



30 November 2017

Mr Rod Sims  
Chairman  
Australian Competition and Consumer Commission  
GPO Box 3131  
Canberra ACT 2601

Submitted by email: [retailelectricityinquiry@acc.gov.au](mailto:retailelectricityinquiry@acc.gov.au)

Dear Mr Sims

### **Public Submission to Retail Electricity Pricing Inquiry Preliminary Report**

Origin Energy Limited (Origin) welcomes the opportunity to respond to the Australian Competition and Consumer Commission (ACCC) Inquiry into retail electricity supply and pricing Preliminary Report. The main points of our submission are summarised below, with additional detail provided in Appendix A. Origin has also provided additional information relevant to this submission in Appendices B, C and D, which have been provided in a separate attachment on a confidential basis.

#### **Retail market**

While there are many factors that point to the competitiveness of retail markets across the National Electricity Market (NEM), the sector must continue to evolve so that all consumers can more broadly benefit from competition. Many areas for improvement were identified through the Prime Minister's roundtable discussion with a group of eight retailers in August. As a result, Origin has agreed to implement several initiatives. If the benefits of these reforms are to be fully realised by all consumers, they should be universally adopted by extending their application to all retailers.

**Comparing offers:** More needs to be done to assist consumers to compare offers and Origin is working with the Australian Energy Regulator (AER) alongside other market participants to develop the methodology for a comparator rate. The practice of discounting should be supplemented by also marketing in dollar terms, which would give customers a better understanding of pricing and assist them to effectively choose the offer that best suits their needs. Origin recently launched our own bill comparison website called 'Savernator' on 2 November 2017 to provide customers with personalised dollar savings calculations.

**Customer engagement:** More is being done to increase customer engagement. At the Prime Minister's roundtable meeting, each retailer agreed to write to standing offer customers by the end of 2017 reminding them they are on a standing offer and informing them that alternative offers are available. Additionally, the Australian Energy Market Commission (AEMC) has recently introduced a new rule that will require retailers to notify small customers of changes to the benefits under their retail electricity and gas contracts. The expectation is the rule will increase engagement by prompting customers to research energy offers and by giving them the information they need to do so.

**Vulnerable customers:** The Commonwealth Government should play a central role in ensuring vulnerable customers have access to affordable energy through the establishment of a national concessions framework. The AER should also leverage the Victorian government's recent review of hardship in the state to develop a set of national standards that would allow for consistency in the regulatory treatment of customers in hardship.

**Innovation and new product development:** We note the comments in the Preliminary Report that there has been limited evidence of significant product innovation across retail markets. In response, we reiterate the views expressed in our submission to the Issues Paper, that through new technology and increased digitalisation the market is on the cusp of a wave of innovation. In this submission, we outline several new products and innovations that are in various stages of the development life cycle.

### **Wholesale market**

**Concentration levels and market power:** The ACCC has raised concerns around wholesale electricity competitiveness, particularly the level of concentration and the impact this may have on prices. Generally, with perhaps the exception of Queensland, concentration levels across the NEM are not inconsistent with those observed in some key international markets. Further, there is no evidence of the exercise of substantial market power in the NEM, with prices generally below long run costs. Recent and pending changes to the electricity rules will also limit any potential exercise of market power.

**Vertical integration:** The ACCC has indicated it is concerned about the impact vertical integration might have on the ability of standalone retailers to compete. While each of the large retailers control substantial generation assets, the extent of effective integration is limited, as generally there is a significant mismatch in terms of the location and profile of generation with retail load. Vertically integrated retailers also have a strong incentive to supply or purchase hedge contracts (even in preference to using generation to back their retail load) if hedge prices diverge from expected spot prices. As seen in Appendix C, Origin is an active participant in the contracts market.

There are several factors that have impacted movements in traded volumes across the NEM. Even if conceptually, integrated firms have a lower trading requirement when compared to stand-alone entities, there is no evidence vertical integration has caused any downward trend in traded volumes. Additionally, there are no signs that the presence of vertical integration places upward pressure on wholesale prices.

**Recent price increases:** It is evident prices continue to be influenced by demand as manifested by changes in weather; and supply, as determined by generator availability and fuel constraints. The further tightening of supply with the retirement of Northern power station and Hazelwood has effectively amplified the impact of the traditional drivers of price movements, resulting in the recent uplift. Additionally, a new dynamic has emerged with higher coal prices, an increased requirement for black coal generation (again due to the closure of Hazelwood) and greater challenges in managing coal stockpiles, all combining to also exert pressure on prices.

The volume of hydro generation has also been down this year, which exacerbates supply/demand tightness.

**Investment incentives:** There has been much debate on the supply/demand balance in the electricity market and whether it is indicative of some broader failing. The NEM has a history of new investment in response to higher prices, however a number of factors have combined that now make investing more challenging. These include ongoing policy uncertainty and increasing government intervention; technology disruption and the increasing uptake of decentralised energy; and uncertainty around future prices. Emissions reduction policy has been particularly problematic, with an extended period of uncertainty around the Renewable Energy Target and years of speculation about a carbon price preceding its introduction in July 2012, and removal two years later.

Where there has been investment in the market, it has been in renewable generation. The Preliminary Report questions the extent to which large retailers are the only beneficiaries of renewables investment.

Over the past few years there has been an emergence of new models to underwrite renewable energy projects. This has added diversity to the contracting of power purchase agreements (PPAs) by both counterparty and location, with many customers, merchant players and smaller retailers now underwriting PPAs. The recent investment boom in utility scale solar has contributed to this trend, as solar is modular and allows contracting parties to more easily size a project to their requirements.

If you wish to discuss any of these issues further, please contact Steve Reid in the first instance at [steve.reid@originenergy.com.au](mailto:steve.reid@originenergy.com.au) or on 02 9503 5111.

Yours sincerely

Anthony Lucas  
Executive General Manager Future Energy and Business Development

## 1 Retail market reforms

As outlined in our submission to the Issues Paper, there are many factors that point to the competitiveness of retail markets across the NEM. Nevertheless, the sector must continue to evolve so that all consumers can more broadly benefit from competition. Many areas for improvement were identified through the Prime Minister's roundtable discussion with a group of eight retailers in August, as a result of which several initiatives have been implemented. The Victorian Government is also considering adopting several measures proposed by an independent review panel.<sup>1</sup> If the benefits of these reforms are to be fully realised by all consumers, they should be universally adopted by extending their application to all retailers.

We discuss these and other potential reform areas in more detail below.

### 1.1 Comparing offers and discounting

More needs to be done to assist consumers to compare offers. As part of the PM's roundtable discussion, the AER was charged with leading work on the development of a comparator rate and user friendly fact sheets. The AER has subsequently established a working group (of which Origin is a member) to progress this work.

The current practice of percentage discounting while beneficial for many customers, can also add to the difficulty for some in comparing offers. In our view also marketing in dollar terms would give customers a better understanding of costs, assisting them to effectively choose the offer that best suits their needs.

Origin has undertaken some recent initiatives to facilitate the expression of offers in dollar terms. Our call centre is now able to provide customers with a bill estimate under both an Origin offer, or that of a competing retailer, allowing for a comparison. To do so, we ask customers for some information to estimate their bills, such as their post code, supply charge and usage rate. We then use this information to advise them of how much they may or may not be better off with Origin.

Under Origin's "Predictable Plan" customers can pay the same agreed monthly dollar amount for 12 months, irrespective of usage, thereby receiving clarity and certainty around their energy cost.

On 2 November 2017 we launched our own bill comparison website, called 'Savernator'<sup>2</sup>, that will provide personalised dollar savings calculations to customers. All a customer will need to do is upload a PDF bill from any retailer, or manually enter basic consumption details, and they will be provided with an estimate within seconds of whether they are better or worse off on their current plan compared with Origin's Maximiser or Saver plan. In keeping with the clarity and transparency of the tool, if a customer is already on a plan better than Origin can offer, then the website will congratulate them.

Another issue of concern has been the practice by some retailers of discounting off prices inflated above the standing offer. Origin's practice is to discount only from a price that is the equivalent to the standing offer. We do not have market rates that exceed the standing offer rate. At present, our discounts for residential customers are off the same rate, which is reflected in the Standing Offer. Origin supports a proposed rule change that requires a reference price for discounting to be the same as a retailer's standing offer.

---

<sup>1</sup> Review of Electricity and Gas Retail Markets in Victoria,  
[https://engage.vic.gov.au/application/files/7415/0267/4425/Retail\\_Energy\\_Review\\_-\\_Final\\_Report.pdf](https://engage.vic.gov.au/application/files/7415/0267/4425/Retail_Energy_Review_-_Final_Report.pdf)

<sup>2</sup> <https://www.originenergy.com.au/savernator.html>

We also welcome the ACCC's intention to examine the suitability of the Energy Comparator Code of Conduct. The ACCC should consider how the Guideline could be more effectively enforced, particularly in relation to information disclosure requirements. Both the voluntary Code of Conduct and ACCC Guidelines address the issue of transparency of commercial interests and disclosure. However, some commercial comparator websites and their agents may not always be adequately disclosing the fees and commissions they obtain for the promotion of offers. Customers should know this information before choosing a plan; not doing so could undermine consumer confidence in commercial comparators, which otherwise serve a useful purpose of engaging customers with choosing an energy plan.

## *1.2 Customer engagement*

More is being done to increase customer engagement. At the Prime Minister's roundtable meeting, each retailer agreed to write to standing offer customers and those whose benefit period has expired within the last 24 months by the end of 2017, reminding them they are on a standing offer (or their benefit period has expired) and informing them that alternative offers are available. In the correspondence, customers will also be advised of the AER Energy Made Easy website or its Victorian equivalent.

Additionally, the AEMC has recently introduced a new rule that will require retailers to notify small customers of changes to the benefits under their retail electricity and gas contracts. The expectation is the rule will increase engagement by prompting customers to research energy offers and by giving them the information they need to do so.

The rule will be implemented in stages commencing on 1 February 2018 when retailers will be obliged to contact customers 20-40 days before a change in benefits, outlining simple information including when the benefits will change and whether any early termination charges would apply. By 1 July 2018, the AER will publish guidelines on more detailed information to be provided, with retailer compliance set to commence no later than 1 October 2018. The guidelines are expected to contain information that will assist customers in comparing available offers, including any differences between the current benefit period and prospective offers.

Origin currently notifies all our customers in simple and clear language before their discount period ends and asks customers to contact us or follow a web link to arrange a new energy plan. We contact customers more than 30 days ahead of the discount period ending by letter or email based on the customer's preference. Our communication is clear that a customer's current discount will not continue if they do not choose a new plan. Notwithstanding this, we support the AEMC's new rule and consider it will be beneficial, particularly where it results in greater consistency across the market.

## *1.3 Bill management*

Origin recognises that quarterly billing based on the conventional meter reading cycle can exacerbate bill shock and is a source of payment problems for some customers resulting in financial difficulty and hardship.

Origin has run campaigns to encourage our smart meter market customers on to monthly billing, and our default market offer for smart meter customers is monthly billing on an opt-out basis. As our smart meter roll out progresses we intend to promote monthly and electronic billing to those customers with a smart meter. Furthermore, Origin offers more flexible payment options for all customers regardless of whether they have a smart meter. This includes weekly, fortnightly and monthly payment options under EasiPay and Predictable Plan. Our customers also have the option to prepay at any time through our online portal, My Account.

Several hundred thousand of our customers have opted to take up more frequent and flexible payment plans.

The Commonwealth Government is also consulting on the merits of changing Explicit Informed Consent requirements to assist retailers in moving customers to monthly billing, a proposal we support.

#### *1.4 Customer access to data*

Despite the existence of minimum standards governing consumers access to metering data, the ACCC has expressed concern that the process is unnecessarily complex and acts as a barrier to data being used to benefit customers.

Origin supports the underlying principle that consumers should be able to access information relating to their account to make informed choices about when and how energy is consumed. The ability of consumers to understand their energy consumption is an important part of supporting a well-functioning and efficient energy market.

Energy companies, like Origin, are investing significantly in the collection, collating, storing and analysis of data to provide more targeted products that allow consumers to make more informed choices about their energy use. There are strong incentives on companies to collect data as a means of understanding their business and to share this data with consumers.

Data sharing methods in the energy sector are continually evolving as technologies and metering capabilities advance. Customers are able to log into web portals to obtain energy consumption data, in-home energy displays can be installed and usage can be viewed on apps on hand held devices. Further, third parties (with the customers' consent) can request standardised data from an energy provider at any time, with this data able to be downloaded to market analysis tools. We believe these options are diverse and adequately provide a means for customers to obtain information regarding their energy consumption.

Energy data is complex and is only likely to be useful for consumers to the extent they can comprehend the data. Therefore, in considering additional reforms in this space, there is a need to determine the level of data a customer requires and how best this can be made available. Origin supports efforts aimed at simplifying the way in which data is presented and raising the awareness of how metering data can be of use to customers.

We note that the Commonwealth Government is currently considering recommendations from the Productivity Commission on customer access to data.

#### *1.5 Vulnerable customers*

As part of the Prime Minister's roundtable, retailers committed to working with the AER to share best practice elements in hardship programs, with the AER expected to complete a review of the hardship regime later this year.

Origin believes our *Power On Hardship Program* is best practice for customers facing payment difficulty. We are also launching a new product exclusively for concession customers that will offer a discount off the supply and usage charges – not just usage. This product will provide concession customers with an ongoing discount.

The Essential Services Commission of Victoria (ESC) recently concluded a comprehensive two-year review in the State. It would therefore be constructive for the AER to leverage the ESC's work in its review, with the aim of establishing minimum national standards. With consistency across jurisdictions an ongoing issue for retailers, this would be a welcome change.

The Commonwealth Government should play a central role in ensuring vulnerable customers have access to affordable energy through the establishment of a national concessions framework. This should provide for a consistent and transparent approach to customer assistance ensuring that customers most in need of help can receive it. Concessions were last reviewed nationally 10 years ago.

### 1.6 Customer Retention

Origin considers that the opportunity to make counter-offers to retain customers is a critical element of any well-functioning market and is a standard practice in many different industries. We believe the process of engaging with a customer following notification that a customer has signed with a competitor allows a retailer to revisit the customer's circumstances and to update their offering so that it remains tailored to the customer's needs. In some cases, the counter offer will be better; but not always. Irrespective, the customer will be presented with greater choice and be in a position to achieve the best possible deal.

Removing the ability for retailers to win-back customers will reduce the competitive dynamic in the market. It could also give rise to greater loss of comparability in offers and increase the risk of provision (accidental or deliberate) of misinformation to customers.

Furthermore, we do not believe there is evidence to demonstrate that win-backs are having a material negative impact on retail competition; on the contrary, we believe it promotes competitive tension and drives better customer outcomes.

## 2 Innovation and new product development

The ACCC comments in the Preliminary Report that there has been limited evidence of significant product innovation across retail markets. In response, we reiterate the views expressed in our submission to the Issues Paper, that through new technology and increased digitalisation the market is on the cusp of a wave of innovation. Technology is changing how consumers interact with energy. A raft of new technologies (primarily behind the meter) will fundamentally change the way Australia's energy system operates. Origin sees this as a huge opportunity to help customers use energy smarter and more efficiently.

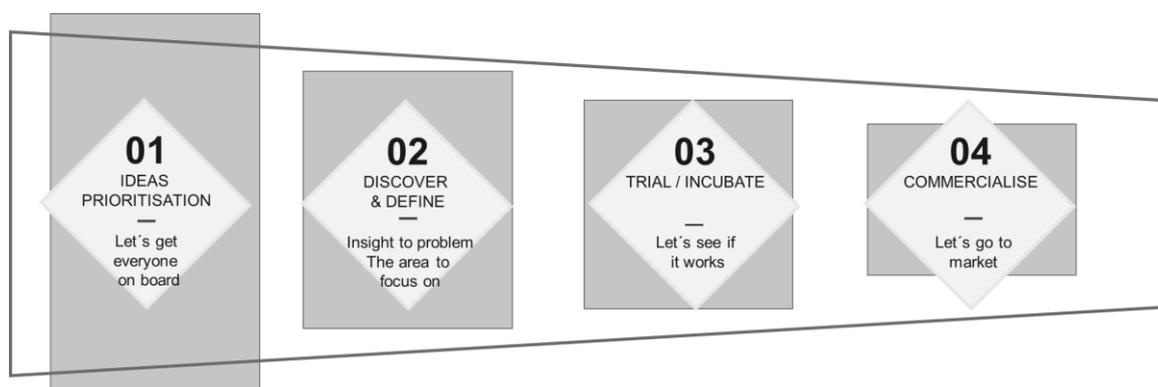
Origin has commenced a series of initiatives that aim to anticipate and respond to changing customer demand, including:

- Launching *O hub* – a collaborative work-space where Origin is co-located with other Australian start-ups, dedicated to rapidly prototyping and trialling new energy solutions for customers.
- Co-founding Free Electrons – a global accelerator bringing together eight forward-thinking utilities and 12 leading start-ups in renewables, smart grids, electric vehicles and home energy management.
- Principal Sponsor of EnergyLab – the new home for clean energy innovation and Australian Energy technology start-ups, which is located at the University of Technology, Sydney.

- Numerous trials and pilot programs for both residential and business customers – the details of these are provided in Table 1 below.

Origin’s products and innovation development process effectively has four main stages: (1) ideas; (2) discover & define; (3) trial & incubate; and (4) commercialise. As with any development pipeline, the number of ideas that translate into viable products and services reduces as you move closer to commercialisation.

**Figure 1: Stages of Origin’s product and innovation development process**



Below, we outline several new products and innovations at varying stages of the development life cycle. Additional products and innovations are set out in the confidential Appendix B.

**Table 1: New products (Residential)**

Product	Stage	Origin Activity
'Savernator' Bill Comparison website	4 – Commercialised	'Savernator' provides personalised dollar savings calculations to customers. Customers either: (1) upload an original PDF bill from any retailer, or (2) manually enter basic consumption and location details; then receive an estimate within seconds of whether they are better or worse off on their current plan compared with Origin’s Maximiser or Saver plans. On the results page, customers can sign up to Origin’s Maximiser or Saver plans. However, if a customer is already on a plan that Origin can’t beat, the website will congratulate them.  Origin is running a media campaign to encourage both Origin and non-Origin customers to visit the website to see how much they could save. The media campaign will involve Origin investing almost \$4 million across TV, radio, out of home (e.g. billboards, transport) and digital media.  <a href="https://www.originenergy.com.au/savernator.html">https://www.originenergy.com.au/savernator.html</a>
Fast & easy moves	4 – Commercialised	Launched a dedicated phone number for moves, which includes a guaranteed answer in two minutes. Extended call hours and next day moves available online. Alerts and notifications provide customers status updates.

Product	Stage	Origin Activity
Launch of Origin mobile app	4 – Commercialise and ongoing improvements	Origin mobile app launched in August 2017. Currently able to: review energy usage and costs, pay gas and electricity bills, set alerts to track energy use and bill due dates and with smart meters, predict next bill. Continue to identify functionality improvements.
Origin App on Google Home Agent (replaces Google Home Origin bill support)	4 – Commercialised & ongoing improvements	The Google Home Agent is an Origin application deployed through the Google Assistant and Home Device. Our first release provides Energy Saving Tips based on your local weather. Have a Google Home and want to check it out? Try 'Hey Google, let me talk to Origin Energy'.
ChatBots	4 – Commercialised and ongoing improvements	We're using ChatBots on selected FaceBook Messenger customer enquiries to provide fast, automated responses and help them solve their problem.
LiveChat	4 – Commercialised	We've added a LiveChat option to selected sales and service experiences online to improve the customer experience and help customers successfully complete their task.
Solar + Grid energy offers	4 – Commercialised	Customers who buy an eligible solar system from Origin can access a Solar Boost Plus Energy Plan, which offers a higher FiT than otherwise available and discounted electricity usage charges.
Energy use disaggregation – TRIAL	3 – Trial / Incubate	In collaboration with California startup Bidgely, trialling disaggregation technology to provide 5,000 customers across Victoria with insights into where energy is being used in their household.  The technology takes a customer's smart meter data and uses a machine learning approach called disaggregation to analyse the unique data signatures – or fingerprints – for each appliance. By combining this with weather data and statistical analysis, Origin can provide the customer with an estimate of what different energy appliance categories are contributing to their bill.  During the trial, we will provide customers with alerts at both the half way mark of the bill and at the end of the bill cycle via SMS/email.  Customers will be provided with a comparison of their energy use relative to previous periods and they will receive helpful tips on how they may be able to adjust their energy use and save money.

Product	Stage	Origin Activity
Home HQ – TRIAL	3 – Trial / Incubate	In August 2017, Origin started a trial of Home HQ, a DIY smart home monitoring kit with a smart phone app with 300 customers. Home HQ connects through a customer’s existing home wi-fi network and can be controlled on their phone through the Home HQ mobile app. The Home HQ kit focuses on home monitoring and includes a range of sensors that detect when your doors or windows are opened or motion is detected in your home. The technology allows users to set notifications to send alerts when any of the devices are activated in their home. Our technology trial partner is People Power, a US-based software company. <a href="http://www.originhomehq.com.au/">http://www.originhomehq.com.au/</a>
Solar Saver Product - TRIAL	2 & 3 – Iterating between trial & discover and define	Current piloting in SA (commenced Aug 2017): this offer combines a grid supply contract and a Solar Power Purchase Agreement (SPPA). Solar Saver offers high usage customers a 5.4kW system under a long/no-fixed term contract for \$0 owned and maintained by Origin.  Under the product model, the customer pays the same ‘discounted’ rate for all the energy supplied to the home, i.e. from both solar and grid. Customers are guaranteed their discounted energy rate will always be at least 5 per cent better than Origin’s best published rate so long as they remain on the Solar Saver plan. Customers can also choose to buyout the system at any time should they wish to own the system outright and optimise their savings from avoided grid costs.
Community energy (Peer to Peer) and blockchain technology – TRIAL	2 – Discover & define	Origin is undertaking a desktop technical trial with Power Ledger, Australian blockchain peer to peer technology company. The trial involves using anonymised and historical customer data to explore the benefits and challenges of peer-to-peer energy trading across the regulated network and prove the accuracy and security of the Power Ledger trading platform.

**Table 2: New products (Business Energy – SME & C&I)**

Product	Stage	Origin Activity
EnergyLink	4 – Commercialised	This Energy Management System provides energy insights and personalised energy recommendations to business customers. The online portal offers business customers a means to better understand energy consumption and opportunities to improve energy efficiency. The portal uses weather data, industry benchmarking, online billing and a daily charge calculation. Real time recommendations to introduce relevant products and services are also available. Available in an insights and premium version.  <a href="http://originbusinessenergy.com.au/">http://originbusinessenergy.com.au/</a>

Product	Stage	Origin Activity
Demand management – TRIAL	3 – Trial / Incubate	A new flexible energy demand trial with C&I customers in SA this summer (2017/18). Working with UK-based start-up Tempus Energy, the trial will seek to use Tempus's demand-side management platform to shift non-time critical load into cheaper periods or when renewables are plentiful and test the potential savings that could be unlocked for the customer. Tempus is part of Free Electrons.
Power Factor Correction – TRIAL	3 – Trial / Incubate	Trial to install equipment that can correct (improve) a business customer's power factor, reducing network costs. Customer has the option to share benefits in return for no upfront cost for equipment. Product information available on Origin website.

### 3 Wholesale Market

Origin notes the ACCC has raised concerns around the competitiveness of the wholesale electricity market, particularly the level of market concentration and the impact this may have on prices.

Generally, with perhaps the exception of Queensland, concentration levels across the NEM are not inconsistent with those observed in some key international markets. Market concentration in Queensland is at elevated levels following the consolidation of the government owned generators in 2011 – a decision that should be reviewed. We note the Queensland Government recently directed its government owned generation business to amend its bidding behaviour. While this appears to have reduced wholesale forward market prices, it is a temporary measure and should not be viewed as a substitute for structural reform.

The ACCC has also queried whether vertical integration might have an impact on wholesale prices. Origin considers that to the extent vertical integration has any impact on wholesale prices, it is likely to lower the incentive for integrated generators to offer generation at high prices, due to the integrated entity's potential exposure to high pool prices.

The ACCC has also raised broader concerns about the impact that vertical integration – particularly by what it refers to as the 'big three' – may have on standalone retailers' ability to compete. While each of the large retailers control substantial generation assets, the extent of effective integration cannot be determined by simply observing an integrated entity's generation and load. There is significant mismatch between the location and profile of the generation and retail loads of each of these retailers. Additionally, vertically integrated retailers have a strong incentive to supply hedge contracts, even in preference to using generation to back their retail load, if hedge prices diverge from expected spot prices, although the limited market size and reliance on a high proportion of renewable generation and imports may at times limit availability of local hedging products in SA.

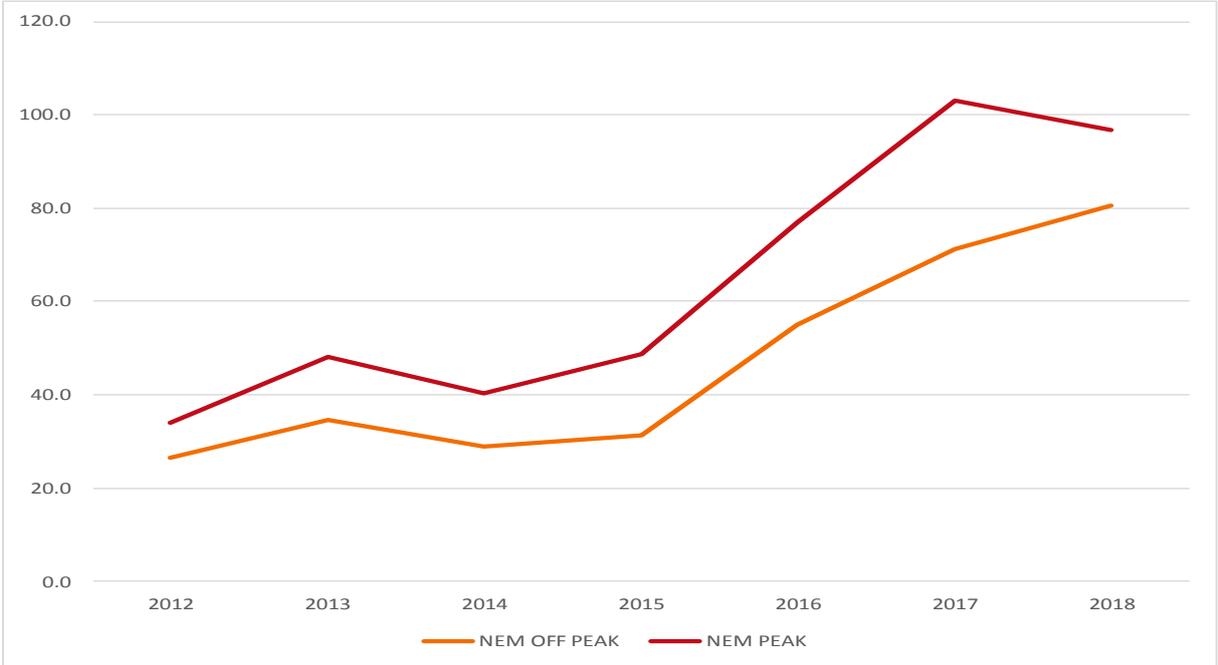
#### 3.1 *No evidence of substantial market power*

The Preliminary Report states that wholesale electricity costs fell slightly in real terms between 2007-08 and 2015-16. Such outcomes appear to be inconsistent with any systemic detrimental exercise of market power.

Where there might be cause for concern in energy only markets is if prices sit above long run costs for an extended period – that is, where there is exercise of substantial market power.<sup>3</sup> As highlighted in our submission to the Issues Paper – this has not been the case in the NEM.

Chart 1 shows that movements in peak prices have generally mirrored that of off peak prices, which indicates that fluctuations have been due to changes in market fundamentals such as increases in fuel costs (e.g. gas, and recently coal) and a tightening demand/supply balance. In Chart 2 we see that the reserve margin in the NEM (as measured by available supply minus demand) has been on a downward trajectory since 2014. If price increases had been primarily due to the exercise of market power, a more distinct uplift would be expected in peak prices given any exercise of market power would be more likely at periods of higher demand.

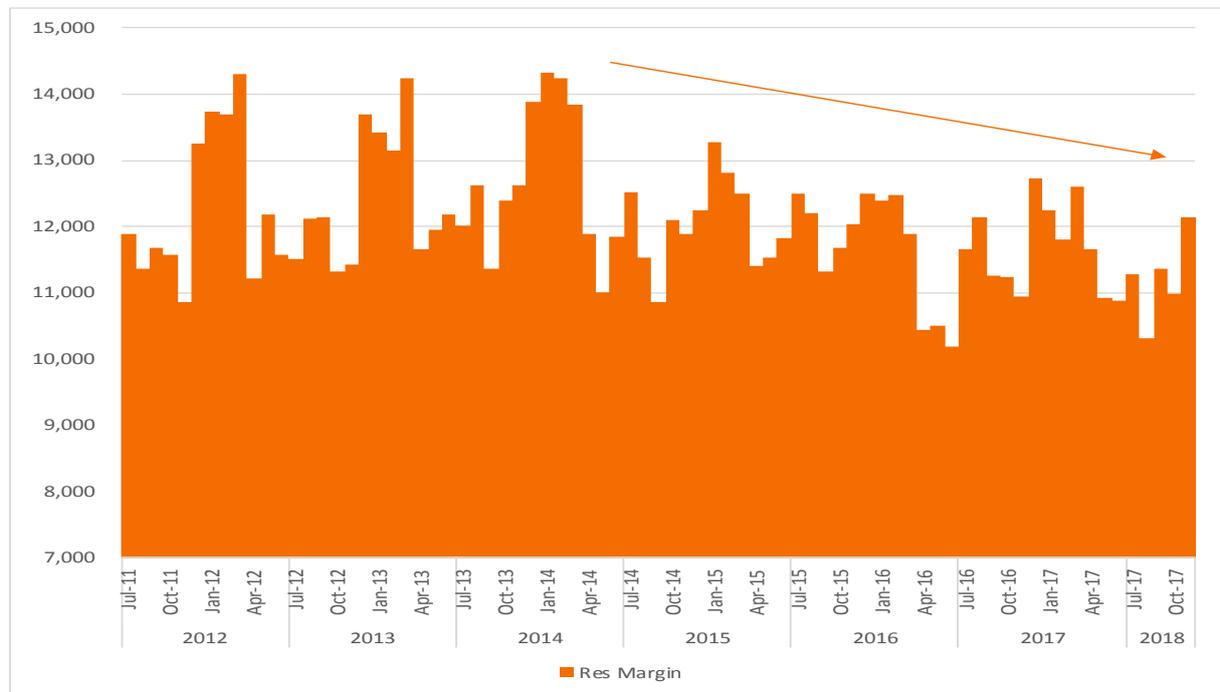
**Chart 1: NEM peak and off-peak average prices have moved together<sup>4</sup>**



<sup>3</sup> See AEMC, Final Rule Determination, Potential Generator Market Power in the NEM, 26 April 2013 which found that “transient pricing power, manifesting itself through occasional spot price spikes, is an inherent feature of a workably competitive wholesale market, and is only a concern if it occurs frequently enough and to a significant enough magnitude to lead to average annual wholesale prices being above the long-run marginal cost (LRMC) of generation”.

<sup>4</sup> Origin analysis, AEMO data.

**Chart 2: NEM reserve margin<sup>5</sup>**



### 3.2 Recent and impending rule changes will further restrict any exercise of market power

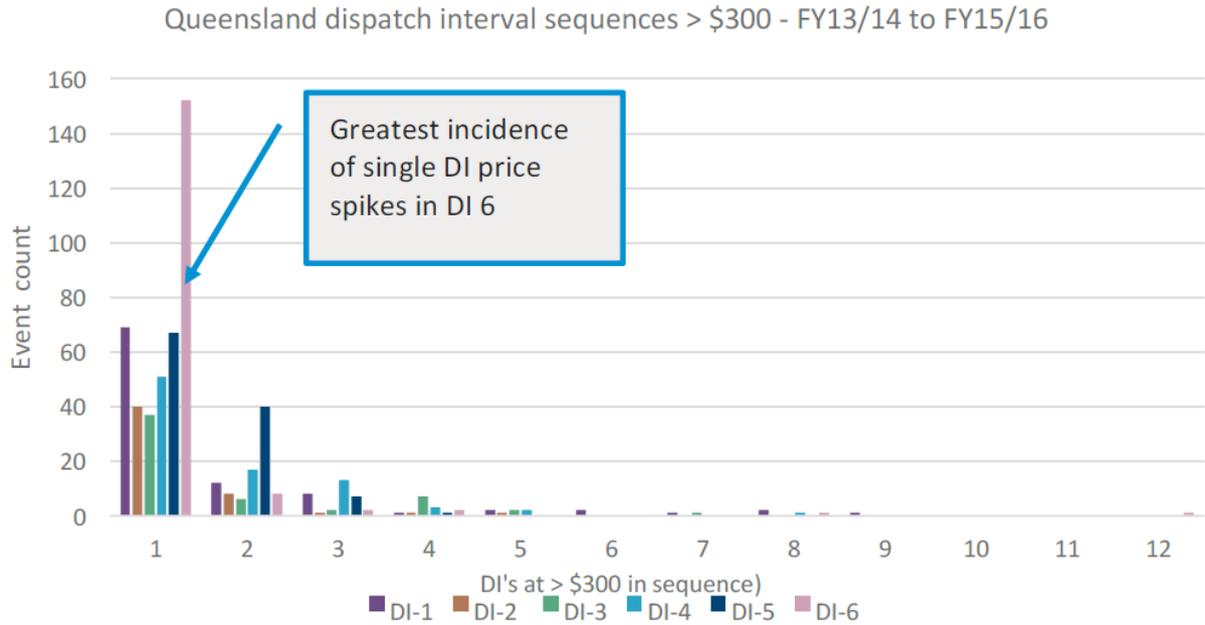
In 2013 the South Australian government raised concerns around the potential for market participants to deliberately delay their rebids to withhold information from the market and influence spot price outcomes. While there was no evidence generators were exercising substantial market power, the ensuing consultation process resulted in the AEMC introducing changes to the rules on 1 July 2016 that placed more stringent rebidding obligations on market generators. These include:

- a prohibition on false or misleading offers, and a requirement that rebids be made as soon as practicable after a change in the material conditions and circumstances upon which the initial offer was based; and
- new information recording requirements for rebids made close to dispatch. For every rebid made during, or less than 15 minutes before the commencement of the trading interval to which the rebid applies, a generator will need to record information on the material conditions and circumstances that gave rise to the rebid. These records are to be made available to the AER on request.

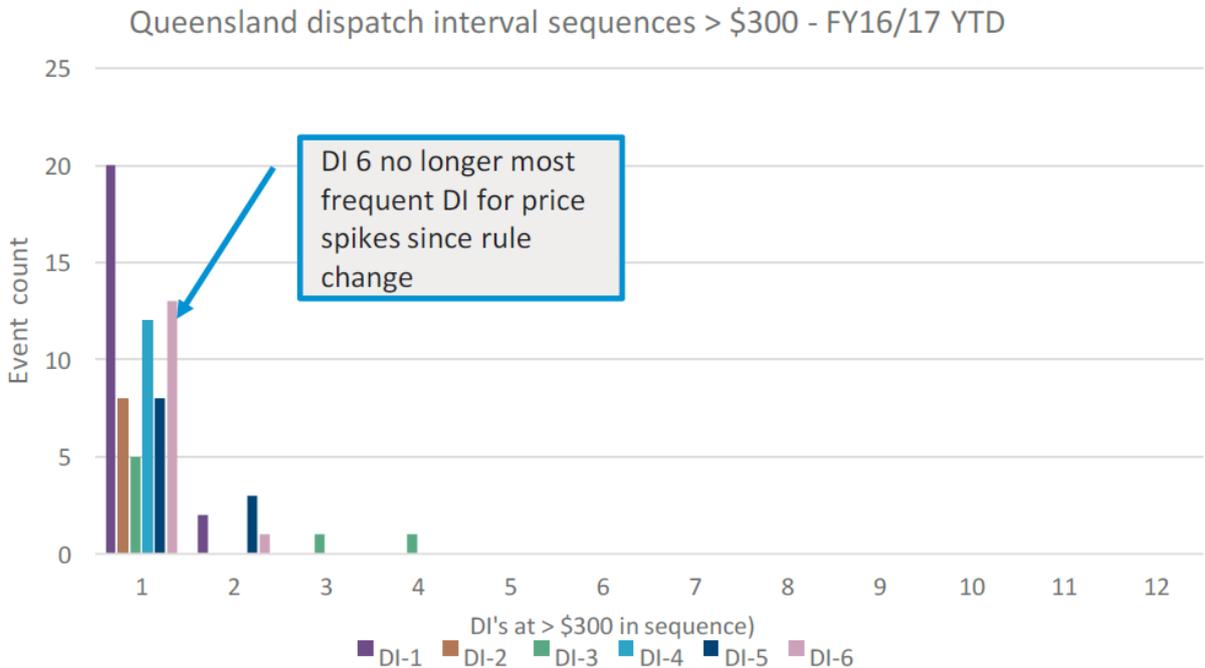
Analysis of generator bidding behaviour since the commencement of the changes indicates there is now a reduced prevalence of Dispatch Interval (DI) 6 price spikes. This is demonstrated in Charts 3 and 4 below with respect to Queensland, which was one of the regions where a high incidence of late price spikes was previously observed.

<sup>5</sup> Origin analysis.

**Chart 3: Incidence of price spikes, prior to Bidding in Good Faith Rule Change, Queensland<sup>6</sup>**



**Chart 4: Incidence of price spikes, post Bidding in Good Faith rule change, Queensland<sup>7</sup>**



<sup>6</sup> Russ Skelton & Associates, *Five Minute Settlement – Assessing the Impacts*, report prepared for the Australian Energy Council, March 2017.

<sup>7</sup> Russ Skelton & Associates, *Five Minute Settlement – Assessing the Impacts*, report prepared for the Australian Energy Council, March 2017.

The misalignment between settlement and dispatch timeframes has been the subject of discussion since the NEM's inception in 1998. Concerns have been raised that the averaging process, while useful to the extent it filters out some of the inherent volatility in a five minute dispatch cycle, can also create distortions and inefficiencies. It was on this basis that Sun Metals submitted a rule change request in December 2015 to align settlement and dispatch periods at five minutes.

While there are still doubts regarding the net benefits of the proposed rule, the AEMC released its Final Determination on 28 November 2017 in support of the change. Under the AEMC's Final Determination, spot prices will no longer be set according to the time-weighted average of dispatch prices across a 30 minute timeframe.

Coupled with the bidding in good faith rule change discussed above, the AEMC's proposal is intended to deliver:

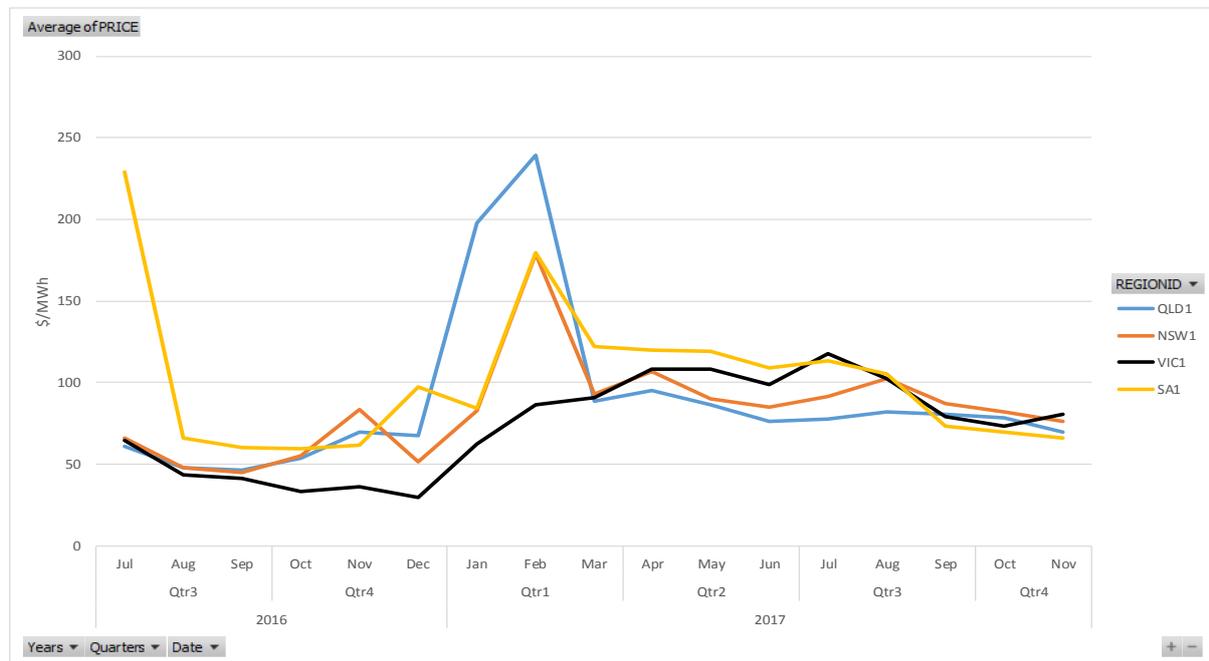
- improved price signals for more efficient generation and use of electricity;
- improved price signals for more efficient investment in capacity and demand response technologies to balance supply and demand; and
- improved bidding incentives (i.e. remove the potential for strategic late rebidding).

### 3.3 *Price increases - 2016/17*

The ACCC has noted that 2016-17 has seen a marked increase in wholesale prices (see Chart 5). In Table 3 we take a closer look at some of the drivers of the movements in both the spot and forward prices. What is evident is that prices continue to be influenced by demand as manifested by changes in weather; and supply, as determined by generator availability and fuel constraints. Further supply/demand tightening with the retirement of Northern power station and Hazelwood has effectively amplified the impact of the traditional drivers of price movements, resulting in elevated prices. A new dynamic has also emerged with higher coal prices coupled with an increased requirement for black coal generation (again due to the closure of Hazelwood) also exerting pressure on prices. This is discussed further in section 3.3.2.

Chart 5 also shows that prices have abated since the start of the year, and the expectations of the market as indicated by forward prices is for lower prices than what we are seeing today.

**Chart 5: Average wholesale spot prices<sup>8</sup>**



**Table 3: Factors impacting spot and contract prices over 2017**

Variable	Development	Price impact
<b>Quarter 1</b>		
Weather / demand	<ul style="list-style-type: none"> <li>January: Record temperatures resulted in a 5 per cent increase in demand compared to the previous month. NSW recorded the highest average cooling degree day (CDD) over last 40 years. QLD also recorded the fifth highest average CDD over last 40 years (highest in last 20 years).</li> <li>February: Sustained hot weather particularly around the 8 -13th contributed to load shedding in SA (8th Feb ,300 MW) and NSW (10th Feb, 290 MW). Hottest February day for NSW recorded (record broken twice in the month, with over 93 per cent of the State recording temperatures 10°C above average).</li> <li>Forced outage on two Eraring units (1,400 MW of capacity) for the first week of January. Vales Point also had a unit outage (650 MW) first week of January, second last week of February and the last two weeks of March.</li> <li>March: Much more subdued than February as there were less extreme temperature events, with average and extreme demand lower.</li> </ul>	<p>Record temperatures and increased demand placed upward pressure on prices early in the quarter.</p> <p>The loss of Hazelwood in March resulted in an increase in off-peak prices</p> <p>High spot prices; the announcement of the funding package for Portland; and the impeding (and subsequent) closure of Hazelwood in March placed upward pressure on the ASX forward curve</p>
Generator availability &	<ul style="list-style-type: none"> <li>January: Significant reduction in hydro generation from Dec to Jan due to Snowy Hydro REC year ending (see section 3.1.1).</li> <li>Hydro Generation Dec 16 to Jan 17, month to month difference down 41 per cent.</li> </ul>	

<sup>8</sup> Origin analysis, AEMO data.

Fuel constraints	<ul style="list-style-type: none"> <li>▪ Monthly hydro generation comparison Jan 16 and Jan 17, down 38 per cent.</li> <li>▪ Q4 16 to Q1 17 difference down 50 per cent.</li> <li>▪ Q1 16 to Q1 17 difference down 30 per cent.</li> <li>▪ February: In SA, Torrens Island A was forced out of service on 8th Feb; and Pelican Point unit 2 unavailable.</li> <li>▪ In NSW there were forced outages at Tallawarra (400MW); start-up failures of Colongra units (600MW); along with reduction in output of number of other generators</li> <li>▪ March: Hazelwood retired. Kogan Creek, Liddell and Loy Yang B experienced low availability. There were unforced outages at Bayswater and Vales Point</li> </ul>	
Market development	<ul style="list-style-type: none"> <li>▪ January: A funding packaging for Alcoa's Portland smelter was announced enabling the plant to remain open, altering the markets expectation of future demand (the smelter uses ~500 MW of energy)</li> <li>▪ March: Origin announced an agreement to underpin the operation of Pelican Point unit 2.</li> </ul>	
<b>Quarter 2</b>		
Weather / demand	<ul style="list-style-type: none"> <li>▪ April: With lower temperatures, system demand on average was down by approximately 10 per cent across the NEM compared to March.</li> <li>▪ May/June: June saw increase in demand (particularly in NSW and VIC) compared to May with the onset of winter</li> </ul>	<p>Despite lower demand compared to March, prices remained higher on average throughout April due to ongoing issues with coal supply across the NEM in addition to the price uplift caused by Hazelwood closure</p> <p>May and June saw a reduction in prices in QLD and NSW as generators returned to service.</p> <p>Higher spot prices as well as Hazelwood closure continues to exert upward pressure on contract prices early in the quarter, however prices started to ease mirroring spot outcomes.</p>
Generator availability & Fuel constraints	<ul style="list-style-type: none"> <li>▪ April: In NSW Eraring unit 2 out of service from 16th; Bayswater unit taken offline for seasonal maintenance.</li> <li>▪ Generation declined in QLD (~8.5 per cent from March) with planned outages at Milmerran and CS Energy.</li> <li>▪ May: A number of baseload units returned to service increasing black coal generation across the NEM.</li> <li>▪ June: Reduction in wind output in SA is offset by 2 units of Pelican Point running. June was lowest month for wind production in the state since 2013.</li> </ul>	
Market development	<ul style="list-style-type: none"> <li>▪ April: Centennial's Springvale (only coal supplier to Mt Piper power station) granted planning approval for expansion.</li> <li>▪ June: QLD Government directs Stanwell to alter bidding practices to put downward pressure on prices</li> </ul>	
<b>Quarter 3</b>		
Weather / demand	<ul style="list-style-type: none"> <li>▪ July: Demand profiles across the NEM mirrored typical winter profiles and was generally steady across both months.</li> <li>▪ September: Saw a load reduction of ~ 1,250 MW across the NEM compared to August.</li> </ul>	<p>Low generation availability placed upward pressure on spot prices at the start of the quarter. By September there was lower volatility with more moderate temperatures and demand.</p>
Generator availability & Fuel constraints	<ul style="list-style-type: none"> <li>▪ July: Brown coal generation declined by about 17 per cent compared to June.</li> <li>▪ Tasmanian Hydro dam levels fell to 35 per cent, down from 44 per cent at the start of the year (minimum threshold is 30 per</li> </ul>	

	<p>cent). This restricted output from the plant, increasing Tasmania's reliance on Vic imports (see section 3.1.1).</p> <ul style="list-style-type: none"> <li>▪ August: While there was little change in demand, there were a number of baseload generator outages in NSW (Eraring unit 1 forced outage (700 MW); Eraring unit 4 reduced availability to 400 MW).</li> <li>▪ September: Record wind generation during the month.</li> </ul>	<p>High spot prices along with the uncertainty from the legal challenges to coal mining expansion put upward pressure on ASX forward prices for NSW. There was a softening in prices toward the end of the quarter mirroring conditions in the spot market.</p>
Market development	<ul style="list-style-type: none"> <li>▪ August: Emergence of legal challenges to the approved extensions of Centennial's Springvale mine and Peabody's Wilpinjong (supplies AGL's MacGen units).</li> </ul>	
<b>October</b>		
Weather / demand	<ul style="list-style-type: none"> <li>▪ Similar conditions to the previous month.</li> </ul>	<p>Spot prices declined in all states except for QLD.</p>
Generator availability & Fuel constraints	<ul style="list-style-type: none"> <li>▪ QLD and NSW experienced multiple baseload outages (~2,200 MW) and (~3,799 MW) respectively.</li> <li>▪ Snowy increased Murray generation to manage inflows but this tapered off toward the end of the month which suggests that Snowy may not be pursuing a REC year (see section 3.1.1).</li> </ul>	
Market development	<ul style="list-style-type: none"> <li>▪ NSW government introduced legislation to ensure the continued operation of the Springvale mine.</li> </ul>	

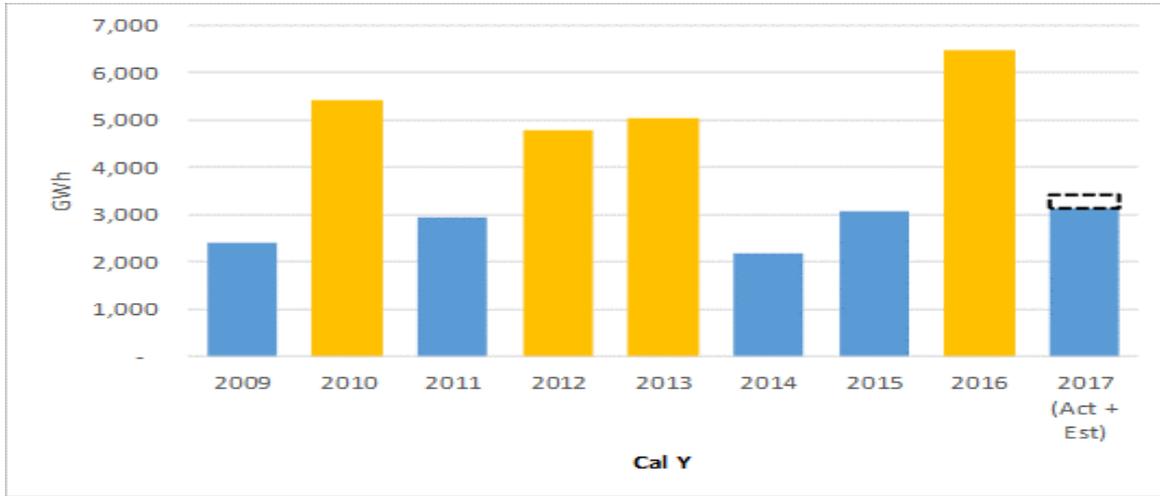
### 3.3.1 Lower output from Hydro generation intensifies market tightness

Output from Snowy Hydro has been lower over 2017 when compared to 2016 (see Chart 6). Under the Renewable Energy Target, Snowy can create renewable energy certificates (RECs) if its production is above a set baseline (4.49 TWh). Generally, Snowy has not exceeded the REC baseline in consecutive years, with the exception being the 2012 and 2013 calendar years.<sup>9</sup> Having exceeded the REC baseline in 2016 with record production, long term water storage levels are likely to be a consideration in 2017.

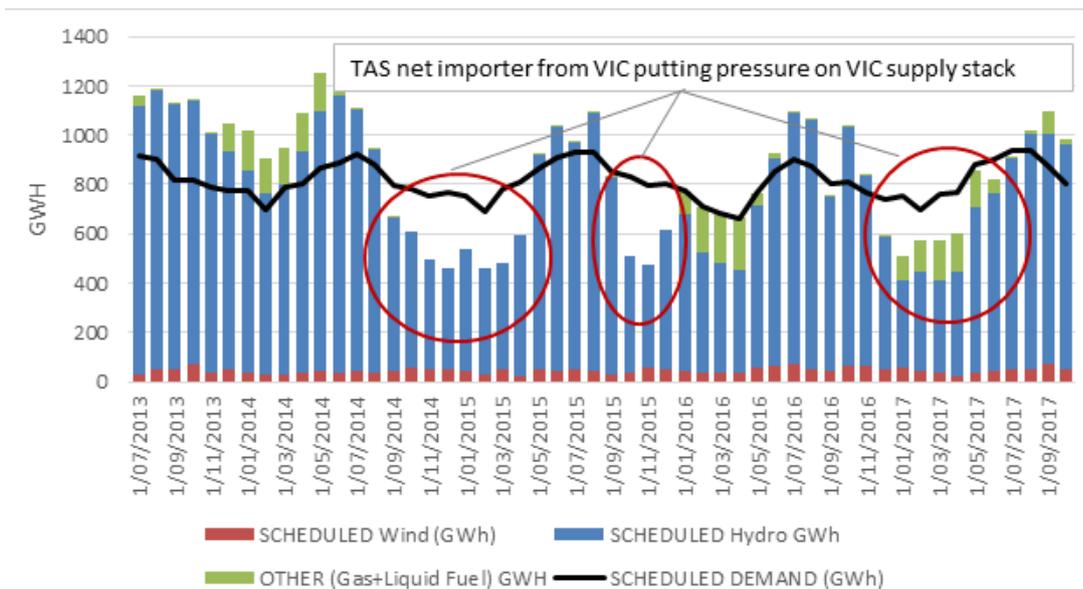
Chart 7 shows that Hydro Tasmania too has had limitations on its output with a need to manage storage levels. This increases the requirement for gas fired generation in the state as well as imports from Victoria. Following the extended Basslink outage in 2015/16, the Tasmanian Government increased the prudent minimum level of Tasmania's hydro storages from 25 to 30 per cent. Water storage levels reportedly fell from 44 per cent in January to about 34 per cent in June this year. While the management of storage levels is not new (as seen in Chart 7), the increased storage threshold combined with lower spare capacity in Victoria following the closure of Hazelwood, amplifies the pressure placed on the Victorian bid stack compared to previous years.

<sup>9</sup> The introduction of the carbon tax in 2012 (and the consequent improved economics of hydro generation) most likely served as incentive for the higher levels of production observed in 2012-13.

**Chart 6: SNOWY - HYDRO Generation since 2009<sup>10</sup>**



**Chart 7: Generation vs. Demand (GWh), Tasmania<sup>11</sup>**



### 3.3.2 Higher coal costs and stockpile management has impacted prices

The closure of Hazelwood has resulted in an increased requirement for black coal generation in NSW, placing additional pressure on coal stock piles. This takes on greater importance in the lead up to summer where sufficient fuel is needed to ensure higher levels of demand are met, particularly given already compressed reserve margins.

<sup>10</sup> Origin analysis, AEMO data.

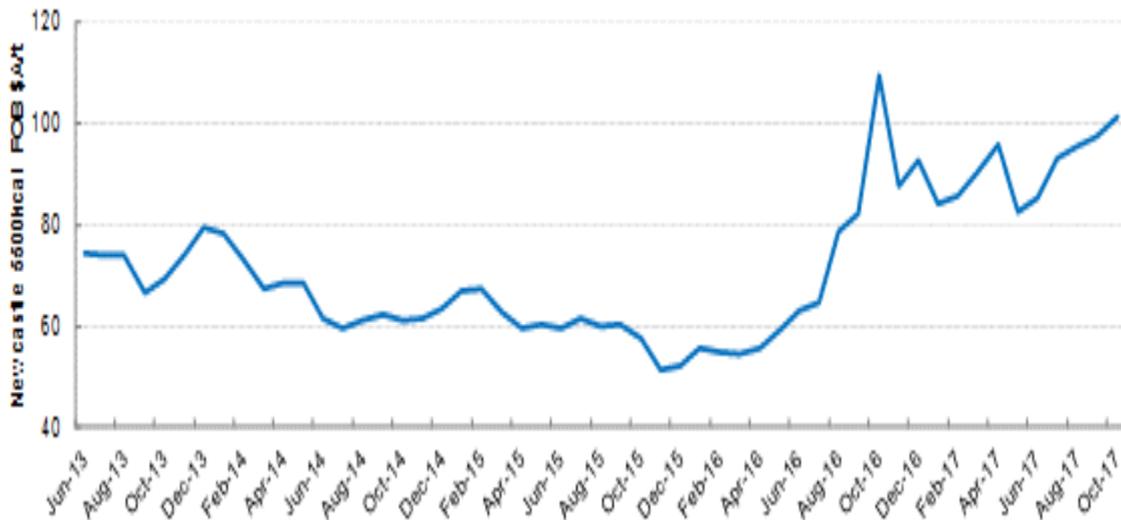
<sup>11</sup> Origin analysis, AEMO data.

Stock pile management is an ongoing issue for coal generators and is impacted by the uncertainty of coal deliveries from time to time. Expected deliveries can be affected by several issues, including longwall movements, conveyor belt issues, rail corridor availability, road transport availability, production issues at relevant mines etc. Given this, expected deliveries can be quite varied and the stock pile provides an important buffer to allow continued dispatch in the midst of uncertainty. In 2017 black coal generators have cited difficulties in sourcing extra coal from the Hunter Valley due to limited rail delivery scheduling, particularly on the Ulan line, and striking at Glencore’s operations which disrupted supply. There was also uncertainty surrounding the operation of the Springvale mine in NSW (supplier to the Mt Piper power station). In August, environmental group 4nature was successful in mounting a legal challenge to block the government’s approval for the mine’s expansion. In October, the government introduced legislation that would effectively allow the mine to remain open.

Another significant development has been the rolling-off of some lower priced coal supply legacy contracts at a time when international coal prices have been rising (see Chart 8). This effectively places upward pressure on the cost of additional supply, increasing the short run marginal cost for impacted plant. Over the last decade many mines located near the coastal generators have closed (see Chart 10) and of those that have survived have an export option.

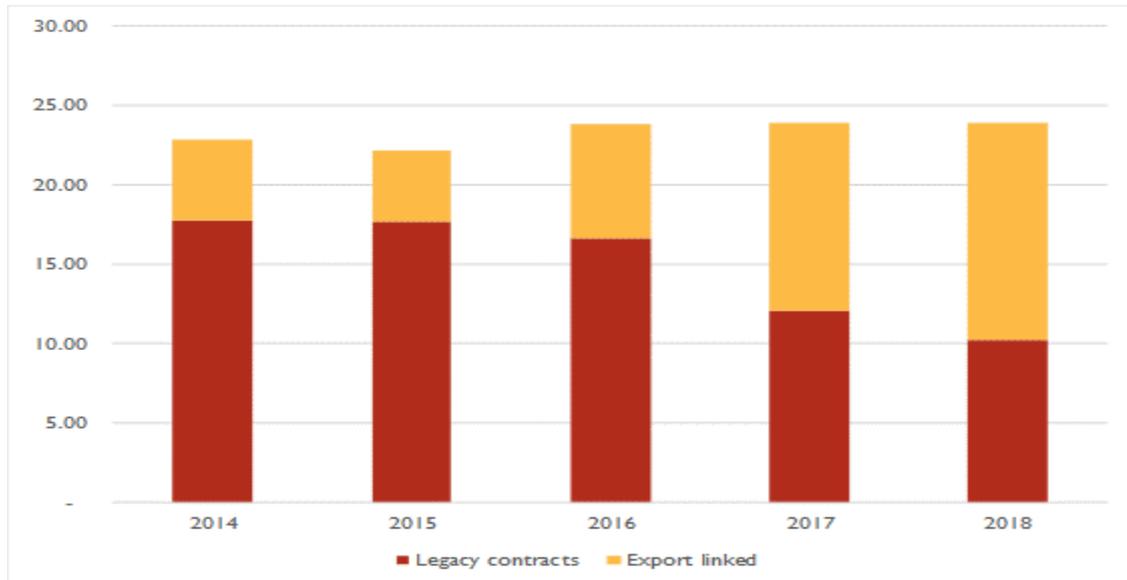
Generally, the price at which generators offer supply into the market will be closely linked to the current and future stockpile (accounting for expected deliveries and consumption); in addition to fuel costs. Throughout 2017, higher coal costs and more challenging stockpile management have combined to exert pressure on prices.

**Chart 8: Newcastle 5500kcal coal price \$A/t<sup>12</sup>**

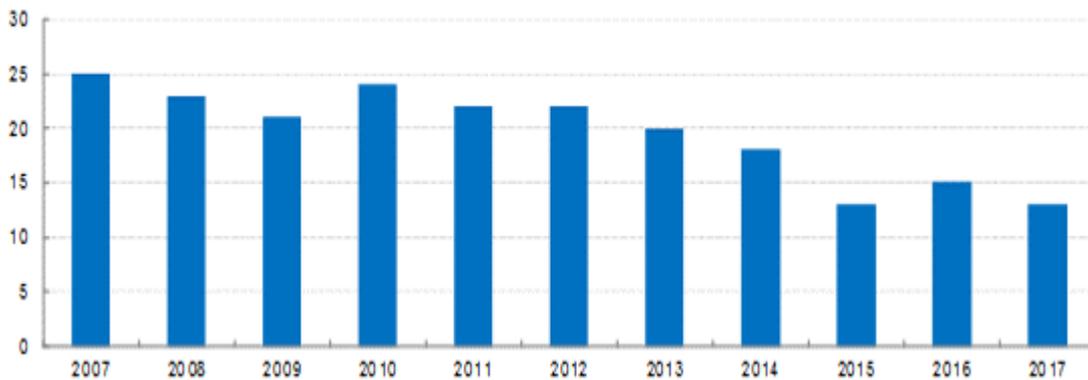


<sup>12</sup> Bloomberg.

**Chart 9: NSW Coal volume breakdown (Mt)<sup>13</sup>**



**Chart 10: Number of mines supplying domestic coal<sup>14</sup>**



### 3.4 Vertical integration

The ACCC states that it is considering the extent to which vertical integration between the retail and wholesale levels of the supply chain is limiting the ability of smaller retailers to compete. In examining the possible impact of vertical integration, the following should be considered:

<sup>13</sup> CoalServices.

<sup>14</sup> Wood Mackenzie.

- Generation does not afford a perfect ‘natural hedge’, which means that even retailers regarded as being ‘vertically integrated’ trade significant volumes of hedge contracts through necessity, and to realise arbitrage opportunities – effectively supporting liquidity. Consistent with this, the data in confidential Appendix C shows that Origin trades significant volumes of hedge contracts.
- While acknowledging the shortcomings of any means of comparison, the levels of vertical integration in the NEM are not above those observed in some other international markets.
- Observing the volume of ASX futures contracts traded in the NEM does not provide a complete picture of the avenues available for retailers to manage risk.
- Taking into consideration the customer demand for non-integrated retailers, the volume of traded contracts appears to be sufficient for these entities to manage their load.
- There are several factors that have impacted movements in traded volumes across the NEM. Even if conceptually, integrated firms have a lower trading requirement when compared to stand-alone entities, there is no evidence that vertical integration has caused any downward trend in traded volumes.
- There are no indicators that the presence of vertical integration places upward pressure on wholesale prices.

We discuss the above issues in greater detail below starting at section 3.4.1.

### *South Australia*

The ACCC has identified the availability of hedge contracts in SA as an issue. There are several factors specific to that region, independent of vertical integration, that are likely to impact trading activity. These include:

- High proportion of renewable generation: with more than 40 per cent of generation in the state coming from intermittent renewable sources, the supply of firm contracts in SA are lower compared to other NEM regions.
- Relatively high concentration in the supply of dispatchable generation, compared to other states.
- Reliance on imports: SA has traditionally been a net importer of energy from Victoria, with the interconnectors typically providing around 20 per cent of the state’s average demand. While settlement residue auctions (SRAs) on the interconnector provide some hedging, the existence of transmission constraints and ensuing basis risk from price separation between the regions, limits their effectiveness.

#### *3.4.1 Measuring levels of vertical integration*

Across the NEM, there are significant differences in the degree of vertical integration. While the ACCC often refers to the ‘big three vertically integrated retailers’, this obscures significant mismatches between generation profiles and their retail load, including:

- **Profile mismatch:** The physical characteristics of different types of generation determine how they are typically used to hedge retail demand. Origin’s baseload generators (e.g. Eraring) provide

hedges against average energy prices ('energy' hedging), while other generators that usually operate as peaking plant (e.g. Mortlake) generally provide protection against high market prices (i.e. 'capacity' hedging). While both types of hedging are important, they contribute to risk management in different ways because of their generation profile.

- **Location mismatch:** While interregional hedging in the NEM is possible, it is often an imperfect strategy due to exposure to transmission constraints. The degree of vertical integration should therefore be assessed on a regional basis. While Origin operates as a retailer across the NEM (other than Tasmania), in regions such as Victoria, there is significant mismatch between our retail load and generation with our only generator in the state being the Mortlake peaking plant. Confidential Appendix C provides some insight into the extent to which Origin's owned generation in each state provides cover for our retail load.
- **Time horizon mismatch:** Investment in generation plant is lumpy and over a long time horizon, in contrast to retail customers which are smaller and contestable on a short time horizon. This means it is very unlikely any retail load would be perfectly naturally hedged at any particular time.

Even accounting for the mismatch explained above, an observation of a generator's capacity alone is likely to overstate the extent to which it is used to manage a retailer's load. The effective cover a generator provides must also be considered in light of contingency events such as planned outages (e.g. for scheduled maintenance) and unplanned outages due to unexpected plant failure. In 2016 a longer than expected all of station outage at Origin's Eraring power station in NSW increased the reliance on external hedges.

Having regard to the significant differences in size and region between the retail load and generation portfolios of retailers in the NEM, Origin expects that the extent to which retail load is matched by a 'natural hedge' in each region within the NEM is not overly high and would likely be comparable to international jurisdictions.

#### *3.4.2 The quantity of hedge products appears sufficient for non-integrated players to manage load*

As discussed in Origin's submission to the ACCC's issues paper,<sup>15</sup> what matters to non-integrated retailers is not 'liquidity' as measured by trading volume, but whether there is sufficient availability of hedging products for them to manage risks associated with their retail loads. Having regard to the significant volume of hedge contract trading activity, Origin believes the volume of traded contracts across the NEM is likely to exceed the load of non-integrated retailers.

#### *3.4.3 Avenues available to retailers to manage risk*

Retailers acquire hedge contracts to avoid the risk of financial distress which could arise from prolonged exposure to high wholesale prices. There are a number of different risk management strategies that can be used by non-integrated retailers to manage this risk, including:

- **Exchange traded contracts (ETCs):** ETCs are traded through ASX participating intermediaries (brokers or clearers). The contracts are standardised with price the only negotiable term. They are of fixed duration and fixed volume. These are a relatively basic hedging option for retailers.

---

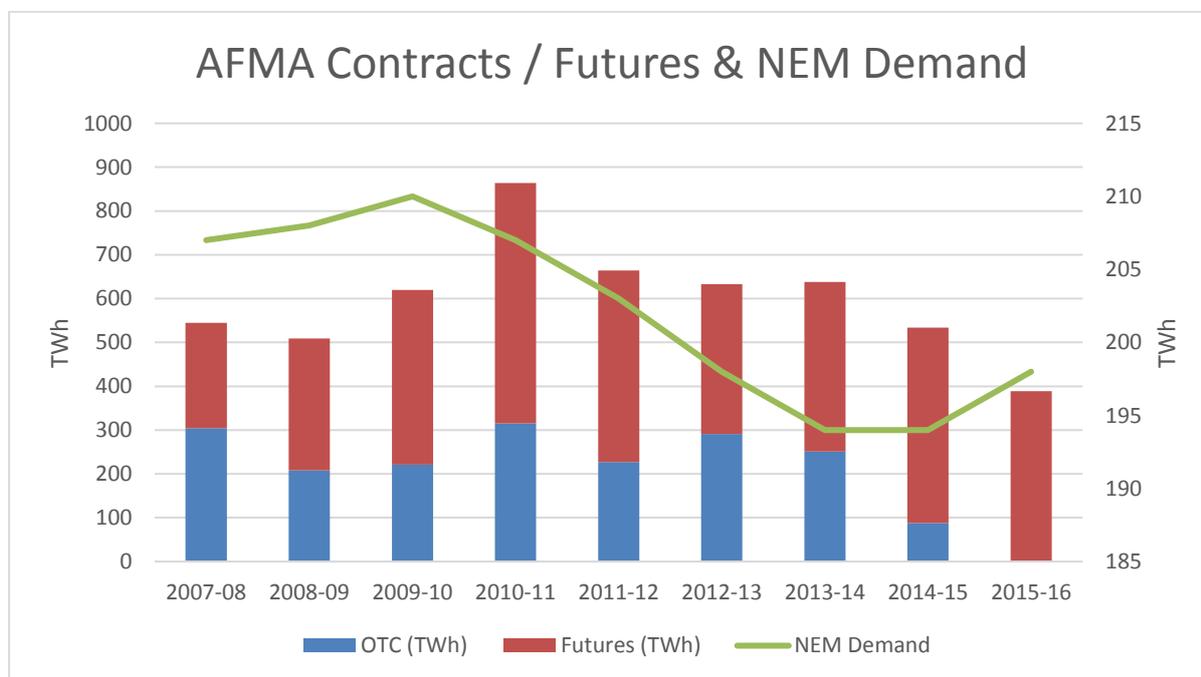
<sup>15</sup> Origin, Public Submission to Retail electricity supply and pricing Issues Paper, section 4.3

- **Over the counter (OTC) contracts:** OTC contracts involve bilateral counterparties (which could be generators, other retailers or financial intermediaries) negotiating the specific terms and conditions of the derivative contract, typically under the International Swaps and Derivatives (ISDA) master contract framework. In contrast to ETCs, OTC contracts can be tailored in terms of volume, duration, cap strike price and other terms.
- **Structured hedge contracts:** Structured hedging involves a retailer collaborating with another market participant (e.g. a generator or financial intermediary) to sculpt or tailor the hedge contracts to minimise the risks and costs that can arise from a vanilla portfolio hedging approach. While Origin is not privy to the commercial details of the recently announced deal between CS Energy and Alinta,<sup>16</sup> Origin expects the arrangement involved some form of structured hedging contract.
- **Other risk management instruments:** There are other risk management instruments which can be used to reduce a retailer's need for hedge contracts, including weather derivatives, inter-regional hedging and settlement residues and long-term PPAs.

Having regards to the wide range of instruments that are available to manage spot price risk, it is important the ACCC does not focus solely on measures of liquidity or trading activity in one type of instrument, such as ETCs.

#### 3.4.4 Several factors have impacted the movement of traded volumes

**Chart 11: Movements in contract traded volumes<sup>17</sup>**



<sup>16</sup> <http://statements.qld.gov.au/Statement/2017/8/13/new-electricity-retailer-offers-25--2-year-electricity-usage-discounts-in-seg>

<sup>17</sup> Origin analysis, AFMA Report 2012-16.

Noting the absence of data on OTC trades in 2015/16, a number of factors external to market structure have impacted movements in traded volumes over the past ten years, as noted below.

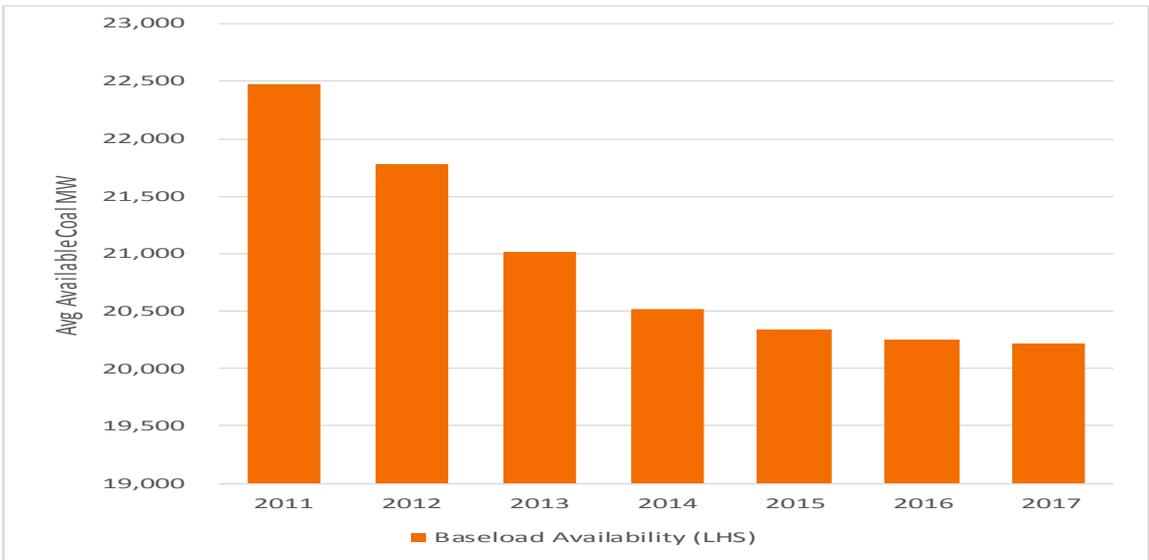
2007/08 – 2010/11:

- Early in the period, drought conditions and ensuing higher prices/volatility created added incentive for hedging.
- Increasing demand over much of the period is also likely to have a positive impact on trading.

2011/12 – 2015/16:

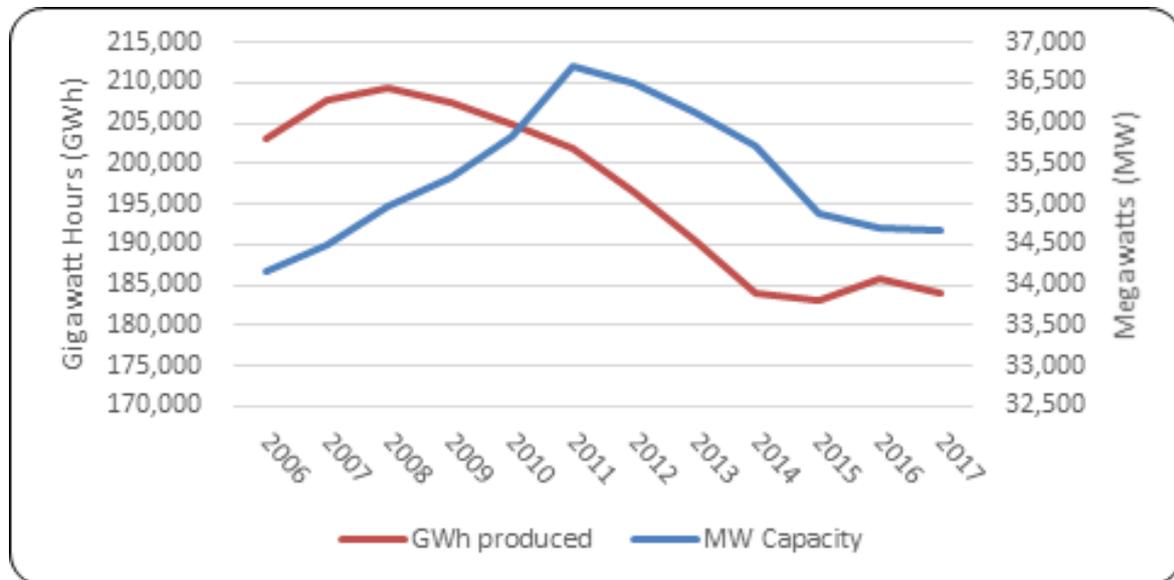
- With demand in the NEM peaking around 2009/10, lower demand after that time reduces the hedging requirement, impacting volumes.
- Early in the period, lower spot prices (with the easing of the drought, more subdued demand, and the increasing entry of zero short run cost renewables) likely reduced the incentive to hedge load.
- Around 2011/12 a number of financial intermediaries exited the market, impacting traded volumes. Some of these include JP Morgan; Barclays; Merrill Lynch, and BP Singapore.
- By 2012 the trend of lower coal fired generator availability due to retirements and plant maintenance issues (perhaps reflecting the ageing coal fleet), likely restricted the supply of hedge products (see Chart 12).
- Generally, the level of dispatchable generation (see Chart 13) in the NEM has steadily declined over the period, which would again impact the supply of hedge products.

**Chart 12: Baseload availability in the NEM<sup>18</sup>**



<sup>18</sup> Origin analysis, AEMO data.

**Chart 13: Dispatchable generation in the NEM<sup>19</sup>**



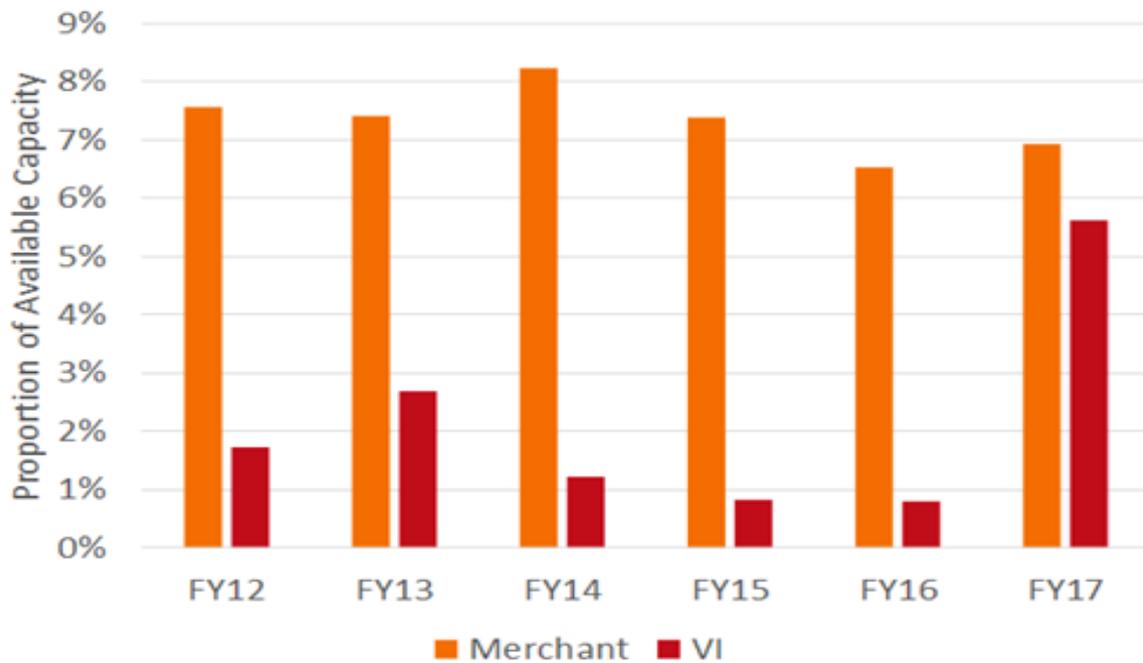
**3.4.5 No indication that vertical integration places upward pressure on wholesale prices**

In its preliminary report, the ACCC indicated that it was considering whether vertical integration might have an impact on wholesale prices.

Chart 14 shows that vertically integrated entities (i.e. Origin, AGL and Energy Australia) have distinctly placed a lower proportion of bids in higher price bands (> \$1,000/MWh) compared to merchant plant. The uplift in the proportion of higher bids in FY17 is most likely reflective of the issues described in section 3.3. It is important to note that particularly where an integrated entity is not fully covered by its own generation, it faces exposure to high prices and volatility. As we discussed earlier, this will occur when there is profile mismatch; generator outages; as well as unexpected bouts of extreme weather. In Origin’s experience, all three factors serve to continually limit the extent to which our generation can be relied on to manage customer load. Where these conditions exist, even if an integrated entity had the means to place upward pressure on prices it would have no incentive to do so.

<sup>19</sup> Origin analysis, AEMO data.

**Chart 14: Incidence of vertically integrated vs non-vertically integrated (merchant) generators placing bids of > \$1000/MWh, FY12 – FY17<sup>20</sup>**

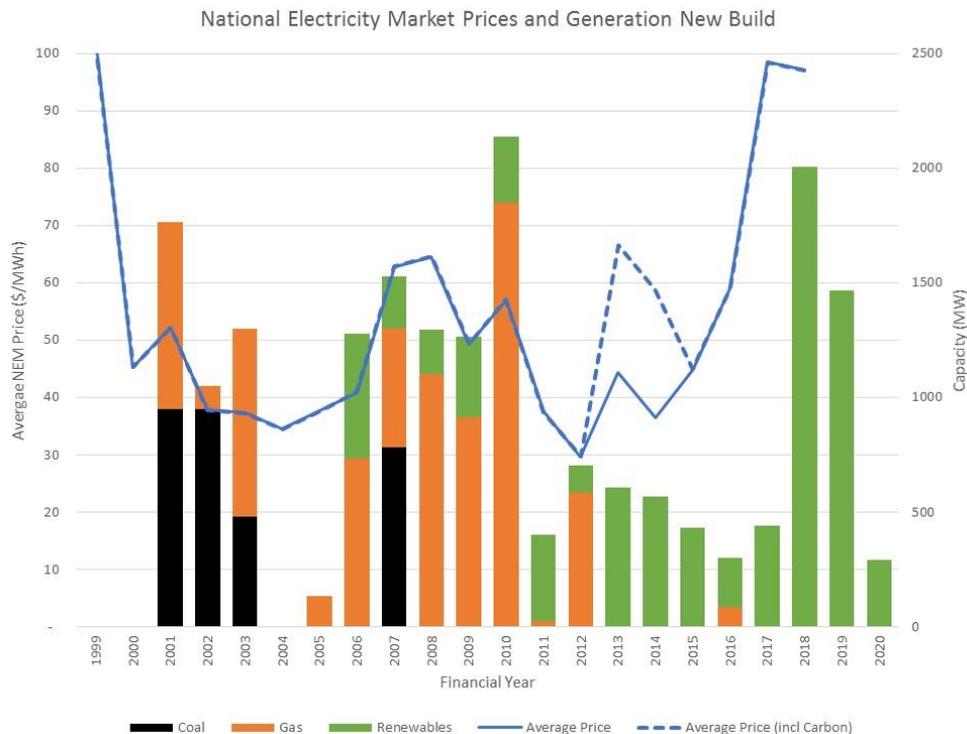


### 3.5 Investment incentives in the NEM

There has been much debate on the current tightness in the electricity market and whether this is indicative of some broader failing. It should be noted that as recently as 2014, it was the oversupply in the NEM that was cause for concern. Since that time a number of generators have exited the market (some without much notice), resulting in a significant contraction in supply. Australia’s electricity market has a history of new entry in response to higher prices, which indicates that market participants have responded to market signals. As seen in Chart 15 below increasing prices from around 2004 resulted in new coal and gas build.

<sup>20</sup> Origin analysis, AEMO data.

**Chart 15: Investment in the NEM has been responsive to prices**



There are several factors now, that make investing more challenging. These include:

- Policy uncertainty, particularly around emissions reduction policy. Investors must understand the magnitude and timing of any future carbon impost, but here has been much confusion in this space. After years of speculation a carbon price was introduced in July 2012, only to be repealed two years later. Regulatory risk has also manifested itself in the many recent government interventions in the market with the SA government building its own generator in the State; the Commonwealth announcing plans for the potential expansion of Snowy Hydro; and contemplation of a new government funded coal fired generator in Queensland. While there is hope the recently announced National Energy Guarantee will provide some much needed clarity, much of the detail still needs to be work through and all jurisdictions have yet to commit to implementing the mechanism.
- Technology disruption, with the increasing uptake of decentralised energy such as rooftop solar PV and the potential for further still, through storage solutions. A lack of clarity around the extent and timing of the future uptake of decentralised energy can undermine the business case for investment in centralised generation, where assets are expected to last up to 40 years.
- Uncertainty around future prices. The market's expectation is that prices will continue to fall as the quantum of zero short run marginal cost renewables enter the market.

### 3.6 Renewables investment

Where there has been investment in the market it is in renewable energy due to the combination of falling costs and the benefit these generators receive from the Renewable Energy Target (RET) scheme.

The Preliminary Report, questions whether larger retailers are the only beneficiaries of renewables investment. Electricity retailers have the liability to surrender certificates under the RET and have historically underwritten most of the new build in large scale renewable energy projects, particularly wind farms. However, a significant shift has occurred in the past few years with different models to underwrite renewable energy projects now emerging. This has added diversity to the contracting of PPAs by both counterparty and location. The recent investment boom in utility scale solar has contributed to this trend, as solar is modular and allows contracting parties to more easily size a project to their requirements.

- Corporate PPAs:
  - such as utility scale solar farms being underwritten by Sun Metals (about 100 MW, near Townsville, Qld) and Telstra (70 MW Emerald solar farm, in Qld);
  - the Whyalla steelworks integrated renewables project in SA (solar, pumped hydro and demand response); and
  - Nectar Farms (with the Victorian Government) for the 200 MW Bulgana wind farm in Vic
- Merchant projects: which are being incentivised by the recent increases in wholesale prices, such as the Hayman and Daydream solar farms in Qld (200 MW total), with a 90 per cent equity interest from Blackrock.
- Government support, such as those underpinned by contracts with:
  - ACT Government – such as the Ararat, Coonooer Bridge, Hornsdale and Sapphire wind farms).
  - Qld Government – directly supported such as the Oakey, Lilyvale and Whitsunday solar farms.
  - South Australian Government – such as the 135 MW Aurora solar thermal project near Port Augusta.
  - As proposed by the Victorian Government under the Victorian Renewable Energy Auction Scheme.
  - Local council – such as the 15 MW Valdora solar farm which is contracted to the Sunshine Coast Council.

Second tier retailers have also announced a number of PPAs to underwrite new renewable energy projects, which adds further diversity to the market. These include the following PPAs:

- Snowy Hydro with the 100 MW Taillem Bend solar farm in SA.

- Engie/Simply with the 55 MW Parkes solar farm and 30 MW Griffith solar farm, both in NSW; and the 100 MW Willogoleche wind farm in SA.
- ERM with the 200 MW Lincoln Gap wind farm in SA.
- Alinta with the 40 MW Collinsville solar farm in Qld.

Further diversification of renewable energy generation has been supported by the significant increase in small-medium enterprise (SME) scale rooftop solar PV systems, which we define as 10-100 kW system size. This has enabled business customers to access the benefits of solar by directly owning the generation source. Whilst residential solar systems have seen most investment over the past decade, this trend has been steadily changing over the past few years. SME sales of solar PV now account for about 30 per cent of the market, with the average system size for SMEs now about 25 kW.