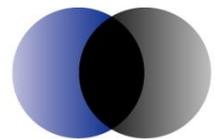


# Projection of customer switching in 2010-11

Development of a method of projecting customer switching for use in the 2010-11 BRCI

Prepared for Queensland Competition Authority

**27 April 2010**



**ACIL Tasman**

Economics Policy Strategy

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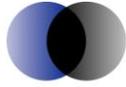
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## 1 Background

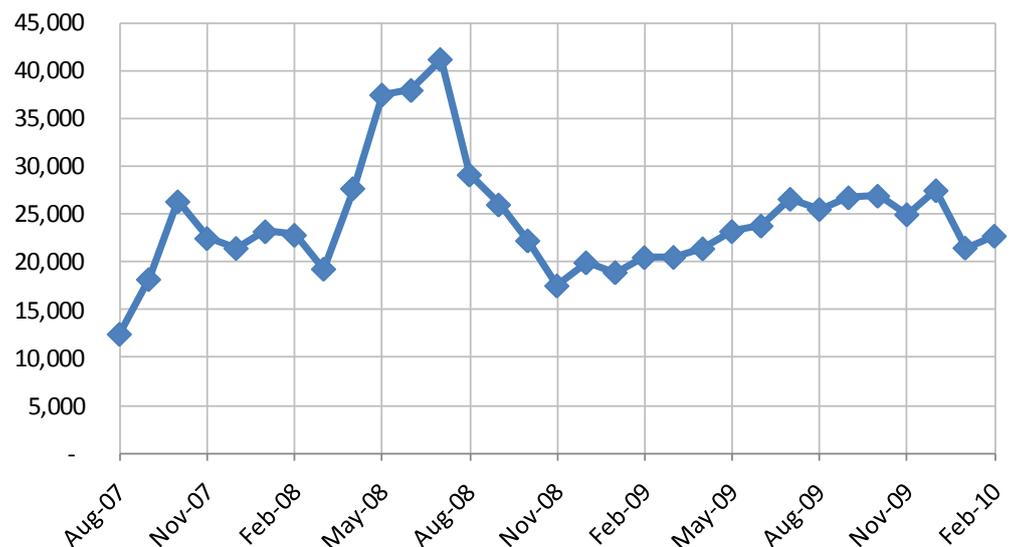
In deciding upon the change in the Benchmark Retail Cost Index (BRCI) for electricity for 2010-11, the Queensland Competition Authority (the Authority) takes into account the anticipated customer acquisition and retention costs (CAC) over the 2010-11 period. This requires a forecast of the likely number of customers transferring and switching between alternative electricity suppliers.

Data on monthly transfers is available from the introduction of full retail competition (FRC), which commenced in July 2007. As can be seen from Figure 1, the first 12 to 18 months of FRC is quite volatile compared to the period since November 2008. In addition, the first 12 to 18 months after the introduction of FRC is unlikely to be representative of the likely customer switching rates in the 2010-11 period.

As a consequence of these data limitations, in its Draft Decision of the BRCI for 2010-11, the Authority stated that it had decided to base its forecasts on a 12 month rolling average of the monthly change in the number of customers switching retailers. With respect to the Final Decision of the BRCI, the Authority will use the most recent 12 months data available.

Comments on the Draft Decision from the Department of Employment,

Figure 1 **AEMO monthly MSATS transfers statistics for Queensland**



Data source: AEMO MSATS data supplied by THE AUTHORITY

Economic Development and Innovation (DEEDI) recommended using an alternative approach suggested by Etrog. The Etrog approach projects the



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## Projection of customer switching in 2010-11

future customer switching rate based on the compounding monthly growth rate between two observations 12 months apart.

This report analyses the Authority and Etrog approaches in more detail.

## 2 Properties of proposed forecasting approaches

### 2.1 Etrog approach

The key problem with the Etrog approach is that it only uses the two points in time to determine a 'trend' which is then used to forecast future customer switching rates.

For well behaved time series data this simple extrapolation method will work but is unreliable for volatile data series. This can be demonstrated very simply by looking at the impact of using different months as the basis for the extrapolation. As shown in Table 1, using the change in customer transfers from December 2008 to December 2009 would result in a forecast monthly growth rate of 2.71 per cent, while using the growth between February 2009 and February 2010 would result in a forecast monthly growth rate of 0.87 per cent. This is a very large discrepancy based on selecting data points two months apart.

Table 1 **Average annual growth projected using Etrog approach for alternative months**

Dec-08	19,966	Jan-09	18,940	Feb-09	20,509
Dec-09	27,517	Jan-10	21,509	Feb-10	22,755
<b>Implied average monthly growth rate</b>	<b>2.71%</b>		<b>1.07%</b>		<b>0.87%</b>

Source: ACIL Tasman calculations using AEMO MSATS transfer Data supplied by the Authority

### 2.2 The Authority's Draft Decision approach

The Authority Draft Decision approach attempts to reduce the forecast error associated with the Etrog method by using the previous 13 data points in the estimation of the trend (and associated forecast) instead of two.

However, using an average of the monthly *percentage changes* on a data series that moves up and down will automatically bias the projection **above** any historical trend that may be present in the data. This bias can be seen by noting that a 20 per cent fall in one month will require a 25 per cent increase in the subsequent month to return back to the original number. Table 2 shows the upward bias effect by using a manufactured data series which has no underlying trend but is volatile around its average of 20,000.

Table 2 **Demonstration of upward bias in the Authority's Draft Decision methodology**

	MONTH					Average
	0	1	2	3	4	
Monthly data value	20,000	16,000	20,000	24,000	20,000	20,000
Change from previous month		-4,000	4,000	4,000	-4,000	0
% change from previous month		-20.00	25.00	20.00	-16.67	2.08 <sup>a</sup>

<sup>a</sup> This calculation is equivalent to the Authority's Draft Decision methodology.

Source: ACIL Tasman

As shown in Table 2, although there is a zero trend over the five data points, the Authority's Draft Decision methodology results in a calculated positive trend of 2.1 per cent.

Consequently, even though the Authority's Draft Decision approach embodies more historical information in its estimation of the current trend compared to the Etrog approach, it should not be used because of its upward bias when applied to a data series whose values move up and down through time.

### 2.3 Alternative approach

If it is believed that the customer transfer rates during the first 18 months after the introduction of FRC are not representative of the current, less immature market, then, for the purposes of estimating the 2010-11 BRCI, there are just 14 months of historical data available. By the time of the Final Decision, March 2010 data should be available which implies just 15 months of historical data will be available to forecast 15 months ahead (to June 2011). Without any clear drivers available to explain why the customer transfer rates can alter significantly from month to month, any traditional forecasting method will generally be unreliable.

Consequently, although a range of complicated forecasting methods can be used to generate a forecast the veracity of any particular method will be hard to justify. Hence, it is recommended that the Authority continue to adopt a simple quantitative formula that can broadly estimate any underlying trend without requiring unnecessarily complicated mathematics.

An alternative method should incorporate more historical data points but which does not suffer from the upward bias problem of the Authority's Draft Decision approach. One such method is similar to the Etrog approach but to calculate the annual growth between a **group** of consecutive months one year apart. Using a group of months (say November to February) will account for any tendencies for customers to transfer at certain times of the year (e.g. after the financial year). Using a group of consecutive months will also reduce any

bias introduced due to customers in one year pushing forward their switching by one or two weeks and therefore resulting in January being significantly higher but with February being significantly lower.

The issue is choosing which group of consecutive months should be used in the calculations. Given that the Authority have reservations regarding the representativeness of the data prior to approximately December 2008, it would be prudent to choose those months available from this time point. For example, by the time of the Final Decision, data to March 2010 should be available. Consequently the Final Decision could calculate the implied average monthly growth between the period Jan-09 to Mar-09 and the period Jan-10 to Mar-10.

The calculated average monthly growth rate is applied to the average monthly customer transfers for the year to March 2010. This will provide a monthly projection of the monthly averages over the previous 12 months. This means that the June 2011 average is the monthly average for the year ending June 2011. The total number of customer transfers for 2010-11 is thus calculated by multiplying the projected June 2011 monthly average by 12.

A comparison of the results from the three methods is presented in Table 3. In Table 3 we have calculated the projected 2010-11 total number of customer transfers from each of the methods using a hypothetical March 2010 data point. The 'Low March' is equivalent to the lowest monthly data point in the past 12 months while the 'High March' equivalent to the highest monthly data point in the past 12 months (rounded to thousands). The 'Average March' is equivalent to the historical average over the previous 12 months (March 2009 to February 2010).

As can be seen, the projected 2010-11 number of customer transfers is highly sensitive to the March 2010 value. The Etrog Approach projects total transfers in 2010-11 to be anywhere between 235,061 and 431,230 depending on the assumed number of transfers in March 2010. This sensitivity to a single data point highlights the problem with using the Etrog approach on a volatile data series. Interestingly, despite using more historical data points, the Authority's Draft Decision Approach does not produce any more 'relative' accuracy. In contrast, the Revised Approach which estimates the annual 'trend' based on a group of months is significantly less volatile. In particular, the 'Revised approach' projects total customer transfers in 2010-11 to be between 317,353 and 377,578. Although the 'Revised approach' exhibits significantly less variation than the other approaches, there is still a high degree of sensitivity to the March 2010 value. This sensitivity highlights the problem with using a quantitative approach for this forecasting problem.

Table 3 **Projected 2010-11 customer transfers using alternative methods for hypothetical March 2010 statistics**

	<b>Low March (20,000)</b>	<b>Average March (24,000)</b>	<b>High March (28,000)</b>	<b>Standard deviation</b>
<b>Average monthly growth rate</b>				
Etrog approach	-0.22	1.31	2.62	1.42
The Authority's Draft Decision approach	0.26	1.73	3.19	1.46
Revised approach	0.58	1.08	1.56	0.49
<b>Implied total number of customer transfers 2009-10</b>				
Etrog approach	282,409	300,572	319,147	
The Authority's Draft Decision approach	262,977	277,196	292,176	
Revised approach	296,206	304,843	313,405	
<b>Projected 2010-11 total number of customer transfers</b>				
Etrog approach	235,061	326,191	431,230	98,166
The Authority's Draft Decision approach	246,119	339,556	455,658	104,974
Revised approach	317,352	346,934	377,578	30,114
<b>Projected change in total number of customer transfers 2009-10 to 2010-11</b>				
Etrog approach	-16.8%	8.5%	35.1%	
The Authority's Draft Decision approach	-6.4%	22.5%	56.0%	
Revised approach	7.1%	13.8%	20.5%	

Source: ACIL Tasman

### 3 Conclusions

Given the limited amount of actual data and the volatility in that data, a forecast of customer transfers using mathematical techniques will necessarily be subject to a great deal of uncertainty.

The methodology used in the Authority's Draft Decision and that proposed by Ertog are both highly volatile producing unstable forecasts. This volatility comes from both the method used to establish the monthly growth rate and the approach of using the last recorded month as the take off point for the monthly projection.

ACIL Tasman proposes an alternative approach of using a group of months a year apart to establish the monthly growth and use the average month from the latest actual year as the base for growth is proposed. Given data limitations there would seem little point in pursuing more complex formulations. The alternative approach is aimed at overcoming the identified shortcomings of the other two approaches.

Table 3 shows that the ACIL Tasman alternative achieves its purpose of being less volatile than the other two methods and recommends this alternative approach.