2020 GSOO

Draft Annual Forecasts – TD and TV

Agenda

1. Key input changes into the forecast since the previous presentation at the October 2019 FRG
2. Presentation of draft results:
   - Tariff D (larger commercial and industrial consumers, metered daily)
   - Tariff V (residential and small commercial, metered bi-monthly)
   - LNG (Liquified Natural Gas industry, metered daily)
3. Total and Regional Outlooks
4. Peak Day Forecasts
5. Questions & Answers

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2020 GSOO scenarios

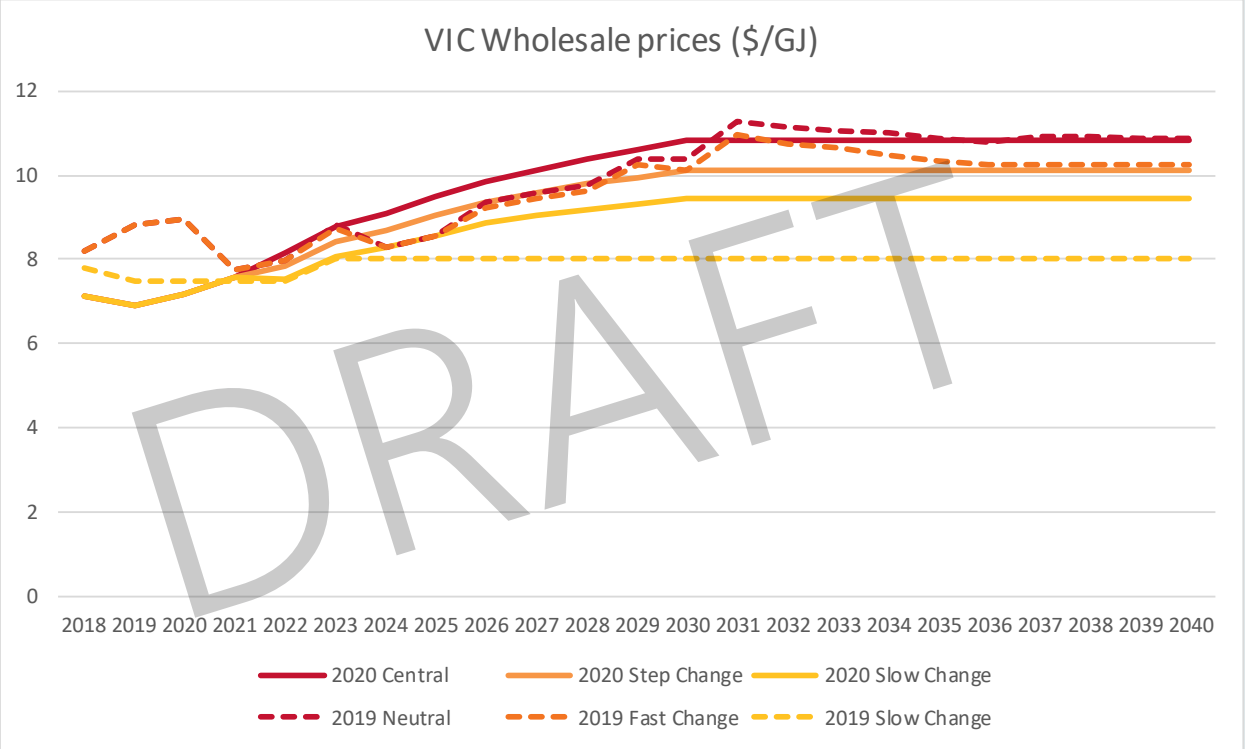
Driver	Slow Change	Central	Step Change
Population growth	Low	Medium	High
Economy	Weak global and domestic demand	Neutral global and domestic demand	Strong global and domestic demand
Energy efficiency	Lower impact of current and committed/planned measures from weaker economy	Current and committed/planned measures	Higher impact of current and committed/planned measures from stronger economy, and more aggressive energy efficiency measures adopted
Fuel switching	Weak economic case for fuel switching	Average economic case for fuel switching	Strong economic case for fuel switching
Gas price	Low gas prices	Medium gas prices	Medium gas prices[A]
Commodity price	Low	Medium	Medium
Foreign Exchange Rate – AUD to USD	Weak	Medium	Strong
Large-scale renewable generation uptake	Medium	Medium	High

[A] In 2019, AEMO identified that high gas prices may lead to price-driven demand destruction, particularly for vulnerable large industrial loads, which would be inconsistent with the strong economic growth outlook that forms part of this scenario narrative.

Gas wholesale prices now forecast to be slightly higher in next decade

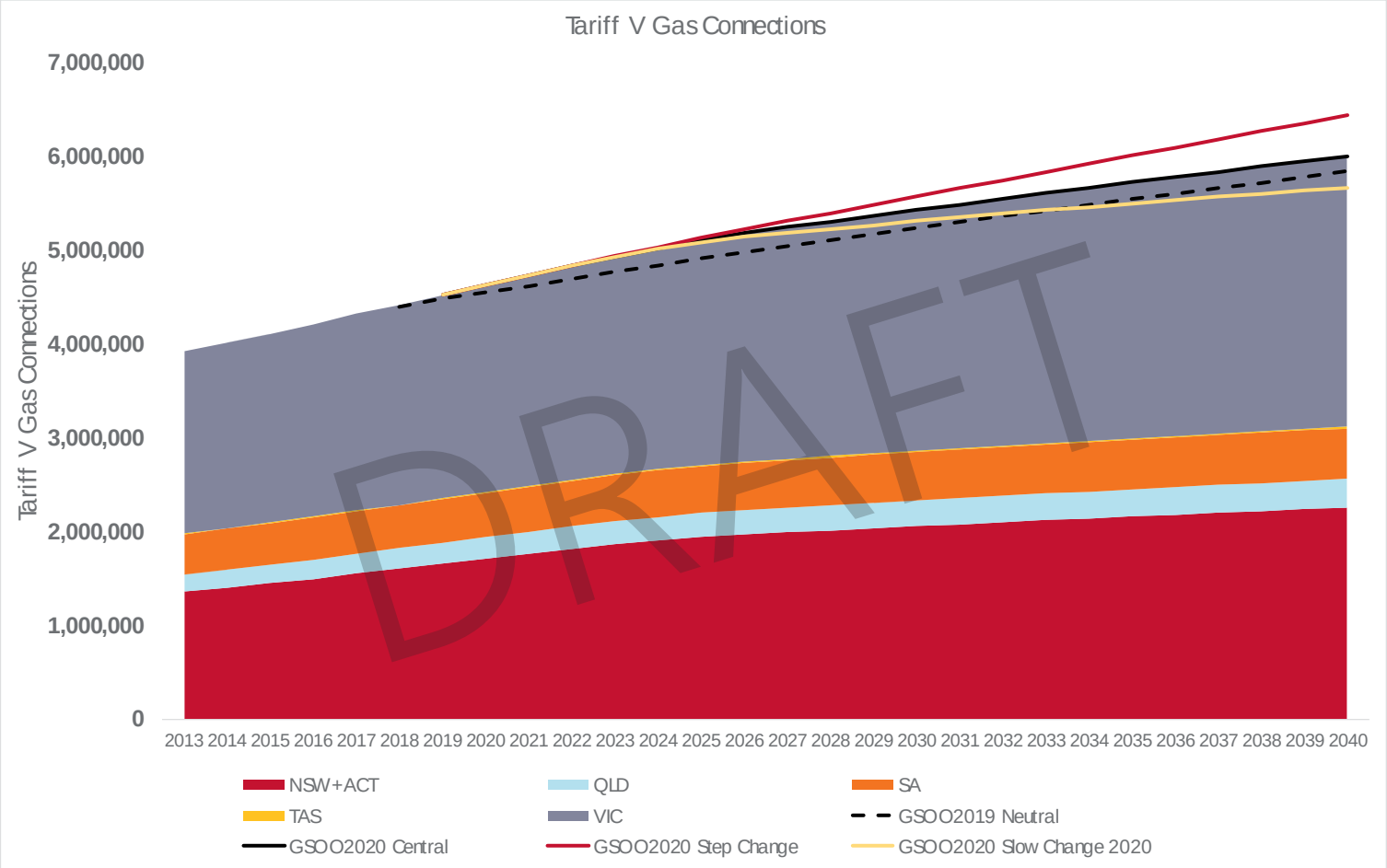
Wholesale Prices

- At the 2019 October FRG Core Energy presented draft wholesale price forecasts in which feedback was sourced from the FRG stakeholders.
- Feedback provided on the risks and uncertainties around key assumptions in the Central scenario resulted in Core Energy providing two additional scenarios that AEMO selected:
  - Core Central (Upper) scenario for the AEMO Central scenario,
  - Core Central (Lower) scenario for the AEMO Slow Change scenario,
  - with the average of the two forming AEMO's Step Change scenario.
- CORE assumes a starting point of contract prices of close to $7/GJ , consistent with ACCC disclosures
- The progressive increase in Eastern Australia to 2032 is primarily the result of assumed linkage between domestic wholesale prices and LNG prices, which are expected to flatten in the longer term due to supply/demand balance.
- Variances between regions are due to differences in assumed contract profiles, existing contract prices, and also differences in transportation and storage costs.
- Report available on the AEMO Input, Assumptions and Methodology page, and is currently under consultation as part of the broader Inputs and Assumptions Consultation.
- As part of the LIL survey process five wholesale price bands were provided for participants to comment on, ranging from < $6 to $14+



More Tariff V gas connections now forecast

- The forecasts utilise the recently updated ABS population and household data and the 2019 ESOO 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.
- Increases in new connections are forecast mainly in NSW, QLD and Tas but slightly lower in Vic in the short- to medium-term.



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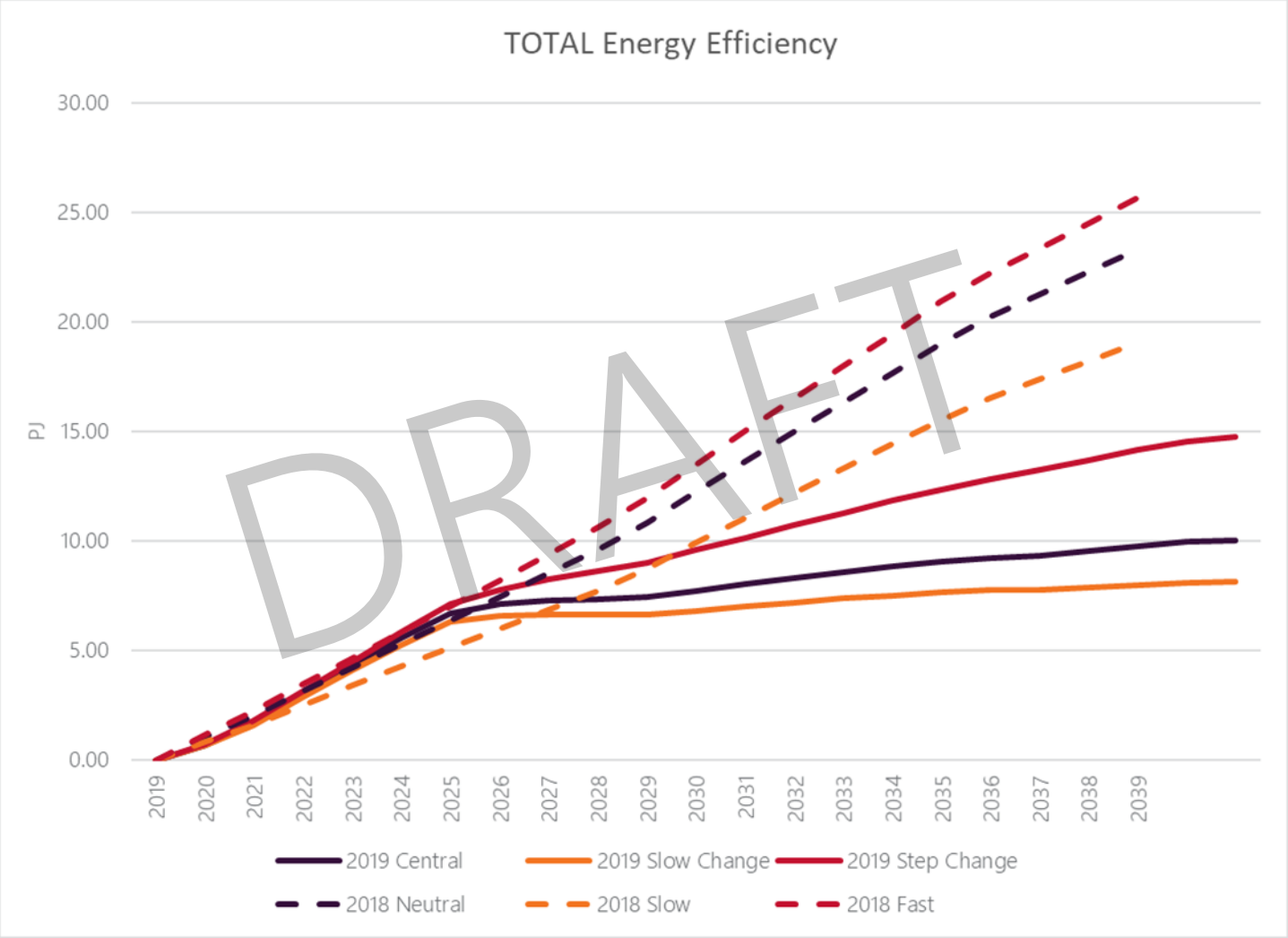
Fewer projected energy efficiency savings

Reduction mainly due to

- National Construction Code (NCC): Higher occupancy discount factor applied
- NCC: Base star rating changed from 2 to 3 stars
- Estimated savings from state-based schemes significantly reduced
- In the 2019 GSOO, AEMO made a post-model adjustment to SPR's forecasts that increased the EE forecasts for that year

In the 2020 GSOO, economic drivers underpin EE savings for all scenarios, in addition to stronger EE policy measures for the Step Change scenario



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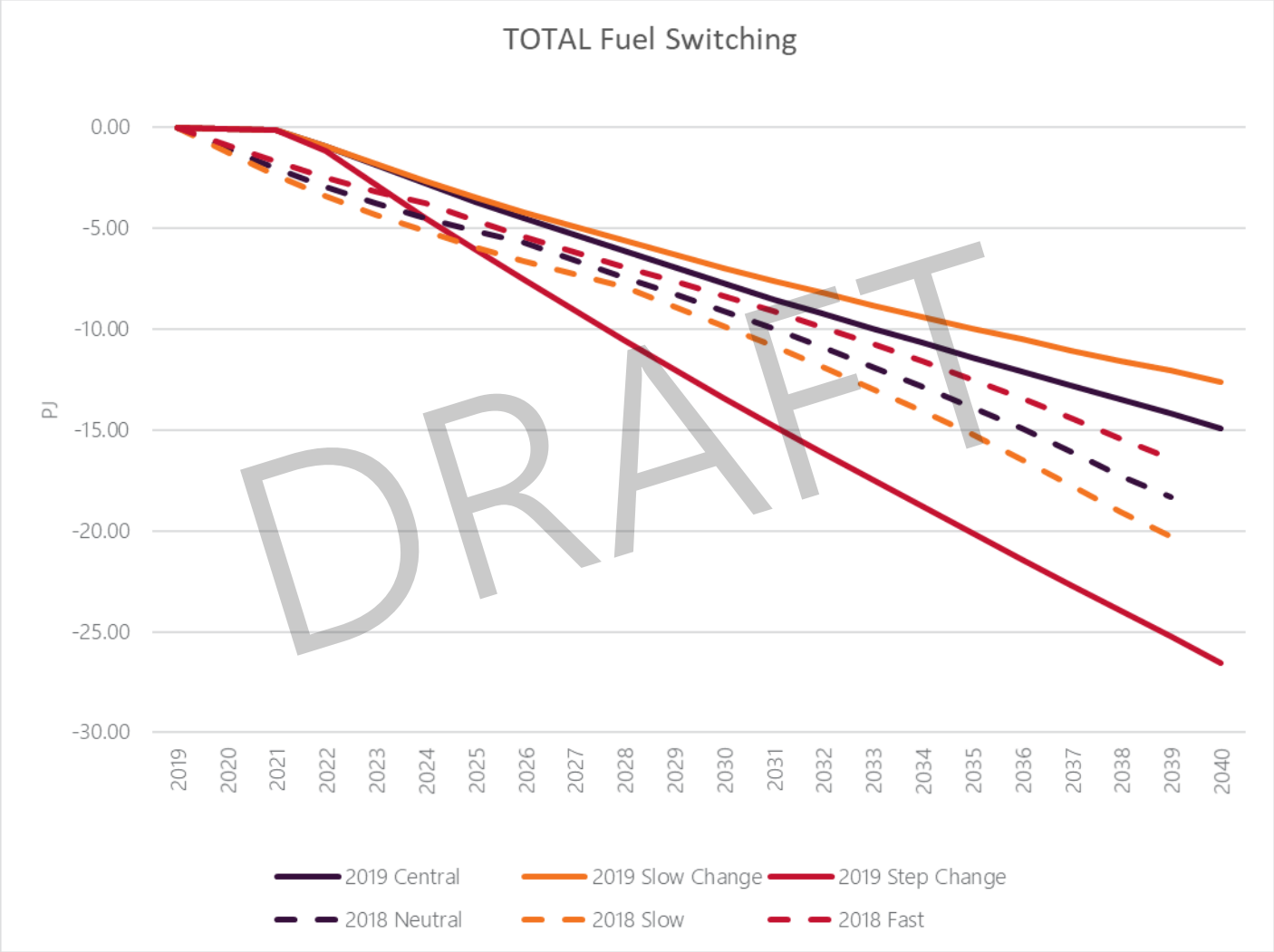
Less fuel switching projected under most

Related to residential water heating (base) and space heating.

The 2020 GSOO based on DoEE data showing FS effect of policy measures. In the 2019 GSOO, space heating estimates based on DoEE data, however water heating estimates reflect a shift from 3 to 5 star gas appliances

Step change has strongest decarbonisation pathway and highest adoption rates. In particular, E3 Program Zoned label for Space Heating has the potential to significantly reduce gas consumption, especially in VIC.



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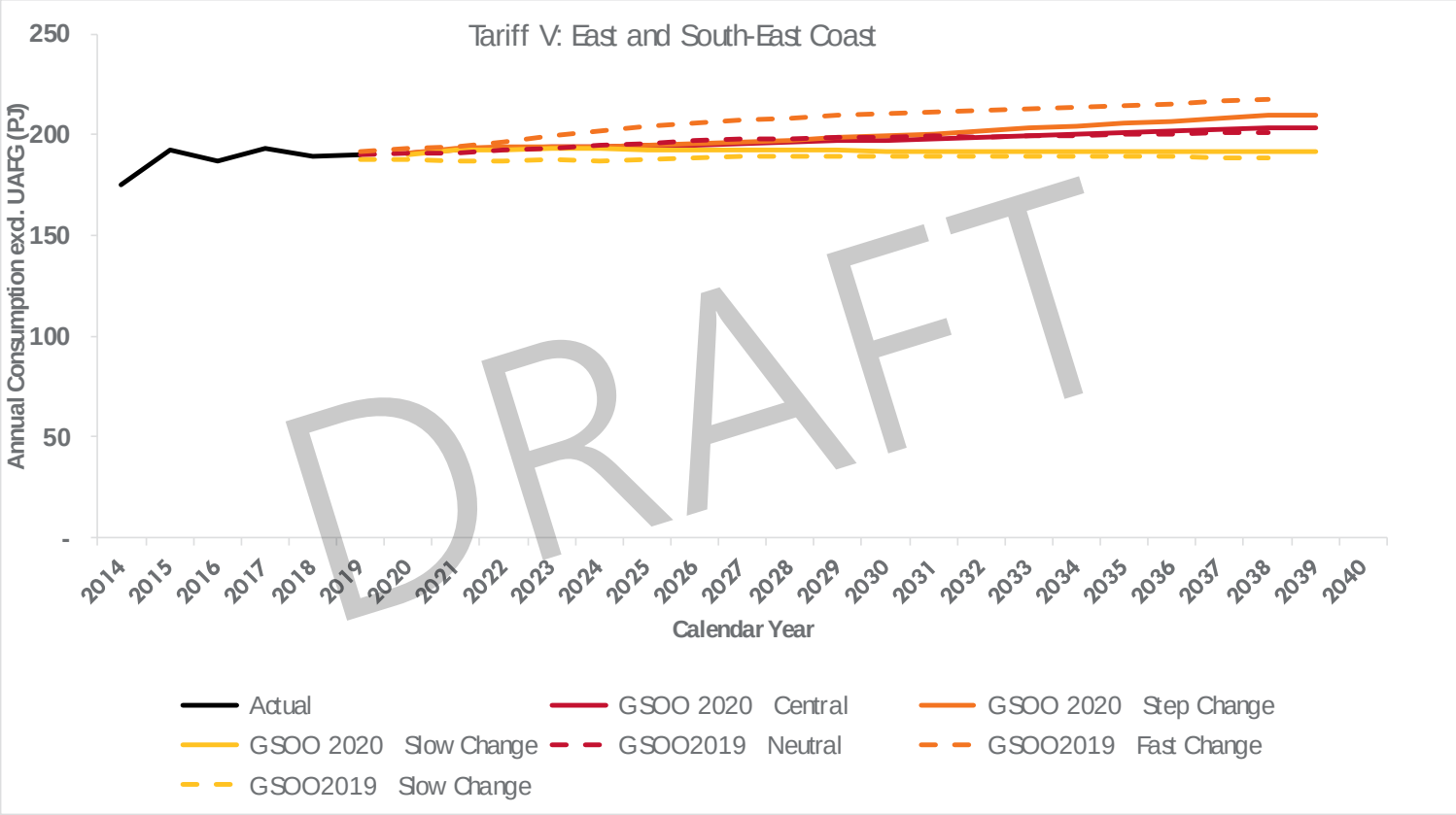
East and South-East Coast Outlook

East Coast Trends (Tariff V)

Tariff V forecast is slightly higher in the Central and Slow Change scenario by 2040, mainly driven by lower energy efficiency impacts.

The 2020 Step Change scenario is lower by 2040 than the 2019 Fast Change due to higher fuel switching impacts.



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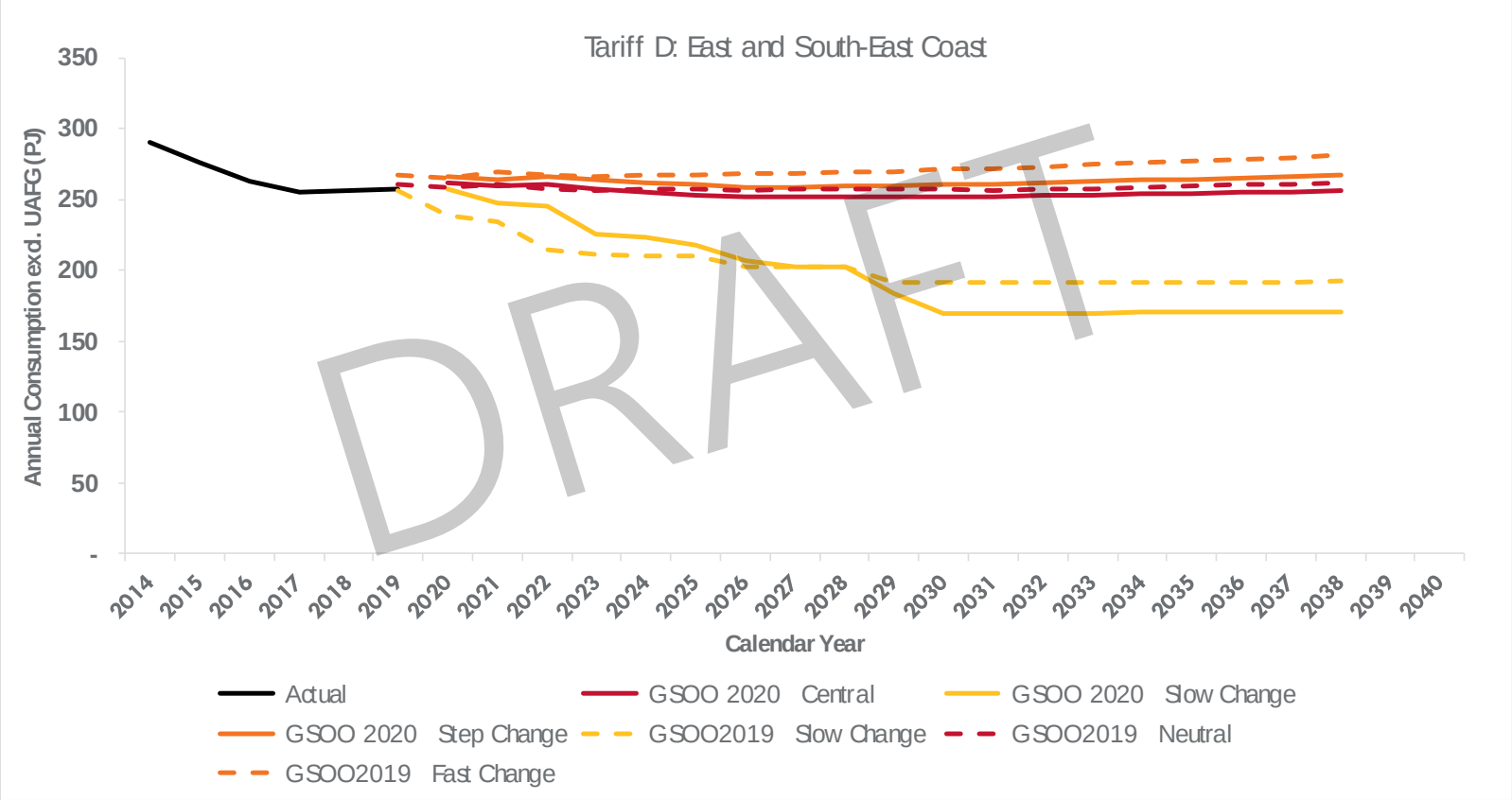
East Coast Trends (Tariff D)

Interviews and surveys with energy users still indicate pessimism with a high risk of closures and demand destruction with views on price increases.

Although the 2020 Slow Change forecasts in the short- to medium-term term are higher this year due to contracting assumptions over the next few years derived from LIL interviews and surveys. However, he long-term outlook is lower than the 2019 Slow Change.

The similar trajectory of the 2020 Step Change scenario, compared to Central, reflects the lack of a strong upside for the sector



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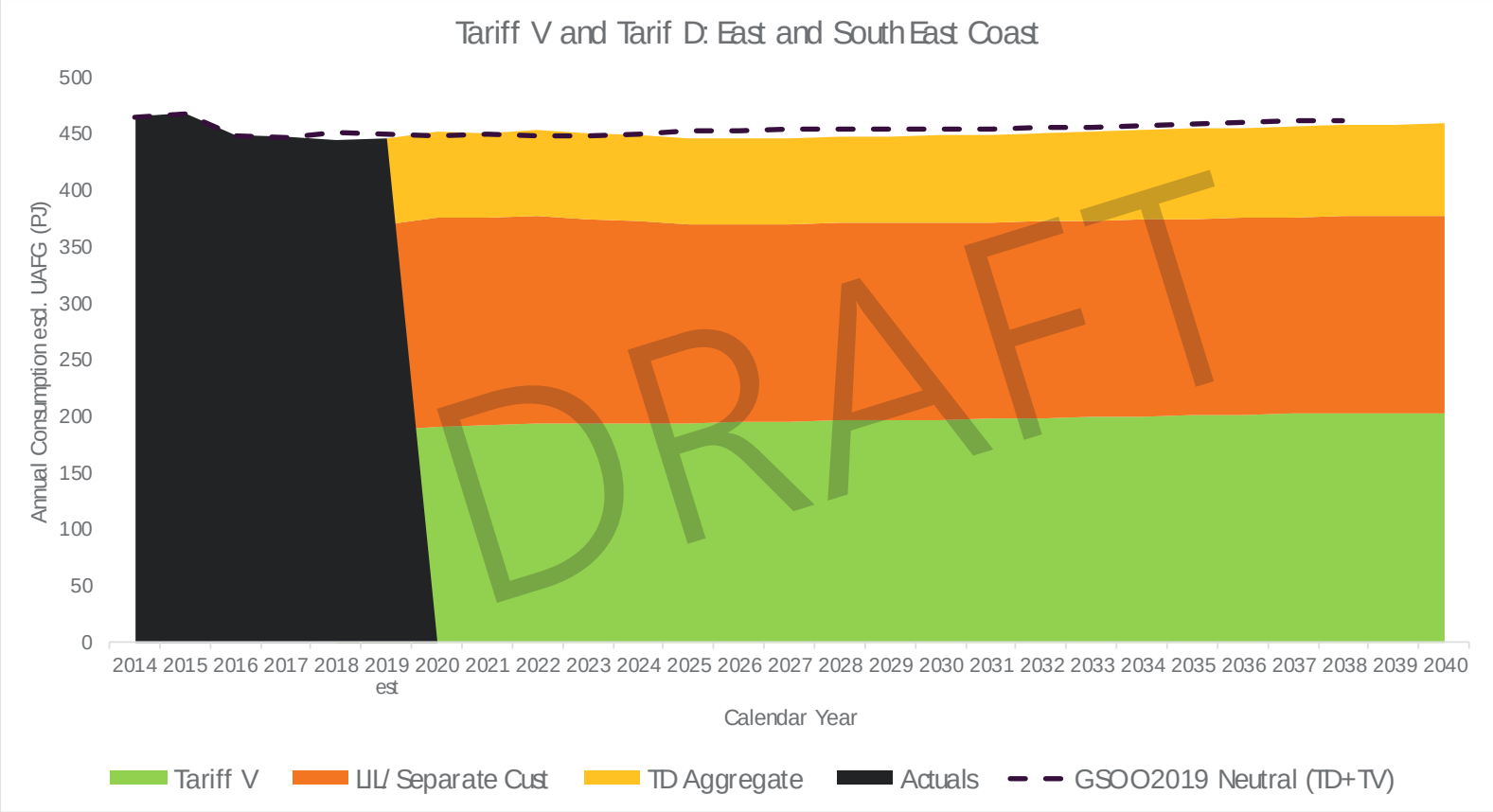
East Coast Trend (Tariff D and Tariff V)

Overall, Tariff D (modelled and displayed separately as large industrial loads (LIL) with the residual modelled in aggregate) and the Tariff V outlook for the GSOO 2020 Central scenario is similar to the GSOO 2019 Neutral forecast.



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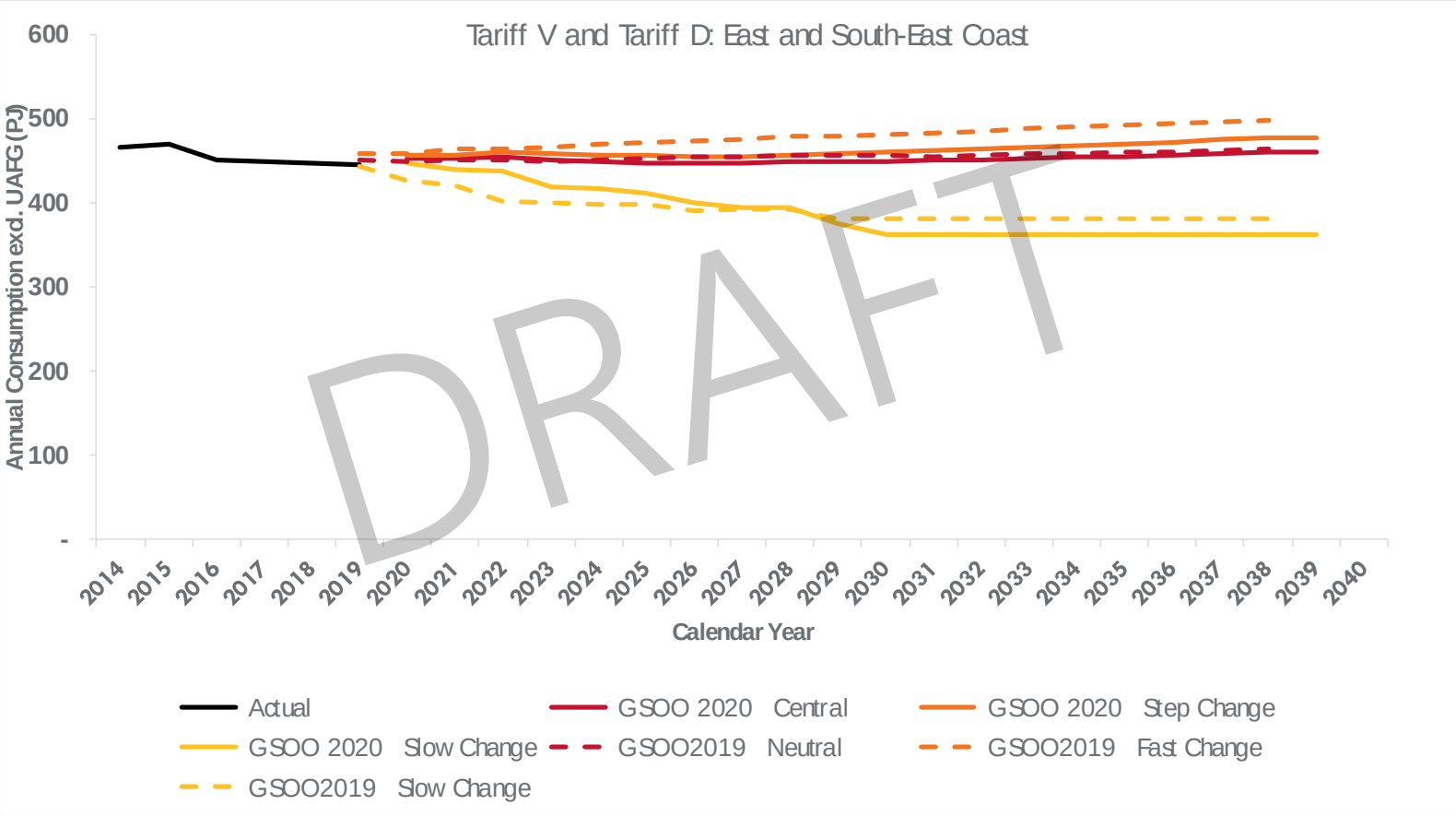
East Coast Trend (Tariff D & Tariff V)

The Tariff V and Tariff D Step Change scenario forecast is closer to the Central forecast due to a combination of a lower upside for gas usage by industry and an assumed increase in gas to electric fuel switching for the residential sector in this scenario.

The Slow Change difference is largely driven by the LIL updates in Tariff D



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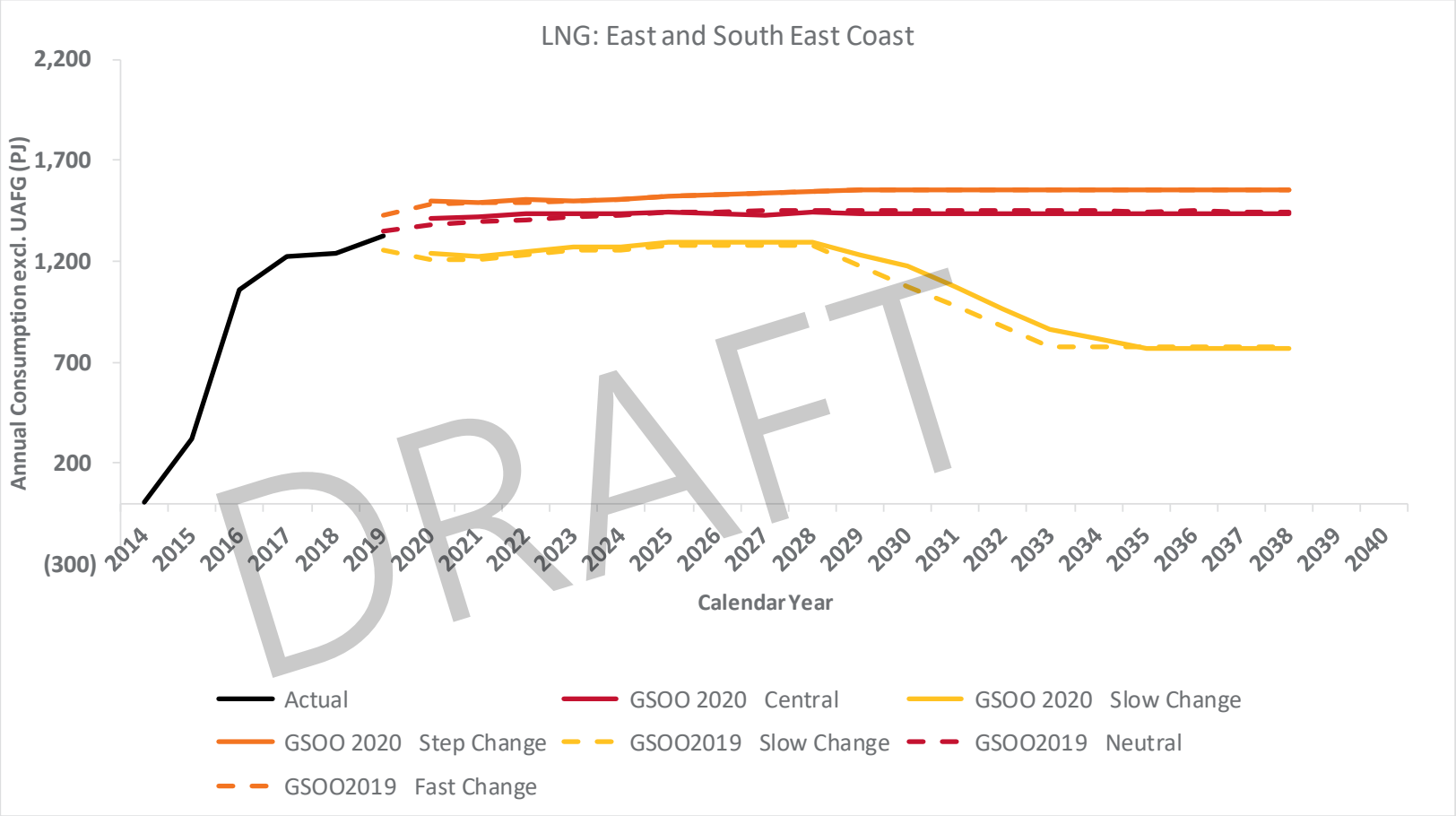
East Coast Trends (LNG)

In the short term, the 2020 Central scenario is expected to rise slightly pushing two of the three LNG facilities towards full nameplate capacity, of higher consumption than the 2019 Neutral scenario.

The 2020 Step Change scenario is similar to the 2019 Fast Change, outlining a stronger international demand for LNG.

The 2020 Slow Change scenario captures a fall in contract quantity, similar to the 2019 Slow Change scenario but with a slightly lower decline reflecting facility onsite gas usage and an updated estimate of remaining contract obligations.



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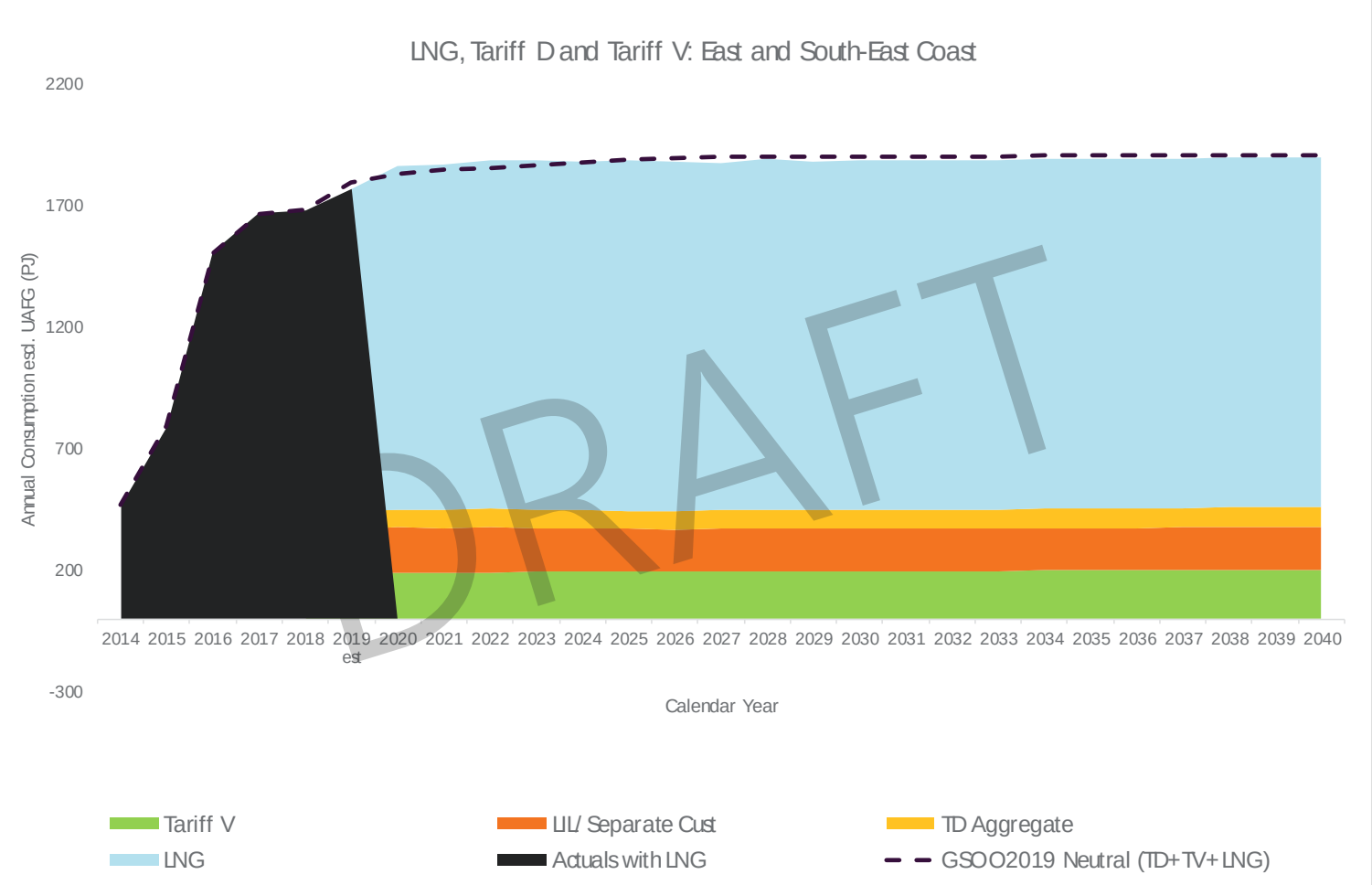
East Coast Stack (TD+TV+LNG)

Overall, the LNG, Tariff V and Tariff D outlook for the GSOO 2020 Central scenario is similar to the GSOO 2019 Neutral forecast.



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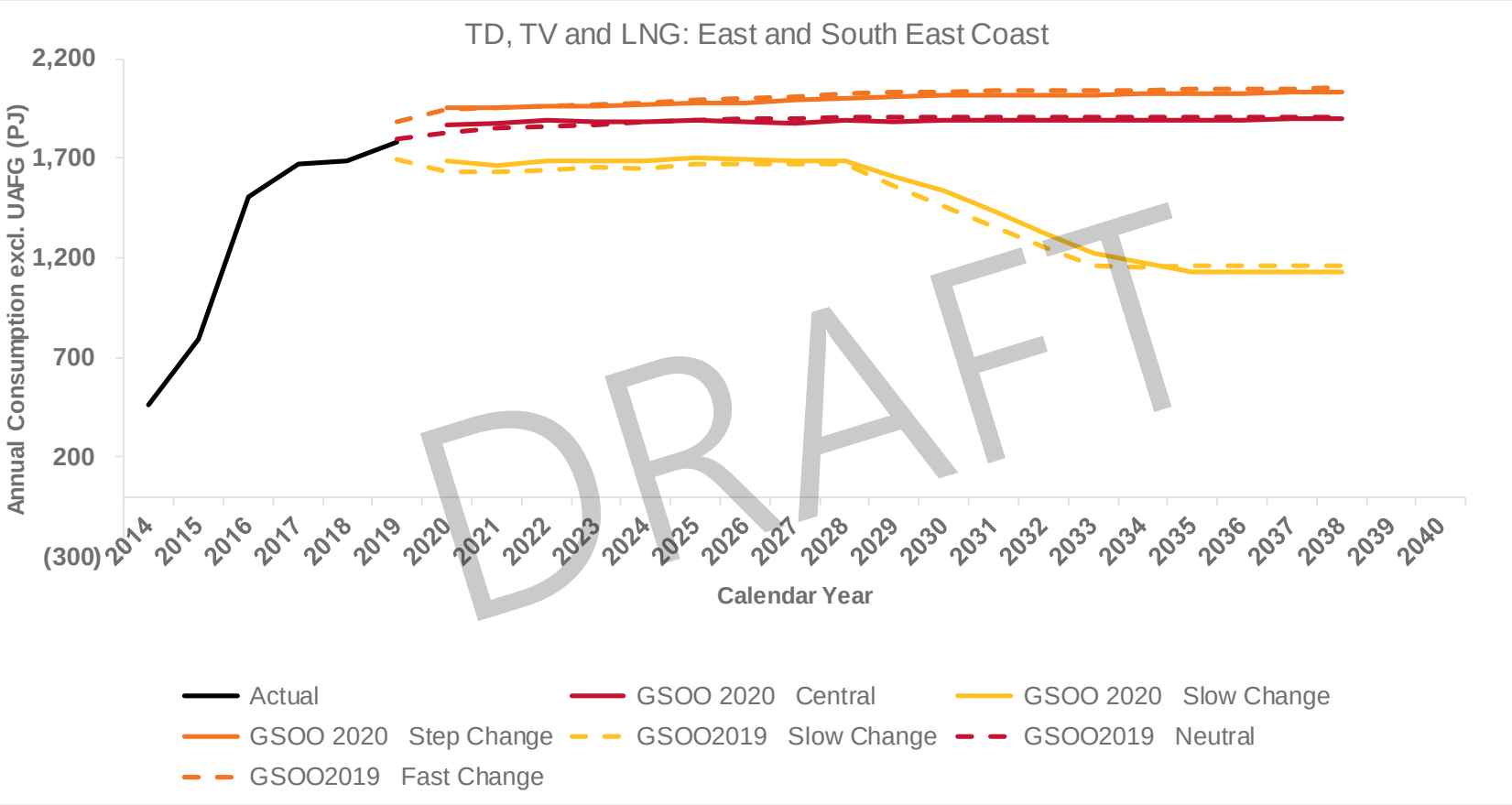
East Coast Trend all scenarios (TD+TV+LNG)

As the LNG sector is significantly larger than Tariff D and Tariff V the small changes in the LNG forecast drive most of the variation between the 2019 GSOO forecasts and the 2020 GSOO forecasts.



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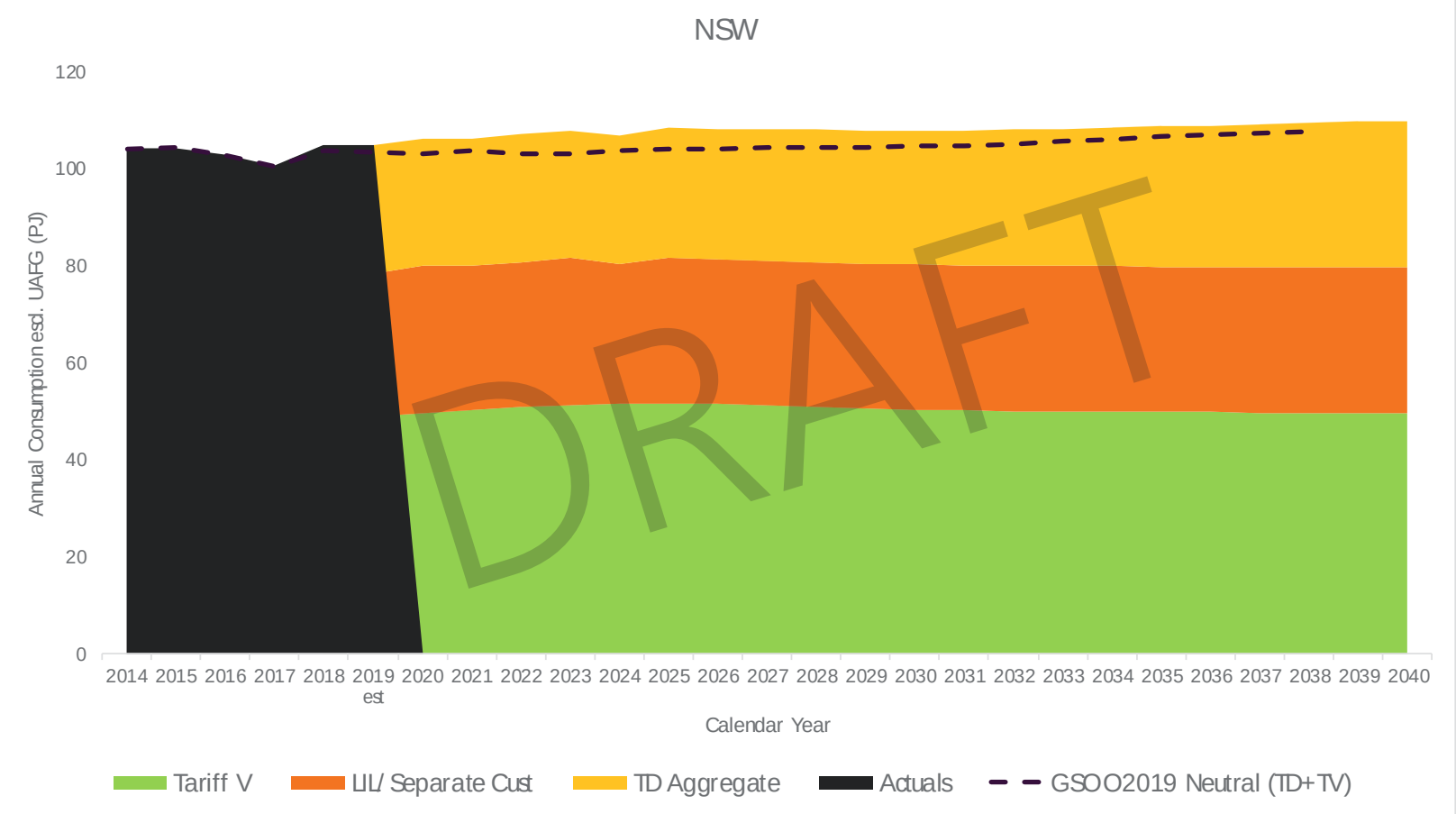
Regional Outlook

NSW Central
(Tariff D and Tariff V)

In the short-term, the Tariff V Central forecast ~5% higher, largely due to increases in expected connections. This growth is moderated in the long-term by energy efficiency and fuel switching impacts (in particular the ACT)

Tariff D is also slightly higher with recent trends reflecting a slight increase in consumption observed in the last few years.

Overall the forecast is higher in the 2020 Central scenario compared to the 2019 Neutral scenario.



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NSW scenarios
(Tariff D and Tariff V)

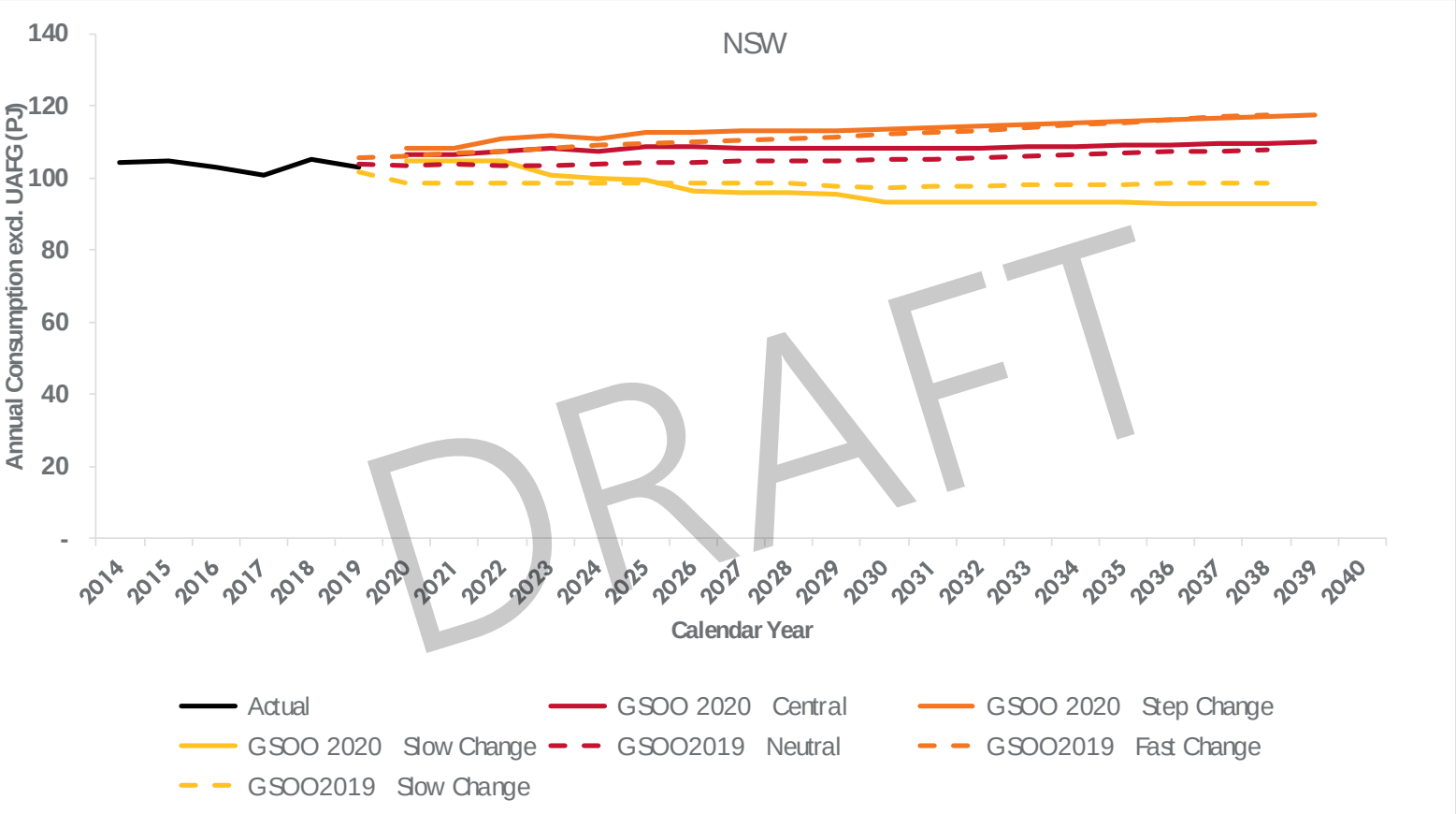
Tariff V growth is higher across all scenarios in the short- term due to new connections growth, but growth is moderated by energy efficiency and fuel switching impacts (in particular the ACT)

Tariff D changes are largely driven by LIL forecasts including, in all scenarios:

- Increased consumption of some large facilities in the earlier forecast years due to improved survey and interview engagement

And in the Slow Change scenario:

- Later closures of marginal facilities due to updated contractual information



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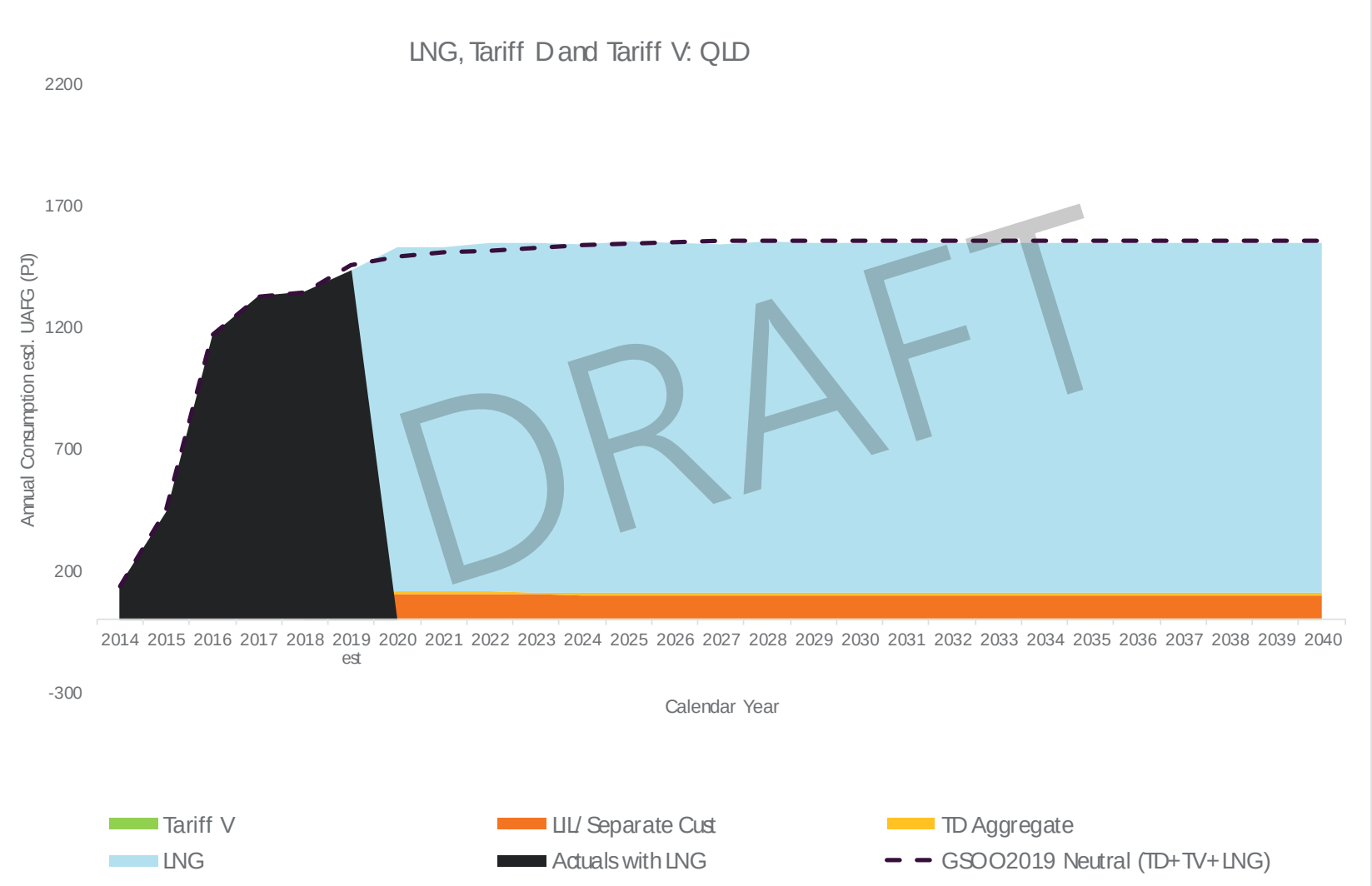
QLD Central
(Tariff D, Tariff V and LNG)

As QLD consumption is strongly influenced by LNG, the main trends are largely explained by the LNG sector trends (refer to the LNG slide in the main section of the pack)



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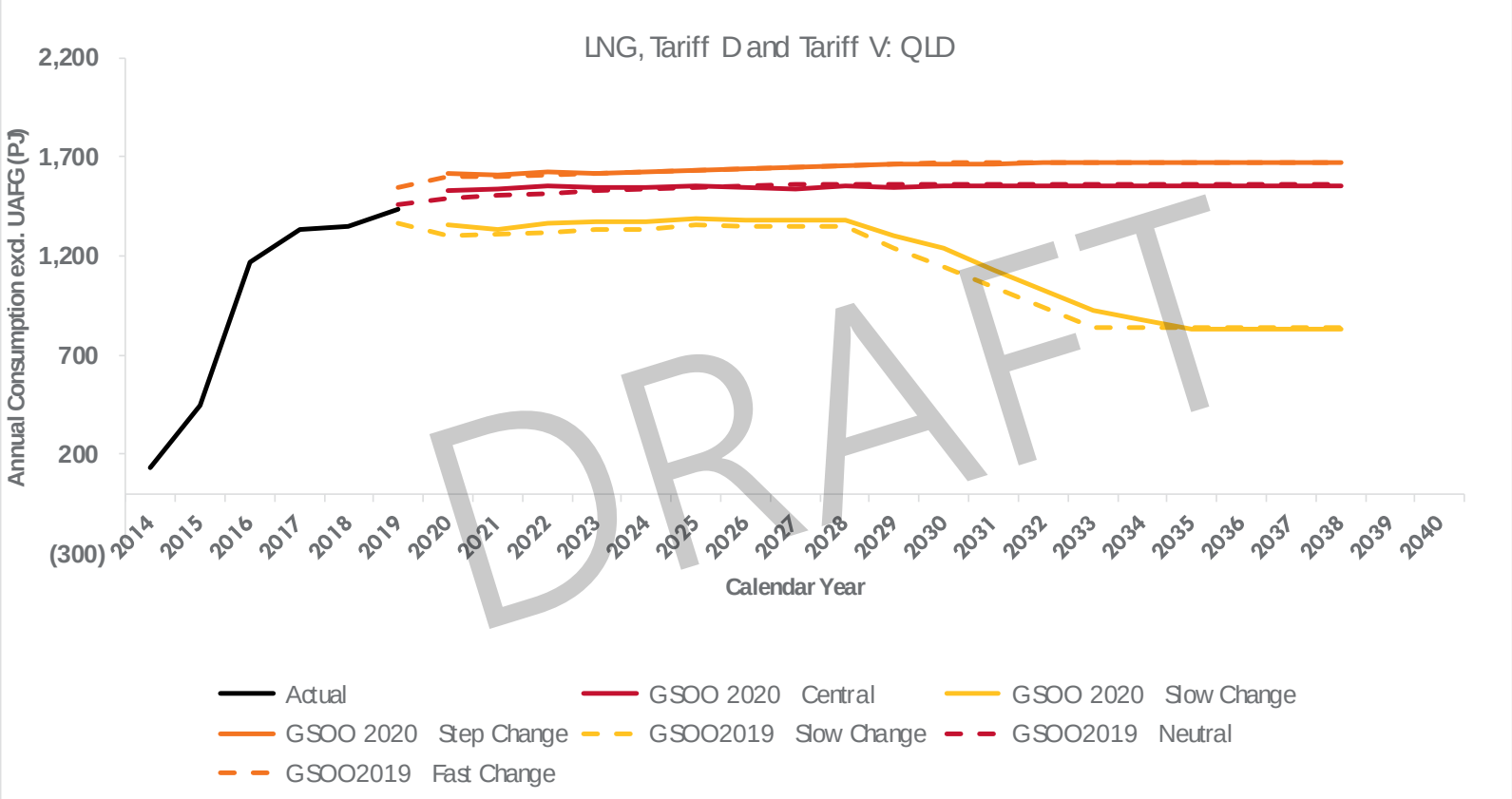
QLD Scenarios (Tariff D, Tariff V and LNG)

As QLD consumption is strongly influenced by LNG, the main trends are largely explained by the LNG sector trends (refer to the LNG slide in the main section of the pack)



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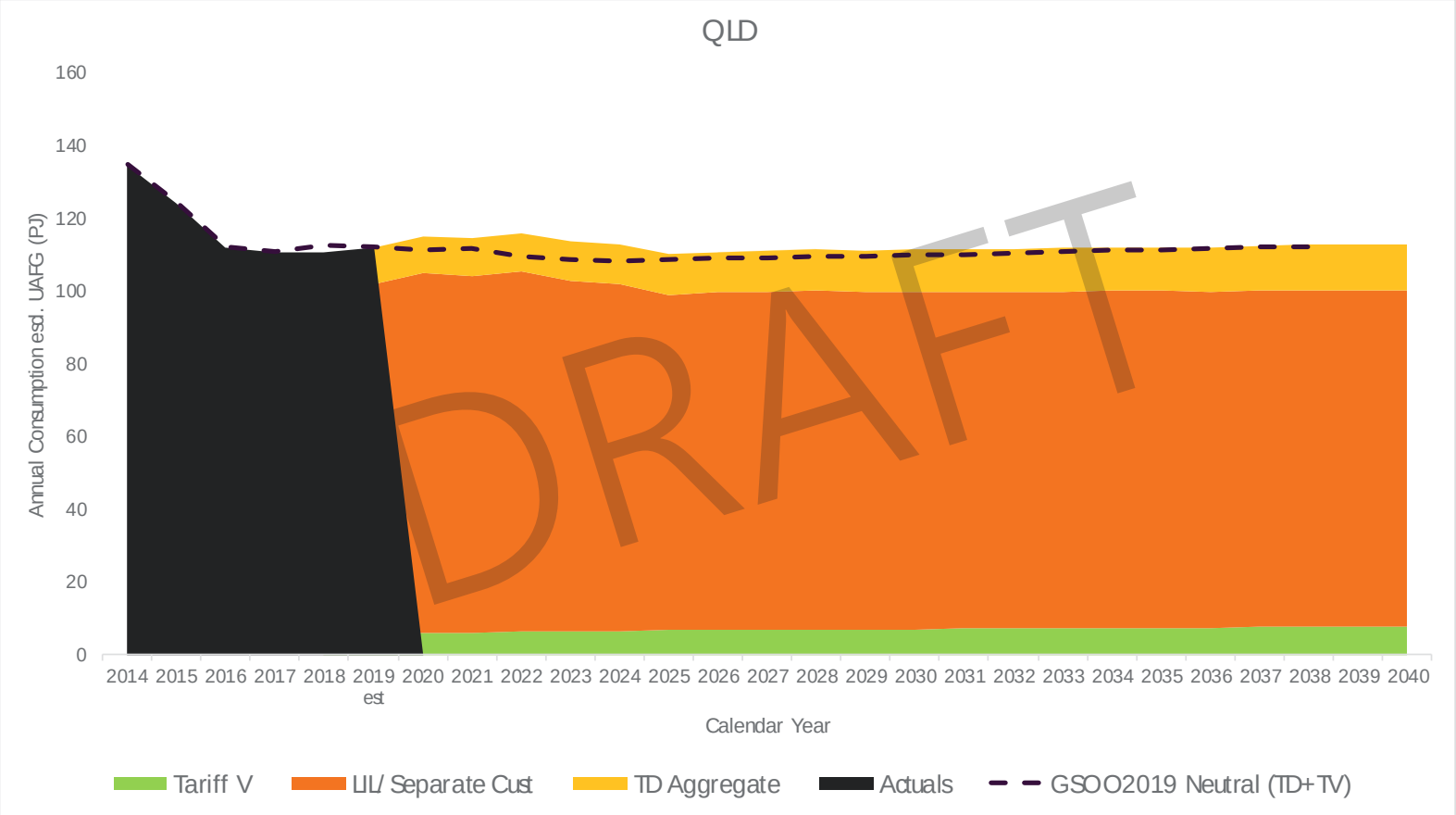
QLD Central
(Tariff D and Tariff V)

The 2020 Central Tariff V outlook is similar to the 2019 Neutral forecast.

Tariff D changes are largely driven by short-term forecast increases from LILs.

Overall the forecast is higher in the 2020 Central scenario compared to the 2019 Neutral scenario largely due to Tariff D updates.



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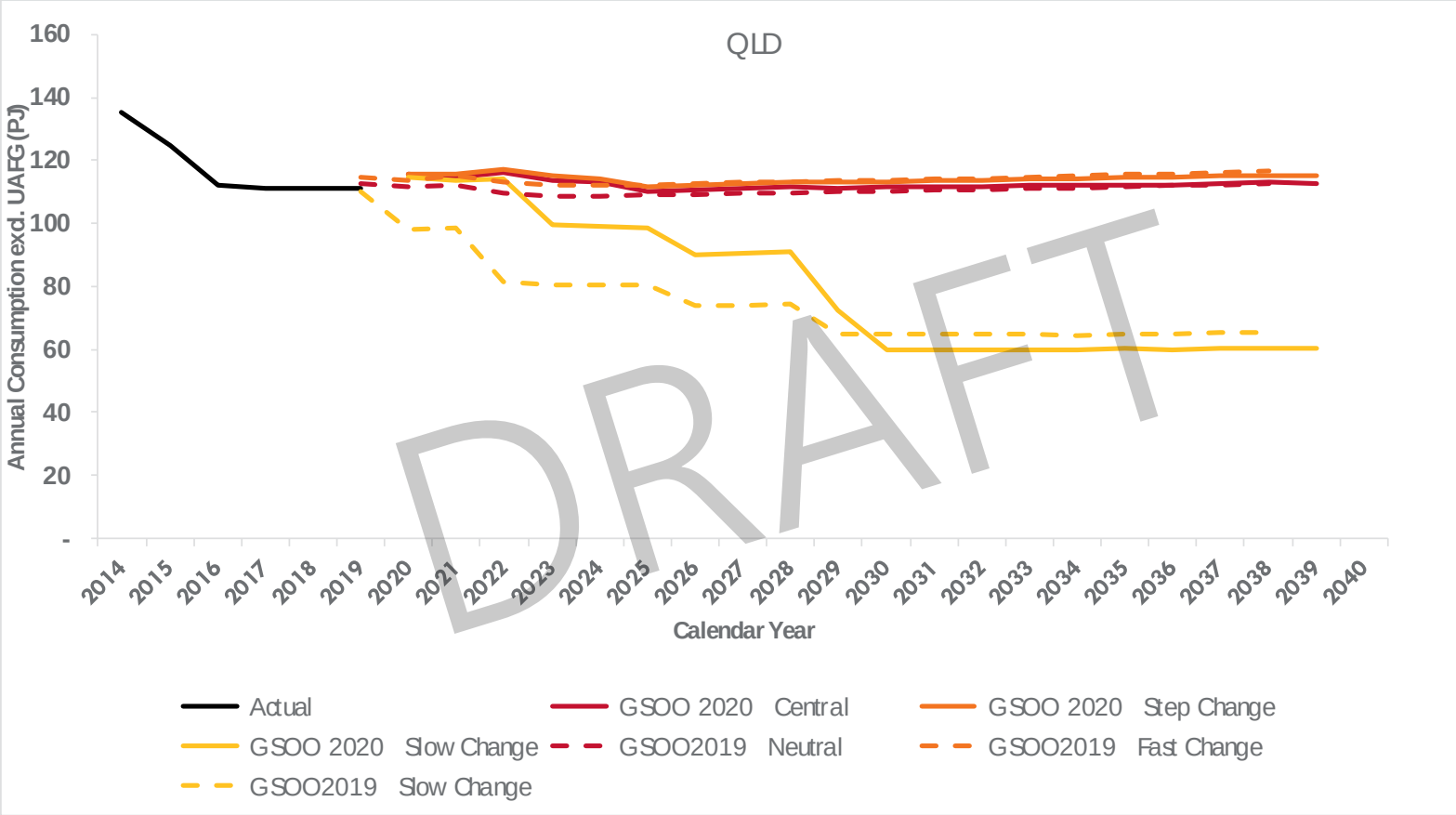
QLD Scenarios
(Tariff D and Tariff V)

The Tariff V outlook is slightly lower in the 2020 Step Change scenario compared the 2019 Fast Change forecast following an increase in energy efficiency impacts. Other scenarios remain similar.

The Tariff D outlook reflects the updated LIL forecasts based on updated survey and interview information including:

- Growth in consumption forecast over the short term for several large LIL facilities.
- Revised closures of marginal facilities due to updated information provided during interviews



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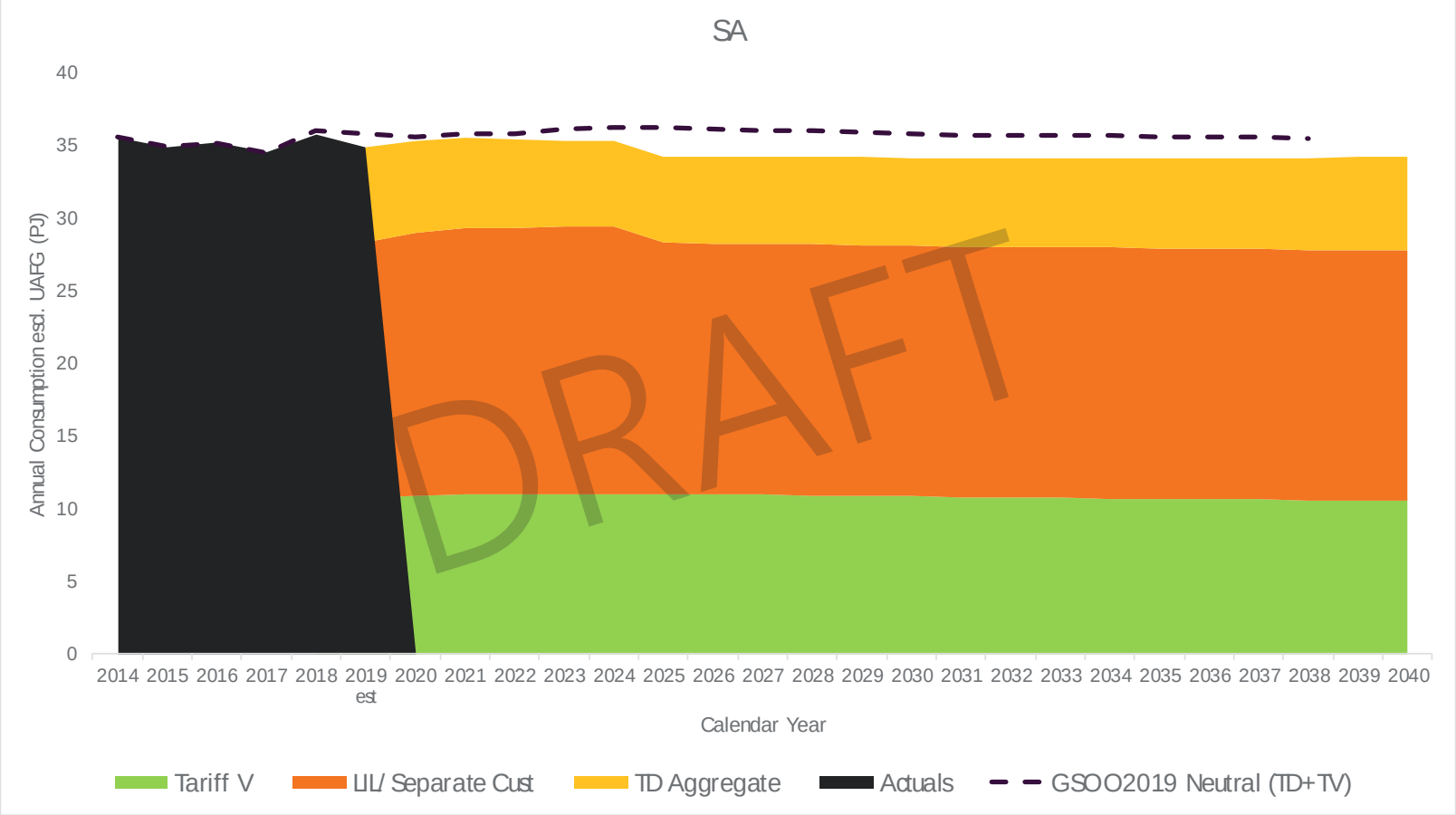
SA Central
(Tariff D and Tariff V)

The Tariff V 2020 Central scenario forecast sits slightly higher (~5%) than the 2019 Neutral forecast from slightly higher connections forecast and an updated view of residential-commercial usage proportions.

Tariff D forecast to be slightly lower in the short-term for the smaller aggregate consumers and LILs but with some expected reductions from certain facilities switching away from gas in their production.

Overall, Tariff D drives the lower forecast.



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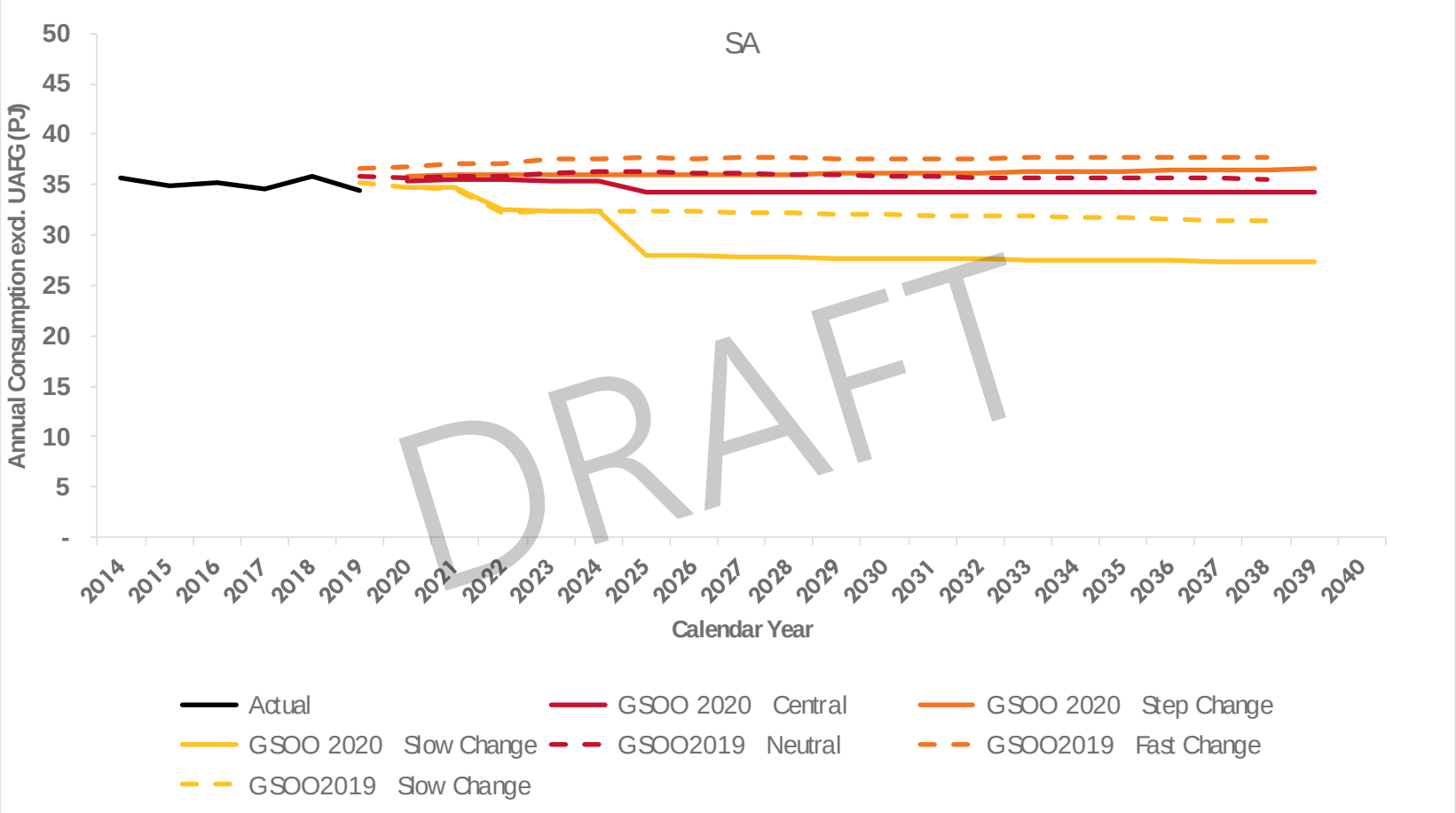
SA Scenarios
(Tariff D and Tariff V)

Tariff V growth is higher in SA across all scenarios, reflecting the update to residential and commercial customer usage and higher connections forecast.

Tariff D spread largely driven by LIL changes with some closures and updates for fuel switching and energy efficiency initiatives for some facilities.

Due to the size of the Tariff D sector, the updates performed dominate the overall outlook.



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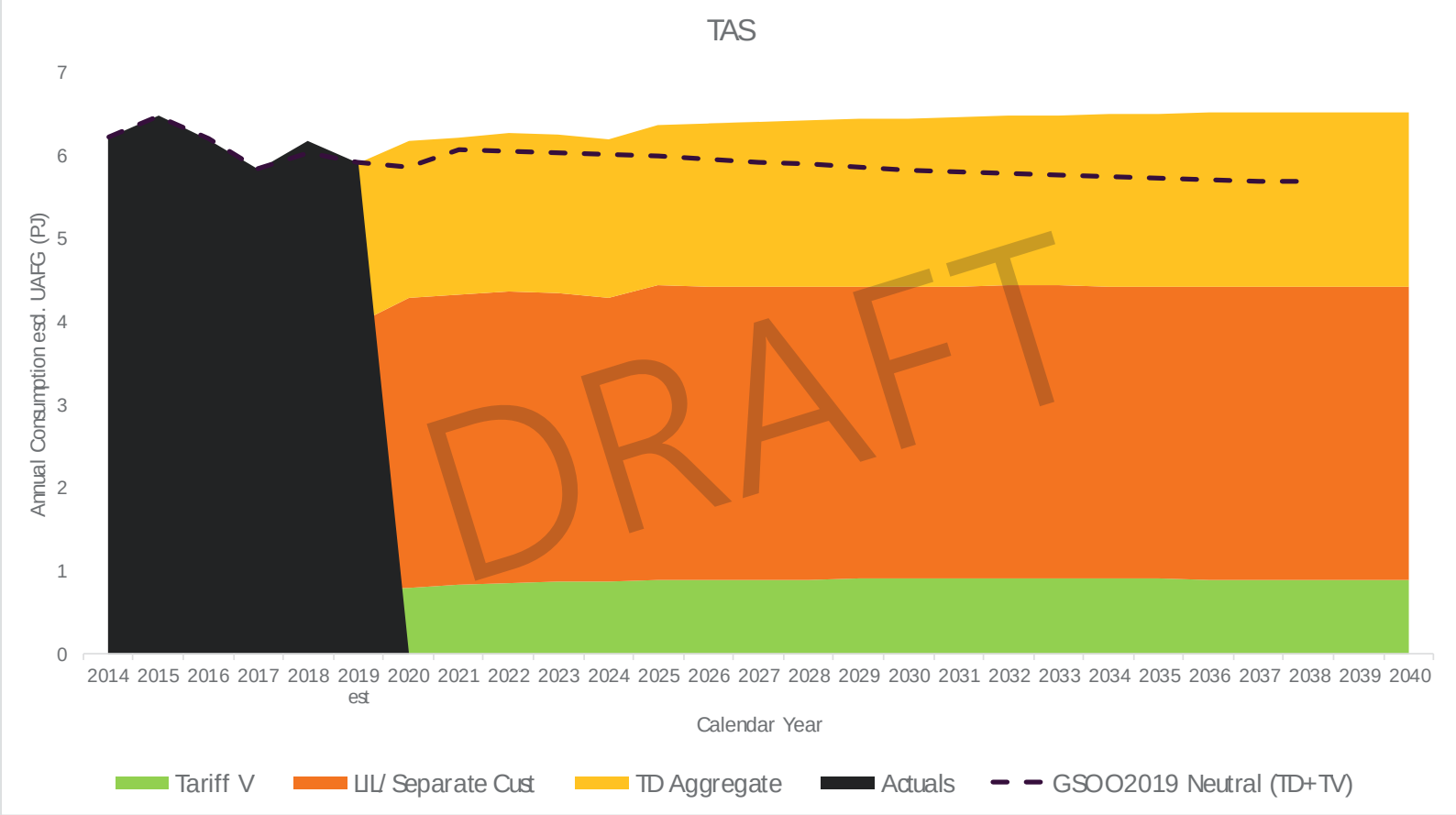
Tas Central
(Tariff D and Tariff V)

Tariff V projects slightly higher growth by 2040 , driven mainly from new connections.

Tariff D forecast to remain relatively flat, with LILs showing a flat outlook and only minor increases in consumption from the smaller aggregate base due to expected increases in GSP.

Overall the 2020 Central forecast is higher than the 2019 Neutral forecast.



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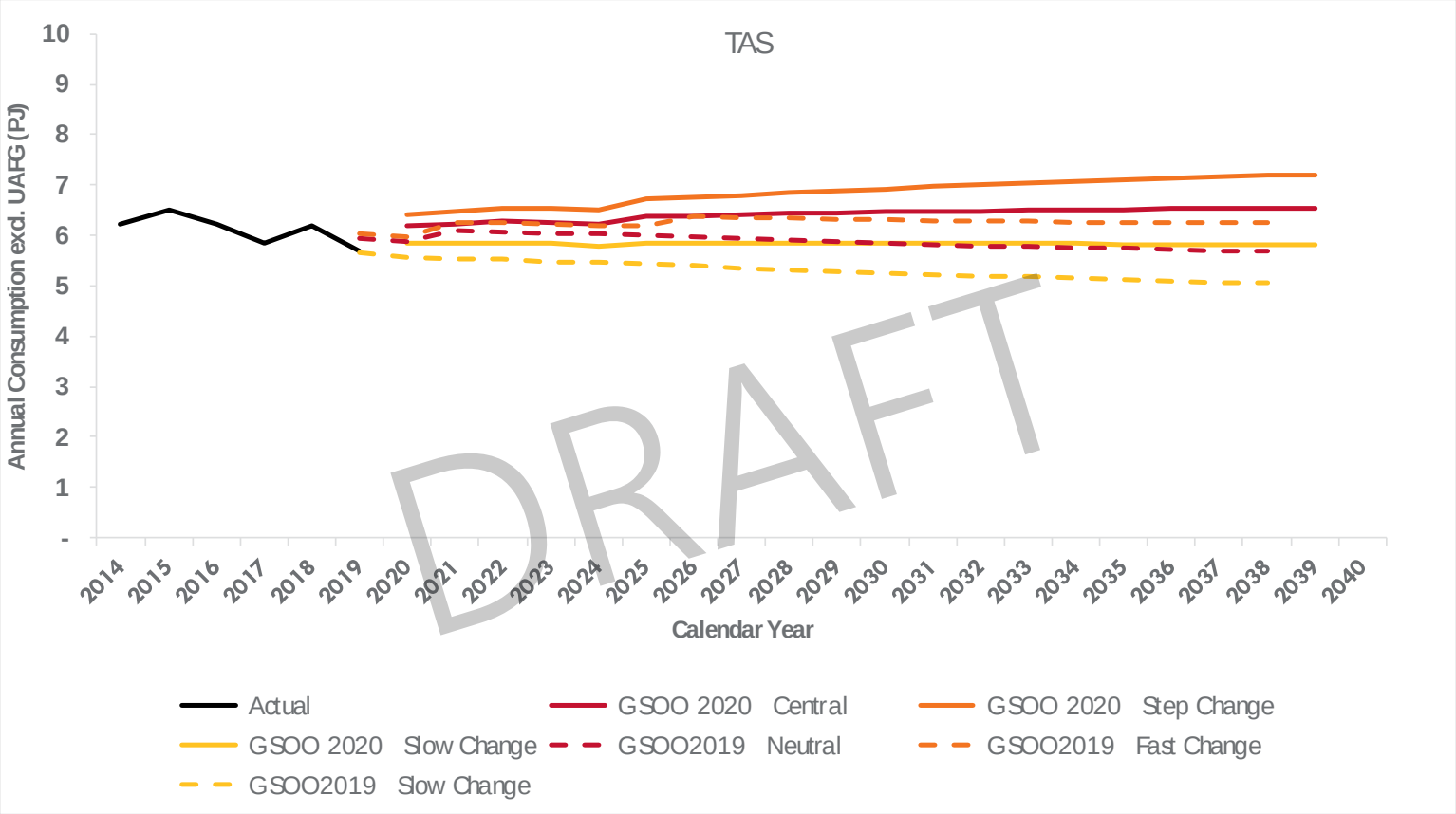
Tas Scenarios
(Tariff D and Tariff V)

Tariff V projects slightly higher growth in Central and Step Change scenarios by 2040, mainly driven by higher growth in new connections in the short-term.

Tariff D Aggregate dispersion driven by historical pattern, variation in GSP and forecast effects from price elasticity.

Updated LIL forecasts are approx. 0.2 PJ higher, reflecting the latest information provided by LIL survey participants.



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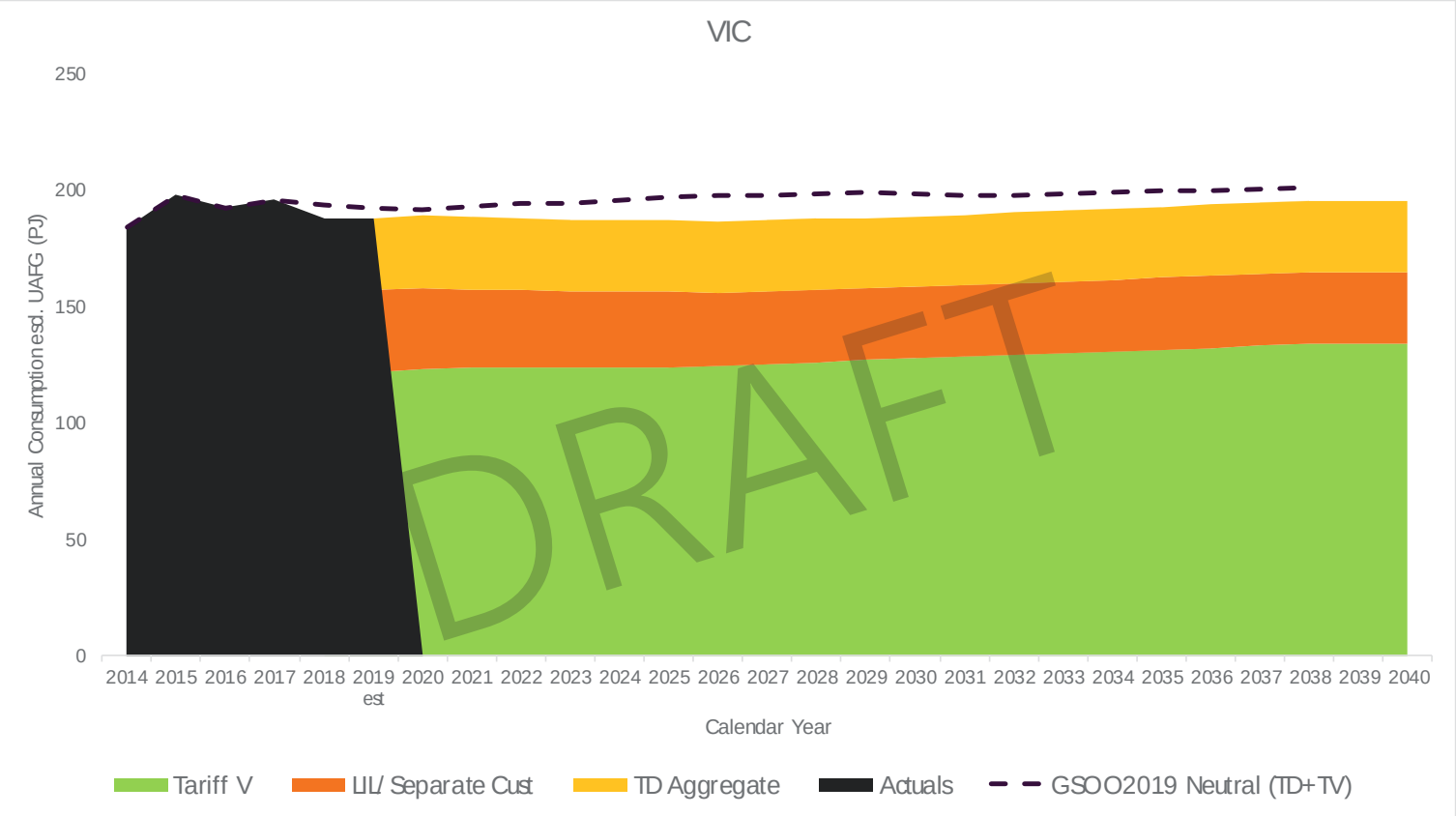
VIC Central
(Tariff D and Tariff V)

Tariff V projects lower growth due mainly to lower connections and an updated view of residential-commercial usage proportions

Tariff D is also reduced relative to the 2019 forecast as it now includes the recently announced closure of Albury paper mill in 2020 and other energy productivity improvements from industrials.

Overall, the outlook for 2020 sits slightly lower than the 2019 forecast.



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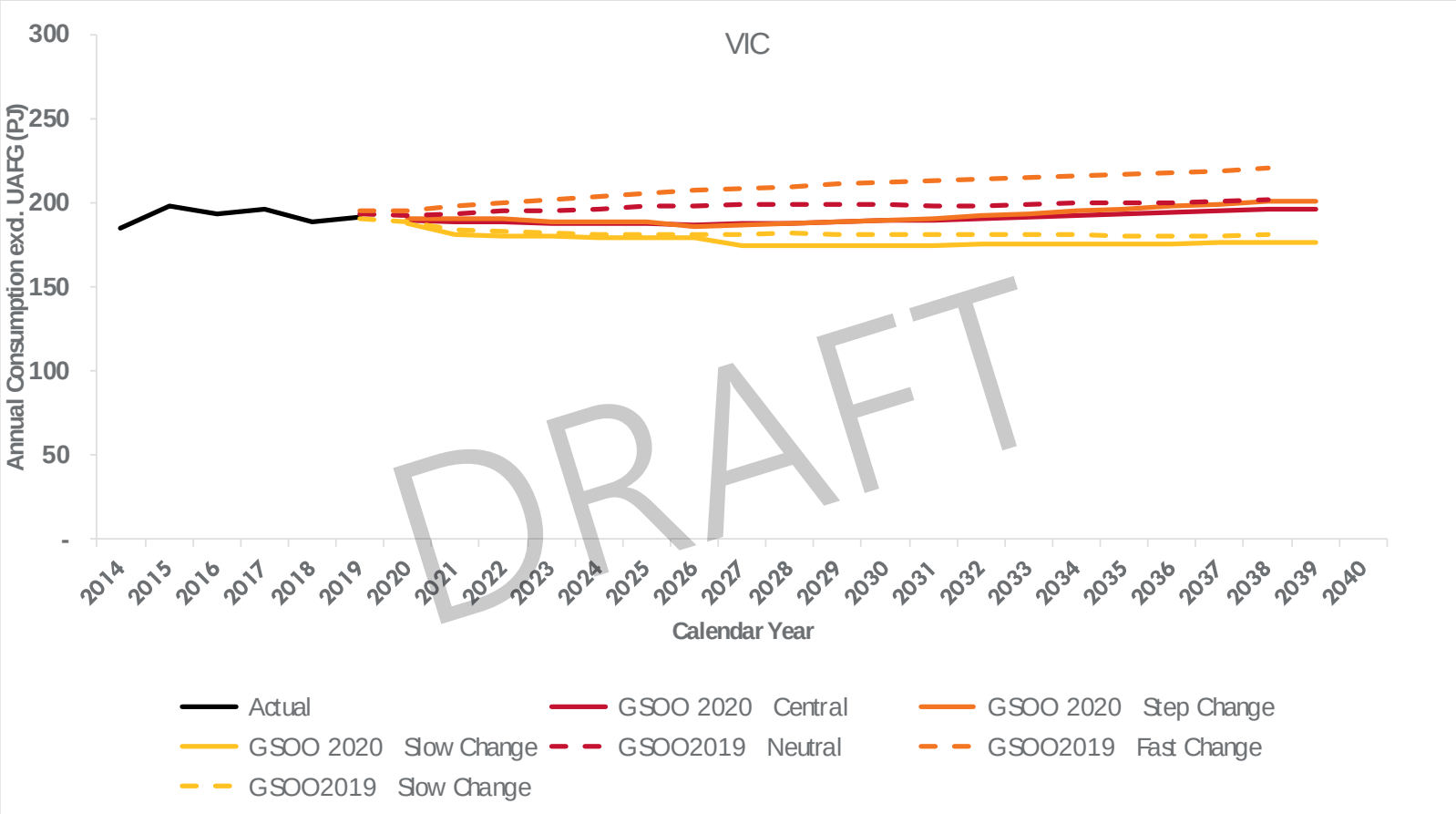
VIC Scenarios (Tariff D and Tariff V)

For all scenarios the Tariff D outlook is lower in 2020:

- from the application of publicly announced closures,
- a trend in the short- medium-term of lower consuming sites despite growth in the number of new connections.

The 2020 Slow Change scenario relative to the 2019 Slow Change includes some noted plans by facilities for waste to energy offsetting facility gas consumption from 2026 and closures.

. The 2020 Step Change Tariff V is also lower than the 2019 Fast Change forecast mainly due to a lower connections forecast, residential-commercial usage and a higher Fuel Switching impact



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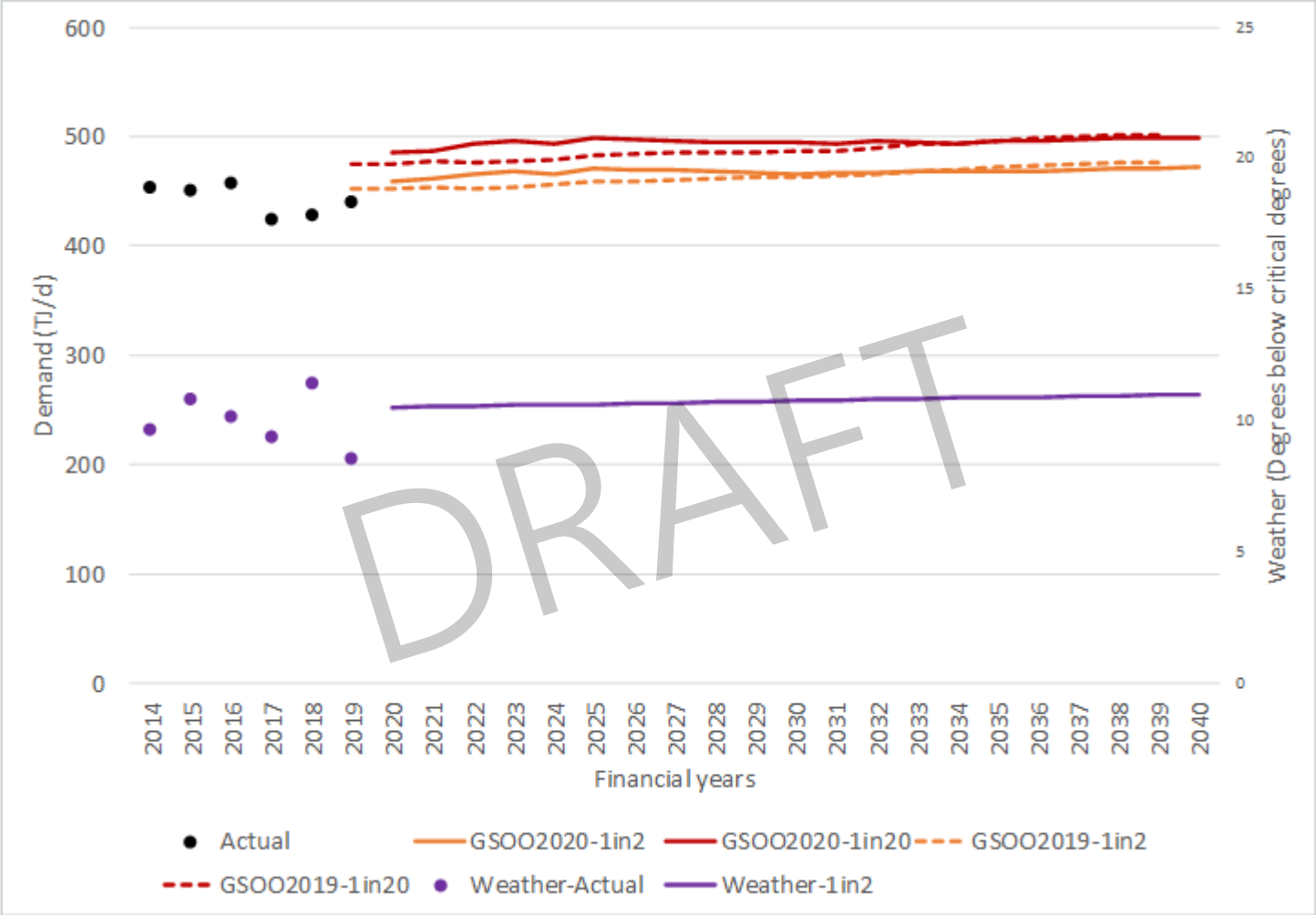
Draft Peak Day Gas

GSOO 2020

NSW – Winter
(draft)

- Residential, Commercial and Industrial demand only
- 2020 Central & 2019 Neutral
- Winter

- Key Updates:
  - Continued upward trend in peakday due to growth in Tariff V demand in the first 10 years driven by forecast connections growth
  - This growth is stronger than the growth projected in GSOO2019 in the first few years
  - The correlation of weather and demand is driven by the proportion of Tariff V among other things
  - In NSW tariff V is 59% of total peak day



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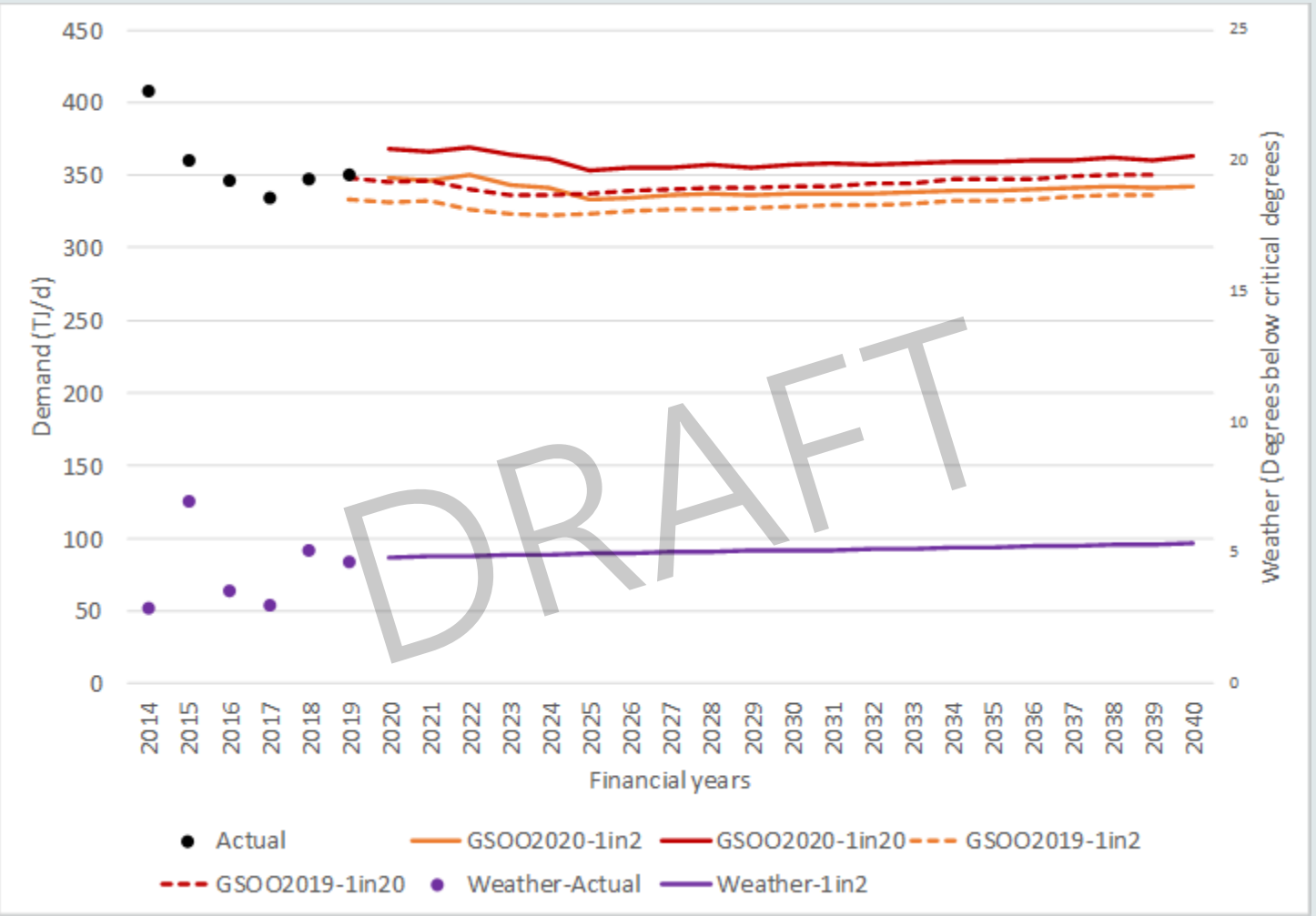
Qld – Winter
(draft)

- Residential, Commercial and Industrial demand only
- 2020 Central & 2019 Neutral
- Winter

- Key Updates:
  - Growth between 2019 forecast and 2020 forecast due to step up in Tariff D driven by advised increase in LIL consumption
  - Tariff D steadily declines between 2022 and 2025
  - Tariff V is 7% of total peak day



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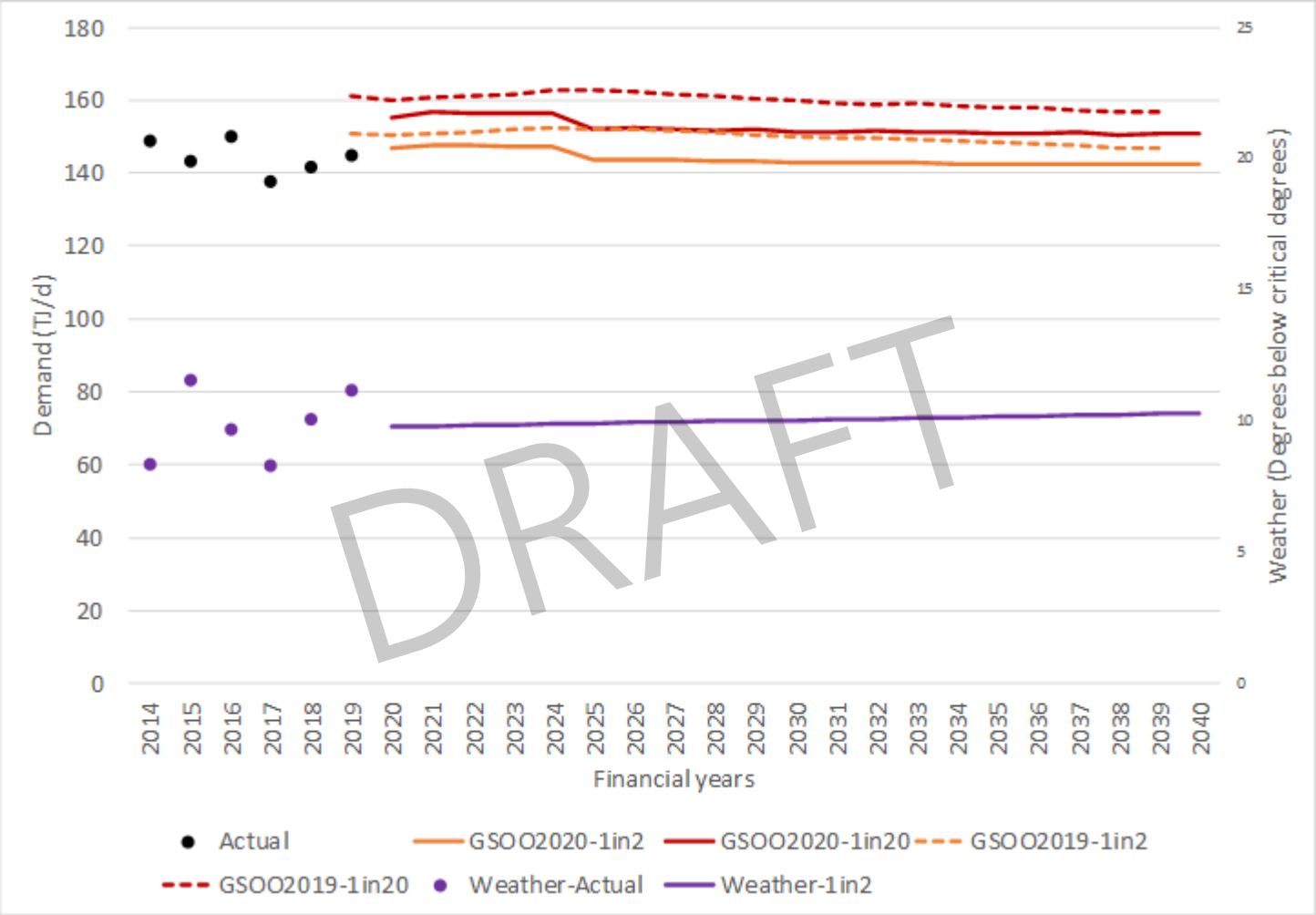
SA – Winter
(draft)

- Residential, Commercial and Industrial demand only
- 2020 Central & 2019 Neutral
- Winter

- Key Updates:
  - Actual demand in 2019 was lower than forecast POEs due to over forecast in Tariff D growth in the GSOO 2019.
  - Tariff D has been updated accordingly
  - Further decline in Tariff D forecast in 2024 due to decline in LILs - some facilities are switching away from gas
  - Tariff V is 45% of total peak day



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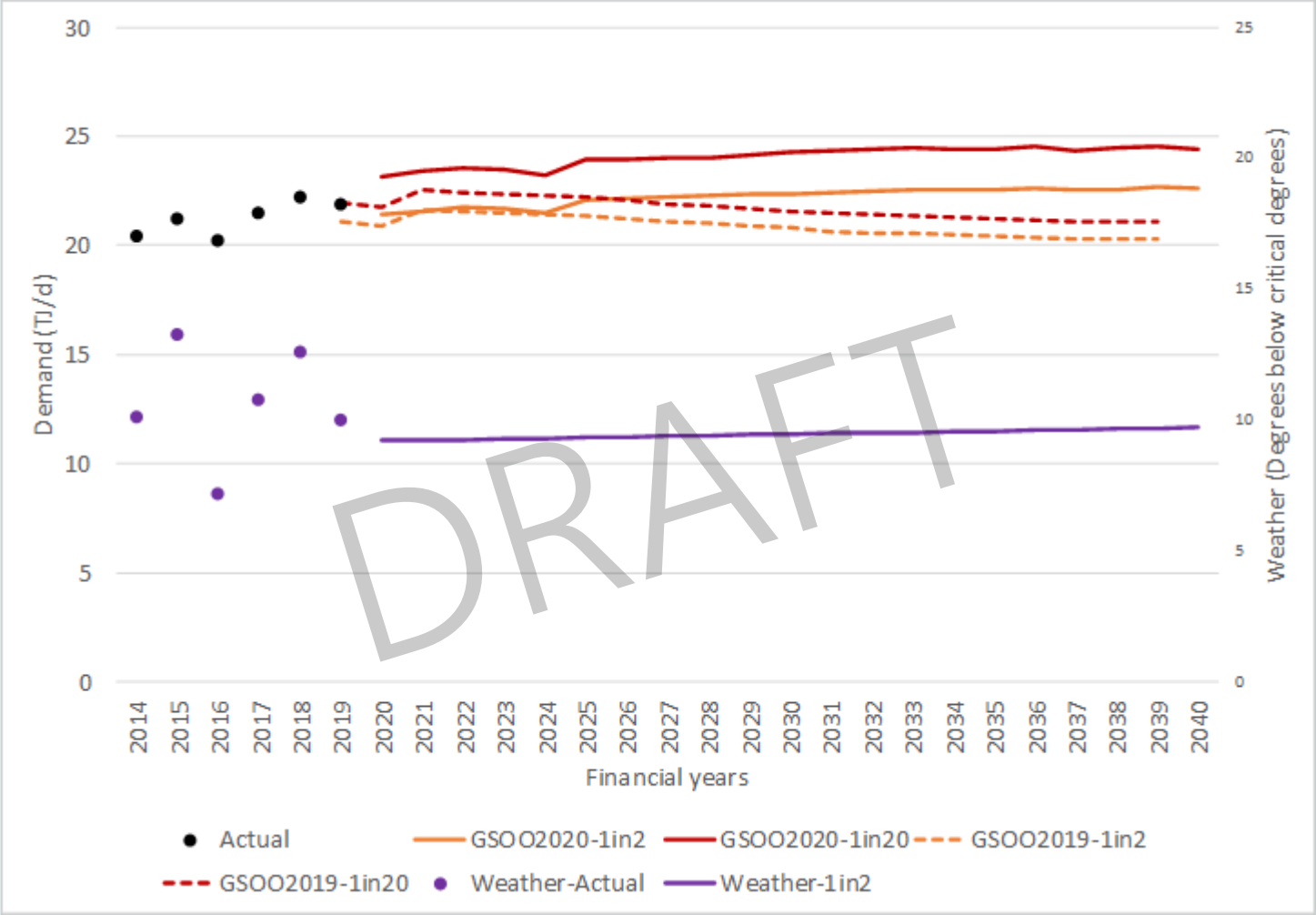
Tas – Winter
(draft)

- Residential, Commercial and Industrial demand only
- 2020 Central & 2019 Neutral
- Winter

- Key Updates:
  - Increase in Tariff V and Tariff D demand in the short term increasing peakday
  - Tariff V growth driven by new connections
  - LIL increasing in the first years then a dip in 2024 due to planned LIL maintenance
  - Tariff V is 15% of total peak day



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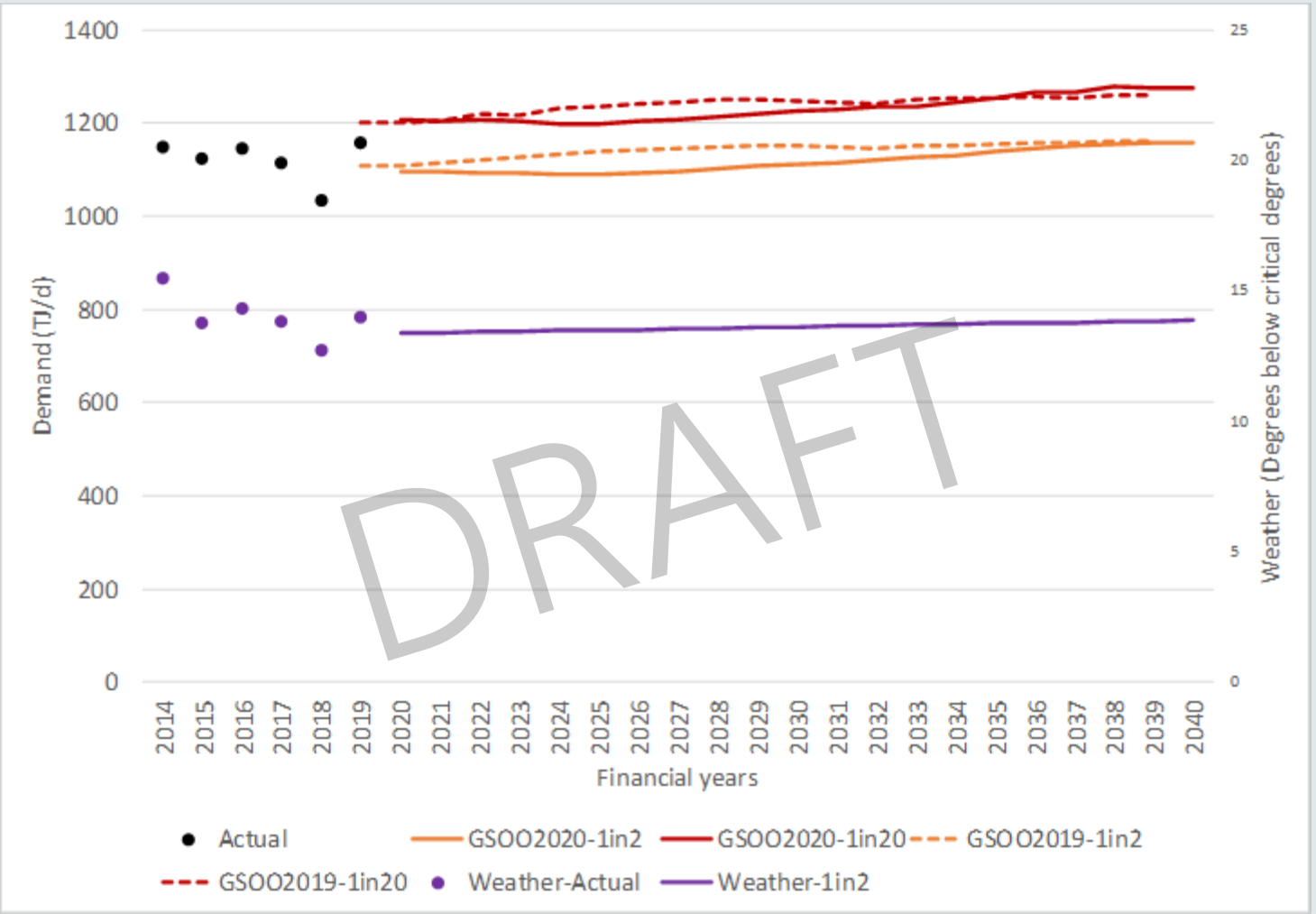
Vic – Winter
(draft)

- Residential, Commercial and Industrial demand only
- 2020 Central & 2019 Neutral
- Winter

- Key Updates:
  - Peakday forecast lower than last year due to lower tariff V driven by lower connections and residential-commercial usage proportions
  - Tariff D peakday decline reflects recently announced closure of Albury paper mill in 2020
  - Tariff V is 80% of total peak day, the largest proportion of all the regions



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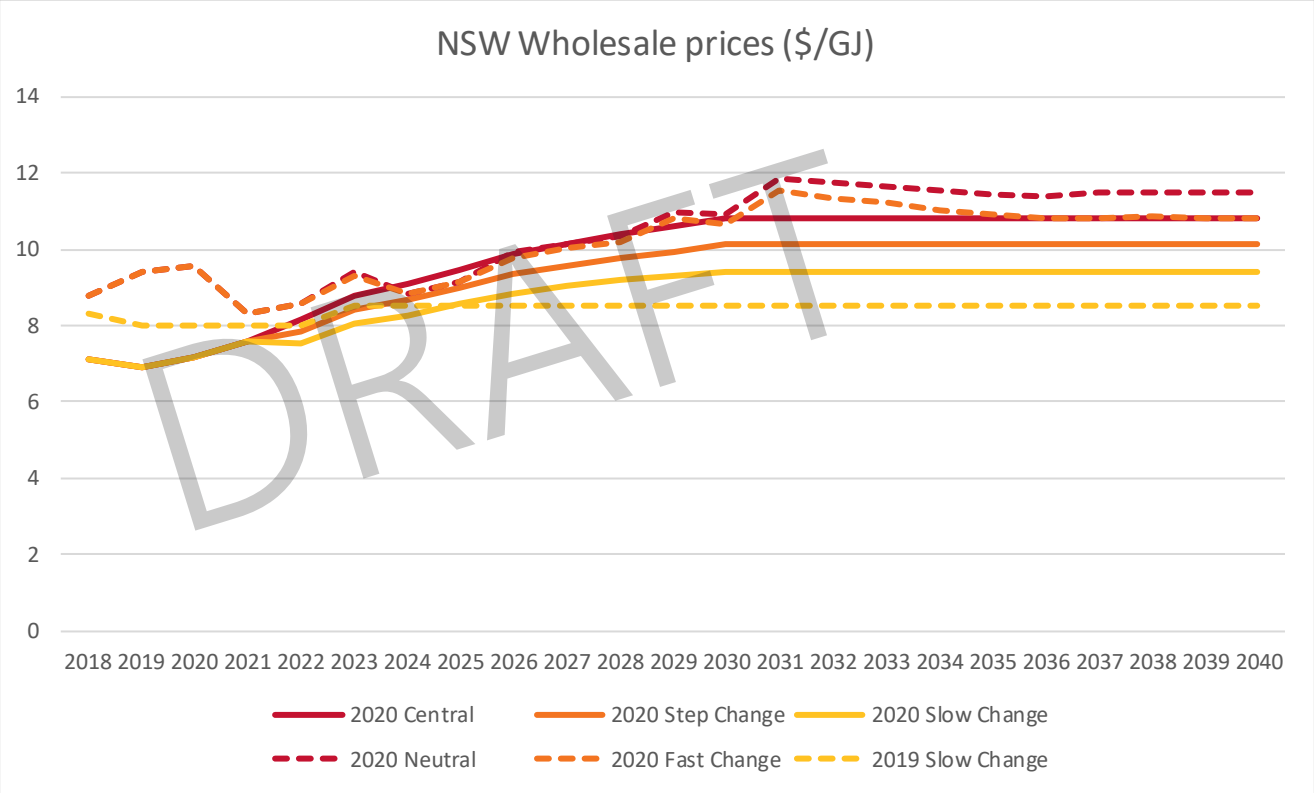
Appendix

Regional Trends and Detail

Price: NSW

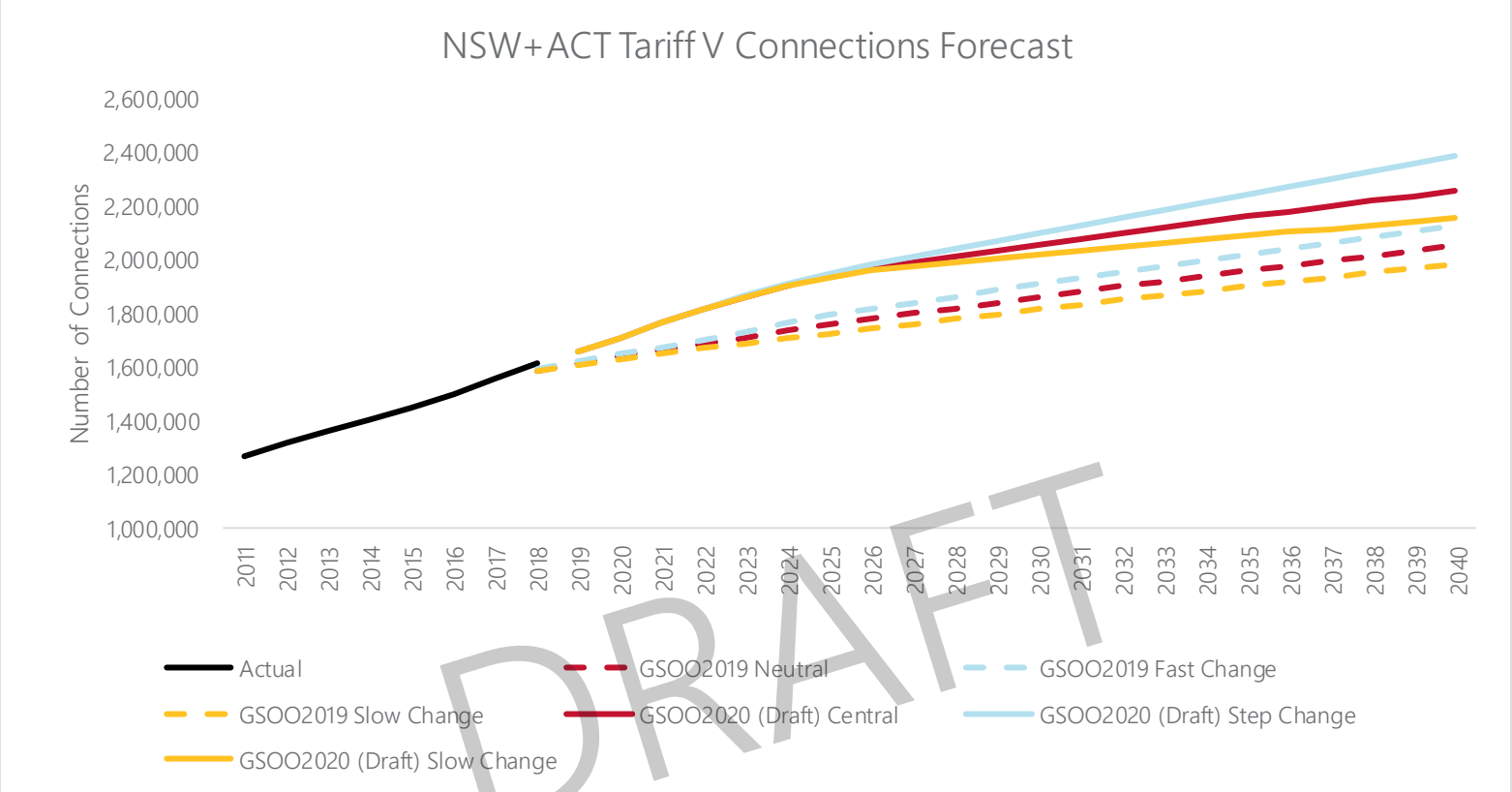
Wholesale Prices

- Core were engaged by AEMO to prepare the wholesale prices for the 2020 GSOO
- AEMO selected Core's Central (Upper) scenario as AEMO's Central scenario, Core's Central (Lower) scenario as AEMO's Slow Change scenario, with the average of the two forming AEMO's Step Change scenario.
- CORE assumes a starting point of contract prices of close to $7/GJ , consistent with ACCC disclosures
- The progressive increase in Eastern Australia to 2032 is primarily the result of assumed linkage between domestic wholesale prices and LNG prices, which are expected to flatten in the longer term due to supply/demand balance.
- Variances between regions are due to differences in assumed contract profiles, existing contract prices and also differences in transportation and storage costs.



NSW (Connections)

The annual average growth rate of connections in NSW has been 3.5% over the last 7 years. Incorporation of this trend into the first 5 years of the forecast has significantly revised the connections forecast



NSW+ACT have had the highest revision (+200,000 connections by 2040) driving the growth.

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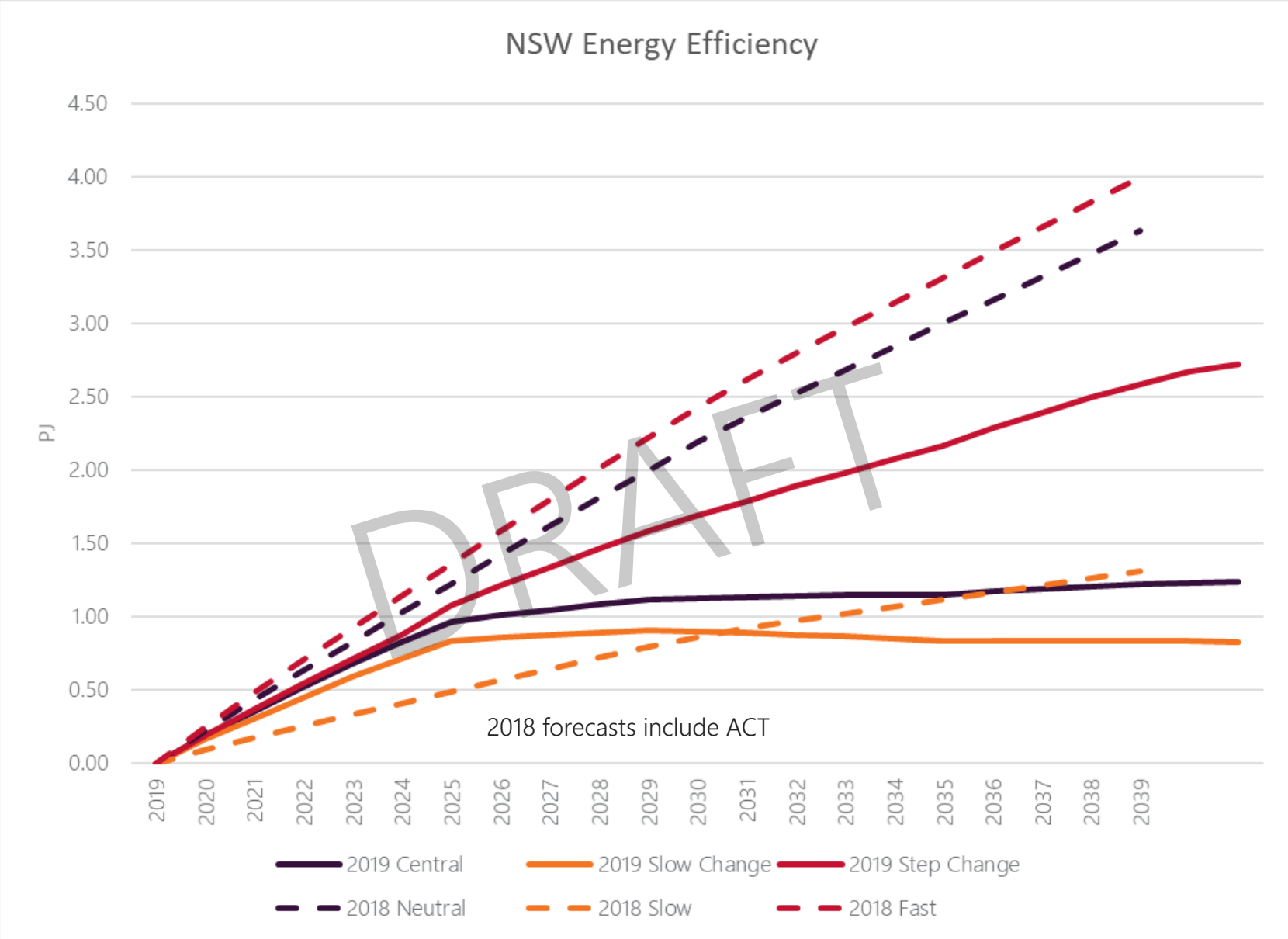
Energy Efficiency: NSW (excl. ACT)

Differences from

- Changes in SPR model and other post-model adjustments by AEMO for the 2019 GSOO
- Improved state-based data for the NSW Energy Savings Scheme from the NSW Govt



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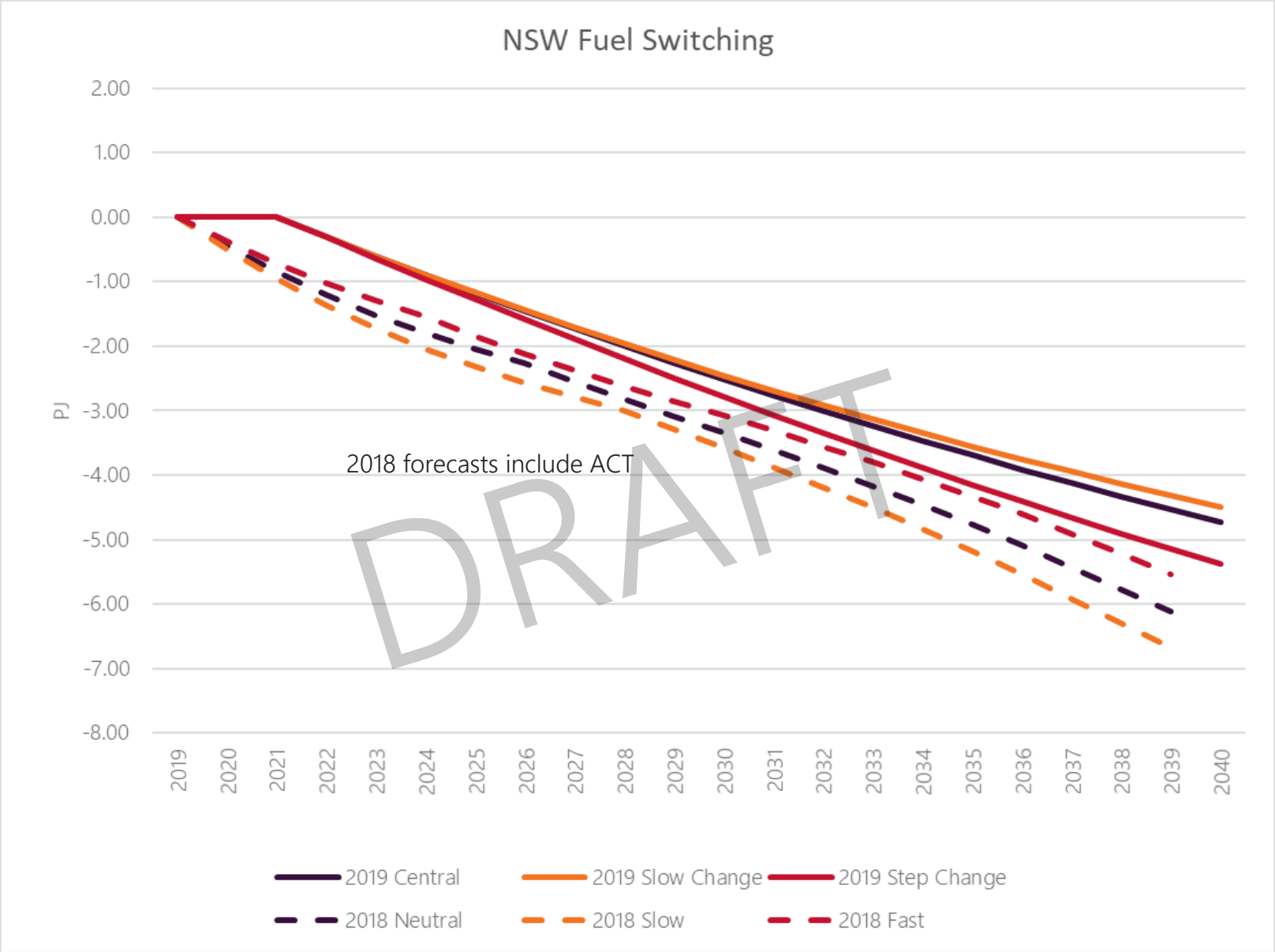
Fuel Switching: NSW (excl. ACT)

- The 2020 GSOO forecast excludes ACT, so fuel switching effect appears less than for the 2019 GSOO
- The 2020 water heating model estimates impact of policy measures whereas the 2019 GSOO estimates the savings of shifting from 3 to 5 star gas appliances
- The 2020 space heating model estimates impact of policy measures based on DoEE data, whereas the 2019 GSOO makes assumptions on the transition from gas to electric space heating



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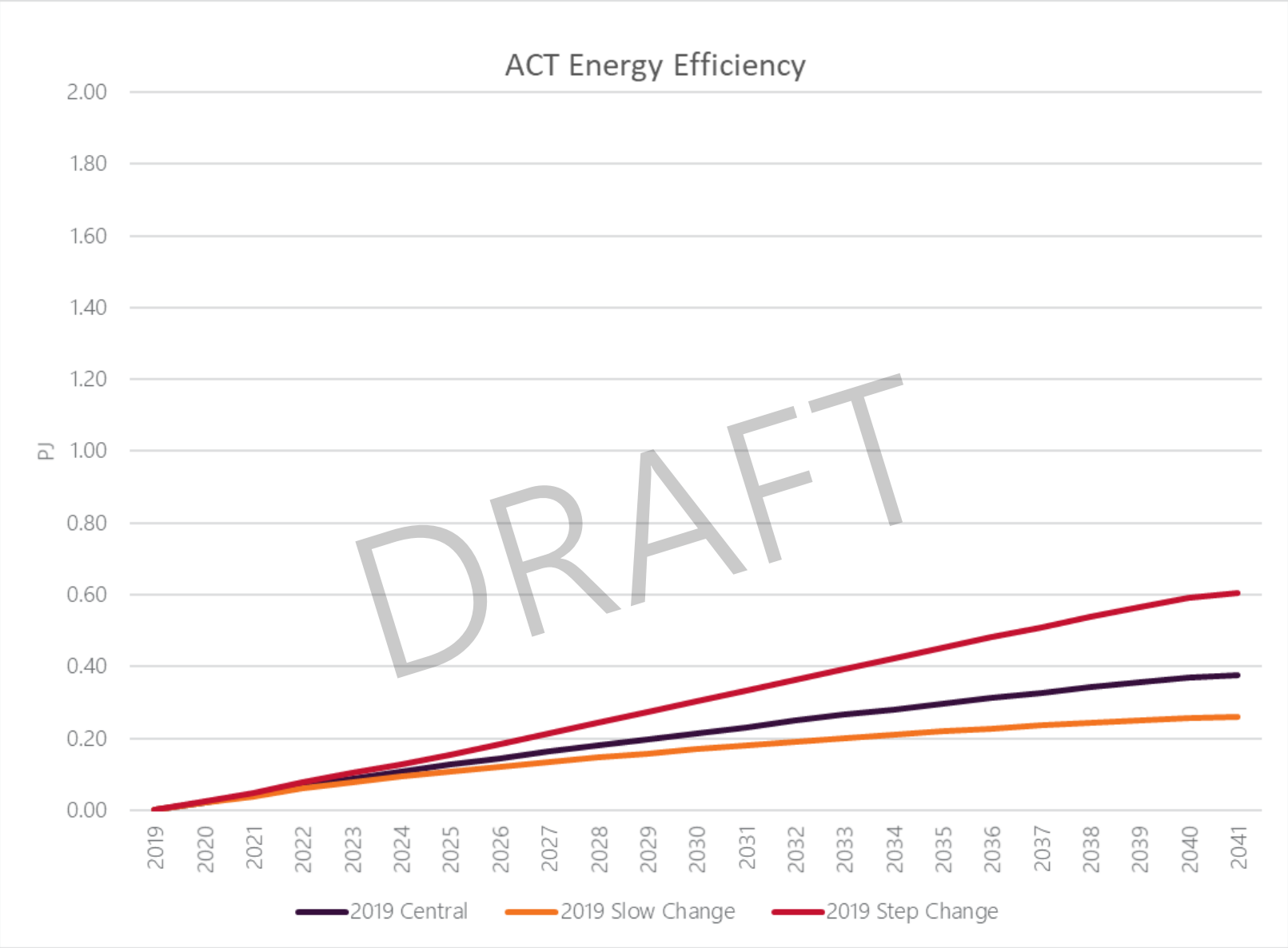
Energy Efficiency: ACT

In 2020 GSOO, the ACT is modelled separately for the first time.



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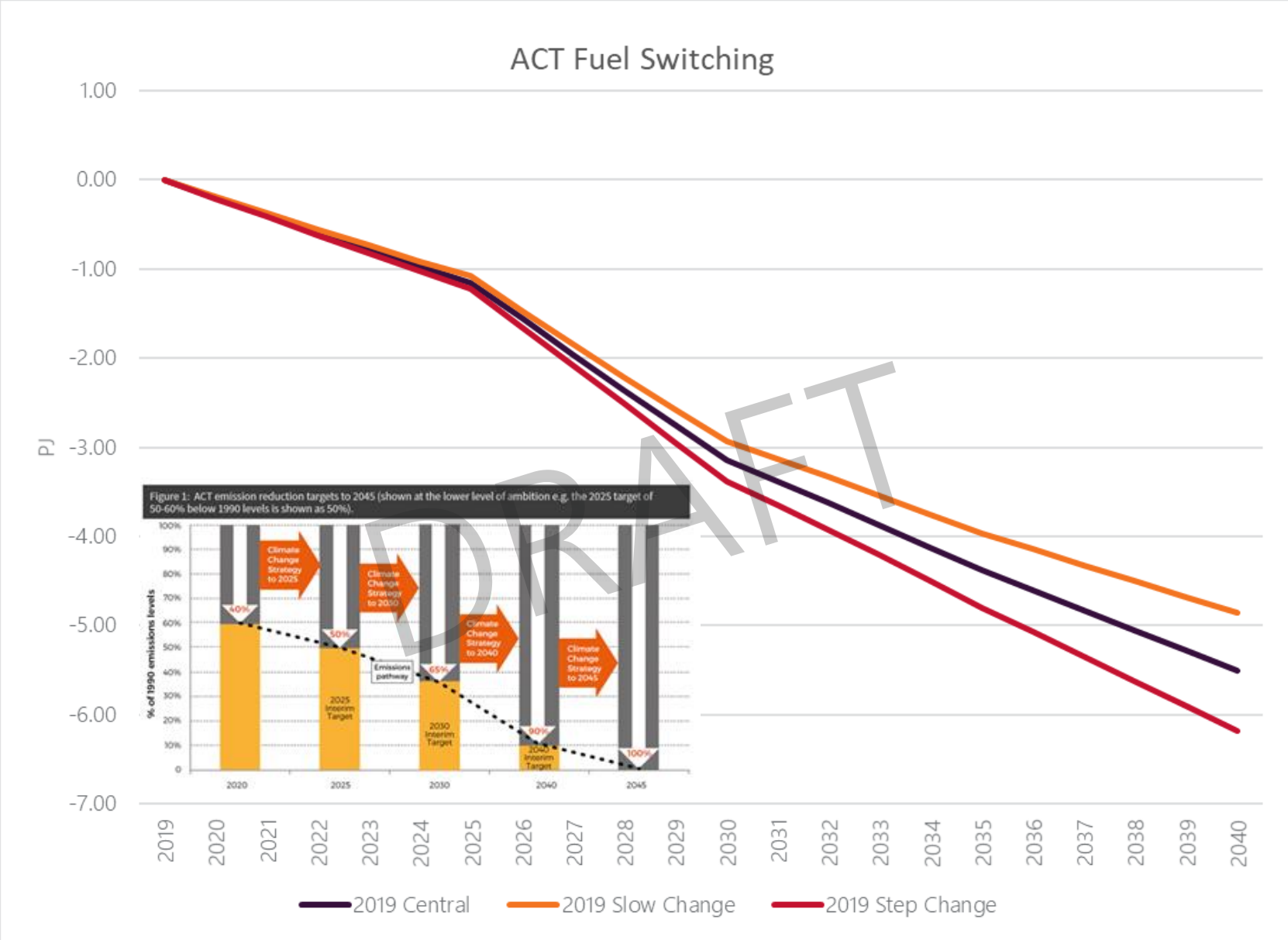
Fuel Switching: ACT

ACT Climate Change Strategy legislated to transition to net zero emissions from gas by 2045.



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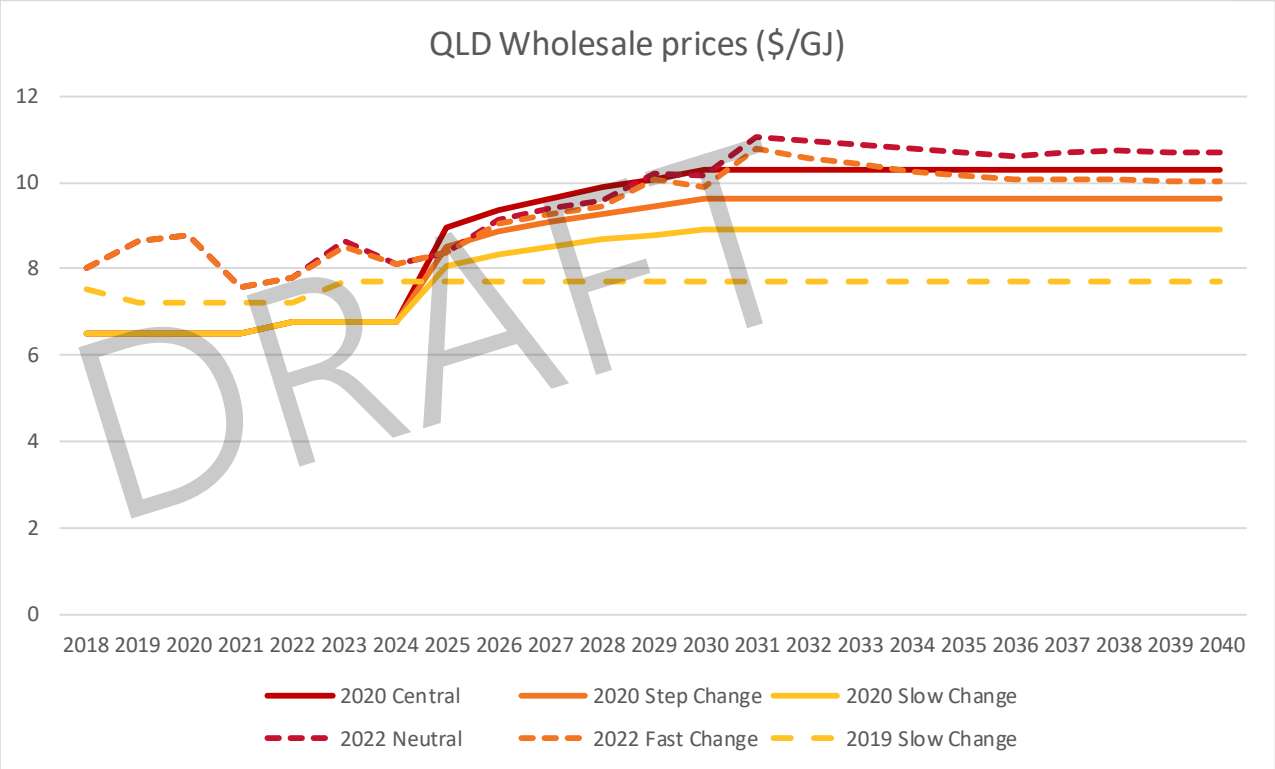
Price: QLD

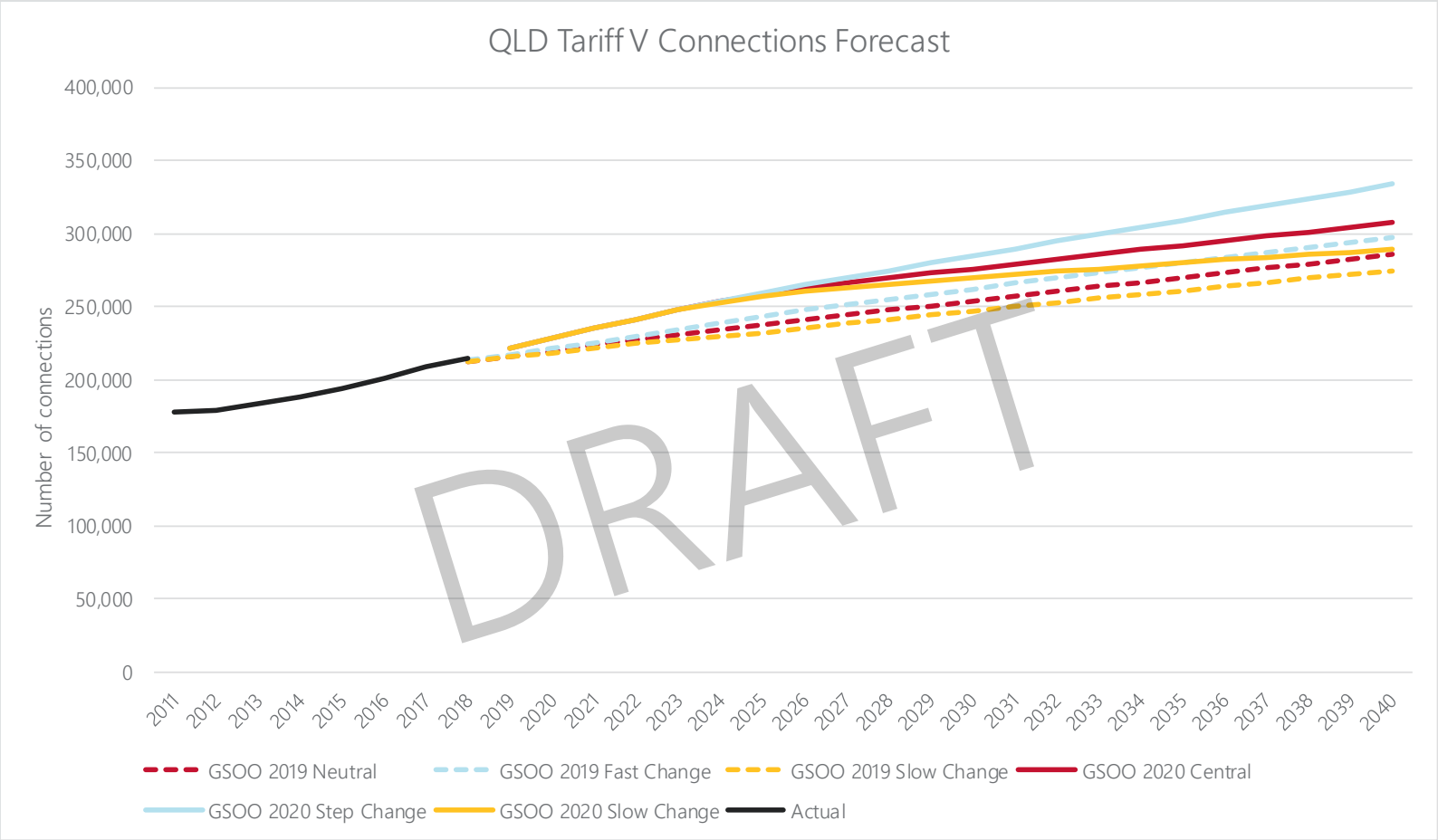
Wholesale Prices

- AEMO selected Core's Central (Upper) scenario as AEMO's Central scenario, Core's Central (Lower) scenario as AEMO's Slow Change scenario, with the average of the two forming AEMO's Step Change scenario.
- CORE assumes a starting point of contract prices of close to $7/GJ , consistent with ACCC disclosures
- The progressive increase in Eastern Australia to 2032 is primarily the result of assumed linkage between domestic wholesale prices and LNG prices, which are expected to flatten in the longer term due to supply/demand balance.
- Variances between regions are due to differences in assumed contract profiles, existing contract prices (particularly Brisbane where low legacy prices are assumed), and also differences in transportation and storage costs.



QLD (Connections)

The QLD connections forecast in the 2020 GSOO is higher than the 2019 GSOO forecast as a result of reviewing recent trends in meter data.



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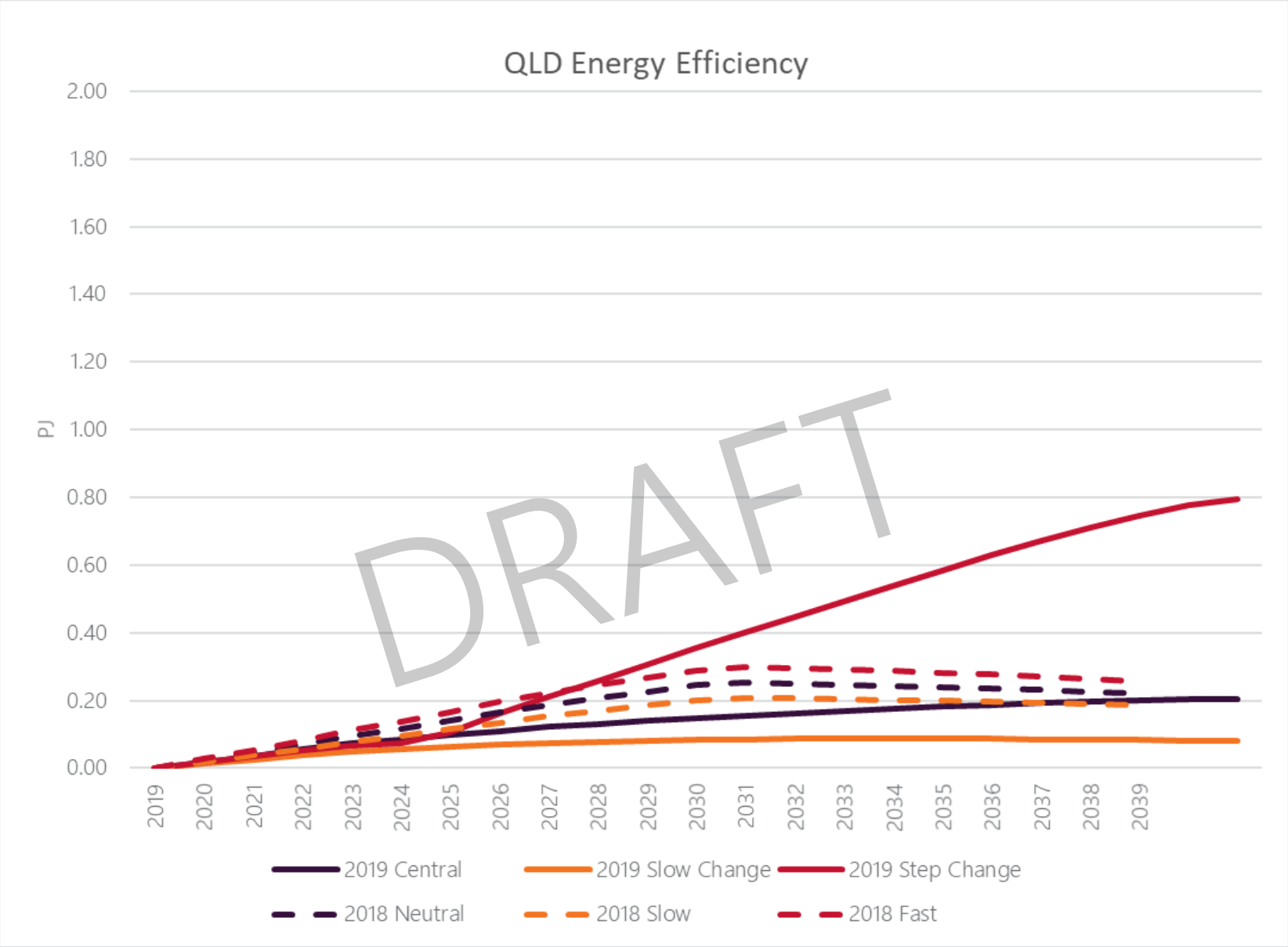
Energy Efficiency: QLD

Differences from changes in SPR model and other post-model adjustments by AEMO for the 2019 GSOO



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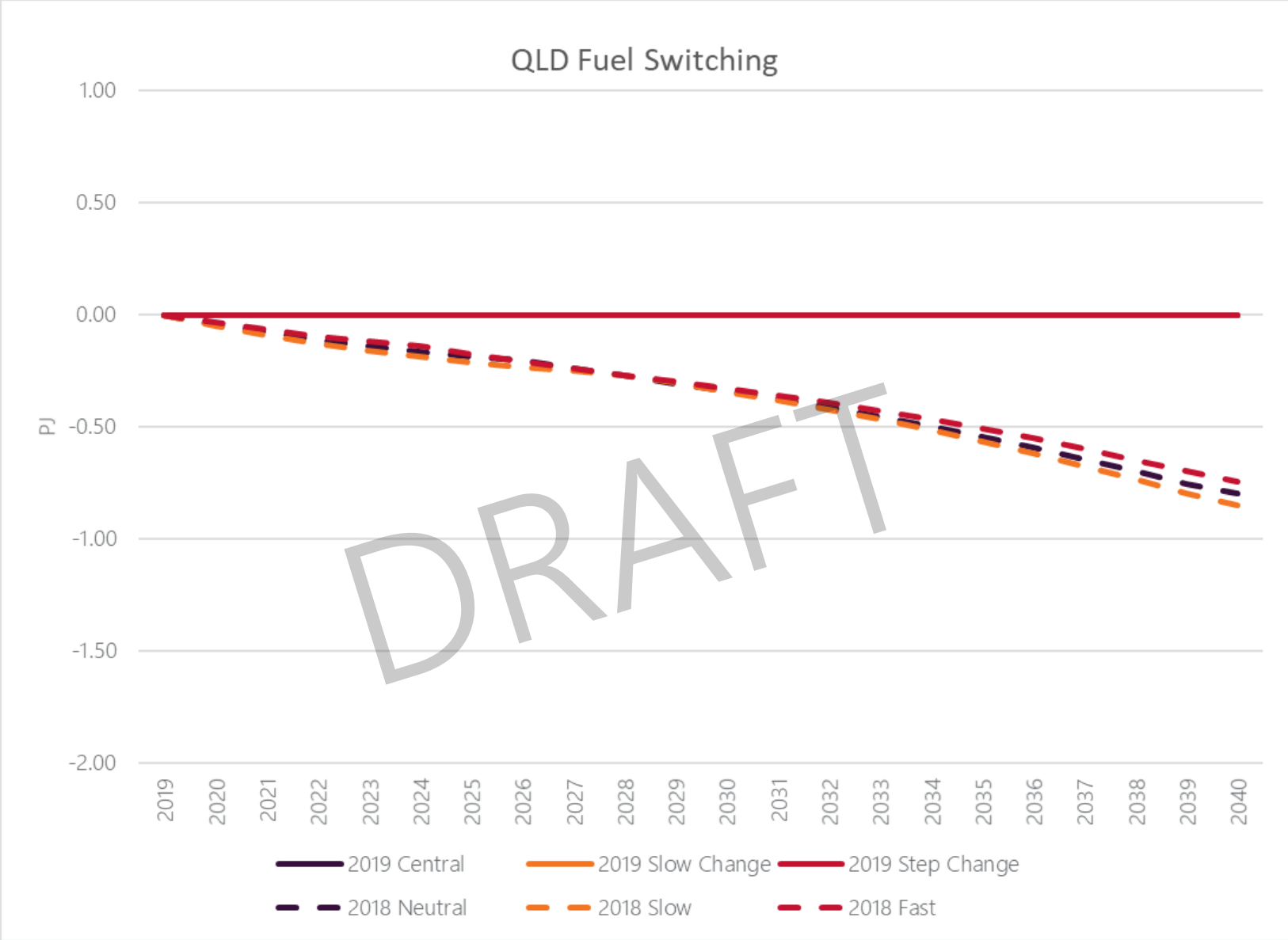
Fuel Switching: QLD

Data from DoEE shows no likely fuel switching in the residential sector for water or space heating from policy measures



AEMO
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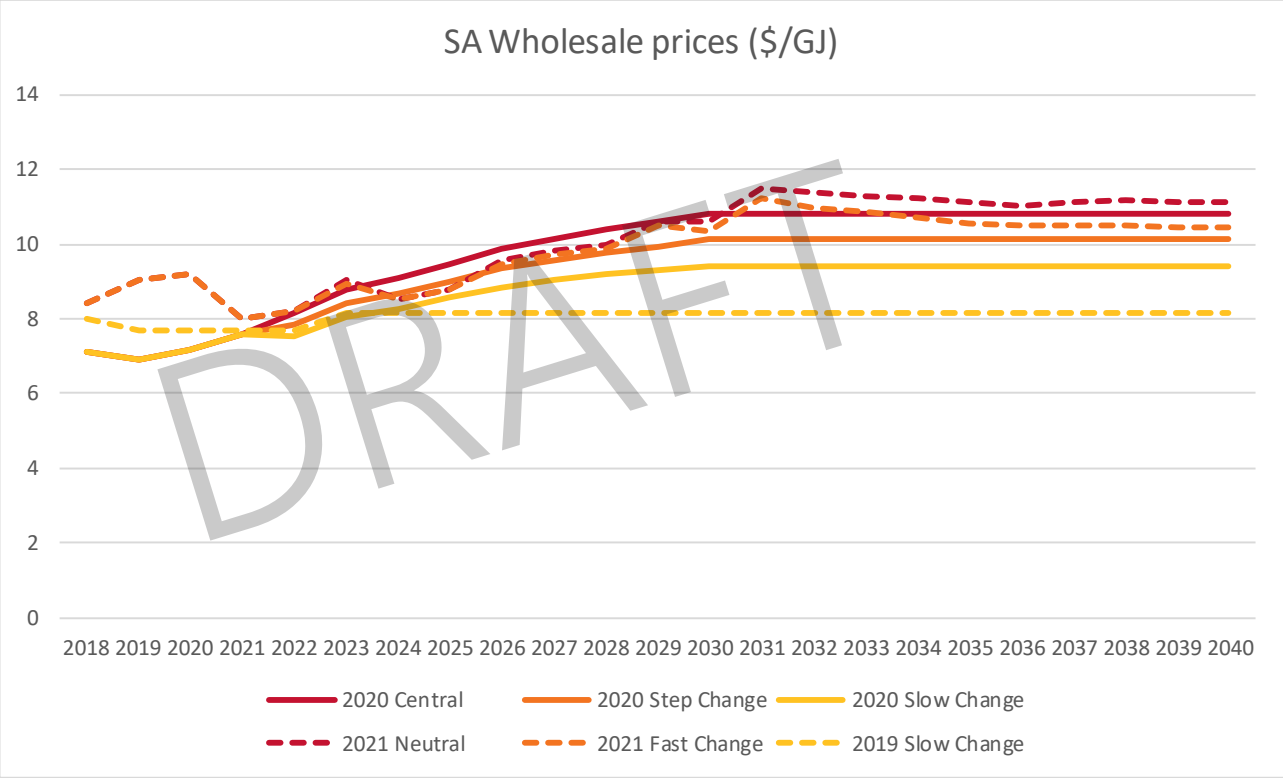
Price: SA

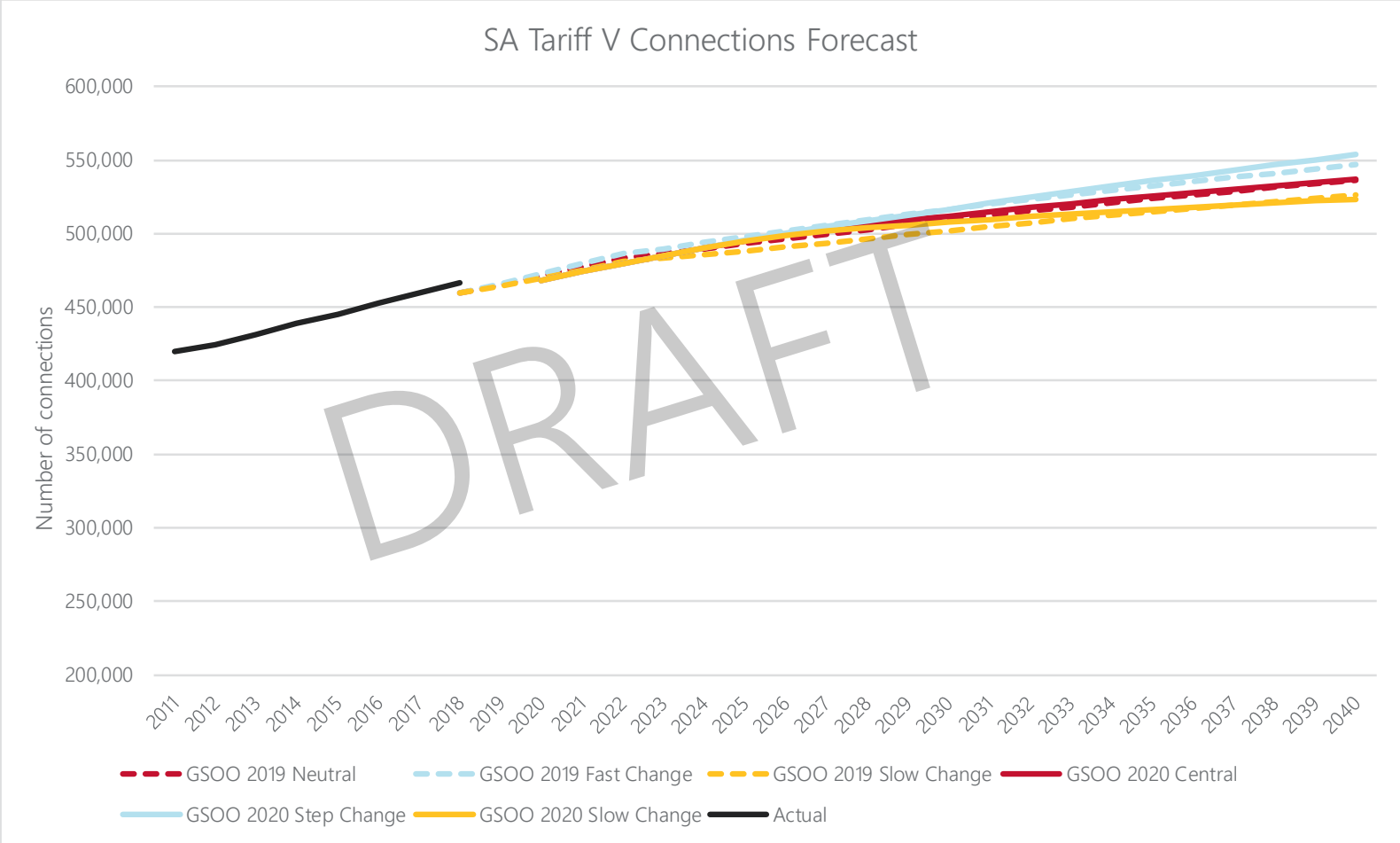
Wholesale Prices

- AEMO selected Core's Central (Upper) scenario as AEMO's Central scenario, Core's Central (Lower) scenario as AEMO's Slow Change scenario, with the average of the two forming AEMO's Step Change scenario.
- CORE assumes a starting point of contract prices of close to $7/GJ , consistent with ACCC disclosures
- The progressive increase in Eastern Australia to 2032 is primarily the result of assumed linkage between domestic wholesale prices and LNG prices, which are expected to flatten in the longer term due to supply/demand balance.
- Variances between regions are due to differences in assumed contract profiles, existing contract prices, and also differences in transportation and storage costs.



SA (Connections)

Connections growth in SA is similar in the 2020 GSOO than the 2019 GSOO



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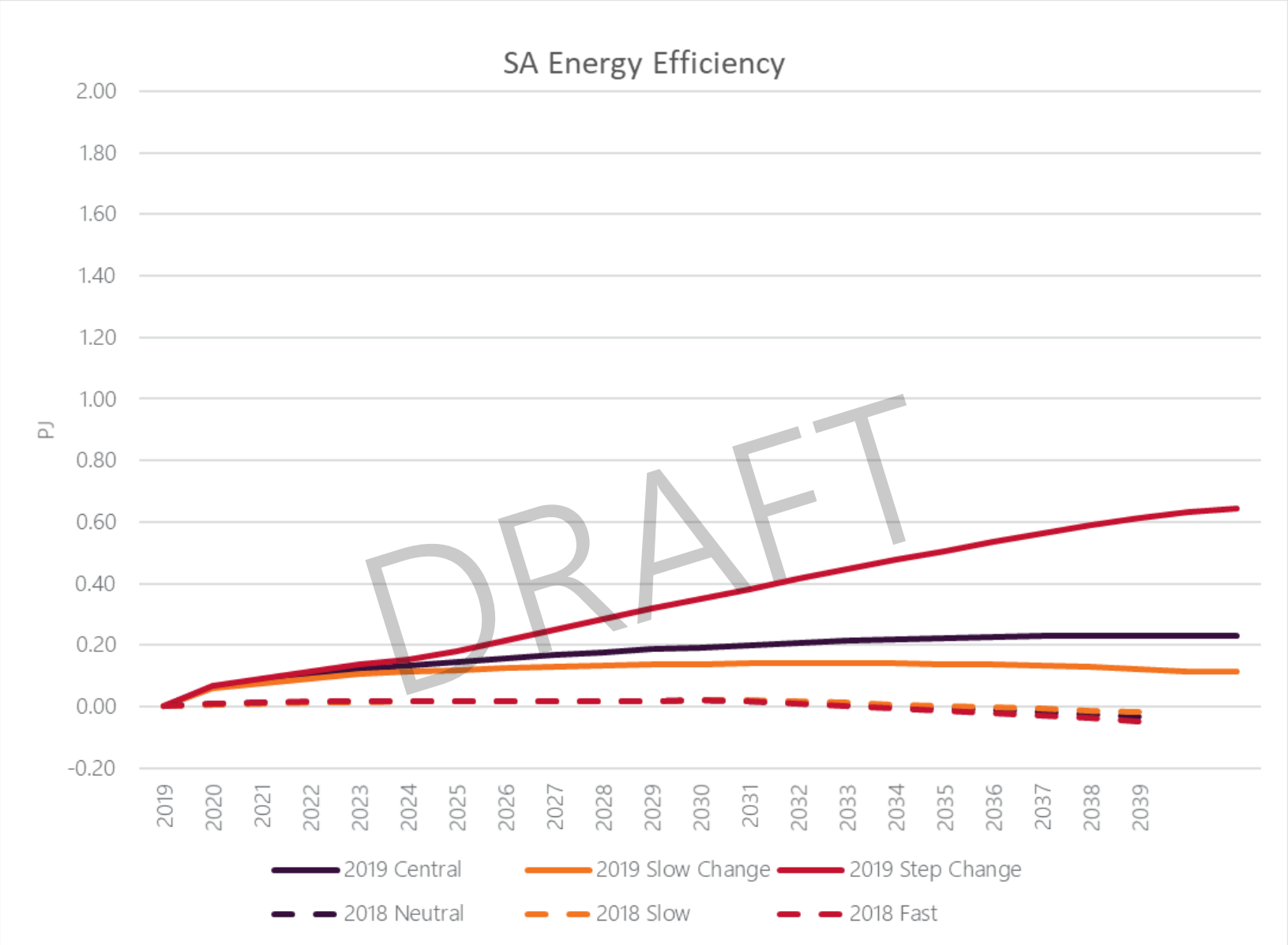
Energy Efficiency: SA

Differences from changes in SPR model and other post-model adjustments by AEMO for the 2019 GSOO



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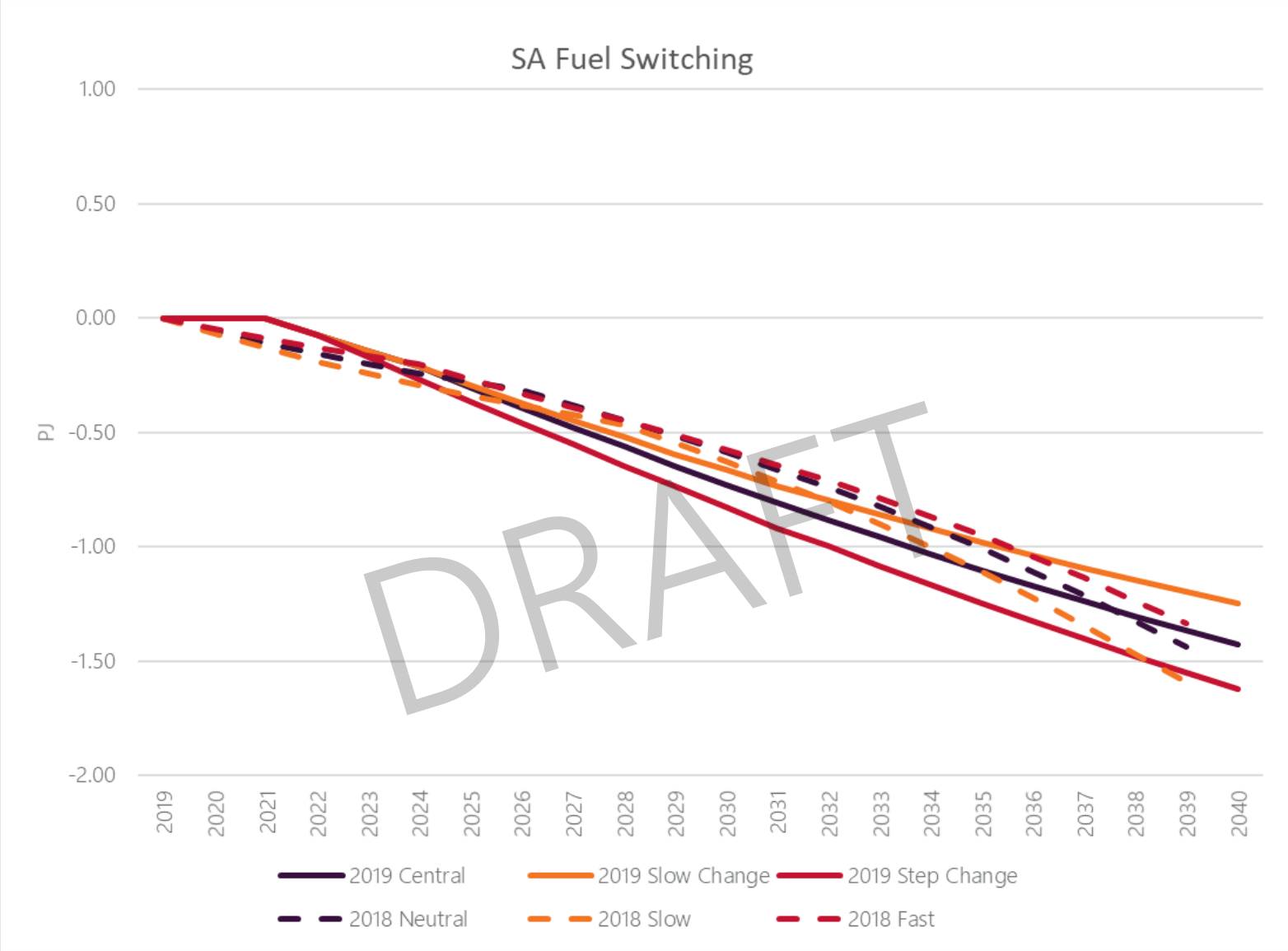
Fuel Switching: SA

The 2020 water heating model estimates impact of policy measures whereas the 2019 GSOO estimates the savings of shifting from 3 to 5 star gas appliances

The 2020 space heating model estimates impact of policy measures based on DoEE data, whereas the 2019 GSOO makes assumptions on the transition from gas to electric space heating



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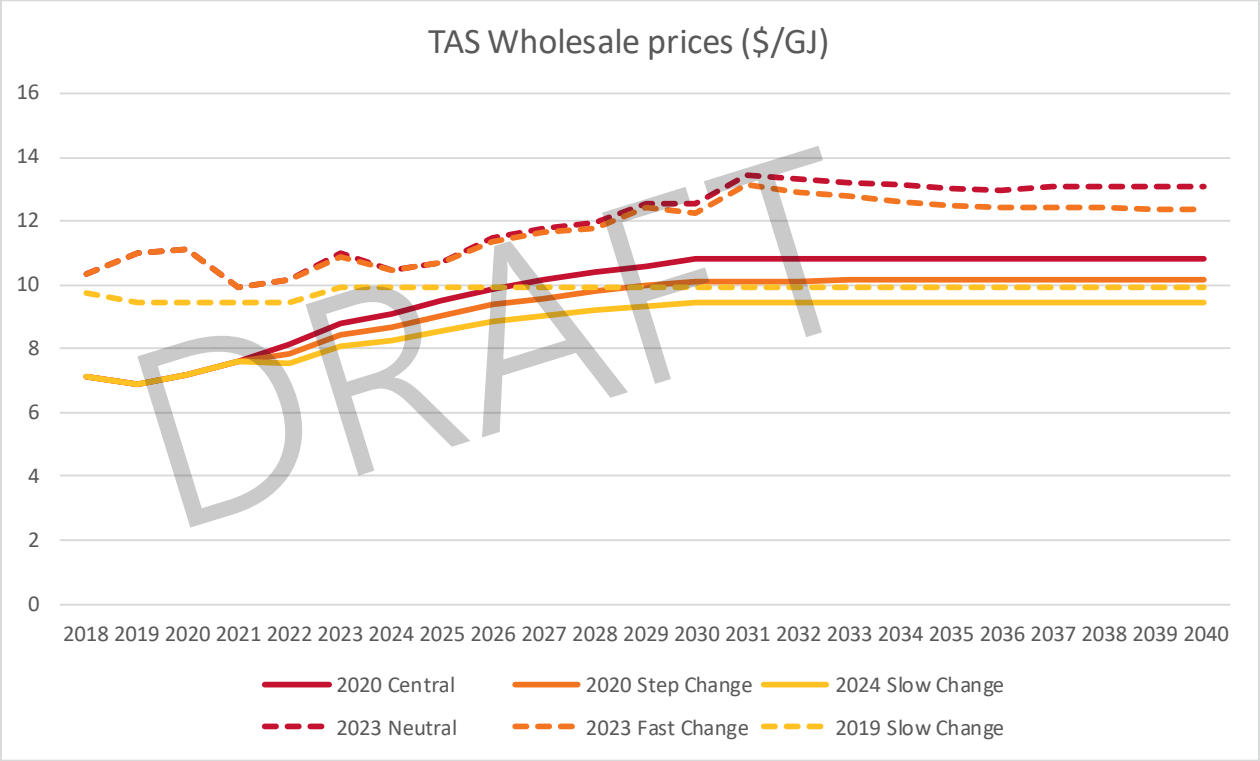
Price: Tas

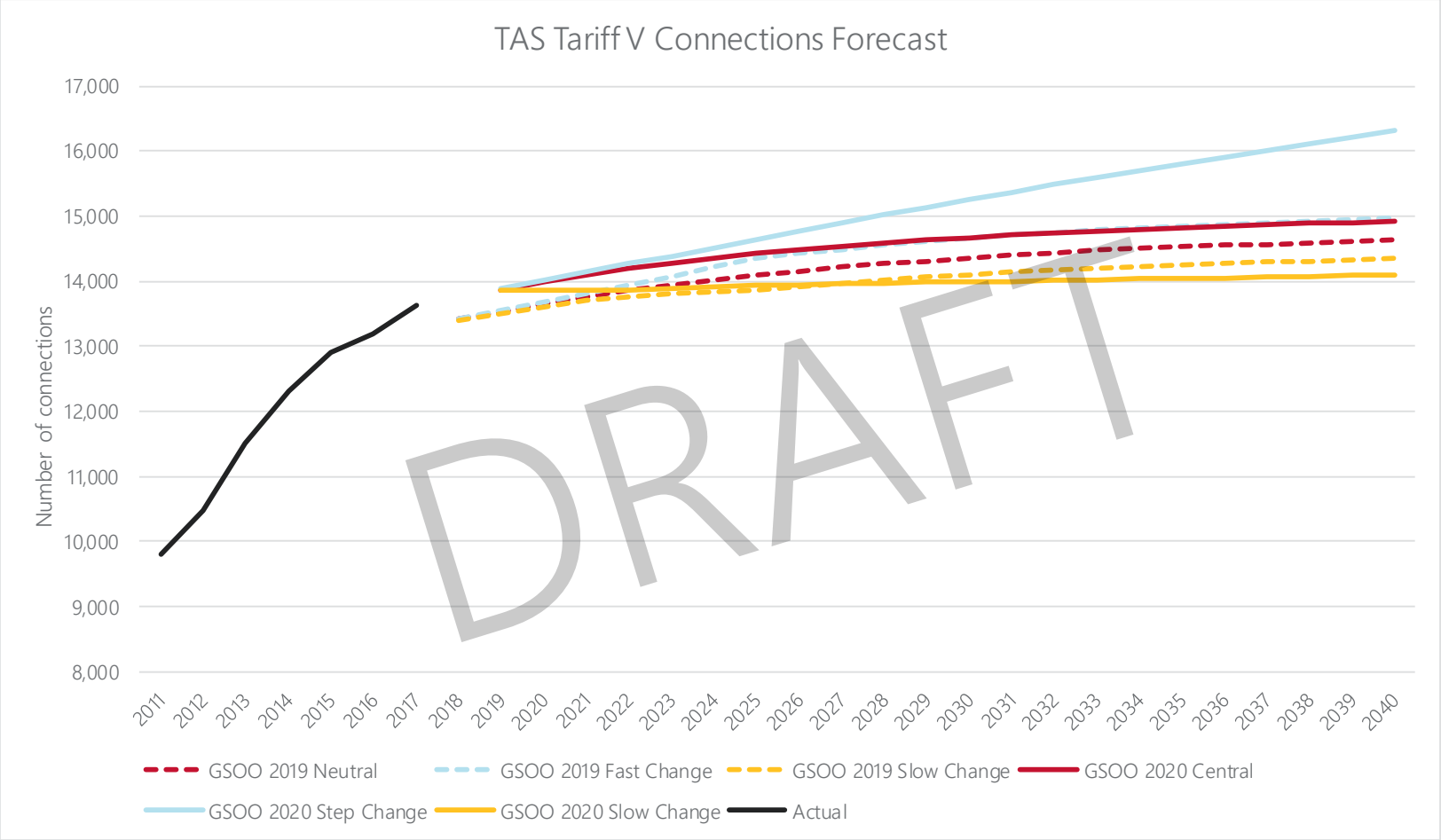
Wholesale Prices

- AEMO selected Core's Central (Upper) scenario as AEMO's Central scenario, Core's Central (Lower) scenario as AEMO's Slow Change scenario, with the average of the two forming AEMO's Step Change scenario.
- CORE assumes a starting point of contract prices of close to $7/GJ , consistent with ACCC disclosures
- The progressive increase in Eastern Australia to 2032 is primarily the result of assumed linkage between domestic wholesale prices and LNG prices, which are expected to flatten in the longer term due to supply/demand balance.
- Variances between regions are due to differences in assumed contract profiles, existing contract prices, and also differences in transportation and storage costs.



TAS (Connections)

The Tas connections forecast in the 2020 GSOO is moderately higher than the 2019 GSOO forecast as a result of reviewing recent trends in meter data.



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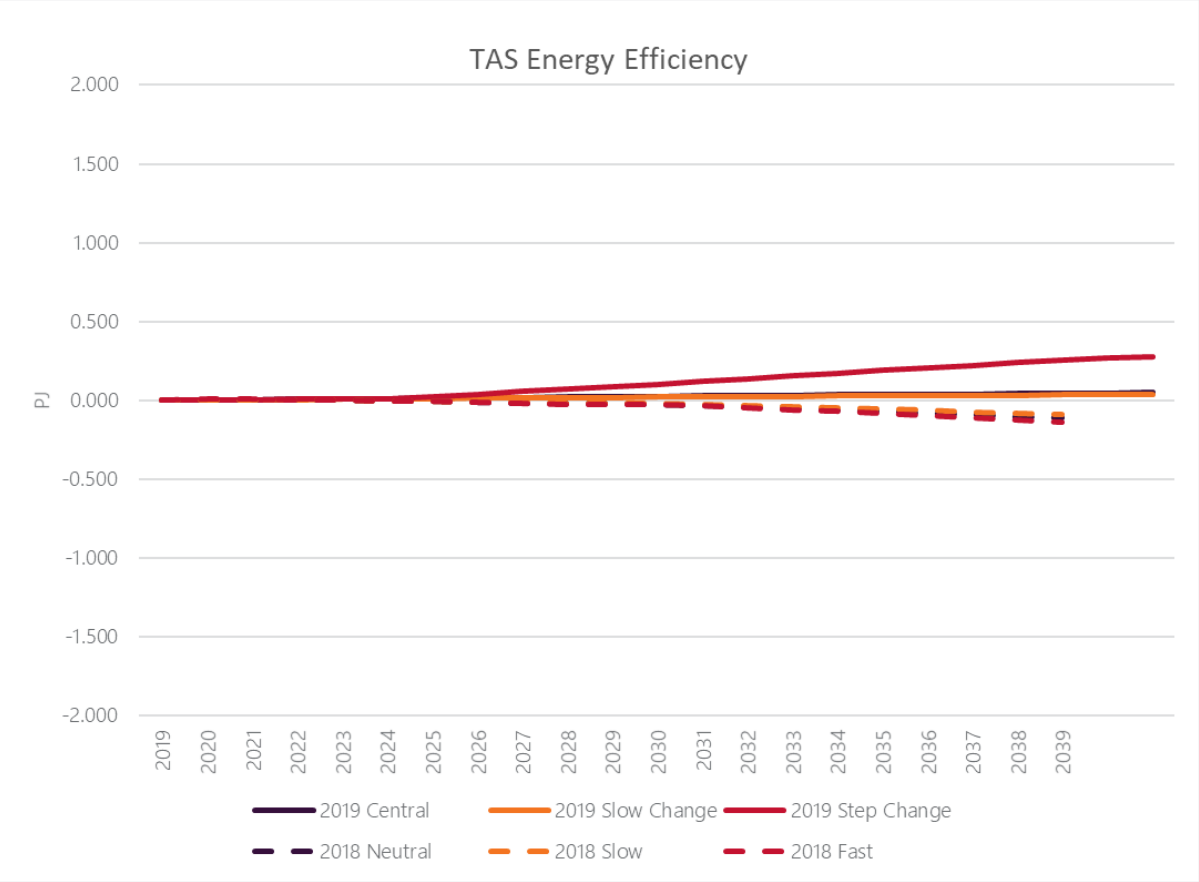
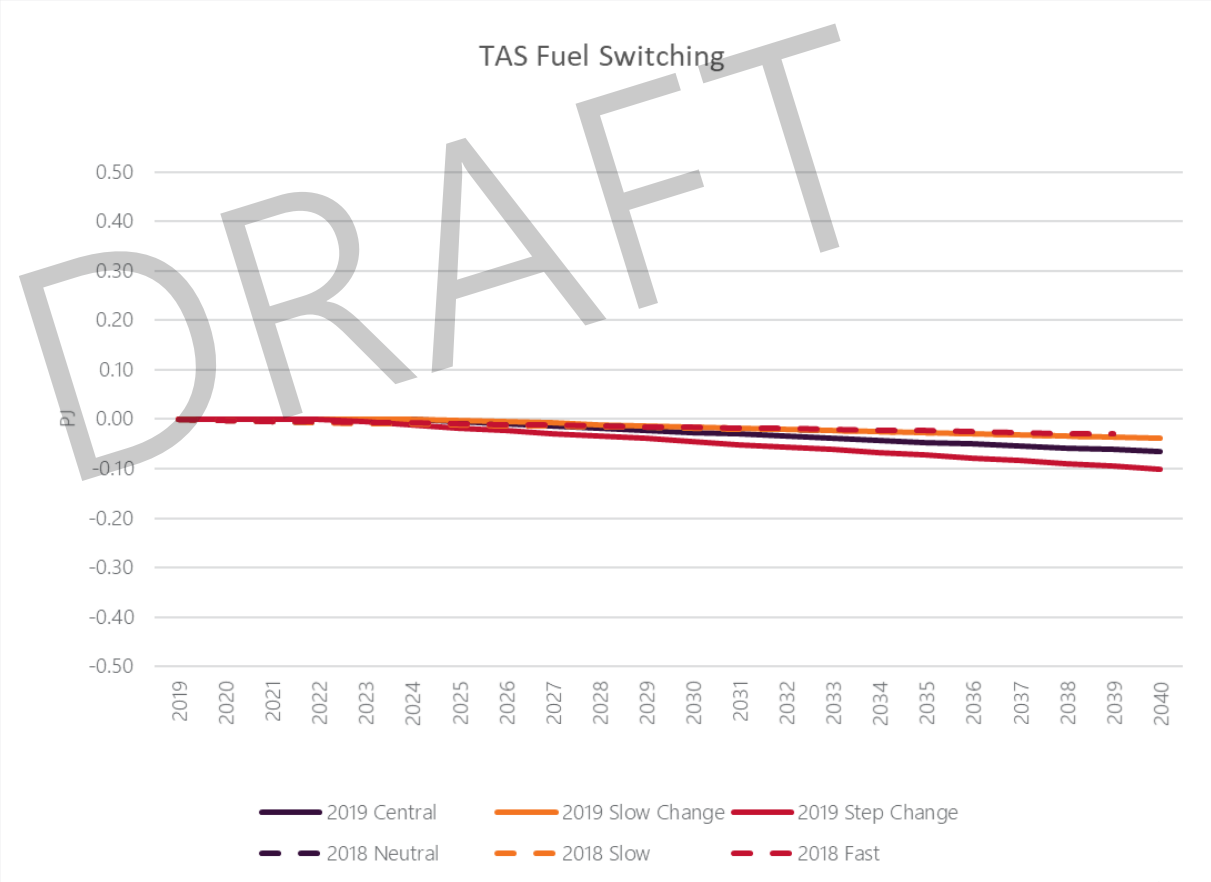
Energy Efficiency: Tas

Energy Efficiency



Fuel Switching



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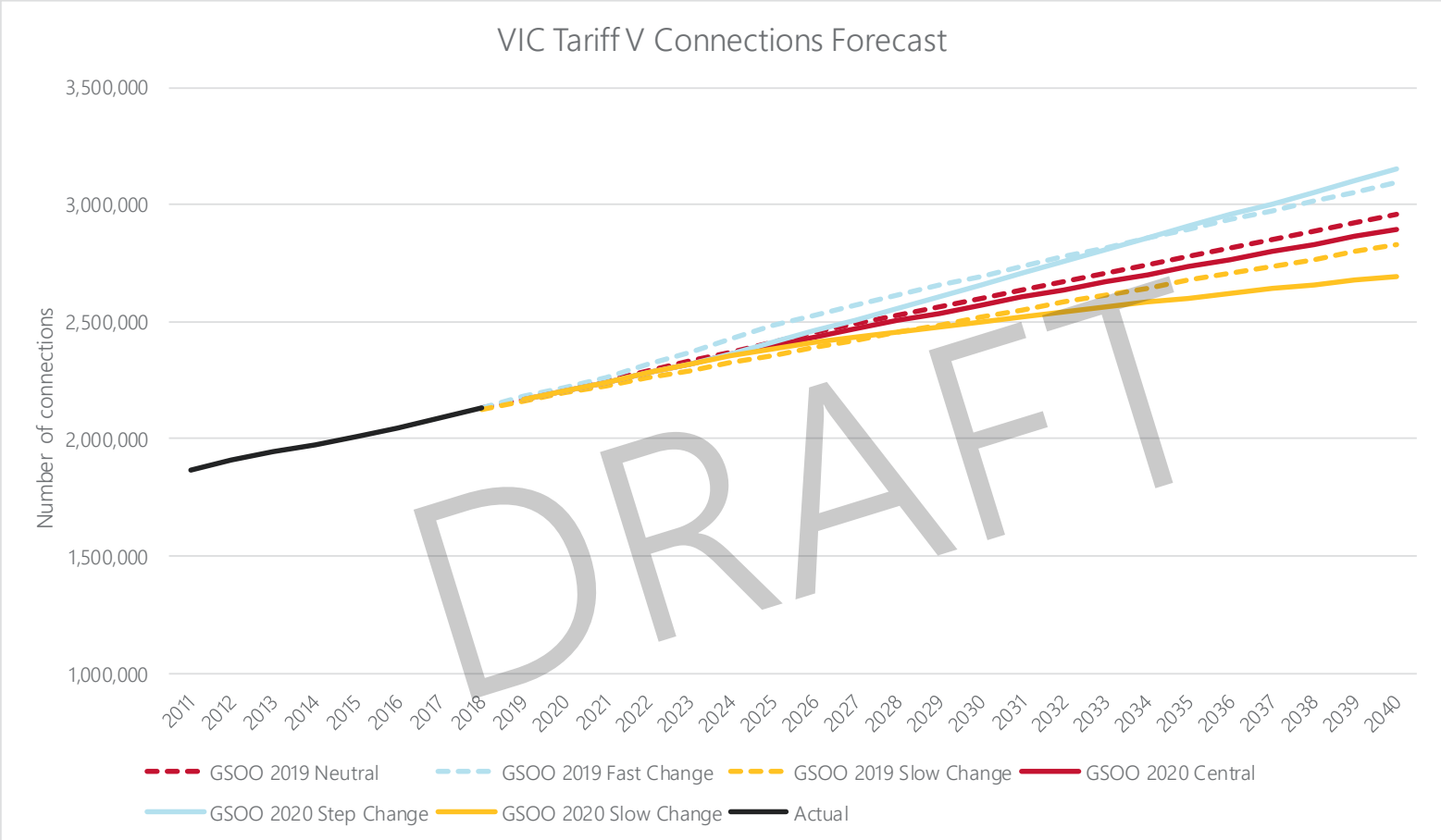
VIC (Connections)

The Vic connections forecast in the 2020 GSOO is moderately lower than the 2019 GSOO forecast as a result of reviewing recent trends in meter data.



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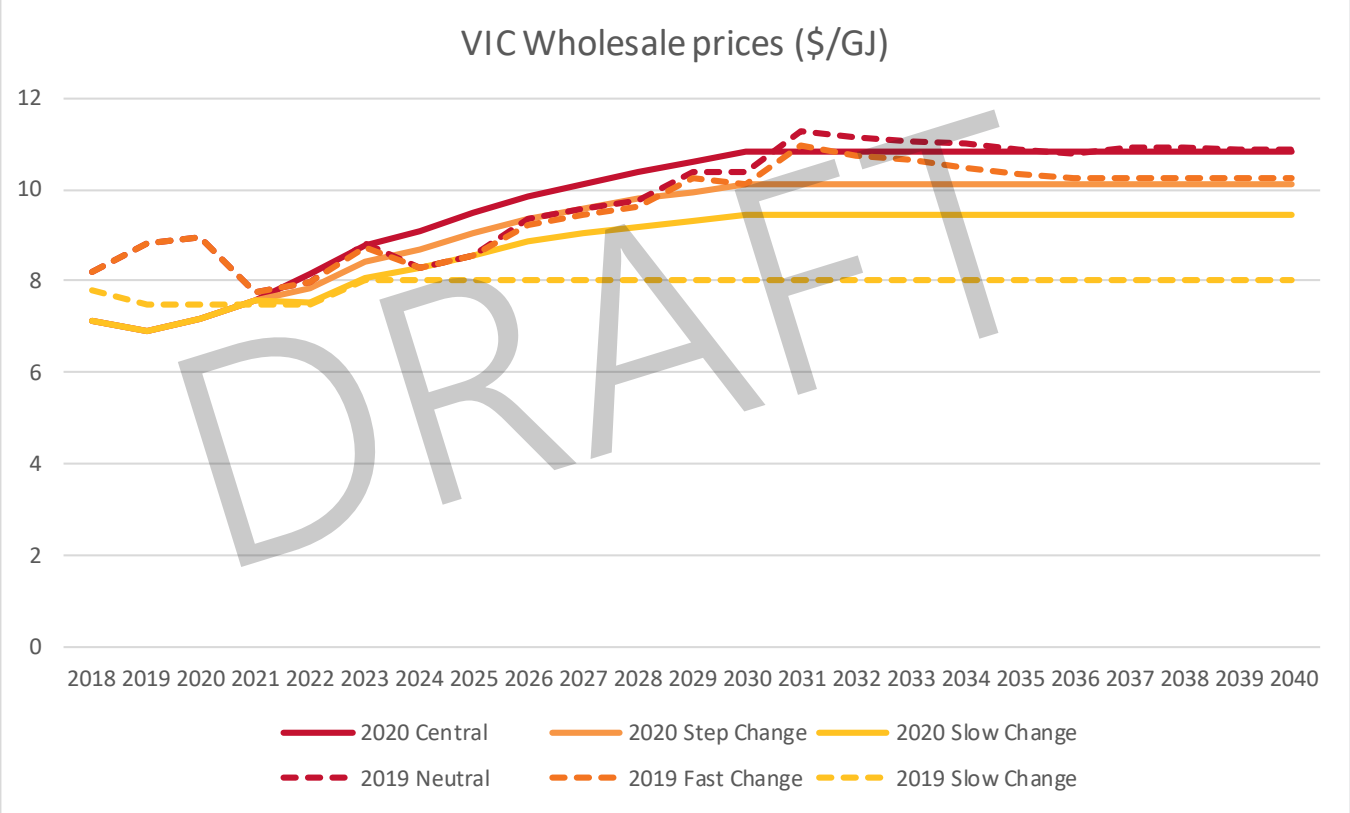
Price: Vic

Wholesale Prices

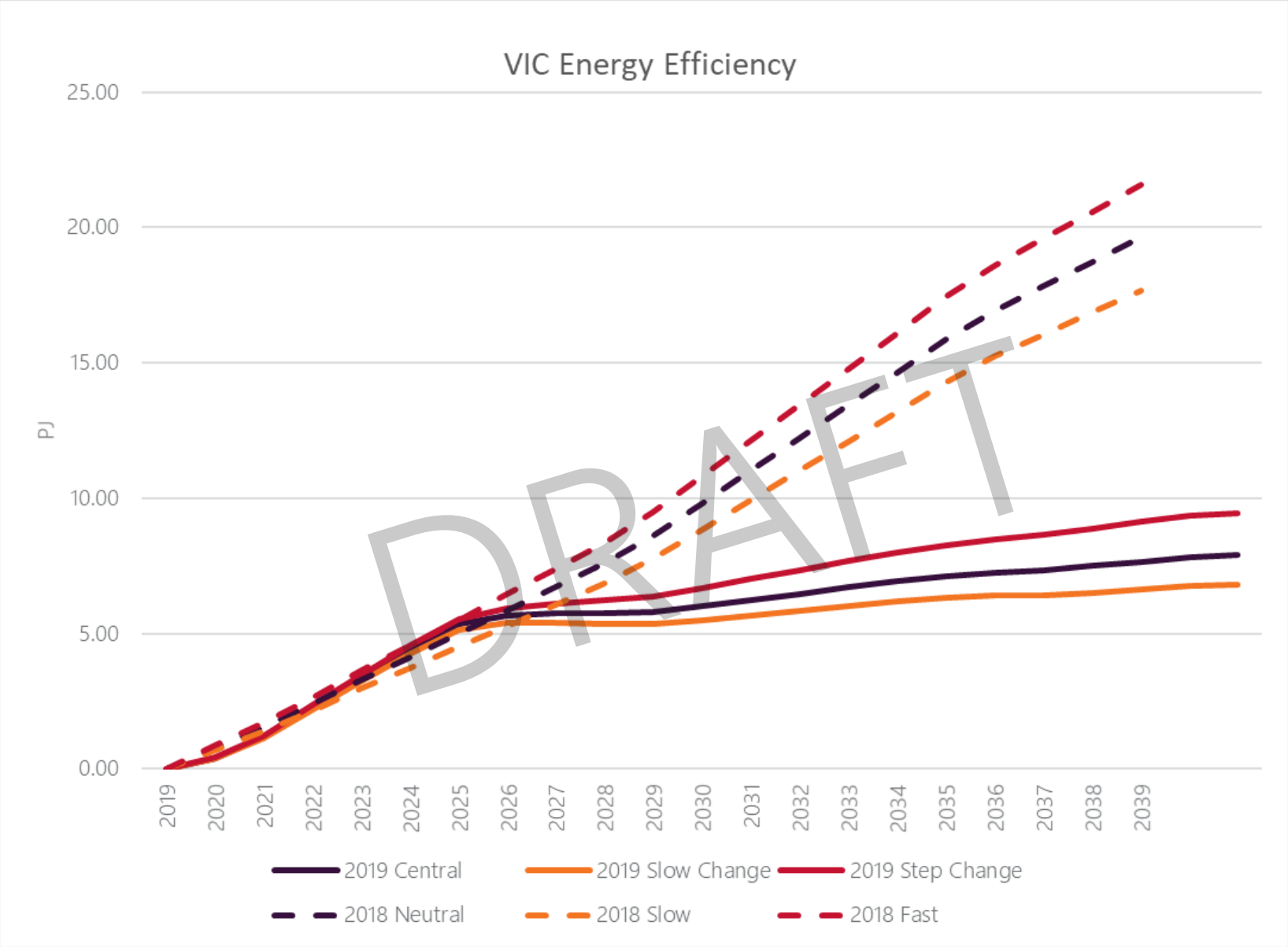
- AEMO selected Core's Central (Upper) scenario as AEMO's Central scenario, Core's Central (Lower) scenario as AEMO's Slow Change scenario, with the average of the two forming AEMO's Step Change scenario.
- CORE assumes a starting point of contract prices of close to $7/GJ , consistent with ACCC disclosures
- The progressive increase in Eastern Australia to 2032 is primarily the result of assumed linkage between domestic wholesale prices and LNG prices, which are expected to flatten in the longer term due to supply/demand balance.
- Variances between regions are due to differences in assumed contract profiles, existing contract prices, and also differences in transportation and storage costs.



Energy Efficiency: VIC

Differences from

- Changes in SPR model and other post-model adjustments by AEMO for the 2019 GSOO
- Revised state-based data for the Victorian Energy Upgrades Program



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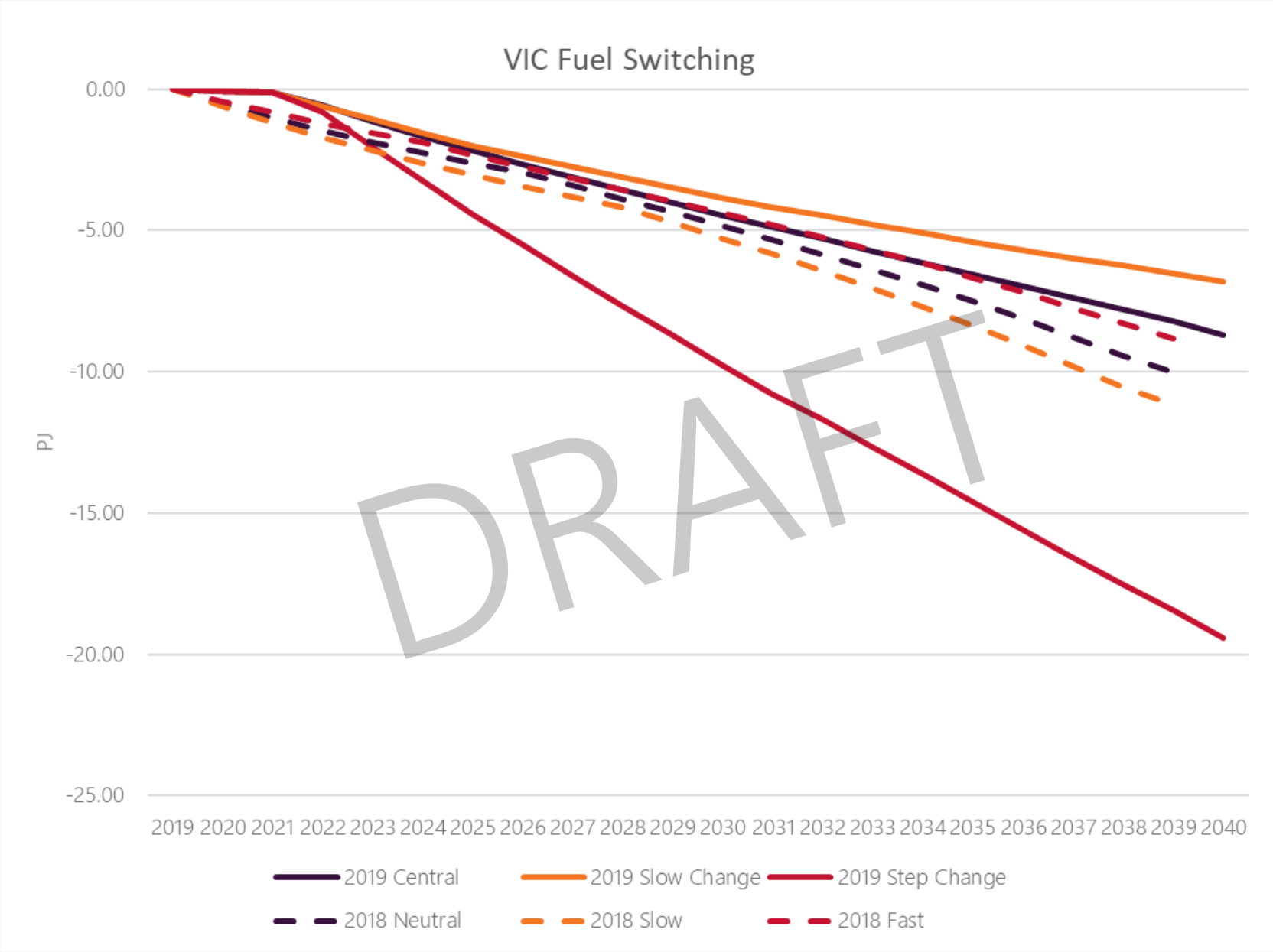
Fuel Switching: VIC

The 2020 water heating model estimates impact of policy measures whereas the 2019 GSOO estimates the savings of shifting from 3 to 5 star gas appliances.

The 2020 space heating model estimates impact of policy measures based on DoEE data, whereas the 2019 GSOO makes assumptions on the transition from gas to electric space heating.

The 2020 GSOO forecast includes the planned E3 Program Zoned label for Space Heating, which has the potential to significantly reduce gas consumption in VIC.



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