




FINAL REPORT

Powercor and CitiPower customer number forecasts



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Powercor and CitiPower
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CANBERRA

Centre for International Economics
Ground Floor, 11 Lancaster Place
Majura Park

Canberra ACT 2609
GPO Box 2203
Canberra ACT Australia 2601

Telephone +61 2 6245 7800
Facsimile +61 2 6245 7888
Email cie@TheCIE.com.au
Website www.TheCIE.com.au

SYDNEY

Centre for International Economics
Level 7, 8 Spring Street
Sydney NSW 2000

Telephone +61 2 9250 0800
Email ciesyd@TheCIE.com.au
Website www.TheCIE.com.au

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Customer number forecasts

The CIE has been requested to undertake customer number projections for Powercor and CitiPower (the Businesses). The projections are prepared at the network level for the following customer categories:

- residential
- non-residential
- low voltage
- high voltage
- unmetered
- other.

In any forecasting exercise there will be forecast errors and these forecasts are subject to some uncertainty. Forecast errors arise because:¹

- of errors in the data used to build the historical model
- of errors in the model used
- the relationship between a driver of demand and demand may change over time
- of errors in forecasts of drivers (such as population growth).

This report sets out the methodology used to estimate each of these customer categories and summarises the forecast results.

Methodology

We have adopted the same approach used to prepare customer number forecasts for the Businesses in 2015.² Table 1 shows our forecasting approach for customer numbers of each category of tariffs.

Residential customer numbers are the only category that is forecast using a driver variable. Industrial customers are assumed to remain at current levels, while non-residential and low voltage customers are forecast using a time trend. Unmetered customers are expected to grow by a fixed amount due to technological change. Customer numbers are forecast 'off-the-point', meaning that projected growth rates are applied to the number of customers in the most recent year of data.

¹ See Hendry, D. and M. Clements 2001, "Economic forecasting: some lessons from recent research", *Economic modelling*, vol. 20(2), pages 301-329, March for a full taxonomy of forecast errors.

² The CIE 2015, Tariff volume forecasts – 2015 update, prepared for CitiPower and Powercor.

1 Forecasting approach for customer numbers

Tariff category	Forecast approach
Residential	Forecast using projected dwelling growth, adjusted for CitiPower to reflect historically lower growth of customers than dwellings
Non-residential	Continuation of historical time trend observed from 2006 through 2016, from most recent data point (2018) The final two years of historical data were excluded from the trend calculation because small commercial customers using more than 60MWh and less than 120MWh have been reclassified from non-residential customers not on demand tariff to low voltage demand tariff, resulting in a structural break in 2017
Low voltage	Continuation of historical time trend observed from 2006 through 2016, from most recent data point (2018) The final two years of historical data were excluded from the trend calculation because small commercial customers using more than 60MWh and less than 120MWh have been reclassified from non-residential customers not on demand tariff to low voltage demand tariff, resulting in a structural break in 2017
High voltage	Zero growth from most recent data point
Un-metered	Assumed to increase by 500 customers and 250 customers for Powercor and CitiPower areas respectively. This is based on expected increase in customers in 2019 due to the installation of telecommunication infrastructure. Data is not available for future years; growth is assumed to continue due to the continued roll out of the NBN the expected future transition from 4G to 5G network
Other customers	Assumed to remain at zero

Source: CIE.

Residential customer projections

The main driver of residential customers is the number of dwellings in the network area and has been forecast by relating customer growth to projected dwelling growth.

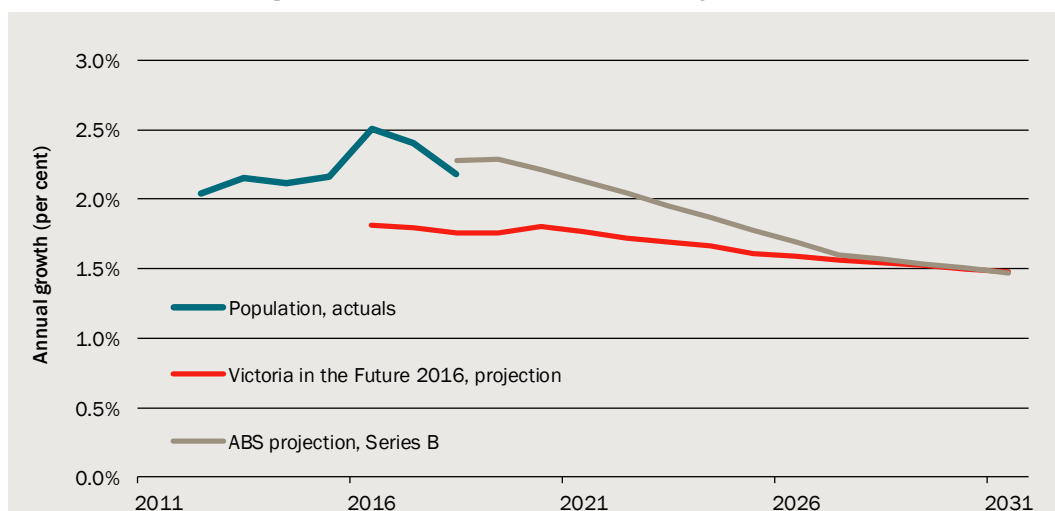
Residential customer projections for each network area were formulated as follows:

- Population for Victoria was taken from ABS population projections.³ This is an assumption-based projection which outlines three scenarios representing a range of possible population driver outcomes (e.g. fertility rates and net overseas migration). The analysis uses scenario B which is based on medium level assumptions for population drivers. ABS projections were used in favour of Victorian Government projections (Victoria in the Future), as growth rates implied by the state government projections have been significantly below population actuals since 2016 (chart 2).⁴

³ ABS 2018, 3222.0 - Population Projections, Australia, 2017 (base) – 2066.

⁴ The projection model includes a switch, which allows projections to be based on VIF 2016.

2 Actual population growth compared to population projections



Note: The difference between the growth rate of population

Data source: Victoria in the future 2016, ABS 3222.0 - Population Projections, Australia, 2017 (base) - 2066, ABS 3101.0 - Australian Demographic Statistics, Jun 2018, CIE

- Population is disaggregated into Victorian Local Government Areas (LGAs), based on the share of the population in each LGA for each future year, calculated from Victorian Government population projections.⁵
- Population is mapped to the number of dwellings, based on the average household size by LGA from Victorian Government dwelling forecasts.⁶
- This data is mapped from the LGA level to the Powercor and CitiPower networks consistent with average and maximum demand forecasts.⁷ Though the borders of LGAs do not map perfectly to the network areas, this does not significantly affect the forecasts because the measures of dwellings are only used to determine a growth rate (in percentage terms), and so the number of dwellings or level of the data is less important.
- Finally, dwelling growth rates are used to forecast the residential customer growth.

For CitiPower, changes in dwellings have historically overstated the change in residential customers, particularly over recent years.

- From 2011 to 2016, the number of residential customers grew by 8.0 per cent compared to a 13.1 per cent growth in the number of dwellings (using Census data).
- The difference in growth rates between dwellings and customers likely reflects the large share of higher-density dwellings in the CitiPower network area, as some apartment blocks are embedded networks and are treated as a single customer. Higher

⁵ Victorian Department of Environment, Land, Water and Planning 2016, Victoria in Future 2016 – Population and Household projections to 2051

⁶ Victorian Department of Environment, Land, Water and Planning 2016, Victoria in Future 2016 – Population and Household projections to 2051

⁷ The CIE 2019, CitiPower and Powercor Maximum demand forecasts, prepare for CitiPower and Powercor, p. 22-23.

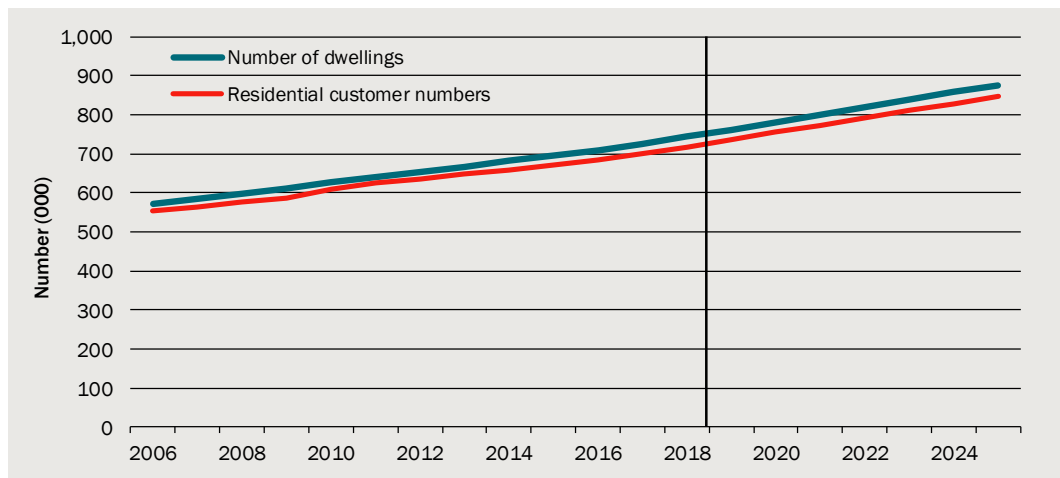
density dwellings account for around 91.1 per cent of building approvals in the CitiPower area compared to only 14.9 per cent in the Powercor network area. The difference between the number of new customers and building approvals has increased, in line with increases of the share of higher-density dwellings in total building approvals.

For the CitiPower network, we apply the ratio of average customer growth between 2006 and 2018 to average dwelling growth between 2006 and 2018 to forecast dwelling growth. Based the historical data, this means that a 1 per cent increase in the number of dwellings results in a 0.59 per cent increase in residential customers in the CitiPower network area. The adjustment is not applied for the Powercor network area, which historically has dwelling growth to customer growth ratio of around 1.05.

Results

Charts 3 and 4 show the actual and forecast number of dwellings and customers for Powercor and CitiPower.

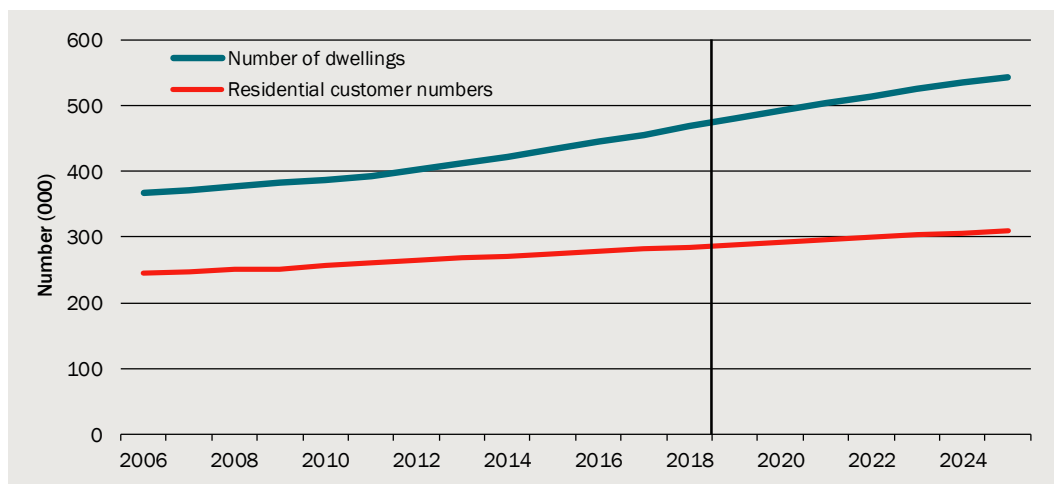
3 Powercor dwellings and residential customer numbers



Note: The difference between the number of dwellings and customers is due to the mapping of LGA dwellings to network areas, as well as some apartment blocks being treated as a single customer.

Data source: CIE.

4 CitiPower dwellings and residential customer numbers



Note: The difference between the number of dwellings and customers is due to the mapping of LGA dwellings to network areas, as well as some apartment blocks being treated as a single customer.

Data source: CIE.

A summary of customer growth over the next 6 years is set out in table 5.

5 Summary of projected growth in customer numbers

	2019	2020	2021	2022	2023	2024
	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
Powercor						
Residential	2.57	2.51	2.48	2.36	2.32	2.25
Non-residential	0.50	0.50	0.49	0.49	0.49	0.49
Low voltage	1.00	0.99	0.98	0.97	0.96	0.95
High voltage	0.00	0.00	0.00	0.00	0.00	0.00
Unmetered	5.88	5.56	5.26	5.00	4.76	4.55
Other	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.34	2.29	2.26	2.17	2.13	2.07
CitiPower						
Residential	1.44	1.45	1.36	1.24	1.16	1.07
Non-residential	1.76	1.73	1.70	1.67	1.64	1.61
Low voltage	0.78	0.78	0.77	0.76	0.76	0.75
High voltage	0.00	0.00	0.00	0.00	0.00	0.00
Unmetered	5.42	5.14	4.89	4.66	4.45	4.26
Other	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.52	1.52	1.44	1.34	1.26	1.19

Source: CIE.



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