Review of Aurora Energy 's customer number forecasting methodologies in its 2012 to 2017 regulatory proposal

- Final report to the Australian Energy Regulator
- 3.0
- 6 September 2011

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1. Executive Summary

1.1. Background

Under the National Electricity Law, the Australian Energy Regulator (AER) is responsible for the economic regulation of electricity distribution services provided by distribution network service providers (DNSPs) in the National Electricity Market (NEM).

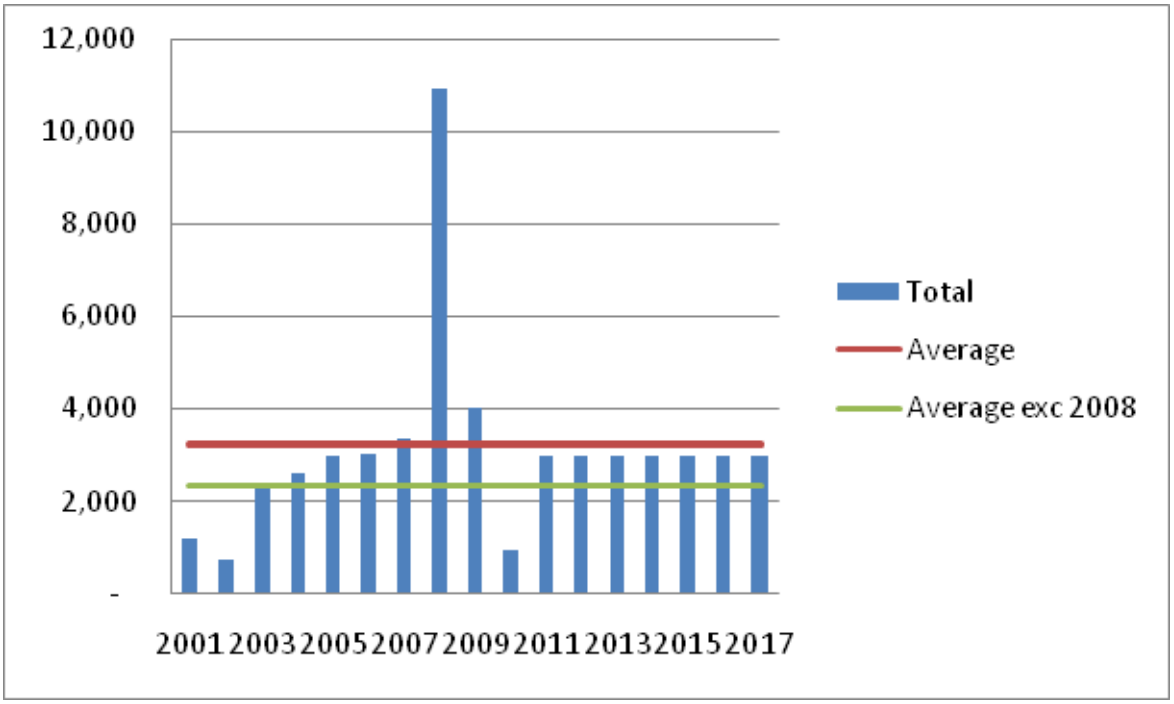
In accordance with these responsibilities, the AER is conducting an assessment into the appropriate revenues and prices for the Aurora DNSP from 1 June 2012 to 30 June 2017. Forecasts of customer numbers are relevant in setting capital expenditure (capex) forecasts and also in energy forecasts. The AER has commissioned SKM MMA to provide a high level review of the reasonableness of Aurora's customer number forecasts.

We consider in this review the customer number forecasts contained in the regulatory information notice (RIN) template submitted by Aurora. We have in our review also considered the customer number history and growth forecasts implied in the ACIL Tasman Connections and Energy Forecast reports.

1.2. History and forecasts

Aurora in 2010 reported a customer base of 278,838 customers, of whom some 82% were residential. Aurora's customer numbers history over the period 2000 to 2010 and forecasts to 2017 are illustrated in Figure 1-1 along with average increases over the period 2000 to 2010, with and without taking into account the 2008 year. Aurora is forecasting an average increase of 3000 net new customers each year.

- **Figure 1-1 Annual changes in total Aurora customer numbers, history and forecast**



Source: RIN plus 2000-2002 history provided by Aurora

As can be seen, according to the RIN numbers, there has been growth of between 740 and 4000 net customers (0.3% to 1.5%) in each year of the period, apart from 2008, when there was reported growth of over 11,000 or 4.2%. Clearly the 2008 result is anomalous and we have excluded it from our calculations.

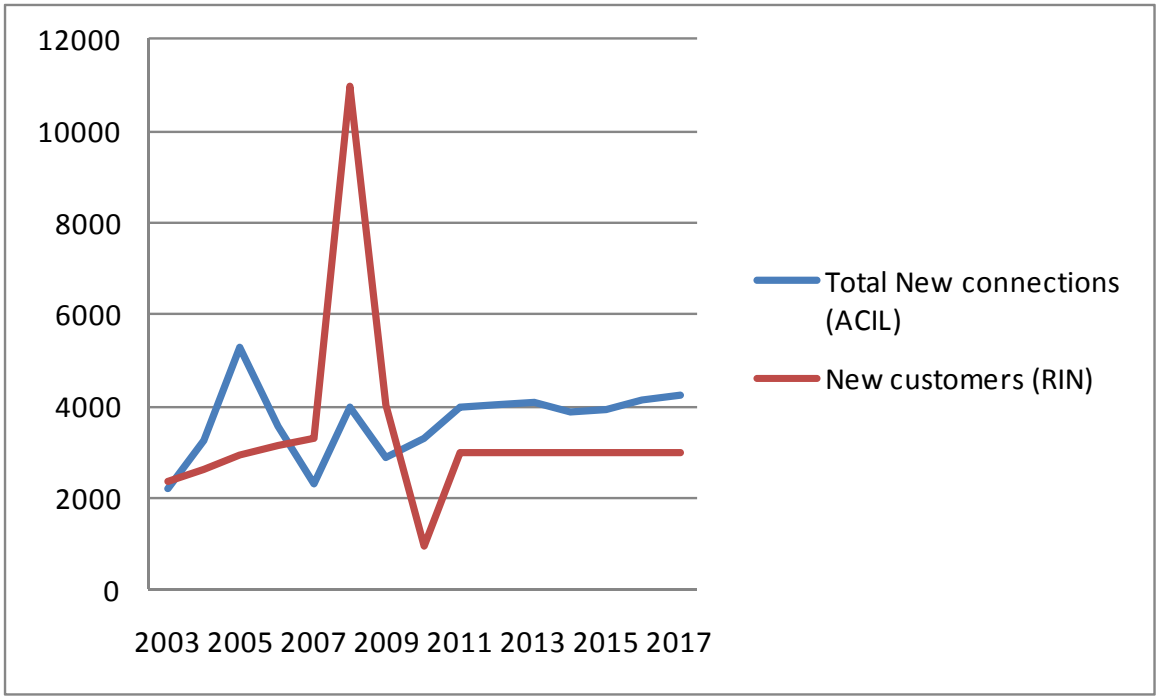
1.3. Basis for the customer number forecasts

The basis for the customer number forecasts in the RIN is not completely clear. According to the spreadsheet associated with the RIN forecasts[1], the customer number forecasts were based on the history of customer number growth over the past 10 years – although this averaged 3223 while 3000 net new customers per year are forecast. Aurora may also be relying on the ACIL Tasman forecasts of connections to drive its customer number growth forecasts, however, there appear to be inconsistencies between the two.

The connections growth history and forecasts by ACIL Tasman and RIN history of customer number growth from 2002 to 2010[2] are illustrated in Figure 1-2.

[1] NW-#30187142-v3-PD_Customer_Numbers_Methodology.xls
[2] Including the 2001/02 history provided by Aurora.

- **Figure 1-2 Annual changes in total Aurora customer numbers, history and forecast and connections history and forecast from ACIL Tasman connections report**



Source: ACILTasman Connections Report, RIN plus 2001/02 history provided by Aurora

While growth in customer numbers in each year of the historical period does not appear to match connections in any specific year, this is understandable, with timing presumably being a key issue[3]. However, over the medium term we would expect growth of the two to be reasonably consistent. If we again exclude the 2008 numbers as anomalous, the historical connection growth over the period is 22,800 while customer number growth is about 19,350[4]. The connection number growth is about 18% higher than the customer number growth.

This could be due to a number of reasons. However, the most obvious appear to be that:

- Connections measures new customers while customer numbers measures net new customers, with permanent disconnections being subtracted – in other words, if a house is knocked down and replaced by another house then there is one new connection but no net additional customers
- That, on average, there is more than one new connection per new customer.

[3] For example, there may be many subdivision connections well before customers actually start using energy. Over time, however, we would expect the relationship to remain reasonably consistent.

[4] We have excluded the 2008 numbers from both series.

However, from 2011, the ratio of customer connections to customer number growth is expected to increase from 1.18 to 1.35, with customer numbers forecast to grow (according to the RIN) by 3000 in each year while total connections have been forecast by ACIL Tasman to grow at 4040 in each year[5].

There does not appear to be an obvious direct link between Aurora's customer number and connection forecasts and the discrepancy in ratios going forward may be of concern in capital expenditure forecasts. In addition, we have also considered the customer number growth assumed in the ACIL Tasman Energy Forecast report in our assessment.

1.4. Residential customer numbers

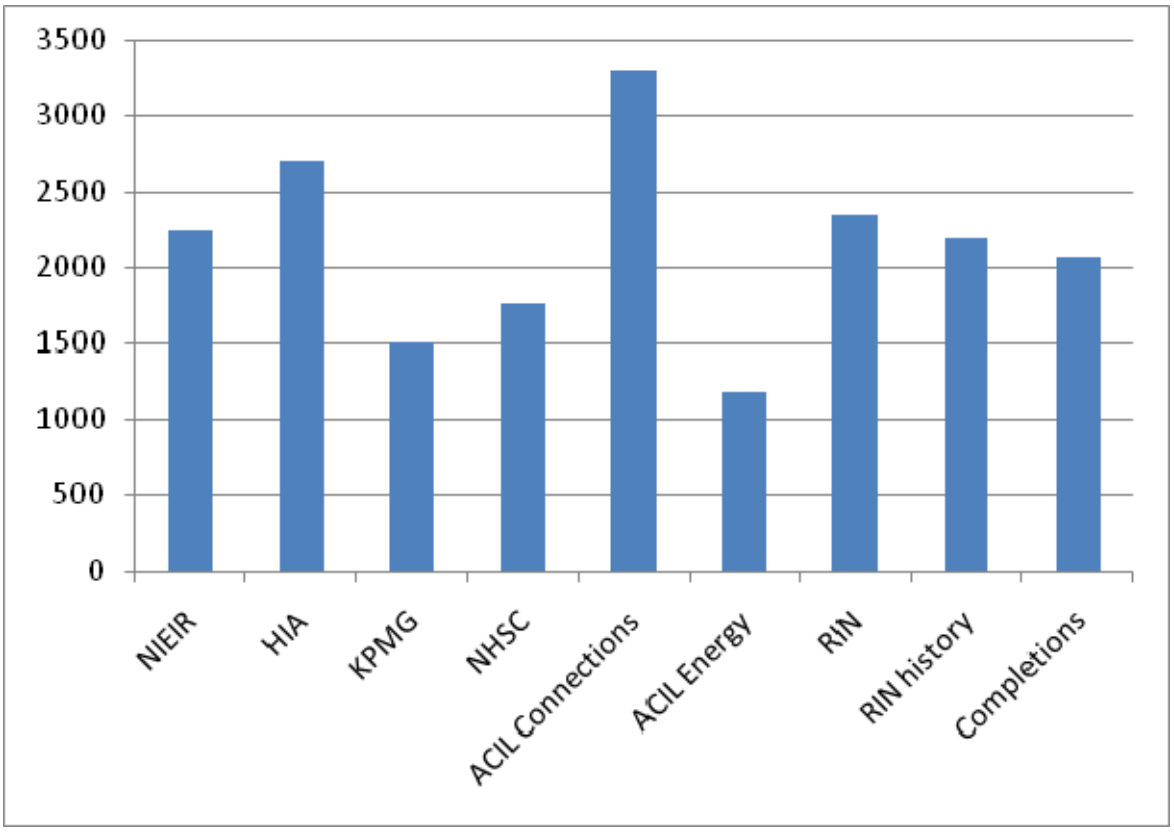
We have compared the RIN[6] and ACIL Tasman forecasts for residential customers in both its Connections and Energy Forecast reports against historical data (2003 to 2010) and against other forecasts[7]. The results are illustrated in Figure 1-3.

5 ACIL Tasman report prepared for Aurora Energy, "Aurora new customer connections forecast", February 2011, Table 1 for all connection types

6 Including associated material provided such as NW-#30187142-v3-PD_Customer_Numbers_Methodology.xls which separated customer number history and forecasts into residential and business.

7 Where required we have assumed a demolition rate of 6.7% of new houses based on a report by the National Housing Supply Council (NHSC).

- **Figure 1-3 Average annual change in residential numbers, dwellings or households, historical, 2003 to 2010 and forecasts to 2017**



All but three of the history and forecasts fall within the 1500-2500 range for net annual customers growth. The ACIL Tasman completions forecast is the highest forecast, the customer numbers in the ACIL Tasman energy forecast is the lowest. Clearly the two appear to be internally inconsistent.

We consider it likely that dwelling growth will be of a similar order to that seen over the past 7 years or possibly a little weaker, in light of the expected weakness of the economy. We consider forecasts which lie between about 1800 and 2400 to be reasonable.

As a result, we consider the residential customer numbers provided in the RIN to be reasonable, although likely to be a little high. We thus do not consider the residential customer number forecasts within the RIN require any change.

We consider it important that the forecasts relied upon by Aurora should be internally consistent. **We recommend that:**

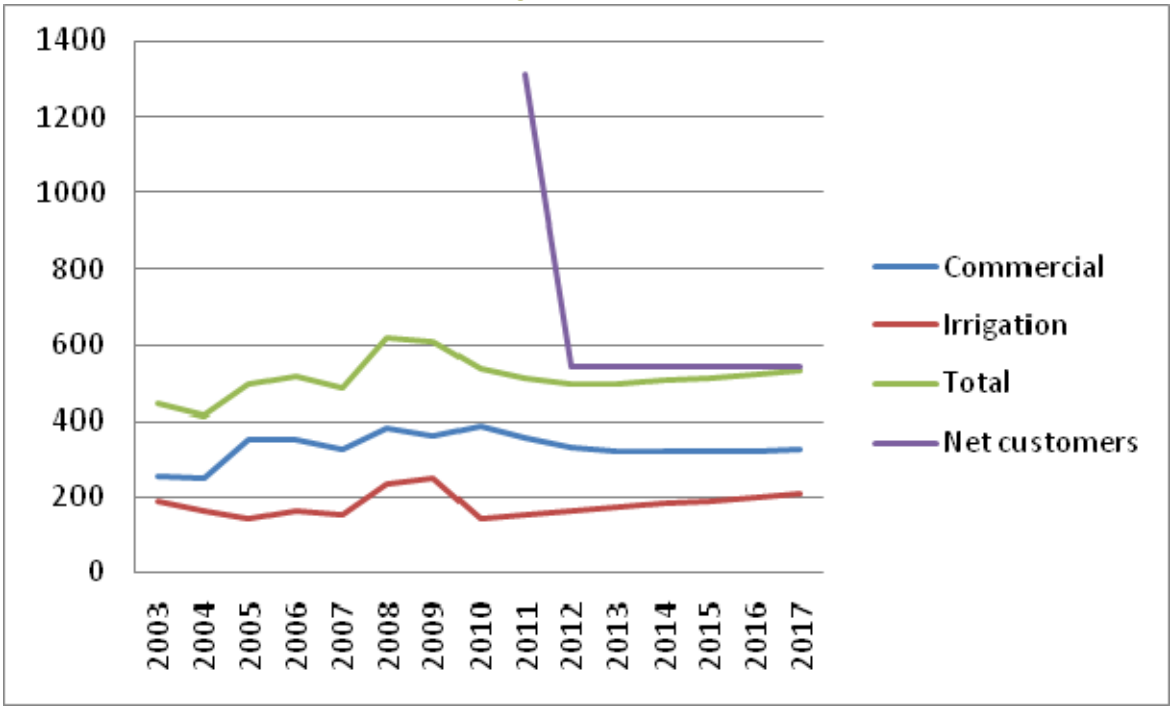
- **The residential connections forecasts should be approximately in line with the RIN forecasts, which over the 2010- 2017 period average a 2350 increase in residential customers pa, grossed up by a factor of 6.7% to take into account demolitions – that is an average of about 2520 new connections per year – unless compelling evidence is provided of a significantly higher demolition rate or of more than one connection per residential customer.**
- **The energy forecasts should similarly be adjusted on the basis of the residential customer numbers in the RIN forecasts – that is to an average of about 2350 new residential customers pa.**

1.5. Non-residential customer number forecasts

We consider the history of growth of Aurora's non-residential customer numbers to be unreliable.

The ACIL Tasman Connections report provides details about commercial (presumably commercial and industrial) and irrigation connections between 2004 and 2010. The history and forecast connection numbers as well as forecast non-residential customer numbers contained in the RIN are illustrated in Figure 1-4.

- **Figure 1-4 Annual commercial and irrigation and total non-residential connections historical and forecast, and forecast growth in non-residential customer numbers**



Source: ACIL Tasman Connections report, RIN and associated spreadsheets

Forecast growth in non-residential connections is very similar to historical growth. While we have not reviewed the sources of the connections numbers, on the basis the history is correct then the forecasts appear reasonable – although perhaps a little high for the commercial connections, given the assumption by ACIL Tasman that the economy will be relatively weak over the coming regulatory period.

Based on the connections history and forecasts, the forecast commercial customer number growth in the RIN appears too high in the first year (2011) and we recommend that this be reduced to 500, although this may not have any ramifications for capital expenditures over the next regulatory period. Although the RIN numbers from then are a little higher than would be expected from connection forecasts, especially as they are net, rather than the gross connections, we consider the difference to be immaterial.

2. Introduction

2.1. Aurora Energy's Regulatory Proposal

Aurora Energy (Aurora) is the electricity distribution network service provider (DNSP) which delivers electricity at the distribution network level to all but the largest electricity customers in Tasmania. Aurora serves some 230,000 residential customers and 50,000 business customers across the state

As the monopoly DNSP in Tasmania, Aurora is subject to economic regulation. Economic regulation of DNSPs is generally applied across a "regulatory period" which spans a number of years, typically five. Over the current regulatory period, which concludes on 30 June 2012, Aurora has been regulated by the Office of the Tasmanian Economic regulator (OTTER). However, the responsibility for economic regulation over the next regulatory period has transferred to the Australian Energy Regulator (AER).

In accordance with the National Electricity Rules (NER), on 31 May 2011 Aurora submitted to AER its Regulatory Proposal (Proposal) for the provision of distribution services in Tasmania over the period 1 July 2012 to 30 June 2017 (next regulatory period). The AER is required to make a Distribution Determination which will apply across this period. The Proposal contains information about planned capital and operating programs and expenditures (capex and opex), demand forecasts and the required revenue over the next regulatory period.

2.2. Review of Aurora Energy's Regulatory Proposal

The AER is responsible, under the National Electricity Law (NEL) and NER for the economic regulation of electricity distribution services provided by distribution network service providers (DNSPs) in the National Electricity Market (NEM).

In accordance with these responsibilities, the AER is conducting an assessment into the appropriate revenues and prices for the Aurora DNSP from 1 July 2012 to 30 June 2017. This assessment is referred to as the Review within this report.

2.3. Review of Aurora Energy's demand forecasting methodologies

Demand forecasts potentially play a significant role in two components of a regulatory review:

- In determining the required capital (and to a lesser extent operating) expenditures applying to a DNSP. Capital and operating expenditures, in turn, are major inputs into the revenue required by the DNSP over the next regulatory period.
- In determining tariffs to apply under price cap regulation (pricing proposal). Here, in simple terms, tariffs are set by dividing the required revenue stream by the forecast demand.

The AER's responsibilities include reviewing the demand forecasts utilised in preparing the capex and opex forecasts and in deriving tariffs under the Proposal.

The two components require different but related demand forecasts. The forecasts of most relevance to capital expenditure requirements are those of maximum demand (MD). Forecasts of most relevance to determining tariffs are those related to energy and customer numbers.

Aurora will be regulated under a revenue cap mechanism. As a result, the maximum demand forecasts are key inputs into capital expenditure forecasts and annual revenue requirements. Energy and customer number forecasts are less important under a revenue cap.

The AER has commissioned SKM MMA to assist it by reviewing the methods, inputs and data sources used by Aurora in its demand forecasting[8] where demand forecasts have been a major input into the Proposal. SKM MMA personnel have previously assisted the AER to review demand forecasts incorporated within proposals by DNSPs in NSW and Queensland.

We have previously provided a detailed report about maximum demand. This report considers customer numbers at a lower level of detail. A further report will review energy, again at a lower level of detail.

2.4. Customer number definitions

According to the response to an AER question, the customer numbers are defined as being one per site and accordingly, are each considered to be a discrete customer[9].

We refer in this report to "net" customer growth and to "gross" or new customers. The difference between the two is taken to be mainly the rate of demolitions – that is houses and premises that are knocked down and lost to the system.

2.5. Process undertaken

The review process undertaken by SKM MMA has been based largely on material provided by Aurora prior to the Proposal, within the Proposal, within the Regulatory Information Notice (RIN) templates and associated spreadsheets including NW-#30187142-v3-PD_Customer_Numbers_Methodology.xls, within reports by ACIL Tasman, a consultant to Aurora and in response to questions raised by the AER or SKM MMA.

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8 Australian Energy Regulator, "Terms of reference – review of Aurora Energy's demand forecasting methodology in its 2012-2017 regulatory proposal", sent to SKM MMA on 9 March 2011.

9 Aurora response to AER/017 question 5: *"Aurora uses the term "NMI" as defined in the National Electricity Rules, with the expectation that there is one NMI per discrete installation/site. Accordingly, the number of actual and forecast NMIs should be the same as, and is assumed by Aurora to be the same as, the number of actual and forecast discrete installations/sites with connection to Aurora's distribution network."*

The two ACIL Tasman reports prepared for Aurora and referred to in this report are:

- Aurora new customer connections forecast dated February 2011[10] (referred to as ACIL Tasman Connections Report)
- Energy consumption forecasts 2010-11 to 2016-17 and dated June 2011[11] (referred to as ACIL Tasman Energy Forecast Report)

As we understand it, the forecasts were prepared based on data available to end June 2010.

On 14 July 2011, AER and SKM MMA personnel held a meeting with Aurora and ACIL Tasman personnel during which questions about customer numbers were raised.

We understand that this report will be provided to Aurora for comment on issues of confidentiality.

2.6. Issues covered by this report

This report deals mainly with issues related to customer numbers, although we also consider connections.

2.7. Assessment criteria

The criteria against which the forecasts need to be assessed are those related to capex and opex determinations, essentially that they "*...reasonably reflects a realistic expectation of the demand forecast*" [....12]

In the Terms of Reference for this assignment provided by the AER the requirement for the assignment as a whole is set out:

"*The demand forecasting consultant will be required to determine whether the forecast methods and data sources (using public information where possible) used by Aurora are robust, represent good electricity industry practice and therefore produce realistic demand forecasts and also review Aurora's forecasts of energy consumption for the forthcoming regulatory control period*."[13]

These are the criteria we have used for the assignment.

2.8. Conventions adopted

Unless otherwise stated, all years referred to in the report are for financial years ending June 30 of the year stated.

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10 ACIL Tasman report prepared for Aurora Energy, "Aurora new customer connections forecast", February 2011
11 ACIL Tasman report prepared for Aurora Energy, "Energy consumption forecasts 2010-11 to 2016-17 ", June 2011
12 NER Sections 6.5.6(c)(3) and 6.5.7(c)(3)
13 Australian Energy Regulator, "Terms of reference – review of Aurora Energy's demand forecasting methodology in its 2012-2017 regulatory proposal", sent to SKM MMA on 9 March 2011, page 2.

2.9. Forecasts assessed

We have assessed the customer numbers included in the RIN as a whole and also the break-up between residential, commercial and industrial customers based on details provided in the spreadsheet NW-#30187142-v3-PD_Customer_Numbers_Methodology.xls.

We have taken into account the residential customer numbers forecast by ACIL Tasman when preparing its energy consumption forecasts.

We have considered the connections forecasts provided by ACIL Tasman in its connections report, which we understand was "*..used to confirm the capital expenditure forecasts for the Customer Initiated Capex category.*"[14]

2.10. Layout of the report

Chapter 3 of this report looks at the Aurora total customer number history and forecasts at network level and our understanding of the basis on which these have been prepared.

Chapter 4 looks at residential forecasts and compares the Aurora history and forecasts against history and forecasts of new dwellings and households.

Forecasts for non-residential customer numbers, commercial, industrial and irrigation are assessed in Chapter 5.

2.11. Handling potential conflicts of interest

Sinclair Knight Merz (SKM), of which SKM MMA is a part, routinely provides consulting services to many participants in regulators and customers of and service providers to the electricity industry in Australia, including to Aurora Energy. SKM has disclosed possible past and present conflicts to the AER in relation to this project. Work by SKM for Aurora with regard to materials cost escalation and reliability data and processes are referred to in the Aurora Proposal.

In order to ensure that there is no actual or perceived conflict of interest with regard to the above work by SKM and the review of demand forecasts by SKM MMA, after discussions with the AER, SKM MMA has committed to:

- Only using a specified "core team" of SKM MMA personnel in the review of demand forecasts. These personnel have not been involved in the other assignments for Aurora.
- Not discussing the assignment for AER outside the core SKM MMA team
- The core SKM MMA team not being involved in any other work for Aurora during the course of the AER assignment

[14] Aurora response to AER/037 question 3, 30 August 2011.``

- Any work by SKM for Aurora not being discussed with the core SKM MMA staff during the course of the AER assignment
- Project managers of potential work for Aurora being asked to identify this while the AER assignment is ongoing
- Discussing with AER any further work by SKM for Aurora prior to it being undertaken.

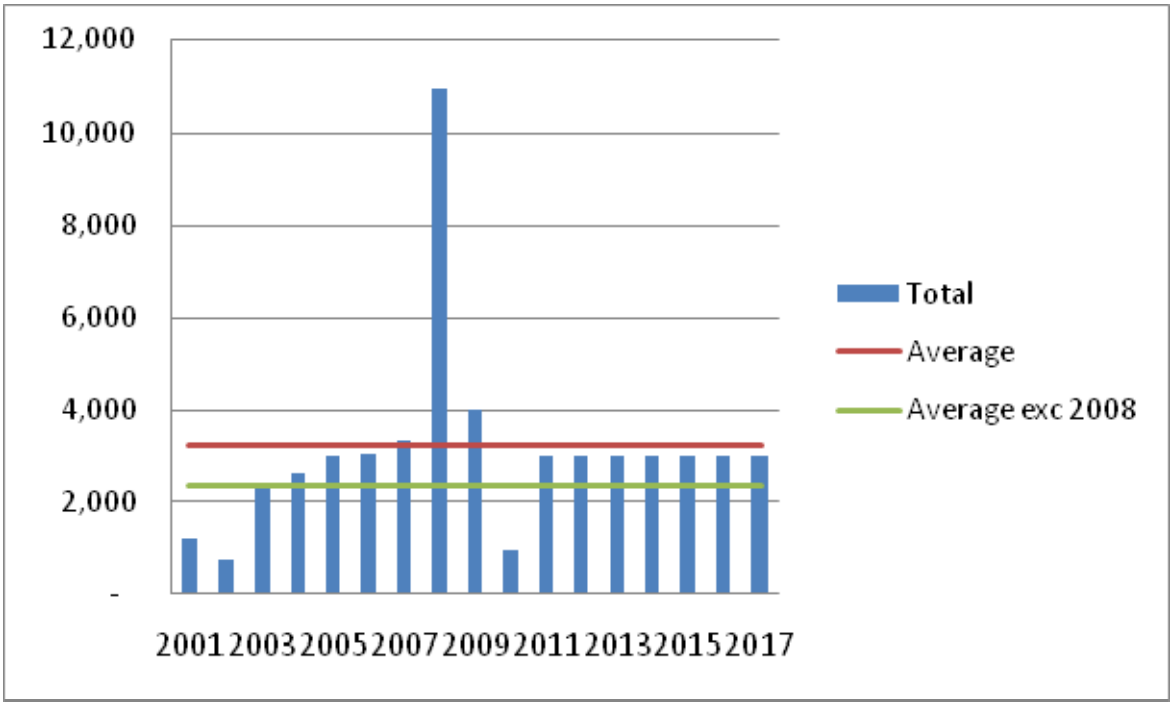
3. History and basis of Aurora forecasts

3.1. Growth in total customer numbers

Aurora in 2010 reported a customer base of 278,838 customers, of whom some 82% were residential.

Net new customer number growth at the network level over the period 2000 to 2010, as provided in the RIN is illustrated in Figure 3-1. We understand these to be the numbers reported in Aurora's annual network performance report. Also included in the figure are the Aurora customer number forecasts, which are a net addition of 3000 customers each year from 2011.

Figure 3-1 Annual changes in total Aurora customer numbers, history and forecast



Source: RIN plus 2000-2002 history provided by Aurora

As can be seen, according to the RIN numbers, there has been growth of between 740 and 4000 net customers (0.3% to 1.5%) in each year of the period, apart from 2008, when there was reported growth of over 11,000 or 4.2%. Clearly the 2008 result is anomalous.

Also included in the figure as a red horizontal line is the average growth over the period 2000 to 2010 including 2008 (3223) and as a green horizontal line for that period apart from growth in 2008 (2364).

Aurora has been asked to explain the 2008 result. In response, Aurora stated:

"Aurora is unable to clearly explain the apparent anomalous large (4.1%) increase in 2006/07 – 2007/08, however it may be related to the migration of data from the Retail Billing System to the Network Billing System.[15]

Aurora can however confirm the validity of the historical actual customer numbers as populated in RIN Table 6.7."

According to the Aurora energy consumption model report, data were supplied from the retail billing system from 2002 to 2007 and then from the distribution billing system from 2008 to 2010[16]. The timing of the migration from one data base to another appears to confirm that this may be the source of the apparent "discontinuity.

As a result of this clearly anomalous outcome we have excluded it from our analysis. We consider it likely to be due to different counting methodology. We note that neither the connections report nor our assessment of new dwellings and customer growth (see Sections 4.1 and 4.2) have suggested anything like the level of growth suggested by the 2008 growth in or around that period.

3.2. Basis for the customer number forecasts

The basis for the customer number forecasts in the RIN is not clear. According to the spreadsheet associated with the forecasts[17] the customer number forecasts were based on the history of customer number growth over the past 10 years – although this averaged 3223 while 3000 net new customers per year are forecast. According to the Regulatory Proposal[18], Aurora appears to be relying on the ACIL Tasman forecasts of connections[19] to drive its customer number growth forecast and we understand the Connections forecast has been used in assessing the relevant capex forecasts. However, there appear to be some inconsistencies between the customer number and connection forecasts..

The connections growth history and forecasts by ACIL Tasman and RIN history of customer number growth from 2002 to 2010[20] are illustrated in Figure 3-2. We understand that these are new physical connections, rather than short-term disconnections and then re-connections.

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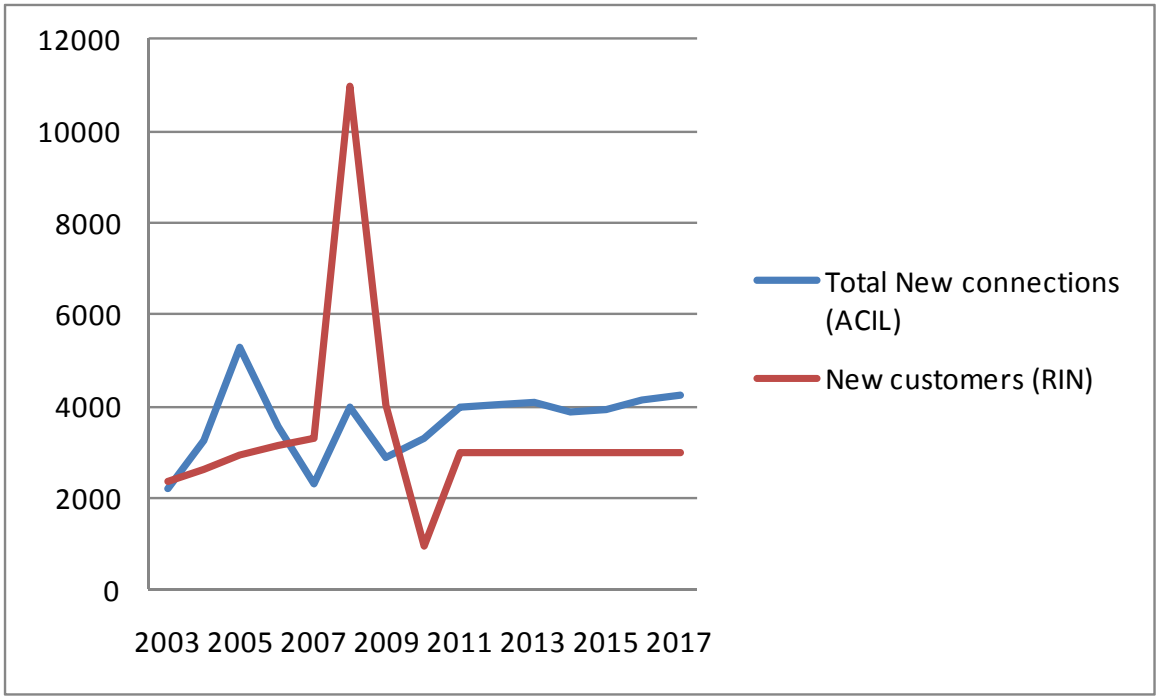
15 Aurora response to AER/017 question 2:
16 Aurora Energy, "Energy consumption model version 4.0", 18 April 2011 page 5.
17 NW-#30187142-v3-PD_Customer_Numbers_Methodology.xls
18 Aurora Energy, Aurora Energy regulatory proposal 2012-2017" pages 95-98
19 ACIL Tasman report prepared for Aurora Energy, "Aurora new customer connections forecast", February 2011
20 Including the 2001/02 history provided by Aurora.

- **Figure 3-2 Annual changes in total Aurora customer numbers, history and forecast and connections history and forecast from ACIL Tasman connections report**



Source: ACILTasman Connections Report, RIN plus 2001/02 history provided by Aurora

While growth in customer numbers in each year of the historical period do not appear to match connections in any particular year, this is understandable, with timing presumably being a key issue. However, over the medium term we would expect growth of the two to be reasonably consistent. If we exclude the 2008 numbers as anomalous (see Section 3.1 above) the historical connection growth over the period is 22,800 while customer number growth is about 19,350. The connection number growth is about 18% higher than the customer number growth.

This could be due to a number of reasons. However, the most obvious appear to be that:

- Connections measures new customers while customer numbers measures net new customers, with permanent disconnections being subtracted – in other words, if a house is knocked down and replaced by another house then there is one new connection but no net additional customers
- That, on average, there is more than one new connection per new customer.

At the meeting on 14 July we asked Aurora to explain the connection between customer number growth and connections and connections per customer and a subsequent question in this regard was

raised. In its response[21] Aurora stated that it did expect a one to one relationship between customers and connections and that new connections should equal net new customers plus disconnections. Aurora has not been able to assess the rate of permanent disconnections[22]

However, from 2011, the ratio of customer connections to customer number growth is forecast to increase from 1.18 to 1.35, with customer numbers forecast to grow (according to the RIN) by 3000 in each year while connections have been forecast by ACIL Tasman to grow at 4040[23] in each year.

There does not appear to be an obvious link between the customer number and connection forecasts. While this report considers primarily the customer number forecasts, the apparent shift in the ratio of connections to net customer numbers going forward may be of concern in capital expenditure forecasts.

We have also taken account of the customer number growth forecast in the ACIL Tasman Energy forecasts report in our assessment.

[21] Aurora response to AER/037, customer numbers, 30 August 2011, Question 4.

[22] Aurora response to AER/017 question 4: *"Aurora does not collect or collate disconnection data (defined as a connection that is disconnected indefinitely) and is therefore unable to provide the data requested in Question 4 of AER/017. Aurora expects that the number is related to the number of premises demolished in the Tasmanian jurisdiction but has been unable to source this data."*

[23] ACIL Tasman report prepared for Aurora Energy, "Aurora new customer connections forecast", February 2011, Table 1 for all connection types

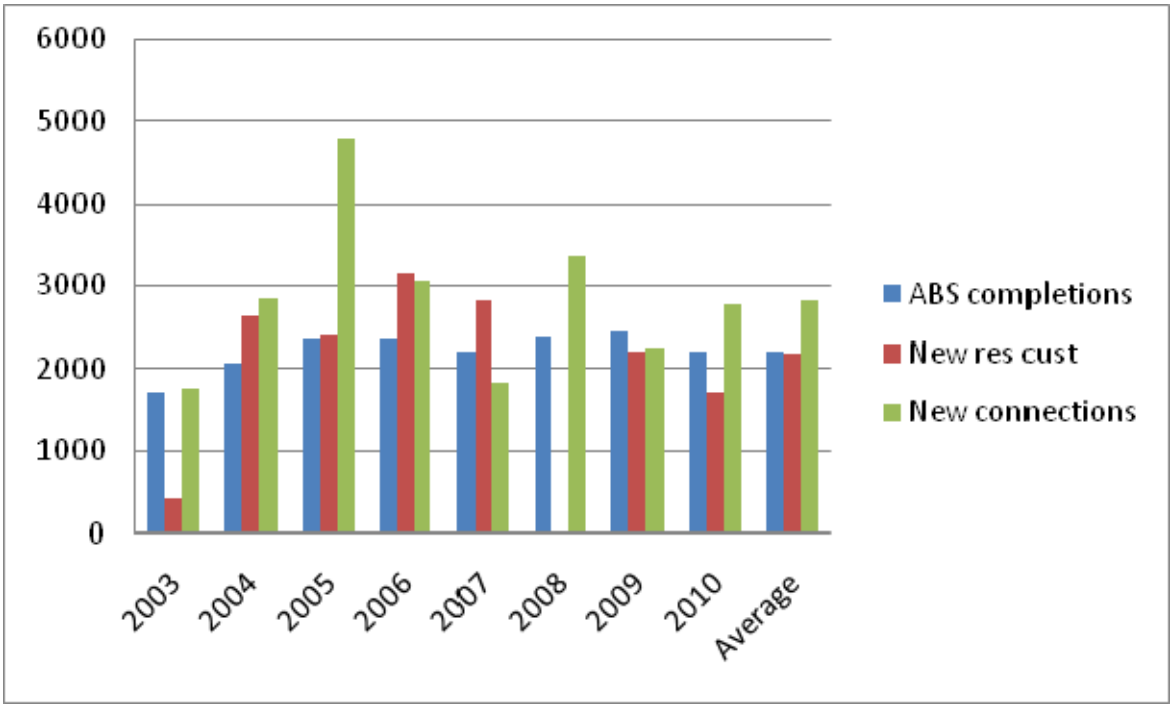
4. Residential customers

Given that some 80% of new customers are residential, the key driver of new customer growth is expected to be growth in new dwellings.

4.1. History of new dwelling completions

The history of new dwelling completions in Tasmania over the period 2003 to 2010 is shown in Figure 3-1 along with the change in residential customer numbers over the period (excluding 2008) and residential plus subdivision connections. The last set of columns provides the average over the period 2003 to 2010, excluding 2008 for customer numbers.

Figure 4-1 Residential completions, customers and connections 2003-2010



Source: ABS 8752.0, ACILTasman Connections Report, RIN plus 2001/02 history provided by Aurora

The averages of building completions and new residential customers over the period (excluding 2008 for customer numbers) are very similar. We note that the level of building completions in 2008 is approximately in line with that in other years. The residential connection numbers, conversely, are some 25% to 30% higher than the other two measures (ie building completions and residential customer growth) and the connection numbers in 2005 and 2008 appear to be particularly high. It is not clear why this should be the case.

4.2. Forecasts of new dwellings

We have considered a number of forecasts of new dwelling growth (or approximations of this) for Tasmania as a proxy for residential customer number growth over the period 2010 to 2017. These are tabulated in Table 4-1. In this context, gross refers to the number of new customers or connections to the system. Net refers to the change in numbers which takes account of demolitions. In other words, (gross) new customers equals net customer increase plus demolitions. We also provide some historical averages in the Table to allow comparison of historical against forecast growth.

Table 4-1 Forecasts and history of growth in residential numbers, average numbers per year

Source	Annual growth, forecasts or historical	Notes
NIEIR residential dwelling stock growth forecasts, 2010 to 2017	2243	Interpolated linearly between 2015 and 2020 for 2017 result. These are net numbers.
Housing Industry Association. Housing starts 2010 to 2013	2890	Only for 2010-2013. These are gross numbers and dwelling starts which may not convert to completions.
KPMG Econtech households, 2009 to 2017	1507	These are net household growth forecasts. Growth in households may be related to growth in dwellings.
National Housing Supply Council, 2010, 2010-2017	1751 net, 1871 gross	The difference between gross and net is due to demolitions, estimated for Tasmania as 6.7% of new housing growth.
ACIL Tasman connections, 2010-2017	3531	Combined residential and sub-division. These are presumably gross numbers.
ACIL Tasman customer number growth in the energy report, 2010-2017	1188	Derived from the ACIL Tasman energy forecasts net customer number calculations, using the regression equation on page 34 and population forecasts on page 43
RIN forecasts, 2010-2017	2350	These are net customer numbers and are 1687 in 2011 and 2460 in each other year, although it is not clear why.
RIN history 2003-2010	2192	We have excluded 2008. These are net
Completions history 2003-2010	2216	2003-2010

Sources: NIEIR 2011[24] , HIA [25,] KPMG Econtech[26,] NHSC[27], ACIL Tasman Connections Report, ACIL Tasman Energy Forecast, ABS8752.0 and RIN and associated material provided by Aurora.

[24] National Institute of Economic and Industry Research (NIEIR) report to Transend, "Electricity sales and maximum demand forecasts for Tasmania to 2042" May 2011, dwelling stock page 7.

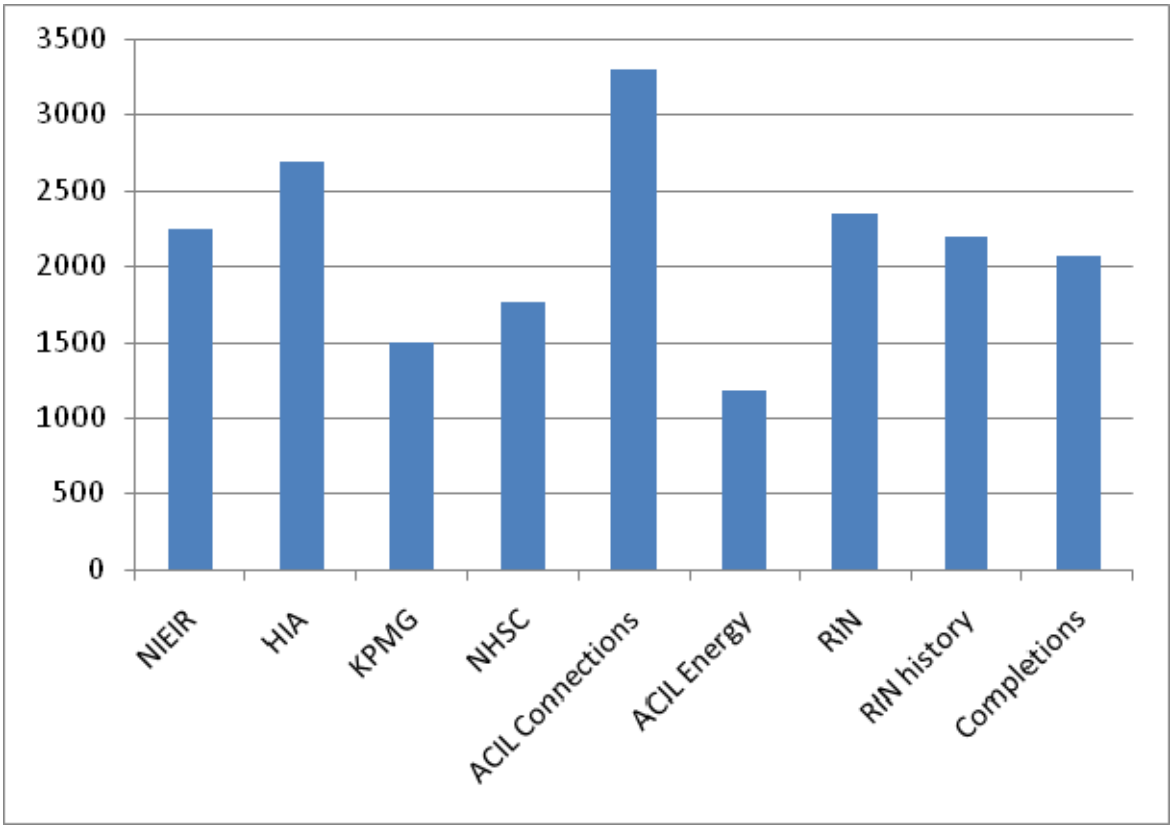
[25] Housing Industry Association economics group dwelling starts by financial year, July 2011 available at http://economics.hia.com.au/media/July%202011%20%20Forecasts.pdf

[26] KPMG Econtech tables associated with the report to Australian Energy Market Operator, Stage 2 report, economic scenarios and forecasts 2009-10 to 2029-30, 2010, available at http://www.aemo.com.au/planning/esoo2010.html

[27] National Housing Supply Council 2nd state of supply report, 2010 and associated tables.

We have illustrated the comparable growth rates on an estimated net basis in Figure 4-2. To calculate net from gross we have assumed a demolition rate of 6.7% of new customers, in line with NHSC 2010[28].

- **Figure 4-2 Average annual change in residential numbers, historical 2003 to 2010 and forecasts to 2017**



4.3. Review of RIN and ACIL Tasman forecasts

All but three of the history and forecasts fall within the 1500 – 2500 range for net annual growth in customer. The ACIL Tasman completions forecast is the highest forecast, the customer numbers in the ACIL Tasman energy forecast is the lowest. Clearly the two appear to be internally inconsistent[29].

The HIA numbers appear high compared to completions, both historically and in forecast. This is, presumably, due to HIA new starts and completions being collected on a different basis and the

[28] National Housing Supply Council 2nd state of supply report, 2010, Appendix 3.

[29] When asked to comment on this, Aurora stated that they were forecast using different methods. Aurora response to AER/017 question 3: *The difference in forecast residential new connections is due to the difference in forecasting methods: Aurora extrapolates actual connections data; ACIL Tasman have linked the number to forecast population growth.*

possibility that new starts do not proceed to completion. The KPMG household number growth is likely to be understated compared to dwelling growth as it does not take into account empty dwellings[30].

We consider it likely that dwelling growth will be of a similar order to that of the past 7 years or possibly somewhat weaker, in light of the strains on the economy (see ACIL Tasman Energy Forecast report[31]). Overall, we consider forecasts which lie between about 1800 and 2400 on a net basis to be reasonable.

As a result, we consider the residential customer numbers provided in the RIN to be reasonable, although likely to be a little high.

4.4. Consistency between forecasts relied upon by Aurora

We consider it important that the forecasts relied upon by Aurora should be internally consistent. As a result we recommend that:

- The residential connections forecasts should be approximately in line with the RIN forecasts, which over the 2010-2017 period average a 2350 increase in residential customers pa, grossed up by a factor of 6.7% to take into account demolitions – that is an average of about 2520 new connections per year[32] – unless compelling evidence is provided of a significantly higher demolition rate or of more than one connection per residential customer.
- The energy forecasts should similarly be adjusted on the basis of the residential customer numbers in the RIN forecasts – that is to an average growth of about 2350 new residential customers pa.

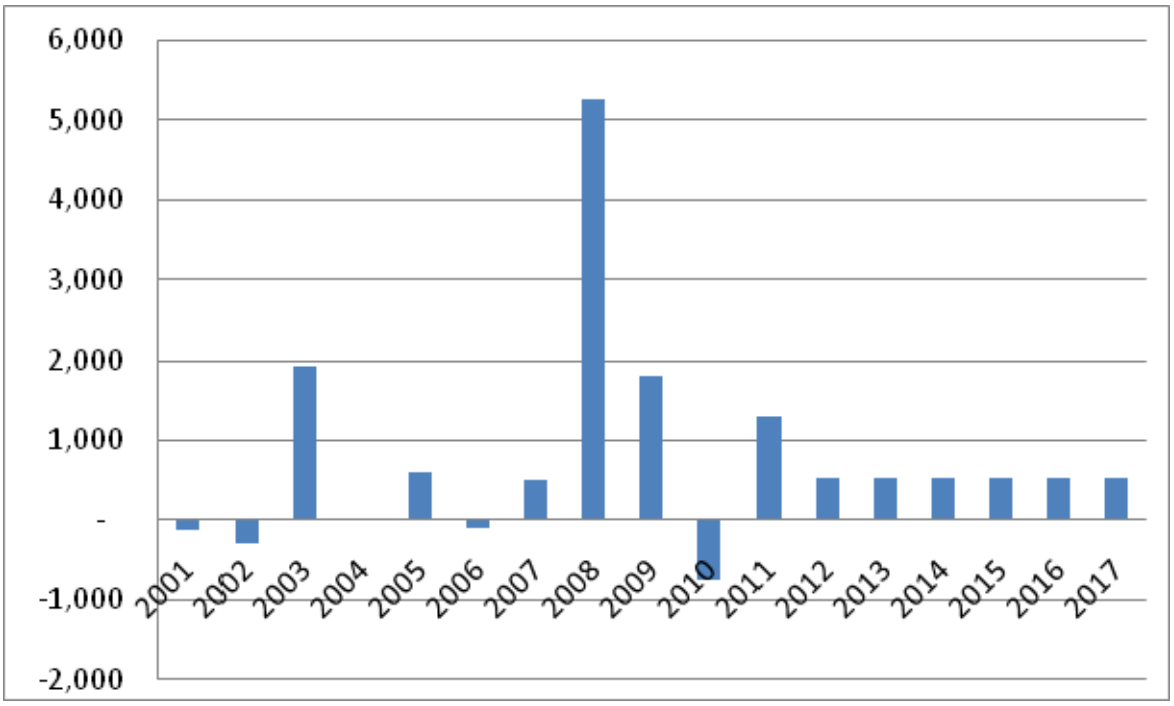
[30] Indeed, the KPMG households are some 8-10% lower than the NIEIR dwelling numbers.
[31] ACIL Tasman report prepared for Aurora Energy, "Energy consumption forecasts 2010-11 to 2016-17", June 2011, pages 18-20.
[32] Note that demolitions are defined here as a proportion (6.7%) of new dwellings. Thus 2350 / (1-0.067) = 2519.

5. Commercial, industrial and irrigation customers

5.1. Historical growth of commercial and industrial customers

The history of growth of Aurora's commercial and industrial customer numbers is illustrated in Figure 5-1.

- **Figure 5-1 Average annual change in commercial plus industrial (ie non-residential) customer numbers, historical to 2010 and forecast to 2017**



Source: RIN plus earlier history and customer number split-up provided by Aurora in NW-#30187142-v3-PD_Customer_Numbers_Methodology.xls

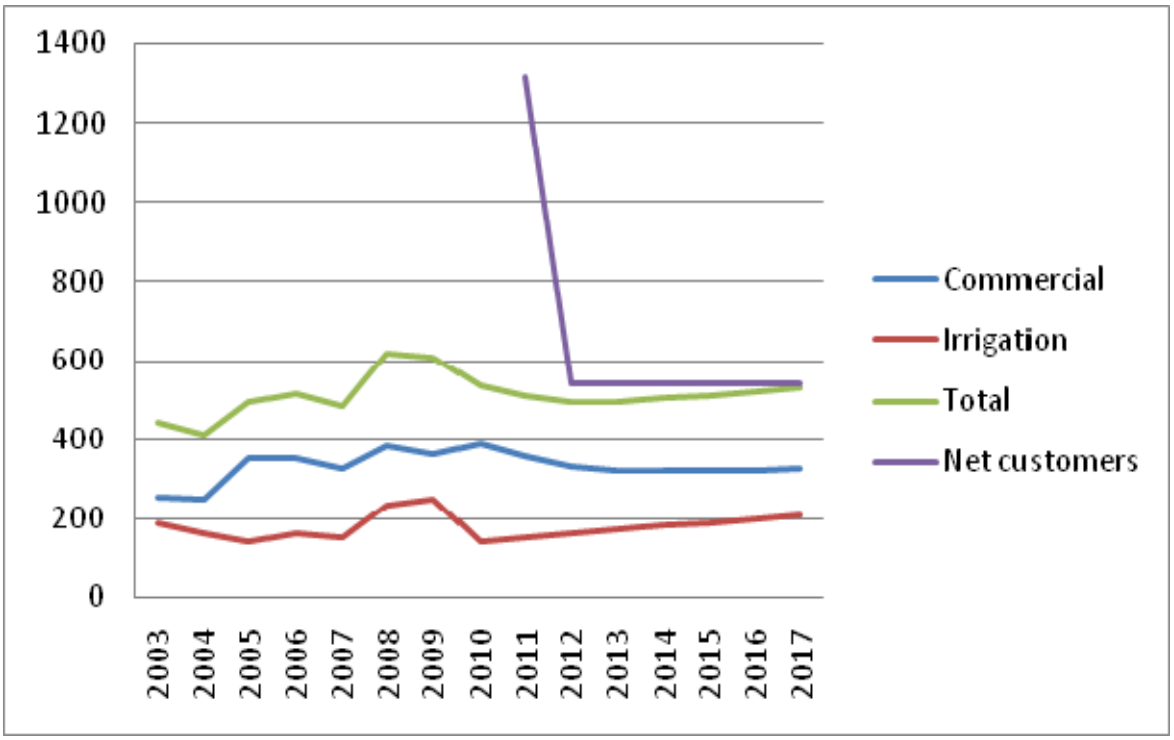
The history of growth in commercial and customer numbers is quite erratic and the numbers in 2008, 2003 and 2009 and 2010 are possibly artefacts of customer counting and allocation methodologies, rather than actual significant increases or decreases of customers. Given the apparent uncertainties associated with these numbers, any analysis is likely to be indicative only.

Aurora is forecasting an increase of commercial/industrial customer numbers of 1300 in 2011, followed by 540 per year thereafter.

5.2. Connection numbers

The ACIL Tasman connections report provides details about commercial (presumably commercial and industrial) and irrigation connections between 2004 and 2010. We understand again that these are new physical connections, rather than short-term disconnections and then re-connections. These, together with forecasts, are provided in Figure 5-2.

- **Figure 5-2 Annual commercial and irrigation and total non-residential connections, historical and forecasts, and forecast growth in non-residential customer numbers**



Source: ACIL Tasman Connections report and RIN

Forecast connections numbers are very similar to those recorded over the period 2003 to 2010 as can be seen in Table 5-1.

- **Table 5-1 Average connections growth per year, historical and forecast**

Period	Commercial	Irrigation	Total
2003-2010	334	180	514
2010-2017	330	181	511

Source: ACIL Tasman Connections report

Forecast growth in connections is very similar to historical growth. While we have not reviewed the sources of the numbers, they appear reasonable – although perhaps a little high for the commercial connections, given the assumption by ACIL Tasman that the economy will be relatively weak over the coming regulatory period[33].

Based on the connections history and forecasts, the forecast commercial customer number growth in the RIN appears too high in the first year (2011) and we recommend that this be reduced to 500, although this may not have any ramifications for capital expenditures over the coming period. Although the RIN numbers from then are a little higher than would be expected from connection forecasts, especially as they are net, rather than the gross connections, we consider the difference to be immaterial.

[33] As seen in the ACIL Tasman energy forecasts report. See discussion of this in the SKM MMA review of maximum demand forecasts.

6. Glossary

2012-2017 regulatory control period	The next regulatory period for Aurora from 1 July 2012 to 30 June 2017
ABS	Australian Bureau of Statistics
ACIL Tasman or ACIL	Consultancy which prepared Aurora's Connections forecasts and energy forecasts as well as maximum demand forecasts
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Aurora Energy, Aurora	Distribution Network Service Provider for Tasmania
DNSP	Distribution Network Service Provider
GSP	Gross State Product – a measure of the goods and services produced in the state in $ terms.
Gross new customers	Number of new customers who connect, not taking into account those who leave the system (disconnections)
HIA	Housing Industry Association
NEM and NEMMCO	National Electricity Market and National Electricity Market Management Company Limited
NER	National Electricity Rules
Net customer numbers	Change in customer numbers after taking into account both new customers and those who leave the system (disconnections)
NHSC	National Housing Supply Council
NIEIR	National Institute of Economic and Industry Research
Proposal	Regulatory Proposals submitted by Aurora to the AER in late May 2011 relating to appropriate revenues and prices for Aurora from 1 July 2012 to 30 June 2017.
RIN	Regulatory Information Notice and associated templates containing information
Templates	Spreadsheet templates submitted as a response to the RIN in the Proposals.