOO).
2. Methodology and inputs discussion by sector.
3. Meter data discovery and insights for improving sub-regional forecasting capacity.

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GSOO Consumption methodology

- AEMO applies a scenario component based model for each market segment*.

- Segments modelled are:
  - Tariff V (residential and small commercial)
  - Tariff D (Industrial and large commercial)
  - GPG (Gas Powered Generation)
  - LNG (Liquified Natural Gas)

* Published methodology available at: https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/GSOO/2019/Gas-Demand-Forecasting-Methodology.pdf

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Tariff D modelling approach

- Large industrial loads (LIL) are surveyed to incorporate into the Tariff D forecast.
- Direct interviews are conducted for the largest industrial consumers
- Interviews and surveys are being finalised.
  - 22 facilities interviewed, and
  - 53 requested providing answers to a questionnaire (approximately 38% of Tariff D).
- The remainder of the Tariff D sector is modelled in aggregate using macro-economic indicators and price as modelling inputs. This methodology is consistent with the 2019 GSOO.

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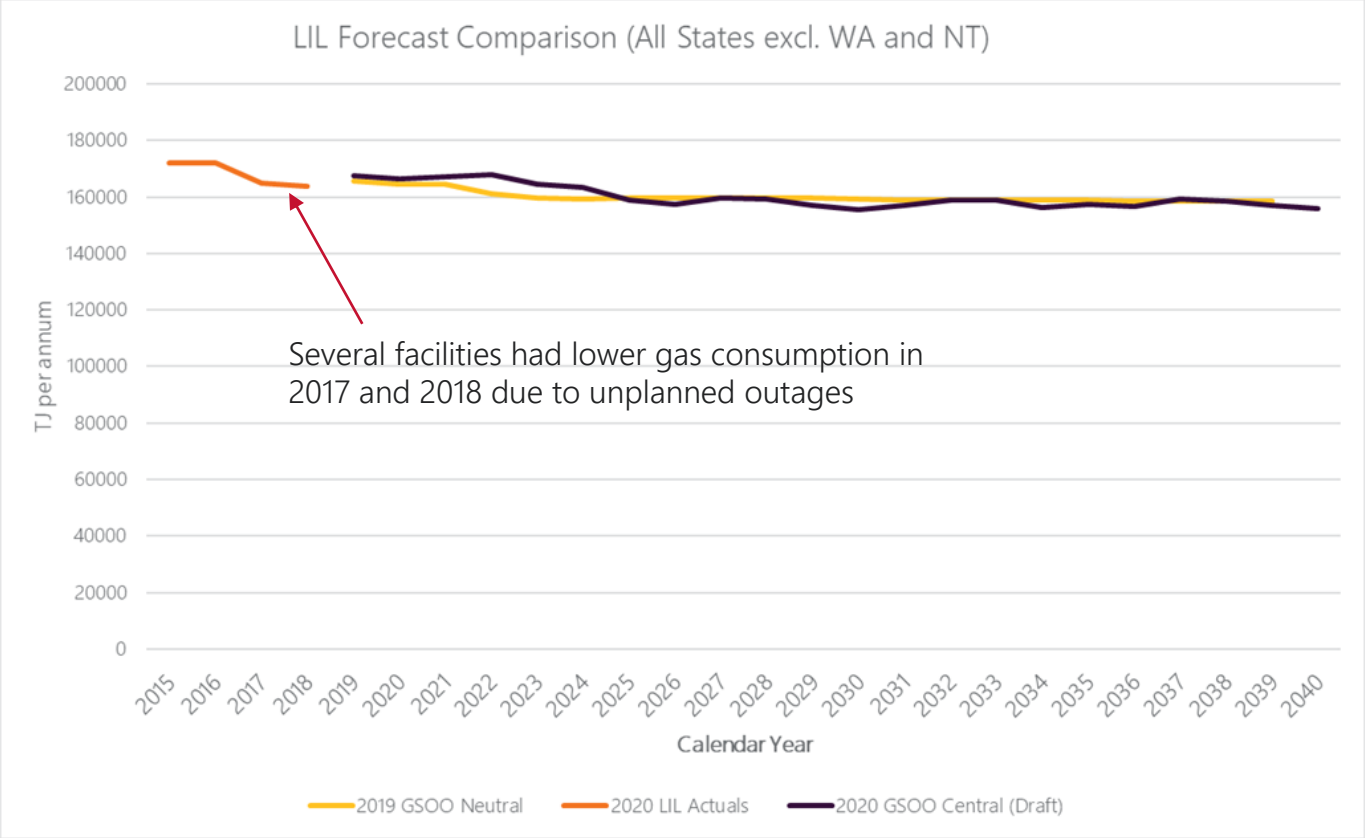
Tariff D Modelling Insights

- Early insights indicate that sustained price uncertainty and broad international market conditions are putting pressure on facilities to increase production efficiency.
- Consumption may reduce due to fuel switching away from gas.
- Industrial closures (partial or complete) are possible.



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Tariff V modelling approach

- Updates for the 2020 GSOO (Tariff V) include:
  - New connections forecast
  - Updated retail price forecast
  - Updated fuel switching model
  - Updated energy efficiency model.

- AEMO has also received information from the separate east coast gas distributors on sub-regional and sub-sector (residential and commercial) usage patterns.

- Sub-regional trends and meter data analysis are used to inform and validate forecast consumption drivers.

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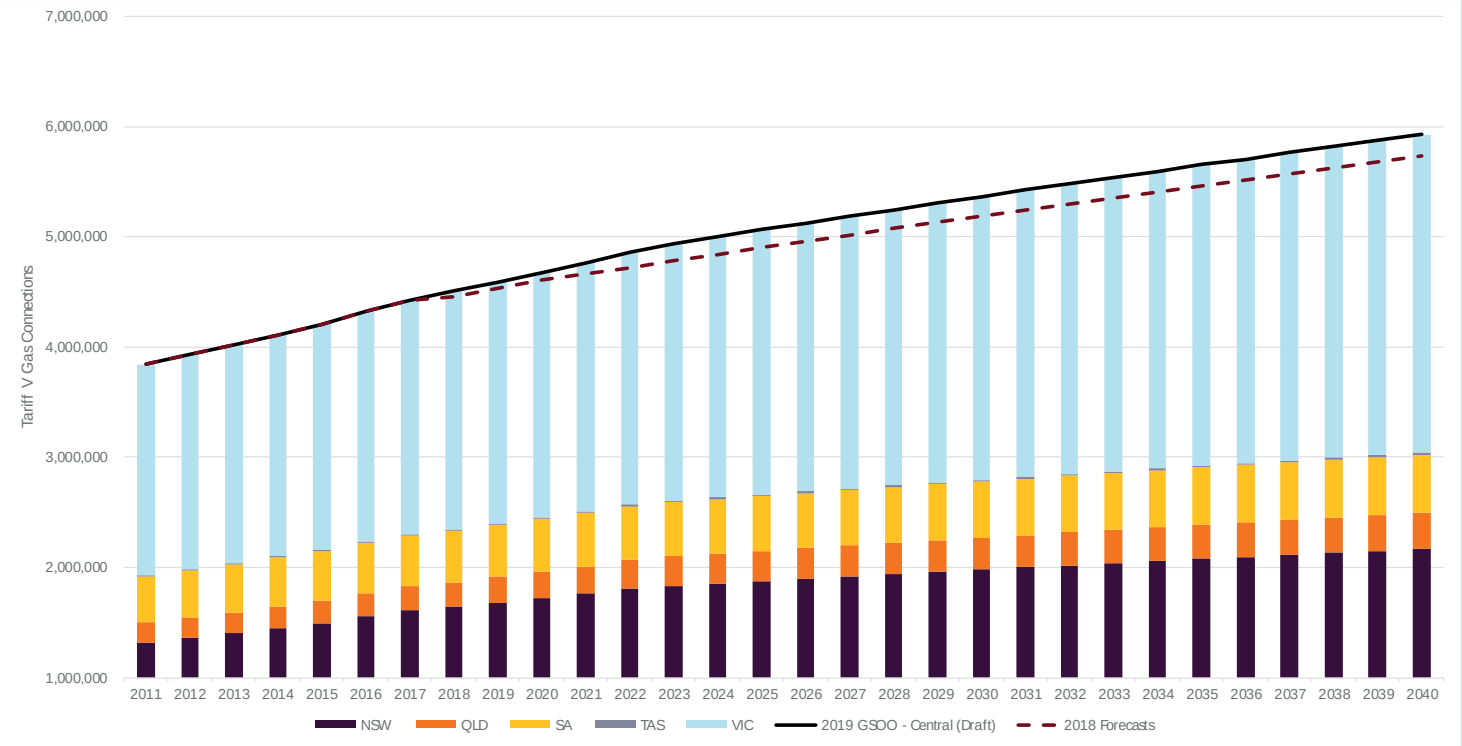
Gas Connections Forecast

- AEMO is updating the Tariff V connections forecast for the 2020 GSOO.
- The forecasts now utilise the recently updated Australian Bureau of Statistics (ABS) population and household data and the 2019 ESOO electricity connections forecast.
- In the 2019 GSOO AEMO applied a growth rate derived from the Housing Industry Association (HIA) to influence the short term growth. Historical MIRN (connections) data is now being incorporated, reflecting recent trends in gas connections growth.



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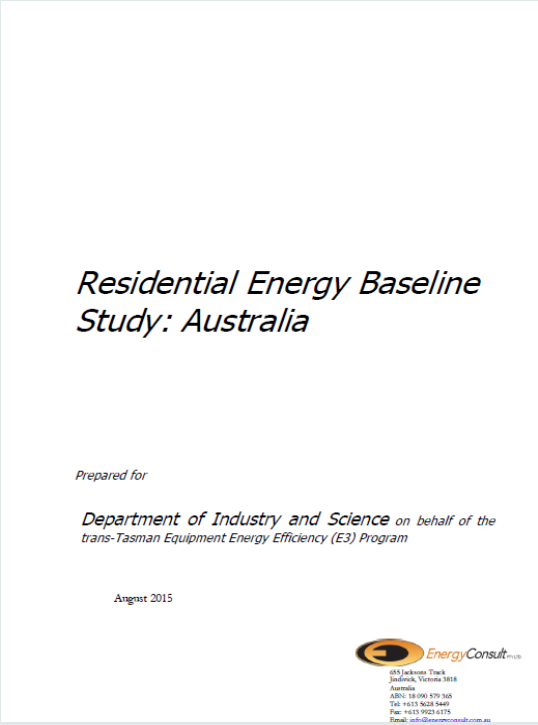
Fuel Switching: Modelling approach

Base model

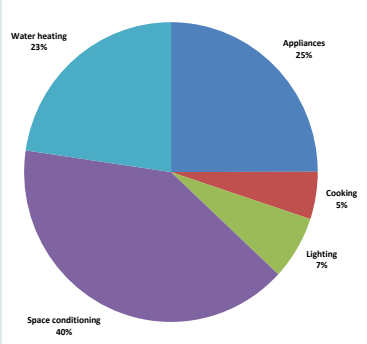
Fuel switching driven by future changes in stock of electric and mains gas technologies



Water heating

Space heating

Cooking

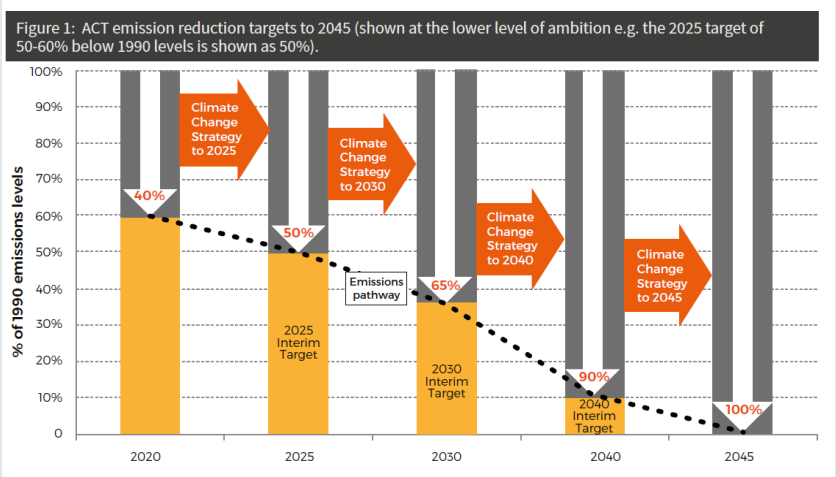


2018 GSOO: Water and space heating only

Adjusted model

Adjustments for existing measures that drive fuel switching

- National Construction Code (NCC) 2022
  - Water heating: 5 star gas, heat pump, solar
  - Space heating: 5 star gas, 4 star RCAC
- State schemes for RCAC (above NCC 2022)
- Federal and state schemes for hot water (above NCC 2022)
- Other strategies, e.g. ACT Climate Change Strategy



ACT Climate Change Strategy: zero emissions from gas by 2045

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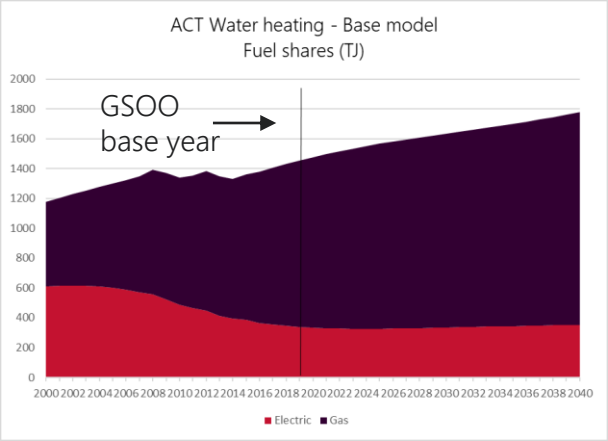
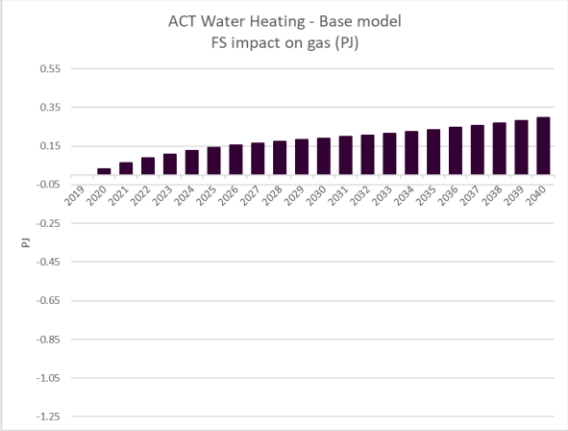
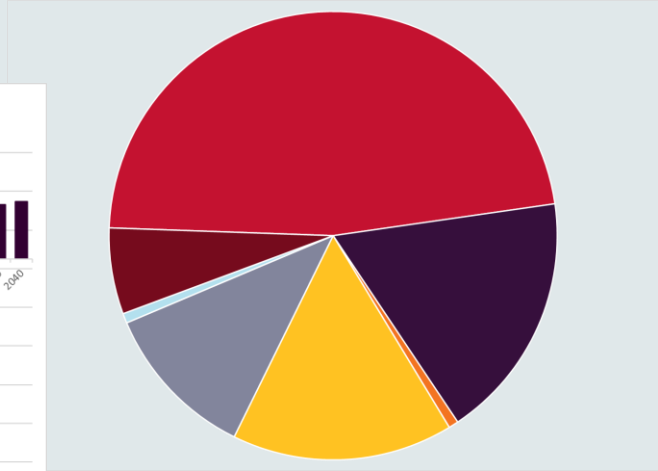
Fuel switching: ACT water heating example

Base model

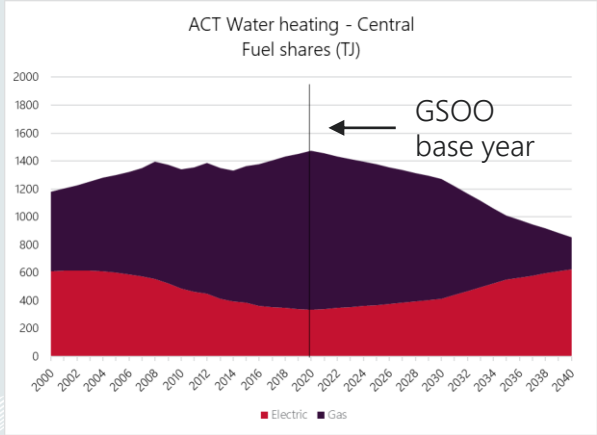


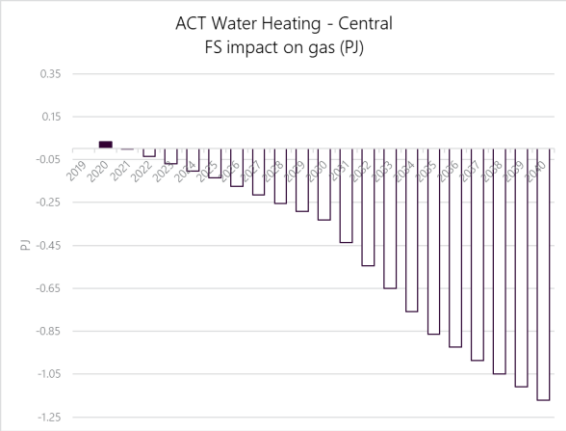


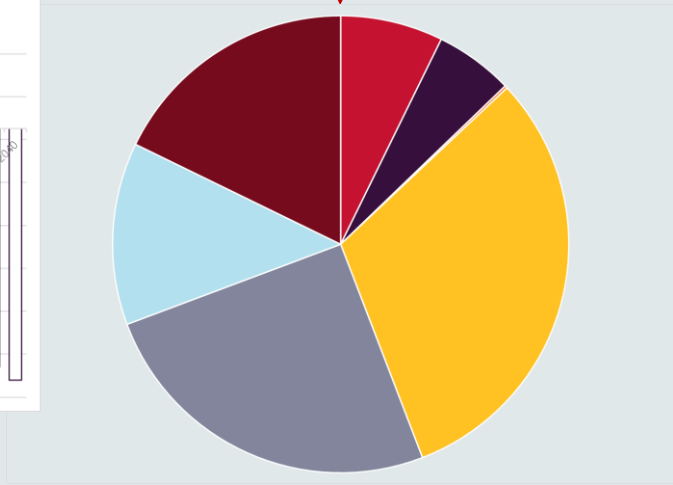


Stock share transition

Adjusted model







Model legend

- Gas
- Electric

Stock share legend

- Gas instant (mains)
- Gas storage (mains)
- Solar gas
- Electric Water - Med/Large
- Electric Water - Small
- Heat pump
- Solar electric

Other regions

Base models will be similarly adjusted to account for measures that drive future fuel switching

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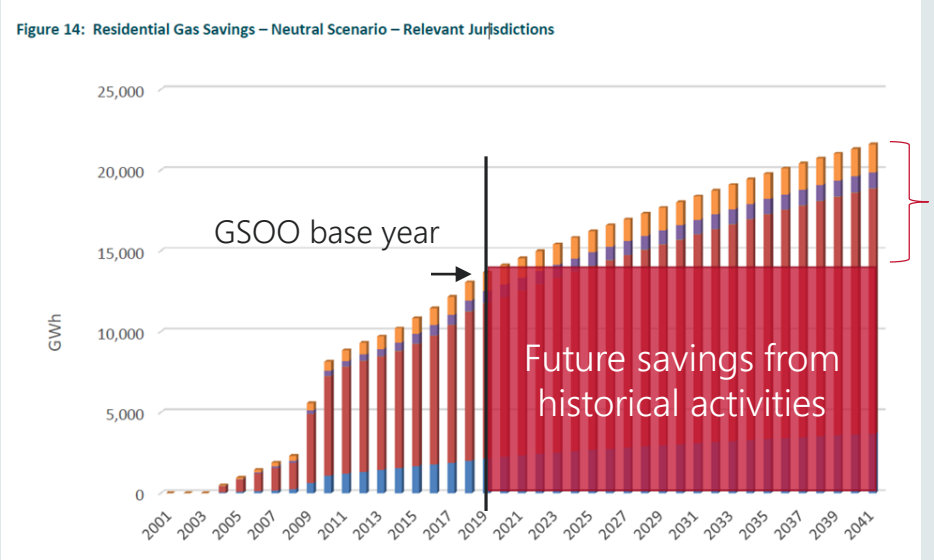
Energy Efficiency

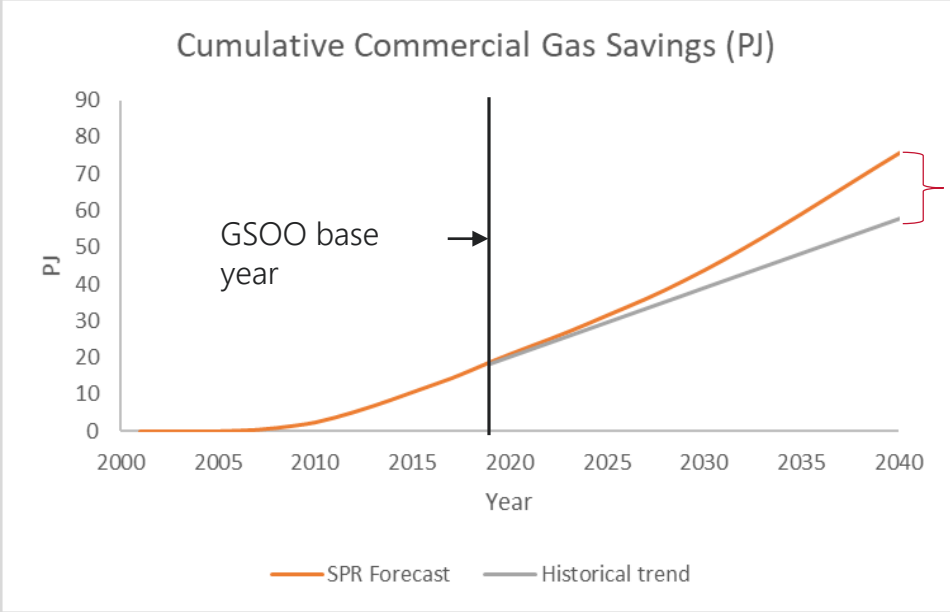
Residential (bottom up model)



Forecast savings

- Savings are from building code improvements to thermal performance of dwellings, e.g. detached houses, flats, etc
- SPR's forecasts apply a discount to reduce occupancy during space conditioning (% varies by climate zone) and for code non-compliance (10%)
- AEMO removes future savings from historical activities and applies the net result to scenarios

Commercial (econometric model)



Cumulative Forecast savings

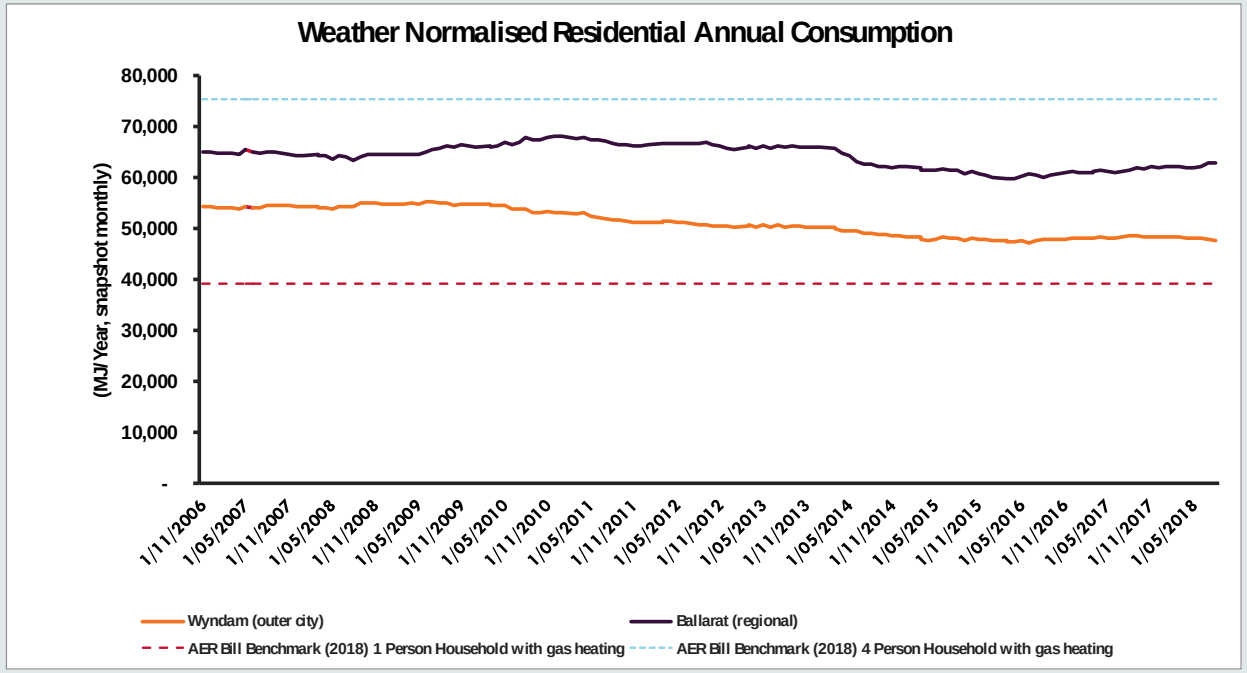
- Savings are from state schemes and building code improvements to thermal performance of buildings e.g. offices, retail, etc
- SPR's forecasts apply a discount for code non-compliance (25%)
- AEMO removes future historical savings based on trend in 7-year period before base year, on a cumulative basis; and applies the annualised net results to scenarios

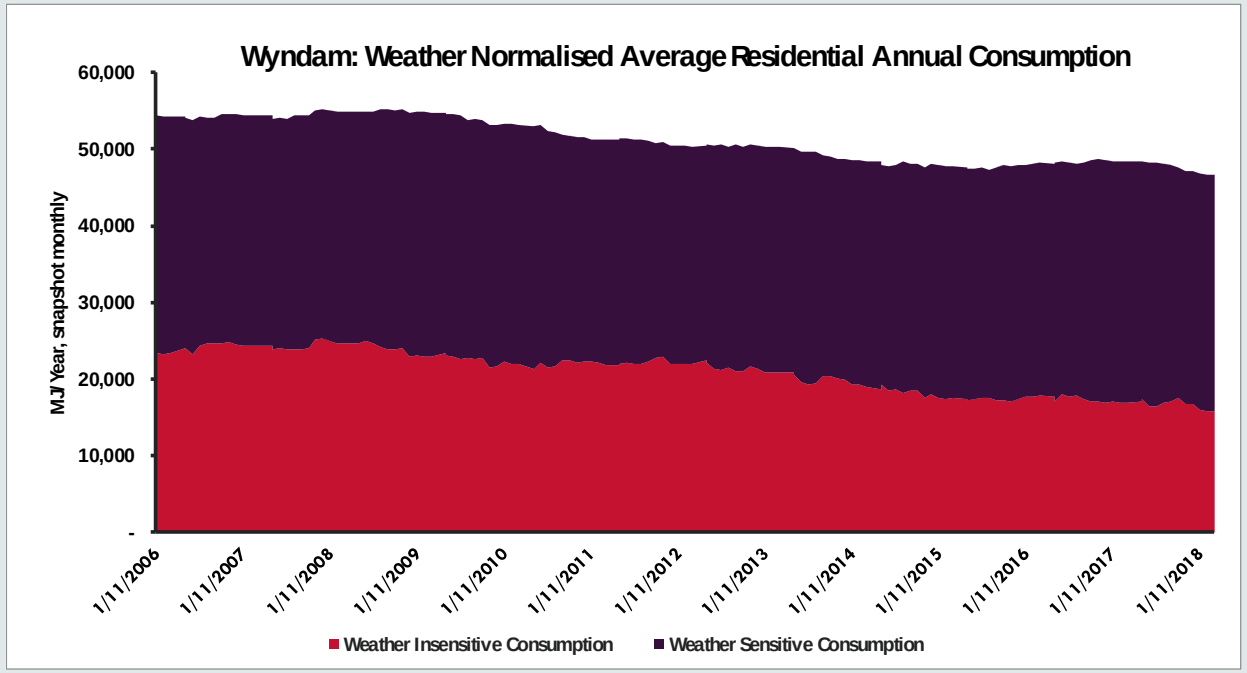
Strategy.Policy.Research (2019) Energy Efficiency Forecasts 2019 – 2041: Final report

Tariff V: Sub-regional insights

Postcode grouped meter data helpful in addressing forecasting trends/validating model outputs:

- Usage varies across subregions in Victoria both in direction and magnitude
- Different rates in heating and baseload usage changes can be observed across time
- Ongoing analysis and advanced modelling techniques (such as a linear mixed effect models) is proposed for further enhancing insights from data





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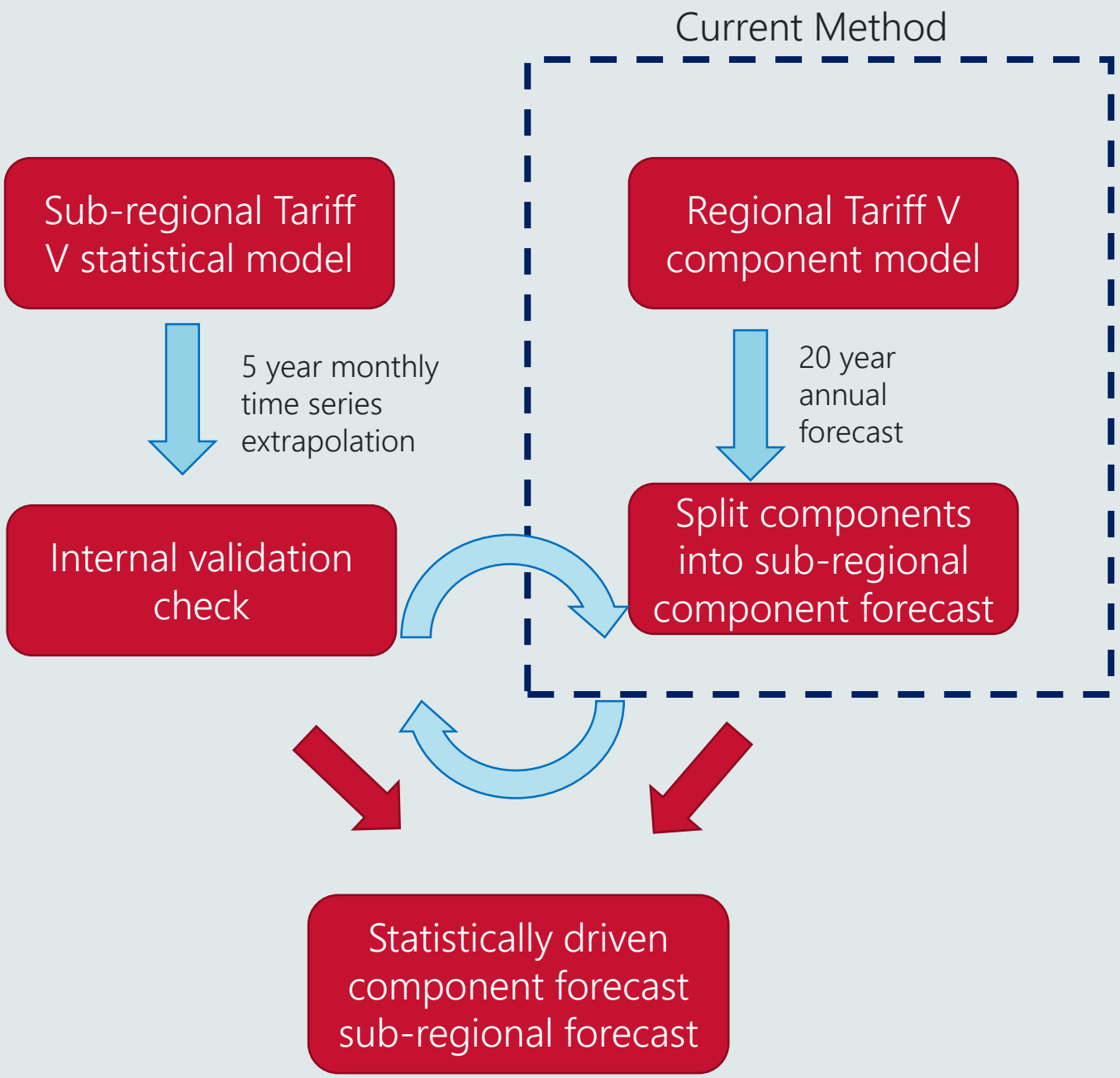
Proposed Tariff V Validation step

- Statistical trend based approach more appropriate for sub-regional information than component forecast that has only regional information
- Blending the statistical information into the component forecast can preserve accuracy and allow scenario analysis
- Approach is similar to other frameworks for long-term forecasting that incorporate long-term structural change



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