# Attachment 8.1

## Update to forecast demand for natural gas

## The Centre for International Economics

### Revised GN21 Plan

### ACT and Queanbeyan-Palerang gas network 2021–26

**Submission to the Australian Energy Regulator**

**January 2021**

evoenergy

INDEPENDENT
QUANTITATIVE
EVIDENCE-BASED

FINAL REPORT

# Update to forecast demand for natural gas

ACT and Queanbeyan-Palarang 2021-2026

*Prepared for*
*Evoenergy*

*22 December 2020*

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# 1 Introduction

On 19 June 2020, the Centre for International Economics (CIE) provided a final report to Evoenergy setting out an independent and detailed forecast of demand and customer numbers for the ACT and Queanbeyan-Palarang gas distribution network for the period 2021-2026 (*the previous forecast*). The forecast informed Evoenergy's regulatory proposal to the Australian Energy Regulator's (AER's) review of gas network tariffs for the 2021–26 Access Arrangement period. The AER accepted some, but not all, components of the demand forecast and indicated that it would like Evoenergy's revised proposal to incorporate, among other things, 2019/20 actual usage and customer numbers, as well as further evidence in support of the forecast impacts of ACT Government policy. Evoenergy has requested that the CIE provide a revised forecast that takes account of:

- additional historical data, including billing data, population, dwelling approvals, gas prices, weather variables, and rebates for heater replacements under the Energy Efficiency Improvement Scheme (EEIS)
- revised forecasts of dependent variables, including (where available) ACT population, NSW households, and gas prices
- any additional literature on price elasticity (e.g. AEMO Gas Statement of Opportunities 2020)
- revising post-model adjustments for
  - any relevant statements made by the government formed following the 2020 ACT election
  - any publicly-available information about the intentions of Tariff D customers for expansion, fuel switching or disconnection
  - results from customer survey work being undertaken by Sagacity Research for Evoenergy.

This report sets out the revised forecast. It focuses on describing the changes made to the previous forecast. For a detailed description of the forecasting method and the analysis of historical demand by which it was informed, see our final report of 19 June 2020.[1]

1 CIE 2020. Forecast demand for natural gas – ACT and Queanbeyan-Palarang 2021-2026. Final Report prepared for Evoenergy, 19 June.

# 2 New information included in the forecast

## Summary

Table 2.1 lists the new information incorporated in the gas demand forecast. The base model was updated for 2019/20 actual data and the latest forecasts of independent variables. New information on ACT Government policy and customer intentions was used both to revise the post-model adjustments included in the previous forecast and to introduce new post-model adjustments.

### 2.1 Summary of new information included in the forecast

| Component | Source and comments |
|---|---|
| **Updating historical data to include 2019/20 actual data** | |
| Tariff V billing data - regressions, starting points, zero-consuming connections | Updated using Evoenergy billing data |
| Tariff D billing data | Updated using Evoenergy billing data |
| Tariff VB billing data and individual unit counts | Updated using Evoenergy billing data |
| Number of suspended and abolished connections | Updated using an Evoenergy status count at the total network level. CIE allocated the total to postcodes and customer types using the proportions observed in 2018/19. |
| ACT population | Updated using ABS cat. No. 3103.0 Table 4, series end March 2020 |
| ACT dwelling approvals | Updated using ABS 87310D0030_202008 Building Approvals, Australia, Aug 2020, Table 1 ACT, SA2 Excel datacube 2019-20 |
| NSW dwelling approvals | Updated using ABS 87310D0004_202008 Building Approvals, Australia, Aug 2020, Table 1 NSW, SA2 Excel datacube 2019-20 |
| Gas price index | Updated using ABS 6401.0 Consumer Price Index, Australia, Table 9, series end June 2020 |
| Weather variables | Updated using data purchased from the Bureau of Meteorology in November 2020. Effective degree days (EDD) was constructed by applying the same coefficients and thresholds used for the previous forecast. |
| **Updating drivers forecasts** | |
| ACT population forecast | Not updated. ACT Treasury has not updated its forecast. The next update is expected in mid 2021. |

| Component | Source and comments |
|---|---|
| NSW household projections and implied dwelling requirements | Updated using NSW DPIE 2019 LGA implied dwelling projections |
| Gas price forecast | Updated using Core Energy and Resources 2019, AEMO Gas Price Scenarios 2020-2050, November, Public Edition. |
| Price elasticity of demand | AEMO Gas Statement of Opportunities (GSOO) 2020 applies the same price elasticity as GSOO 2019. We have therefore retained the price elasticity used in our previous forecast. |
| Effective degree days | Trend forecast estimated for previous forecast was updated to account for new historical data |
| **Post-model adjustments** | |
| Abolishments for ACT owner-occupiers | Updated based on Sagacity Research survey for Evoenergy |
| Zero-consuming and suspended ACT owner-occupiers | New post-model adjustment based on Sagacity Research survey for Evoenergy |
| Reduced average consumption for ACT owner-occupiers | Updated based on Sagacity Research survey for Evoenergy |
| Reduced average consumption for ACT Government and Australian National University Tariff V customers | New post-model adjustment based on the Parliamentary and Governing Agreement of the 10th Legislative Assembly of the ACT and the Australian National University Acton Campus Energy Management Strategy |
| Reduced consumption and chargeable demand for ACT Government Tariff D customers | New post-model adjustment based on the Parliamentary and Governing Agreement of the 10th Legislative Assembly of the ACT |
| Reduced consumption and chargeable demand for Australian National University Tariff D customers | New post-model adjustment based on Australian National University Acton Campus Energy Management Strategy |
| Removal of one Tariff D customer that is set to be demolished | New post-model adjustment based on development application |
| Setting new ACT connections to zero from 1 January 2023 | New post-model adjustment based on the Parliamentary and Governing Agreement of the 10th Legislative Assembly of the ACT |

*Source:* CIE

The following sections describe the incorporation into the gas demand forecast of:

- actual demand in 2019/20
- the latest forecasts of the drivers of gas demand, and
- information on ACT Government policy and customer intentions.

# Actual demand in 2019/20

## Tariff V usage

Total Tariff V usage was 6.52 PJ in 2019/20, which is 0.9 per cent higher than the estimate included in the previous forecast. The higher usage can be explained by colder weather and lower prices than had been assumed in the previous forecast. EDD was 2415 in 2019/20, which is around 1.4 per cent higher than the estimated EDD for 2019/20 in the previous forecast and around 2.2 per cent higher than the long-term trend. Gas prices in 2019/20 were around 6.3 per cent lower than forecast.

Weather-normalised usage was 0.5 per cent higher than had been estimated for residential connections, but 4.7 per cent lower for non-residential connections. It is possible this difference is due to an increase in the number of people working from home during the last few months of the financial year in response to the COVID-19 pandemic.

## Tariff V customer numbers

The number of connections paying fixed charges in 2019/20 was calculated at 152 442, which is 0.14 per cent lower than the estimate included in the previous forecast. Total dwelling approvals in 2019/20 were 4922, which is very similar to the 4948 approvals that had been forecast.

The number of suspended connections continued to decline in 2019/20 to 1378, rather than remaining relatively constant at 1692 as had been forecast.

The number of abolishments in 2019/20 was 288, which was slightly lower than the 320 abolishments that had been forecast.

The number of new E2G connections continued to decline in 2019/20 to 50, rather than remaining relatively constant at 99 as had been forecast.

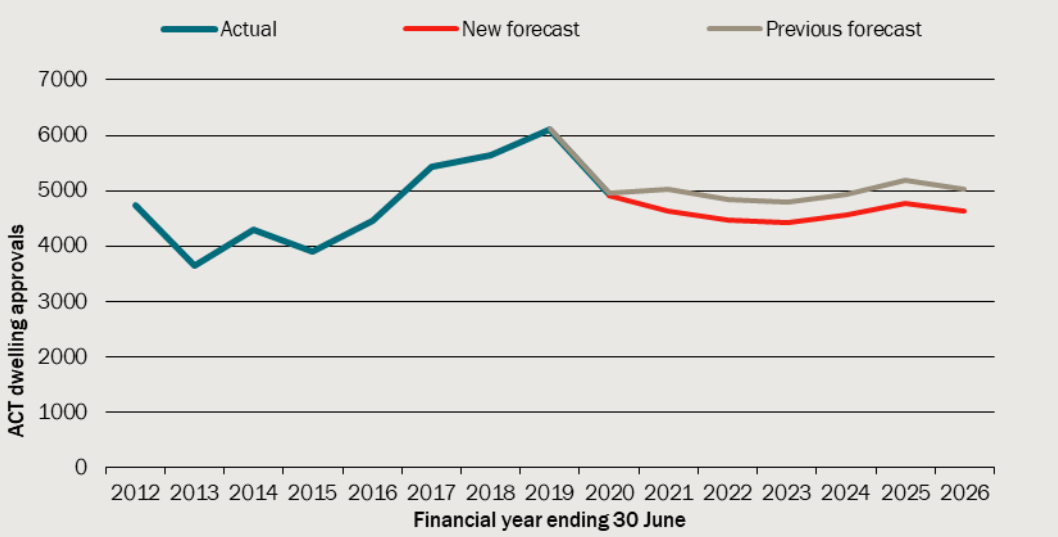
## Tariff D

At 1218 TJ, Tariff D usage in 2019/20 was 2.1 per cent lower than the previous forecast. The sum of each connection's ninth-highest usage day, which determines chargeable demand, was 4.6 per cent lower than had been forecast.

# Updated drivers

Following updates to the relationship between population and dwelling approvals the forecast number of dwelling approvals has been reduced slightly relative to the previous forecast.

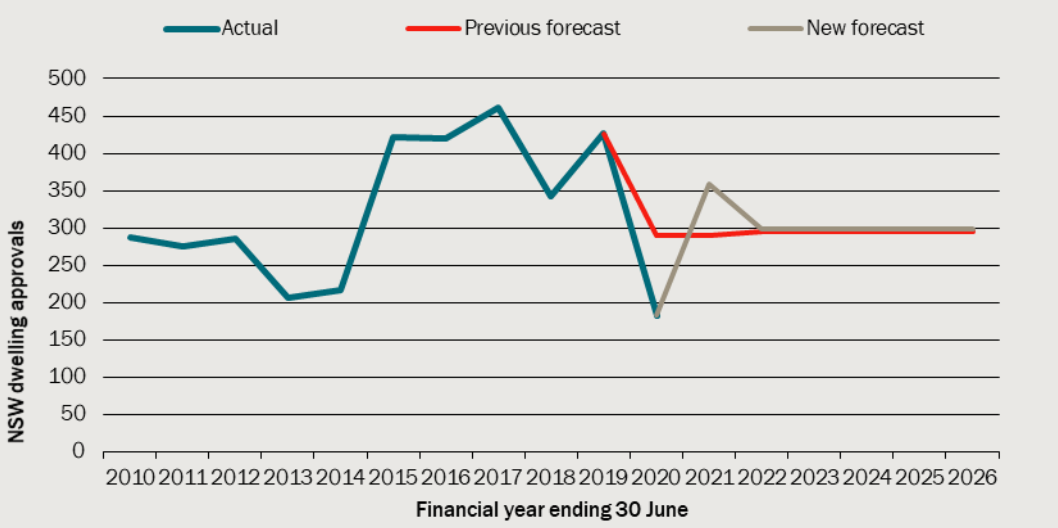
## 2.2 Forecast ACT dwelling approvals




*Data source:* CIE analysis; ABS 87310D0030_202008 Building Approvals, Australia, Aug 2020, Table 1 ACT, SA2 Excel datacube 2019-20.

The forecast of NSW dwelling approvals is similar to the previous forecast from 2021/22.

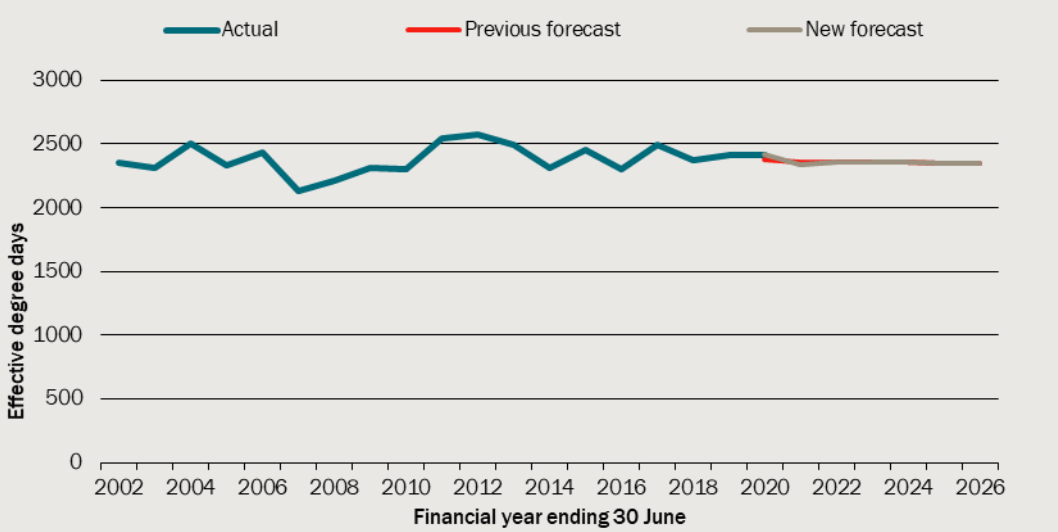
## 2.3 Forecast NSW dwelling approvals




*Data source:* CIE analysis; ABS 87310D0004_202008 Building Approvals, Australia, Aug 2020, Table 1 NSW, SA2 Excel datacube 2019-20; NSW DPIE 2019 LGA implied dwelling projections.

The forecast of EDD is almost identical to the previous forecast. Actuals up to October 2020 have been incorporated in the new forecast.

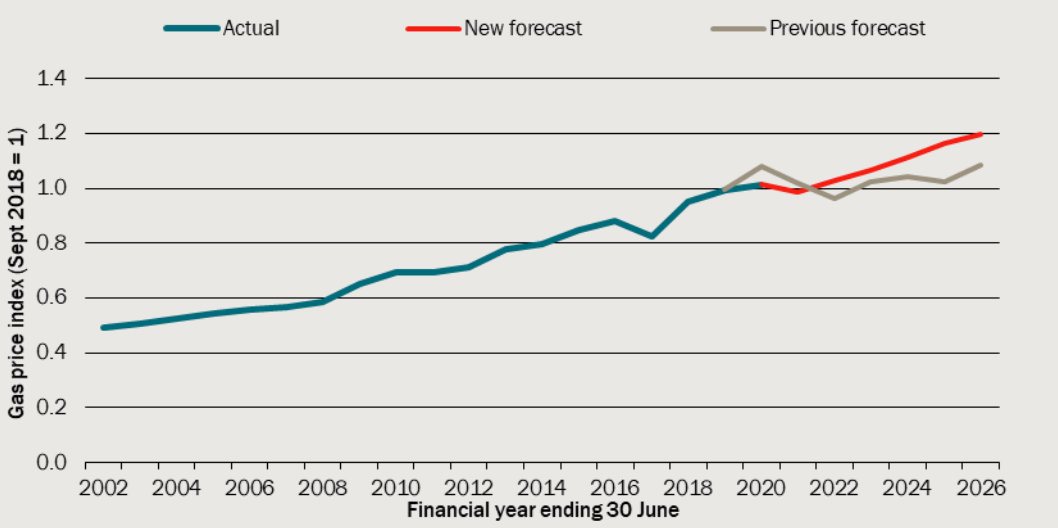
### 2.4 Forecast effective degree days




*Data source:* CIE analysis; Bureau of Meteorology

The forecast of gas prices is higher than the forecast included in the previous forecast from 2021/22 onwards.

### 2.5 Forecast gas prices




*Data source:* ABS 6401.0 Consumer Price Index, Australia, Table 9, series end June 2020; Core Energy and Resources 2019, AEMO Gas Price Scenarios 2020-2050, November, Public Edition.

## *Post-model adjustments*

Significant changes have been made to the post-model adjustments to reflect new information, most notably from the parliamentary agreement of the newly-formed ACT Labor and Greens government and from an online survey of 1755 owner-occupiers in the ACT conducted for Evoenergy by Sagacity Research in November 2020. It indicates that gas demand in the ACT is set to decline at a faster rate than had been assumed in the previous forecast.

Although there is still considerable uncertainty over future gas demand, the new information provides a stronger basis for quantitative estimation of demand impacts than was available at the time of the previous forecast. Sagacity took steps to minimise any sample selection bias by offering a relatively generous prize draw incentive of a one-in-five chance to win a $100 e-gift card. Although it is preferable from a selection bias perspective to survey without announcing the topic in the invitation, this approach is not practicable unless recruiting from existing panels — a recruitment method that was unsuitable for this research project due to unavailability of the required sample size. The survey title "Tell us about how you plan to use gas for your chance to win!" is reasonably neutral and does not obviously bias selection towards people with a preference for electrification. The survey results were weighted to address under- and over-sampling of some age groups and analysis indicates that the weighted sample is also reasonably representative in terms of household income.

### *Setting new ACT connections to zero from 1 January 2023*

The Parliamentary and Governing Agreement of the 10th Legislative Assembly states:

> The ACT Labor and Greens Agreement will take the next essential steps to a net zero-emissions ACT, through the following actions:
>
> > Phase out of fossil-fuel-gas in the ACT by 2045 at the latest, support energy grid stability and support vulnerable households, by doing the following:
> >
> > > …
> > >
> > > Legislate to prevent new gas mains network connections to future stages of greenfield residential development in the ACT in 2021-22. Future stages of Jacka and Whitlam will be all-electric.
> > >
> > > Commence a transition project, working with industry and other stakeholders, to advance all-electric infill developments, with a goal of no new gas mains network connections to future infill developments from 2023.

The CIE has therefore retained the assumption in the previous forecast that ACT greenfield connections will be prevented from 1 July 2021.

In addition, the CIE has assumed there will be no new connections of any kind in the ACT from 1 January 2023.

### *Abolishments, suspended and zero-consuming ACT owner-occupier connections*

The Sagacity survey results were used to estimate that the weighted average likelihood that a representative owner-occupier connection would no longer have any gas appliances within the next five years is 17 per cent. Three survey questions were used in the calculation:

- When do you think you would be most likely to replace each of these gas appliances?
- When you need to replace each of these gas appliances, how likely would you be to replace it with another gas appliance?

- If you were to change your home heating system to electric, would you also switch any of the following appliances over to electric?[2]

The likelihood for each survey respondent was calculated as:

- if the respondent was asked the third question listed above
  - zero, if the respondent indicated they would not switch at least one appliance, or
  - the stated likelihood of switching heating to electric within five years (based on the first and second questions listed above), if the respondent indicated they would switch all appliances
- otherwise, the product of the likelihoods of switching each gas appliance owned by the respondent to electric within five years (based on the first and second questions listed above).

Likelihoods of switching within five years were derived by combining responses to questions about the timing of replacement and the likelihood of switching, where the likelihoods were assumed to be the midpoints of the range included in the survey response, as specified in table 2.6.

### 2.6 Derivation of likelihoods from survey responses

| Survey response | Assumed likelihood |
|---|---|
| | per cent |
| Definitely NOT a gas appliance (0%) | 0.0 |
| Unlikely (1-24%) | 12.5 |
| Somewhat likely (25-49%) | 37.5 |
| Highly likely (50-74%) | 62.5 |
| Most likely (75-99%) | 87.5 |
| Definitely another gas appliance (100%) | 100.0 |

*Source:* Sagacity survey, CIE analysis

When applied to an estimated 87 880 owner-occupied gas connections, this result suggests 15 329 connections will become either abolished, suspended or zero-consuming over the next five years.

Based on the current proportions of connections in these categories, we estimate that 2795 connections will be abolished, 2100 will be suspended and 12 534 will become zero-consuming connections over the next five years.

#### *Abolishments*

The forecast number of abolishments for ACT residential connections has been increased above the base forecast by 157 per cent as a post-model adjustment, taking the forecast number of ACT residential abolishments for the period 2021/22 to 2025/26 from 1271 to 3266. The adjusted forecast is made up of:

2 This question was asked only of respondents who (a) indicated a high likelihood of switching heating to electric; and (b) also have other gas appliances.

- retaining 34.6 per cent of the unadjusted forecast (440 abolishments) on account of rented dwellings (who were not represented in the Sagacity survey), and
- a forecast 2826 abolishments of ACT owner-occupied dwellings, based on an extrapolation of the Sagacity survey results described above.

### 2.7 Adjustment to ACT residential abolishments

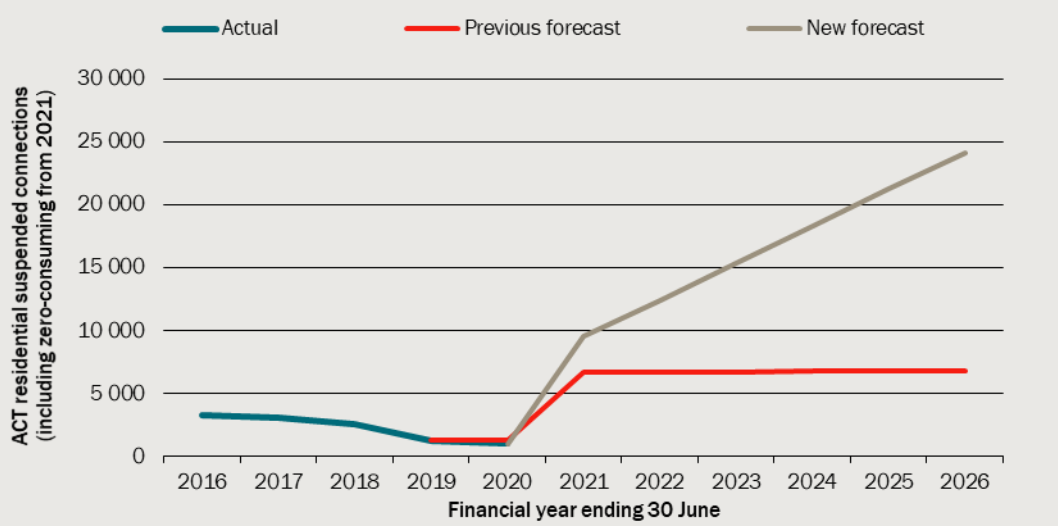
| Financial year ending 30 June | Renters | Unadjusted owner-occupiers | Unadjusted total | Adjusted owner-occupiers | Adjusted total |
|---|---|---|---|---|---|
| 2021 | 85 | 161 | 246 | 546 | 631 |
| 2022 | 86 | 163 | 249 | 553 | 639 |
| 2023 | 87 | 164 | 251 | 559 | 646 |
| 2024 | 88 | 166 | 254 | 565 | 653 |
| 2025 | 89 | 168 | 257 | 572 | 661 |
| 2026 | 90 | 170 | 260 | 578 | 668 |

*Source:* CIE analysis

#### *Suspended and zero-consuming connections*

We assumed linear growth in suspended and zero-consuming connections in line with the finding of the survey analysis that an expected 2100 connections will be suspended and 12 534 connections will become zero-consuming over the next five years.

### 2.8 Adjustment to ACT residential suspended connections, including zero-consuming connections from 2020/21




*Data source:* CIE analysis

## *Reduced average consumption for ACT owner-occupiers*

Forecast average usage by ACT residential connections was adjusted by:

- scaling the time trend component of the unadjusted forecast by the proportion of dwellings rented in the ACT, so that it effectively applies only to rented dwellings

- applying the adjustments set out in table 2.9 on account of expected changes in gas appliances in owner-occupied dwellings derived from the Sagacity survey.

### 2.9 Adjustment to average usage by existing ACT residential connections

| Financial year ending 30 June | Adjustment |
|---|---|
| | per cent |
| 2021 | -3.6 |
| 2022 | -7.1 |
| 2023 | -10.8 |
| 2024 | -14.5 |
| 2025 | -18.3 |
| 2026 | -22.3 |

*Note:* Abolished connections excluded from base, but suspended and zero-consuming connections included in base

*Source:* CIE analysis

These adjustments were calculated using the following steps. Survey responses were used to calculate, for each type of appliance:

- the number of gas-to-electric (G2E) replacements within the next five years
- the number of gas-to-gas (G2G) replacements within the next five years
- the number of new gas appliances (see table 2.10).

Likelihoods of each appliance change occurring within five years were derived using the approach described in the 'Abolishments, suspended and zero-consuming ACT owner-occupier connections' section above.

The number of G2E ducted heater replacements conducted under the Energy Efficiency Improvement Scheme (EEIS) in the 12 months to August 2020 was 749. The survey results suggest annual G2E ducted heater replacements over the next five years could be triple that number. We have based our post-model adjustment on the survey results, since the EEIS does not capture all replacements and may not reflect the expected future rate of E2G replacement following the commitments made by the newly-formed ACT Labor and Greens government.

### 2.10 Forecast changes in appliances in owner-occupied ACT dwellings within 5 years

| | Home heating (ducted or central) | Room heater (not fireplace) | A fireplace | Hot water system | Cooking (cooktop / stove) | Cooking (oven) |
|---|---|---|---|---|---|---|
| G2E | 12721 | 2814 | 869 | 10374 | 10205 | 1834 |
| G2G | 5068 | 780 | 434 | 5152 | 6827 | 630 |
| New | 144 | 249 | 397 | 551 | 372 | 113 |

*Source:* CIE analysis of Sagacity survey

The gas usage impact of each of the appliance changes described above was estimated by:

- taking data points for gas usage by typical existing appliances

  - 90 GJ/year for gas ducted heating assuming four-star energy efficiency, a medium house (160 $m^2$) and cold climate[3]
  - 24 GJ/year for gas room heater assuming three-star energy efficiency, a medium room (30 $m^2$) and cold climate[4]
  - 5 GJ/year for a gas fireplace assuming a Mezzo 1000 operating at 33 per cent capacity for three hours per day on 150 days per year
  - 15 GJ/year for gas hot water assuming four-star energy efficiency, external gas instantaneous hot water, with 10-year warranty, daily hot water load 125 litres[5]
  - 6 GJ/year for a cooktop assuming a Westinghouse WHG646SA cooktop used 150 hours annually[6]
  - 1 GJ/year for an oven assuming a Westinghouse WVG613S used one hour per day on 100 days per year[7]
- calculating the implied total appliance usage by multiplying the data points by the stock of appliances estimated from the survey responses
- estimating total usage by owner-occupied dwellings based on the average usage by detached dwellings observed in Evoenergy billing data
- deriving a scaling factor, which, when applied to the data points for gas usage by appliance type, equates implied and estimated total appliance usage
- applying the scaling factor to data points for gas usage by typical existing and new appliances to derive calibrated estimates of the usage impact of G2E replacements, G2G replacements and new appliances (see table 2.11)

### 2.11 Assumed impact of appliance changes on gas usage

| | Home heating (ducted or central) | Room heater (not fireplace) | A fireplace | Hot water system | Cooking (cooktop / stove) | Cooking (oven) |
|---|---|---|---|---|---|---|
| | GJ/a | GJ/a | GJ/a | GJ/a | GJ/a | GJ/a |
| G2E | -48.6 | -11.3 | -2.3 | -7.1 | -2.9 | -0.5 |
| G2G | -11.7 | -1.6 | 0.0 | -0.8 | 0.0 | 0.0 |
| New | 36.9 | 9.7 | 2.3 | 6.3 | 2.9 | 0.5 |

*Source:* CIE analysis

The estimated impact of 161 TJ per annum (see table 2.12) was applied to total ACT residential usage (with the time trend applied only to rental dwellings) and dividing by forecast ACT residential connections, taking account of the adjusted forecast number of

3 https://www.sustainability.vic.gov.au/You-and-your-home/Save-energy/Heating/Heating-running-costs

4 Ibid

5 Syneca Consulting 2009. Regulatory impact statement – Proposal to introduce a minimum energy performance standard for gas water heaters. Issued by the Equipment Energy Efficiency Committee under the auspices of the Ministerial Council on Energy, 26 October. p. 52

6 https://www.betterwithgas.com.au/about-the-calculator/

7 Ibid

abolishments, to derive the revised average usage per ACT residential connection (see table 2.13).

### 2.12 Forecast annual impact of appliance changes in owner-occupied ACT dwellings

| | Home heating (ducted or central) | Room heater (not fireplace) | A fireplace | Hot water system | Cooking (cooktop / stove) | Cooking (oven) | Total |
|---|---|---|---|---|---|---|---|
| | TJ/a | TJ/a | TJ/a | TJ/a | TJ/a | TJ/a | TJ/a |
| G2E | -123.7 | -6.3 | -0.4 | -14.7 | -5.9 | -0.2 | -151.2 |
| G2G | -11.8 | -0.2 | 0.0 | -0.8 | 0.0 | 0.0 | -12.9 |
| New | 1.1 | 0.5 | 0.2 | 0.7 | 0.2 | 0.0 | 2.6 |
| **Total** | **-134.5** | **-6.1** | **-0.2** | **-14.8** | **-5.7** | **-0.2** | **-161.4** |

*Source:* CIE analysis

### 2.13 Adjusted forecast average usage by ACT owner-occupied dwellings

| Financial year ending 30 June | Average usage | Connections | Usage |
|---|---|---|---|
| | GJ/conn/a | No. | TJ/a |
| **Adjusted only for removal of component of time trend relating to ACT owner-occupied dwellings** | | | |
| 2021 | 31.9 | 133 995 | 4 271 |
| 2022 | 31.9 | 133 748 | 4 272 |
| 2023 | 31.7 | 133 498 | 4 232 |
| 2024 | 31.5 | 133 245 | 4 191 |
| 2025 | 31.2 | 132 989 | 4 150 |
| 2026 | 31.0 | 132 731 | 4 114 |
| **Adjusted for increased abolishments and reduced average usage by owner-occupied connections** | | | |
| 2021 | 30.7 | 133 783 | 4 109 |
| 2022 | 29.7 | 133 147 | 3 949 |
| 2023 | 28.3 | 132 505 | 3 748 |
| 2024 | 26.9 | 131 855 | 3 546 |
| 2025 | 25.5 | 131 198 | 3 343 |
| 2026 | 24.1 | 130 533 | 3 146 |

*Source:* CIE analysis

## *Reduced consumption and chargeable demand for ACT Government and ANU Tariff V and Tariff D customers*

### *Published information on fuel switching intentions*

The Parliamentary and Governing Agreement of the 10th Legislative Assembly states:

> The ACT Labor and Greens Agreement will take the next essential steps to a net zero-emissions ACT, through the following actions:

> Phase out of fossil-fuel-gas in the ACT by 2045 at the latest, support energy grid stability and support vulnerable households, by doing the following:
>
> …
>
> Ensure all new ACT Government buildings and facilities are fossil-fuel-gas free, including new leases. All retrofitting in Government buildings and facilities will have a goal of net-zero emissions post retrofit.

The ANU has stated in its Acton Campus Energy Management Plan,

> Natural gas forms a substantial part of the current energy mix. The University recognises however that ultimately electricity enables much more straightforward use of renewable sources and intends to move fully to this single flexible form of energy.[8]

The plan includes a chart that indicates there could be a reduction of gas usage by 2026 of around 70 per cent relative to business-as-usual due to existing building upgrades, new building standards, server heat recovery and 100 per cent electric heating roll-out.

#### *Post-model adjustment for Tariff V*

Our post-model adjustment for ACT Government and ANU Tariff V connections assumes a reduction in demand based on linear progress towards the ACT Government target of phasing out fossil-fuel gas in the ACT by 2045; that is, a reduction by 4 per cent of the current baseline usage each year.

We removed the corresponding time trend component of the base forecast for ACT commercial customers to recognise that the post-model adjustment is a gross impact, which should not apply in addition to a continuation of the energy efficiency and fuel switching observed historically.

The volumes associated with the adjustment are set out in the confidential Excel workbook that accompanies this report.

#### *Post-model adjustment for Tariff D*

To the forecast usage and ninth-highest usage day for ACT Government Tariff D sites, we applied a 4 per cent reduction on the current baseline usage each year in line with linear progress towards the target of phasing out fossil-fuel gas in the ACT by 2045. To the forecast usage and ninth-highest usage day for ANU Tariff D sites, we applied an annual growth rate of -18 per cent in line with the reduction of approximately 70 per cent by 2026 envisaged in the Acton Campus Energy Management Plan.

The volumes associated with these adjustments are set out in the confidential Excel workbook that accompanies this report.

### *Removal of one Tariff D site that is set to be demolished*

One of Evoenergy's Tariff D sites is set to be demolished and replaced with a mixed-use development, primarily residential apartments. The development application had been

8 ANU 2019. Acton Campus Energy Management Plan, p. 17.

lodged in January 2019 and proposed to develop the site over two stages. We have removed this site from forecast Tariff D site numbers, usage and chargeable demand.

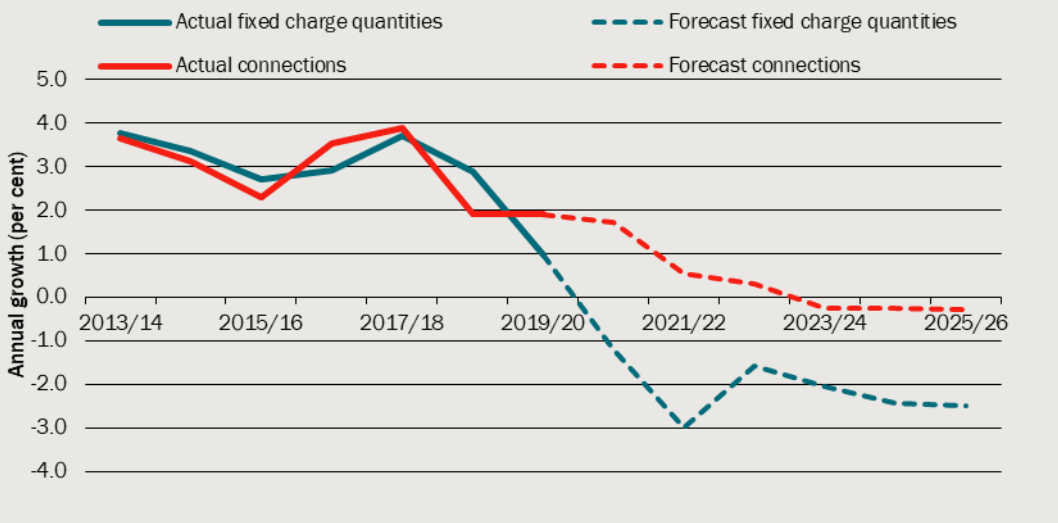
# 3 Forecast demand

## Tariff VI customer numbers and usage

### Residential Tariff VI

The revised post-model adjustments see forecast residential connection growth drop to slightly below zero, with no new ACT connections from 1 January 2023 and NSW connections expected to be offset by abolishments in the ACT after that date. Significant decreases in total fixed charge quantities are forecast due to the expected suspension of existing zero-consuming connections and the large number of ACT residential connections forecast to become zero-consuming connections due to fuel switching.

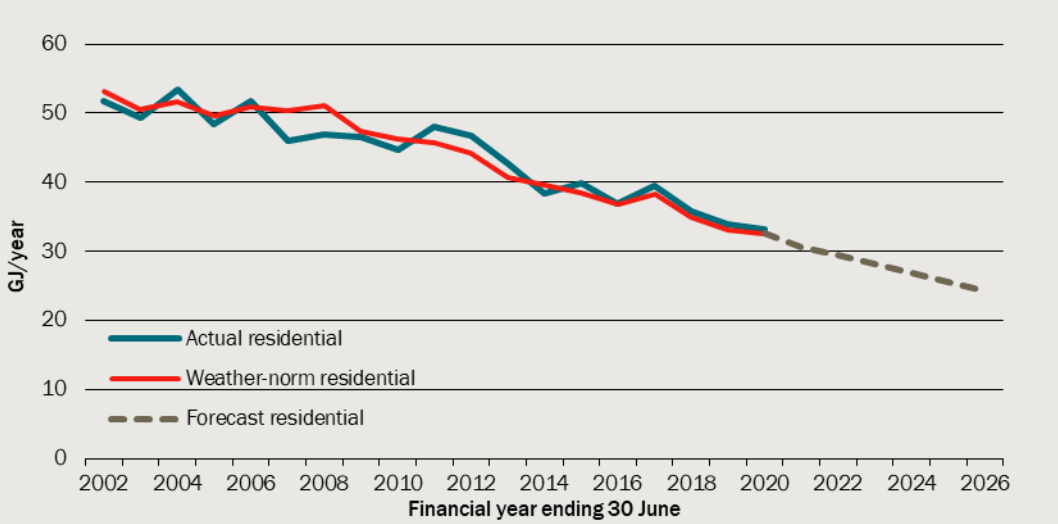
**3.1 Forecast growth in residential fixed charge quantities**




*Data source:* CIE analysis

Average residential usage is forecast to decrease from 32.5 GJ in 2019/20 to 24.3 GJ in 2025/26. A significant part of this decrease is due to the forecast fuel switching derived from the Sagacity survey results, including the forecast increase in suspended and zero-consuming connections, which are included in the base for the average.

### 3.2 Weather-normalised actual and forecast usage per residential customer




*Data source:* CIE analysis

## *Commercial Tariff VI*

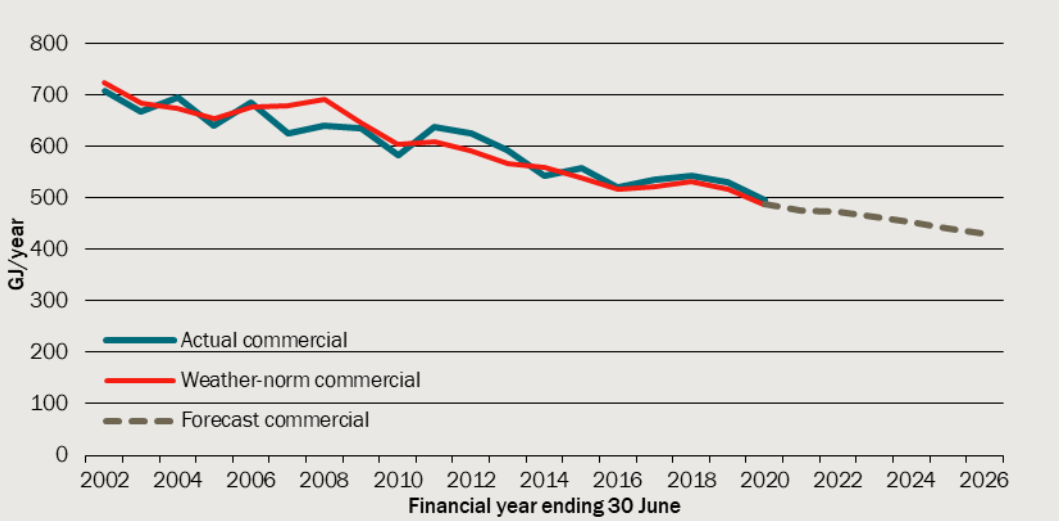
The revised post-model adjustments see forecast commercial connection growth decrease below zero, with no new ACT connections from 1 January 2023 and NSW connections expected to be offset by abolishments in the ACT after that date.

### 3.3 Actual and forecast growth in commercial customer numbers


*Data source:* CIE analysis

Average commercial usage dropped below 500 GJ in 2019/20 and is forecast to decrease further to 430 GJ by 2025/26. This decrease is partly the continuation of a historical trend and partly due to a forecast increase in fuel switching by the ACT Government and the Australian National University.

### 3.4 Actual and forecast usage per commercial customer




*Data source:* CIE analysis

## *Tariff VI total usage*

Table 3.5 shows the forecast fixed charge quantities,[9] average usage per connection and total usage. Total usage is forecast to decline by around 17.5 per cent over the access arrangement period to 5.2 PJ per year by 2025/26.

### 3.5 Forecast Tariff VI fixed charges and total usage

| | Fixed charge quantities | Growth in fixed charge quantities | Usage per connection[a] | Growth in usage per connection | Total usage | Growth in total usage |
|---|---|---|---|---|---|---|
| | Number | per cent | GJ/year | per cent | PJ/year | per cent |
| 2011/12 | 120 637 | | 58.7 | | 7.2 | |
| 2012/13 | 125 035 | 3.6 | 54.0 | -8.1 | 6.9 | -4.5 |
| 2013/14 | 129 746 | 3.8 | 48.7 | -9.7 | 6.4 | -6.4 |
| 2014/15 | 134 135 | 3.4 | 50.9 | 4.5 | 6.9 | 7.8 |
| 2015/16 | 137 789 | 2.7 | 47.6 | -6.6 | 6.6 | -4.4 |
| 2016/17 | 141 803 | 2.9 | 49.8 | 4.7 | 7.2 | 8.4 |
| 2017/18 | 146 963 | 3.6 | 45.6 | -8.4 | 6.8 | -4.9 |
| 2018/19 | 151 098 | 2.8 | 43.7 | -4.3 | 6.7 | -2.5 |
| 2019/20 | 152 442 | 0.9 | 41.9 | -4.0 | 6.5 | -2.2 |
| 2020/21 | 150 477 | -1.3 | 39.5 | -5.8 | 6.2 | -4.2 |
| 2021/22 | 145 872 | -3.1 | 38.5 | -2.6 | 6.1 | -2.0 |
| 2022/23 | 143 621 | -1.5 | 37.0 | -3.8 | 5.9 | -3.5 |
| 2023/24 | 140 719 | -2.0 | 35.6 | -3.9 | 5.7 | -4.1 |

9 Fixed charge quantities are a 50-50 weighting of opening and closing connections, where connections are defined as total connections prior to 2012/22 and as active connections (excluding suspended connections) from 2021/22 onwards.

| | Fixed charge quantities | Growth in fixed charge quantities | Usage per connection[a] | Growth in usage per connection | Total usage | Growth in total usage |
|---|---|---|---|---|---|---|
| | Number | per cent | GJ/year | per cent | PJ/year | per cent |
| 2024/25 | 137 351 | -2.4 | 34.0 | -4.3 | 5.4 | -4.5 |
| 2025/26 | 133 975 | -2.5 | 32.6 | -4.3 | 5.2 | -4.6 |

[a] includes suspended connections

*Source:* CIE analysis

## *Tariff VB customer numbers and usage*

The reported actual of six boundary tariff (Tariff VB) connections in 2019/20 reflects a weighted average of four connections at the start of the year and nine connections at the end of the year, accounting for the timing of each new connection. The estimate for 2020/21 has been set at the current actual number of Tariff VB connections, as at November 2020. Consistent with the previous forecast, customer numbers are forecast to increase by three in 2021/22. No growth is forecast thereafter to reflect the ACT Government goal of no new gas connections from 2023. The estimated number of individual units for these customers are subtracted from the residential Tariff VI customer number forecasts. Forecast usage has been updated to account for the actual average usage per individual unit in 2019/20 by existing Tariff VB customers. Table 3.6 provides a summary of the Tariff VB forecasts.

### 3.6 Summary of Tariff VB forecasts

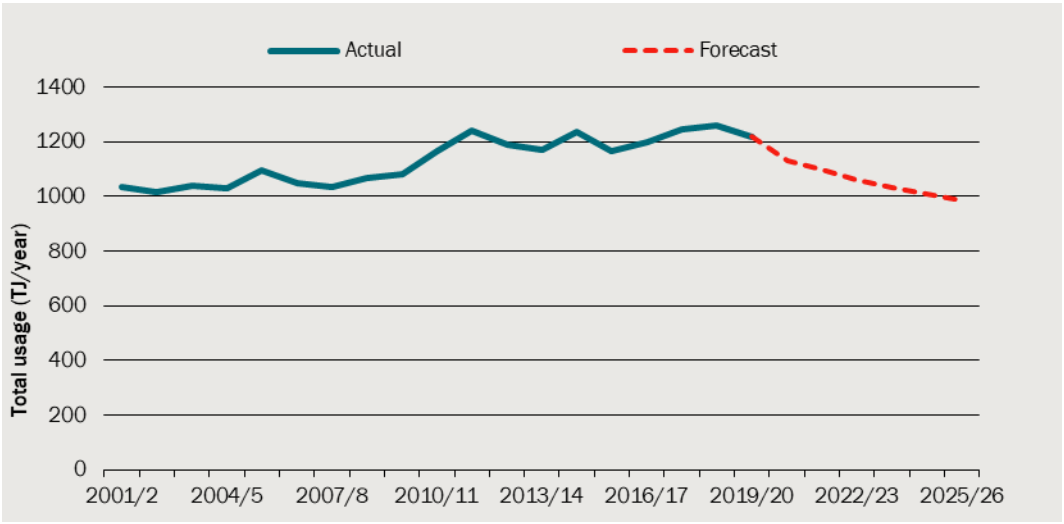
| | Customers | Usage Band 1 | Usage Band 2 | Usage Band 3 | Usage Total |
|---|---|---|---|---|---|
| | Number | GJ | GJ | GJ | GJ |
| 2015/16 | 1 | 18 | 0 | 0 | 18 |
| 2016/17 | 4 | 227 | 0 | 0 | 227 |
| 2017/18 | 4 | 547 | 0 | 0 | 547 |
| 2018/19 | 4 | 842 | 0 | 0 | 842 |
| 2019/20 | 6 | 1 434 | 1 440 | 0 | 2 874 |
| 2020/21 | 10 | 2 242 | 1 035 | 0 | 3 277 |
| 2021/22 | 13 | 2 891 | 1 335 | 0 | 4 226 |
| 2022/23 | 13 | 2 846 | 1 314 | 0 | 4 160 |
| 2023/24 | 13 | 2 800 | 1 293 | 0 | 4 093 |
| 2024/25 | 13 | 2 755 | 1 272 | 0 | 4 027 |
| 2025/26 | 13 | 2 713 | 1 252 | 0 | 3 965 |

*Source:* CIE analysis

## *Tariff D customer numbers, usage and chargeable demand*

Demand tariff (Tariff D) customer numbers are forecast to decrease by one customer, to account for the imminent demolition of one of the Tariff D sites, and remain at a total of 39 customers for the duration of the access arrangement period. Total usage is forecast to decline, partly due to the removal of the site mentioned above and partly due to forecast fuel switching by ACT Government and ANU sites. Usage at other sites is forecast to decrease from the weather-normalised 2019/20 level in line with the forecast decrease in EDD.

### 3.7 Actual and forecast annual usage by Tariff D customers




*Data source:* CIE analysis

Forecasts of chargeable demand use the ninth-highest usage day for each customer in 2019/20 as a starting point, with annual growth in line with the growth in usage described above. Table 3.8 provides the chargeable demand forecasts by block.

### 3.8 Summary of Tariff D forecasts

| | Usage | Chargeable demand Block 1 | Chargeable demand Block 2 | Chargeable demand Block 3 | Chargeable demand Total |
|---|---|---|---|---|---|
| | TJ/year | GJ/day | GJ/day | GJ/day | GJ/day |
| 2020/21 | 1 129 | 1 935 | 2 377 | 2 187 | 6 499 |
| 2021/22 | 1 096 | 1 936 | 2 371 | 2 025 | 6 331 |
| 2022/23 | 1 062 | 1 936 | 2 354 | 1 864 | 6 154 |
| 2023/24 | 1 033 | 1 936 | 2 340 | 1 725 | 6 001 |
| 2024/25 | 1 007 | 1 932 | 2 332 | 1 603 | 5 868 |
| 2025/26 | 984 | 1 924 | 2 331 | 1 496 | 5 751 |

*Source:* CIE analysis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