

23 November 2022

Report to Transgrid

Transgrid TUOS

as a proportion of residential and small
business electricity bills



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Introduction

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Transgrid is preparing its submission to the Australian Energy Regulator (AER) for the 2023-28 Revenue Determination and would like to understand the share of residential and small business electricity bills in New South Wales and the Australian Capital Territory (ACT) that are represented by Transgrid's Transmission Use of System (TUOS) charges. ACIL Allen has been engaged by Transgrid to assist on this matter.

Scope of work

ACIL Allen is required to estimate the proportion of electricity bills for households and small businesses in New South Wales and the ACT that is attributed to Transgrid's TUOS for 2020-21, 2021-22 and 2022-23. ACIL Allen is not required to project the proportion of TUOS for electricity bills beyond 2022-23. Hence, if the results of this analysis are to be used when assessing the future percentage of TUOS in an electricity bill, then any changes in future mixes of the electricity bill components ought to be considered.

Approach

2

New South Wales

As part of the annual process to determine Default Market Offers (DMO), the AER publishes a breakdown of the DMO price into the core components for a typical electricity bill for residents and small businesses in New South Wales, south-east Queensland, and South Australia. The core components are:

- wholesale
- environmental
- network
- residual (which can be thought of as retail costs and margin).

We have used the DMO as the starting point for this analysis. The DMO includes a single network component (Network Use of System or NUOS) which comprises TUOS charges, Distribution Use of System (DUOS) charges and jurisdictional scheme costs (which are the costs associated with state government policies that are collected via network charges, and in the case of New South Wales is currently the Climate Change Fund (CCF)¹), and metering. Hence, for this analysis, we need to split out the network component into its subcomponents.

¹ And in subsequent years will include scheme costs arising from the *Electricity Infrastructure Investment Act 2020 (NSW)*

Each year, each distribution network service provider (DNSP) submits to the AER an annual pricing proposal. In these pricing proposals, there is a split between TUOS, DUOS and other network charges (metering and jurisdictional scheme costs). In response to the pricing proposal, the AER releases its Statement of Reasons, summarising the AER’s approval of the pricing proposal, and includes the AER’s estimated network cost movements attributable to the various components of network tariffs and metering charges for residential and small business customers respectively.

When estimating the network cost changes in the Statement of Reasons, the AER used:

- for 2020-21 and 2021-22, consumption profiles from the most recent economic benchmarking regulatory information notice (RIN) data of the corresponding DNSP
- for 2022-23, its analysis on actual data for residential electricity usage and customer numbers reported in the DNSP 2022–23 pricing proposals.

Using this information, we can then ascertain the proportion of network costs which is attributed to TUOS.

Ideally, the consumption profiles adopted by the AER in its DMO determination and Statement of Reasons would be the same. However, this is not always the case. For the purposes of this analysis, if the consumption volumes are different (between the DMO and Statement of Reasons), ACIL Allen has adopted the volumes from the Statement of Reasons and adjusted the variable non-network cost components of the DMO price by the ratio of the Statement of Reasons consumption to the DMO consumption levels.

The non-network components of the DMO are wholesale and environmental costs, and residual costs. We have chosen to adjust the non-network components of the DMO because the wholesale and environmental costs are charged on a c/kWh basis and therefore are not related to daily or demand-based charges, and hence make for a more straight-forward transformation.

Residual costs are a mix of fixed and variable costs. However, the AER provides a single dollar value for a typical customer, and not a split into the fixed and variable portions. Only the variable component of the residual cost ought to be scaled to the ratio of Statement of Reasons to DMO consumption levels; and the fixed component of the residual cost should remain unchanged.

We have split the residual costs into their fixed and variable components by using the split information contained in the 2020-21, 2021-22 and 2022-23 regulatory determinations made by the Queensland Competition Authority (QCA), as shown below. Although the QCA data relates to Queensland, it is the most recent estimate of the split of residual costs. In effect, we are assuming the split is no different in New South Wales.

Table 2.1 Residual retail costs for typical residual and small business customers

		2020-21	2021-22	2022-23
Residential	Fixed (\$/customer)	\$137	\$124	\$130
	Variable (c/kWh)	2.13	1.28	1.45
Small business	Fixed (\$/customer)	\$194	\$173	\$182
	Variable (c/kWh)	2.49	3.40	3.87

Source: ACIL Allen analysis of QCA reports

Using the above information and steps, we can then ascertain the proportion of network costs which is attributed to TUOS.

We have undertaken the analysis for 2020-21, 2021-22 and 2022-23 (covering all 3 DMO periods) for the three electricity distribution networks in New South Wales:

- Ausgrid
- Endeavour Energy
- Essential Energy.

Australian Capital Territory

Similarly, in the ACT the Independent Competition and Regulatory Commission (ICRC) determines prices for the supply of electricity by ActewAGL to customers on its regulated retail tariffs.

The ICRC publishes a breakdown of the regulated price into the cost components for residents and small businesses in the ACT as shown in Table 2.2. The cost components are reported by the ICRC at a more detailed level than the DMO components, and we have mapped them to the DMO core cost components for reference. Unlike the DMO which reports the DMO core costs on a dollar basis for a typical residential and small business consumer, the ICRC costs are presented on a \$/MWh basis and are the same for residential and small business customers. Given this is the case, we can simply multiply the ICRC non-network costs by the consumption volumes assumed by the AER in its Statement of Reasons for the Evoenergy pricing proposal.

Table 2.2 Electricity cost components reported by the ICRC, and a mapping to the DMO core cost components

Cost component	Mapping to equivalent DMO core component
Wholesale energy purchase cost	Wholesale
National green scheme costs	Environmental
Energy losses	Wholesale
Volatility allowance	Wholesale
NEM fees	Wholesale
Network costs (excluding ACT Government scheme costs)	Network
ACT Government schemes	Network
Retail operating costs	Residual
Energy efficiency scheme costs	Environmental
AEMC Power of Choice costs	Residual
Smart meter costs	Residual
Retail margin	Residual

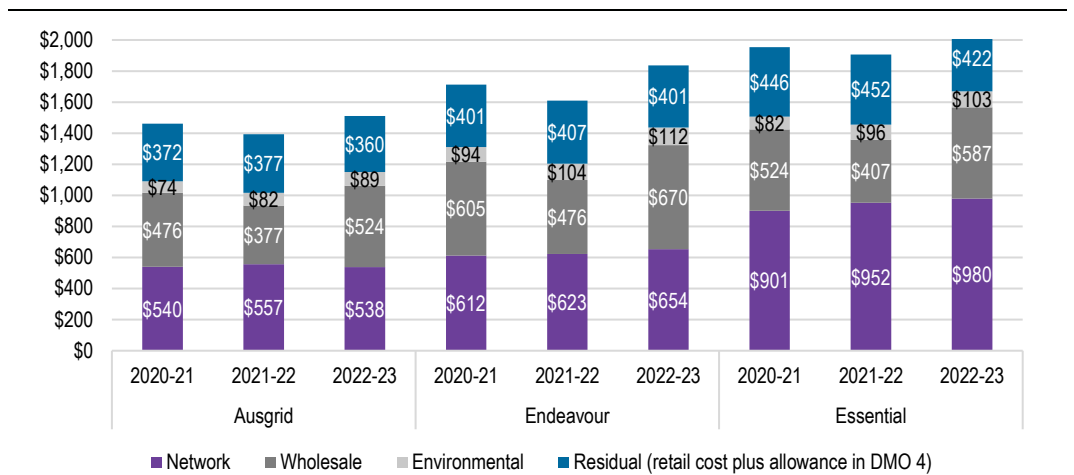
Source: ACIL Allen analysis of ICRC reports

Analysis 3

Retail bill components – New South Wales

Figure 3.1 summarises the DMO bill components for the three DNSPs in New South Wales for 2020-21, 2021-22 and 2022-23. Network costs represent 41 per cent of the total bill for households, and 37 per cent for small businesses, on average across the 3 DMO periods. In the latest DMO period 2022-23, network costs as a percentage of the total bill for households and small businesses, have reduced to 39 per cent and 35 per cent, respectively. This is primarily due to a 40 per cent increase in wholesale costs in the 2022-23 DMO period.

Figure 3.1 Default Market Offer cost (\$, nominal per year) for typical household / small business



Source: ACIL Allen analysis of AER DMO reports

The DMO cost estimates provided in Figure 3.1 are based on the consumption volumes in Table 3.1. In the 2022-23 DMO, the AER adopted lower consumption volumes for small business in of 10 MWh compared to 20 MWh in previous DMOs. For illustrative purposes, the AER also provided cost estimates based on the 20 MWh volumes, which we have used in this analysis.

Table 3.1 Consumption volumes (MWh) of a typical customer adopted by the AER for the 2020-21, 2021-22 and 2022-23 DMO

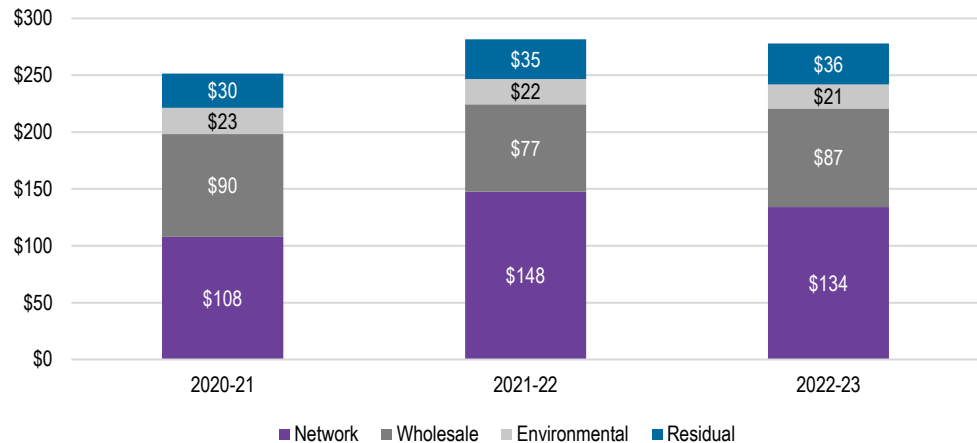
	Residential	Small business
Ausgrid	3.9	20
Endeavour Energy	4.9	20
Essential Energy	4.6	20

Source: ACIL Allen analysis of AER DMO reports

Retail bill components – Australian Capital Territory

Figure 3.2 summarises the ICRC regulated cost components for Evoenergy in the ACT for 2020-21, 2021-22 and 2022-23. Network costs represent 43 per cent of the total bill in 2020-21, increasing to 52 per cent in 2021-22 due to an increase in ACT Government scheme costs, and then decreasing to 48 per cent in 2022-23 due to a decrease in ACT Government scheme costs.

Figure 3.2 Regulated costs (\$/MWh, nominal) for households and small businesses in the ACT



Source: ACIL Allen analysis of ICRC reports

Network component of retail bill

In the 2022-23 Statement of Reasons, the AER changed the way it calculates the network component of the typical bill in 2 ways compared to its 2021-22 Statement of Reasons – firstly, in the 2022-23 Statement of Reasons, the AER did not separate the TUOS component from the metering and jurisdictional scheme components, and, secondly, the AER modified the consumption volumes. Therefore, a direct comparison cannot be made between the bill component estimates in the 2021-22 and 2022-23 Statement of Reasons.

For consistency, in this report ACIL Allen has estimated the network components in 2022-23 using the same subcomponents and assumed consumption volumes as the 2021-22 Statement of Reasons. To do this, ACIL Allen has used the percentage change of subcomponents sourced from the DNSP 2022-23 pricing models and applied this percentage change to the 2021-22 Statement of Reasons estimates.

These percentage changes for the 2022-23 year, for each subcomponent, as set out in the DNSP pricing proposals, are shown in Table 3.2 (for residential) and Table 3.3 (for small business).

Table 3.2 % change in network costs in 2022-23, by subcomponent and DNSP – Residential

	DUOS	TUOS	Jurisdictional schemes	Metering
Ausgrid	-6.6%	4.6%	-2.5%	2.1%
Endeavour	5.3%	2.9%	2.1%	5.5%
Essential	2.8%	1.3%	4.4%	5.9%
Evoenergy	-4.6%	5.4%	-19.5%	3.6%

Source: 2022-23 DNSP annual SCS pricing models

Table 3.3 % change in network costs in 2022-23, by subcomponent and DNSP – Small business

	DUOS	TUOS	Jurisdictional schemes	Metering
Ausgrid	-3.9%	4.5%	20.6%	1.7%
Endeavour	5.5%	2.9%	5.0%	5.5%
Essential	2.5%	1.3%	1.3%	5.9%
Evoenergy	-6.3%	1.3%	-25.0%	3.8%

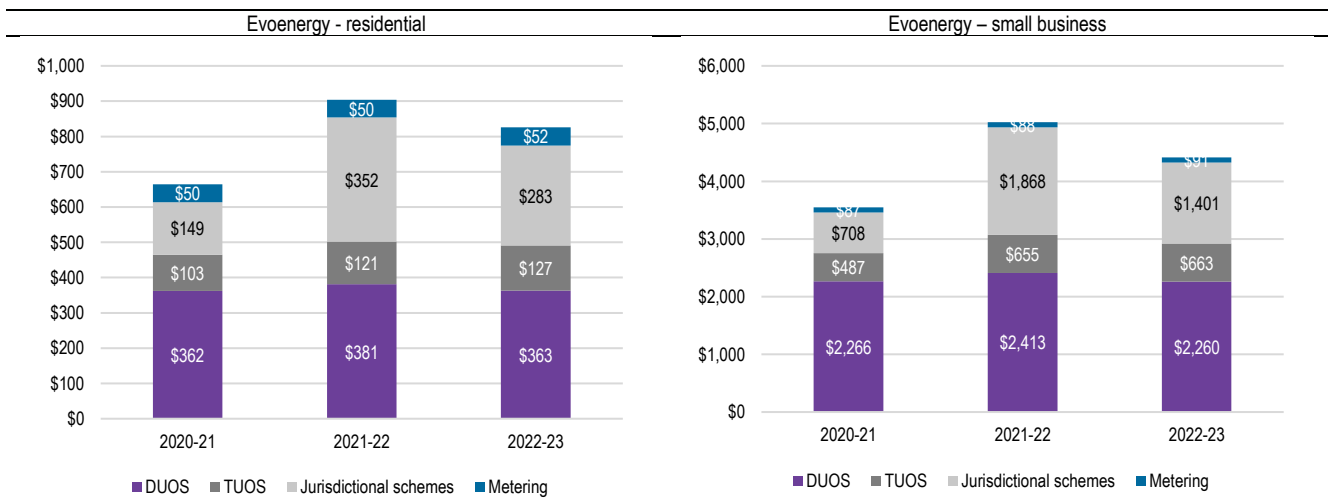
Source: 2022-23 DNSP annual SCS pricing models

Figure 3.3 and Figure 3.4 summarise the subcomponents of the network component of household and small business electricity bills in the ACT and New South Wales, respectively. The subcomponents:

- for 2020-21 and 2021-22 are taken from the relevant Statement of Reasons
- for 2022-23 are estimated by applying the percentage changes in Table 3.2 and Table 3.3 above to the 2021-22 bill estimates.

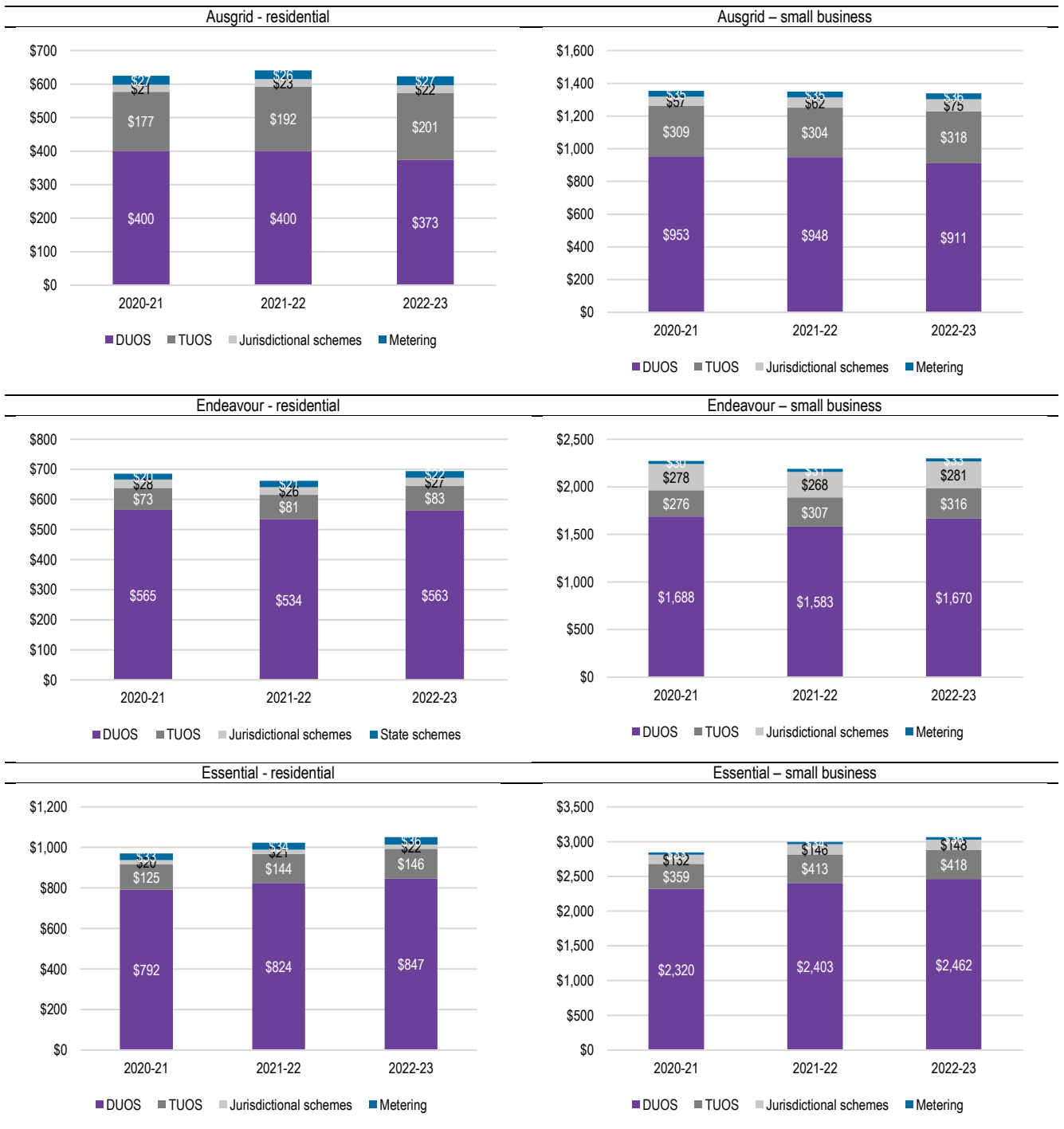
Across 2020-21, 2021-22 and 2022-23, TUOS represents between 10 and 32 per cent of the network component of a bill.

Figure 3.3 Statement of Reasons network component costs (\$, nominal per year) for typical household / small business – ACT



Source: ACIL Allen analysis of AER Statement of Reasons reports and DNSP pricing proposals

Figure 3.4 Statement of Reasons network component costs (\$, nominal per year) for typical household / small business – New South Wales



Source: ACIL Allen analysis of AER Statement of Reasons reports and DNSP pricing proposals

TUO component of retail bill, by DNSP

The consumption volumes adopted by the AER in the 2020-21 and 2021-22 Statement of Reasons are shown in Table 3.4. As discussed earlier, the 2022-23 Statement of Reasons assumes lower consumption volumes than 2020-21 and 2021-22. For consistency, we have based the analysis in this report on the higher consumption volumes used in the 2020-21 and 2021-22 Statement of Reasons. If we were to assume the lower average consumption in all years of this analysis, the bill

estimates would be lower. However, we would expect that the percentage of the bill attributed to TUOS to be very similar. We tested this for 2021-22 and 2022-23 by using the lower consumption volumes and found that TUOS as a percentage of the total retail bill was within 0.5 percentage points of the estimates presented in this report.

Table 3.4 Consumption volumes (MWh) of a typical customer adopted by the AER for the 2020-21 and 2021-22 DNSP Statements of Reasons

	Residential	Small business
Ausgrid	5.472	10.616
Endeavour Energy	6.096	22.95
Essential Energy	6.014	17.266
Evoenergy	6.37	26.695

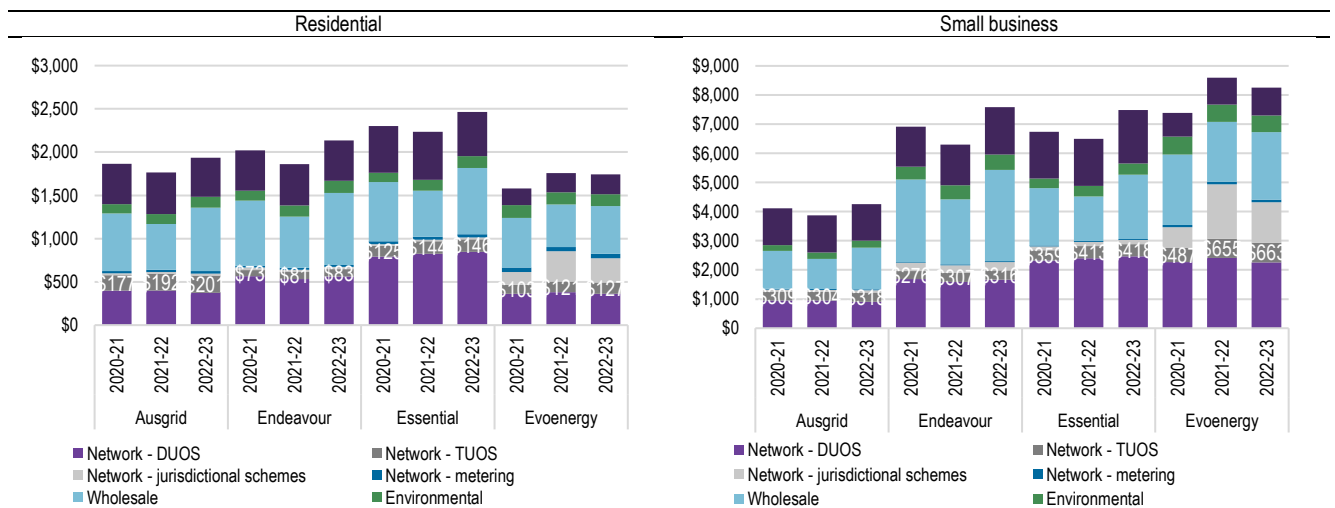
Source: ACIL Allen analysis of AER Statement of Reasons reports

For the New South Wales DNSPs, we have taken the ratio of the Statement of Reasons volume to the DMO volume, to scale the variable non-network cost components from the DMO and added these, together with the estimated fixed residual component, to the corresponding network components from the Statement of Reasons to arrive at the total electricity bill breakdown, as shown in Figure 3.5 (in dollars) and in Figure 3.6 (in percentage terms).

For the ACT, we have multiplied the Statement of Reasons volume by the non-network cost components from the ICRC and added these to the corresponding network components from the Statement of Reasons to arrive at the total electricity bill breakdown, as shown in Figure 3.5 (in dollars) and in Figure 3.6 (in percentage terms).

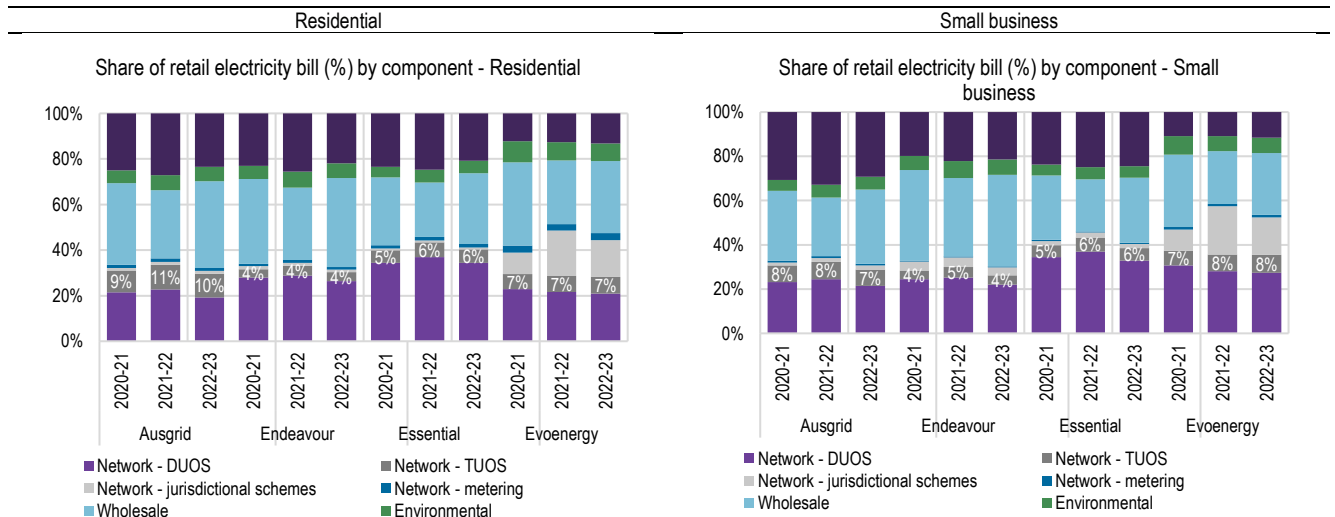
The TUOS component represents between 4 and 11 per cent of a typical bill. Aside from Ausgrid bills tending to have a TUOS component that represents a higher percentage of the total bill when compared with the other three DNSPs, there is no discernible pattern in the TUOS component as a percentage of the total retail bill in terms of customer type.

Figure 3.5 Retail electricity bill (\$, nominal) by component for a typical customer



Source: ACIL Allen analysis of AER data

Figure 3.6 Share of retail electricity bill (%) by component



Source: ACIL Allen analysis of AER and ICRC data

Transgrid requested ACIL Allen to aggregate the costs at a slightly higher level, and this is shown in Table 3.5.

Table 3.5 Share of retail electricity bill (%) by component by DNSP

		Ausgrid			Endeavour			Essential			Evoenergy		
		2020-21	2021-22	2022-23	2020-21	2021-22	2022-23	2020-21	2021-22	2022-23	2020-21	2021-22	2022-23
Residential	Generation	35.8%	30.0%	38.0%	37.2%	31.8%	39.0%	29.7%	23.9%	31.2%	36.5%	27.9%	31.7%
	Transmission	9.5%	10.9%	10.4%	3.6%	4.4%	3.9%	5.4%	6.5%	5.9%	6.5%	6.9%	7.3%
	Distribution	21.5%	22.7%	19.3%	28.0%	28.7%	26.4%	34.4%	37.0%	34.4%	22.9%	21.7%	20.9%
	Retail and other	26.5%	28.6%	24.8%	24.0%	26.7%	22.9%	24.9%	26.1%	22.2%	15.3%	15.4%	16.1%
	Environmental policies	6.7%	7.8%	7.6%	7.2%	8.4%	7.8%	5.5%	6.6%	6.3%	18.7%	28.1%	24.1%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Small business	Generation	31.5%	26.5%	33.6%	41.0%	35.4%	41.4%	29.2%	23.5%	29.4%	32.7%	23.9%	28.0%
	Transmission	7.5%	7.9%	7.5%	4.0%	4.9%	4.2%	5.3%	6.4%	5.6%	6.6%	7.6%	8.0%
	Distribution	23.2%	24.5%	21.4%	24.4%	25.1%	22.0%	34.4%	37.0%	32.9%	30.7%	28.1%	27.4%
	Retail and other	31.5%	33.7%	30.1%	20.2%	22.6%	21.8%	24.2%	25.4%	25.0%	12.1%	11.8%	12.7%
	Environmental policies	6.3%	7.4%	7.4%	10.4%	12.0%	10.6%	6.8%	7.8%	7.2%	17.9%	28.6%	23.9%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: ACIL Allen analysis of AER and ICRC data

TUOS component of retail bill, in aggregate

Transgrid also requested ACIL Allen to report the aggregate component shares of retail electricity bills across the four DNSPs. We have done this by finding the weighted average of the shares in Table 3.5 using customer numbers as the weighting (as shown in Table 3.6).

Table 3.6 Customer numbers by DNSP – 2020-21

	Ausgrid	Endeavour	Essential	Evoenergy
Residential	1,590,154	959,048	771,827	192,476
Small business	184,050	108,301	163,352	20,029

Source: ACIL Allen analysis of AER State of the Energy Market report 2022, and DNSP RINs

Across the four DNSPs, the transmission component represents 7 and 6 per cent of the total bill for residential and small business customers, respectively.

Table 3.7 Share of retail electricity bill (%) by component across New South Wales and the ACT in 2022-23

	Residential	Small business
Generation	36%	34%
Transmission	7%	6%
Distribution	25%	24%
Retail and other	23%	26%
Environmental policies	8%	9%
Total	100%	100%

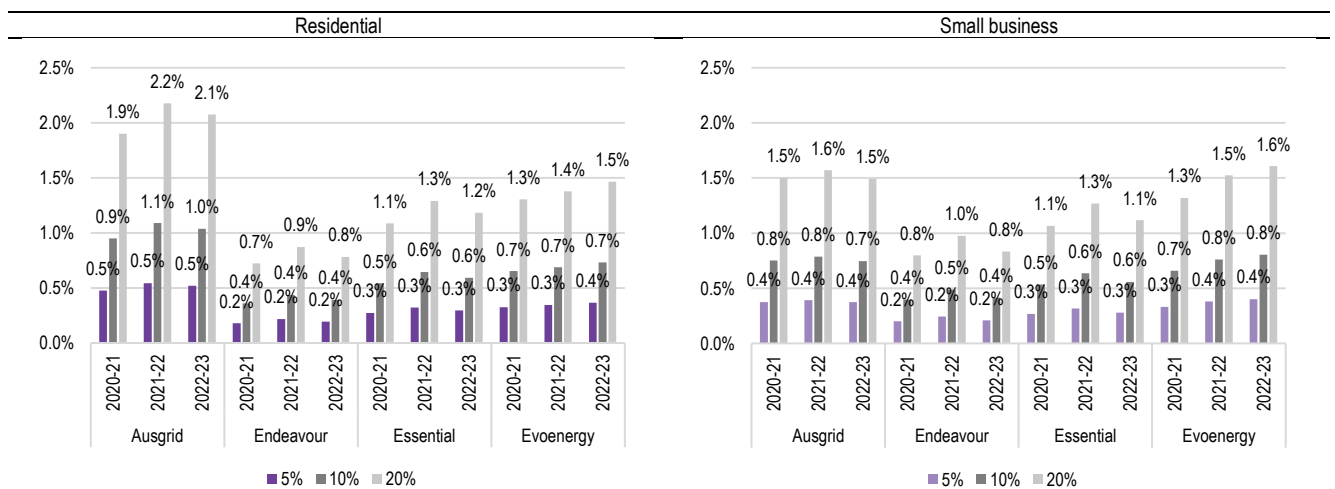
Note: Numbers will not necessarily sum to 100 per cent due to rounding.

Source: ACIL Allen analysis

Sensitivity analysis

We then undertook a simple sensitivity analysis, in which we increased the TUOS component of the derived electricity bill by 5, 10 and 20 per cent. Figure 3.7 shows that with a 20 per cent increase in TUOS, if the other components were to remain unchanged, electricity bills would increase by between 0.7 and 2.2 per cent.

Figure 3.7 Percentage change in retail electricity bill given 5%, 10% and 20% change in TUOS component



Source: ACIL Allen analysis of AER data

Melbourne

Suite 4, Level 19; North Tower
80 Collins Street
Melbourne VIC 3000 Australia
+61 3 8650 6000

Canberra

Level 6, 54 Marcus Clarke Street
Canberra ACT 2601 Australia
+61 2 6103 8200

ACIL Allen Pty Ltd
ABN 68 102 652 148

acilallen.com.au

Sydney

Level 9, 50 Pitt Street
Sydney NSW 2000 Australia
+61 2 8272 5100

Perth

Level 12, 28 The Esplanade
Perth WA 6000 Australia
+61 8 9449 9600

Brisbane

Level 15, 127 Creek Street
Brisbane QLD 4000 Australia
+61 7 3009 8700

Adelaide

167 Flinders Street
Adelaide SA 5000 Australia
+61 8 8122 4965