



Contract market liquidity in the NEM

A REPORT PREPARED FOR HERBERT SMITH FREEHILLS

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Executive summary

Impact of vertical integration on liquidity

A number of NEM institutions have published reports in the last 12 months claiming that liquidity in the contract market operating alongside the NEM wholesale spot market is low or has declined. These reports – by the Finkel Expert Panel, the ACCC and AEMO – have all partly attributed these outcomes to increasing vertical integration between formerly independent generation and retail businesses.

However, our analysis reveals that when measured appropriately, contract liquidity *improved* in the aftermath of two prominent vertical integration transactions. These results stem from the reduced need for the formerly-unintegrated retailer to procure contracts from other generators. The reduction in contract demand from the vertically-integrated retailer increases the ease with which competing retailers may acquire swap contracts. The improvement in liquidity following key vertical integration transactions means that, contrary to the views expressed by the Finkel Expert Panel, AEMO and the ACCC, unintegrated retailers would have greater rather than fewer opportunities to hedge their exposures.

Conversely, in the ACCC’s Preliminary Report for the Retail Electricity Price Inquiry, the ACCC expressed the concern that by providing retailers with a ‘natural hedge’ against spot price volatility, vertical integration “has the direct effect of limiting the pool of potential generation counterparties for retailers to contract with, and/or the volumes of exchange-traded product available.”

Meaning of ‘liquidity’

Neither the ACCC’s Preliminary Report, nor the reports prepared by the Finkel Expert Panel and AEMO explicitly defined the meaning of liquidity. The ACCC’s Preliminary Report referred to traded volumes of financial instruments (swaps and caps), and made specific mention of the very small volume of hedging contracts traded in South Australia compared to other NEM regions. The report also noted how these volumes compared to “underlying market volumes”, by which it meant regional consumption.

In the 2014 litigation over AGL’s proposed acquisition of Macquarie Generation (the MacGen case), the ACCC adopted a more precise definition of liquidity as:

...the degree and speed with which an asset can be bought or sold without affecting that asset’s price.

We largely agree with that definition. There are five key characteristics of liquid markets – tightness, immediacy, depth, breadth and resiliency. While many different indicators are available to measure liquidity, no single measure unequivocally measures all liquidity characteristics. A key issue with contract

liquidity ratios of the type cited in the ACCC's Preliminary Report is that they compare traded contract volumes to regional or NEM-wide electricity demand without having regard to the *demand* for derivative contracts. By ignoring the impact of a vertical transaction on the demand for contracts, the ACCC's analysis fails to consider the ease with which a hedge trade can be executed and hence provides an indirect and misleading indication of liquidity. That is, it would be potentially misleading to consider the impact that a transaction might have on the supply of derivative contracts without considering the impact that the same transaction might have on the demand for those contracts.

Contract demand and the 'hedge volume turnover ratio'

In our view, a more appropriate measure of liquidity is the 'hedge volume turnover ratio'. This ratio takes account of both the demand and supply of hedge contract volumes.

Whereas the ACCC's liquidity ratio is:

Hedge Contract Volume / Total System Demand

the hedge volume turnover ratio is:

Hedge Contract Volume / Hedge Demand

This means that an event that reduces the volume of hedge contracts by reducing hedge demand (e.g., AGL's purchase of Macquarie Generation) could leave the ratio constant – or higher – to reflect the fact that both the supply of and demand for hedges has simultaneously reduced.

In the MacGen case, the Australian Competition Tribunal cited the hedge volume turnover ratio (which was 5.59) as its primary indicator of liquidity:

While the technical meaning of [liquidity] was the source of some debate in this matter, ultimately it boils down to whether there is a ready supply of contracts that will satisfy the likely demands of retailers...

In the end, the expert witnesses appeared to agree that present levels of liquidity in the market were unexceptional, with the total hedge volume measuring around 5.59 times the underlying generation capacity sold.*

[*NB: This expression is better described as 5.59 times the underlying capacity sold to retailers in the form of contracts.]

In our view, the hedge volume turnover ratio offers a much better indicator of liquidity than the ACCC's liquidity ratios because the turnover ratio provides a better indicator of the probability or opportunity for a market participant to execute a desired trade than the liquidity ratio.

Impact of AGL's acquisitions of Loy Yang A and Macquarie Generation

We estimated changes in the hedge volume turnover ratio following two significant transactions in the NEM: the acquisition of Loy Yang A by AGL in

2012 and the acquisition of Macquarie Generation by AGL in 2014. Both of these transactions involved the combining of a retailer with a large baseload generator(s).

To determine the change in the hedge volume turnover ratio, we estimated changes in both contract volume and hedge demand, assuming no changes in the contract positions of third parties (due to data limitations). We believe this approach is, if anything, likely to *overstate* any declines and *understate* any increases in liquidity that may be observed in the analysis.

The changes in both hedge demand and contract volumes are based on a comparison of the overall positions of AGL and the relevant generator preceding and following the acquisitions. We found that for both acquisitions, the net impact on liquidity was positive. For the:

- Loy Yang A acquisition, the hedge volume turnover ratio *increased* from 5.59 to 5.91.
- Macquarie Generation acquisition, the hedge volume turnover ratio also *increased*, this time from 5.59 to 6.00.

Therefore, contrary to the views expressed by the ACCC, removing AGL as a ‘pure’ retailer from the demand side of the hedge market likely increased liquidity by increasing the ease with which competing retailers could acquire swap contracts.

AGL’s response to generation closures

Finally, we note that following the departure of the Northern power station in South Australia, AGL responded by increasing its supply of contracts in that region. In other words, AGL made a positive contribution to contract liquidity following the exit of that plant. This may allow inferences to be made about the behaviour of other vertically-integrated energy businesses, and generators in general, following plant departures or reduction in the supply of hedge contract volume.

1 Introduction

Frontier Economics has prepared this report for Herbert Smith Freehills (HSF) in relation to measures of contract market liquidity in the National Electricity Market (NEM).

Several NEM institutions have recently published reports claiming that contract market liquidity in the NEM has declined and that vertical integration may have been partly responsible for those declines. This report discusses the fitness of the liquidity indicators relied on by those reports in coming to their conclusions before putting forward a more appropriate measure of contract liquidity. The report then compares the performance of the preferred measure of liquidity before and after key vertical mergers involving AGL Energy. Our findings suggest that liquidity has not suffered as a result of those mergers. Importantly, our report does not discuss the implications of changes in contract liquidity for the competitiveness of eastern Australian wholesale and retail electricity markets.

This report is structured as follows:

- Section 2 comments on the liquidity measures used in the recent published reports. This section also describes our preferred measure of contract liquidity and explains why it is more relevant and useful than the indicators used in recent reports.
- Section 3 sets out how our preferred measure of liquidity appears to have been affected by key vertical mergers in the NEM.

2 Measures of liquidity

2.1 Finkel, ACCC and AEMO liquidity indicators

Over the last 12 months, reports have been published by the CoAG Energy Council Expert Panel (‘the Finkel Review Panel’),¹ the ACCC² and AEMO³ all claiming that liquidity in the contract markets operating alongside the NEM wholesale spot market is low or has declined. All these reports in part attributed these outcomes to increasing vertical integration between former (predominantly) generation and retail businesses.⁴

None of the three reports in question explicitly defined the meaning of liquidity in the contract market. The Finkel Review and AEMO reports both used ‘contract liquidity’ simply to refer to the traded volumes of financial derivative instruments (swaps and caps), as measured in GWh or TWh. The ACCC’s report also referred to traded volumes – and in particular, the very small volume of hedging contracts traded in South Australia compared to other NEM regions. However, the ACCC also noted how these volumes compared to “underlying market volumes,” by which the ACCC was referring to regional consumption (also in TWh).

2.2 ACCC measures in the MacGen case

By contrast, in the 2014 litigation over AGL’s proposed acquisition of Macquarie Generation (the MacGen case), the ACCC adopted a more precise definition of liquidity as:⁵

...the degree and speed with which an asset can be bought or sold without affecting that asset’s price.

The ACCC’s report to the ACT in the MacGen case said that liquidity could be measured in several different ways, including:

- **Turnover** (traded volume, in MWh) –the volume of electricity traded

¹ Commonwealth of Australia, *Independent Review into the Future Security of the National Electricity Market: Blueprint for the Future*, 2017 (Finkel Review).

² ACCC, *Retail Electricity Pricing Inquiry, Preliminary report*, 22 September 2017 (ACCC Preliminary Report).

³ AEMO, *AEMO observations: Operational and market challenges to reliability and security in the NEM*, March 2018 (AEMO Observations Report).

⁴ See Finkel Review, p.81, ACCC Preliminary Report, pp.102-104, AEMO Observations Report, p.52.

⁵ *ACCC’s Report in the Australian Competition Tribunal, File No.1 of 2014, Re: Proposed acquisition of Macquarie Generation by AGL Energy Limited* (ACCC report), para 7.144, p.105.

- **Liquidity ratio** (MWh) – the turnover of traded volumes divided by NEM system demand
- **Open interest** (in numbers) – the number of outstanding positions (unmatched bids of buyers and sellers) and
- **Bid-offer spread** (in \$) – the offer price less the bid price.

The ACCC report also referred approvingly to KPMG’s description of liquidity as “the existence of ready and willing buyers and sellers at all times” and KPMG’s suggestion that:⁶

...a market [is] deeply liquid if ‘there are ready and willing buyers and sellers in large quantities where orders involving marketable parcels do not strongly influence prices.’

The ACCC report appeared to focus most on the potential change in the New South Wales region liquidity ratio following the proposed acquisition of Macquarie Generation by AGL. On the basis of a report prepared by one of the ACCC’s experts, Angus Macleod,⁷ the ACCC commented that the decline in New South Wales hedge contract demand as a result of the transaction would likely have a significant effect on contract liquidity, which in this context referred to the ratio of hedge volumes to underlying physical load.⁸

2.3 Characteristics of liquidity

The concept of liquidity in financial markets refers to the ability of a market participant to execute a desired trade quickly without having a material impact on price. In this sense, we largely agree with the definition adopted by the ACCC in the MacGen case, which was cited above. Importantly, liquidity is not simply synonymous with trading volumes: the key variable is not the number of trades, but the extent to which those trades can be quickly and efficiently executed.

The five characteristics of liquid markets cited by Sarr and Lybek are:⁹

- **Tightness** – which refers low transactions costs, such as a low spread between buy and sell (or bid and ask) prices
- **Immediacy** – which represents the speed with which orders can be executed, including the efficiency of trading, clearing and settlements

⁶ ACCC report, para 7.147, pp.105-106.

⁷ Affidavit of Angus Carl Torquil Macleod, 16 May 2014 (Macleod report).

⁸ ACCC report, paras 7.159-160, p.106.

⁹ Sarr, A. and T. Lybek, “Measuring Liquidity in Financial Markets”, *International Monetary Fund Working Paper*, December 2002, p.8.

- **Depth** – which refers to the existence of abundant orders, either actual or potential, both above and below the current traded price
- **Breadth** – which means that orders are both numerous and sufficiently large in volume that their impacts on price is minimal
- **Resiliency** – which is a characteristic of markets in which new orders flow quickly to correct order imbalances

A number of different types of measures are available to measure liquidity. The four key categories of measures are:

- **Transaction costs measures** – capture the costs of trading financial assets and trading frictions in secondary markets.
- **Volume-based measures** – reflect trading volumes to measure depth and breadth.
- **Equilibrium price-based measures** – attempt to capture orderly movements towards equilibrium prices to mainly measure resiliency.
- **Market impact measures** – attempt to differentiate between market conditions or the arrival of new information to measure resiliency and the speed of price discovery.

However, no single measure unequivocally measures tightness, immediacy, depth, breadth and resiliency.

2.4 Preferable liquidity measure

In our view, contract liquidity ratios such as of the type cited in the ACCC's Preliminary Report provide more direct indicators of liquidity than some of the other measures referred to in the ACCC's report submitted in relation to the MacGen case.

However, a key issue with liquidity ratios is that they compare traded contract volumes to regional or NEM-wide system *electricity demand*, without having regard to the *demand for derivative contracts*. This provides an indirect and incomplete indication of liquidity because it ignores the demand for contracts – and hence the ease with which a hedge trade can be executed.

In our view, a more appropriate measure of liquidity may be the **hedge volume turnover ratio**. This ratio takes account of both the demand *and* supply of hedge contract volumes.

Whereas the ACCC liquidity ratio is:

$$\text{Hedge Contract Volume} / \text{Total System Demand}$$

the hedge volume turnover ratio is:

$$\text{Hedge Contract Volume} / \text{Hedge Demand}$$

This means that an event that reduces the volume of hedge contracts by reducing hedge demand (e.g., AGL's purchase of MacGen) could leave the ratio constant to reflect the fact that both the supply of and demand for hedges has simultaneously reduced.

The advantage of taking account of hedge demand in this way is that the hedge volume turnover ratio provides a better indicator of the probability or opportunity for a market participant to execute a desired trade than the liquidity ratio. The Australian Competition Tribunal in the MacGen case cited the hedge volume turnover ratio (of 5.59 in that case):¹⁰

While the technical meaning of [liquidity] was the source of some debate in this matter, ultimately it boils down to whether there is a ready supply of contracts that will satisfy the likely demands of retailers...

In the end, the expert witnesses appeared to agree that present levels of liquidity in the market were unexceptional, with the total hedge volume measuring around 5.59 times the underlying generation capacity sold.

[*NB: This expression is better described as 5.59 times the underlying capacity sold to retailers in the form of contracts.]

A hedge volume turnover ratio of, say, 5.59, effectively means that intending buyers of contracts have 5.59 'chances' to satisfy their demand from the contract volumes traded. The terminology adopted in the MacGen case was that a retailer has more than five chances to "get set" in relation to each unit of hedge contract it requires. In our view, this offers a much better indicator of liquidity than the ACCC's liquidity ratios.

¹⁰ Australian Competition Tribunal, *Application for Authorisation of Acquisition of Macquarie Generation by AGL Energy Limited* [2014] ACompT 1, paras 327-328, available at: <http://www.judgments.fedcourt.gov.au/judgments/Judgments/tribunals/acompt/2014/2014acompt0001> (accessed 28 March 2018).

3 Impact of vertical mergers on liquidity

3.1 Transactions examined

We focussed on two significant structural events that occurred relatively recently in the NEM: the acquisitions by AGL of Loy Yang A in Victoria and Macquarie Generation in New South Wales. Both of these transactions involved the combining of a retailer with large baseload generators.

3.1.1 Loy Yang A

The acquisition of Loy Yang A by AGL took place in June 2012, resulting in the retailer controlling a baseload generator with a nameplate capacity of 2,210MW.

Prior to the acquisition, AGL was a large retailer in the Victorian region of the NEM and owned a 32.54% share in the Great Energy Alliance Corporation Pty Limited (GEAC), which was responsible for Loy Yang A's trading activities. While AGL had no direct influence on GEAC's decisions, AGL's holding in GEAC could be regarded as giving it a degree of a financial hedge cover against spot price volatility in Victoria.¹¹

3.1.2 Macquarie Generation

The acquisition of Macquarie Generation by AGL took place in September 2014, resulting in the retailer controlling two baseload generators, Bayswater and Liddell,¹² with nameplate capacities of 2,760MW and 2060MW, respectively. Prior to the acquisition, AGL was a large retailer in the NSW region.¹³

3.2 Assumptions

Based on data provided by AGL on the swap positions of AGL and the acquired generators, we have no definitive information regarding the values of the elements of the hedge volume turnover ratio in Victoria. We do not see positions of all market participants. While we can observe system demand, which was used in the ACCC's liquidity ratio measure, hedge demand is more challenging to observe. Similarly, hedge contract volume requires information that is not available.

¹¹ In addition to this pseudo-hedge, AGL contracted extensively with Loy Yang Company in the VIC RRP swap market.

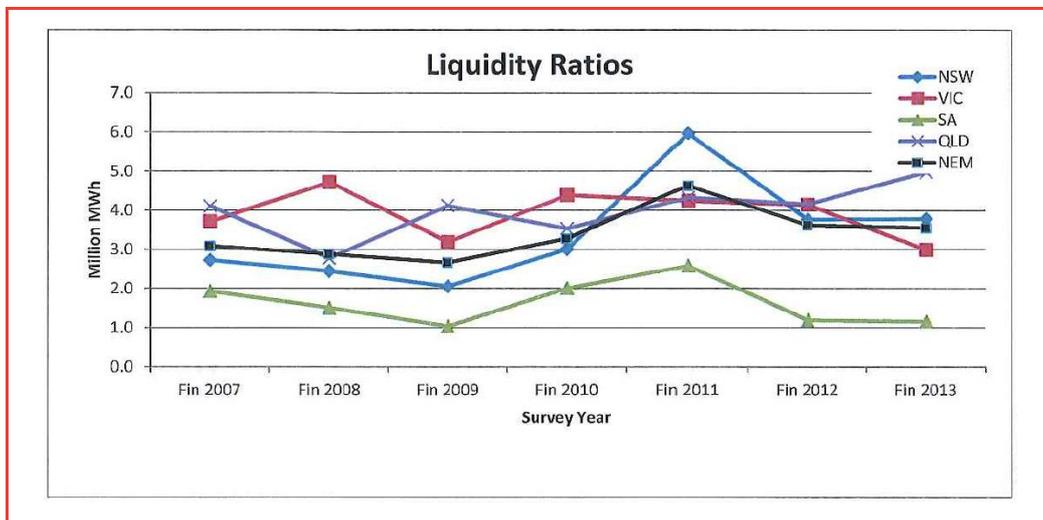
¹² Hunter Valley, with a capacity of 50 MW, was also acquired by AGL as part of the transaction.

¹³ While it was a gentailer in other regions, prior to the acquisition AGL owned no generators in the NSW region.

As a consequence, we assume starting values of volume and demand drawn from previous analysis of the New South Wales swap contract market tabled in the MacGen case. We assume that the values in Victoria, prior to the acquisition, are equal to 80 percent of the values ascribed to the NSW region. This is justified for two reasons:

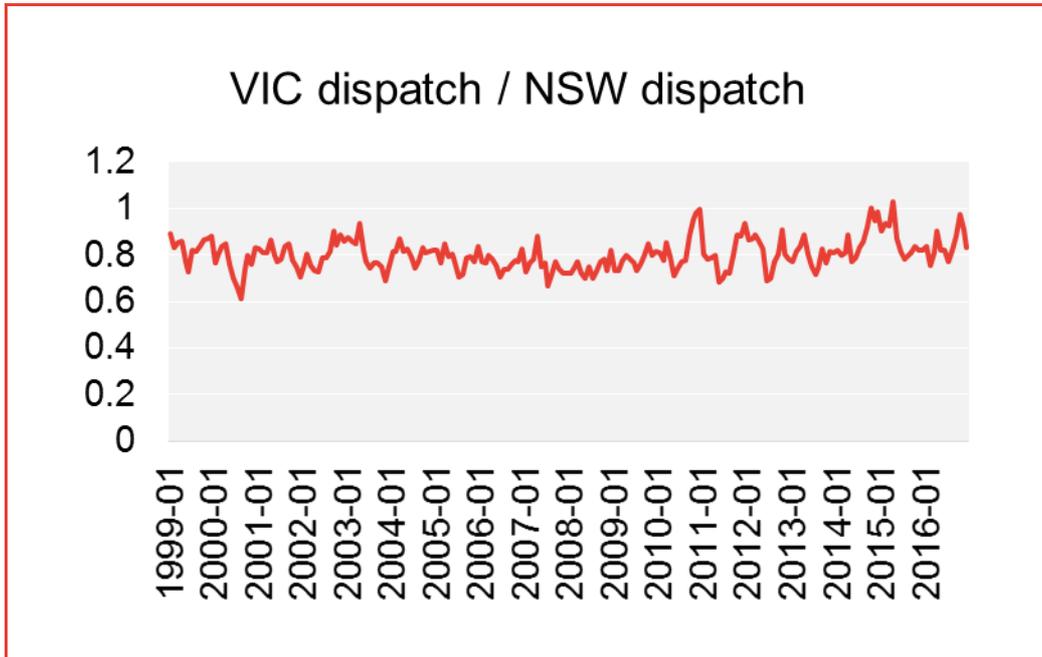
- Liquidity ratios are similar for New South Wales and Victoria, shown below in Figure 1. Accordingly, the hedge volume turnover ratios of New South Wales and Victoria may be expected to be similar.
- The size of the Victoria wholesale market, as measured by dispatched volume, is approximately 80 percent of New South Wales, as shown in Figure 2.

Figure 1: Liquidity ratios



Source: Macleod report (2014), Figure 22.

Figure 2: Relative dispatch volumes



Source: Frontier Economics analysis of NEMWEB data

- Examining hedge volume turnover ratios in NSW, we determined based on Figures 20-21 of the Macleod report a hedge contract volume of 28,500 MW. Hedge demand is taken to be 5,100 MW for New South Wales prior to the Macquarie Generation acquisition in 2014, as reported in the Macleod report.¹⁴ This yields a ratio of 5.59, as noted by the Tribunal.¹⁵
- Accordingly, we assume that in Victoria, prior to the Loy Yang acquisition, hedge contract volume was 22,800 MW and hedge demand was 4,080 MW, yielding a hedge volume turnover ratio of 5.59.
- In determining the response of the contract market to the acquisition, we assume that the impacts on supply and demand are limited to the changes in positions of the parties involved: AGL and the acquired generators. This is due to data limitations: we only directly see the swap contract positions of AGL and the acquired generators. This approach rules out a compensating increase in volume supply from alternative generators. Accordingly, we consider that the estimated impact on liquidity is pessimistic: generators have

¹⁴ Para 419.

¹⁵ Para 328.

been observed to increase contract supply in response to reductions in supply from competing generators.¹⁶

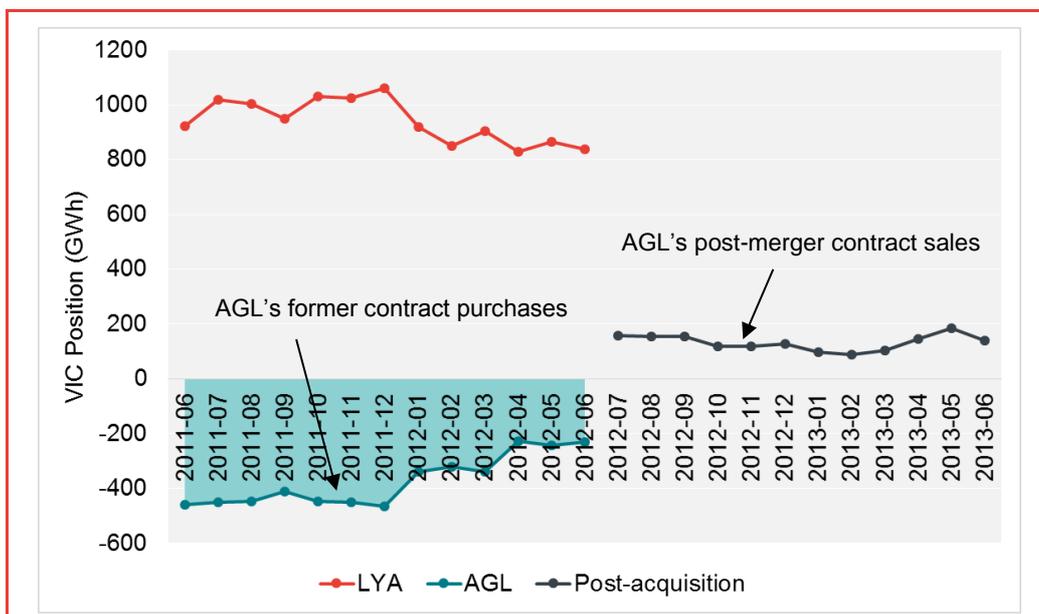
- To determine the change in the hedge volume turnover ratio, we determine the change in contract volume, and the change in hedge demand. The change is based on the positions of AGL and the relevant generator in the six months preceding and following the acquisitions. For Loy Yang A, we compare the first half of 2012 to the second half of 2012. For Macquarie Generation we compare March-August 2014 and September 2014-February 2015.¹⁷

3.3 Results

3.3.1 Loy Yang A

As can be seen in Figure 3, at the time of the acquisition, Loy Yang was a net seller in the Victorian swap market while AGL was a buyer. Following the acquisition, the vertically-integrated AGL business became a net seller of contracts.

Figure 3: Swap positions of AGL and Loy Yang A



¹⁶ We do note that in the past, AGL has been observed to increase its supply of hedge contracts in a region (backed by baseload generators in the region) considerably at the time of closure of baseload generators in a region, see Section 3.5.

¹⁷ We also considered a simple month before and after analysis. While results were similar, this approach reduces the time available for the acquisition to impact behavior (relevant for the Macquarie Generation acquisition, Figure 4 shows a substantial change between September and October 2014), while also increasing the impact of monthly fluctuations.

Source: Frontier Economics analysis of data provided by AGL

The acquisition reduced the supply of contracts from an average of 867 GWh in the first half of 2012 to 138 GWh in the second half of 2012 – a decrease of 729 GWh, or 998 MW. However, the acquisition also reduced hedge demand, reducing AGL’s contract demand from 284 GWh (389 MW flat) on average in the six months prior to the acquisition to zero in the period afterwards. The shaded area represents the swap contracts previously bought by AGL at the Victorian regional reference price (RRP). Post-acquisition, AGL no longer needed to procure these contracts, which were instead made available for other retailers. This increased availability of contracts improves contract liquidity, as shown below.

Table 1: Impact of Loy Yang A acquisition

	Pre-acquisition	Post-acquisition
Hedge contract volume (MW)	22,800	21,802
Hedge demand (MW)	4,080	3,691
Hedge volume turnover ratio	5.59	5.91

Source: Frontier Economics analysis of data provided by AGL and from the Macleod statement (2014)

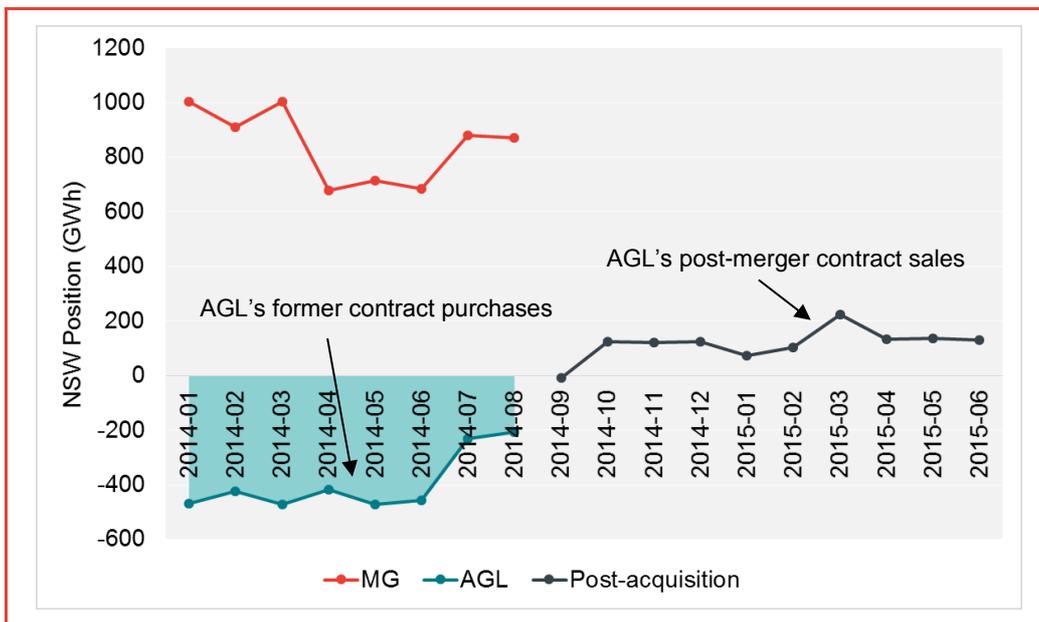
Table 1, demonstrates that the net impact of the Loy Yang acquisition on contract liquidity was positive. The hedge volume turnover ratio increased from 5.59 to 5.91, as the reduction in supply of contacts was offset by the reduction in contract demand. This increased liquidity by increasing the ability of retailers to acquire contracts: the volume of contracts available for each unit of retailer contract demand increased. This contrasts with the measured impact of the transaction on the ACCC’s liquidity ratio – the liquidity ratio decreased, as it includes the reduction in supply from the generator in the transaction. However, the liquidity ratio measure ignores the reduction in demand for contracts from the retailer in the transaction.

3.3.2 Macquarie Generation

As can be seen in Figure 4, at the time of its acquisition, Macquarie Generation was a net seller of contracts in the New South Wales swap market while AGL was a buyer. Following the acquisition, the integrated AGL business became a net seller of contracts.^{18,19}

¹⁸ In September 2014, AGL maintained a net buy position of 9 GWh; the acquisition took some time to fully impact the position of AGL.

Figure 4: Swap positions of AGL and Macquarie Generation



Source: Frontier Economics analysis of data provided by AGL

The acquisition reduced the supply of contracts from an average of 806 GWh in the 6 months prior to 89 GWh in the 6 months subsequent, a decrease of 716 GWh, or 981 MW. However, the acquisition also reduced hedge demand, reducing the demand from AGL from 376 GWh (515 MW flat) on average in the six months prior to the acquisition to zero in the period afterwards. As previously, the shaded area represents the swap contracts previously bought by AGL at the NSW RRP. Post-acquisition, AGL no longer required these contracts,²⁰ again leading to an increase in contract availability and greater liquidity, as shown below.

Table 2: Impact of Macquarie Generation acquisition

	Pre-acquisition	Post-acquisition
Hedge contract volume (MW)	28,500	27,519
Hedge demand (MW)	5,100	4,585
Hedge volume turnover ratio	5.59	6.00

Source: Frontier Economics analysis of data provided by AGL and from the Macleod statement (2014)

¹⁹ Contracting with Tomago aluminium smelter is omitted from the analysis; it is assumed that these long term contracts were not affected by the acquisition.

²⁰ Notwithstanding a trivial position in the month of acquisition.

Table 2 demonstrates that the net impact of the acquisition on liquidity was positive. The hedge volume turnover ratio increased from 5.59 to 6.00, as the reduction in supply was offset by the reduction in demand for contracts. As was the case with Loy Yang A, the transaction increased liquidity by increasing the ability of generators to acquire contracts.

3.4 Impact of AGL's vertical integration

The preceding analysis calculated the impact on the hedge volume turnover ratio of the vertical integration transactions involving AGL, assuming that third parties' demand and traded volumes of hedges did not change as a result of the transactions. We note that such an assumption is restrictive; to the extent that a vertically-integrated AGL reduces its hedge contract supply compared to before the transaction, other generators may be induced to supply more volume to the contract market. The opposite may also occur. Assumptions regarding starting values were also required for Victoria due to incomplete information.

Nevertheless, our analysis provides an estimate of at least how AGL's vertical integration and contracting decisions may have affected contract liquidity. We find that the transactions have resulted in an *increase* in liquidity, due to the reduction in hedge demand they involve. Removing AGL from the demand side of the hedge market has increased the ease with which competing retailers can acquire hedge contracts.

3.5 Impact of plant closures on AGL's contracting behaviour

The next step we took was to consider generator responses to major reductions in supply from the recent closures of scheduled plant in the NEM. The rationale for this was that such baseload generators are far more likely to supply firm contracts than semi-scheduled and non-scheduled plant.

This aspect of the analysis examined AGL's contracting behaviour following the recent closure of Alinta's Northern plant in South Australia in 2016.²¹ The purpose of this analysis is to ascertain whether, as a vertically-integrated entity, AGL made a positive or negative contribution to contract liquidity following this plant exit. This may allow inferences to be made about the behaviour of other

²¹ While we also examined the impact of the Hazelwood closure in Victoria (2017), the findings were less clear, perhaps owing to the sudden announcement November 2016 and the retained ownership of Loy Yang B by Hazelwood owner Engie. Subsequent to the announcement AGL increased swap contract supply, subsequently reducing to pre announcement position in April 2017, then increasing offering by 250 GWh through to December 2017.

vertically-integrated energy businesses, and generators in general, following plant departures or exogenous reductions in the supply of hedge contract volumes.

Northern Power Station

Northern power station was a coal fired baseload generator supplying up to 520 MW in the South Australian region of the NEM. This would presumably have enabled its owner, Alinta, to offer a significant volume of swap contracts to South Australian retailers. Following Northern's closure on 31 March 2016, Alinta no longer owned baseload generation in South Australia, reducing its ability to supply swap contracts. However, AGL was in a position to supply contracts in South Australia, given that it owns the Torrens Island A and B generators.

We find that AGL did in fact increase its swap position in response to the closure. In March 2016, AGL was a net buyer of contracts in South Australia, buying 49 GWh. In May 2016, following the closure, it was a net seller, selling 111 GWh. This increase in position, a change of 160 GWh, represents approximately 50% of the swaps that may have been offered by Alinta/Northern.²² Accordingly we conclude that the response of vertically integrated AGL at least partially offset any reduction in contract volume resulting from the closure of the Northern plant.

²² Assuming a swap position equal to 80 percent of nameplate capacity.

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