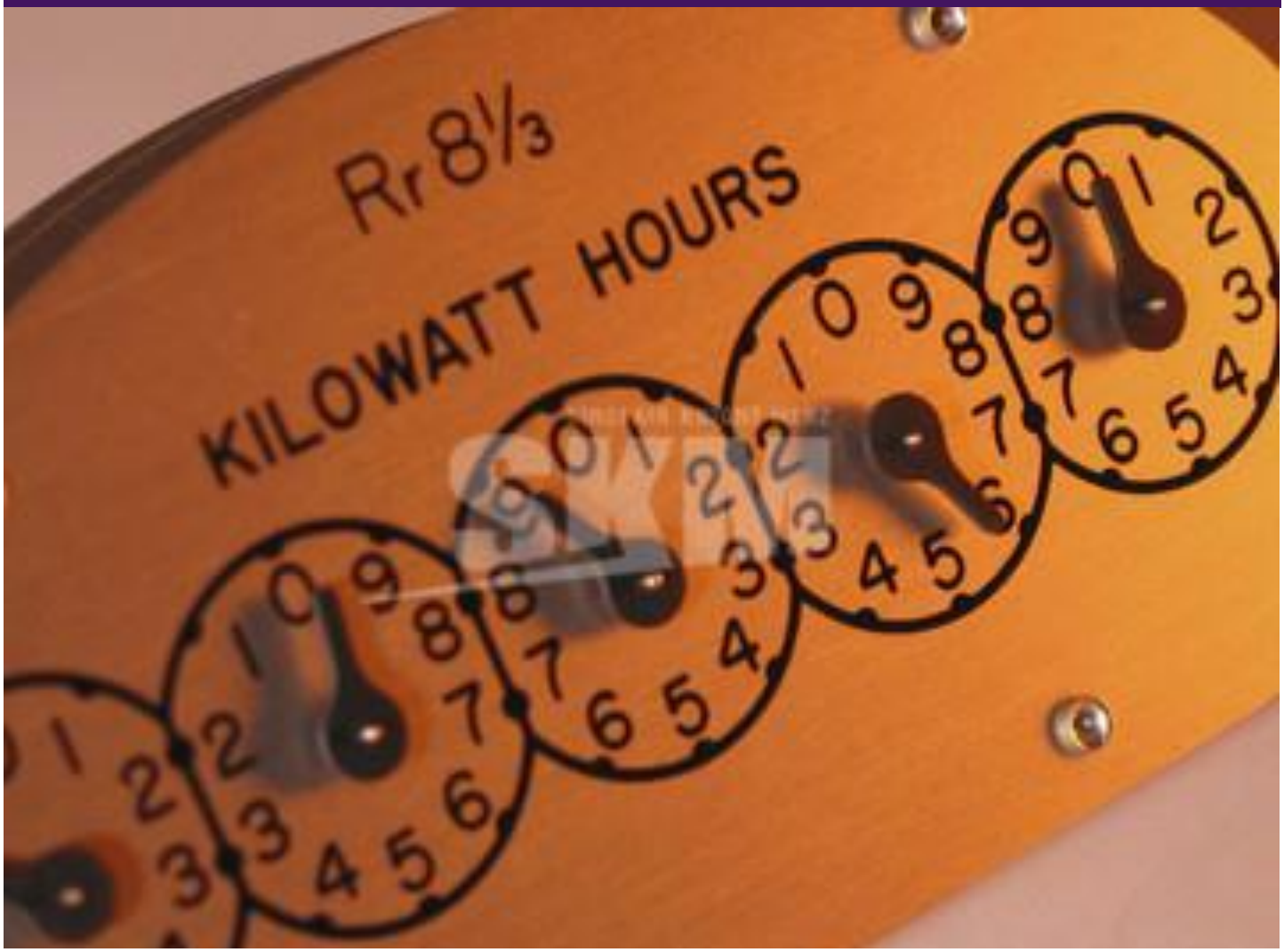
Analysis of Electricity Retail Prices and Retail Margins 2006 - 2012

REPORT FOR ESSENTIAL SERVICES COMMISSION

SH43361 | 10th May 2013



SINCLAIR KNIGHT MERZ SKM MMA

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Executive summary

The Essential Services Commission (Commission) engaged SKM MMA to undertake a research project analysing electricity retail prices and retail margins. The objectives of this project were to:

- identify trends in electricity retail margins in recent years (from Financial Year ending June 2006 to Financial Year ending June 2012).
- compare Victorian electricity retail margins to those in other jurisdictions.
- identify any trends or patterns in retailers' pricing behaviour(s).

Thus the focus of the work was to allow the assessment of trends in retail margins, both gross and net, for different retailer types and across different network tariffs and geographic locations. The retail revenues earned by retailers have been based on retail market prices provided to the Commission or regulated in other states. We have built up the wholesale supply costs based on a combination of published network costs and generic assumptions about contracting strategies and applicable load profiles. The Retail Operating Costs assumed have been derived from regulatory determinations and are not specific to any retailer. SKM MMA did not have access to confidential information about retailer's costs or business practices therefore the analyses we have carried out have been based on a generic cost build-up and do not necessarily accurately portray actual costs, contracting or business strategies for any specific retailer.

Retail cost components

In this report, the wholesale supply cost refers to all costs incurred by electricity retailers, excluding retail operating cost. The wholesale supply cost is made up of the following components:

- Generation or purchased energy costs, including hedging costs
- Green and white certificate costs, including LGCs, STCs, NGACs, VRECs, and VEECs where applicable
- Network use of system charges (NUoS) and metering costs[1]
- Market operation charges, including ancillary services
- Adjustment factors to account for losses in transmission and distribution

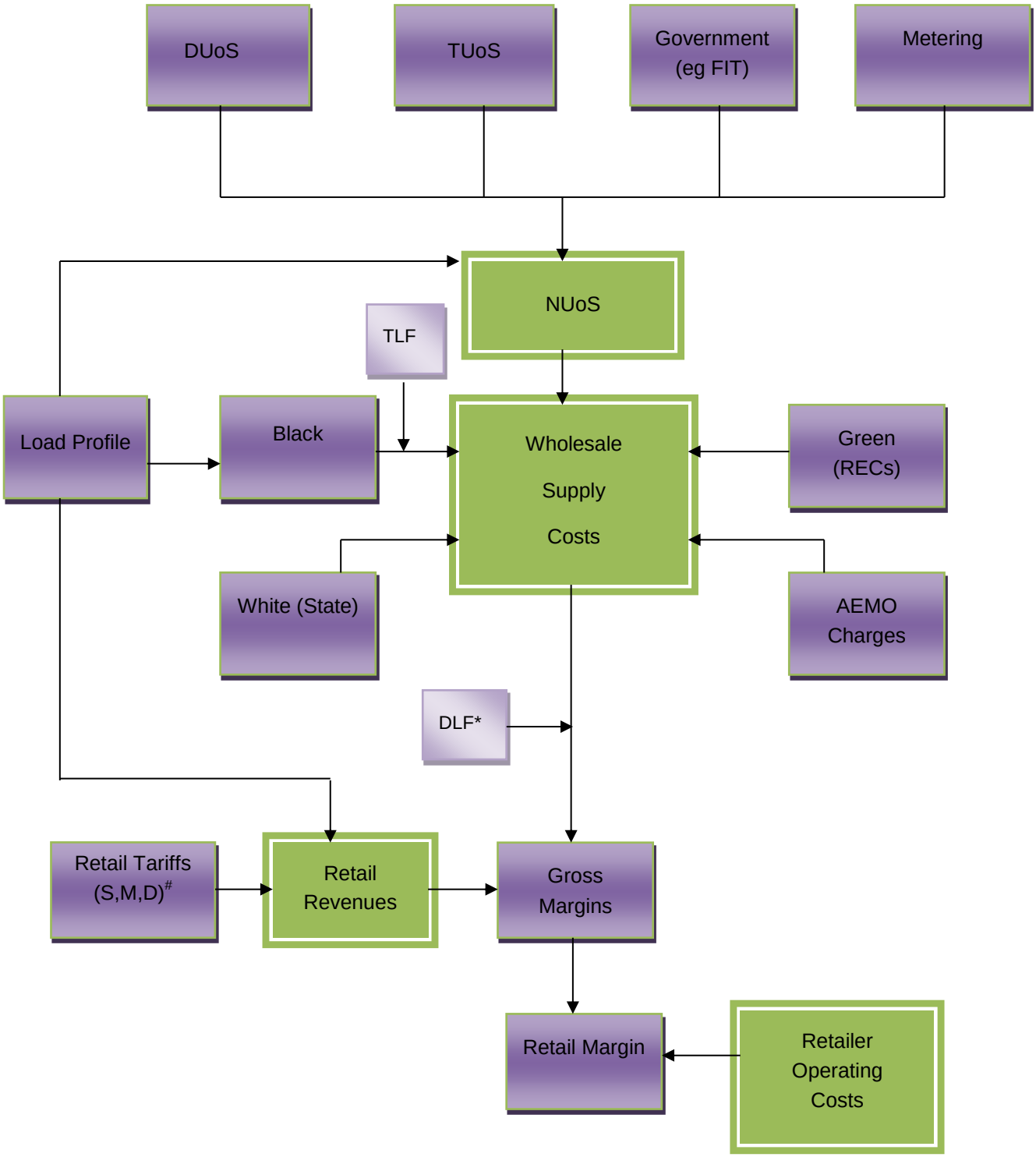
The Gross margin is the difference between the wholesale supply cost and the retail revenue and excludes provision for retailers' internal business operations costs.

Retailers bear costs for customer service including the cost of winning and retaining customers, accounts receivable and recoveries costs, regulatory compliance costs, and the costs of information systems to manage customer information and contact. From the Gross margin, a retailer seeks to recover these costs and expects to earn a profit, the so called Net margin.

Figure 1-1 diagrammatically represents the modelling framework developed to calculate the Gross and Net retail margins, and Table 1-1 summarises the methodology adopted to estimate the cost of each of these components.

[1] Including Advanced Metering Infrastructure (AMI), or "Smart meter" costs

Figure 1-1 Model framework for calculating Gross and Net retail margins



* DLFs do not apply to the NUoS cost component of the wholesale supply costs.
# Under retail tariffs, S means Standing, M means market and D means discounted.

Table 1-1 Retail cost components ($/MWh)

Cost component	Description	Methodology for estimating the cost
Black energy costs	The cost to retailers (including hedging costs) associated with sourcing electricity from the NEM.	Wholesale electricity costs are calculated based on an assumed forward contracting strategy that has an 80% probability of providing a Net settlement in the retailer's favour. Historical contract prices are sourced from historical NGeS data retained by SKM MMA.
Green certificate costs	The cost to retailers of meeting obligations under State and Federal greenhouse gas abatement schemes such as the expanded Renewable Energy Target (eRET) and NSW Greenhouse Gas Abatement Scheme (NGAS).	Determine the retailer's obligation based on legislated parameters and multiply by certificate costs estimated from historical NGeS data retained by SKM MMA and an assumed forward contracting strategy.
White certificate costs	The cost to retailers of meeting obligations under State energy efficiency schemes.	Determine the retailer's obligation based on legislated parameters and multiply by certificate costs estimated from historical NGeS data retained by SKM MMA and an assumed forward contracting strategy.
NUoS	The network tariff distributors charge the retailers in order to recover network costs. These network costs include DUoS, TUoS, metering charges and any FIT costs associated with small-scale solar photovoltaics.	Extract historical Network tariffs published by the Australian Energy Regulator (AER) or distribution service providers.
AEMO market charges and ancillary service costs	The fees charged by AEMO to recover the costs of operating the wholesale market, the allocation of customer meters to retailers, and settlement of wholesale electricity purchases.	Determine costs based on historical data sourced from AEMO.
Retail operating costs	The costs of serving and maintaining existing customers, and the costs of marketing, signing and transferring new customers.	Based on regulated retail operating costs, including customer acquisition and retention costs, in another jurisdiction.

Retail tariff types

Three different retail tariff types have been considered in this analysis:

- Single rate – customers pay the same rate for energy irrespective of time of use. A block tariff structure may still apply, whereby customers pay a different rate once consumption exceeds a pre-specified monthly or quarterly volume, but this is volume dependent rather than time dependent.
- Dual rate – these customers have dedicated off-peak hot water/heating supply and typically pay a lower rate for energy used on this dedicated circuit. All other energy is charged at the single rate as described above.

- Time of use – these customers pay a different rate for energy depending on time of use (eg peak of offpeak). The peak rate may also have a block tariff structure whereby the rate also varies depending on the volume of peak consumption.

Network costs to retailers also differ depending on these three tariff types. The network charges assumed to be incurred by retailers for each retail tariff type are summarised in Table 1-2.

Table 1-2 Mapping of retail tariff types to network charges

Retail tariff type	Network charge
Single rate	Single rate
Dual rate	Dedicated network charge for off-peak hot water/heating on the dedicated circuit and single rate for all other electricity consumption.
Time of use	Interval rates, which may vary by time of day, day or week, or even season.

Retail revenue

Retail tariffs consist of a fixed supply charge and a usage charge. As already discussed, for many retail packages, different usage charges apply depending on:

- when electricity was consumed in the day or week
- the total level of consumption in a given month or quarter.

Retail revenue for retailers in Victoria was determined from retail tariff information provided by the Commission for the period from 2005/06 to 2011/12. Both standing and market offers, with and without discounts, were provided, for the three different retail tariff types. For South Australia and New South Wales, retail tariff information was sourced from ESCOSA and Ausgrid/Energy Australia respectively, albeit it at a more aggregated level. The Independent Pricing and Regulatory Tribunal of NSW (IPART) also provided some information on retail market offers for a limited time period.

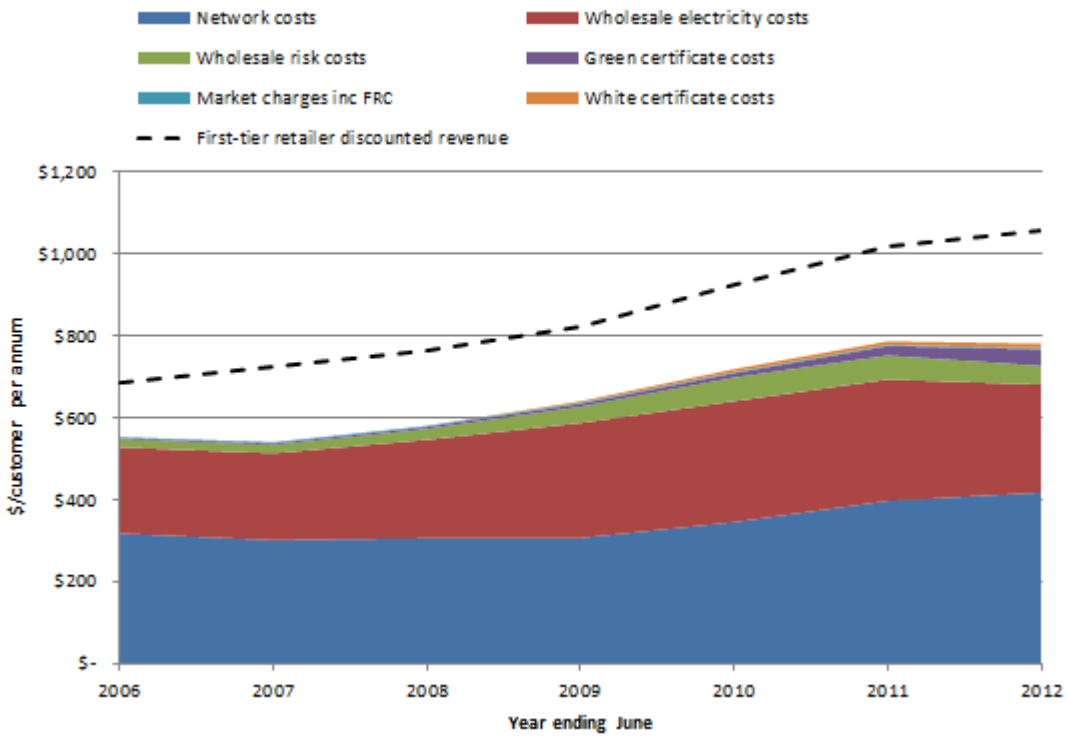
Costs and revenue per customer

To determine total retail costs per customer per annum under the various retail tariff types, assumptions have been made about the total annual average consumption per customer and the load shape of that customer (based on Net System Load Profiles (NSLPs) obtained from AEMO).

Similarly, based on the retail tariffs provided, total retail revenue per customer per annum was determined for an average customer consumption level. For time of use tariffs, peak, off-peak and shoulder electricity usage was estimated based on the relevant NSLP.

By means of demonstration, Figure 1-2 shows the resulting total wholesale costs per single rate customer faced by a retailer in the Powercor distribution zone. The figure also shows the average retail revenue received from an average customer on a discounted retail tariff with AGL, Origin Energy or EnergyAustralia (“first-tier retailers”).

Figure 1-2 Wholesale supply costs to retailers in the Powercor distribution zone, single rate (nominal)



NOTE: Figure assumes an annual average consumption of 4,000 kWh per customer

The black energy costs (being the wholesale electricity and wholesale risk costs) and network costs are of approximately the same order of magnitude and make up the majority of wholesale supply costs to retailers. Green and white certificate costs and market charges account for approximately 7% of total wholesale supply costs to retailers in 2011/12.

Figure 1-2 shows that network costs have increased over time, with a noticeable step increase observed in 2009/10 and 2010/11 partly due to metering service charges increasing in the 2010 calendar year. In the Citipower, Jemena, and Powercor distribution zones, the prescribed metering service charge increased between $70 and $100/customer/year in 2010. The metering service charge increase in the United Energy and SP Ausnet distribution zones was not as significant.

By 2011/12, the total wholesale supply cost to a retailer is approximately $800/customer in all but the Citipower distribution zone where network costs are slightly lower. With low demand growth and subdued electricity prices in the NEM, total wholesale supply costs generally level out in 2010/11 and even decline slightly in 2011/12 in some distribution zones.

Retail revenue has increased relatively steadily from year to year over the study horizon from 2005/06 to 2011/12.

Trends in Gross retail margins

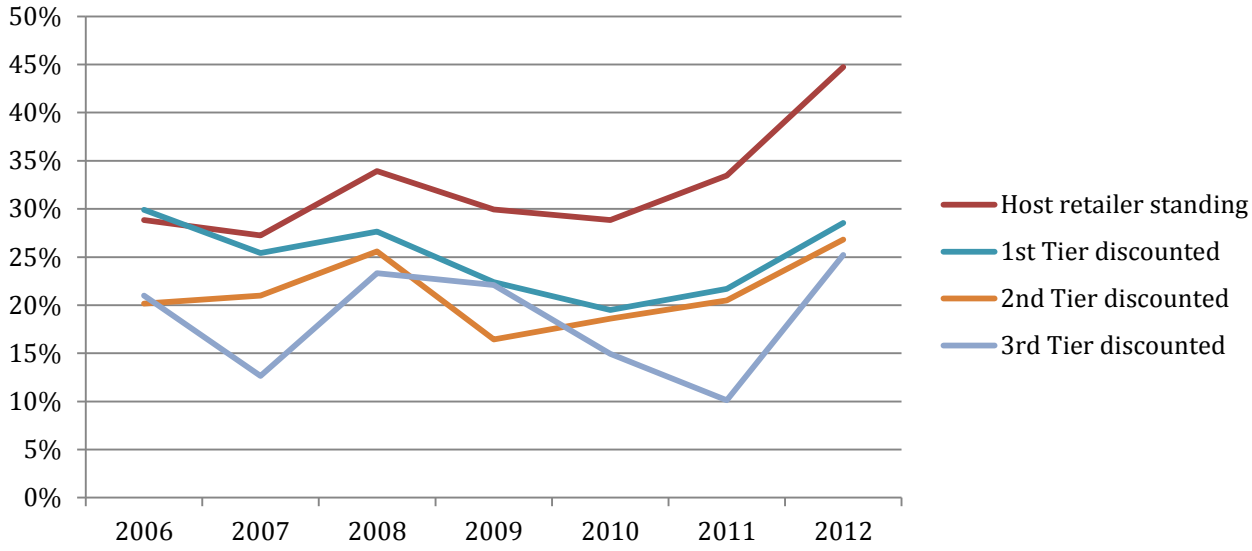
Using the retail cost and revenue information, a retail margin model has been developed by SKM MMA for the Commission to analyse the retail margins from 2005/06 to 2011/12 in order to assess trends and make inter-state comparisons. The model calculates the revenue received per customer for all retailers in a selected distribution zone and for a given retail tariff type, and subtracts the estimated wholesale supply cost to retailers in order to assess the retail margins.

For a given distribution zone, there are a number of retailers offering packages. In order to summarise this information in a meaningful way to observe trends, retailers were categorised into groups:

- 1st tier retailers: Origin Energy, AGL and EnergyAustralia (formerly TRUenergy)
- 2nd tier retailers: Australian Power and Gas, Lumo Energy, Simply Energy and Red Energy
- 3rd tier retailers: all other retailers.

Figure 1-3 shows the trends in single rate, Gross retail margins for the host, 1st, 2nd and 3rd tier retailers on average across Victoria, applying a straight averaging methodology.

Figure 1-3 Single rate, Gross retail margin averaged across Victorian distribution zones



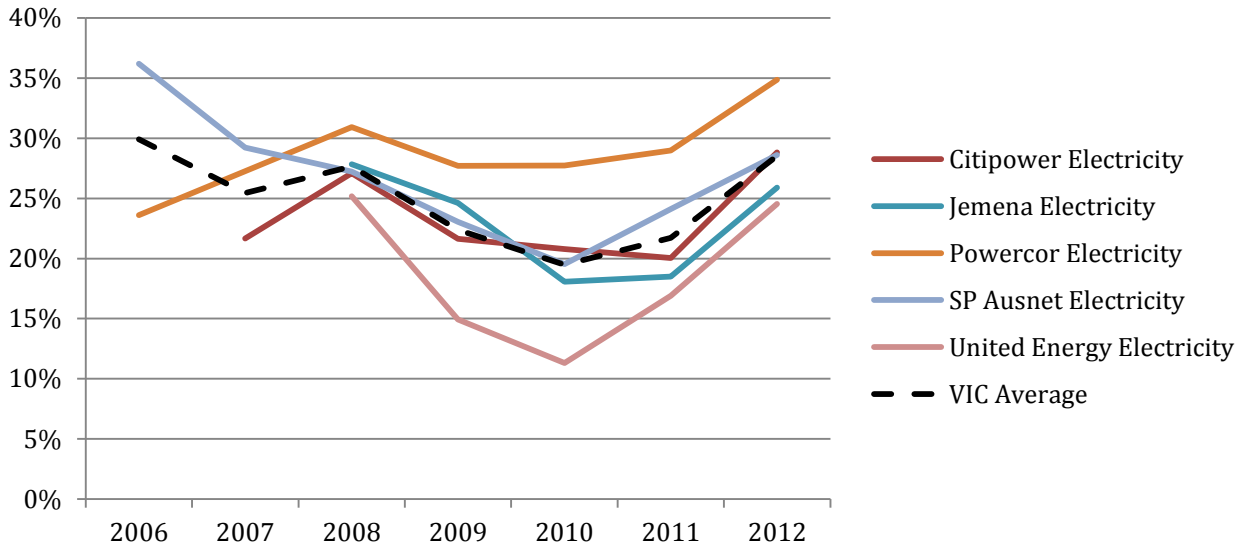
NOTE: Figure assumes an annual average consumption of 4,000 kWh per customer

Looking at Victoria as a whole, the following Gross retail margin trends were identified when averaged across the distribution zones, single rate:

- Since 2007/08, Gross retail margins on discounted market offers have been noticeably lower than Gross retail margins on standing offers (Gross margin is 13 percentage points less on average)
- Gross retail margins for standing offers of host retailers appear to have increased by more than 10 percentage points on average between 2010/11 and 2011/12
- Gross retail margins for discounted offers for 1st tier retailers have been declining since 2007/08 but started increasing again in recent years and in 2011/12 were at similar levels to the 2007/08 year
- In the last three years from 2009/10 to 2011/12, the Gross retail margins of the third-tier retailers have been lower than the first and second-tier retailers.

The above single rate trends were generally consistent across the Victorian distribution zones, although the magnitude of the trends differed, as shown in Figure 1-4. The Gross retail margin increase observed in recent years was most noticeable in the SP Ausnet and United Energy distribution zones where the increase in network costs, specifically metering service charges, was not as pronounced as in the other zones. Gross retail margins from discounted market offers for 1st tier retailers (including the host retailers) were similar in the Citipower, Jemena and SP Ausnet distribution zones, with no more than 8 percentage points separating the three zones in any given year. Since 2007/08, the Gross retail margin from discounted market offers for 1st tier retailers in the Powercor distribution zone were on average 6 percentage points higher than the Victorian average, and in the United Energy zone the margin was 6 percentage points lower on average, although this difference has been reducing in recent years.

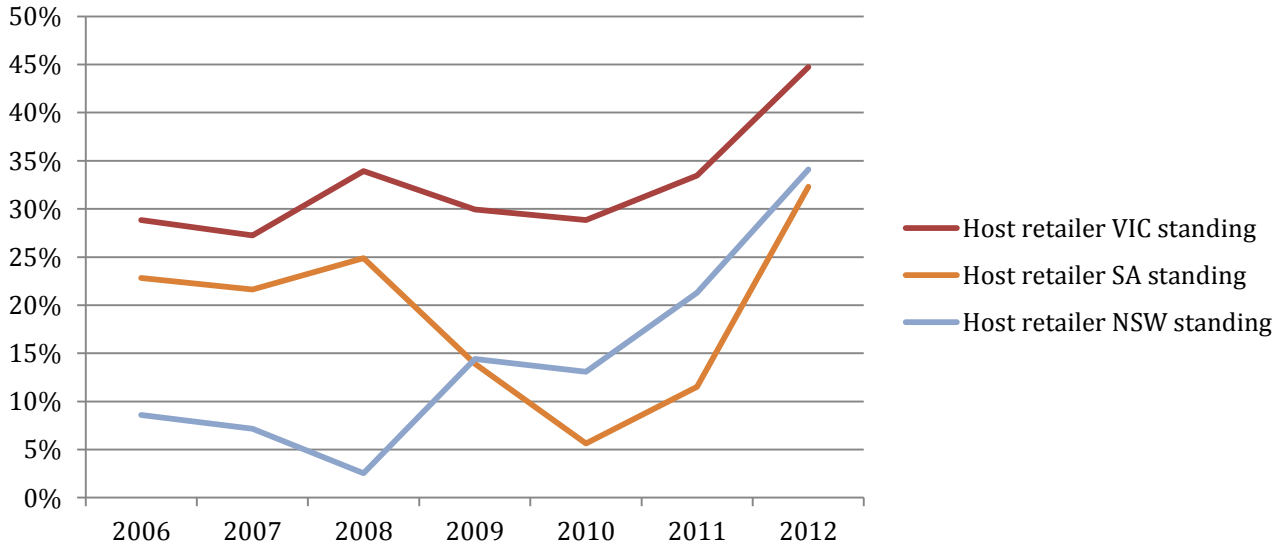
Figure 1-4 Single Rate, 1st Tier retailers, discounted market offer, comparison across Victorian distribution zones



NOTE: Figure assumes an annual average consumption of 4,000 kWh per customer

Figure 1-5 provides a comparison of Gross retail margins on discounted market offers in Victoria, New South Wales and South Australia for single rate customers. Based on the data provided and input assumptions used, the figure indicates that the Gross retail margins from 1st tier Victorian retailers are generally higher than the margins for retailers in South Australia and New South Wales. Moreover, the year-on-year retail margin volatility in the other regions appears to be greater than experienced in Victoria. There was insufficient data available to make similar comparisons with Queensland retailers.

Figure 1-5 Single rate, average Gross retail margin from host retailer, standing offer – interstate comparison

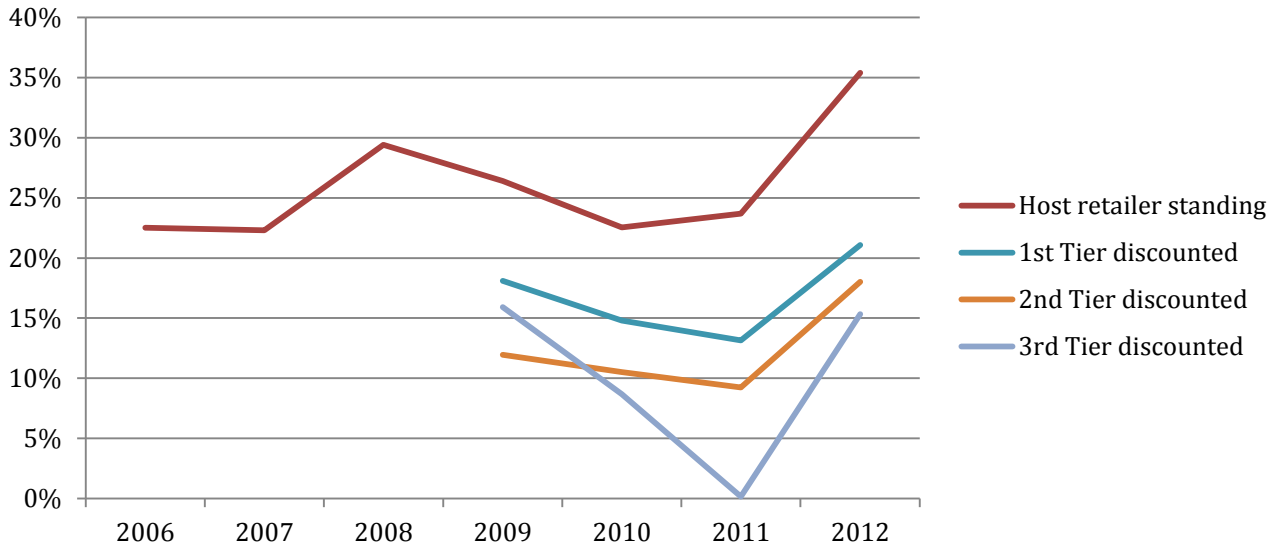


NOTE: Figure assumes an annual average consumption of 4,000 kWh per customer in VIC, 4,700 kWh per customer in New South Wales, and 5,000 kWh per customer in South Australia.

The Gross retail margins calculated for dual rate and time of use tariffs differed from those calculated under the single rate, but the trends and comparisons remained similar. Figure 1-6 shows the Gross retail margins under

time of use tariffs for Victoria as a whole. Gross retail margins have trended down since 2008/09 but increased again in the 2011/12 financial year. For this tariff rate, discounted market data was only available from 2008/09 onwards.

Figure 1-6 Time of use, Gross retail margin averaged across Victorian distribution zones, reshaped NSLP



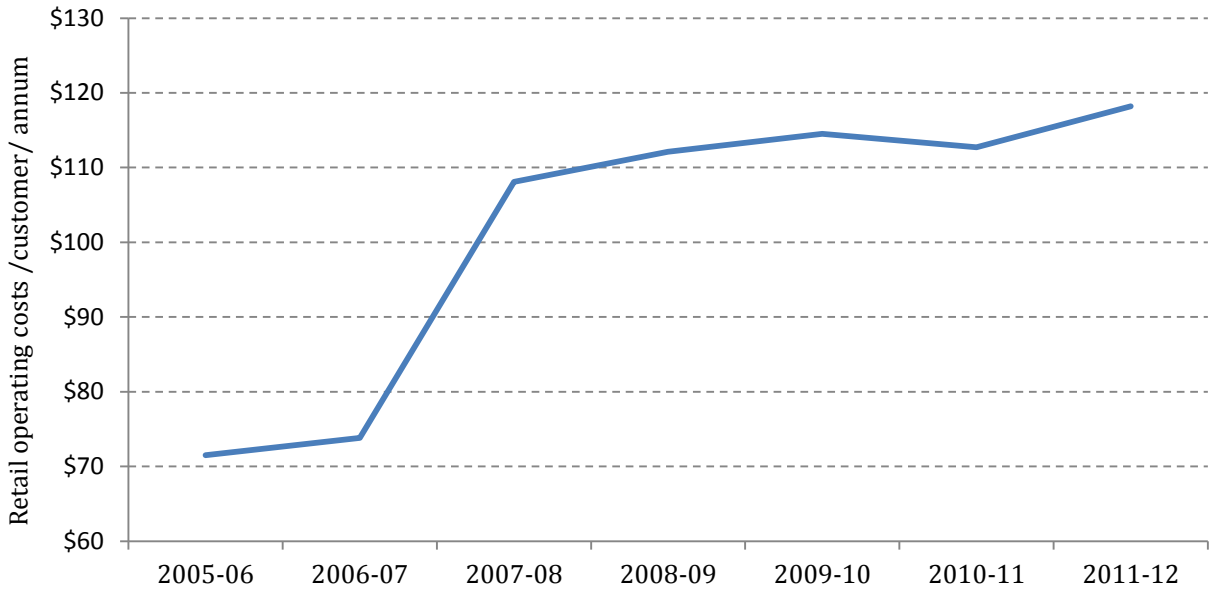
*in Victoria, no time of use market offers were provided by the Commission for periods prior to 2008/09. Figure assumes an annual average consumption per customer of 9,000 kWh.

Retail operating costs

Costs faced by retailers in supplying small markets include those related to acquiring, retaining and serving the customer base. Actual retail costs may vary significantly with respect to retailer, retailer size, incumbency and with the time and pattern of industry and organisational development.

As this study was not intended to be a detailed review of retail operating costs, it was agreed with the Commission that the costs used should be those regulated in a nearby jurisdiction. We consider the retail operating costs determined by the Independent Pricing and Regulatory Tribunal of NSW (IPART) to be reasonably representative of those which have applied across eastern Australia over the period and have used these in our analysis, shown in Figure 1-7.

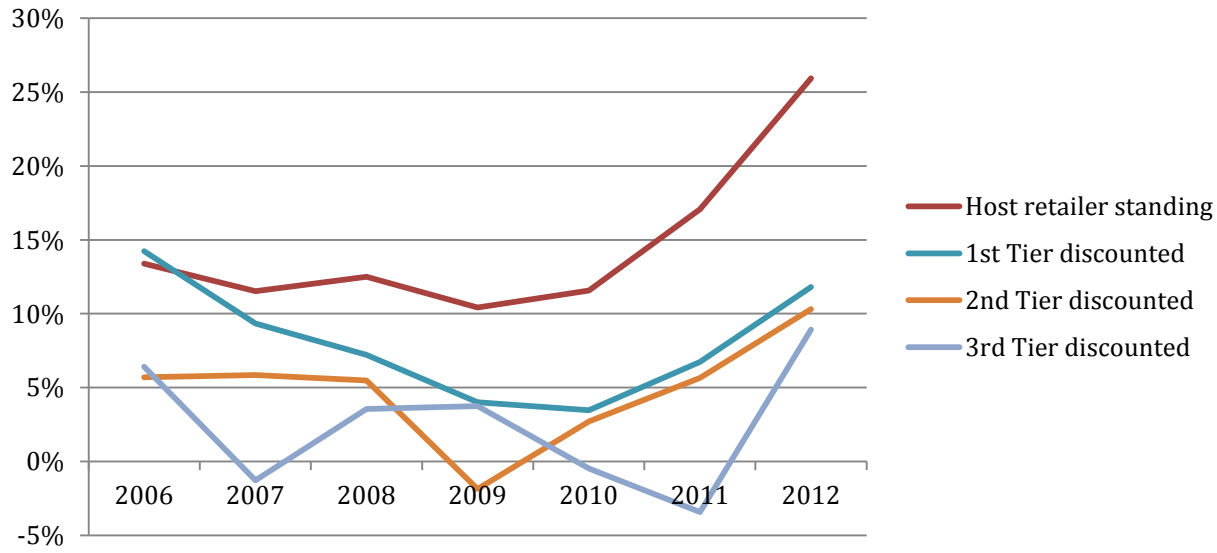
Figure 1-7 Regulated retail operating costs assumed per customer (nominal)



Trends in Net retail margins

In assessing the Net retail margins, the same retail operating cost per customer has been assumed for all retail customers irrespective of the retailer type, tariff type, location and level of consumption, so the inter-state and inter-zone comparisons remain the same. As shown in Figure 1-7, the retail operating costs used in this analysis increased over time. So in addition to a universal drop in margins, one would expect the trend in Net retail margins to be slightly higher at the beginning of the study period and slightly lower towards the end of the study period when compared against the trend in Gross retail margins. Figure 1-8 provides an overview of Net retail margins in Victoria, averaged across all distribution zones. More of a downward trend can be observed from 2005/06, as expected. Nonetheless, an increase in Net retail margins is clearly still evident in the last couple of years.

Figure 1-8 Single rate, Net retail margin averaged across Victorian distribution zones



NOTE: Figure assumes an annual average consumption of 4,000 kWh per customer

Abbreviations

The following abbreviations are used in this report

AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CAC	Customer Acquisition Cost
CER	Clean Energy Regulator
DLF	Distribution Loss Factor
DUoS	Distribution Use of System
eRET	Expanded Renewable Energy Target
ESCOSA	Essential Services Commission of South Australia
ESS	NSW Energy Savings Scheme
FIT	Feed in Tariff for small-scale solar photovoltaics
GHG	Greenhouse Gas
IPART	Independent Pricing and Regulatory Tribunal of NSW
LGC	Large-scale Generation Certificate for renewable energy from large scale generation 100 kW and above
LRET	Large-scale Renewable Energy Target
LUAC	Large User Abatement Certificate
NEM	National Electricity Market
NGAC	New South Wales Greenhouse Abatement Certificate
NGAS	New South Wales Greenhouse Gas Abatement Scheme
NGeS	Next Generation Energy Solutions – a provider of contract price data
NSLP	Net system load profile provided by AEMO as the aggregate shape for accumulation customer metered load
NUoS	Network Use of System
QCA	Queensland Competition Authority
QGS	Queensland Gas Scheme
RE	Greenhouse Gas Reduction Rate for Electricity
REC	Renewable Energy Certificate
REES	South Australian Residential Energy Efficiency Scheme

RG	Greenhouse Gas Reduction Rate for Electricity
ROC	Retail Operating Cost
RPP	Renewable Power Percentage
SRES	Small-scale Renewable Energy Scheme
STC	Small-scale technology certificates for renewable energy from small scale technologies of less than 100 kW capacity
STP	Small-scale Technology Percentage
TLF	Transmission Loss Factor
TUoS	Transmission Use of System
VEEC	Victorian Energy Efficiency Certificate
VEET	Victorian Energy Efficiency Target

Acknowledgements

We wish to particularly acknowledge the assistance provided to SKM during the course of this study by personnel at:

- The Essential Services Commission of Victoria
- The Essential Services Commission of South Australia
- The Independent Pricing and Regulatory Tribunal of NSW
- The Queensland Competition Authority
- The Australian Energy Market Commission
- The Australian Energy Market Operator
- Ausgrid

1. Introduction

The Essential Services Commission (Commission) is the regulator of retail energy businesses in Victoria. The Commission oversees compliance and performance reporting by energy businesses, issues energy distribution and retail licenses and provides information to consumers.

The Commission engaged SKM MMA to undertake a research project analysing electricity retail prices and retail margins. The objectives of this project were to:

- identify trends in Victorian electricity retail margins in recent years (from Financial Year ending June 2006 to Financial Year ending June 2012).
- compare Victorian electricity retail margins to those in other jurisdictions.
- identify any trends or patterns in retailers' pricing behaviour(s).

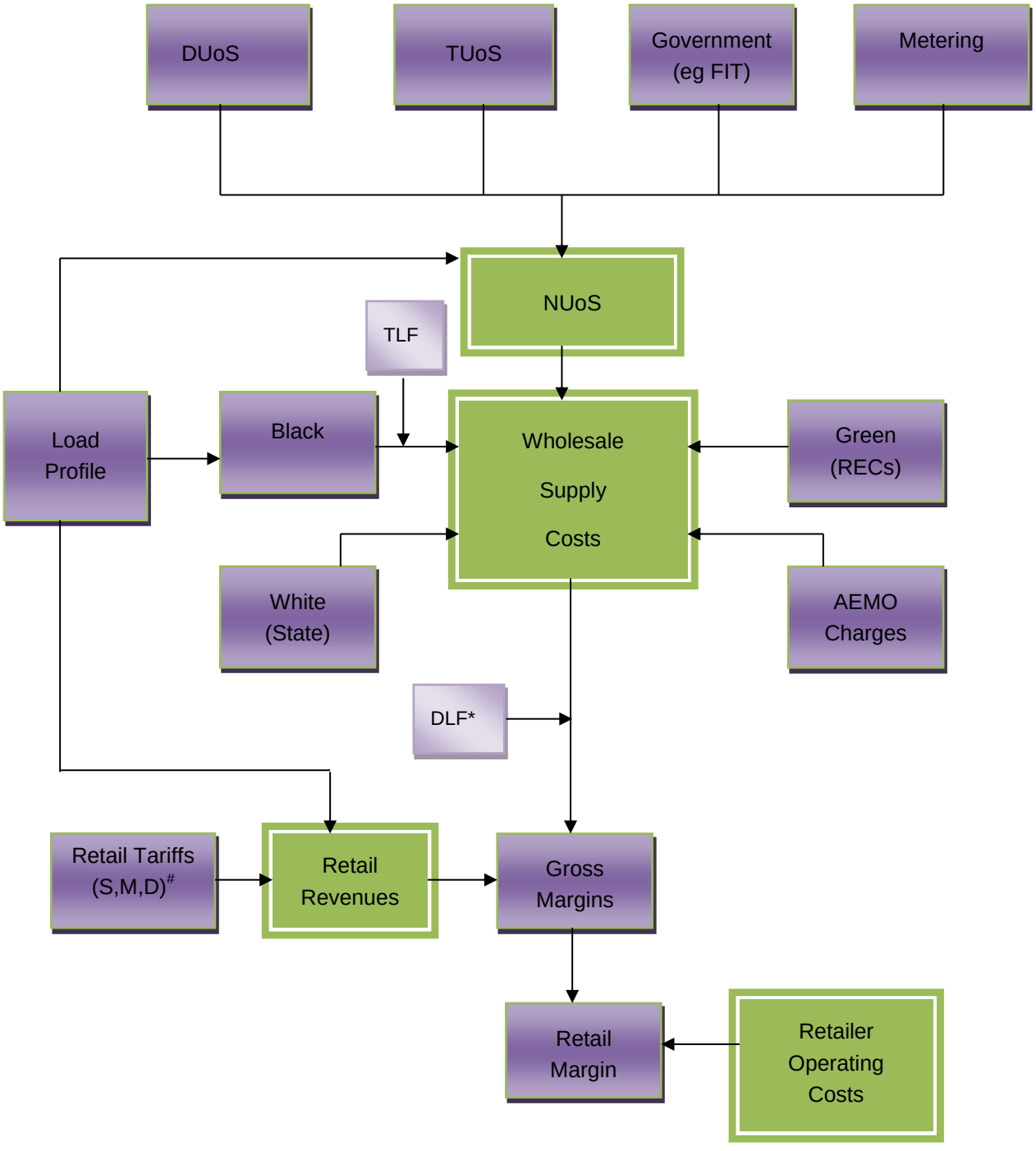
Thus the purpose was not so much to accurately estimate retail margins but to identify trends and to make comparisons across jurisdictions. SKM MMA relied upon retail tariff information provided by the Commission to undertake this analysis and did not seek to independently verify the data as this was outside the scope of work. Also, SKM MMA did not have access to confidential information about retailer's costs or business practices and therefore had to rely on publicly available information, and make hypotheses about risk management and wholesale market trading practices. Thus the analysis was designed to capture the major cost components and to represent retail revenues and wholesale supply costs so as to achieve the project objectives.

Unless otherwise stated, all costs, prices and revenues discussed in this report are in nominal dollars. Moreover, unless otherwise stated, all averages applied in the analysis are straight averages.

2. Assessing retail margins

A retail margin model (the Model) has been developed by SKM MMA for the Commission to analyse the retail margins from 2005/06 to 2011/12. The model calculates the revenue received per customer for all retailers in a selected distribution zone and for a given retail tariff type, and subtracts the estimated wholesale supply cost to electricity retailers in order to assess the retail margins. The modelling framework used to analyse the retail margins is summarised in Figure 2-1 and discussed below.

Figure 2-1 Retail margin analysis framework



* DLFs do not apply to the NUoS cost component of the wholesale supply costs.

Under retail tariffs, S means Standing, M means market and D means discounted.

In general terms, the wholesale supply cost to electricity retailers is made up of the following components:

- Generation or purchased energy costs (black energy costs)
- Green and white certificate costs, including RECs, VRECs or LGCs, STCs, NGACs, GECs, and VEECs where applicable
- Network use of system charges (DUoS, TUoS, FIT charges, and metering charges)
- Market operation charges, including ancillary services

The Gross margin is the difference between the wholesale supply cost and the retail revenue and excludes provision for retailers' internal business operations costs.

That is:

$$Gross\ retail\ margin = \frac{(Retail\ revenue - Wholesale\ cost\ to\ retailer)}{Wholesale\ cost\ to\ retailer}$$

Retailers bear costs for customer service including the cost of winning customers, and the information systems to manage customer information and contact. From the Gross margin, a retailer seeks to recover these costs and expects to earn a profit, the so called Net retail margin.

That is:

$$Net\ retail\ margin = \frac{(Retail\ revenue - Wholesale\ cost\ to\ retailer - Retail\ Operating\ Cost)}{(Wholesale\ cost\ to\ retailer + Retail\ Operating\ Cost)}$$

2.1 Retail tariff types considered

Three different tariff types have been considered in this analysis: single rate, dual rate and time of use. These tariff types are described in Table 2-1 along with assumptions on average annual consumption per residential customer for each tariff type. For this analysis, it is assumed that the households do not have solar PV installed.

Table 2-1 Tariff types analysed and average annual consumption assumed per customer

Retail Tariff	Description	Average annual consumption assumed per customer (kWh)		
		Victoria	New South Wales	South Australia
Single rate	A single rate for energy applies in all periods of the day. Retailers receive a single price for energy sold, and pay distributors a single price for energy used, irrespective of time of use.	4,000	4,700	5,000
Dual rate	Customers on a dual rate are assumed to have dedicated off-peak hot water/heating supply. Retailers receive a lower rate for dedicated load, and pay a lower dedicated circuit rate to distributors. Retail tariffs and network costs for all other energy are the same as for the single rate.	6,500*	N/A**	N/A**
Time of use	Customers on a time of use tariff get charged a varying rate for electricity depending on when the electricity was consumed. Network costs also vary depending on time of use, with a peak, off-peak and sometimes even a shoulder rate specified. The definition of peak, shoulder and off-peak usage varies by distribution zone but, typically, electricity consumed during weekdays attracts a higher retail rate and network cost than electricity consumed in the evenings or weekends.	9,000	8,000	N/A**

* Approximately 4,000 kWh charged at single rate, and 2,500 kWh at dedicated rate. Source of typical average residential consumption for Ausgrid region in New South Wales and in South Australia based on information from IPART[2] and ESCOSA.

** N/A since no information on network costs are available for this tariff type in this State.

The peak, shoulder and off-peak definitions that apply to time of use tariffs in the various states are summarised in Table 2-2.

Table 2-2 Time slices applying for dual rate and time of use retail tariffs

State	Peak usage	Shoulder usage	Off peak usage
Victoria	7am to 11pm, Monday to Friday	N/A	All other times
South Australia	7am to 11pm, Monday to Friday	N/A	All other times
New South Wales	2pm to 8pm, Monday to Friday	7am to 2pm and 8pm to 10pm, Monday to Friday 7am to 10pm Weekends	All other times

For a given distribution zone, total peak, shoulder and off-peak consumption per quarter was determined for the time of use retail tariff using the applicable Net System Load Profile (NSLP) and the above time slice definitions, assuming an average annual consumption per time of use customer of 9,000 kWh in Victoria and 8,000 kWh in New South Wales.

[2] Independent Pricing and Regulatory tribunal of NSW, " Changes in regulated electricity retail prices from 1 July 2012" June 2012 Table 6.1.

2.2 Load profiles

As can be seen from Figure 2-1, the load profiles are used in three parts of the analysis related to calculating:

- Retail revenue
- Black energy costs
- NUoS charges

We have for our analysis used Load Profiles which are derived from the NSLPs produced by AEMO. NSLPs and controlled load profiles were obtained from the AEMO web-site[3] for the calendar years 2005 to 2011. These profiles are obtained half-hourly for each of the distribution regions of Victoria, New South Wales, and South Australia. The loads are provided for the areas shown in Table 2-3. The Net system load in Victoria includes the off-peak time-switched hot water heating load as this is not a controlled load.

The Commission also provided average residential load profiles for weekdays and weekends for residential and small business customers in Victoria with and without time switched hot water load. Comparing the NSLPs against the residential average shapes, it is apparent that the NSLP is much flatter on both weekdays and weekends than the average residential profile. A method was therefore devised to adjust the NSLPs to more closely represent the average residential profile and to reduce the influence of commercial load. This method is described in Appendix B.

The retail margin analysis provided in this report uses the adjusted NSLPs to better represent the average residential profile. However, sensitivity analysis has indicated that the retail margins are not particularly sensitive to choice of NSLP.

Table 2-3 List of profile areas and networks

ProfileName	ProfileArea	Network / Company Name
CLOADNSWCE	COUNTRYENERGY	Essential Energy
CLOADNSWCE	ENERGYAUST	Ausgrid
CLOADNSWCE	ERGON1	Ergon Energy Corporation Limited
CLOADNSWEA	ENERGYAUST	Ausgrid
CLOADNSWIE	INTEGRAL	Endeavour Energy
NSLP	ACTEWAGL	Actew Distribution Ltd and Jemena Networks (ACT) P
NSLP	AURORA	Aurora Energy Pty Ltd
NSLP	CITIPOWER	CitiPower Pty
NSLP	COUNTRYENERGY	Essential Energy
NSLP	ENERGEX	Energex Limited
NSLP	ENERGYAUST	Ausgrid
NSLP	ERGON1	Ergon Energy Corporation Limited
NSLP	INTEGRAL	Endeavour Energy
NSLP	POWERCOR	Powercor Australia Ltd
NSLP	TXU	SPI Electricity Pty Ltd
NSLP	UMPLP	ETSA Utilities
NSLP	UNITED	United Energy Distribution Pty Ltd
NSLP	VICAGL	Jemena Electricity Networks (Vic) Ltd
QLDEGXCL31	ENERGEX	Energex Limited
QLDEGXCL33	ENERGEX	Energex Limited
SACLOAD	UMPLP	ETSA Utilities

[3] http://www.aemo.com.au/Electricity/Data/Metering/Load-Profiles last cited 17 October 2012

2.3 Calculating retail revenues

The Commission provided SKM MMA with retail tariffs for retailers in the Victorian distribution zones for the period from 2005/06 to 2011/12. Both standing and market offers were provided by the Commission, for the three different rate types. Information was not available for every retailer, every rate type and every year. Where data was missing, retail margins were not calculated for that retailer in that year.

The retail tariffs consist of a fixed supply charge and a usage charge. For many retail packages, different usage charges apply depending on when electricity was consumed in the day or week, or how much was consumed.

For peak usage rates (including single rate tariffs), block tariffs often applied, whereby consumers paid a different rate for electricity consumed in excess of a certain block limit. In some South Australian retail packages, multiple blocks applied to the peak usage tariff. Block tariffs tended not to apply for shoulder and off-peak usage rates. For example, Table 2-4 shows the supply charge and usage rates offered in Origin Energy's GHGL PCA Daily Saver 8% (Usage) package in the 2011/12 financial year for the Powercor distribution zone.

Table 2-4 Origin Energy's time of use market tariff offered in the Powercor distribution zone in 2011/12

Component of tariff	Rate
Supply charge ($/day)	0.7 $/day
Peak rate (First 1,000 kWh in quarter)	25.86 c/kWh
Peak rate for balance of usage	27.16 c/kWh
Off-peak rate	10.7 c/kWh

The Origin Energy tariff highlighted above also offered an 8% discount on usage. However, not all market offers included a discount. The model is therefore set up to calculate both the discounted and undiscounted retail revenue from market offers, and retail margins are reported with and without discount.

Some packages included other incentives, such as variations to the contract period (or no contract) or discounts that only apply to the first month. These incentives have not been captured in the current modelling.

Standing contract retail tariffs for South Australia were provided ESCOSA. ESCOSA also provided maximum market offer discounts for a retailer applying each year and we have used these, and a "half way" discount (being half way between the cost under the standing tariff and the cost under the maximum discount) in our analysis. We have not been able to provide the discount for any specific retailer.

Standing contract retail tariff data for the EnergyAustralia/Ausgrid distribution region of New South Wales was sourced from the EnergyAustralia website. IPART provided us with market offer data for a number of retailers applying for a limited period (about a year) which we have used in our analysis.

For some retailers, more than one retail package of a particular rate type was on offer in a given financial year. In these instances, the retail revenue calculated represented the average revenue from these packages[4].

Green packages were excluded from the analysis to ensure that comparisons were made between similar sorts of retail offerings. Green packages would be expected to have a higher proportion of green certificates in the wholesale supply cost, and consequently higher retail prices.

It should be noted that, given the fixed and variable components of the retail tariffs, the assumed revenue per kWh for a household depends crucially on the assumed consumption of the representative household. This may

[4] As different tariffs may be offered by the same retailer in a single year, we have chosen to use a straight average rather than the best offer. The best offer may not have been available for the whole year. Moreover, using the best offer is likely to add additional, unwarranted volatility into the results. On balance, we believe that the average offer is more representative.

lead to discrepancies when compared to wholesale supply costs calculated on a bottom-up basis, based on $/MWh, as discussed in the next section.

2.4 Cost components

The actual costs of a retailer for energy and green and white certificates depends on its risk management strategy as indicated by how much of its requirements it contracts forward at any particular time. This depends on its remaining exposure to the spot market and liquidity in the contract market. With increasing vertical integration, it also depends on its own committed generation resources which are effectively a long-term swap or cap contract. These generation costs are commercially confidential and may only be estimated by reference to industry benchmarks for fixed operating and financing costs. The marginal costs may be estimated from market spot energy prices and published bid, offer and traded prices for hedging contracts.

Recognising these complexities, Section 3 provides a brief description of the approach taken to estimate each cost component for the purpose of examining broad trends in costs and retail margins over time.

3. Estimating the cost to retailers

3.1 Black energy costs

The black energy costs faced by retailers include:

- The cost of production from owned power generation sources, thermal and renewable generation dedicated to retail sales position
- Spot energy cost as paid to AEMO adjusted by the applicable transmission and distribution loss factors
- Hedging costs around the spot energy price consisting of swaps, caps and floor contracts

Self-generation costs are ignored on the assumption that retailers would value self-generation at its market value. Furthermore, this project was not required to evaluate the actual costs of any particular retailing entity, and so self-generation cost analysis was not required.

Consequently, the black energy costs were calculated solely using a wholesale electricity cost model developed by SKM MMA. Spot energy exposure is minimised by retailers but cannot be completely avoided due to the variability of the retail load supplied. To estimate the peak and off-peak spot energy exposure for retailers, SKM MMA formulated a contract strategy that has an 80% probability of providing a net settlement in the retailer's favour. On this basis, contract difference payments are not explicitly modelled as part of the black energy cost. The 80 percentile value is zero. The black energy cost has an 80% probability of being lower than the assessed cost. This confidence level is typical of contracted trading in energy markets.

Under this contract strategy, the peak contract volumes were estimated as a ratio of the average annual peak period retail demand, derived from annual system load profiles, with the ratio selected to minimise the black energy cost that is exceeded 20% of the time. This was typically about 120% of the average peak period load and ranged between 101% and 133% for the assessed load shapes. For off-peak contract volumes, the optimum contracting ratio was found to be less than 50% of the average off-peak load using this approach. This is not practicable as generators require off-peak hedging. Therefore, a value of 95% of off-peak load was selected which was about the median level of off-peak load and ranged between the 47% percentile and the 58% percentile. Appendix C provides a more detailed description of the contracting strategy assumed in each distribution zone. It is important to realise that the assessed retail margin is quite sensitive to the risk adjusted measure of black energy cost, whereas the trends are not sensitive to this formulation.

To estimate the cost of energy in each season, the contract volume was multiplied by an estimated peak or off-peak contract strike price. Use of a strike price required assumptions to be made regarding the forward contracting of energy. Typically, a retailer's hedge book will consist of a combination of contracts negotiated one, two or three years in advance. This analysis assumed that retailers set 20% of their contract position three years in advance, 30% two years in advance and 50% one year in advance. A sensitivity on this assumption was also undertaken. The resulting strike price applied to calculate the black energy cost was a weighted average of the assumed contract portfolio mix. The strike prices for swaps were sourced from historical NGeS data retained by SKM MMA.

In addition to swaps, retailers typically purchase caps to minimise exposure to high price events in the NEM, which normally occur at times of very high peak summer demand. For the purpose of this analysis, the volume of cap contracts required was estimated based on how much the diversified peak demand, as defined by the system load shape, exceeds the average peak period demand. By multiplying this contract volume by the cap contract option fee for $300/MWh caps, the cost of carrying caps was included as part of the black energy cost. Difference payments under the caps were not explicitly calculated as part of the retailer's black energy cost as these payments were included in the wholesale electricity cost model for the total contract settlement which was designed to be zero at the 80% coverage level as described above.

The option fees for $300/MWh caps were sourced from d-cypha and were similarly analysed in terms of the average cap price traded one and two years prior to them taking effect. The available data are shown in Figure A- 4 in Appendix A. No cap price data were available three years prior and in the case of 2005 only the 2004

priced data were available. In view of this limitation, it was assumed that caps were contracted based on the average prices shown for the two years.

Black energy costs were further adjusted by the distribution and average transmission loss factors to reflect the cost of supply at the customer's meter.

The overall black energy cost equation (c/kWh) was:

100 ((P * PR * PC + O * OR * OPC)/1000/H + (L - P * PR/PH) * CC) * TLF * DLF

Where:

H	Total hours per year
P	Peak volume in kWh (Based on NSLP)
PH	Peak hours per year
PR	Peak contract ratio
PC	Peak contract price ($/MWh)
O	Off peak volume in MWh (Based on NSLP)
OR	Off-peak contract ratio = 0.95
OPC	Off-peak contract cost ($/MWh)
L	Peak load (MW)
CC	Cap Cost ($/MWh)
TLF	Transmission loss factor
DLF	Distribution loss factor

3.2 Network use of system charges

In order to improve the quality of supply, maintain high level of performance and deliver long term sustainability to the distribution network, the distributors invest in their network infrastructure. To recover the network cost, the distributors charge the retailers under their distribution zone via the application of network tariffs which were treated as 'network costs' in the model. The network tariffs or network use of System Charges (NUoS) consist of two components: Distribution Use of System (DUoS) and Transmission Use of System Charges (TUoS), which represent the costs of distribution and transmission businesses respectively. Network tariffs are published by the Australian Energy Regulator (AER) or the distribution service providers and SKM MMA managed to extract most of the historical network tariffs for the relevant distribution zones from 2005/06 to 2011/12.

The distribution networks consist of different levels of voltage supply: serving different end users (eg, Residential, Commercial and Industrial). Given the costs allocated to customers are based on connection to, and use of, the transmission system at different voltage levels, the charges to different groups will vary depending on the number of voltage levels that group of users access. In other words, different charging rates will be applied to different user groups in a cost-reflective manner. In this model, to work out the retail margin, only the tariffs associated with 'Low Voltage (<90kVA)', 'Residential' users are included in the calculation, with both the Single Rate and Two Rate considered.

The individual network tariff is made up of different charging components. Fixed charges such as standing charges and prescribed metering service charges are the charges applying to all the connected retailers in the distribution zone irrespective of their network usage. There are also variable charge components in the network

tariff in which the charges are differentiated by usage. In the tariff, the usage is categorised by block definitions with different charging rates applying to different blocks. For example, for Citipower 2006 Single Rate network Tariff, the charges shown in Table 3-1 apply[5].

Table 3-1 Citipower NUoS charges, 2006

NUoS Tariff	Standing charges $/customer/year	Prescribed metering service charge $/customer/year	Peak Charges (c/kWh)	
			First 340 kWh/Month	Balance
Residential Single Rate	16.4	11.897	4.093	5.371

Because distribution charges vary on a calendar year basis and retail tariff information was provided by the Commission on a financial year basis, the total network costs per average customer were calculated monthly and summed to provide a financial year estimate. Monthly costs per customer were calculated based on assumed monthly peak and off-peak consumption. These consumption values were derived from NSLPs, assumptions on annual consumption (see Table 2-1), and definitions of peak and off-peak periods that apply to the particular distribution zone (see Table 3-2).

Table 3-2 Time slices used to define network charges for the various retail tariff types and distribution zones

Time slice definition	Retail tariff type	Seasonality	Applicable distribution network
Flat Rate all times	Single rate	All months	All distribution zones
Peak: 7am-11pm weekday, Offpeak: All other times	Dual rate	All months	All VIC distribution zones
Peak: 7am-11pm weekday, Offpeak: All other times	Time of Use	All months	Jemena, Citipower, Powercor
Peak:15:00-23:00 weekdays, Shoulder: 7:00-15:00 weekday, Off-Peak all other times	Time of Use	All months	United Energy
Peak: 14:00-20:00 weekdays, Shoulder: 7:00-12:00, 20:00-22:00 weekdays 7:00-22:00 weekends, Off-peak: All other times	Time of Use	All months	Ausgrid
Peak: 2pm- 6pm weekdays, Shoulder: 12pm-2pm, 6pm-8pm weekdays, Off-peak: All other times in summer	Time of Use	December - March	SP Ausnet
Peak: 4pm-8pm weekdays June - August, Off-peak: All other times	Time of Use	April - November	SP Ausnet

No DLF or TLF need be applied to these network costs as the NUoS price applies at the customer connection point.

[5] http://www.citipower.com.au/Electricity_Networks/CitiPower_Network/Network_Charges/CitiPower_Network_-_Tariff_Schedule_Archive/

3.3 Market charges and ancillary services

Market fees are regulated to recover the costs of operating the wholesale market, the allocation of customer meters to retailers, and settlement of black energy purchases. The assessed market fees are shown in Figure 3-1. These fees, charged by the Australian Energy Market Operator (AEMO) to retailers, are applicable to wholesale black energy purchases and range from 35 to 50 c/MWh. They are a very small part of a retailer's wholesale supply cost.

Additionally, ancillary services charges are passed through by AEMO to retailers. Retailers are charged ancillary service costs according to load variability. Figure 3-2 shows the recent history of ancillary services charges for customers for the NEM as a whole. The average value over the range shown is 39c/MWh.

The average annual charges by region are shown in Table 3-3. For the regions of interest in this study, they range from 15c/MWh up to 82c/MWh. The average values for each of the key NEM regions assessed in this study were:

- 20c/MWh for Victoria
- 69c/MWh for NSW
- 45c/MWh for South Australia.

Figure 3-1 AEMO market fees (c/MWh)

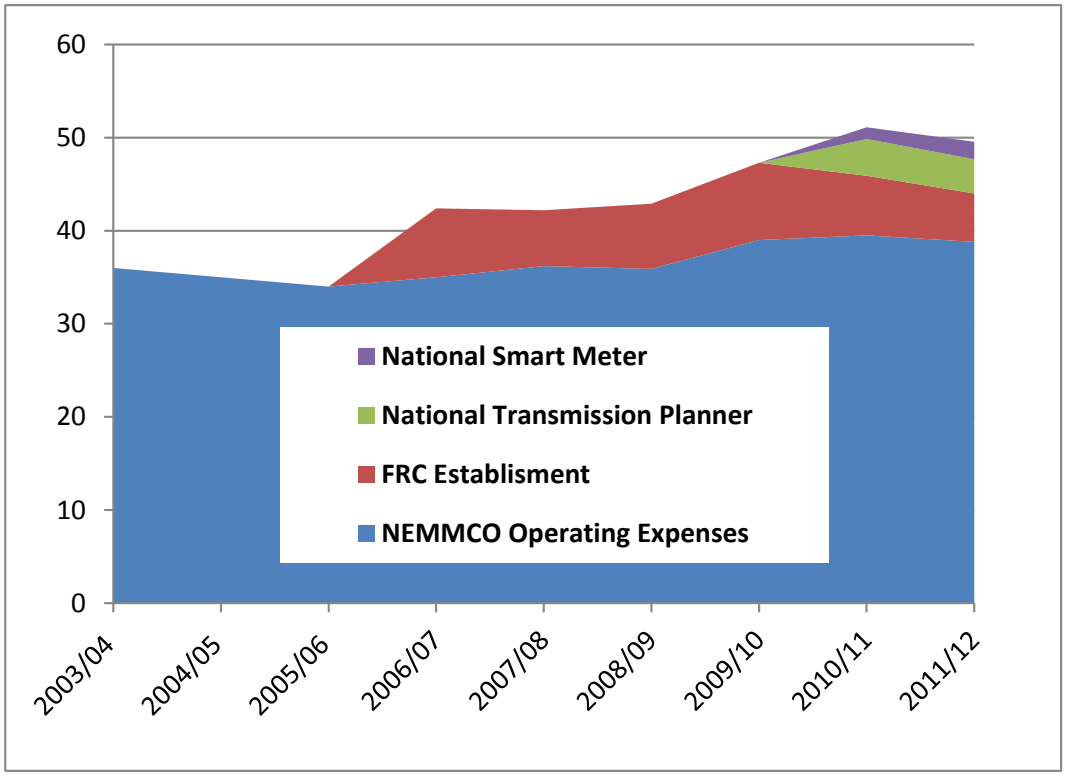


Figure 3-2 NEM ancillary service cost[6]

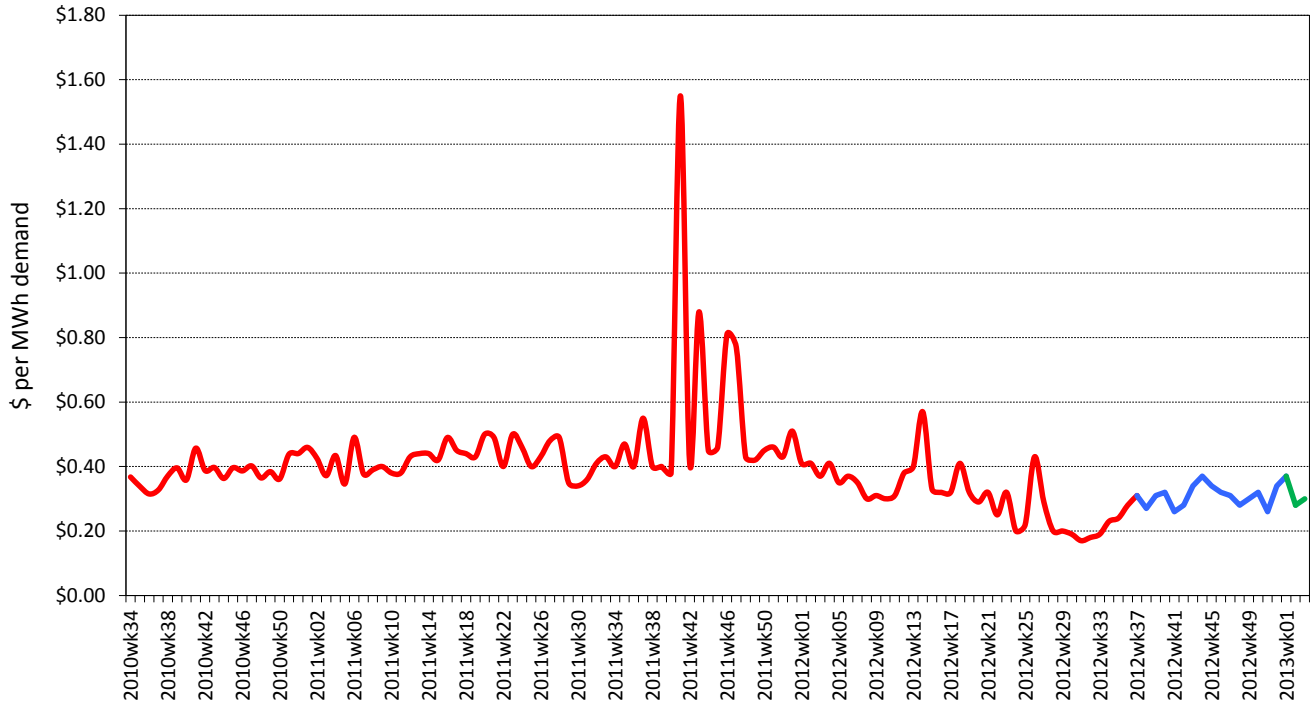


Table 3-3 Ancillary service charges assumed

Year	SA	Vic	NSW
2010	0.151	0.22	0.751
2011	0.745	0.232	0.82
2012	0.267	0.167	0.552
Average ($/MWh)	**0.45**	**0.2**	**0.69**

Due to the volatility of these values, retailers are not able to foresee variations in these costs, and therefore the average values have been applied over the study period as indicative.

These market and ancillary service charges are adjusted by DLFs as the charges are related to the wholesale metered quantity purchased by retailers.

3.4 Green certificates

There are a number of State and Federal Greenhouse Gas (GHG) Abatement schemes which interact with the NEM and impose obligations on retailers. In order to meet the obligations under these schemes, retailers must acquire and surrender “green” certificates each year.

There were several schemes in operation in the NEM over the time period analysed that fall into the category of a green certificate scheme. These schemes include the Mandatory Renewable Energy Target (MRET),which was extended to become eRET and now includes LRET and SRES, the Victorian Renewable Energy Target (VRET), which ceased when eRET was introduced, and the New South Wales Greenhouse Gas Abatement

[6] http://www.nemweb.com.au/REPORTS/CURRENT/Ancillary_Services_Payments/ provides a spreadsheet of weekly costs.

Scheme (NGAS). Table 3-4 provides a list of the green certificates that retailers are obliged to surrender each year under these various schemes in the States of interest for this analysis. The majority of these green certificates are obtained through contracts although some trading can occur on the spot markets.

Table 3-4 Summary of green certificates that retailers are required to surrender

Scheme	Region of relevance	Name of green certificate	Comment
MRET	All regions	REC	Superseded by eRET
VRET	Victoria	VREC	Superseded by eRET
eRET	All regions	REC	Replaced MRET. Superseded by LRET
LRET	All regions	LGC	Replaced eRET
SRES	All regions	STC	Replaced eRET
NGAS	New South Wales	NGAC	

3.4.1 Expanded renewable energy target

The Mandatory Renewable Energy Target (MRET) commenced in April 2001, with the objective of achieving a two percentage point increase in the level of renewable energy generation by 2010, relative to 1997 levels. The election of the Rudd Government in 2007 led to the eventual implementation of the Expanded Renewable Energy Target (eRET) scheme, with a target of 45,000 GWh in 2020, so that the total level of renewable energy generation would comprise around 20% of total generation in 2020.

On 24 June 2010, new legislation split the eRET into small-scale and large-scale components: SRES and LRET.

The SRES includes small-scale technologies of less than 30kW such as solar panels and solar hot water systems. There is no implied target for this scheme, but there is fixed cap price for certificates generated of around $40/certificate (in nominal terms). The retailer's share of the certificates created is set by the small-scale technology percentage (STP), which is determined by the Clean Energy Regulator (CER) prior to the beginning of each year based on predictions of the uptake. Clearing of overs and unders from prior year predictions are also carried forward. The historical STP was sourced from the CER's website[7].

Because the amount of certificates generated in any year may differ from the predicted levels, the clearing price for the certificates may differ from the $40/certificate level and have historically traded at closer to $30/certificate.

The LRET Scheme mandates a target of 41,000 GWh of renewable energy generation from large scale sources, over and above 1997 levels. Eligible sources of generation are large-scale renewable energy projects like wind farms, commercial solar and geothermal. These generation sources earn LGCs, equivalent to a REC under eRET.

The Renewable Power Percentage (RPP) determines the number of LGCs that must be acquired and surrender by a retailer each year. The RPP is calculated and published by CER based on the amount of renewable electricity required to meet the target in a given year, and an estimate of total electricity demand in that year, Net of any partial exemptions that may apply to emission intensive trade-exposed industries. The RPP was

[7] http://ret.cleanenergyregulator.gov.au/For-Industry/Liable-Entities/Small-scale-Technology-Percentage/stp

obtained from the clean energy regulator website[8]. These values apply by calendar year in accordance with the annual target for renewable energy. The RPP is multiplied by the wholesale sales level to determine the volume of LGCs that need to be purchased by the retailer. Retailers obligation's based on retail sales are therefore adjusted according to average DLFs.

For a given retailer, the cost of acquiring these certificates will depend on the forward contracting strategy adopted. For this analysis, it has been assumed that 95% of LGCs are contracted under self-owned assets or long-term PPAs with cost approaching new entry cost, one or two years in advance. The remaining 5% is assumed to be sourced based on the average spot LGC price in the year.

Table 3-5 summarises the historical RPP and weighted average REC/LGC price, the historical STP and the STC price used for this analysis. These data had been compiled by SKM MMA from NGeS reports. STPs did not apply prior to 2011 before the eRET was split into large and small scale segments.

Table 3-5 LGC and STC key parameters

Cal Year	RPP %	REC/LGC Quantity (no. of certificates)	REC/LGC weighted average price	STP %	STC quantity (no. of certificates)	STC price
2005	1.64%	3,400,000	$37.66			
2006	2.17%	4,500,000	$38.51			
2007	2.70%	5,600,000	$39.48			
2008	3.14%	6,800,000	$30.31			
2009	3.64%	8,100,000	$30.61			
2010	5.98%	12,500,000	$46.04			
2011	5.62%	10,400,000	$52.46	14.80%	28,000,000	$30.88
2012	9.15%	16,700,000	$45.38	23.96%	44,786,000	$28.88

Charges for LGCs are priced at the volume at the transmission bulk supply point, so DLFs are applied to define the LGC share required.

3.4.2 Victorian Renewable Energy Target

The Victorian Renewable Energy Target (VRET) commenced on 1 January 2007 with a 0% renewable energy target in that year increasing to 10% by 2016. The scheme excludes old hydro systems and solar hot water, and for modelling purposes it was assumed that energy could only be sourced from within the state. The scheme transitioned to the eRET in 2010 and therefore price and sales data was only available for the calendar years of 2008 and 2009.

The scheme was regulated by the Commission, and mandated retailers and large wholesale purchasers of electricity to acquire and surrender Victorian Renewable Energy Certificates (VRECs), each worth 1 MWh of eligible renewable energy. Each liable entity has to yield sufficient certificates to satisfy a percentage of its electricity purchases for the year. The target percentage was set annually by the Governor in Council, and was dependent upon the total GWh electricity required to be supplied in Victoria by renewable sources. The target increases from 0 GWh in 2007 to 3,274 GWh (estimated as 10% of Victorian demand) in 2016.

The GWh targets in 2008 and 2009 were taken from the Victorian Energy Act 2006 (193 GWh and 578 GWh respectively). These were converted to estimated percentage targets by equating the 2008 and 2009 GWh targets to the 10% target in 2016 (estimated to be 0.6% in 2008 and 1.8% in 2009).

[8] http://ret.cleanenergyregulator.gov.au/For-Industry/Liable-Entities/Renewable-Power-Percentage/rpp provides the renewable power percentage.

Certificate prices were extracted from NGeS publications and averaged to derive values for 2008 and 2009 ($61.74/MWh and $55.17/MWh respectively). Certificate prices were then multiplied by the estimated percentage target to derive the average cost increase per MWh for retailers. This average cost was derived to be 37c/MWh in 2008 and 99c/MWh in 2009.

3.4.3 New South Wales Greenhouse Gas Abatement Scheme

The NGAS aimed to reduce the carbon intensity of electricity supplied in NSW to 7.27 tonne/head of population. The calculation of the NSW retailer obligation comes from four components:

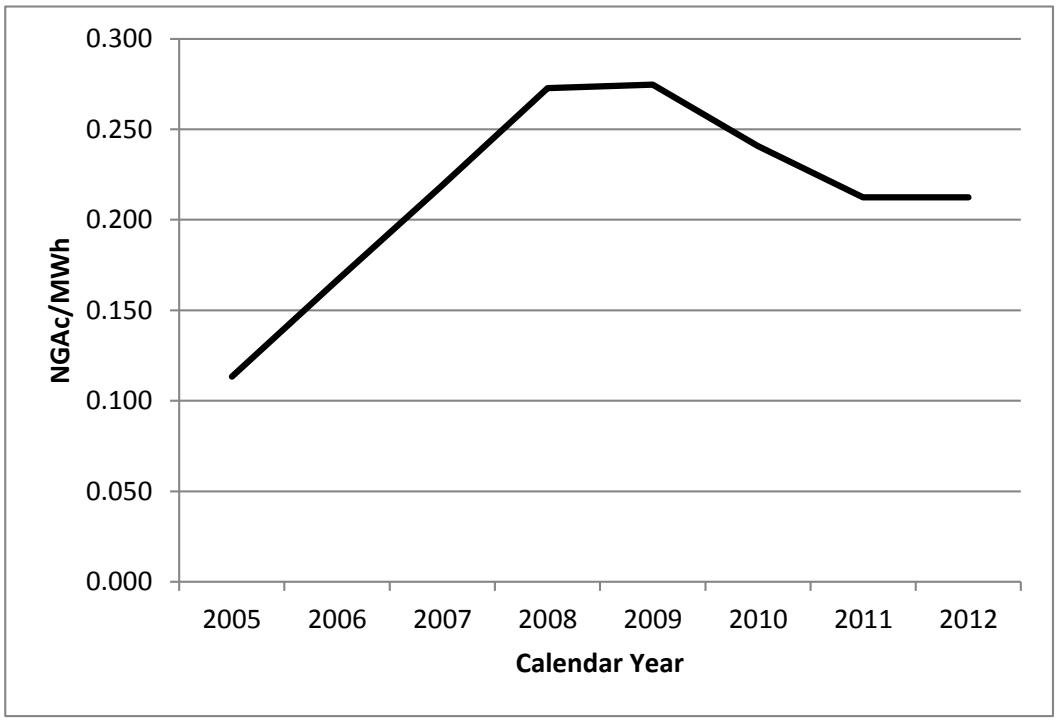
- The NSW population (P in millions)
- The carbon intensity of the NSW generation pool in tCO_2e/MWh, typically between 0.9 and 0.975 (tCO_2e/MWh)
- The wholesale sales, about 65,000 GWh (E in GWh)
- The benchmark target in tCO_2e/head of population (B = 7.27 target by 2007)

The NGAS scheme reports published by IPART[9] show these parameters for each of the years. From these parameters, the number of NGACs (C) is calculated as necessary to reduce the carbon intensity of the retailers' purchases:

C =(E*1000-P B * 1,000,000)

The number of NGACs to be purchased by NSW retailers allows for the impact of the renewable energy certificates in reducing the carbon intensity of purchases. SKM MMA have used the published data on the NGAC requirement to calculate the effective purchases and form the ratio to determine the number of NGACs per MWh of wholesale purchases. This value is presented in Figure 3-3. Some of the NGACs can be supplied from Large User Abatement Certificates (LUACs). We have assumed that LUACs would be priced at the same price as NGACs to retailers, due to their equivalent value.

Figure 3-3 NGACs per MWh of purchases



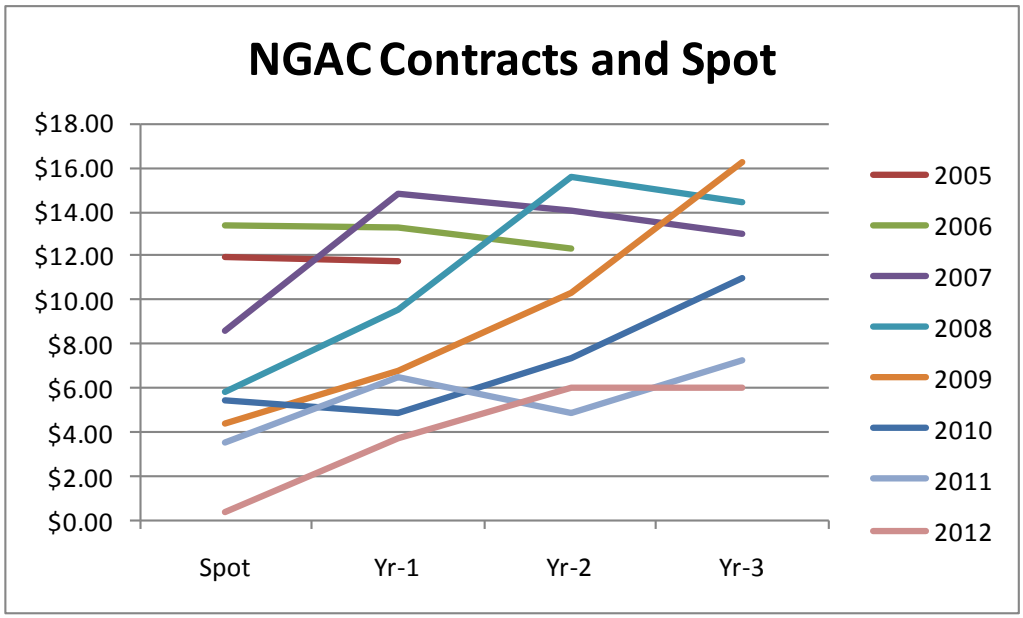
[9] Annual Greenhouse Gas Abatement Scheme Reports are available at http://www.ipart.nsw.gov.au/Home/Industries/Electricity/Greenhouse_Gas_Reduction_Scheme

Figure 3-4 shows the contract and spot prices for NGACs from 2005 to 2012. The average contracted price is shown 1, 2 and 3 years prior as well as the spot price during the corresponding year. The contracting strategy assumed in calculating retail costs for this analysis is:

- 45% of the retailer's obligation is met through contacts purchased two years in advance
- 50% of the retailer's obligation is met through contracts purchased one year in advance
- 5% of the retailer's obligation is met through spot purchases.

Charges for NGACs are priced at the volume at the transmission bulk supply point, so DLFs are applied to define the NGAC share required.

Figure 3-4 NGAC spot and contract prices ($/certificate)



3.4.4 Calculation of total green certificate costs

Total green certificate costs per MWh are calculated as follows:

Green certificate cost ($/MWh) = (RPP * LGC + STP * STC + NQ * NGAC + VQ *VREC)/1000 * DLF

Where:

RPP	Renewable power percentage
LGC	Large generation certificate price (or REC)
STP	Small-scale technology percentage
STC	Small technology certificate price
NQ	NGAC quantity required in NGAC/MWh (NSW only)
NGAC	NGAC price $/NGAC based on forward contracting (NSW only)
VQ	VREC quantity based on the annual percentage target (VIC only)
VREC	Spot VREC price for the year (VIC only, prior to eRET)
DLF	Distribution loss factor

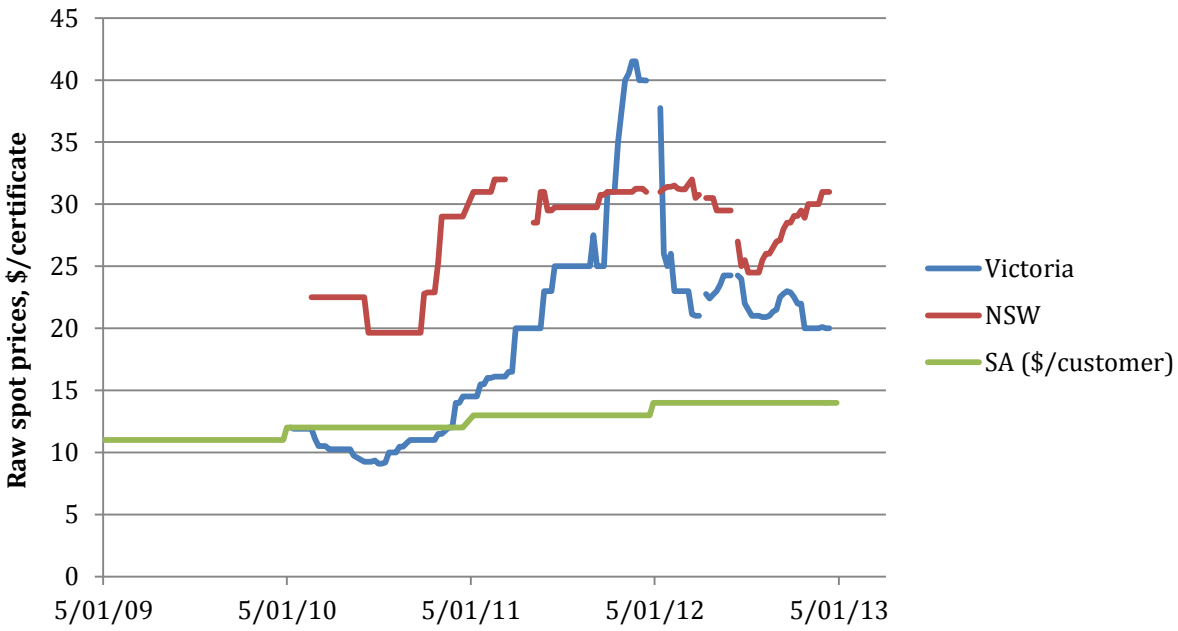
3.5 White certificates

A 'white certificates' scheme is a policy approach that encourages the uptake of energy efficiency. "White certificates" are tradable documents certifying that a given reduction of energy consumption has occurred. Most schemes include an obligation from liable parties to achieve a certain target of energy savings, or pay a penalty. The certificates are a unique and tradeable commodity carrying a property right over a given level of additional energy savings, and guarantee that the benefit of these savings has not been accounted for elsewhere.

There are three schemes in operation in Australia that fall into the category of a white certificate scheme. These schemes include the New South Wales Energy Savings Scheme (ESS), the Victorian Energy Efficiency Target (VEET) and the South Australian Residential Energy Efficiency Scheme (REES). Recently the ACT also developed its own scheme. Key differences between the schemes are summarised in Table D- 1 in Appendix D.

The obligation to provide white certificates falls on energy retailers in all three schemes. Figure 3-5 displays raw historical white certificate spot price data for the Victorian and NSW schemes. The chart indicates missing data for 2009, but beyond this time the evidence indicates that spot prices have been steadily increasing with some levelling out in NSW from 2011 and levelling out in Victoria from 2012. Certificate values for South Australia are not available as this market deals predominantly with energy saving credits between energy retailers which are not publicly available. Instead, estimated costs per customer are shown[10].

Figure 3-5 Historical white certificate price data



Source: Victoria and NSW data supplied from NGeS[11]

[10] The REES commenced in South Australia in 1 January 2009 and will continue until at least 31 December 2014.

In the Essential Services Commission of South Australia's (ESCOSA's) "2010 Review of retail electricity standing contract price path", the cost of the REES scheme was estimated, following a detailed review, to be $12.55/customer in dollars of December 2010[10]. For an average usage of 5000 kWh/customer this equals $0.00251/kWh. The Commission used as the basis of its estimate an analysis of costs carried out by SKM MMA which assessed costs at between $11.28-$12.55/customer, however, stated that the lower cost activities were starting to saturate.

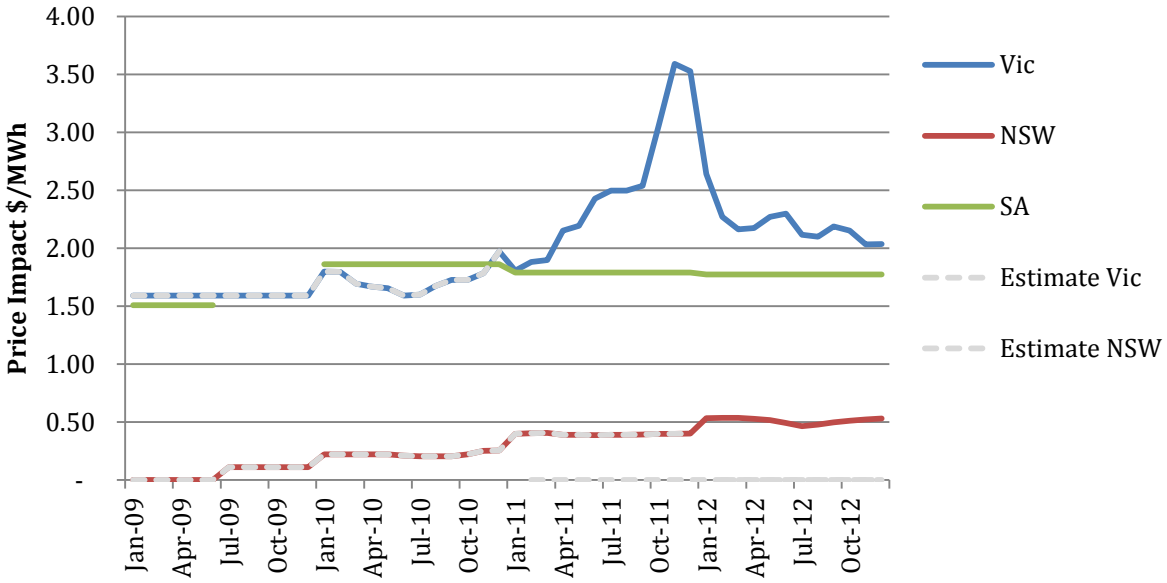
In its review of operations of REES in the years 2009 – 2011, ESCOSA estimated that REES cost a typical residential electricity customer about $14.[10]

In the absence of certificates or other ways in which to estimate costs, SKM MMA has indicatively modelled REES costs as increasing from $11 to $14 per customer over the period 2009 to 2012, about $0.0022 to $0.0028/kWh for a 5000 kWh electricity customer.

[11] Subscription www.nges.com.au

The burden on obligated retailers is, however, not simply defined by spot price levels. Spot prices define the marginal cost of achieving a given level of energy efficiency, rather than an average cost. Further, retailers will, where possible, pay contract rates to achieve a given target where these are available, and where these are expected to be provided at lower cost than the spot market. SKM MMA has made the assumption that the average rate per certificate can be approximated by calculating the average of spot prices and contract prices where these are available. Missing spot price data has been assumed to be an average of the nearest available data points. The resulting estimated costs, after conversion to a common rate of $/MWh, are shown in Figure 3-6.

Figure 3-6 Estimated white certificate costs, $/MWh



While the certificate prices define the cost of achieving targeted energy savings, they do not in themselves define allocation of certificates to all residential consumers. The cost of certificates must be spread over the entire residential customer base. In NSW, the percentage target value may be used to do this. For example, if the target is 4% and the certificate price is $20/MWh, then the cost for all residential consumers may be calculated as 4% x $20 = $0.80. In Victoria, this is slightly more complicated, because the target is based on emissions rather than energy units, and therefore a prescribed greenhouse gas reduction rate (RE[12] for electricity usage and RG for gas usage) value is used. These values have been provided by the Commission and are summarised in Table 3-6.

Table 3-6 RE values applicable to VEET scheme

Calendar year	VEET RE values
Unit	liability/VEEC/ MWh
2009	0.13727
2010	0.15508
2011	0.13767
2012	0.12673

[12] "E" is the amount of electricity (in MWh) acquired by the relevant entity under scheme acquisitions in that year

In Victoria, each certificate represents a tonne of greenhouse gas abated, and the scheme target for the first 3 years is 2.7 million certificates per annum (2009-2011), increased to 5.4 million certificates per annum for the following three years (2012-2014). The RE value represents a relevant entity's rate of liability and therefore the number of VEECs they are required to surrender each year. A relevant entity's liability is calculated by multiplying the total liable electricity acquisitions for a year by the RE value.

The total liable electricity acquisitions are measured at the transmission node and therefore DLFs are applied to determine the cost to retailers.

It should be noted that the VEET obligation only falls on electricity and gas retailers who supply to more than 5,000 customers in Victoria. In this analysis, the obligation is assumed to fall on all Victorian retailers, irrespective of the size of the customer base. Given that the white certificate cost is a relatively small component of the wholesale supply cost to retailers, this is not expected to be material, but could be a further refinement to the model at a future time.

Total white certificate costs are calculated as follows:

White certificate costs ($/MWh) = (E * EP)/1000 * DLF

Where:

E Energy efficiency obligation in certificates /MWh

EP Energy certificate price in $/certificate

DLF Distribution loss factor

3.6 Trends in costs over time

In Figure 3-7, trends in wholesale costs to retailers and retail revenue from 1st tier retailers' discounted market offers in the Citipower distribution zone are observed and compared for the single rate tariff, at the consumption level of 4,000 kWh per annum. Similar charts for the other distribution zones are provided in Appendix E.

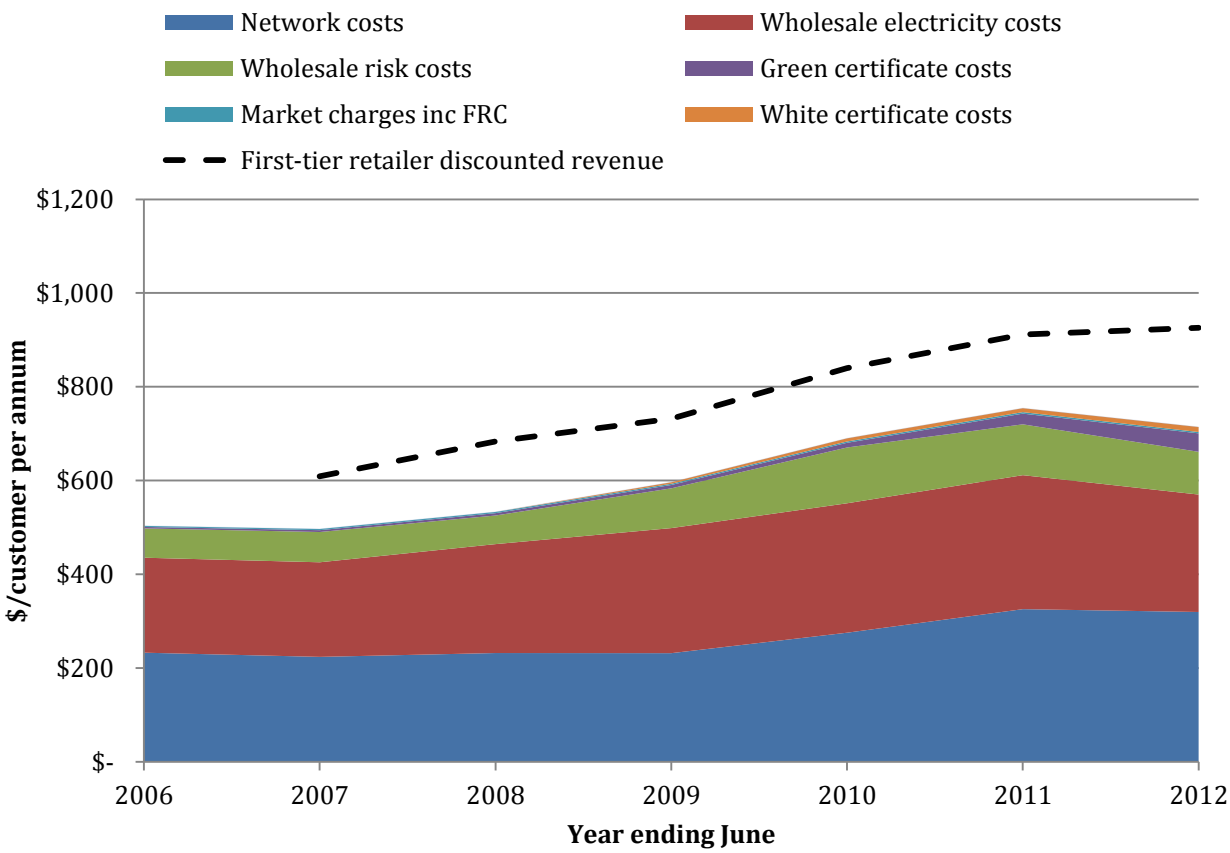
The black energy costs (wholesale electricity costs and wholesale risk costs) and network costs are of approximately the same order of magnitude and make up the majority of costs to retailers. Green and white certificate costs and market charges are hardly visible on the charts and account for only 7% of total costs in the Citipower distribution zone in 2011/12. Similar percentages are observed in other distribution zones.

In all zones, network costs have increased over time, with a noticeable step increase observed in 2009/10 and 2010/11 partly due to metering service charges increasing in the 2010 calendar year. In the Citipower, Jemena, and Powercor distribution zones, the prescribed metering service charge increased between $70 and $100/customer/year. The metering service charge increase in the United Energy and SP Ausnet distribution zones was not as significant and accordingly there is a less noticeable step increase in that period in these two zones.

With low demand growth and subdued electricity prices in the NEM, total wholesale supply costs generally level out in 2010/11 and even decline slightly in 2011/12 in some distribution zones. However, retail revenues have continued to increase relatively steadily over the entire horizon.

By 2011/12, the total wholesale supply cost to a retailer in the Citipower distribution zone is approximately $715/customer for a customer on a single rate. Assuming an average annual consumption of 4,000 kWh per customer, this is equivalent to 17.9 c/kWh, as indicated in Table 3-7. In the other distribution zones, network costs are slightly higher, leading to total wholesale supply costs to retailers being approximately $800/customer by 2011/12.

Figure 3-7 Wholesale supply costs and revenue per single rate customer, Citipower distribution zone, reshaped NSLP



*no single rate discount first-tier retail tariff information was provided by the Commission for the 2005/06 financial year. An average annual consumption of 4,000 kWh per customer is assumed.

Table 3-7 Wholesale supply costs per unit of electricity consumed for an average single rate customer, Citipower

Citipower Electricity	Single Rate	2006	2007	2008	2009	2010	2011	2012
Network costs	*c/ kWh*	5.8	5.6	5.8	5.8	6.9	8.1	8.0
Wholesale electricity costs	*c/ kWh*	5.1	5.1	5.9	6.8	7.0	7.3	6.4
Wholesale risk costs	*c/ kWh*	1.5	1.6	1.5	2.1	2.9	2.7	2.2
Green certificate costs	*c/ kWh*	0.1	0.1	0.1	0.2	0.3	0.6	1.0
Market charges	*c/ kWh*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
White certificate costs	*c/ kWh*	0.0	0.0	0.0	0.1	0.2	0.2	0.3
TOTAL Costs	***c/ kWh***	**12.6**	**12.5**	**13.4**	**15.0**	**17.3**	**18.9**	**17.9**

4. Trends in Gross retail margins

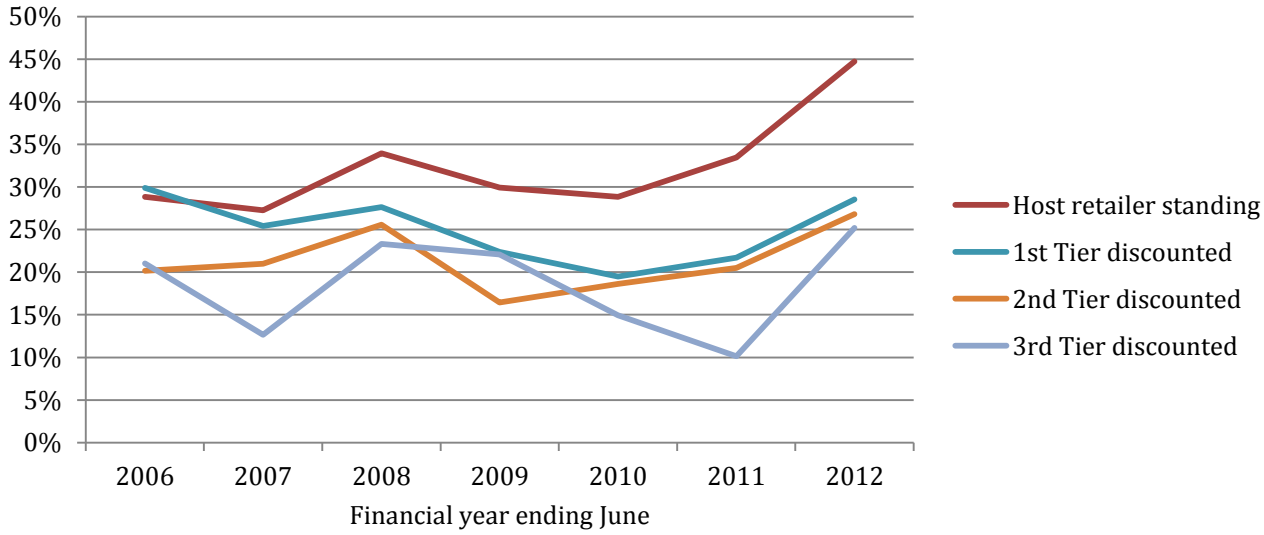
In this section, trends in Gross retail margins are observed and compared, both between distribution zones and across various regions in the NEM, assuming average annual consumption per customer consistent with Table 2-1. Most of the discussion is focused on single rate tariffs, although some discussion of dual rate and time of use tariffs is also provided at the end of the section.

4.1 Single rate

4.1.1 Victorian overview

Figure 4-1 provides an overview of Gross retail margins in Victoria, averaged across all distribution zones, using a straight average methodology. Gross retail margins from host retailers' standing offers and discounted market offers are compared against the Gross retail margins for 1st tier, 2nd tier and 3rd tier discounted market offers.

Figure 4-1 Single rate, Gross retail margin averaged across Victorian distribution zones



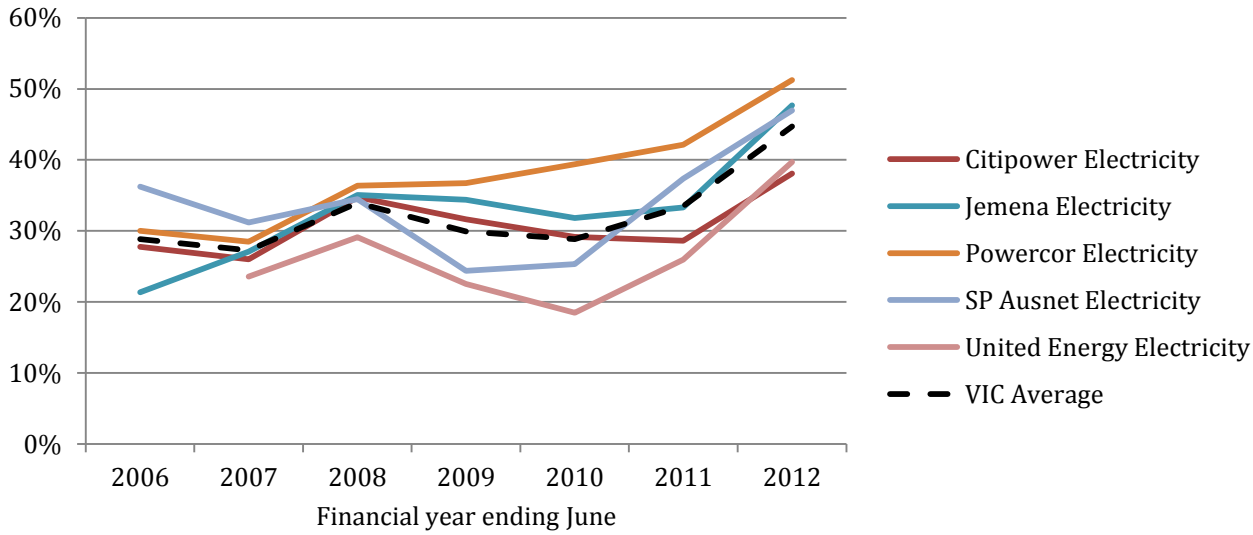
Some key observations are:

- Since 2007/08, Gross retail margins on discounted market offers have been noticeably lower than Gross retail margins on standing offers (Gross margin is 13 percentage points less on average)
- Gross retail margins for standing offers of host retailers appear to have increased by more than 10 percentage points on average between 2010/11 and 2011/12
- Gross retail margins for discounted offers for 1st tier retailers have been declining since 2007/08 but started increasing again in recent years and are now at similar levels to the 2007/08 year
- In last three years, the Gross retail margins of the third-tier retailers have been lower than the first and second-tier retailers.

4.1.2 Victorian distribution zone overviews

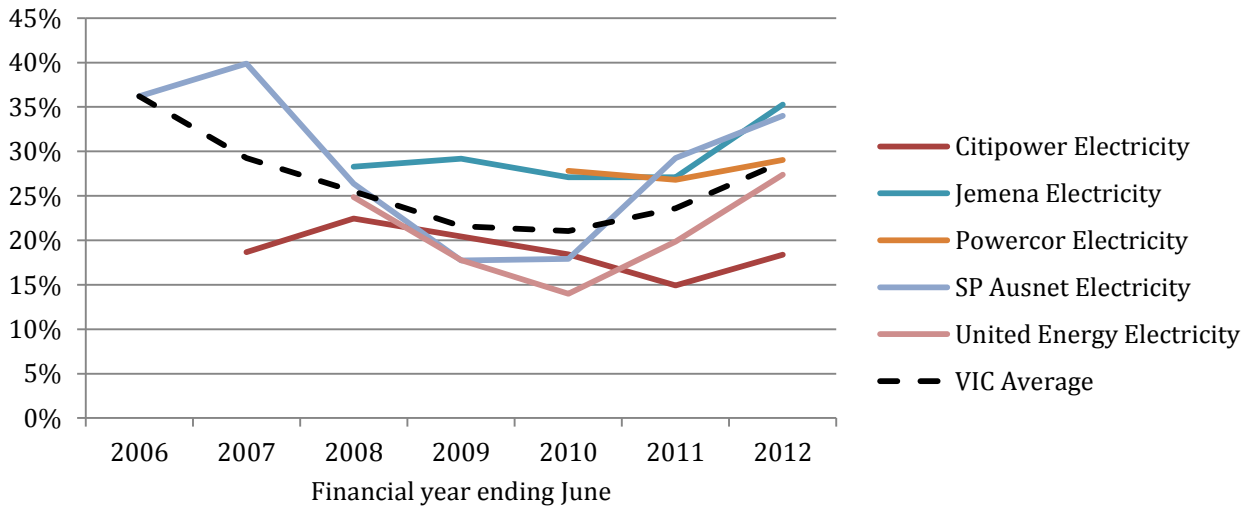
The Gross retail margin from the host retailer's standing offer in each distribution zone in Victoria is shown in Figure 4-2. The estimated retail Gross margins received by host retailers on standing offers varies up to 21 percentage points across distribution zones in Victoria, although the range has narrowed in recent years. With the exception of the host retailer in the Powercor distribution area, the trends in Gross margins received by host retailers in the various distribution areas are consistent with the trends observed on average across Victoria,

Figure 4-2 Single rate, host retailer, standing offer, Gross retail margin comparison across Victorian distribution zones



discussed in Section 4.1.1. The Gross margins for the host retailer in the Powercor distribution area appear to have increased year on year since 2007/08. Notably, the Gross retail margins on standing offers for the host retailers in the SP Ausnet and United Energy distribution zones have increased by over 20 percentage points since 2009/10.

Figure 4-3 Single rate, host retailer, discounted market offer, Gross retail margin comparison across Victorian distribution zones



The Gross retail margin from the host retailer's discounted market offer in each distribution zone in Victoria is shown in Figure 4-3. Gross margins on discounted market offers for host retailers are generally lower than for the standing offers in the period from 2007/08 to 2011/12[13], with the difference increasing over time. In 2007/08 the average difference was 8 percentage points, increasing to 16 percentage points in 2011/12. Gross margins for the host retailers in the SP Ausnet and United Energy distribution zones still increased more noticeably from 2009/10 to 2011/12 than in the other distribution zones and are at levels higher than observed in 2007/08. Conversely, in the Citipower distribution area, the Gross margins for the host retailer have declined from 22% in 2007/08 to 18% in 2011/12.

[13] There was some data missing in the discount information provided by the Commission prior to 2007/08 so inferring trends from data before that time is not recommended.

Figure 4-4 Single rate, 1st Tier retailers, discounted market offer, Gross retail margin comparison across Victorian distribution zones

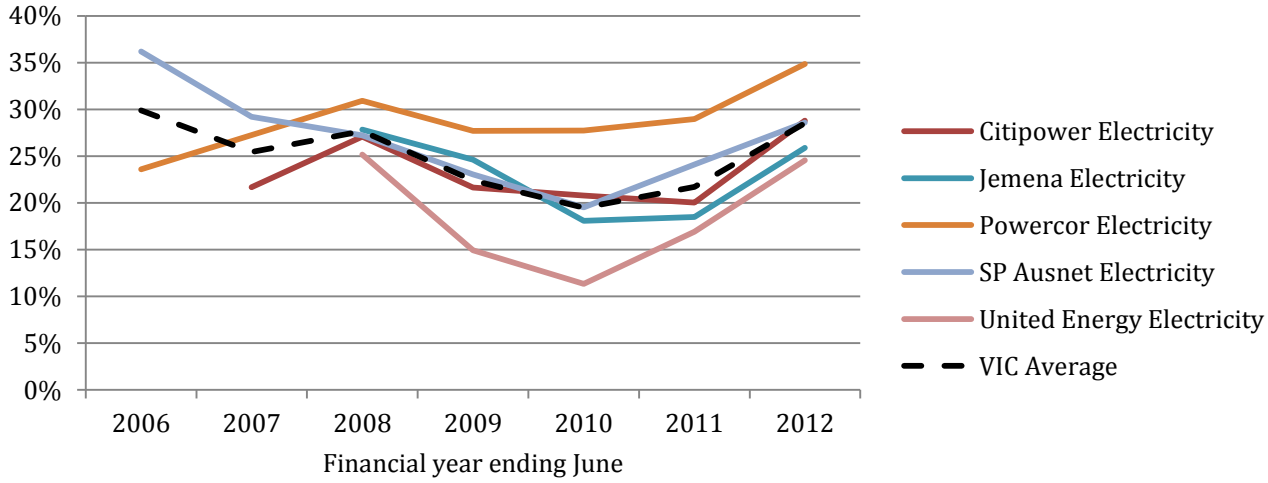


Figure 4-5 Single rate, 2nd Tier retailers, discounted market offer, Gross retail margin comparison across Victorian distribution zones

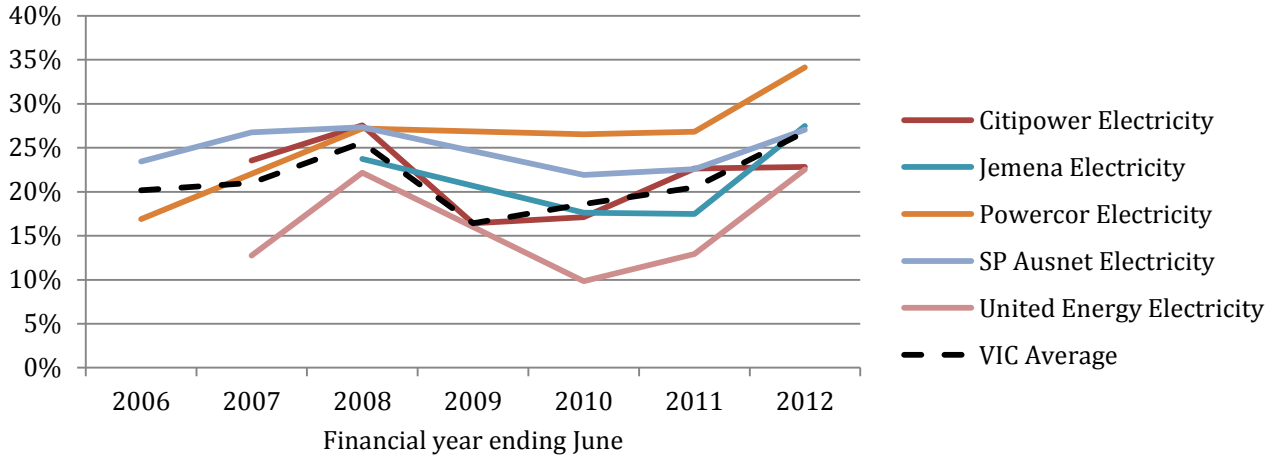


Figure 4-6 Single rate, 3rd Tier retailers, discounted market offer, Gross retail margin comparison across Victorian distribution zones

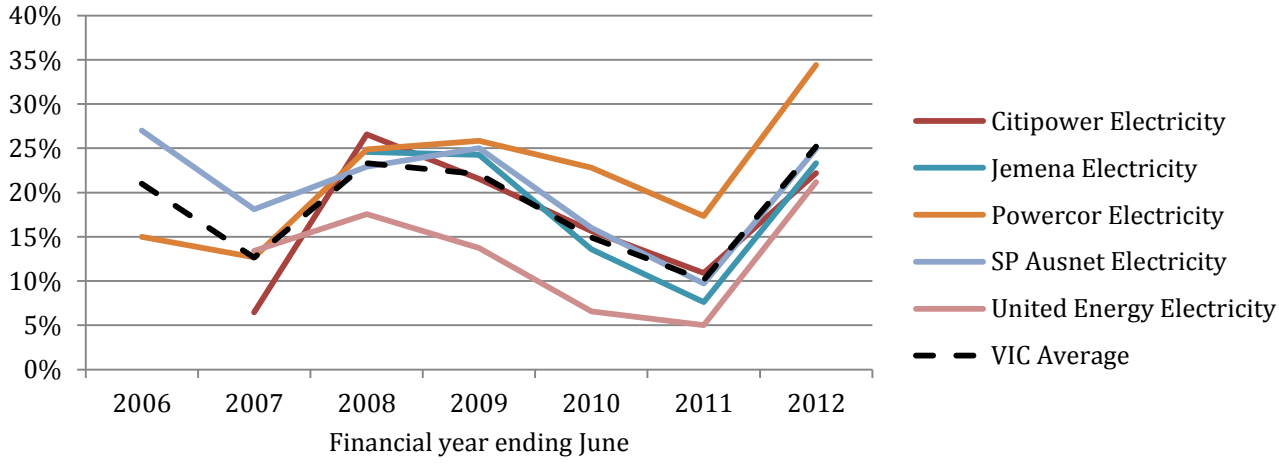


Figure 4-4 to Figure 4-6 compare the Gross margins for discounted market offers for 1st tier, 2nd tier and 3rd tier retailers. There is little difference between the Gross margins for 1st and 2nd tier retailers. Gross margins for 3rd tier retailers appear to be more volatile from year to year, which could be expected as these smaller players often need to take more strategic risk to increase market share and maintain healthy profit margins.

4.1.3 Victorian distribution zone comparisons

Figure 4-7 to Figure 4-11 show the Gross retail margins for the host retailer, 1st tier, 2nd tier and 3rd tier retailers in each individual distribution zone. Comparing Gross retail margins in individual distribution zones, the following observations can be made:

- Gross margin for standing offer is consistently higher than all market offers
- In over half the distribution areas (i.e. Jemena, United Energy and SP Ausnet in the last two years), the host retailer's discounted offer returns a higher Gross margin than the discounted offers from the other retailers. This likely indicates that the other retailers are being more aggressive with their pricing strategies in order to encourage customers to switch.
- 2nd tier retailers are generally pricing more aggressively than 1st tier retailers in the Citipower and United Energy distribution zones and to a lesser extent in the Powercor distribution zone.
- In the Citipower distribution zone, the discounted retail tariff offered by the host retailer is generally very competitive when compared against other retailers in the zone.
- In the Powercor distribution zone most retailers appear to be offering similar discounted rates, with the range of Gross margins being much narrower than in the other distribution zones.
- In 2010/11 the Gross margins for 3rd tier retailers were between 8 and 13 percentage points lower than for 2nd tier retailers in all but the Citipower zone. However, this difference noticeably reduced in 2011/12, with the Gross margins for 3rd tier retailers increasing by at least 15 percentage points.

Figure 4-7 Citipower, single rate, Gross retail margin

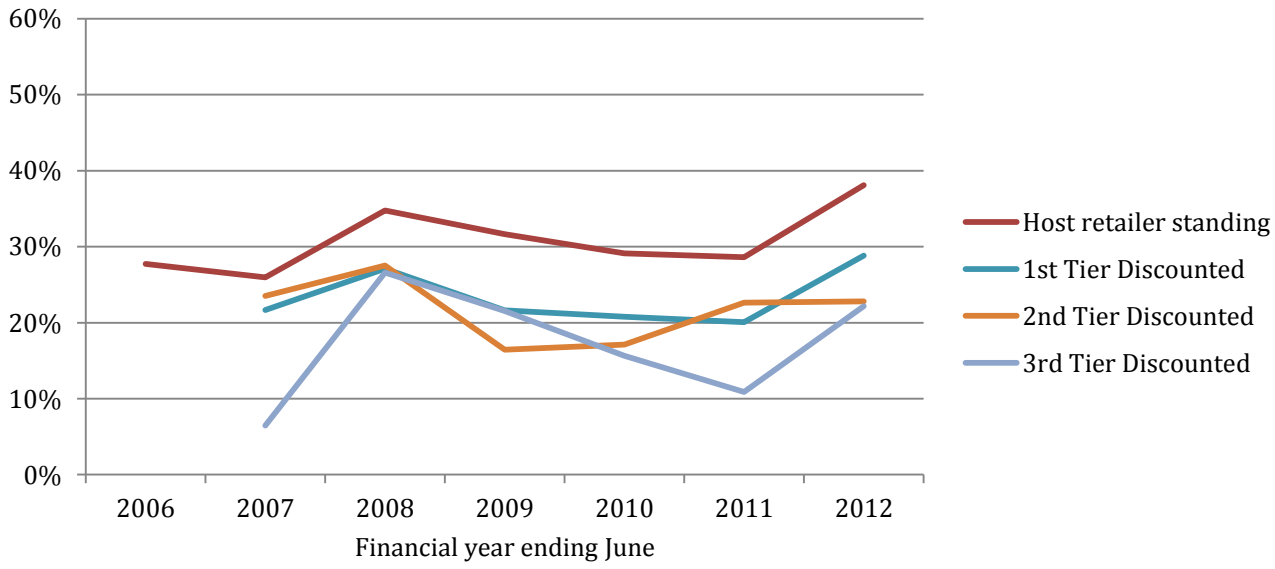


Figure 4-8 Jemena, single rate, Gross retail margin

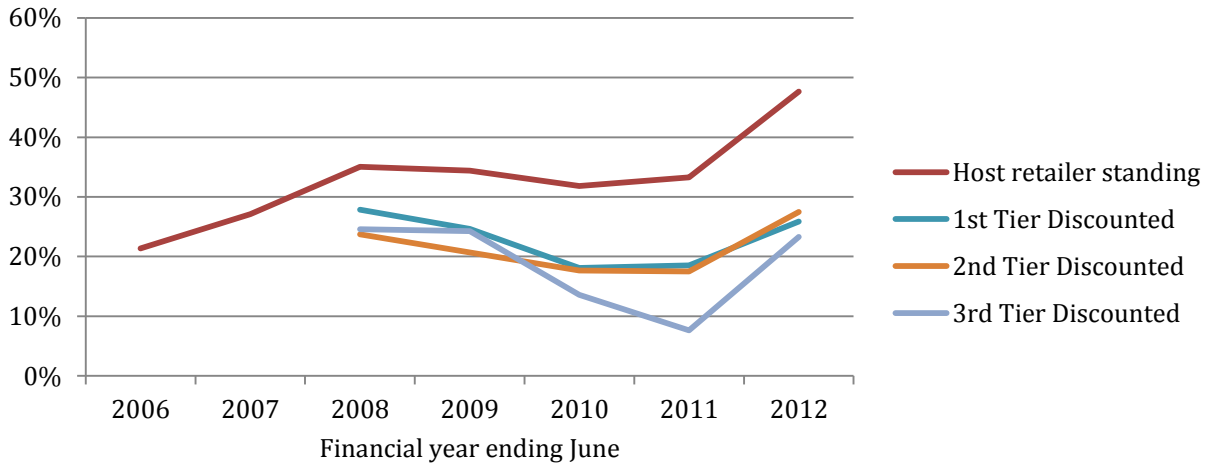


Figure 4-9 Powercor, single rate, Gross retail margin

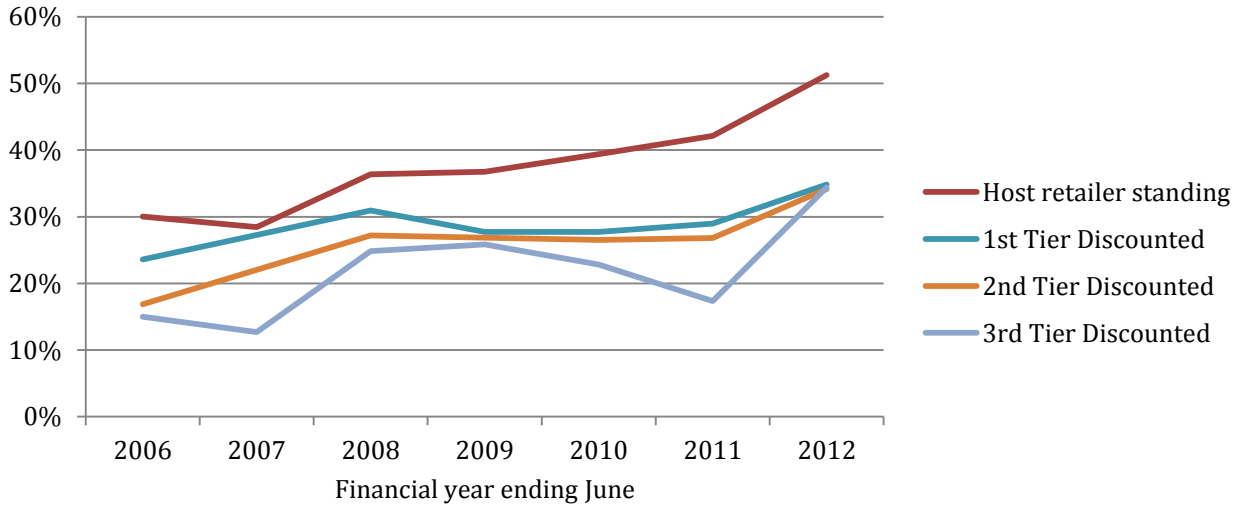


Figure 4-10 SP Ausnet, single rate, Gross retail margin

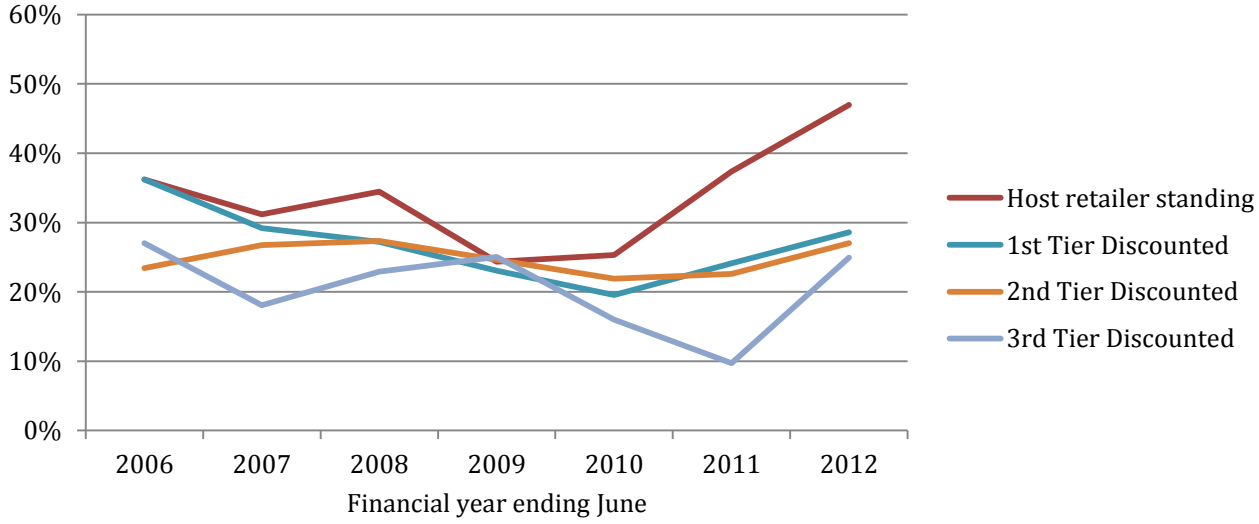
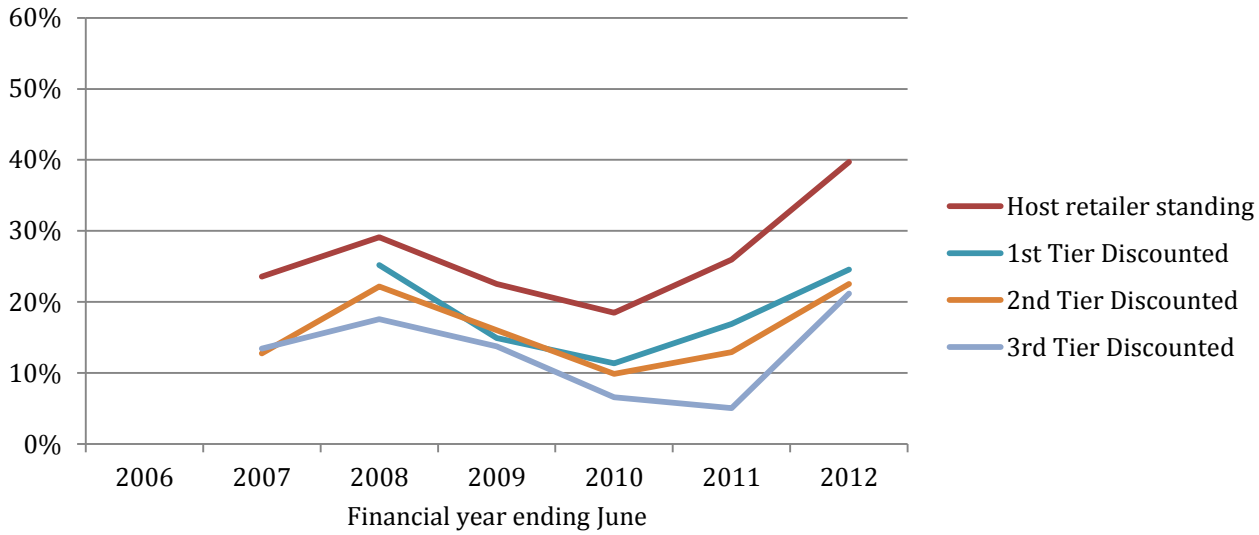


Figure 4-11 United Energy, single rate, Gross retail margin

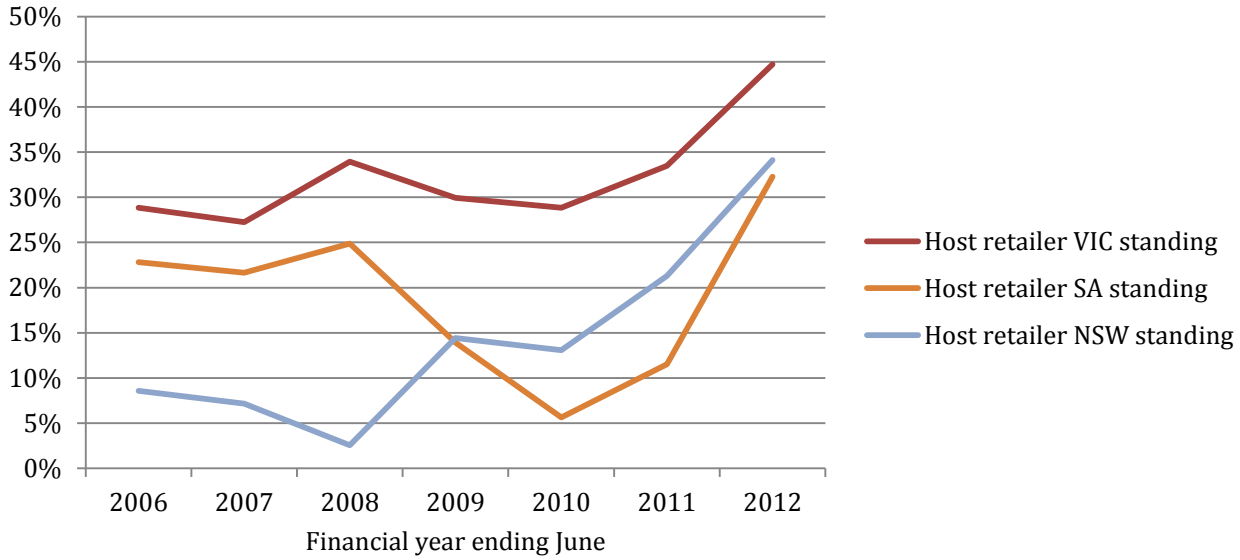


4.1.4 Interstate comparisons

Based on the data provided to SKM MMA, the average Gross margin received by the Victorian host retailers on their standing offer is higher than in South Australia or New South Wales, as shown in Figure 4-12. No comparison has been made to retail tariffs in Queensland as the analysis based on the data available suggested that reliable comparisons were not possible. Gross margins in all three states considered have increased from 2009/10 levels. Relative to the Gross retail margins in 2005/06, Gross retail margin increases in Victoria are greater than in South Australia, but not as large as in New South Wales.

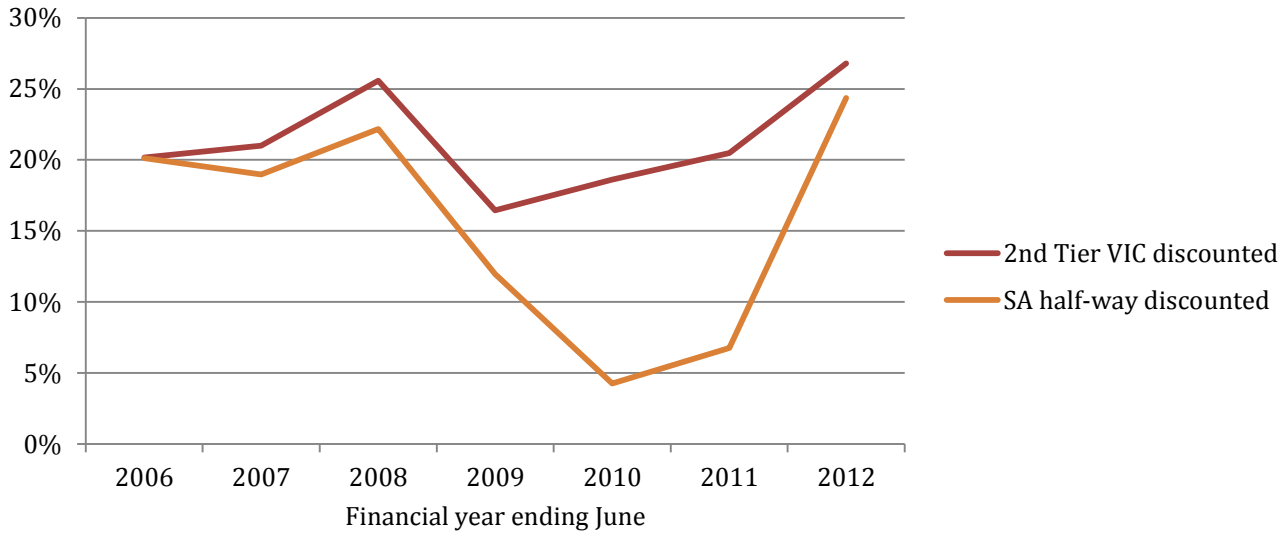
It should be noted that the interstate comparisons do not represent state-wide averages. Rather, they are based on the ETSA, EnergyAustralia/Ausgrid interstate zones.

Figure 4-12 Single rate, average Gross retail margin from host retailer, standing offer – interstate comparison



* For this analysis, the host retailer in SA is AGL and in NSW is Energy Australia

Figure 4-13 Single rate, average Gross retail margin, discounted offer – interstate comparison



*no discount retail tariff information was available for NSW over the time horizon

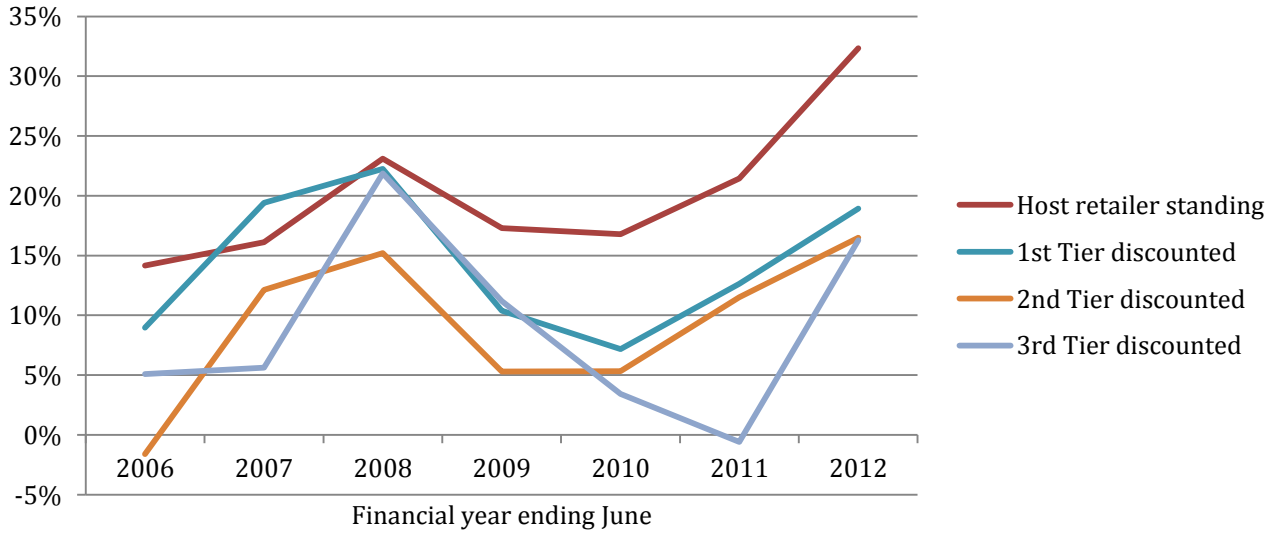
When comparing the average Gross margin from discounted market offers of 2nd tier retailers in Victoria with the Gross margin from "half-way" discounted offers in South Australia (Figure 4-13), similar trends are observed over time, except that in South Australia the magnitude of the decline and subsequent increase in Gross retail margins was more extreme. The unavailability of data in other states meant that similar comparisons with New South Wales, Tasmania and Queensland were not possible. The South Australian half-way discounted Gross retail margins were compared against 2nd Tier Victoria discounted offers since it was considered that this would be most representative for a "like-with-like" comparison.

4.2 Dual rate

4.2.1 Victorian overview

The average Gross retail margins from standing and discounted market offers classified as "dual rate" or "two rate" are summarised for the Victorian region as a whole in Figure 4-14.

Figure 4-14 Dual rate, Gross retail margin averaged across Victorian distribution zones, reshaped NSLP

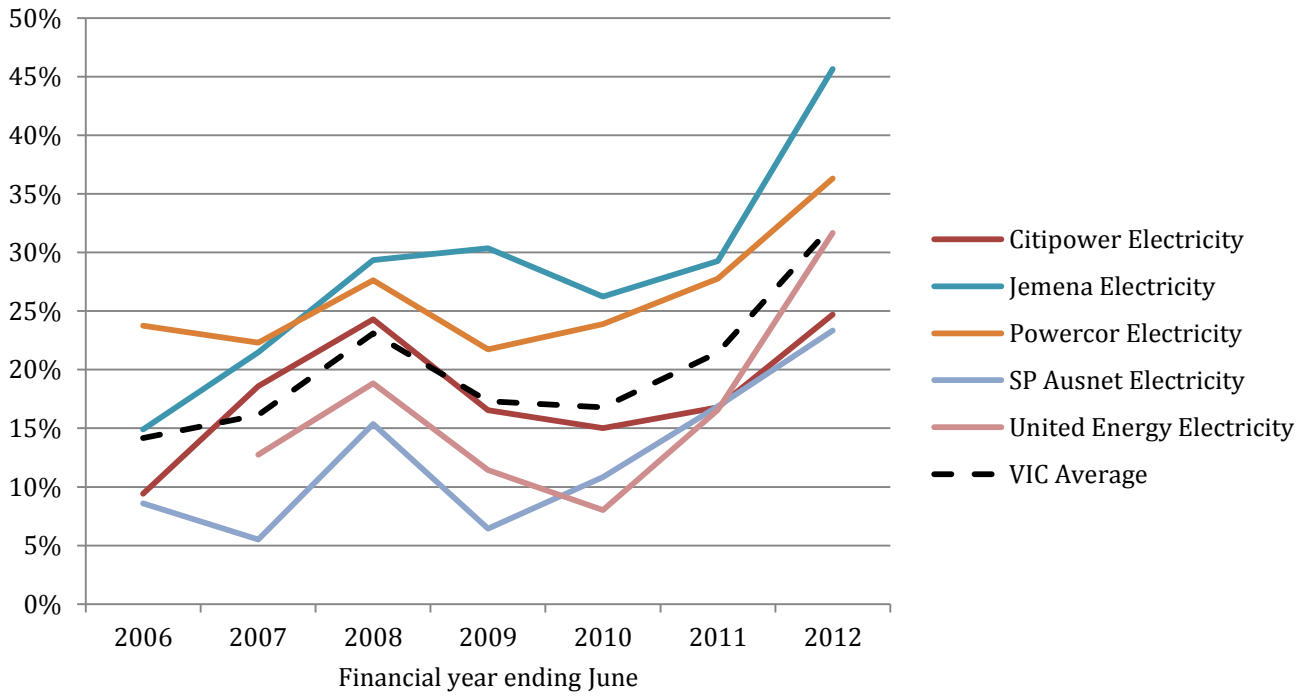


The average Gross margins from dual rate standing and market offers are generally lower than the Gross margins from single rate offers shown in Figure 4-12. This is to be expected, as more risk would typically get factored into a single rate tariff to cover uncertainty in peak and off-peak energy usage and associated wholesale supply costs. The Gross margins on both the host retailers' standing offer and discounted market offer were on average 12 to 14 percentage points lower under the dual rate than under the single rate.

Gross margins on dual rate offers from other retailers in each distribution zone appear to be quite volatile from year to year, and are even slightly negative in some instances. This could be an indication of a short-term strategy to increase market share, or may indicate some anomalies in the data provided by the Commission. It may also reflect the possibility that traded wholesale contract prices did not reflect retailer's actual black energy costs based on their actual contracted positions and owned generation for dual rate customers.

Figure 4-15 shows the Gross margins for the host retailers' standing offers, dual rate, across the various distribution zones in Victoria. Gross retail margins for host retailers in the SP Ausnet and United Energy distribution zones are lower than the Victorian average, Jemena and Powercor have higher retail margins than the VIC average. Gross retail margins for the host retailer in the Citipower distribution zone more or less followed the State average in the first five years analysed, but were lower than the State average in 2010/11 and 2011/12.

Figure 4-15 Host retailer, standing offer, comparison across Victorian distribution zones, dual rate

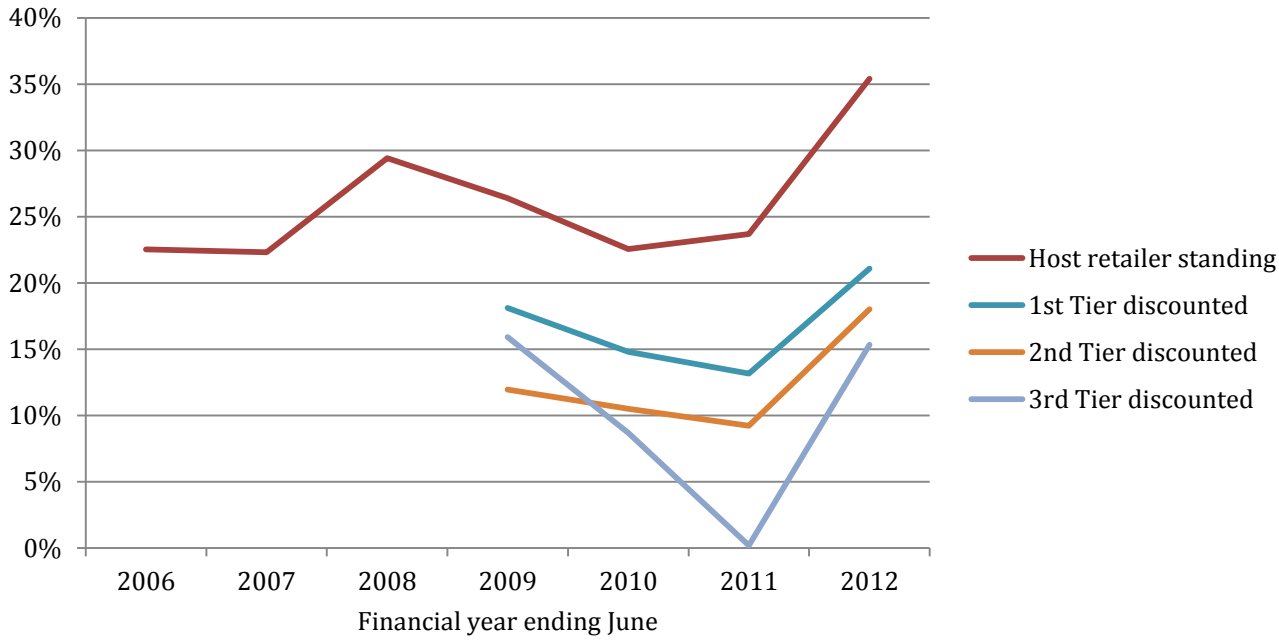


4.3 Time of use

4.3.1 Victorian overview

The average Gross retail margins from standing and discounted market offers classified as "time of use" are summarised for the Victorian region as a whole in Figure 4-16.

Figure 4-16 Time of use, Gross retail margin averaged across Victorian distribution zones, reshaped NSLP



*in Victoria, no time of use market offers were provided by the Commission for periods prior to 2008/09.

From the four years of data available, it is difficult to draw any strong conclusions about the trends in Gross retail margins from time of use tariffs, however the following observations are made:

- Gross retail margins from the host retailers' time of use standing offers are on average 8 percentage points lower than for single tariffs. Since retailers are better able to match revenue with wholesale supply costs under time of use tariffs, Gross retail margins would normally be expected to be lower under this tariff structure.
- The larger 1st tier retailers tend to have higher Gross retail margins than the 2nd tier retailers, which in turn generally have higher Gross retail margins than the 3rd tier retailers.
- Gross retail margins from time of use tariffs declined since 2008/09 but then increased again in 2011/12.

5. Retail Operating Costs

5.1 Use of regulated outcomes

Costs faced by retailers in supplying small markets include those related to acquiring, retaining and serving the customer base. We note that there is a broad range of operational models that can deliver electricity retail services. Indeed, these models can range significantly in respect of levels of functional outsourcing, levels of system automation, capacity for growth and scale, and flexibility for innovation and product expansion. Moreover, these operational models can also vary in respect of maturity, as well as levels of process efficiency, particularly given the cycles of acquisition and business transformation that have shaped the evolution of current suppliers in the retail market.

It follows that actual retail costs may vary significantly with respect to retailer, retailer size, incumbency and with the time and pattern of industry and organisational development.

As this study was not intended to be a detailed review of retail operating costs, it was agreed with the Commission that the costs used should be those regulated in a nearby jurisdiction. We consider the retail operating costs determined by the Independent Pricing and Regulatory Tribunal of NSW (IPART) to be reasonably representative of those which have applied across eastern Australia over the period and have used these in our analysis.

5.2 IPART determinations

There have been three IPART relevant determinations over the period of concern:

- Covering the period 1 July 2004 to 30 June 2007[14]
- Covering the period 1 July 2007 to 30 June 2010[15]
- Covering the period 1 July 2010 to 30 June 2013[16].

These studies have described and assessed retail operating costs and also retail margins. Both the type of retailers considered and the type and level of costs included in the IPART assessments have changed somewhat over time. For example, the costs in the second period related to new costs while those in the third period to Standard retailers. The costs of acquiring customers were included only in the second period and the cost of acquiring and retaining customers in the third period. Despite this, given the overall range of considerations and outcomes we consider the costs assessed to have been representative against the background of changes to operations and the contestability environment over this time and reasonable to use for this study.

5.3 Costs included

The categories of retail operating costs assessed by IPART in its determination for 2010 - 2013 included:

5.3.1 Retail Operating Costs

- Call centre costs
- Customer information costs

[14] Independent Pricing and Regulatory Tribunal of NSW, "NSW electricity regulated retail tariffs: 2004/05 to 2006/07: Final report and determination", June 2004.

[15] Independent Pricing and Regulatory Tribunal of NSW, "Promoting retail investment and competition in the NSW electricity industry: Regulated electricity retail tariffs and charges for small customers 2007 to 2010: Electricity final report and final determination", June 2007.

[16] Independent Pricing and Regulatory Tribunal of NSW, "Review of regulated retail tariffs and charges for electricity 2010 to 2013: Electricity final report", March 2010.

- Corporate overhead costs
- Administrative costs associated with regulatory compliance
- Billing and revenue collection costs
- Bad and doubtful debt.

5.3.2 Customer Acquisition and Retention Costs

- Marketing
- Acquiring new customers from another retailer onto a negotiated or standard contract
- Transferring existing customers from a standard contract onto a negotiated contract
- Retaining all existing customers, which includes the cost of transferring existing customers from a negotiated contract onto a standard contract.

IPART included the costs of depreciation and amortisation and return on working capital within the retail margin.

5.4 IPARTs regulated Retail Operating Costs

The retail operating costs regulated by IPART in the above determinations[17] [18] [19] are provided in Table 5-1 in the dollar terms in which they were denominated at the time. They are also provided in nominal dollar terms (that is dollars of the day) in the final row. To calculate the dollars of the day we have used the all groups consumer price index (CPI) for eight capital cities with the December quarter CPI being used as representing that for the financial year20.

Table 5-1: Retail operating costs per customer regulated by IPART

Period	Dollars of	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
2004-2007	$2004-05	$70	$70						
2007-2010	$2006-07			$105	$105	$105			
2010-2013	$2009-10						$109.8	$111.7	$113.7
2004-2013	**Nominal**	**$71.5**	**$73.8**	**$108.1**	**$112.1**	**$114.5**	**$112.7**	**$118.2**	**$123.4**

We have used the costs in the final row, in nominal dollars, in our analysis. Note that the same retail operating cost per customer has been assumed for all retail customers irrespective of the retailer type, tariff type, location and level of consumption.

As part of its 2010 decision on retail costs, IPART used a bottom-up methodology for estimating the retail operating costs of the incumbent New South Wales retailers. This methodology allows for the impact of changing customer numbers on fixed cost recovery. In its determination IPART assumed that 75% of retail

[17] Independent Pricing and Regulatory Tribunal of NSW, "NSW electricity regulated retail tariffs: 2004/05 to 2006/07: Final report and determination", June 2004 page 9.

[18] Independent Pricing and Regulatory Tribunal of NSW, "Promoting retail investment and competition in the NSW electricity industry: Regulated electricity retail tariffs and charges for small customers 2007 to 2010: Electricity final report and final determination", June 2007 page 7.

[19] Independent Pricing and Regulatory Tribunal of NSW, "Review of regulated retail tariffs and charges for electricity 2010 to 2013: Electricity final report", March 2010 page 16.

[20] For example the December 2004 index value was used to represent the 2004-05 year.

costs are fixed, based in part on the submissions by the incumbent retailers. This appears to be a reasonable basis to use to estimate the variable retail operating cost per customer.

6. Trends in Net retail margins

In this section, trends in Net retail margins are observed and compared, based on the retail operating cost assumptions outlined in Section 5 and assuming average annual consumption per customer outlined in Table 2-1. In nominal dollars, these costs increased over time, from $71.50/customer in 2005/06 to $118.20/customer in 2011/12.

The same retail operating cost is assumed to apply to all retailers irrespective of distribution zone, region or retail tariff type, so the inter-state and inter-zone comparisons remain the same. In reality, there may be differences in retail operating costs between 1st tier, 2nd tier and 3rd tier retailers, and so, comparisons of Net retail margins between retailers of difference sizes will be sensitive to this assumption.

In general, care should be taken in interpreting the Net retail margin analysis, as the results will also be sensitive to:

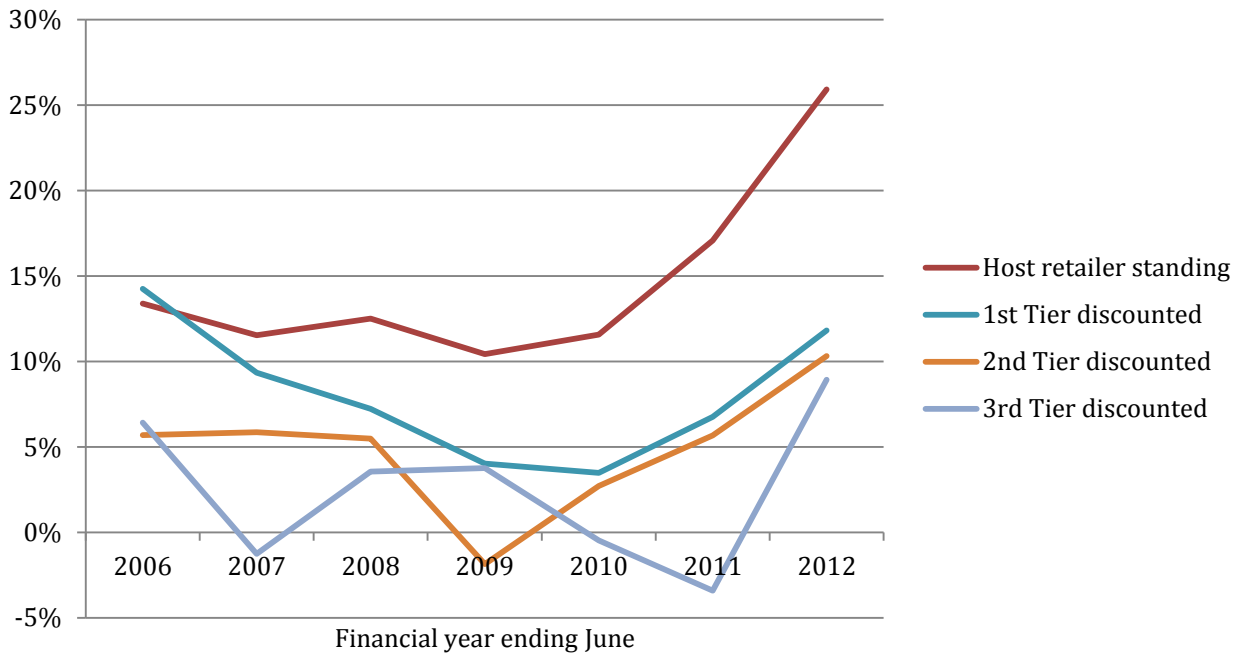
- Choice of average consumer load – there are both fixed and variable components of the retail revenue, but some of the retail energy costs estimated are entirely variable.
- Estimated costs, including retail operating costs – as more costs need to be estimated, the degree of error increases.
- Choice of retail tariff used – as previously discussed, where more than one retail tariff was offered by a retailer in a given year, we have estimated the retail revenue using a straight averaging methodology.

6.1 Single rate

6.1.1 Victorian overview

Figure 6-1 provides an overview of Net retail margins in Victoria, averaged across all distribution zones using a simple average.

Figure 6-1 Single rate, Net retail margin averaged across Victorian distribution zones

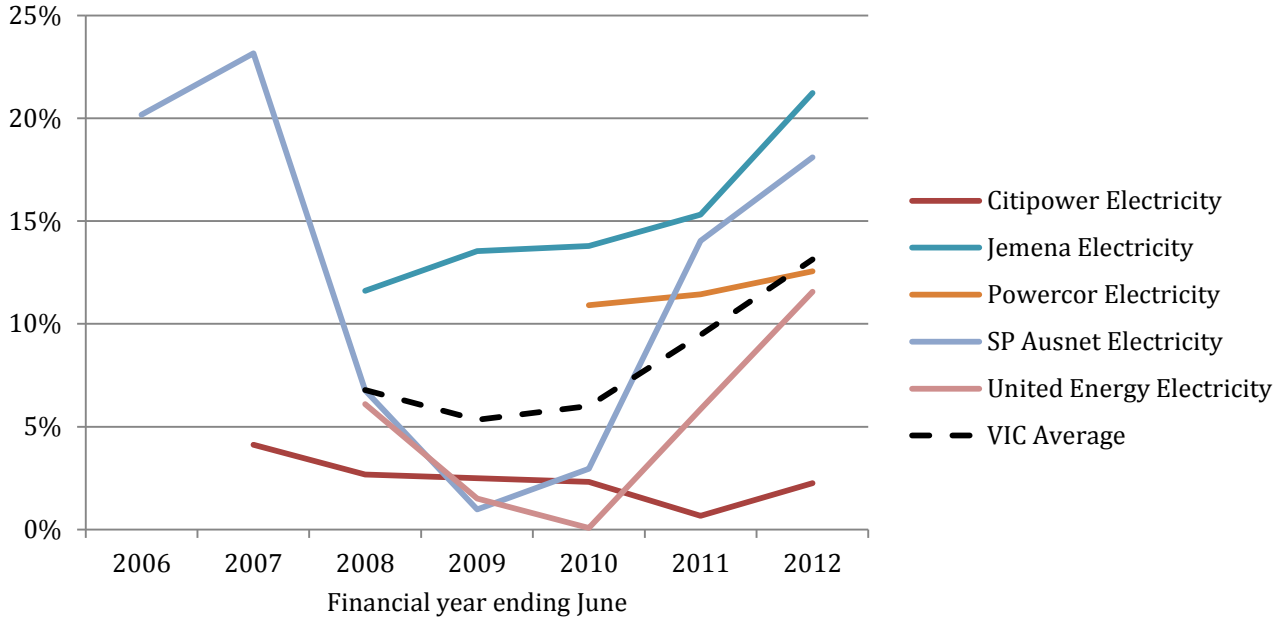


Some key observations are:

- Net retail margins on discounted market offers for host, 1st and 2nd tier retailers have, on average, been increasing since 2009/10.
- Net retail margins on discounted market offers were less than 15% in all years analysed.
- In some years, Net retail margins for 2nd and 3rd tier retailers appear to be slightly negative based on the information provided and cost assumptions made.

When looking at Net retail margins from discounted market offers for host retailers in the respective distribution zones, it is apparent that the margins are quite volatile from year to year (see Figure 6-2), particularly for host retailers in the SP Ausnet and United Energy distribution zones. Moreover, the average Net retail margin for Victoria as a whole in the last three years of the study period is brought down by the retail margin in the Citipower distribution zone. The Net retail margin for the host retailer in the Citipower distribution zone has been well below 5% since 2007/08 and in 2010/11 there was no Net retail margin if the information provided and assumptions used are correct.

Figure 6-2 Host retailer, discounted single rate market offer, Net retail margin comparison across Victorian distribution zones



6.2 Dual rate

6.2.1 Victorian overview

The average Net retail margins from standing and discounted market offers classified as “dual rate” or “two rate” are summarised for the Victorian region as a whole in Figure 6-3. Given that the Gross retail margins from dual rate offers were calculated to be marginal, it is not surprising that the Net retail margins from dual rate discounted market offers are negative in some years. This result highlights that the data and interpretation applied to the dual rate information is questionable as it is hard to imagine that such a pricing strategy would be sustainable to retailers. However, the trends in the margins are still meaningful, and show an increase in Net retail margins in the last two years (2010/11 and 2011/12).

Figure 6-3 Dual rate, Net retail margin averaged across Victorian distribution zones

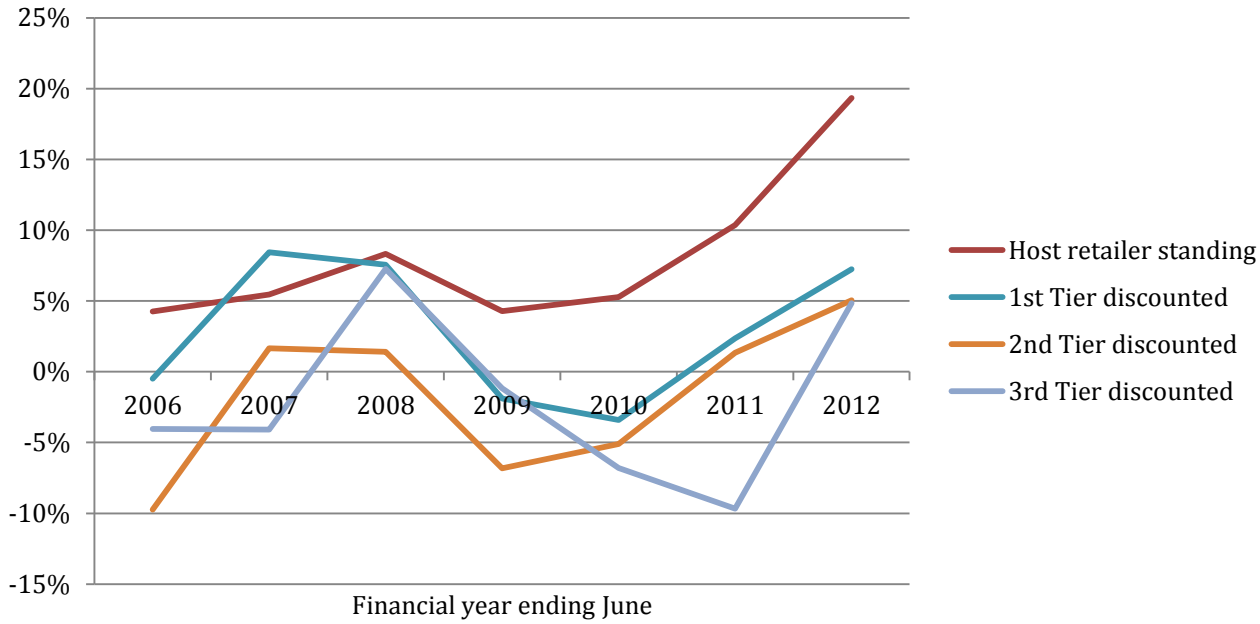
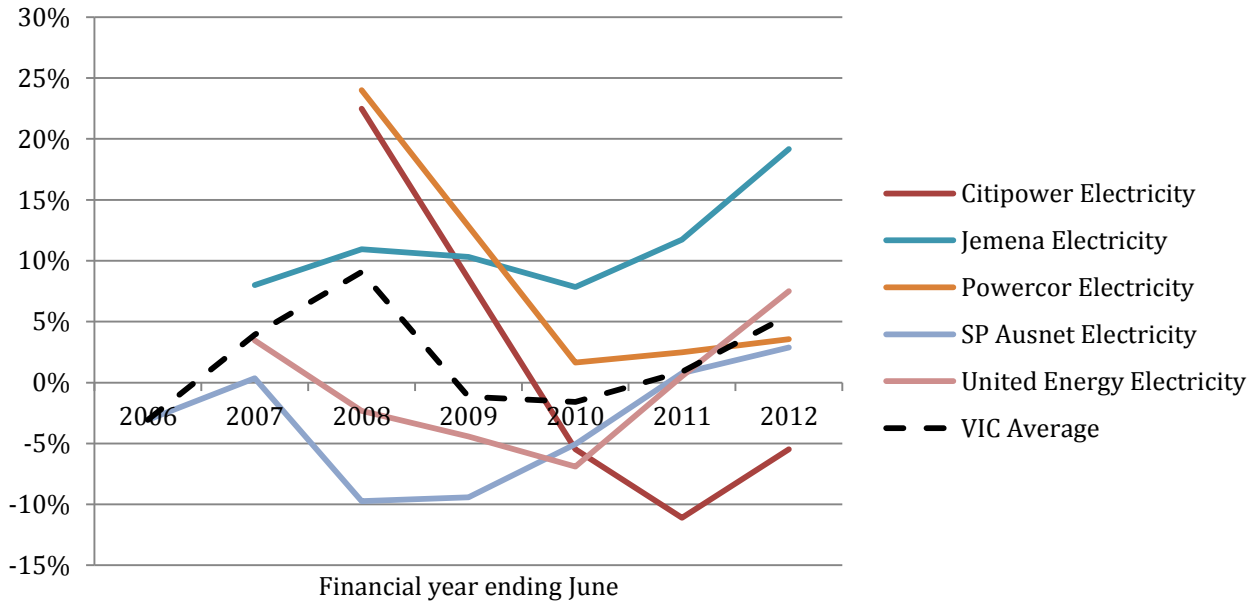


Figure 6-4 shows the Net retail margin from discounted dual rate market offers for host retailers in each of the Victorian distribution zones, and once again highlights that, in the last three years, the retail margin in the Citipower distribution zone is low relative to the other zones.

Figure 6-4 Host retailer, discounted dual rate market offer, Net retail margin comparison across Victorian distribution zones



6.3 Time of use

6.3.1 Victorian overview

The average Net retail margins from standing and discounted market offers classified as “time of use” are summarised for the Victorian region as a whole in Figure 6-5. On average, modest Net margins are maintained for all but the 3rd tier retailers, with an obvious increase in Net retail margin in 2011/12.

Figure 6-5 Time of use, Net retail margin averaged across Victorian distribution zones

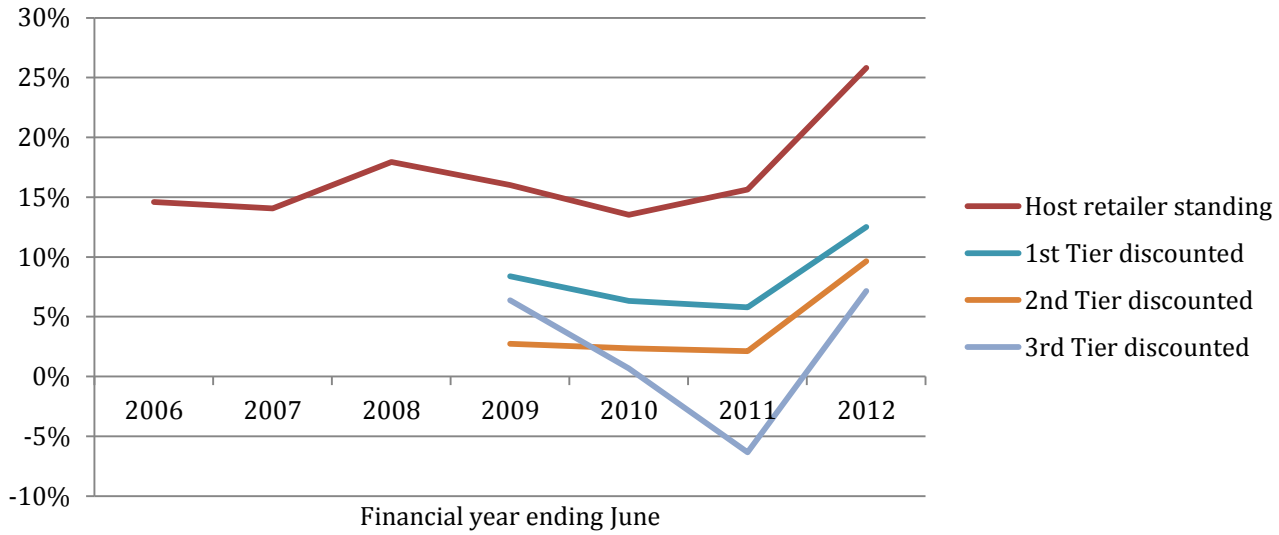
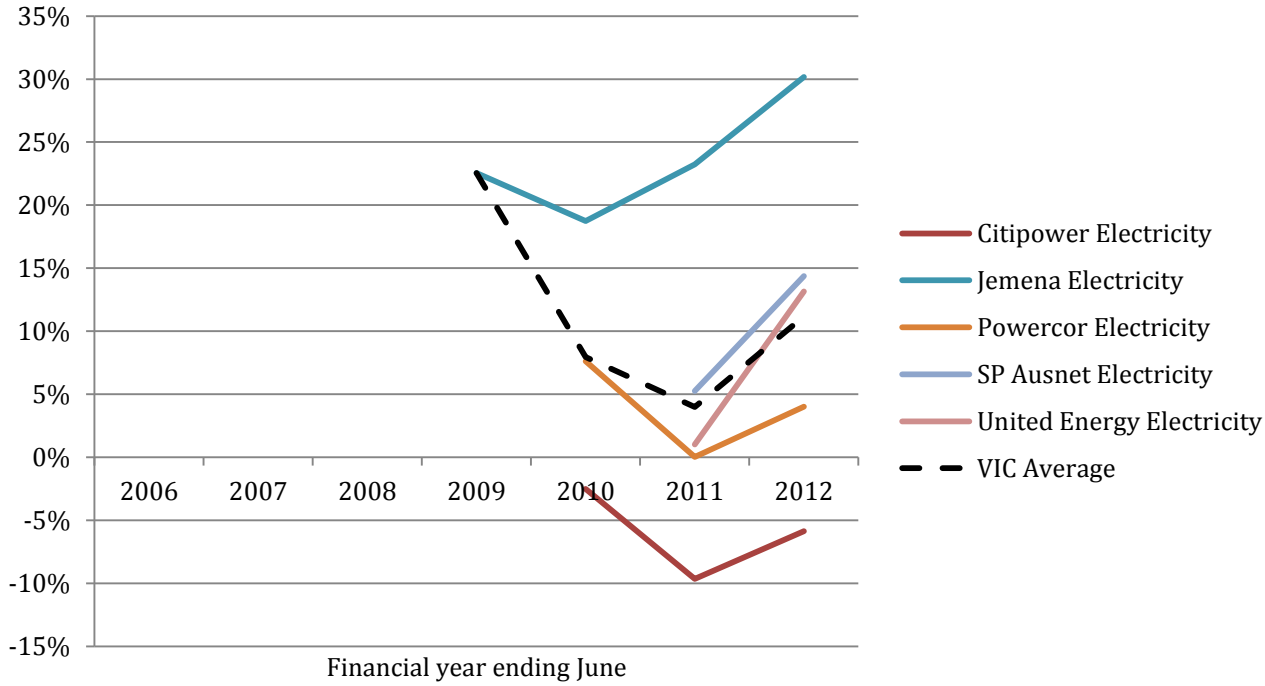


Figure 6-6 shows the Net retail margin from discounted time of use market offers for host retailers in each of the Victorian distribution zones. The Citipower revenue from time of use market offers is slightly lower than from single rate market offers, but network costs are higher. Given that Net retail margins were already low under the single rate, the negative Net retail margins observed here are consistent with the input data used. The Net retail margins for the host retailer in the Jemena distribution zone is on average 15 percentage points higher than any other host retailer, based on the information provided by the Commission.

Figure 6-6 Host retailer, discounted time of use market offer, Net retail margin comparison across Victorian distribution zones



7. Sensitivities

Sensitivity analysis was conducted on these results to ensure that input assumptions were not unduly influencing the outcomes. Specifically, the following variations in input assumptions were tested:

- Sensitivities on forward contracting strategy for peak, off-peak and cap electricity contracts
- Sensitivities on the choice of NSLP used.

7.1 Forward contracting strategy

The results discussed in previous sections are based on the assumption that each retailers' hedge book consists of a mixed forward contracting strategy, with 20% of peak and off-peak contracts negotiated three years in advance, 30% of contracts negotiated two years in advance, and 50% of contracts negotiated one year in advance. Additionally, it was assumed that there was a 50:50 mix of cap contracts negotiated one and two years in advance.

To test the sensitivity of retail margins to these assumptions, two contract strategy variations were explored:

- 50% of all peak, off-peak and cap contracts negotiated two years in advance, and 50% negotiated one year in advance
- All peak, off-peak and cap contracts negotiated one year in advance.

7.1.1 Victorian overview

Table 7-1 shows the percentage point differences in Gross retail margins, averaged across distribution zones in Victoria, under the different contracting strategies.

Table 7-1 Impact of varying forward contracting strategy – Gross retail margins, single rate

VIC average - three year forward contracting strategy

Distribution Area	Unit	2006	2007	2008	2009	2010	2011	2012
Host retailer standing	%	29%	27%	34%	30%	29%	33%	45%
1st Tier discounted	%	30%	25%	28%	22%	19%	22%	29%
2nd Tier discounted	%	20%	21%	26%	16%	19%	20%	27%
3rd Tier discounted	%	21%	13%	23%	22%	15%	10%	25%

VIC average - two year forward contracting strategy (difference compared to 3 year)

Distribution Area	Unit	2006	2007	2008	2009	2010	2011	2012
Host retailer standing	%	1%	0%	0%	-1%	-2%	-1%	1%
1st Tier discounted	%	1%	0%	0%	-1%	-2%	-1%	1%
2nd Tier discounted	%	1%	0%	0%	-1%	-2%	-1%	1%
3rd Tier discounted	%	1%	0%	0%	-1%	-2%	-1%	1%

VIC average - one year forward contracting strategy (difference compared to 3 year)

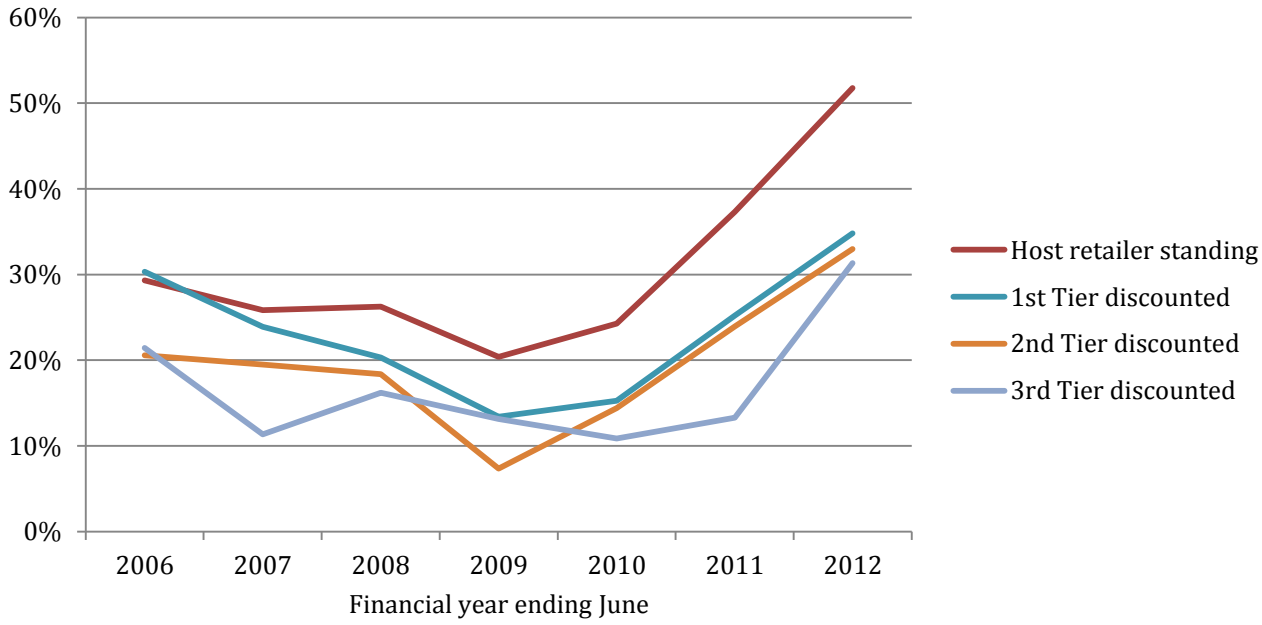
Distribution Area	Unit	2006	2007	2008	2009	2010	2011	2012
Host retailer standing	%	0%	-1%	-8%	-10%	-5%	4%	7%
1st Tier discounted	%	0%	-2%	-7%	-9%	-4%	3%	6%
2nd Tier discounted	%	0%	-2%	-7%	-9%	-4%	3%	6%
3rd Tier discounted	%	0%	-1%	-7%	-9%	-4%	3%	6%

Moving to a contract strategy with an equal mix of contracts negotiated one and two years in advance had little impact on the results. However, if all contracts are negotiated only one year in advance the retail margins are lower on average from 2006/07 to 2009/10 and higher in 2010/11 and 2011/12. In earlier years, there was quite

a difference in contract prices with contracts negotiated closer to real time being much higher than contracts negotiated two to three years in advance. This was due to the impact of the 2007/08 drought which restricted wholesale electricity supply and caused spot and contract prices to rise markedly. Therefore, if there was little forward contracting occurring, retailers would be faced with much higher black energy costs. The reverse logic applies in the later years when the drought finished and wholesale prices reduced. Hence, under this sensitivity, the trend in Gross retail margins is more marked, with a greater increase observed in recent years.

Figure 7-1 provides an overview of Gross retail margins in Victoria, averaged across all distribution zones using the one year forward contracting strategy.

Figure 7-1 Single rate, Gross retail margin averaged across Victorian distribution zones, one year forward contracting



7.2 Net system load profile

Three different NSLPs were tested in the analysis:

- Adjusted residential shape ("reshaped NSLP")
- Original shape ("original NSLP")
- Average of original and residential shape ("averaged NSLP")

For single rate retail margins, the choice of NSLP does not matter as all consumption is priced at the same rate. For time of use and dual rate tariffs, the results reported in previous sections were based on the reshaped NSLP. This section discusses the sensitivity of the retail margins to the choice of NSLP.

7.2.1 Victorian overview

Table 7-2 shows the percentage point differences in Gross retail margins, averaged across distribution zones in Victoria, under the different NSLPs. Because both network costs and retail tariffs were varied depending on the choice of NSLP tested, the total impact on Gross retail margins was generally less than 2%. Only in the 2008/09 financial year was a greater difference observed, with the host retailer discounted offer varying up to 6% when using the original NSLP rather than the reshaped NSLP.

Table 7-2 Impact of varying NSLP – Gross retail margins, time of use

VIC average – reshaped NSLP

Distribution Area	Unit	2006	2007	2008	2009	2010	2011	2012
Host retailer standing	%	23%	22%	29%	26%	23%	24%	35%
1st Tier discounted	%				18%	15%	13%	21%
2nd Tier discounted	%				12%	11%	9%	18%
3rd Tier discounted	%				16%	9%	0%	15%

VIC average – original NSLP (difference compared to reshaped NSLP)

Distribution Area	Unit	2006	2007	2008	2009	2010	2011	2012
Host retailer standing	%	-2%	-2%	-2%	-2%	-1%	-1%	-1%
1st Tier discounted	%				-2%	-1%	-1%	-1%
2nd Tier discounted	%				-2%	-1%	-1%	-1%
3rd Tier discounted	%				-2%	-1%	-1%	-1%

VIC average – average of reshaped and original NSLP (difference compared to reshaped NSLP)

Distribution Area	Unit	2006	2007	2008	2009	2010	2011	2012
Host retailer standing	%	-1%	-1%	-1%	-1%	-1%	0%	0%
1st Tier discounted	%				-1%	-1%	0%	0%
2nd Tier discounted	%				-1%	-1%	0%	0%
3rd Tier discounted	%				-1%	-1%	0%	0%

8. Conclusion

The aim of this report has been to allow the assessment of trends in retail margins, both gross and net, for different retailer types and across different network tariffs and geographic locations. The retail revenues earned by retailers have been based on retail market prices provided to the Commission or regulated in other states. We have built up the wholesale supply costs based on a combination of published network costs and generic assumptions about contracting strategies and applicable load profiles. The retail operating costs assumed have been derived from regulatory determinations and are not specific to any retailer.

Both the Gross and Net retail margins were examined in this analysis. However, given that the retail operating costs assumed in calculating the Net retail margins were the same for all retailers, the comparisons apply equally to both Gross and Net margins. The retail operating costs assumed increased over time, meaning that the trends in Net retail margins were slightly flatter than the trends in Gross retail margins, but general trends were the same.

Looking at Victoria as a whole, the following Gross retail margin trends were identified when averaged across the distribution zones, single rate:

- Gross retail margins on discounted market offers from 1st tier retailers are on average 13 percentage points lower than on standing offers.
- Gross retail margins for discounted offers for 1st tier retailers have been declining since 2007/08 but started increasing again in recent years and are now at similar levels to the 2007/08 year
- In recent years, Gross retail margins on discounted market offers from 3rd tier retailers have been on average 5 percentage points lower than from 1st or 2nd tier retailers.
- Gross retail margins for standing offers of host retailers appear to have increased by more than 10 percentage points on average between 2010/11 and 2011/12

The above single rate trends were generally consistent across the Victorian distribution zones, although the magnitude of the trends differed. The Gross retail margin increase observed in recent years was most noticeable in the SP Ausnet and United Energy distribution zones where the increase in network costs, specifically metering service charges, was not as pronounced as in the other zones. Gross retail margins from discounted market offers for 1st tier retailers (including the host retailers) were similar in the Citipower, Jemena and SP Ausnet distribution zones, with no more than 8 percentage points separating the three zones in any given year. Since 2007/08, the Gross retail margin from discounted market offers for 1st tier retailers in the Powercor distribution zone were on average 6 percentage points higher than the Victorian average, and in the United Energy zone the margin was 6 percentage points lower on average, although this difference has been reducing in recent years.

Based on the data provided and input assumptions used, interstate comparisons indicate that the Gross retail margins from 1st tier Victorian retailers are generally higher than the margins for retailers in South Australia and New South Wales. Moreover, the year-on-year retail margin volatility is lower in Victorian than in either South Australia or New South Wales.

The actual retail margins calculated for dual rate and time of use tariffs differed from those calculated under the single rate, but the trends and comparisons remained similar.

We stress that the analyses we have carried out have been based on a generic cost build-up and do not necessarily accurately portray actual costs, contracting or business strategies for any specific retailer.

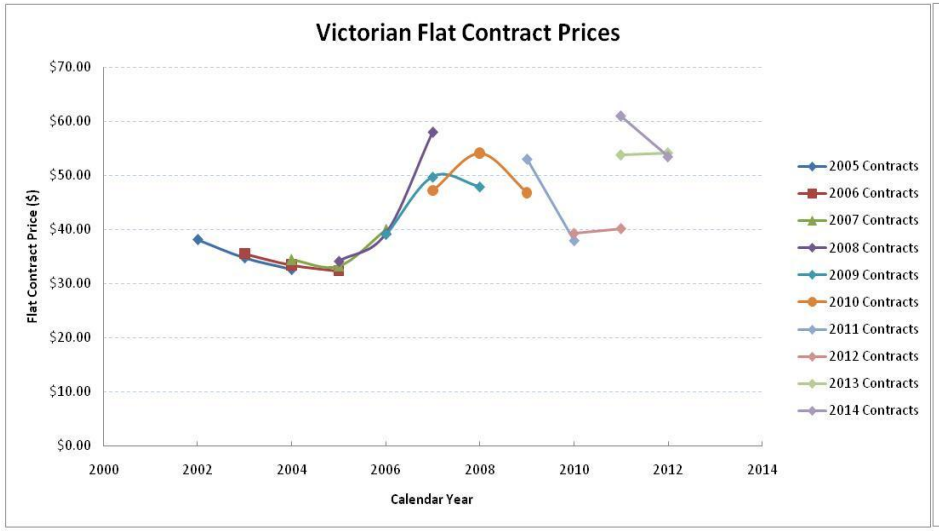
Appendix A. Wholesale contract prices

Contract prices for each of the regions in nominal dollars for each contract type are provided in this Appendix.

Table A- 1 Victoria Contract Prices

Year of Effect	Year of Traded Price	Flat Contract Price	Peak Contract Price	Off peak Contract Price
2002	2005	$38.09	$55.53	
2003	2005	$34.77	$50.01	
2004	2005	$32.66	$47.81	
2003	2006	$35.54	$51.80	
2004	2006	$33.48	$49.34	
2005	2006	$32.38	$45.18	$23.30
2004	2007	$34.42	$50.92	
2005	2007	$33.26	$46.59	$23.90
2006	2007	$39.91	$60.22	$24.61
2005	2008	$34.17	$48.41	$24.24
2006	2008	$39.24	$58.79	$24.48
2007	2008	$58.04	$88.28	$35.20
2006	2009	$39.03	$58.22	$24.51
2007	2009	$49.73	$71.96	$32.85
2008	2009	$47.90	$71.59	$29.92
2007	2010	$47.23	$65.80	$33.22
2008	2010	$54.10	$81.81	$33.20
2009	2010	$46.82	$70.45	$28.99
2008	2011			
2009	2011	$53.00	$80.27	$32.59
2010	2011	$37.97	$57.11	$23.65
2009	2012			
2010	2012	$39.24	$59.75	$23.85
2011	2012	$40.12	$55.45	$28.62
2010	2013			
2011	2013	$53.75	$71.17	$40.62
2012	2013	$54.13	$65.52	$45.54
2011	2014	$60.90	$76.43	$49.20
2012	2014	$53.37	$64.73	$44.81

Figure A- 1 Victorian contract prices



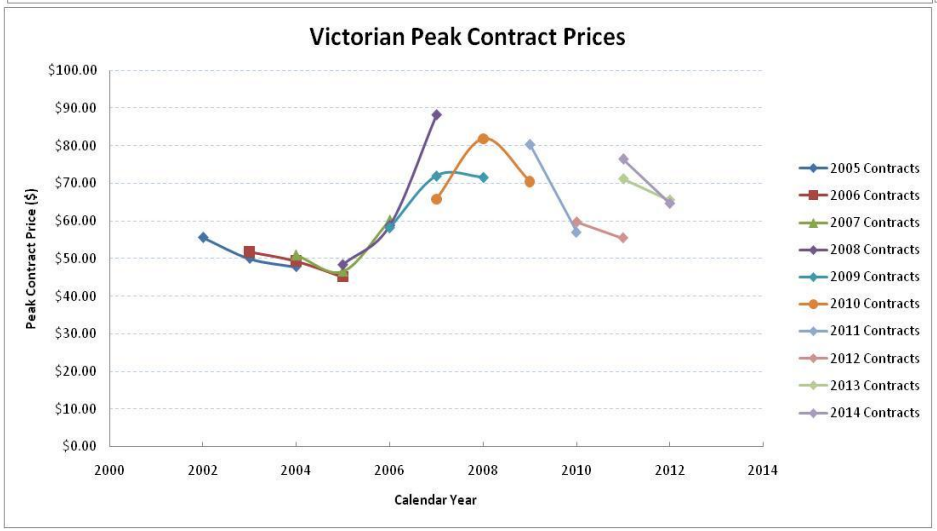
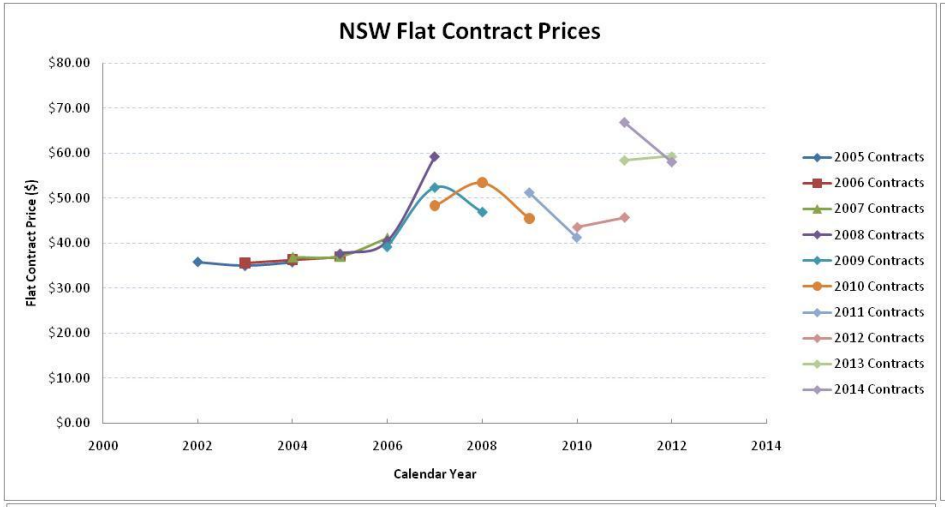
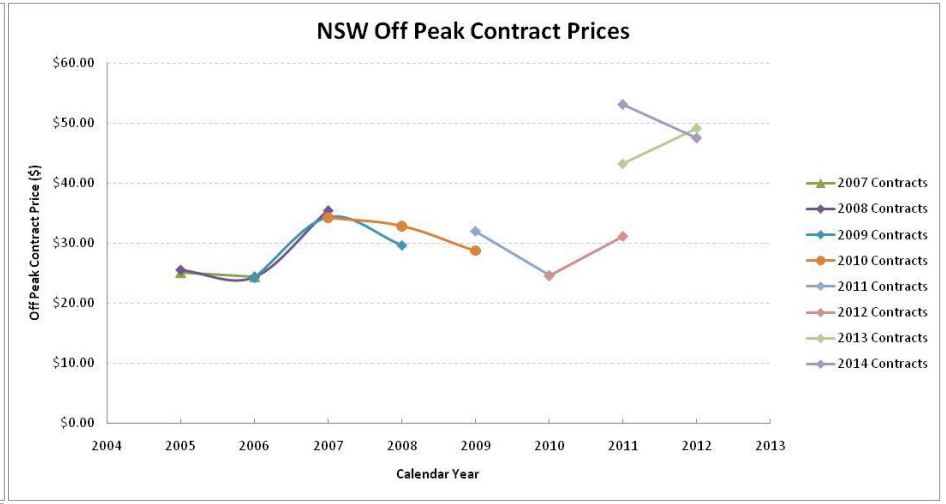


Table A- 2 NSW Contract Prices

Year of Effect	Year of Traded Price	Flat Contract Price	Peak Contract Price	Off peak Contract Price
2002	2005	$35.86		
2003	2005	$34.95	$46.89	
2004	2005	$35.80	$51.63	
2003	2006	$35.63		
2004	2006	$36.34	$52.52	
2005	2006	$37.00	$52.85	$25.05
2004	2007	$36.95	$53.45	
2005	2007	$37.11	$52.96	$25.11
2006	2007	$41.17	$63.21	$24.45
2005	2008	$37.62	$53.61	$25.57
2006	2008	$40.49	$61.65	$24.39
2007	2008	$59.31	$90.62	$35.49
2006	2009	$39.26	$59.09	$24.22
2007	2009	$52.32	$75.87	$34.35
2008	2009	$46.92	$69.51	$29.65
2007	2010	$48.35	$66.95	$34.24
2008	2010	$53.47	$80.61	$32.88
2009	2010	$45.50	$67.57	$28.75
2008	2011			
2009	2011	$51.14	$76.52	$32.01
2010	2011	$41.18	$63.13	$24.65
2009	2012			
2010	2012	$43.52	$68.69	$24.50
2011	2012	$45.70	$64.96	$31.13
2010	2013			
2011	2013	$58.45	$78.57	$43.18
2012	2013	$59.30	$72.68	$49.14
2011	2014	$66.82	$84.87	$53.12
2012	2014	$58.09	$71.95	$47.56

Figure A- 2 New South Wales contract price data





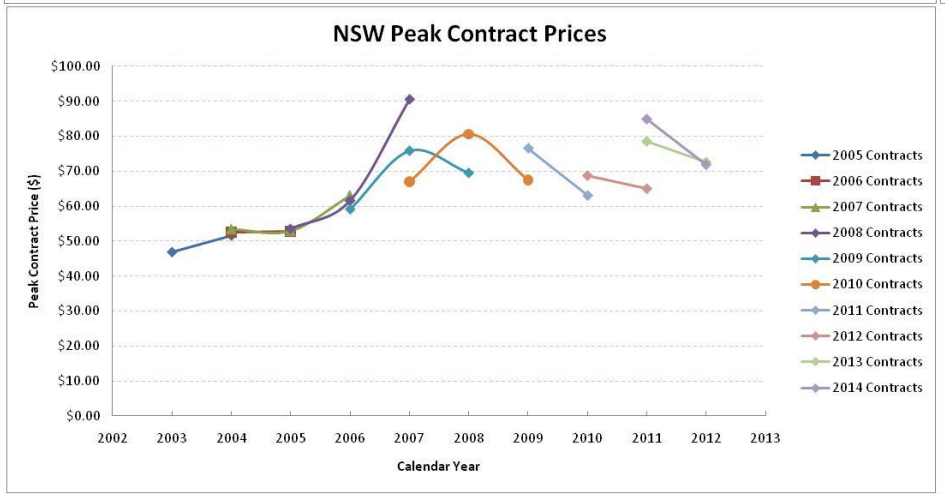
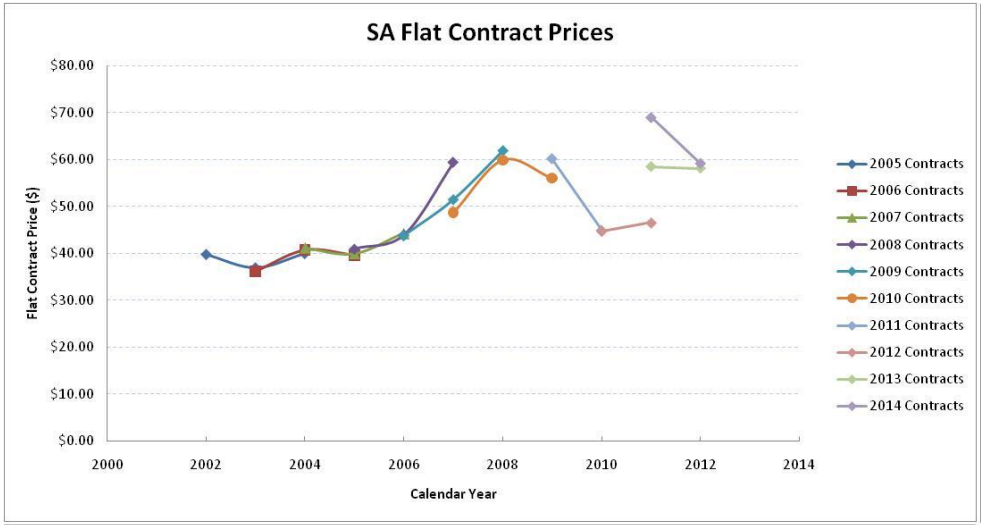
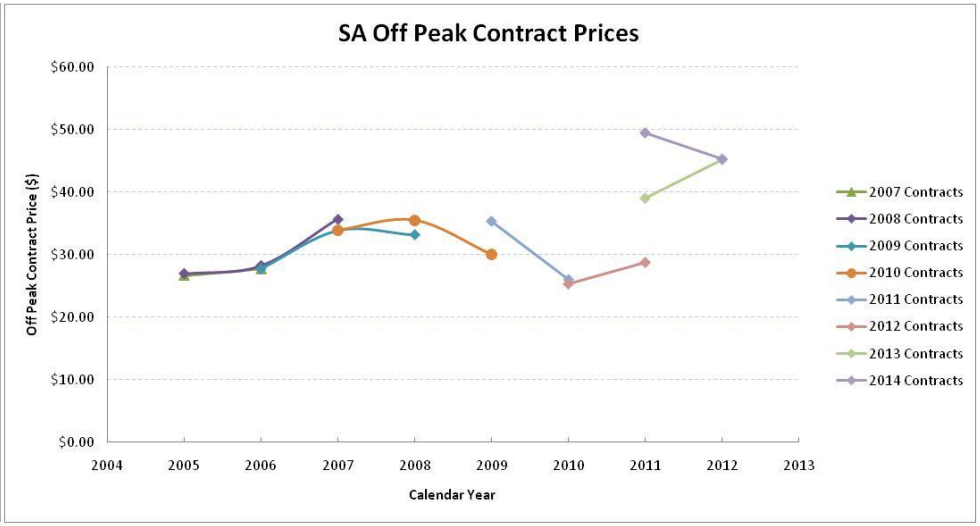


Table A- 3 SA Contract Prices

Year of Effect	Year of Traded Price	Flat Contract Price	Peak Contract Price	Off peak Contract Price
2002	2005	$39.78	$66.00	
2003	2005	$36.97	$52.00	
2004	2005	$39.98	$58.53	
2003	2006	$36.19		
2004	2006	$40.71	$60.04	
2005	2006	$39.63	$57.32	$26.44
2004	2007	$41.15	$60.67	
2005	2007	$39.94	$57.05	$26.67
2006	2007	$44.27	$66.20	$27.75
2005	2008	$40.95	$59.16	$26.98
2006	2008	$43.95	$64.71	$28.26
2007	2008	$59.45	$90.91	$35.68
2006	2009	$43.75	$64.76	$27.69
2007	2009	$51.46	$74.53	$33.85
2008	2009	$61.94	$99.62	$33.13
2007	2010	$48.73	$68.38	$33.91
2008	2010	$59.88	$92.27	$35.47
2009	2010	$56.02	$90.61	$30.02
2008	2011			
2009	2011	$60.17	$93.42	$35.28
2010	2011	$44.98	$70.33	$25.99
2009	2012			
2010	2012	$44.77	$71.33	$25.35
2011	2012	$46.54	$69.65	$28.76
2010	2013			
2011	2013	$58.49	$84.28	$39.05
2012	2013	$58.13	$75.35	$45.15
2011	2014	$69.00	$94.85	$49.52
2012	2014	$59.20	$77.61	$45.32

Figure A- 3 South Australian contract price data





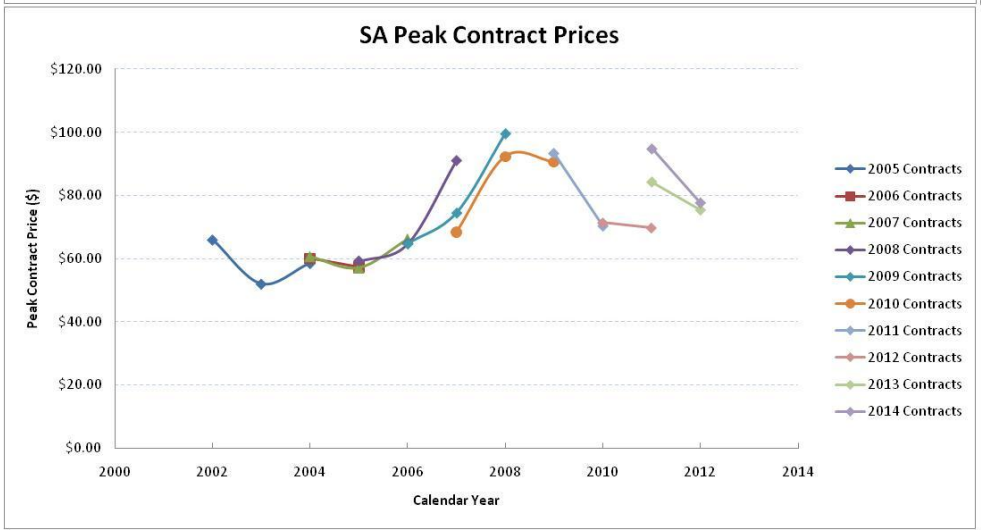
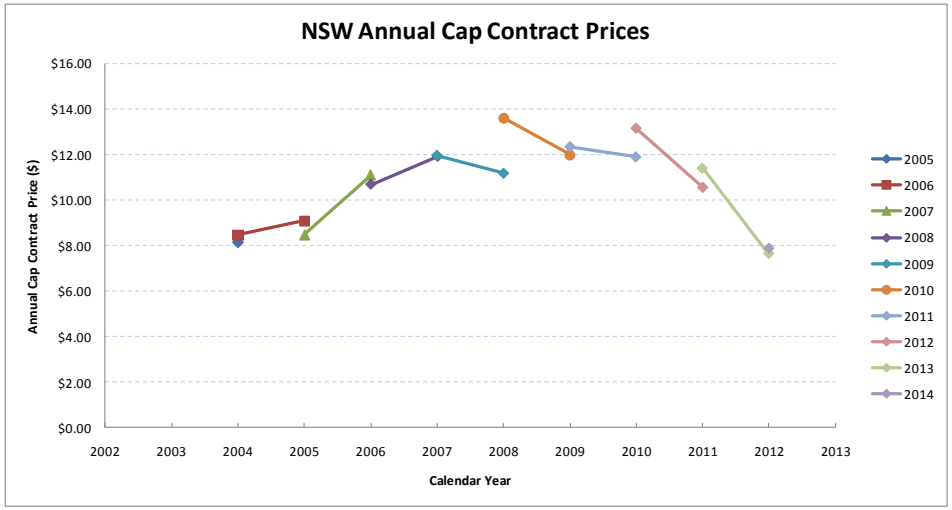
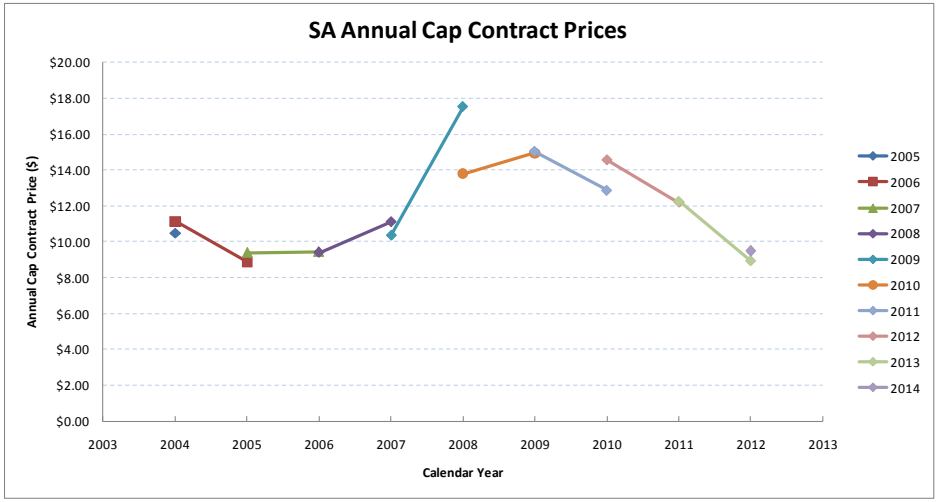


Figure A- 4 Cap price data





Appendix B. Estimating residential load shapes

B.1 Adjustment to reflect average residential profile

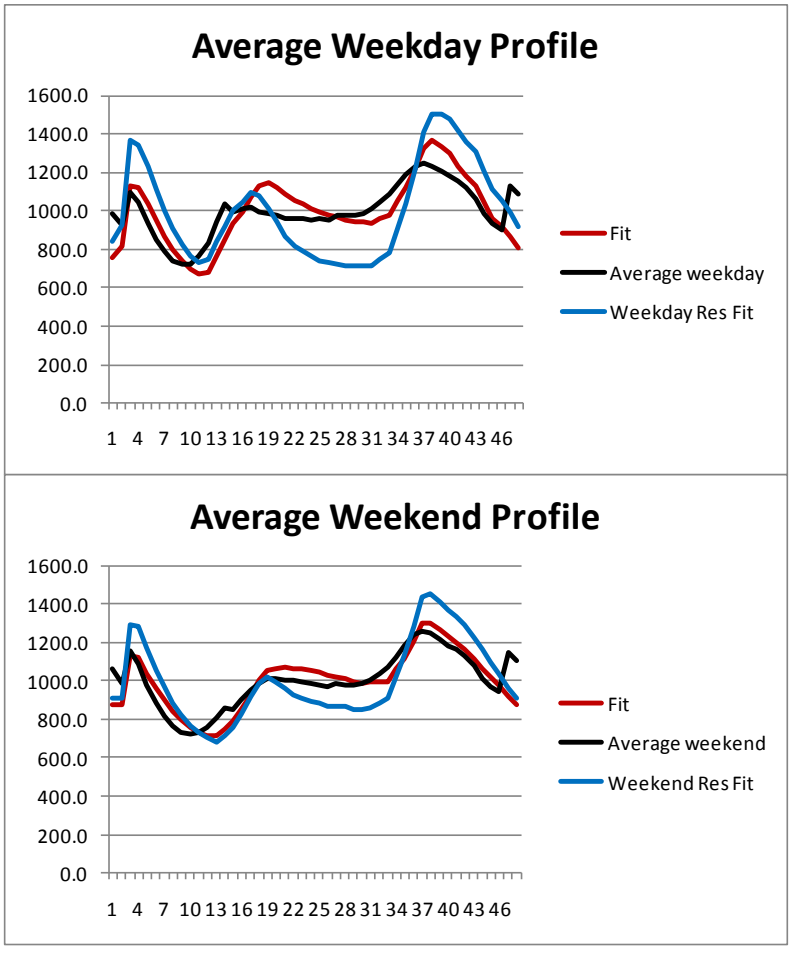
An analysis of load shapes available to the project showed that the Net system load profile is much flatter on both weekdays and weekends than the average residential profile, and that to assess supply costs on this profile would result in under-estimation of wholesale supply costs. It was also apparent that the average daily profile includes a portion of the off-peak heating load between 1 am and 5 am.

A method was therefore devised to adjust the NSLPs to more closely represent the average residential profile and to reduce the influence of commercial load as follows:

1. The average weekday and weekend daily profiles were calculated from the NSLP and normalised to 1000 kW average load

2. A regression analysis was conducted to obtain the best combination of the four profiles that made up the weekend and weekday profiles. The black lines in Figure B- 1 show average profile for the NSLP and the red lines show the best fit made up of the four corresponding residential and small business average daily shapes, normalised to an average daily load of 1000 kW. The weekend fit is good, the weekday fit less so. In this case the commercial profile was 26.8% of the weekday profile and 32.8% of the weekend profile. The off-peak commercial profile was not needed in this case.

Figure B- 1 Average daily profiles for Powercor 2010



3. We then calculated the Net shape solely from the residential components and renormalised it to 1000 kW which is shown by the blue lines in Figure B- 1. This is more credible as a residential Net system load profile as it shows reduced usage during the day-time on weekdays, rather than the flatter characteristic in the NSLP. This is due to the removal of the commercial load component.

4. We then calculate in each trading interval of the day the ratio between the residential component of the fitted curve (blue) and the total fitted curve (red) for weekdays and weekends. This ratio is shown in Figure B- 2. This ratio is then applied to each trading interval of the NSLP according to weekday or weekend to create a new residential system load profile. The original average daily shape and the modified shape is shown in Figure B- 3. The original profiles are shown as dotted lines. This produces a much more appropriate profile for cost analysis.

Figure B- 2 Ratio of residential component to total fitted component

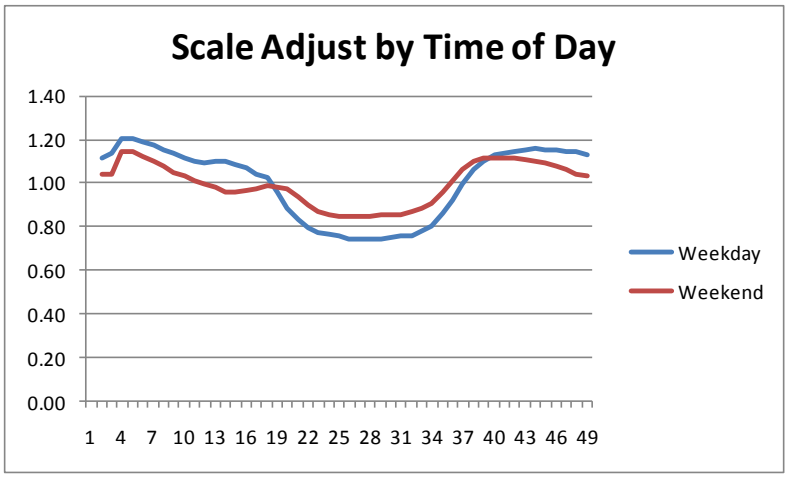
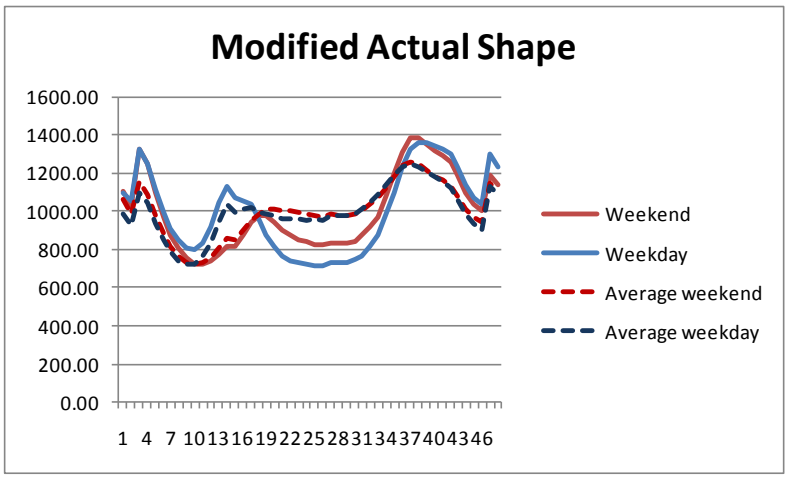


Figure B- 3 Original and modified average daily shape for NSLP



The average daily shapes were not available in sufficient detail for the other states, and therefore two options are available:

- Make inter-state comparisons solely on the NSLP recognising that retail margins would be over-stated due to the flatter load shape

- Use the Victorian daily profiles to remove the commercial component from the other regions. This would enable comparison on the same adjustment basis but the results may not be meaningful depending on how residential load varies in other regions.

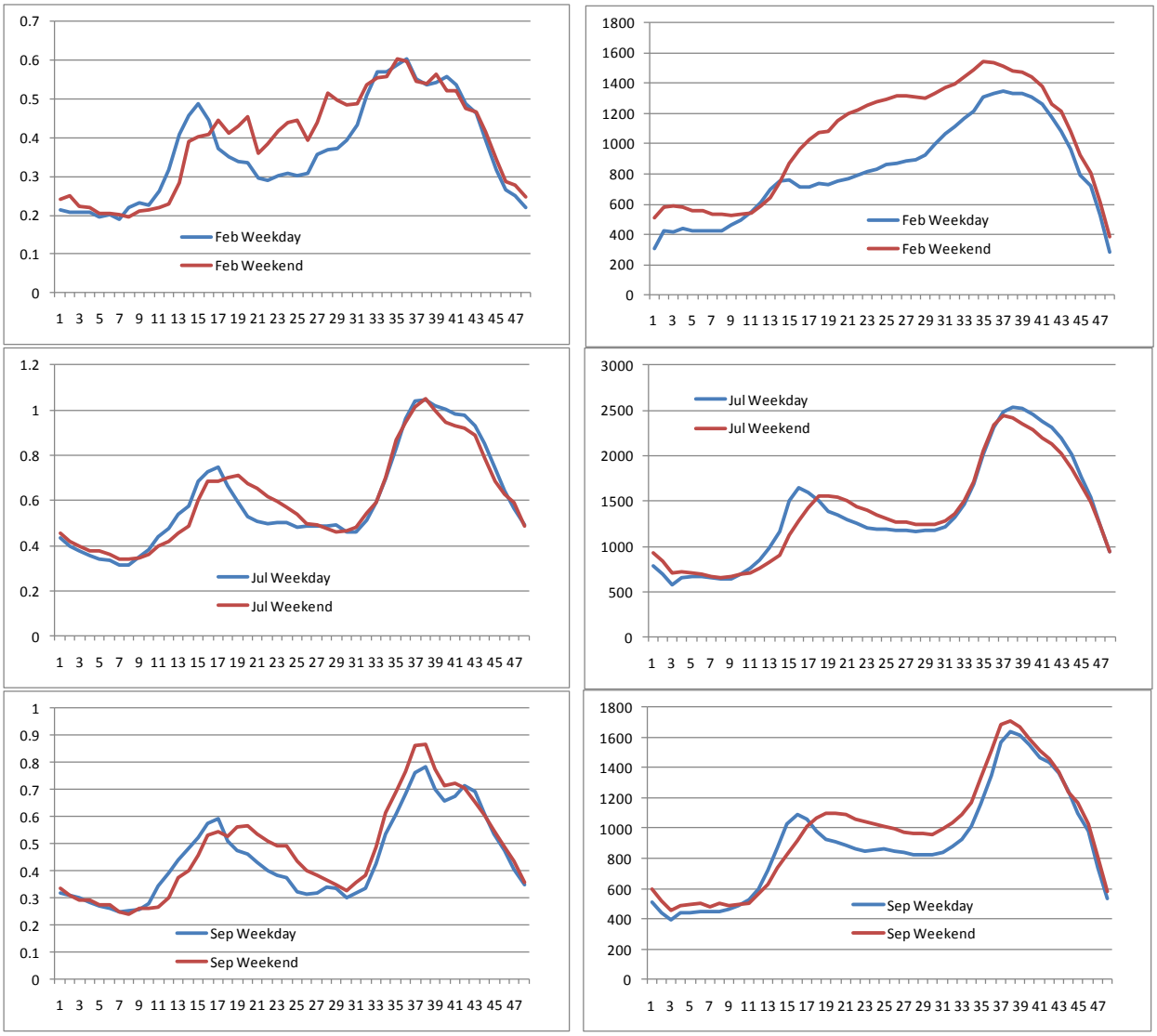
The latter method is considered less than satisfactory and is not preferred. Therefore, except for NSW where 2011/12 residential data were available, we were limited to comparisons based on NSLP.

B.2 NSW residential profile

A residential load profile was provided from AusGrid for 37 customers over the period July 2011 to June 2012. The data were analysed and compared with the 2011 Net System Load Profile (NSLP) as shown in Figure B- 4. It was found that the two profiles had a similar load factor (NSLP 33.8%, residential 29.2%) and that the average daily profiles for weekdays and weekends were quite similar except for the January to March period. A comparison of shapes for February, July and September is shown in Figure B- 4. There was no equivalent information about commercial load shapes to decompose the NSLP into residential shapes for each of the years 2005 to 2011. Therefore we have chosen to take the 2011/12 residential load shape as indicative for the whole period 2005 to 2011 for the purposes of tariff analysis, as well as consider the individual NSLP shapes for each year.

Figure B- 4 Comparison of NSLP and residential load for NSW

Residential Load (2011/12) Net System Load (2012 calendar year)



Appendix C. Optimal contracting levels

In order to determine the optimal contracting parameters for each load shape, we assumed that the available load shape and price information for the period 2005 to 2011 calendar years corresponded to retailer's perception of volume and price risk and that they would construct an optimal trading profile around that risk. The total black energy cost consists of Gross spot purchases and difference payments. This is equal to contract payments at the strike price plus spot purchases on the uncontracted volume. In this cost model we use the later formulation, calculate what portion of the peak and off-peak load should be hedged with swaps, plus a cap for the difference between the diversified peak load (across the customer class profile), and the contracted peak period volume.

Using the annual load profiles from 2005 to 2011, we assessed the sum of the contract and spot settlements for variation in the level of peak and off-peak contracting and found the level of peak period contracting which:

- Minimised the average monthly cost of contract and spot settlement over the period from 2005 to 2011
- Set the 80 percentile of the 12 month moving cost to zero

The values for the optimal solution for the Jemena NSLP are shown in Figure C- 1. It may be noticed that in nearly all months the Net spot peak settlement is a negative cost and that the off-peak settlement was sometimes a high cost, particularly during the 2007/08 drought. The total spot and contract components are shown in Figure C- 2.

Figure C- 1 Example of optimal profile for Jemena NSLP

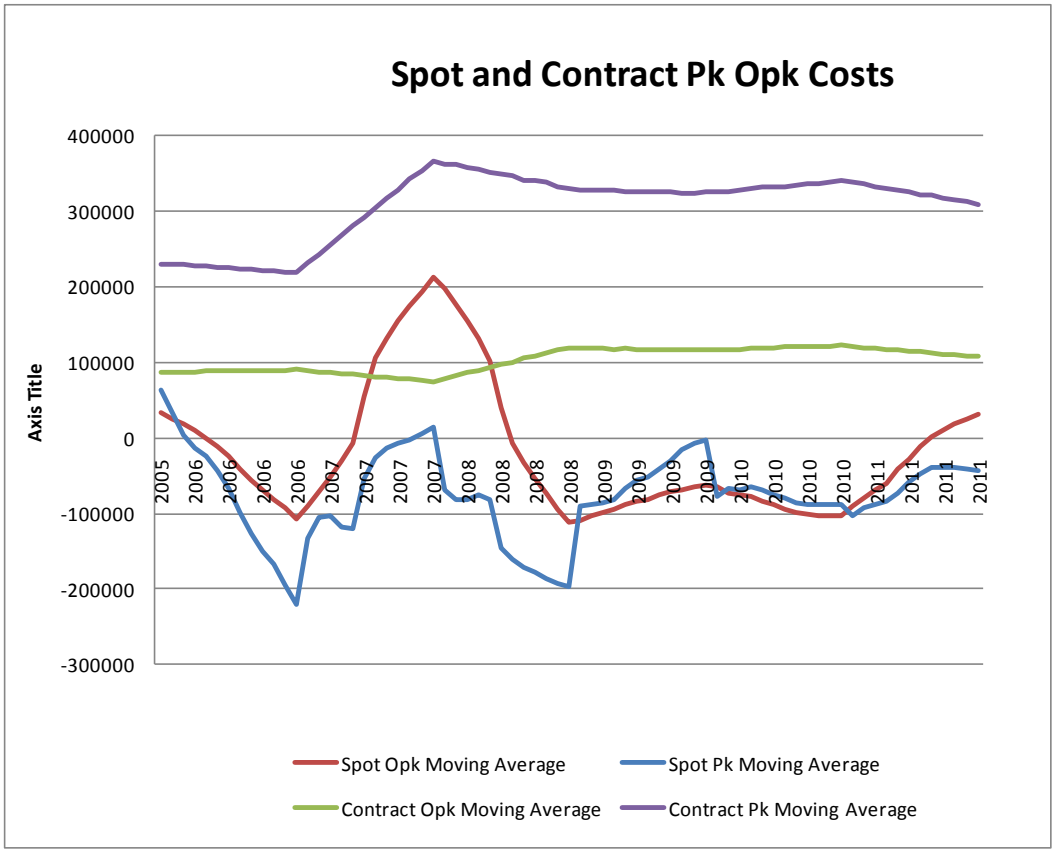
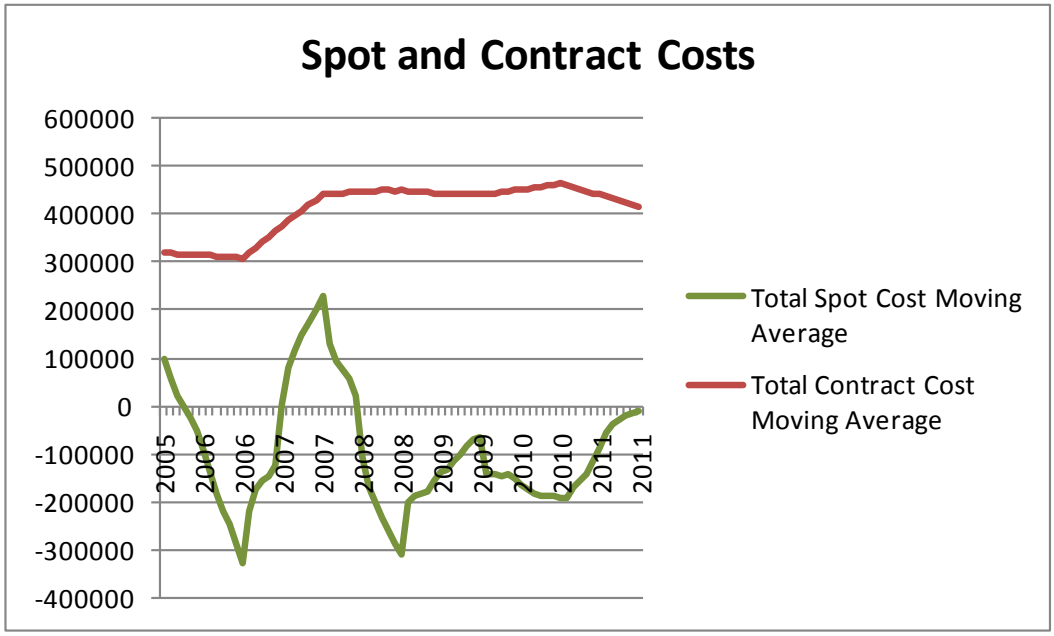


Figure C- 2 Spot and contract costs for Jemena NSLP



The composite parameters for each of the load shapes which minimise the black energy cost in this way are shown in Table C- 1. We always selected a ratio of 95% for the off-peak even though the optimum level was less than 50% due to the low volatility of prices in off-peak periods. However, it is understood that generators will not offer peak period contracts without taking some off-peak volume as well. So we settled on this level which is about the median off-peak demand. The optimal level of peak period contracting on this basis is at 120% of average peak period demand which is about the 80% percentile coverage of the load.

Table C- 1 Optimal contracting parameters

Region	Residential	NSLP	Peak Ratio	Peak Percentile	Off-Peak Ratio	Off-Peak Percentile
Jemena	Y		118%	76%	95%	53%
Jemena		Y	101%	57%	95%	52%
United	Y		130%	80%	95%	50%
United		Y	130%	90%	95%	50%
Powercor	Y		122%	79%	95%	44%
Powercor		Y	123%	87%	95%	43%
Citipower	Y		113%	74%	95%	51%
Citipower		Y	112%	75%	95%	49%
SP Ausnet	Y		117%	74%	95%	49%
SP Ausnet		Y	114%	77%	95%	47%
Ausgrid		Y	129%	85%	95%	55%
ETSA		Y	133%	88%	95%	58%

Appendix D. Energy efficiency schemes in the NEM

The following table highlights the key differences between the energy efficiency schemes in operation in the NEM.

Table D- 1 Key differences between state based white certificate schemes

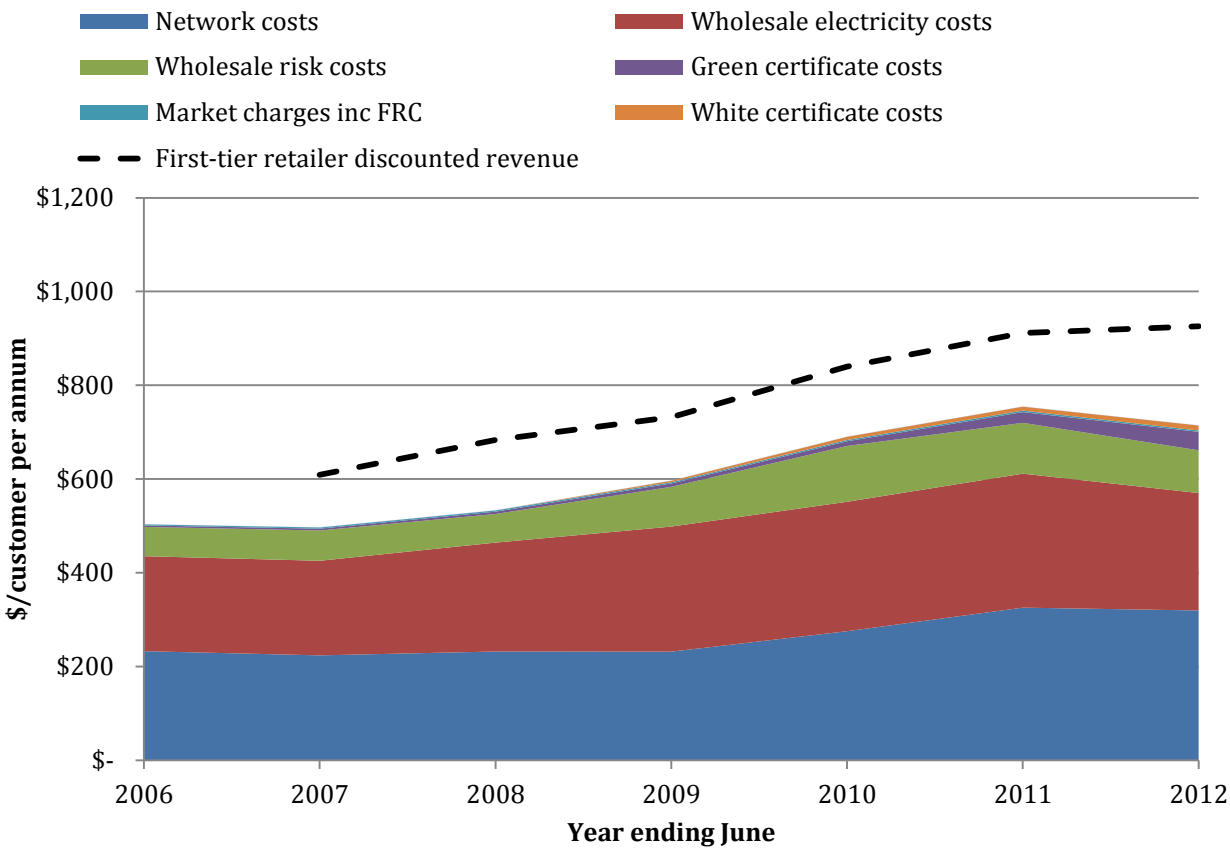
Item	ESS (NSW)	VEET (Vic)	REES (SA)
Covered fuel	Electricity	Electricity, gas	Electricity, gas
Type of target	State wide energy saving target, measured in % of annual liable NSW electricity sales	State wide greenhouse gas abatement target, measured as millions of tons of avoided greenhouse gas emissions. Some industrials are excluded as they are covered under other programs.	A greenhouse gas abatement target exists covering energy efficiency activities over the residential sector only. A 35% sub-target also exists for activities for low income households, and a prescribed number of audits within low income households are also mandated.
Target	Starting at 0.5% of annual liable NSW electricity sales in 2009, increasing to 4% by 2014, continuing to 2020	Phase One target is 2.7 Mt for 2009-2011, and Phase Two target is 5.4 Mt for 2012-2014.	Target begins at 155 $ktCO_2e$ in 2009, increasing to 235 $ktCO_2e$ in 2010, 255 $ktCO_2e$ in 2011 and 2012, 335 $ktCO_2e$ in 2013 and 410 $ktCO_2e$ in 2014.
Obligated parties	Electricity retailers and large energy users	Electricity and gas retailers who supply to more than 5,000 customers in Victoria	Electricity and gas retailers who supply to more than 5,000 residential customers in SA
Trading	Free trading between certificate creators and obligated parties	Free trading between registered VEET certificate account holders	Trading of energy credits (rather than certificates) between obliged energy retailers

Source: Extracted from http://www.climatechange.gov.au/en/government/initiatives/energy-savings-initiative/~/media/government/initiatives/esi/ESI-ProgressReport-20121031-PDF.pdf

Appendix E. Wholesale supply costs to retailers and retail revenue

This Appendix shows trends in wholesale supply costs to retailers and retail revenue from 1st tier retailers' discounted market offers for all distribution zones, single rate customer consuming an average of 4,000 kWh per annum in both graphical and tabulated form.

Figure E- 1 Wholesale supply costs to retailers in the Citipower distribution zone, single rate

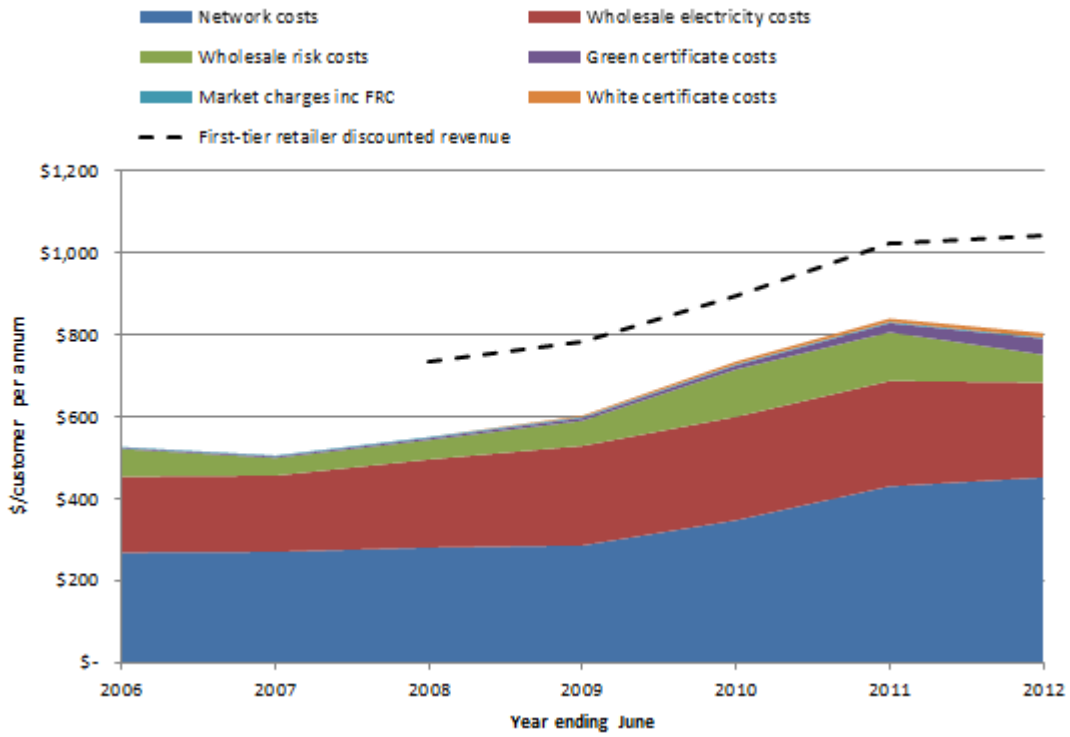


*no single rate discount first-tier retail tariff information was provided by the Commission for the 2005/06 financial year

Table E- 1 Wholesale supply costs per unit of electricity consumed for an average single rate customer, Citipower

Citipower Electricity	Single Rate	2006	2007	2008	2009	2010	2011	2012
Network costs	*c/ kWh*	5.8	5.6	5.8	5.8	6.9	8.1	8.0
Wholesale electricity costs	*c/ kWh*	5.1	5.1	5.9	6.8	7.0	7.3	6.4
Wholesale risk costs	*c/ kWh*	1.5	1.6	1.5	2.1	2.9	2.7	2.2
Green certificate costs	*c/ kWh*	0.1	0.1	0.1	0.2	0.3	0.6	1.0
Market charges	*c/ kWh*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
White certificate costs	*c/ kWh*	0.0	0.0	0.0	0.1	0.2	0.2	0.3
TOTAL Costs	***c/ kWh***	**12.6**	**12.5**	**13.4**	**15.0**	**17.3**	**18.9**	**17.9**

Figure E- 2 Wholesale supply costs to retailers in the Jemena distribution zone, single rate



*no single rate discount first-tier retail tariff information was provided by the Commission for the 2005/06 or 2006/07 financial year

Table E- 2 Wholesale supply costs per unit of electricity consumed for an average single rate customer, Jemena

Jemena Electricity	Single Rate	2006	2007	2008	2009	2010	2011	2012
Network costs	*c/ kWh*	6.7	6.8	7.0	7.2	8.7	10.8	11.3
Wholesale electricity costs	*c/ kWh*	4.6	4.7	5.4	6.1	6.3	6.4	5.8
Wholesale risk costs	*c/ kWh*	1.7	1.1	1.2	1.5	2.9	3.0	1.7
Green certificate costs	*c/ kWh*	0.1	0.1	0.1	0.2	0.3	0.6	1.0
Market charges	*c/ kWh*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
White certificate costs	*c/ kWh*	0.0	0.0	0.0	0.1	0.2	0.2	0.3
TOTAL Costs	***c/ kWh***	**13.2**	**12.7**	**13.8**	**15.1**	**18.4**	**21.0**	**20.1**

Figure E- 3 Wholesale supply costs to retailers in the Powercor distribution zone, single rate

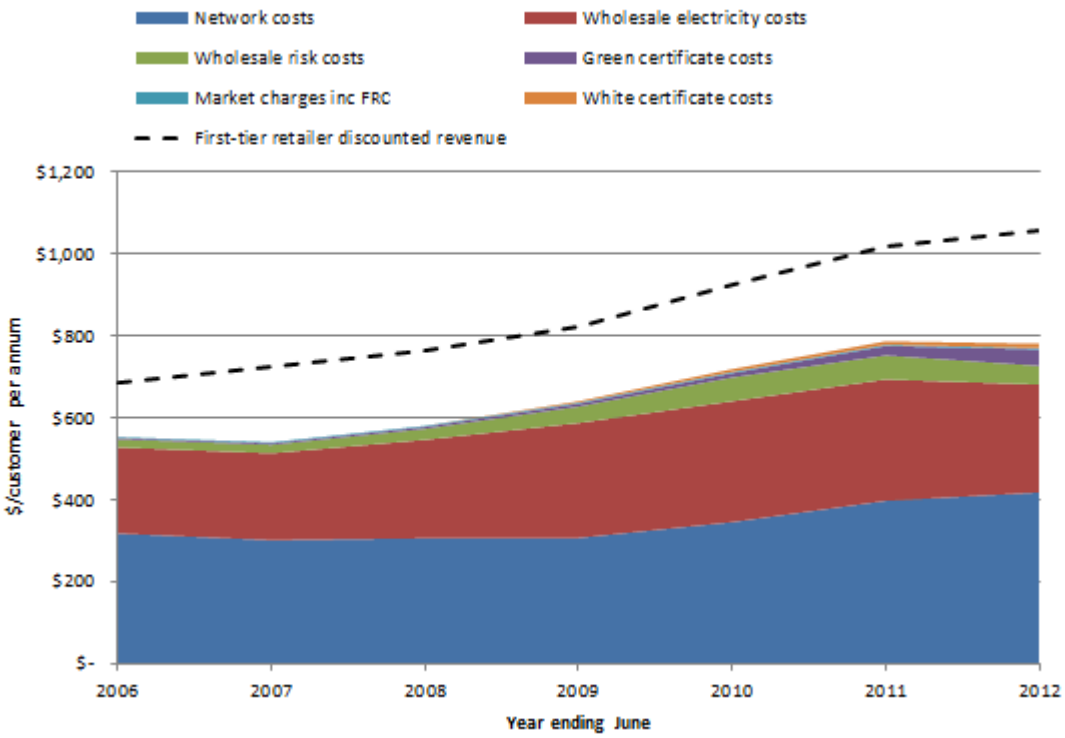


Table E- 3 Wholesale supply costs per unit of electricity consumed for an average single rate customer, Powercor

Powercor Electricity	Single Rate	2006	2007	2008	2009	2010	2011	2012
Network costs	*c/ kWh*	7.9	7.5	7.7	7.7	8.6	9.9	10.5
Wholesale electricity costs	*c/ kWh*	5.3	5.3	6.0	7.0	7.4	7.4	6.6
Wholesale risk costs	*c/ kWh*	0.5	0.5	0.7	1.0	1.5	1.5	1.1
Green certificate costs	*c/ kWh*	0.1	0.1	0.1	0.2	0.3	0.6	1.0
Market charges	*c/ kWh*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
White certificate costs	*c/ kWh*	0.0	0.0	0.0	0.1	0.2	0.2	0.3
TOTAL Costs	***c/ kWh***	**13.8**	**13.5**	**14.5**	**16.0**	**18.0**	**19.7**	**19.5**

Figure E- 4 Wholesale supply costs to retailers in the SP Ausnet distribution zone, single rate

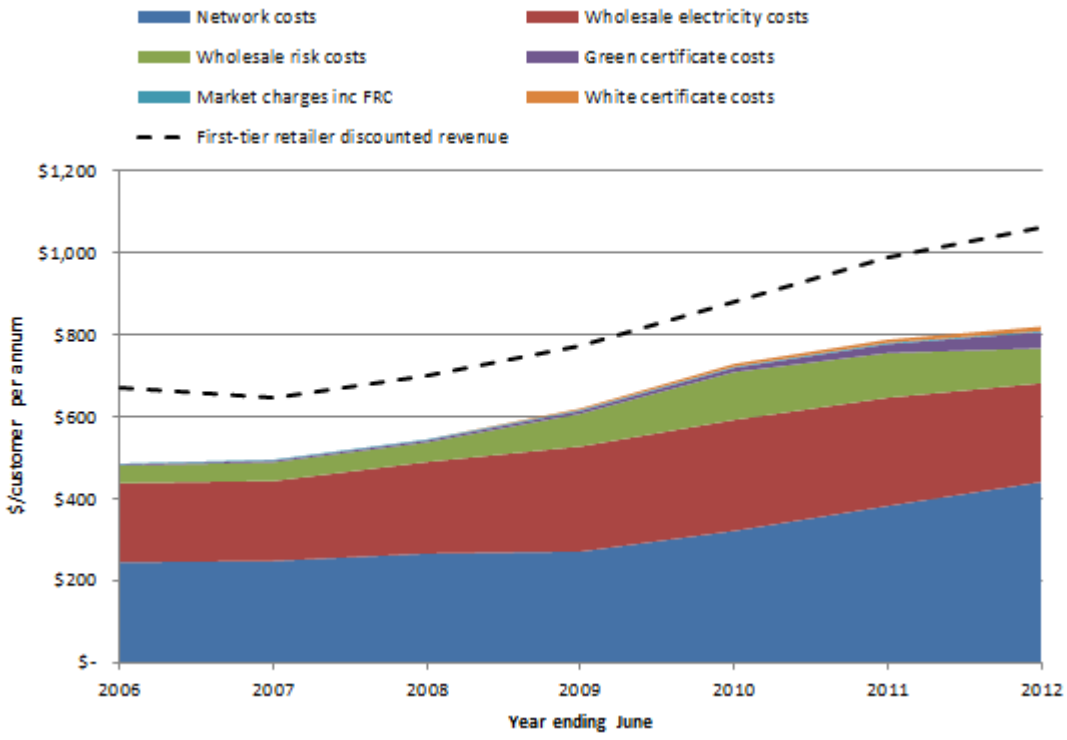
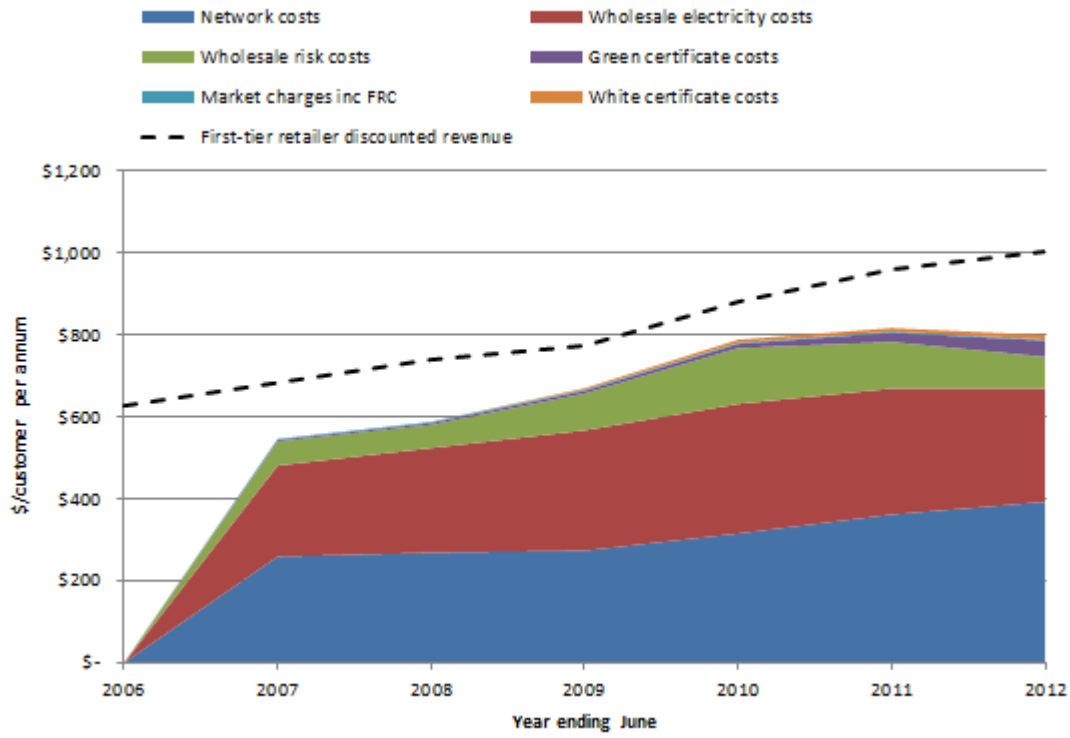


Table E- 4 Wholesale supply costs per unit of electricity consumed for an average single rate customer, SP Ausnet

SP Ausnet Electricity	Single Rate	2006	2007	2008	2009	2010	2011	2012
Network costs	*c/ kWh*	6.1	6.2	6.7	6.8	8.0	9.6	11.0
Wholesale electricity costs	*c/ kWh*	4.8	4.9	5.6	6.4	6.8	6.6	6.0
Wholesale risk costs	*c/ kWh*	1.1	1.1	1.2	2.0	2.9	2.7	2.1
Green certificate costs	*c/ kWh*	0.1	0.1	0.1	0.2	0.3	0.5	1.0
Market charges	*c/ kWh*	0.1	0.1	0.1	0.1	0.1	0.1	0.1
White certificate costs	*c/ kWh*	0.0	0.0	0.0	0.1	0.2	0.2	0.3
TOTAL Costs	***c/ kWh***	**12.2**	**12.4**	**13.6**	**15.5**	**18.2**	**19.7**	**20.5**

Figure E- 5 Wholesale supply costs to retailers in the United Energy distribution zone, single rate



*no single-rate network cost information was available for the 2006/07 financial year

Table E- 5 Wholesale supply costs per unit of electricity consumed for an average single rate customer, United Energy

United Energy Electricity	Single Rate	2006	2007	2008	2009	2010	2011	2012
Network costs	*c/ kWh*		6.5	6.7	6.8	7.9	9.1	9.8
Wholesale electricity costs	*c/ kWh*		5.6	6.4	7.4	7.9	7.7	6.9
Wholesale risk costs	*c/ kWh*		1.5	1.4	2.2	3.4	2.8	1.9
Green certificate costs	*c/ kWh*		0.1	0.1	0.2	0.3	0.6	1.0
Market charges	*c/ kWh*		0.1	0.1	0.1	0.1	0.1	0.1
White certificate costs	*c/ kWh*		0.0	0.0	0.1	0.2	0.2	0.3
TOTAL Costs	***c/ kWh***		**13.7**	**14.7**	**16.8**	**19.7**	**20.4**	**20.0**