

IN THE AUSTRALIAN COMPETITION TRIBUNAL

AGL ENERGY LIMITED

1 of 2014

RE: PROPOSED ACQUISITION OF MACQUARIE GENERATION (A CORPORATION
ESTABLISHED UNDER THE ENERGY SERVICES CORPORATIONS ACT 1995
(NSW))

ANNEXURE CERTIFICATE

This is the annexure marked "DP3" annexed to the affidavit of DANIEL ENOCH PRICE dated
26 March 2014

Annexure DP 3

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Competition Issues

A REPORT PREPARED FOR ASHURST

26 March 2014

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Competition Issues

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1 Authorship

- 1 This document has been jointly prepared by Danny Price and Dr Philip Williams AM. Philip Williams is the primary author of the sections discussing the general economic principles of competition analysis and efficiencies, namely, sections 2.2, 4.1, 5.2, 6.2 and 8.1. Danny Price is the primary author of the sections discussing the application of the general principles to the National Electricity Market and the proposed merger, these being all the other sections.

2 Introduction

2.1 Outline of the ACCC's concerns

2.1.1 Sol concerns

2 The ACCC's more recently-stated concerns about the proposed merger between AGL and Macquarie Generation are set out in its Statement of Issues (SoI) document, published on 6 February 2014. The SoI describes two broad types of competition concerns arising from the proposed transaction:

- Increased barriers to entry and expansion in the retail supply of electricity in NSW: The ACCC appears to be concerned that the proposed acquisition would substantially lessen competition in the retail supply of electricity in NSW as a result of:
 - A significant reduction of liquidity in the supply of hedge contracts due to the reduced volume of hedge contract trading as AGL's retail load will be supported with a natural hedge; and
 - The increased ability and incentive of AGL to withhold competitively priced and customised hedge contracts to independent retailers; and
- Horizontal aggregation: The ACCC appears to be concerned that the aggregation of Macquarie Generation's capacity with AGL's existing generation capacity in the NEM may have the effect of substantially lessening competition in a relevant wholesale market. An increase in the price of electricity in wholesale markets is ultimately likely to flow through to the price of electricity paid by retail end users.

3 In our view, these concerns are unlikely to be realised if the transaction were to proceed.

2.1.2 Coordinated effects

4 Prior to the SoI, in a letter to AGL's solicitors sent on 15 January 2014, the ACCC raised a number of concerns similar to those raised in the SoI. However, the 15 January letter also referred to the risk that the proposed transaction could increase the risk of 'coordinated effects' between the major 'gentailers' in the NEM. The letter expressed the ACCC's concerns as follows:

Market participants have raised concerns that the proposed acquisition would result in the vast majority of NSW generation and electricity retailing being controlled by AGL, Origin and EnergyAustralia – these companies would account for over two thirds of generation capacity and almost 80% of generation output in NSW and almost 75% of electricity retail customers. This would give rise to an increased likelihood and material risk of coordinated effects in the supply of wholesale electricity and/or hedge contracts. The proposed acquisition would align the interests

of these major vertically-integrated gentailers, particularly in NSW and more broadly in the NEM. The proposed acquisition may result in an increased risk of coordinated effects in both the spot price formation process as well as the price formation process of hedging contracts. This is due to the repeated and regular interaction between the major gentailers in the wholesale spot market across multiple regions of the NEM, as well as in trading of hedge contracts where coordinated conduct may be facilitated due to the regular interaction of generation and retail arms of vertically-integrated gentailers with their gentailer competitors and independent retailers. These companies would have a common incentive to decrease the availability of competitively priced hedge contracts and engage in conduct to increase the level and volatility of wholesale electricity prices and thereby increase their returns from generation and reduce competition at the retail level from smaller retailers and potential market entrants.

- 5 The ACCC’s concerns about the increased risk of ‘coordinated effects’ due to the proposed transaction appear to span both horizontal and vertical issues.

2.2 General principles of competition analysis

- 6 Economics views market power and competition as opposites: “market power and competition are but the inverse of each other”.¹ That is, conduct that has the effect of lessening competition has the effect of increasing the market power of members of that market. It does this by lessening the constraint that would otherwise be placed on members of that market by the pressure of competition. This is explained by the famous words of the United States Attorney-General’s National Committee to Study the Antitrust Law in its Report of 1955:

The basic characteristic of effective competition in the economic sense is that no one seller, and no group of sellers acting in concert, has the power to choose its level of profits by giving less and charging more. Where there is workable competition, rival sellers, whether existing competitors or new or potential entrants into the field, would keep this power in check by offering or threatening to offer effective inducements ...²

- 7 The best-known economic models of market power and competition involve extreme cases. The model of pure monopoly involves an enterprise that has unfettered market power: it has no direct competitors and its pricing is not constrained by the threat that potential competitors may enter its market. It is able to earn monopoly profits. The other extreme model is that of perfect competition. In this model no enterprise has any market power at all. There are many firms in the market and there are no barriers to entry to the market. So each enterprise in the perfectly-competitive market has no discretion at all as to the price that it charges; and it can only earn that level of profit that just compensates its shareholders for the opportunity cost of using their funds.

¹ Maureen Brunt, “Market Definition’ Issues in Australian and New Zealand Trade Practices Litigation”, *Australian Business Law Review*, 1990, Vol 18, No 2, 86-128, at 95.

² Quoted in Brunt, *op cit*, p 95.

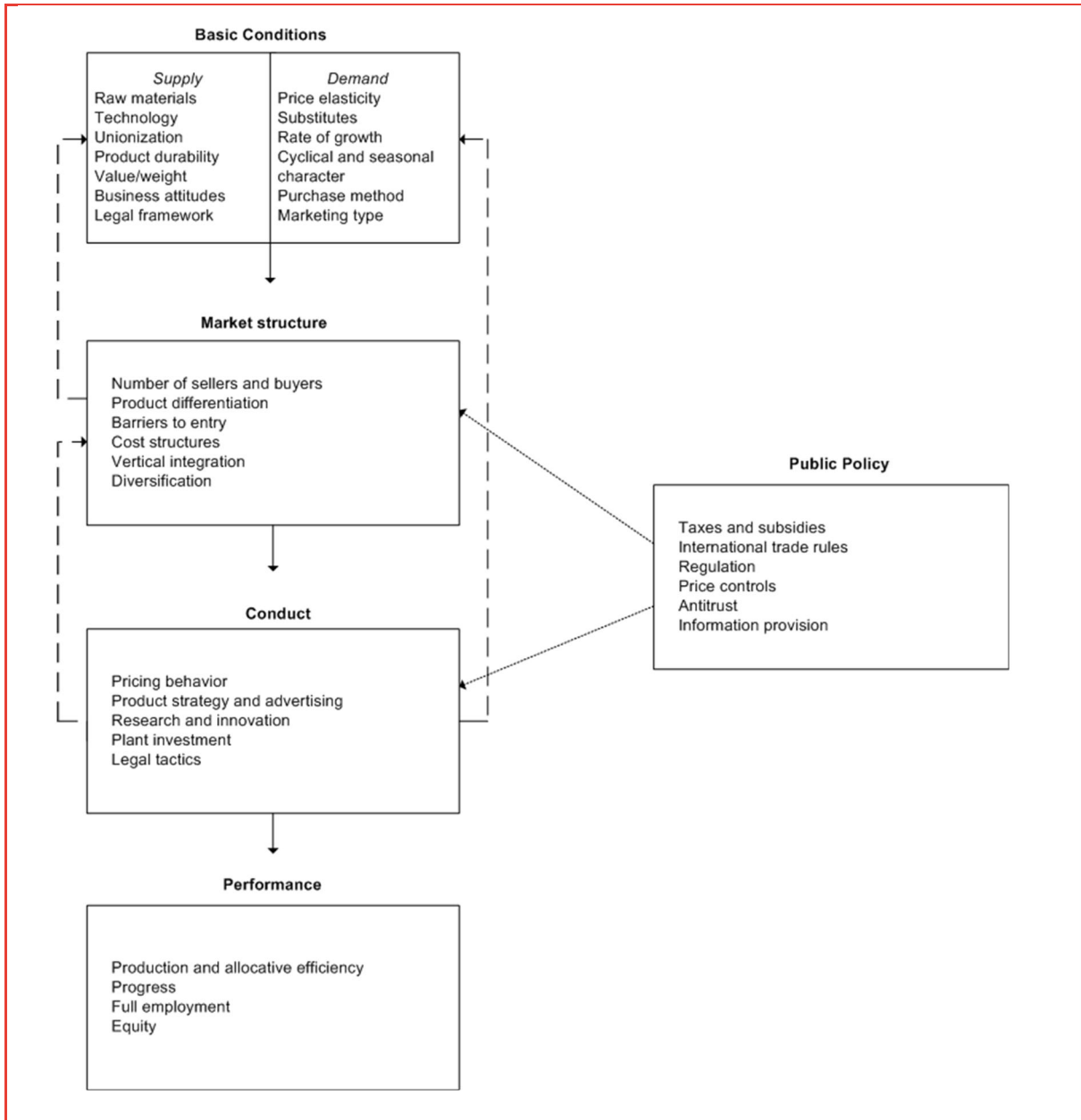
- 8 Almost all antitrust disputes involve enterprises that operate in competitive environments between these two extremes. Almost all such enterprises are constrained, to a greater or lesser degree, by the price and product policies of other enterprises. In order to analyse the effects of conduct on patterns of competition in these markets, one must examine the features of the particular market or markets that are likely to be affected by the conduct. In particular, the features of a market are commonly classified under the headings of the market's structure, its conduct and its performance.

2.2.1 Links between structure, conduct and performance

- 9 The structure-conduct-performance system of classification is not always clear-cut. The links between (i) the structure of a market, (ii) the conduct of enterprises within the market, and (iii) the performance of the market are complex. Sophisticated versions of the structure-conduct-performance schema in the professional industrial organisation literature do not suppose a rigid one-way causal link from structure to conduct then to performance. Indeed the textbook by Scherer and Ross properly points to feedback loops in the other direction. This is summarised in Figure 1 below.³

³ From F M Scherer and David Ross, *Industrial Market Structure and Economic Performance*, Houghton Mifflin, 3rd edition, 1990, p 5.

Figure 1: Structure-Conduct-Performance schema



Source: Scherer and Ross, *Industrial Market Structure and Economic Performance*, 3rd edition, 1990, p. 5.

10 When making judgments about the effect of conduct on competition, one will look to the effects of those changes on the structure, conduct and performance of the relevant market(s). As Professor Fisher has noted:

Often an examination of the actual activity of firms in the market and the results of their interaction can reveal whether the market is effectively competitive. Economists, however, have traditionally undertaken the analysis of the competitiveness of a market by an examination of indicia of competition and monopoly categorized under the headings of market structure, market conduct, and market performance.⁴

11 The academic writing of Professor Brunt stresses the links between competitive conduct and the performance of the market in terms of efficiency and progress. For example, she quotes the High Court in *Queensland Wire Industries* referring to competition as a process that operates to ‘protect the interest of consumers’ and continues: ‘What we have been discussing is a concept of competition which is profound and goes to the heart of its role as the engine of efficiency and progress.’⁵

12 Competition is said to be an engine of efficiency and progress because, in chasing profit opportunities, competing firms innovate and thereby create value. Economics defines value as the difference between the willingness to pay of purchasers and the opportunity cost of production. So an innovation can create value by: (i) creating some difference in a product that consumers value more highly than its predecessor; (ii) decreasing the cost of producing a product; or (iii) some combination of (i) and (ii). Conduct that creates value is said to promote economic efficiency.

13 The principle that competition needs to be considered in conjunction with considerations of efficiency is discussed in the seminal paper by Professor Fisher, ‘Diagnosing Monopoly’.⁶ Professor Fisher discusses how conduct that leads to a high market share may be justified within the context of the monopolisation provision of the Sherman Act. His answer is that it can be justified if the high market share has been gained by competitive conduct rather than by monopolistic restriction.

⁴ Franklin M Fisher, John J McGowan and Joen E Greenwood, *Folded, Spindled, and Mutilated, Economic Analysis and U.S. v. IBM*, MIT Press, 1983, p 39.

⁵ Brunt, *op.cit.*, p 201.

⁶ F M Fisher, “Diagnosing Monopoly”, reprinted in *Industrial Organization, Economics, and the Law: Collected Papers of Franklin M Fisher*, edited by John Monz (1990) pp 3-32.

14 Professor Fisher proposes two tests for distinguishing between competitive conduct and monopolistic restriction. The first is that the conduct, to be suspect, should at least be more restrictive than necessary. The second points to the link between competition and efficiency:

The second principle (and the one the overlooking of which leads to confusion) is that conduct should not be condemned if it is precisely the conduct which competition would lead us to expect. One has to be careful to distinguish between cases in which competition is forcing firms to react and cases in which firms are taking unnecessary action to forestall competition. The competitive model itself points to situations in which firms, faced with competition, will be forced to do certain things or lose business. Firms observed to be doing those things in those situations should not be regarded as monopolizing. They are engaging in conduct which competition makes 'economically inevitable'.⁷

15 These observations of Professor Fisher have gained wide currency among economists when considering (in the context of behaviour that is alleged to substantially lessen competition or constitute monopolisation) the effect of conduct on competition.

16 In summary, competition can generally be thought of as rivalrous behaviour; and competition will be lessened if that rivalry has been lessened and the constraints imposed by that rivalry have been decreased. However, competition should only be said to be lessened if the rivalry that is lessened by the conduct at issue is of a socially-beneficial kind.

2.2.2 The appropriate time horizon

17 Competition takes place over time. As noted above, an enterprise can create value by introducing a new product or by adopting a new technique to reduce costs. This may generate substantial profit for the innovator. However, in a competitive market, other enterprises (which may be new entrants) will observe this profit-making formula and copy it. That copying will reduce the profits that were being enjoyed by the innovator.

⁷ *ibid.*, p 27. A further excellent, if somewhat technical, treatment of the relationship between competition and efficiency is Joseph Farrell and Carl Shapiro, "Horizontal Mergers: An Equilibrium Analysis", *American Economic Review* (1990) Vol. 80, March, pp 106-126.

- 18 This process of innovation and copying will take time – particularly if the copying occurs by new entry to the market. For this reason, good competition policy does not focus on short-lived positions of market power. Rather, it allows time for competitive processes to work themselves out. As Professor Brunt states:

Competition is a process rather than a situation. Dynamic processes of substitution are at work. Technological change in products and processes, whether small or large, is ongoing and there are changing tastes and shifting demographic and locational factors to which business firms respond. Profits and losses move the system: it is the hope of supernormal profits and some respite from the “perennial gale” that motivates firms’ endeavours to discover and supply the kinds of goods and services their customers want and to strive for cost-efficiency. Such a vision tells us that effective competition is fully compatible with the existence of strictly “limited monopolies” resting upon some short run advantage or upon distinctive characteristics of product (including location). Where there is effective competition, it is the on-going substitution process that ensures that any achievement of market power will be transitory.⁸

- 19 This long-run view of competition has been adopted as a matter of principle by the Australian courts and Tribunal. This is most evident in the famous passage in *Re QCMA and Defiance Holdings* (1976) ATPR 40-012, where the Tribunal states that competition depends on the structure of the relevant market and that undoubtedly the most important element of market structure is the condition of entry.⁹ This indicates that, as a matter of public policy, the Tribunal (and the courts which have adopted this passage) are prepared to wait for competition to play out. In particular, they are acknowledging that the prospect of short-run supernormal profits can create valuable social incentives providing it is likely that competition will triumph in the long-run.

⁸ Maureen Brunt, “Market Definition” Issues in Australian and New Zealand Trade Practices Litigation”, *Australian Business Law Review*, Vol 18 (1990) pp 86-128 at 96.

⁹ at p 17, 246.

3 Proposed merger and counterfactual

3.1 Proposed merger

20 We understand that AGL proposes to acquire all of Macquarie Generation, including Bayswater and Liddell power stations.

21 Our understanding is that the NSW Government has not identified any bidder other than AGL which has offered a purchase price that the State is willing to accept for the Bayswater and Liddell power stations, either together or individually. Further, we understand that AGL does not intend to separate the power stations.

3.1.1 Bayswater highlights

22 Bayswater power station comprises four 660 MW black coal fired units totalling 2640 MW.¹⁰ The power station is located in the Hunter Valley in NSW near the towns of Muswellbrook and Singleton. The Bayswater units were commissioned between 1985 and 1986. The units are over 28 years old.

23 Bayswater is one of the cheapest coal fired generators in the NEM.¹¹ AGL intends to operate the plant until 2035.¹²

3.1.2 Liddell highlights

24 Liddell power station is co-located with Bayswater power station. The station comprises four 500 MW black coal fired units that were commissioned between 1971 and 1973. AGL intends to operate the plant until 2022.¹³

¹⁰ AEMO registration shows Bayswater has a registered capacity of 660MW and a Maximum Capacity of 700MW per unit: <http://www.aemo.com.au/Electricity/Registration>

¹¹ AEMO Planning Studies (2013), Weblink: http://www.aemo.com.au/Consultations/National-Electricity-Market/~/_media/Files/Other/planning/2013Consultation/Planning_Studies_2013_Existing_Generator_Technical_Data.ash

¹² Statement of Glenn Schumacher [18]

¹³ Statement of Glenn Schumacher [18]

3.2 Counterfactual

3.2.1 Context of NSW Government sale process

- 25 After negotiating directly for the sale of its other generation assets to the owners of the GenTraders - EnergyAustralia and Origin - the NSW Government is selling its remaining generators, Macquarie Generation and Delta Coast.
- 26 The NSW Government is selling these remaining generators in our view in a market characterised by considerable uncertainty. Fuel markets are in a state of change with coal prices going through a cycle of recent rapid rise and, more recently, a softening. At the same time, wholesale gas prices on the east coast of Australia are going through a transition as the coal seam gas industry ramps up production to feed the export LNG terminals being developed in Queensland. While the initial glut of ramp up gas has suppressed spot gas prices, the prospect of being able to sell LNG processed from coal seam gas at higher international prices has discouraged producers from entering into domestic long term gas contracts.
- 27 While thermal generators' costs have been rising due to higher fuel prices, thermal generators have also experienced higher costs as a result of the introduction of the carbon tax on 1 July 2012.
- 28 At the same time that generation costs have been rising due to increases in fuel costs and the introduction of the carbon tax, the demand for electricity has either been levelling out or, in some regions of the NEM, falling.¹⁴ This softening of demand growth has occurred at the same time that the supply of generation capacity has increased due largely to the operation of the Renewable Energy Target (RET)¹⁵ and generous subsidies paid to consumers installing solar panels. The RET is expected to continue delivering additional capacity to meet the 41,000 GWh target which is expected to result in there being a Reserve Plant Margin (RPM)¹⁶ approaching 40% by 2017 (see Figure 38 of the General Industry Report).

3.2.2 Probable counterfactuals

- 29 Given that the sale process of Macquarie Generation to date has revealed that AGL is the only bidder prepared to pay a price the NSW Government appears

¹⁴ AEMO (2014), February Update: Supply-Demand Snapshot For the National Electricity Market, March, Weblink: <http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities>

¹⁵ See General Industry Report., Section 4.2.3

¹⁶ See General Industry Report.

willing to accept, the likely counterfactual is that Macquarie Generation will remain in the hands of the NSW Government for the foreseeable future.

- 30 In our view, the ACCC's decision to oppose the proposed acquisition of Macquarie Generation by AGL increases the likelihood that the NSW Government will not be successful with the sale of Delta Coast. In that case, the NSW Government has the option of leaving both businesses in their current form or, alternatively, merging them to better position them to compete in the NEM. This not without precedent. The Queensland Government merged two of its (then) three generation businesses in 2011.¹⁷ The Government justified this move on the grounds that it would help "strengthen" the progeny businesses.
- 31 Therefore, a realistic medium-term counterfactual to the proposed acquisition proceeding is a merger of Macquarie Generation and Delta Coast by the NSW Government.

¹⁷ See The Hon. Rachel Nolan, Minister for Finance and Arts, *Statement from the Finance Minister: power stations allocation*, Thursday 10 March 2011, available at: <http://statements.qld.gov.au/Statement/Id/73901> (accessed 21 March 2014)

4 Market definition

4.1 Principles of market definition

32 As we observed in Section 2.2, economics views market power and competition as opposites: “market power and competition are but the inverse of each other”.¹⁸ Analysis of substitution is important when defining markets because the possibility of substitution limits the market power of individual enterprises. That is, the possibilities of substitution set the boundaries to markets. This was explained by the Tribunal in *Re QCMA and Defiance Holdings*¹⁹:

It is the possibilities of such substitution which set the limits upon a firm’s ability to “give less and charge more”. Accordingly, in determining the outer boundaries of the market we ask a quite simple but fundamental question: If the firm were to “give less and charge more” would there be, to put the matter colloquially, much of a reaction? And, if so, from whom? In the language of economics the question is this: From which products and which activities could we expect a relatively high demand or supply response to price change, i.e. a relatively high cross-elasticity of demand or cross-elasticity of supply?

33 Although analysis of substitution sets the outer boundaries of a market, such analysis will not help in determining the starting point from which a market is defined. That is, before one can determine the outer boundaries to substitution, one must be able to answer the question, substitution for what? As Professor Baker explains, the starting point for the investigation of substitution is not always obvious:

Where should the process of market definition begin? Suppose a product market must be defined in order to analyse the competitive effects of conduct undertaken by Coca-Cola. Perhaps Coke is acquiring another firm, is accused of harming competition by excluding some rivals, or has introduced a practice (on its own or by agreement with other firms) said to facilitate coordination among rivals. Among other products, Coca-Cola sells regular Coca-Cola (a cola-flavored soft drink), Diet Coke (sugar-free), caffeine-free Coca-Cola, caffeine-free Diet Coke, Sprite (a lemon-lime flavoured soft drink), and Dasani (bottled water). Moreover, these products are sold in a variety of package types, including bottles and cans in a range of sizes. In principle, one might specify each finely distinguished product – for example, caffeine-free Diet Coke in 12 oz. Cans – as a candidate market, thus beginning the analysis with a large number of candidate markets. If caffeine-free Diet Coke in 12 oz. Cans were not a market, the candidate market would be expanded to the next best substitute – perhaps caffeine-free Diet Coke in bottles, perhaps caffeine-free Coca-Cola, perhaps Diet Coke (caffeinated), or perhaps caffeine-free Diet Pepsi (sold by a competitor) – and the hypothetical monopolist test applied again.

¹⁸ Maureen Brunt, “Market Definition? Issues in Australian and New Zealand Trade Practices Litigation”, *Australian Business Law Review*, 1990, Vol 18, No 2, 86-128, at 95.

¹⁹ (1976) ATPR 40-012 at 17,247.

In practice, market definition would likely begin with a larger aggregate – all colas, all soft drinks, or all beverages, for example. If disaggregated information about buyer substitution patterns is available and the outcome turns on the starting point, a more finely defined product might be an appropriate place to begin the analysis. But it would almost never be appropriate to begin by disaggregating more narrowly than the specific products that are purchased by the buyers alleged to have been harmed by the conduct under review.²⁰

34 If the definition of markets is to facilitate the analysis of competition and market power, the definition must be based on the means by which enterprises compete. They compete by undertaking certain activities; and, in particular, competition is focused on the activities in which the enterprises are rivals with one another.

35 The starting point of any definition of markets should be the activities of the firm(s) whose conduct is at issue. This approach to the problem of market definition is frequently identified with Edward Mason, the founder of the field of economics that is known as industrial organisation:

... the market, and market structure, must be defined with reference to the position of a single seller or buyer. The structure of a seller's market, then, includes all those considerations which he takes into account in determining his business policies and practices. His market includes all buyers and sellers, of whatever product, whose action he considers to influence his volume of sales.²¹

36 The Mason perspective suggests, in the words of Professor Brunt, a 'practical methodology' that should guide the definition of markets in the context of antitrust litigation:

This suggests, as a practical methodology, that one begins with a specification of the conduct claimed to be unlawful, (or for which authorisation is sought). That specification will be assisted by study of the requirements for breach laid down in the relevant provisions of the Act. The next question will be: what productive activities of the enterprise generate this conduct? And, finally, what decision-making unit within the firm (whether it be a company, a division, an establishment – or the whole complex organisation), and what product or set of related products, should be the centre-point of the analysis? It is a matter, in short, of seeking the constraints upon the 'price and production policies of the relevant activity of the firm in question'.²²

37 Although Professor Brunt's methodology suggests a number of steps prior to seeking competitive constraints, each of these steps is, in effect, a way of focusing the market definition on a coherent set of activities that is undertaken

²⁰ Jonathan B. Baker, "Market Definition", Chapter 13 of ABA Section of Antitrust Law, *Issues in Competition Law and Policy* (2008) at 328-329. A similar passage appears in Jonathan B Baker, "Market Definition: An analytical overview", *Antitrust Law Journal*, Vol 74 (2007) 129 at 145-146.

²¹ E S Mason, "Price and Production Policies of Large-Scale Enterprise", *American Economic Review*, 1939, Reprinted in E S Mason, *Economic Concentration and the Monopoly Problem*, Harvard University Press, 1957, pp 55-72, at p 65.

²² Maureen Brunt, "Market Definition' Issues in Australian and New Zealand Trade Practices Litigation", *Australian Business Law Review*, Vol 18, 1990, 86-128, at 105.

by the firm(s) whose market power is at issue. In other words, Professor Brunt's 'practical methodology' involves two phases – the first is focusing on a coherent group of activities undertaken by the firm(s) whose market power is at issue, and the second involves seeking out competitive constraints on the set of activities selected in the first stage. Each of these two phases involves a number of suggested steps.

- 38 We use the word 'coherent' to qualify the initial set of activities on which attention is focused because some judgment needs to be exercised in specifying these activities. Once one has specified the conduct that is claimed to be unlawful, one must ascertain the productive activities that are the subject of the conduct. One guide to the specification of these activities might be the way the enterprises are organised. That is, in specifying a particular group of activities, one is seeking a group of activities that, in some way, corresponds to the process of decision-making within the enterprises(s) whose market power is at issue.
- 39 This does not mean that the initial putative market should embrace all the activities within the enterprises; indeed, the putative market may well involve a small part of those activities. However, if the initial group of activities is to be a useful base for the analysis of competition, the activities should correspond in some way to decisions about competition within the enterprise(s) whose market power is at issue.
- 40 It follows from these principles that the process of defining markets involves issues of judgment. For this reason, it is generally not appropriate to characterise a particular definition of a market as right or wrong. Rather, some markets are more (or less) appropriate for the analysis of the issues of competition and market power that are before the court or regulator.
- 41 The methodologies proposed by Professor Brunt define markets that are contingent on the problem that one is seeking to analyse. The markets will consist of sets of activities undertaken by the enterprises (both the enterprises whose conduct is at issue and their competitors) and other constraints that they may face. The sets of activities will be defined with respect to product, geography and function.

4.1.1 Dimensions of the market

- 42 The activities that constitute a market can be characterised in various ways. The usual ways in which markets are characterised are according to:
- the products(or services) that those activities produce;
 - the geographical areas in which those activities occur; and
 - the section of the chain of production in which those activities occur.
- 43 These dimensions of the market are generally referred to as the product, geographical and functional dimensions. Some writers refer to the product

market, the geographical market and the functional market. However, it is important to bear in mind that the market is the set of activities and these various dimensions are merely ways of characterising the set of activities.

44 In our opinion, each of these dimensions of a market should be defined in the same way; that is, one should first seek a coherent set of activities that give rise to the conduct that is at issue (sometimes this is said to be determining the initial candidate market). Secondly, one should seek out substitutes that constrain the exercise of market power with respect to the activities in the initial candidate market.

4.1.2 Methodologies to determine the initial set of activities

45 As indicated by the quotation in the preceding section, Professor Brunt offers some suggestions of matters that might be considered when one identifies the initial putative market. These are:

- begin with a specification of the conduct claimed to be unlawful (or for which authorisation is sought);
- investigate the productive activities that generate this conduct; and, finally,
- investigate what decision-making unit within the firm (company, division etc) and what product or set of related products should be the centre-point of the analysis.²³

46 When determining the product or set of related products that should be the centre of the analysis (for the initial putative market), it is often useful to link together goods or services that are complements in demand or supply.

Complements in demand

47 Goods or services may be classified as complements in demand if consumers are prepared to pay more to buy them together than the sum of the prices they would pay to buy them separately.²⁴

48 Services that are complements in demand need not be produced by a single enterprise. For example, a flight to a tropical holiday destination might be provided by an enterprise that does not operate the hotel at the destination. Nevertheless, consumers will tend to prefer to buy both services from one supplier and leave the suppliers to co-ordinate these services between themselves. Furthermore, economic theory suggests that consumers may end up paying lower

²³ Maureen Brunt, 'Market Definition' Issues in Australian and New Zealand Trade Practices Litigation', *Australian Business Law Review*, Vol 18 (1990) pp 86-128, at 105.

²⁴ Joshua Gans, *Core Economics for Managers*, Thomson (2005) p 42.

prices for the services if producers of services that are complements in demand co-ordinate their pricing in certain ways.²⁵

49 Because consumers find it convenient to purchase services that are complements in demand in one transaction, they tend to be produced within a single enterprise or, if not produced within a single enterprise, co-ordinated and sold to final consumers by a single enterprise. That is, competition takes place either between enterprises that offer the whole bundle of complementary services or between groups of enterprises that compete with other groups of enterprises – where each group offers the whole bundle of complementary services. In either case, the coherent group of activities may well combine services that are complements in demand.

Complements in supply

50 Common costs may be the reason for linking products, regions or functions together when seeking a coherent set of activities before one seeks out competitive constraints. Common costs are sources of complementarities in supply.

51 Complements in supply may be defined as goods or services which can be supplied more cheaply if they are supplied together.²⁶ An example might be different models of motor vehicles that share parts in common. The common costs associated with producing common parts give rise to complementarities in supply – which are also known as economies of scope in economics.

52 Economies of scope may be relevant to market definition – particularly if the condition of entry is an important part of the analysis of market power – because, if firms are offering homogeneous products and competing by means of tough price competition, they will only be able to survive by offering the range of products joined by strong economies of scope.²⁷ That is, if an entrant only supplies one product, it risks having its prices undercut by firms that offer multiple products if these firms can recover their costs differently over all products.

53 As with complementarities in demand, an enterprise may be able to take advantage of economies of scope by means of contractual arrangements with other enterprises instead of undertaking the complete range of activities itself.²⁸ In that case, the firms whose market power is at issue may gain access to

²⁵ Joshua Gans, *Core Economics for Managers*, Thomson (2005) p 56.

²⁶ Joshua Gans, *Core Economics for Managers*, Thomson (2005) p 42.

²⁷ See J C Panzar and R D Willig, “Economies of scope”, *American Economic Review* (1981) Vol 71, pp 268-272.

²⁸ See David Teece, “Economies of scope and the scope of the enterprise”, *Journal of Economic Behavior and Organization* (1980) Vol 1, pp 223-247.

economies of scope via contractual means; and these firms may be competing with firms that gain access to economies of scope by means of co-ordination within a single enterprise. In that case, competition might be appropriately analysed across the range of activities that are linked by means of economies of scope.

4.1.3 Methodologies to determine the extent of substitution

54 As noted above, markets should be defined to include both the activities of the firm(s) whose market power is at issue and those who might act as material constraints on any exercise of market power. These constraints on market power operate through substitution. However, because substitution is a matter of degree, the analyst needs to decide which patterns of substitution might constrain the exercise of market power in a material way and which do not. This decision has led to the development of certain methodologies.

The SSNIP (or hypothetical monopolist) test

55 One approach to deciding which substitutes are included in the market and which are not is based on the idea that a market includes the minimum set of activities which, if controlled by a single enterprise, would enable that enterprise to profit by raising prices significantly above the competitive level.²⁹ This approach suggests that one should include in the market as constraints the minimum set of activities that would, if not controlled by the enterprise(s) whose market power was at issue, constrain those enterprises from raising prices above the competitive level. In practice, a significant increase in prices for these purposes is normally thought to be five or ten per cent.

56 An application of this method to test the constraints faced by the firms whose market power is at issue is to ask whether it might (without enlisting the support of others) be profitable for them to raise the prices of the relevant goods or services above the non-collusive level in a non-transitory way by five to ten per cent. This way of testing the extent of constraint they might face is called the SSNIP test – where SSNIP stands for small but significant non-transitory

²⁹ See P Areeda and D F Turner, *Antitrust Law – An analysis of Antitrust Principles and Their Application*, Volume II, Little, Brown and Company, Boston (1978) pp. 370-371: “We note again the economic definition of a market: any producer with, or any group of producers which if combined would have, some degree of power over price. A market thus includes producers of identical products, of products with physical or brand differences entirely disregarded by consumers, and of products regarded by consumers as such close substitutes that a slight relative price change in one will induce intolerable shifts in demand away from the other. The latter products are described as having a high cross-elasticity of demand. Such products are presumptively in the same market [excluding footnote]”.

increase in prices. The SSNIP test is also referred to as the hypothetical monopolist test.³⁰

- 57 If the group of firms whose market power is at issue can profitably sustain the relevant prices above the non-collusive level by the chosen percentage or more, that would indicate that the activities undertaken by this initial group of firms constitutes the relevant market. However, if this initial group of firms could not sustain a SSNIP then the putative market should be widened to include other activities which are substitutes. With each widening of the field of activities, the same question should be asked: can those undertaking this putative set of activities impose a SSNIP? As soon as the question can be answered affirmatively, the widening should cease because the outer boundaries to the relevant area of substitution have been determined.
- 58 The SSNIP test can be used to extend the boundaries to a market in any direction – the range of goods or services, the geographical boundaries or the functional levels. In each case, the extension should only be carried to the point at which the firms whose activities are included in the putative market can impose a SSNIP.
- 59 The SSNIP test is a means of thinking about the extent to which constraining activities should be included in a market. After identifying a coherent set of activities of the firms whose market power is at issue, the only constraints on those activities that should be included in the market are those which would prevent a SSNIP in the activities of interest.
- 60 The SSNIP test can be implemented empirically; but its empirical implementation requires data on variable costs and price elasticities of demand.³¹ Such estimation rarely provides more information than would be provided by the elasticity estimates considered by themselves.

Demand elasticities

- 61 Demand elasticities are estimates of the ways in which the sales of products are affected by changes in variables such as prices and incomes. If a group of sellers attempts to increase prices, they may be constrained by the reaction of consumers in switching to sellers who have not increased their prices. The extent of the constraint will depend on the extent of the switching. The cross-elasticity of demand between any two groups of products shows the percentage increase in the volume of sales of one group of products if the price of the other group were to increase by one per cent. These cross-elasticities of demand can be estimated if

³⁰ Massimo Motta, *Competition Policy, Theory and Practice* Cambridge University Press (2004) p 102.

³¹ See, for example, Simon Bishop and Mike Walker, *The Economics of EC Competition Law: Concepts, Application and Measurement*, Sweet and Maxwell (2010) pp 550 – 562.

an econometrician has data showing how consumers have switched in response to movements in prices in the past.

Supply elasticities

- 62 Elasticities of supply are defined in a way similar to elasticities of demand. They are estimates of the extent to which the market power of a firm or firms is constrained by competitors being able to utilise their assets to take advantage of an increase in price in activities in which they had not previously been engaged. These can also be estimated empirically – providing data are available showing how these responses have occurred in the past.
- 63 Reference to supply substitution among incumbents in a market raises the question as to the difference between:
- firms that are classified as incumbents because of high cross-elasticity of supply; and
 - potential entrants to the market.
- 64 Each category of enterprise can act as a constraint on the exercise of market power. However, the nature of these constraints can differ.
- 65 Barriers to entry can be defined in different ways. Nevertheless, the general idea of a barrier is a competitive advantage that incumbents have over the most-likely potential entrant to a market. It is important to note that the advantage is with respect to the most-likely potential entrant because it is the most-likely potential entrant which will exercise the most immediate constraint on the exercise of market power by the incumbent producers.
- 66 Within a market, some enterprises are likely to face closer competition from some incumbents than from others. The closer competitors will own assets that are close substitutes for the assets of the firm(s) whose market power is at issue. The incumbents that are less-close competitors will own assets that are less-close substitutes for those whose market power is at issue.
- 67 This theoretical framework led Caves and Porter to propose a distinction between barriers to entry to a market and barriers to mobility within a market.³² A potential entrant to a market will need to invest in significant new assets in order to enter the market.³³ An incumbent will have acquired many, but not all,

³² R E Caves and M E Porter, “From entry barriers to mobility barriers: conjectural decisions and contrived deterrence to new competition”, *Quarterly Journal of Economics* (1977) Vol 91, pp 241 – 267.

³³ Professor Brunt writes: “...the concept as here defined embraces cross-elasticity of supply (production substitution) but stops short of comprehending that substitution or competition which would require the creation of entirely new capacity for entry. If one defines a trade practices market as one ‘that could be subject to the exercise of market power’ one means to be mentally added ‘in the absence of entirely new entry’. Maureen Brunt, “Market Definition’ Issues in Australian and New Zealand Trade Practices Litigation”, *Australian Business Law Review* (1990) Vol 18 at p 103.

the assets needed to compete closely with incumbents in other sub-markets or groups within the overall market. As with all matters of market definition, the difference between barriers to entry and barriers to mobility is one of degree. Judgment is needed in electing to classify an enterprise as:

- a potential entrant to the market; or
- an incumbent in the market that would need to acquire some extra assets if it is to compete strongly with the enterprises whose market power is at issue.

4.2 Market definition for the proposed merger

68 As explained above in Section 4.1, market definition involves focusing on the activities that generate the conduct claimed to be unlawful and taking account of activities that can help constrain any exercise of market power by the firm in question.

69 This suggests, as a practical methodology, that one begins with a specification of the conduct claimed to be unlawful, (or for which authorisation is sought). That specification will be assisted by study of the requirements for breach laid down in the relevant provisions of the Act. The next question will be: what productive activities of the enterprise generate this conduct.

70 A key determinant of the extent to which other activities constrain the firm in question is the likely extent of substitution from buyers and sellers. On the demand side, substitution involves buyers of the firm's products switching to other firms' products in response to pricing, quantity and product or service quality attributes associated with the products. On the supply side, sellers of other goods may be able to substitute towards producing a similar product to the one offered by the firm in question. In this way, firms that produce or could produce similar products to those of the firm in question can constrain its decisions on price, quantity and quality.

71 Before applying the principle of substitutability to consider the different aspects of market definition relevant to the proposed acquisition, we note the findings of French J (as he then was) in *Australian Gas Light Company v Australian Competition and Consumer Commission*.³⁴ (the Loy Yang case)

³⁴ (No 3) [2003] FCA 1525 (**Loy Yang Case**) at [387]

72 In the Loy Yang case, in the context of an acquisition by AGL of an interest in the Loy Yang Marketing Management Company (operator of the Loy Yang A power station in Victoria), French J found that:

- there was a single wholesale market for electricity across the NEM, encompassing the sale of electricity and the provision of derivative contracts. In coming to this view, French J considered that:³⁵
 - physical electricity supplies and hedge products are traded in the same market
 - there are not separate markets for generators of different types or technologies that stand in particular parts of the ‘merit order’
 - there are not separate markets for the supply of particular types of hedge contracts; and
- in accordance with the common position put forward by AGL and the ACCC, there were separate state-based retail markets for electricity supply to:
 - residential and small business customers; and
 - industrial and commercial customers.

73 In applying the principles discussed in Section 4.1 to define the relevant market for the current matter, we will return to the findings of French J to provide a point of reference for our analysis.

4.2.1 Product dimension - wholesale

74 The ACCC’s SoI states that financial contracts (or hedges) are sold in a different product market to physical electricity delivered at spot prices:

Consistent with previous reviews, the ACCC considers that the wholesale supply of electricity and the supply of financial (hedge) contracts are appropriately defined as separate product markets. However, the ACCC recognises the close connection between hedge contracts and wholesale electricity markets, with hedge contracts being an essential input to sustainably participating in wholesale and retailing markets on a material scale.³⁶

75 This sub-section discusses the factors that we consider are relevant to the question of wholesale product market definition, in line with the approach suggested by Professor Brunt.

76 Macquarie Generation, like other generators in the NEM, produces and sells its electrical output through the centralised market operated by the Australian Energy Market Operator (AEMO). Due to the characteristic of the NEM as a

³⁵ at [382], [387]

³⁶ See ACCC (2014), Statement of Issues, AGL Energy Limited – proposed acquisition of the business and assets of Macquarie Generation, 6 February, p4 para 25

compulsory gross pool, AEMO acts as a buyer and seller of all physical electricity traded in the NEM.³⁷ In exchange for selling their power to AEMO, generators are entitled to receive the applicable prevailing wholesale spot price in respect of their power output. Due to the energy-only design of the NEM, in which spot prices can range between the Market Price Cap (currently, \$13,100/MWh) and the Market Floor Price (-\$1,000/MWh), spot prices can be extremely volatile.

77 As explained in the General Industry Report, generators have some costs that are fixed and some that vary with their output. The proportion of fixed and variable costs varies by the type or technology of the generator, with coal-fired generators having the highest fixed costs and the lowest variable costs. The presence of large fixed costs in a market where the spot price varies considerably through time creates financial risk for the generator. In this environment, both generators and their financiers will seek to mitigate the risk that generators' revenues will be insufficient to meet the cost of funds required to service their fixed costs.

78 The primary mechanism for a standalone generator to reduce its spot price exposure is by offering electricity derivative contracts for sale, such as swaps or caps.³⁸ Such contracts can be offered as OTC transactions as well as instruments traded on the ASX.

79 All significant generators in the NEM engage in the activity of selling derivative contracts in addition to supplying and selling physical electricity. In this way, generators can vary the degree of their exposure to the wholesale spot price. This means that while selling physical electricity and derivatives contracts are separate activities for a generator, by varying the amount of its physical and contract sales, a generator can substitute between selling unhedged electricity (physical electricity sold without a corresponding hedge) and hedged electricity (physical electricity sold with a corresponding hedge). On the margin, an increase in the price of unhedged electricity (i.e. an increase in the expected wholesale spot price) should reduce the supply of – and hence raise the price of – wholesale derivative contracts.

80 Paragraphs 130-132 of the Fowler statement indicate that AGL manages its wholesale risks as a generator by choosing a level of derivative hedging that reflects trade-offs between:

- the certainty offered by hedging output through derivative contracts
- the prices of hedges versus expected spot prices,
- the cost of fuel and other variables.

³⁷ See General Industry Report.

³⁸ See General Industry Report.

- 81 In addition, we understand that generators have regard to the potential implications of entering derivative contracts for their future bidding incentives and spot price outcomes. Other things being equal, a generator that has entered relatively few derivative contracts and remains highly exposed to the spot price will have a greater ability to profit from higher spot prices and hence a greater incentive to contribute to higher spot prices where it can, compared with a generator that has relatively little exposure to the spot price. Consequently, any generator has to weigh up the trade-off between, on one hand, the opportunities for earning high revenues through spot prices by leaving capacity uncontracted, and, on the other, the risk of losses through exposure to low pool prices or losses incurred through the need to make difference payments (particularly unfunded difference payments). Over a longer time horizon, a generator that is able to affect the spot price through its bidding behaviour may consider the trade off between short term losses on difference payments and its ability to raise wholesale prices (including contract prices) in the long run as a consequence of its bidding behaviour.
- 82 Similarly, electricity retailers engage in the activities of purchasing physical electricity from the market operated by AEMO at the same time as purchasing derivative contracts. In this way, retailers can vary their degree of exposure to the wholesale spot price. On the margin, an increase in the price of unhedged electricity should increase the demand for – and hence increase the price of – wholesale derivative contracts.
- 83 Paragraph 124 of the Fowler statement indicates that AGL does not necessarily seek to eliminate all of its retail business’s exposure to spot prices. Rather, AGL seeks to be physically or financially hedged to about the 50% probability of exceedance level of forecast demand from its customers. However, it does not apply this as a ‘hard and fast rule’. Rather, AGL compares swap contract prices to expected future spot prices and if AGL considers swap prices to be relatively high, it considers alternatives such as purchasing caps or running more expensive plant.
- 84 There is thus a complex interplay between factors that drive demand and supply of contracts and decisions regarding exposure to pool prices. At a very basic level, the spot price will play an important role in determining contract prices. Retailers as well as generators have to, as matter of routine commercial practice, determine whether they trade electricity on a hedged or an unhedged basis, based on their expectations of spot prices. Their expectations, and consequent decisions, will determine contract prices. As discussed in para 81, generators do not contract naively, and hence contract prices are likely to affect bidding behaviour. Taken together, these factors have the consequence that the revenues of generators, and hence their investment decisions, are the function of developments in both the spot market operated by AEMO and contract trading.

85 Therefore, unhedged and hedged electricity transactions are substitutes on both the supply-side (i.e. amongst generators) and on the demand-side (i.e. amongst retailers). Accordingly, in our view, based on the principles espoused by Professor Brunt, the relevant wholesale product incorporates the activities of the physical production and sale of power along with trading in electricity derivative contracts.

86 Finally, we note the comments of French J in the Loy Yang case :

There is a degree of unreality involved in separating out and identifying separate markets for the sale of electricity and the provision of derivative contracts... derivative contracts should be regarded as an integral part of the pricing and payment arrangements between generators and retailers in relation to the underlying product.³⁹

4.2.2 Product dimension – retail

87 In the SoI, the ACCC identifies separate retail markets for residential and small business (‘mass-market’) customers (those consuming up to 160 MWh of electricity p.a.) and industrial and commercial (‘large business’) customers (those consuming more than 160 MWh p.a). The ACCC commented that given the differing nature of the customer-retail relationship and they types of risk management required by retailers to service each category of customer, some retailers focus on only one customer type.

88 As noted above, the ACCC’s SoI retail product market definition is similar to the retail market definition agreed by the parties in the Loy Yang case. Nothing has changed, in our view, in the interim to fundamentally change this approach to retail market definition.

4.2.3 Geographic dimension - wholesale

89 In addition to the ACCC’s adoption of two different wholesale product market definitions, the SoI adopts two separate wholesale geographic market definitions to examine the proposed transactions. These are:⁴⁰

- Wholesale supply of electricity:
 - Wholesale supply of electricity in NSW, taking into account interconnector flows;
 - Wholesale supply of electricity in a combined NSW/Victoria/South Australia market, taking into account interconnector flows; and/or
 - Wholesale supply of electricity in the NEM.

³⁹ at [382]

⁴⁰ see paras 26-29, 73.

- Supply of financial hedge contracts: Contracts settled at the NSW regional reference price (RRP), thereby excluding contracts settled at other RRP's combined with Inter-Regional Settlement residue (IRSR) units.

90 Prior to embarking on our analysis of wholesale geographic market definition, we make the observation that the ACCC's approach to market definition gives rise to a certain inconsistency. This inconsistency arises because:

- For the proposed transaction to give rise to **horizontal** concerns, the merged AGL-Macquarie Generation must engage in economic withholding conduct without causing the Victoria-NSW interconnector to 'bind' (i.e. causing the interconnector to reach the limit of its ability to transfer any more energy). If this interconnector bound, AGL would gain no greater benefit from the withholding than would a standalone Macquarie Generation because the behaviour would not increase prices (and, hence, revenues) for AGL's plant in other regions; and
- For the proposed transaction to give rise to **vertical** concerns the ACCC has argued, potential new retailers must not be able to use contracts settled at other RRP's combined with IRSR units to hedge their loads. This is because the ACCC have argued that it is too risky for a retailer to hedge a load in NSW with contracts from an adjacent region, together with IRSR units because the IRSR unit are not sufficiently firm due to constraints on the interconnects. Yet if a merged AGL-Macquarie Generation engaged in economic withholding without causing Victorian and NSW RRP's to separate, then retailers would be able to hedge their exposures by entering financial contracts settled at the Victorian RRP, with or possibly even without acquiring Victoria to NSW IRSR units.

91 This inconsistency suggests that the ACCC's SoI approaches to product and geographic market definition are not compatible with both types (horizontal and vertical) of the ACCC's concerns.

92 The remainder of this sub-section considers the appropriate scope of the wholesale geographic market. As discussed in Section 4.1.3, one way to decide which substitutes are included in the definition of a market is to apply the SSNIP test.

93 In the present case, a strict application of the SSNIP test would likely yield a geographic market definition of NSW. However, the SSNIP test is, in our view, a rather crude tool for establishing geographic market definition in the context of the NEM, in which the competition provided via interconnectors can impose a significant constraint on generator bidding behaviour and spot price outcomes.

94 As explained in the General Industry Report, the NEM operates over the interconnected power system situated across a large tract of south-eastern Australia. Power flows freely across the entire interconnected system, subject to the influence of transmission constraints and losses. It is not possible to know

whether electricity consumed by a customer in South Australia was produced by a generator in Queensland. In this sense, the geographic product market is NEM-wide.

95 Section 6.4.3 of the General Industry Report discussed the proportion of time when transmission interconnector flows into NSW were limited by binding constraints. As shown in Figure 33, the key QNI and Vic-NSW interconnector each bound for less than 10% of the year. Further, even when interconnectors were constrained, spot price differences between the NSW RRP and neighbouring RRP's tended to remain below \$10/MWh, and were almost universally below \$100/MWh (see Figures 34 and 35). These data support the view that the relevant geographic market is much wider than NSW.

96 As also noted in the General Industry Report, NEM participants can and do:

- enter derivative contracts are settled against RRP's other than the RRP pertaining to the region in which their activities are located; and
- acquire or develop different activities in other regions (eg a retailer acquiring an interstate generator and vice versa),

with or without acquiring IRSR units to hedge inter-regional basis risk.

97 For example, paragraph 128 of the Fowler statement notes that:

.... AGL may chose [sic] alternate methods to manage capacity demand. Some of these might include:

- (a) Using a combination of IRSR units together with cap contracts referenced to the pool price in another region, or generation assets located in another region. AGL may consider this in instances where the cap prices in the region in which the customer demand is located are (in AGL's view) unexpectedly higher than the equivalent contract referenced to the pool price in an adjacent region;
- (b) Using a combination of IRSR units together with generation assets located in another region even where those generation assets may be required to manage capacity demand in the region in which they are located. AGL may consider this in instances where the coincidence of maximum demand in both regions is improbable, thereby creating a greater level of utilisation of AGL's generation capacity across its portfolio;
- (c) Acquiring insurance products related to weather conditions (which may be in the form of a simple financial payout if certain weather conditions prevail, or may be directly referenced to the pool price in a particular region if certain weather conditions prevail). AGL would typically use such products to hedge its maximum demand for a 10POE event (that is, demand conditions that would be expected to occur only one year in every ten).

98 In relation to AGL's actual hedging of its NSW retail load, Fowler notes in paragraph 136:

As the graphs showing AGL's hedge position which I discuss in the paragraphs below demonstrate, AGL established its NSW hedge position:

- (a) principally by entering into hedge contracts referenced to the NSW RRP with generators located in NSW (in particular, with [REDACTED] and [REDACTED]);
- (b) by entering into hedge contracts referenced to the NSW RRP with generators located in other regions of the NEM (in particular Queensland generators); and
- (c) by utilising hedge contracts referenced to other regions of the NEM and/or physical generation located in other regions (in particular Victoria and Queensland), supplemented by IRSRs.

99 As observed above, in the Loy Yang case French J found that the appropriate geographic definition for the wholesale market was at a NEM-wide level. On various occasions since that ruling, the ACCC has sought to identify substantially narrower geographic markets, notably on a State basis.⁴¹ In its recent SoI, the ACCC again asserted this view stating in respect of the ACCC's (separate) wholesale supply market:

The ACCC's preliminary view is that either or both a NSW or a combined NSW/Victoria/South Australia market may be relevant for the purposes of defining the geographic dimensions for wholesale supply of electricity

100 The reason for the ACCC's regional definition of the NEM is as follows:

There are constraints and degrees of substitution between jurisdictions of the NEM that arise from interconnectors between the regions. Electricity imports typically act as a very limited constraint at times of high demand (and hence prices) when interconnectors between regions bind (preventing further imports into the adjoining region), but will provide a more effective constraint at other times of lower demand. This makes it relevant to consider both a narrow and a broader market. Regardless of the geographic dimension considered, the ACCC takes into account flows of electricity via regional interconnectors in its assessment.⁴²

101 The ACCC does not explain how it takes account of electricity interconnector flows between regions in coming to this geographic market definition, but the passage above suggests that the ACCC may consider the market definition to be broader at times when there are fewer interconnector constraints and narrower when the flows over interconnectors reach the transfer limits of the interconnectors. In terms of this time dimension of the geographic boundaries of the market, French J concluded:

The geographic market is not to be determined by a view frozen in time or by observations based on shortrun times scales. The NEM is an evolving market which

⁴¹ See for example, ACCC(2007) *AGL Energy Limited and TRUenergy Pty Ltd – proposed swap of South Australian electricity generation assets - Public Competition Assessment* (para32) and ACCC (2011), *AGL Energy Limited and Origin Energy Limited – proposed acquisitions of assets being sold as part of the New South Wales Energy Privatisation –Public Competition Assessment*, para 50.

⁴² See ACCC (2014), Statement of Issues, *AGL Energy Limited – proposed acquisition of the business and assets of Macquarie Generation*, 6 February, p4 para 26

is intended and designed to operate as a single market for electricity throughout the regions which it covers. Transient price separations between those regions may define temporally limited sub-markets which can be referred to for the purposes of competition analysis. And they may well attract the appellation 'market' in the ordinary parlance of suppliers and retailers operating within them. In my opinion, however, having regard to the structure of the market and the extent to which its major participants operate across boundaries, I am satisfied that there is one NEM-wide geographic market for the supply of electricity, and associated with that, entry into electricity derivative contracts.⁴³

Empirical analysis of interconnector constraints and RRP

- 102 The issue of whether the market for the supply of electricity should be segmented on a regional level (for example, different markets for each NEM region or groups of regions) can be examined by measuring the extent to which there are constraints to trade between regions.
- 103 In particular, it is possible to test whether the ACCC's propositions (see para 100 above) regarding the circumstances under which interconnectors typically bind are true. The ACCC's propositions are that:
- electricity imports "typically" act as a limited competitive constraint at times of high demand
 - interconnector constraints bind between regions when demand is high
 - there is a strong correlation between times of high demand, interconnector constraints and high prices.
- 104 As a matter of market design, binding constraints on transmission interconnectors between regions can result in congestion, with the result that generation plant are dispatched out of 'merit order' (the ordering of generation capacity from those with the cheapest variable costs to the most expensive variable costs).
- 105 When an interconnector binds the generators in the importing region face no further competitive threat from generators that are exporting to that region because these exporting generators cannot transfer any more energy into the constrained region.
- 106 Nevertheless, in the present case, the evidence does not support the ACCC's proposition that there is a strong correlation between times of high demand, interconnector constraints and high prices – or at least large price differences.
- 107 The frequency and severity of constraints of interconnectors can be analysed in different ways. Section 6.4.3 of the General Industry Report presents the frequency of 5 minute dispatch intervals where each of the three interconnectors with NSW have bound over the period from 2009 to 2014 year-to-date. This

⁴³ at [387]

analysis showed that there has been a steady decline in the proportion of the year that these interconnectors bind.

108 The analysis presented in the General Industry Report did not address two important issues. First, it did not test the ACCC's assertions (SoI para 27) that:

- interconnectors bind at times of high demand; and
- times of high demand are also associated with high prices.

109 Second and more importantly, the simple analysis of interconnector constraints in the General Industry Report did not analyse the most important issue for market participants deciding whether and how to hedge their spot price exposures – that is, the level of price correlation (or separation) between RRP.

110 The latter issue is important in the present case for two reasons. First, to the extent that price levels between the regions of the NEM are similar for the vast majority of periods (after accounting for transmission losses), this would be informative in determining the geographic boundaries of the wholesale market. Second, if large RRP differences between regions are rare occurrences, it would be difficult to contend that a retailer with load in NSW would be unable to hedge that load either in total or in part using the combination of a hedge settled at an adjacent region's RRP coupled with the acquisition of appropriate IRSR units. As discussed elsewhere in this report, this hedging strategy has been used by AGL to support the development of its retail business in NSW.

Inter-regional price correlation

111 AEMO's 5 minute dispatch interval data has been analysed to explore the extent of price correlation between regions in the NEM. Interregional price differences will occur even in the absence of transmission constraints due to transmission losses, so it would be expected that some price differences would occur even in an unconstrained system.

112 Figure 2 shows the extent of spot price (in nominal terms) dispersion across the NEM over the period from financial year 2009 to 2014 to date. Each coloured band of a column indicates the percentage of time during the above period when the price difference was within a certain range. It also groups the region-pairs by those that:

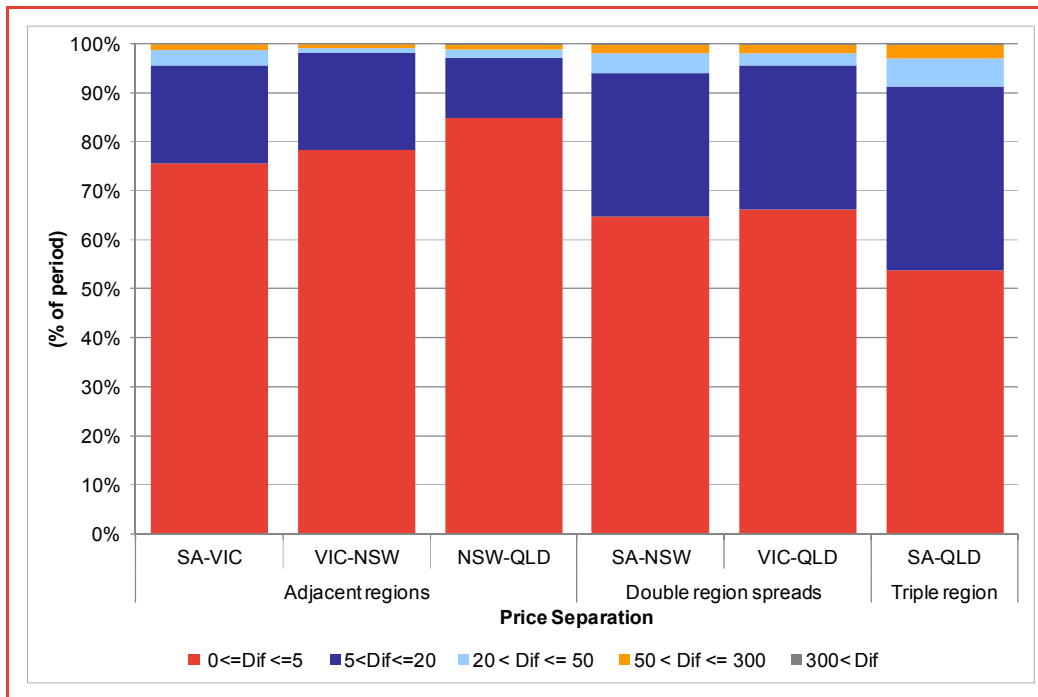
- are directly connected via interconnectors (i.e. SA-VIC, VIC-NSW, and NSW-QLD),
- have one region between them (SA-NSW, VIC-QLD) and
- have two regions in between (SA-QLD).

113 It can be seen from Figure 2: Percentage of price separation across the NEM over FY2008 to FY2014 to date that for the vast majority of the five-year nine-month period, the differences in spot prices between any two *adjacent* regions were no more than \$5/MWh (the lowest percentage among adjacent region-pairs

was 75.6% in the case of SA-VIC.). Even in the case of SA-QLD, which is separated by *two regions* between them, the difference in spot prices was no more than \$50/MWh for 96.9% of the period. Further, the instances with differences in spot prices greater than \$300/MWh were very rare. Among the adjacent regions, the maximum percentage of time when spot prices differed by more than \$300/MWh was about 0.28% (NSW-QLD), which accounts for only 142.9 hours over the entire five-year, nine month period. Even in the case of SA-QLD, only about 0.43% of the period sees price difference above \$300/MWh (which accounts for about 214.5 hours over the period).

114 This analysis of interregional price separations suggests that, for the vast majority of time, price differences between the NEM regions are relatively small and most likely reflect transmission losses (being less than \$20/MWh). There is a small percentage of time that price differences are between \$20/MWh and \$50/MWh. Beyond this, material price separations are rare. The annual results of this price separation analysis are presented in Annex A.

Figure 2: Percentage of price separation across the NEM over FY2008 to FY2014 to date



Source: Frontier Analysis of AEMO data (incorporates data from dispatch intervals 1/07/2008 00:05 to 16/03/2014 00:05 inclusive)

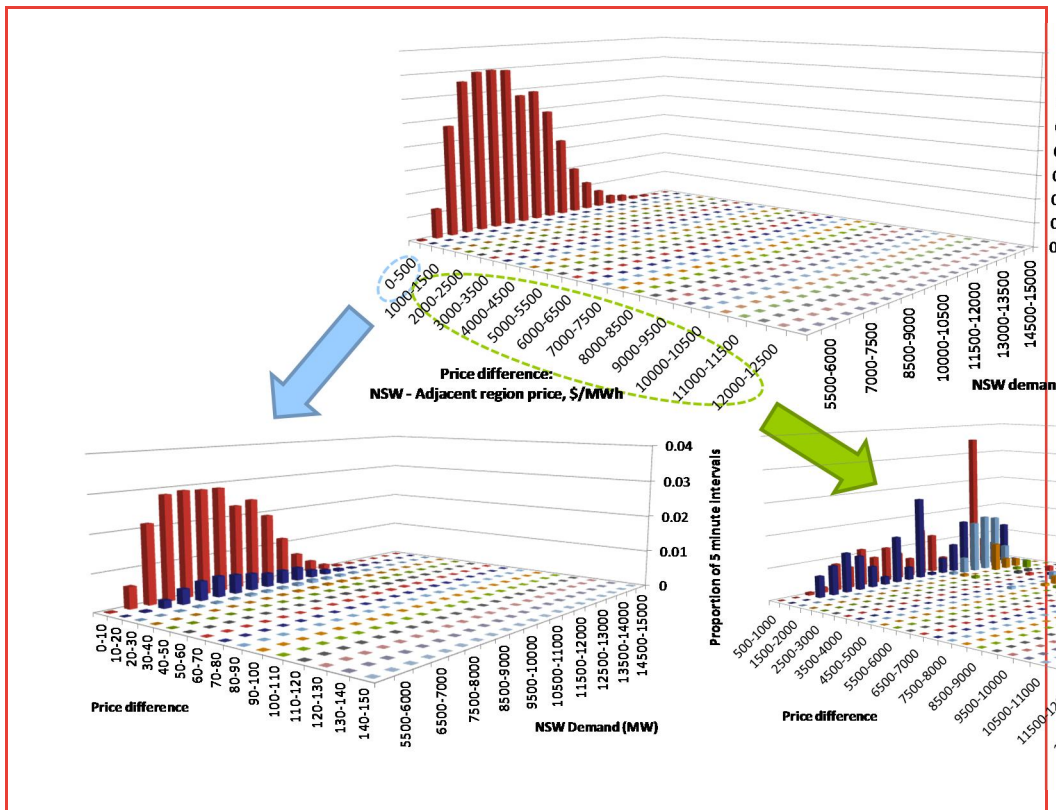
Relationship between price separation, price levels and demand

115 This analysis examines the circumstances in which the NSW RRP has diverged from the RRP in other NEM regions. Specifically, we have focussed on whether price separation in recent years has occurred at high demand and/or high price times or under more benign demand and price conditions.

- 116 Our analysis of the relationship between NSW demand and RRP separation is shown in Figure 3. It presents the percentage of 5 minute dispatch intervals over the last five years and nine months of where at least one interconnector exporting to NSW was binding. At least one interconnector was binding into NSW for 29.26% of the period. The Figure depicts the difference between the NSW RRP and the RRP in an adjacent region when the interconnector between the two regions was binding. If two interconnectors exporting to NSW were binding at the same time, the Figure shows the maximum price difference between the NSW RRP and the RRP of the exporting regions. This has the effect of biasing the results towards reporting greater price separation.
- 117 Figure 3 comprises three panels. The top centre panel shows the cumulative annual durations of RRP separations between \$0/MWh and the Market Price Cap at times of binding constraints. This Figure shows that the vast majority of price separations (99.54% of events) occur in the 'bin' marked \$0-\$500/MWh. The Figure also shows that the vast majority of price separations occur at moderate levels of demand rather than at very high levels of demand: NSW average demand over this period was 8,558 MW and peak demand over the five years of data was 14,648 MW.
- 118 To better understand the nature of RRP separations, the instances of price separation are split into two. The left bottom panel breaks out the price separations that are less than \$150/MWh. This bottom left panel has the same vertical scale as the top centre panel (showing the percentage of the 5 minute intervals in the 5 years and 9 months of data). The right bottom panel breaks out

the price separations that are greater than \$500/MWh.⁴⁴ As there are very few instances of price separation in excess of \$500/MWh, the vertical scale for the

⁴⁴ There are very few price separations between \$150-\$500/MWh. For ease of presentation, price separations in this range have not been included bottom two panels of Figure 3: Proportion of time interconnects bind Vs NSW demand and NSW price difference

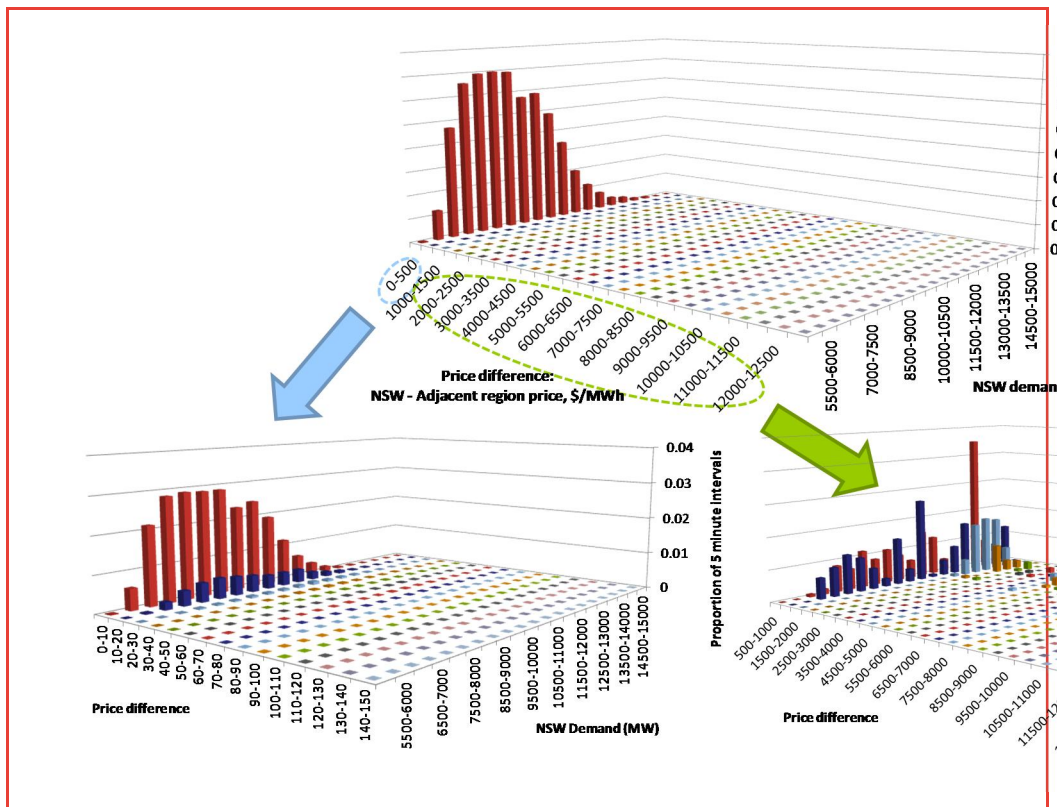


Source: Frontier Analysis of AEMO data (incorporates data from dispatch intervals 1/07/2008 00:05 to 16/03/2014 00:05 inclusive)

bottom right panel has been magnified 400 times so that the circumstances of these price separations can be reviewed more easily. The colours used in the three panels relate to the price difference 'bin' that each bar relates to (read off the horizontal axis on the left).

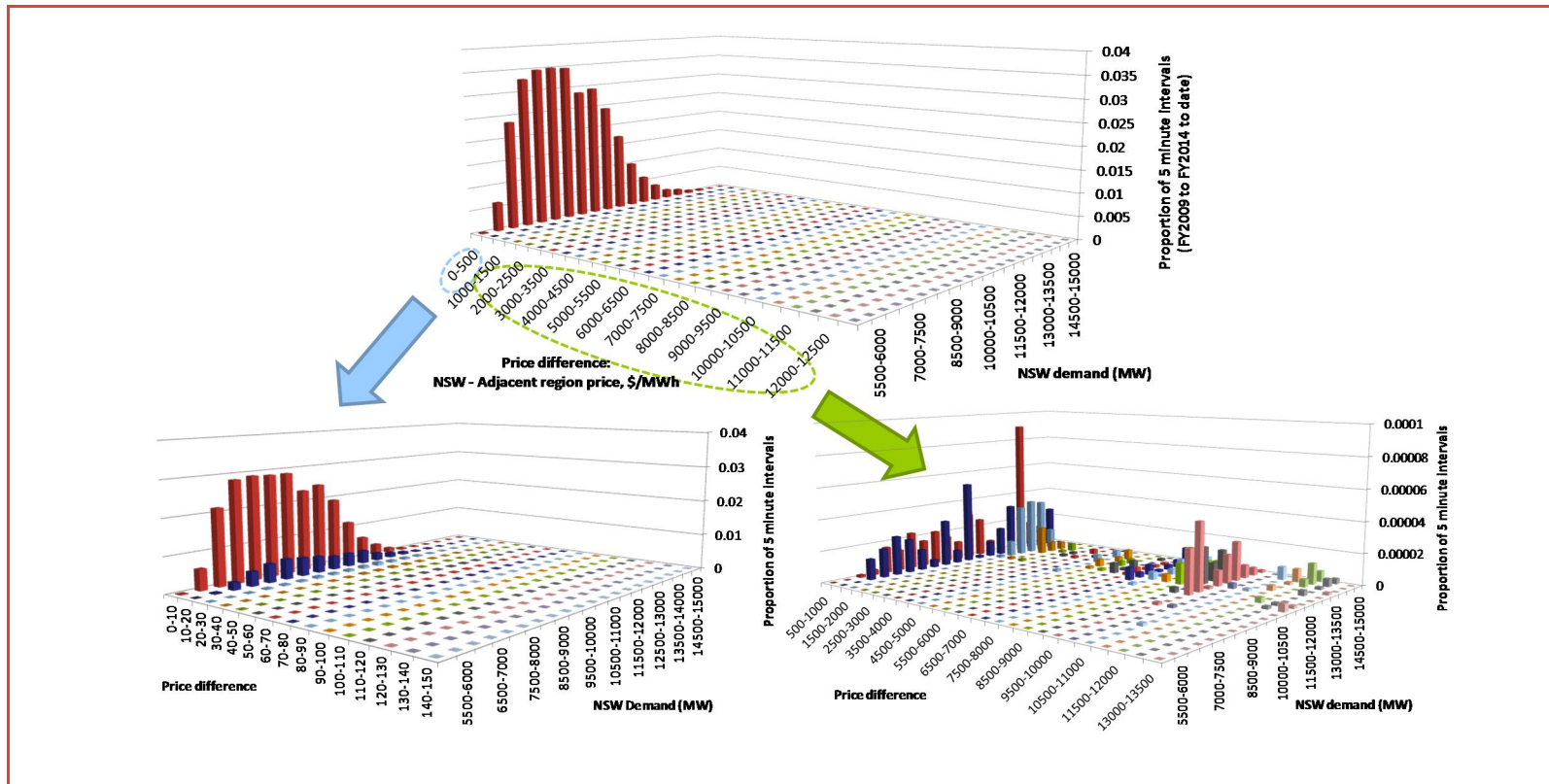
119 It is evident from the data that more severe price separations tend occur at times of high demand and prices. However, these severe price separations have occurred very rarely over the period of analysis.

, although they are included in the analysis in the top panel of Figure 3: Proportion of time interconnects bind Vs NSW demand and NSW price difference



Source: Frontier Analysis of AEMO data (incorporates data from dispatch intervals 1/07/2008 00:05 to 16/03/2014 00:05 inclusive)

Figure 3: Proportion of time interconnects bind Vs NSW demand and NSW price difference



Source: Frontier Analysis of AEMO data (incorporates data from dispatch intervals 1/07/2008 00:05 to 16/03/2014 00:05 inclusive)

4.2.4 Geographic dimension – retail

- 120 The ACCC expressed the view that the geographic dimension of the retail market was not determinative in their assessment of the proposed merger. The ACCC was therefore indifferent to whether the retail market was defined on a regional or NEM wide basis.⁴⁵ However, the ACCC noted that for a business to operate in a region it must satisfy certain requirements, including obtaining a retailer licence and acquiring hedge contracts.
- 121 According to the AER's *State of the Energy Market 2013* (see Figure 4) there are 21 retailers that operate in one of the major four regions of the NEM, being NSW, Victoria, Queensland and South Australia. Of these four regions, Victoria has the highest number of retailers (18) and South Australia has the lowest (12). Only six retailers operate across all of these regions. Tasmania has the fewest number of retailers in Australia (it is dominated by the Government owned Aurora Energy).
- 122 The AEMC has reviewed the competitiveness of retail electricity markets in Victoria, the ACT, South Australia and NSW.⁴⁶ In each of these jurisdictions (other than the ACT), the AEMC concluded that there is sufficient retail competition to justify the abolition of retail price controls.⁴⁷

⁴⁵ ACCC Statement of Issues, p 5.

⁴⁶ See AEMC website at: <http://www.aemc.gov.au/Market-Reviews/Completed.html> (accessed 21 March 2014).

⁴⁷ For Victoria, see AEMC, *Review of the Effectiveness of Competition in Electricity and Gas Retail Markets in Victoria, First Final Report*, 19 December 2007.; For South Australia, see AEMC, *Review of the Effectiveness of Competition in Electricity and Gas Retail Markets in South Australia, First Final Report*, 19 September 2008; For the NSW, see AEMC, *Review of Competition in the Retail Electricity and Natural Gas Markets in New South Wales*, 3 October 2013.

Figure 4: AER listed of active energy retailers

Table 5.1 Active energy retailers – small customer market, October 2013

| RETAILER | OWNERSHIP | QLD | NSW | VIC | SA | TAS | ACT |
|------------------------|--|-----|-----|-----|----|-----|-----|
| ActewAGL Retail | ACT Government and AGL Energy | | * | | | | * |
| AGL Energy | AGL Energy | * | * | * | * | | |
| Alinta Energy | Alinta Energy | | | * | | | |
| Aurora Energy | Tasmanian Government | | | | | * | |
| Australian Power & Gas | AGL Energy | * | * | * | | | |
| BlueNRG | BlueNRG | | | * | | | |
| Click Energy | Click Energy | * | * | * | | | |
| Diamond Energy | Diamond Energy | * | * | * | * | | |
| Dodo Power & Gas | M2 Telecommunications Group | | | * | | | |
| EnergyAustralia | CLP Group | * | * | * | * | | * |
| Ergon Energy | Queensland Government | * | | | | | |
| Lumo Energy | Infratil | * | * | * | | | |
| Momentum Energy | Hydro Tasmania (Tasmanian Government) | | | * | | * | |
| Neighbourhood Energy | Alinta Energy | | | * | | | |
| Origin Energy | Origin Energy | * | * | * | * | | * |
| People Energy | People Energy | | | * | | | |
| Powerdirect | AGL Energy | * | * | * | | | |
| Powershop | Meridian Energy | | | * | | | |
| Qenergy | Qenergy | * | * | * | * | | |
| Red Energy | Snowy Hydro ¹ | | * | * | | | * |
| Sanctuary Energy | Living Choice Australia/Sanctuary Life | * | * | * | * | | |
| Simply Energy | International Power | * | * | * | * | | |
| Tas Gas Retail | Brookfield Infrastructure | | | | | * | |

Electricity retailer (orange), Gas retailer (grey), Host retailer (*)

1. Snowy Hydro is owned by the New South Wales Government (58 per cent), the Victorian Government (20 per cent) and the Australian Government (13 per cent).

Note: The host retailers listed for New South Wales, Tasmania and the ACT are those responsible for offering 'regulated offer' contracts to customers in defined regions of each state. The host retailers listed for Victoria, South Australia and Queensland are those responsible for offering 'standing offer' contracts to customers that establish a new connection in defined regions of each state.

Sources: AER, jurisdictional regulator websites, retailer websites and other public sources.

Source: AER's State of the Energy Market 2013

4.2.5 The appropriate time horizon and scope for entry

123 As noted in Section 2.2.2, an important factor in characterising the strength of competition in a market – and thereby the extent of a firm’s market power – is the time horizon over which firms compete and over which new entry can occur.

Wholesale market – Electricity generation

124 Electricity generators have a long life, commonly operating for 40 years or more (e.g. Liddell power station). Hence their ability to earn prices in excess of their marginal operating costs in an energy-only market such as the NEM is essential

to their ability to recover their total costs and make normal profits over the life of the asset.⁴⁸ The energy market is designed so that investors will develop new generators when forecast wholesale prices are sufficient to make new generation profitable. The development of new generation typically takes several years from conception to commissioning. In our view this is the time period over which a market such as the NEM can be assessed as being workably competitive or not. As explained in the General Industry Report Section 6.4.2, wholesale prices in recent years in NSW (and elsewhere) have been well below Long Run Marginal Cost (LRMC). Such outcomes are consistent with a market that is workably competitive over the relevant timeframe.

125 In the Loy Yang case, French J noted [at 391] that gas turbine generators could be commissioned in less than two years. He also noted that substantial new generation entry had occurred in the years since the NEM had commenced. In light of this he stated that:

In my opinion, having regard to the above matters and the response of potential new entrants to price signals in the summer of 2000/2001, it cannot be said that barriers to entry into the NEM-wide wholesale market are such as significantly support or contribute to market power on the part of any of the market participants.

126 As discussed in Section 3.2 of the General Industry Report, substantial quantities of new generation have continued to be developed in the NEM since the Loy Yang case, with aggregate generating capacity rising from approximately 38 GW in 2005 to over 45 GW now. This is consistent with the same low barriers to entry found in the Loy Yang case.

Retail market – Electricity retailing

127 Electricity retailing is a less capital-intensive business than generation. Most retailers have limited fixed assets, comprising IT systems and offices, with staffing levels that are easier to vary than power station staffing levels.

128 Larger retailers tend to invest more in marketing and place a higher value on their brand reputation than small niche retailers. This means that larger retailers tend to be less inclined to enter and exit markets over short time periods than niche retailers. For example, in submissions to the Tasmanian Electricity Supply Industry Expert Panel (Panel), TRUenergy (now EnergyAustralia) commented that:

By taking on obligations as the financially responsible market participant we would be unable to easily exit if the environment was not conducive to our long term

⁴⁸ See General Industry Report.

business direction. Furthermore brand damage via an exit is significant. In summary, a commitment to a region is a significant business decision.⁴⁹

129 Conversely, the Panel noted that a more sustainably competitive market would emerge from the presence of larger, nationally based retailers rather than smaller niche retailers that are more likely to engage in ‘hit-and-run’ entry than larger retailers, particularly if such ‘hit-an-run’ retailers focussed on serving larger business customers.⁵⁰

⁴⁹ See Electricity Supply Industry Panel, *An Independent Review of the Tasmanian Electricity Supply Industry, Final Report Volume I*, March 2012, p.82,

⁵⁰ Electricity Supply Industry Expert Panel (2012), *An Independent Review of the Tasmanian Electricity Supply Industry, Final Report, Vol 1*, p87, Weblink: http://www.electricity.dpac.tas.gov.au/_data/assets/pdf_file/0006/160584/Final_Report_Volume_I.pdf

5 Horizontal considerations

5.1 ACCC's concerns

5.1.1 Horizontal aggregation

130 As noted above, the ACCC's SoI raised concerns regarding the horizontal aggregation resulting from the proposed transaction. These concerns stemmed from the aggregation of Macquarie Generation's capacity with AGL's existing generation capacity. The ACCC's SoI suggested that this aggregation could have the effect of substantially lessening competition in one or more of the following markets:

- the wholesale supply of electricity in NSW, taking into account interconnector flows;
- the wholesale supply of electricity in a combined NSW/Victoria/South Australia market, taking into account interconnector flows; and/or
- the wholesale supply of electricity in the NEM.

131 In the ACCC's view, the transaction could increase the incentives for AGL to engage in some form of 'economic withholding' of power to increase spot prices, such as by:

- Shifting some of the capacity it bid at low price bands to high price bands, thereby;
- Physically removing some of its capacity from the market, through 'mothballing' units (or not repairing units), not running units for parts of the year or retiring a plant altogether (for example, the Liddell power station).

132 In the ACCC's view, these strategies could reduce any excess generation capacity of AGL in NSW and may result in a tightening of the supply and demand balance in NSW with flow on impacts which benefit AGL's positions in Victoria and South Australia. The ACCC contended (at para [79]) that because of AGL's present lack of generation capacity in NSW:

...the proposed acquisition could only result in a material increase in market power to the extent that a wholesale electricity price increase in one NEM region could cause a corresponding increase in another NEM region. If, for example, a wholesale price increase in NSW caused a corresponding increase in Victoria and/or South Australia.

133 In support of these concerns, the SoI notes⁵¹ that the ACCC conducted modelling using AEMO's "price sensitivity forecasts" that it claims show

⁵¹ ACCC Statement of Issues p 17.

significant numbers of trading intervals in 2011-13 where, if it was assumed that a demand spike occurred in NSW, this would have resulted in a price rise in Victoria.⁵²

134 The SoI goes on to discuss the uncertainty surrounding trajectories of demand growth and additions to supply, and notes that:

The ACCC considers that if electricity demand in the NEM continues to decline or experiences very low rates of growth, it is less likely that the proposed acquisition would provide AGL with opportunities to engage in profitable withholding in the foreseeable future. Conversely, if demand increases at a greater rate there is an increased risk that market conditions would be favourable for withholding in the foreseeable future.⁵³

5.1.2 Coordinated effects – horizontal

135 As noted in Section 2.1.2, the ACCC has also expressed concern that the proposed transaction could also give rise to an increased risk of ‘coordinated effects’. Some of these coordinated effects could be categorised as horizontal competition issues. In particular, the ACCC suggested that the merger could lead to the gentailers having a common incentive to, *inter alia*, “increase the level and volatility of wholesale electricity prices”.

5.2 Principles for horizontal merger analysis

136 Although economic theory does suggest some possible exceptions, almost all horizontal mergers will decrease the competitive constraints on the parties to a horizontal merger. The real issue is whether this reduction in competitive constraints on the parties to the merger constitutes a substantial lessening of competition in a market.

137 In analysing the issue of substantiality, some relevant considerations might be:

- Is the merger likely to lead to an increase in prices or is the reduction in competitive constraints likely to be offset by reductions in marginal costs?

⁵² It is important to note that this For each pre-dispatch run performed, an additional 39 dispatch scenarios are run utilising the same “base case” parameters as the initial pre-dispatch run. These 39 scenarios are intended to provide estimates of the sensitivity to (forecast) regional spot prices from changes to demand and generator availability. AEMO’s approach for estimating the sensitivity of forecast spot prices to changes in underlying demand/supply conditions involves “flexing” the base case level of demand used in the initial pre-dispatch run by a range of MW values. This process is performed holding all else constant. Importantly, generator bids are assumed static in AEMO’s sensitivity analysis, and do not respond to (for example) a large increase in demand or reduction in supply. The implication of adopting this assumption is that the forecast sensitivity of spot prices produced by AEMO has tended to systematically overstate the true sensitivity of spot prices to changes in underlying demand-supply conditions.

⁵³ ACCC Statement of Issues p 17

- If the merger is likely to lead to an increase in prices, how large is this increase likely to be?
- If an increase in prices is likely, is this likely to be sustained or is it likely to lead to entry which will ultimately defeat the increase in prices?

138 Economic theory offers many suggestions as to how one should approach the answers to these questions. As illustrated in Figure 1 above, these suggestions from economic theory are conditional upon the basic conditions, public policy and structure of the relevant market. In this section, we outline how these conditions affect the analysis of the extent to which a horizontal merger might substantially lessen competition. The literature generally classifies the effects of a merger on competition as unilateral effects or coordinated effects.

5.2.1 Unilateral effects

139 The ACCC Merger Guidelines offer a useful definition of unilateral effects:

Mergers have unilateral effects when they remove or weaken competitive constraints in such a way that the merged firm's unilateral market power is increased. That is, as a result of the merger the merged firm finds it profitable to raise prices, reduce output or otherwise exercise market power it has gained, and can do so, even given the expected response of other market participants to the resulting change in market conditions.⁵⁴

140 One feature of market structure that determines the appropriate way to analyse unilateral effects is whether the products produced in the market are homogeneous or differentiated. A homogeneous product is one for which purchasers are indifferent as to the identity of the supplier. The wholesale supply of electricity is an example of a homogeneous product, so this section of the report will concentrate on markets of this kind.

141 Within homogeneous product markets, a second feature of the market that influences the way in which one analyses patterns of competition is whether the suppliers are nominating prices or whether prices are determined by an impersonal market mechanism. The national electricity market is organised along the latter lines.

142 The standard way in which to analyse competition in a homogeneous product market in which prices are determined by an impersonal market mechanism was developed by the French economist/engineer, Augustin Cournot.⁵⁵ Cournot

⁵⁴ ACCC Merger Guidelines, November 2008, para 5.1.

⁵⁵ A. Cournot, *Researches into the Mathematical Principles of the theory of Wealth*, 1st French ed. 1838, Translated by N Bacon, Macmillan, (1929) Almost any introductory microeconomics textbook will explain the Cournot model.

showed that markets with these two characteristics will have a margin of price on marginal cost that increases as market concentration increases. Later writers have shown that the relevant measure of market concentration for Cournot-type markets is the Hirschman-Herfindahl index (HHI).⁵⁶ That is, in a Cournot-type market, such as the national electricity market, an increase in market concentration as measured by the HHI will lead to increases in the margin of price on marginal costs in ways that can be modelled providing one knows the marginal cost functions of the relevant suppliers.

143 The Cournot model gives a way of gauging the magnitude of the increase in the margin of price on marginal cost caused by the unilateral effects of a merger in a homogeneous product market where price is set by an impersonal market mechanism. However, this model is static. That is, it does not indicate whether the predicted effect on price can be sustained.

144 Whether or not such an increase in the margin of price on marginal cost can be sustained will depend on the condition of entry to the market. In particular, if barriers to entry are low, the increase of margin of price on marginal cost will not be sustained in the long run. If barriers to entry are low, the increase in profit margins will be observed by potential entrants. They will be attracted into the industry and the resultant increase in capacity will reduce profit margins back to normal levels.

145 In summary, the unilateral effects of a merger in a Cournot-type market (with homogeneous product and prices set by an impersonal market mechanism) will be to increase profit margins in ways that can be predicted by the model. However, whether these increases in profit margins can be sustained will depend on the condition of entry to the market.

5.2.2 Coordinated effects

ACCC Merger Guidelines

146 The ACCC's Merger Guidelines include a section on coordinated effects. The guidelines note that:

Mergers have coordinated effects when they assist firms in the market in implicitly or explicitly coordinating their pricing, output or related commercial decisions. A merger may do so simply by reducing the number of firms among which to coordinate, by removing or weakening competitive constraints or by altering certain market conditions that make coordination more likely. Coordinated effects may occur in addition to unilateral effects so that the merged firm is able to achieve even higher prices than it would on its own. In some cases, coordinated effects, either alone or in

⁵⁶ K. Cowling and M. Waterson, "Price-Cost Margins and Market Structure", *Economica*, Vol 43 (1976).

conjunction with unilateral effects, may amount to a substantial lessening of competition.⁵⁷

US Merger Guidelines

147 The latest (2010) US horizontal merger guidelines describe coordinated effects as follows:

Coordinated interaction involves conduct by multiple firms that is profitable for each of them only as a result of the accommodating reactions of the others. These reactions can blunt a firm's incentive to offer customers better deals by undercutting the extent to which such a move would win business away from rivals. They also can enhance a firm's incentive to raise prices, by assuaging the fear that such a move would lose customers to rivals.⁵⁸

Economic literature review

148 Ordover (2008)⁵⁹ provides a useful discussion of the origins and rationale of the literature on coordinated effects. He differentiates between the following effects of a merger:

- Unilateral effects – which refer to changes in firms' price-quantity decisions, assuming firms continue to behave or react in the same way after the merger as before the merger. For example, if firms are assumed to play a Cournot game before the merger, unilateral effects refer to the changes in market outcomes due to changes in the game equilibrium due to the merger; and
- Coordinated effects – which refer to changes in firms' price-quantity decisions that are attributable to changes in the ease with which firms can sustain collusive outcomes. Coordinated effects typically arise from dynamic analysis where firms engage in repeated interactions. For example, if firms are assumed to play a Cournot game before the merger, coordinated effects refer to the increased scope for firms to sustain a collusive (i.e. monopoly) outcome following the merger given the impact of repeated interaction and the reduced number of participants.⁶⁰

149 Ordover explains how coordinated effects originated from George Stigler's framework for tacit collusion. In this framework, firms earn a normal (i.e. zero) profit if they do not collude and a share of monopoly profits (defined by the number of firms in the industry) if they do collude. Although all firms could earn

⁵⁷ para 6.1.

⁵⁸ US Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines*, Issued: August 19, 2010, section 7, pp.24-27.

⁵⁹ Ordover, J.A., "Coordinated Effects", chapter 57 in *2 Issues in Competition Law and Policy* 1359 (ABA Section of Antitrust Law 2008) (Ordover).

⁶⁰ Ordover, pp.1361-62.

more from colluding, each firm potentially has an incentive to cheat on the collusive agreement by slightly undercutting the prices of its rivals and capturing the entire market for itself. The model assumes that such cheating is eventually detected and ‘punished’ by all firms reverting to non-collusive strategies, in which case, all firms earn normal profits for all future periods.

150 In this model, collusion is made more likely where:

- the number of firms is small, because a smaller number of firms means that each firm captures a larger share of the collusive profit.
- firms do not discount the future heavily, as higher rates of discounting cause firms to devalue the punishment imposed due to cheating; and
- the changes of getting caught cheating are high and/or cheating is detected quickly.⁶¹

151 Ordover highlights the many difficulties associated with identifying and proving tacit collusion resulting from coordinated effects. He begins by noting that “the empirical evidence on the evidence of successful and persistent tacit coordination is actually quite scant.”⁶²

152 Second, the simple Stiglerian model of tacit collusion “vastly understates the difficulties faced by any would-be tacit or explicit colluders in that it assumes that cartel members can clearly identify a certain course of action.”⁶³ In reality, a range of coordination problems could arise, including:

- The need to agree on one out of potentially many collusive outcomes – different firms may prefer different outcomes.
- The need to agree on some mechanism for flexibly responding to changing market conditions: “this may be impossible or difficult in the absence of explicit communications since ‘market signalling’ may simply be too slow.” Further, “in fact, when markets are subject to frequent shocks, tacit collusion may simply be impossible.”
- The need to agree on the nature of ‘punishment’ strategies in the event they need to be implemented: “while reversion to ‘competition’ seems like a simple prescription, it may mean different things to different market participants.”; and
- The need to agree on when to trigger punishment strategies – because punishment is costly to all market participants, firms may want to coordinate on when they trigger the punishment phase: “jumping the punishment gun

⁶¹ Ordover, pp.1364-65.

⁶² Ordover, p.1363.

⁶³ Ordover, p.1363.

may appear to others as cheating and lead to further unravelling of tacit collusion, but too much restraint in punishing can embolden cheating and thus reduce the chances of successful collusion.” Further: “this conflict can be especially pronounced in those realistic market situations in which firms cannot clearly determine, based on private information and public signals, whether rivals are cheating or not.”⁶⁴

153 Drawing on recent court decisions in the United States and Europe, Ordover comments that:

The more complex the terms of coordination, the less likely it is that these can be implemented absent some direct communications or absent a price leadership being assumed by one of the market participants.⁶⁵

154 As for the task of competition authorities to demonstrate the likelihood of coordinated effects, Ordover says:

[T]he obstacles facing market participants also complicate the task of establishing the likelihood of coordinated effects from a merger. This is so if only because the economic foundations on which coordinated effects rest are much less developed and much more complex as compared to the Bertrand and Cournot workhorse models of static competition, and the assessment of the risks does not yield itself to the ready quantification associated with unilateral effects.⁶⁶

155 Elsewhere, he says:

[I]t is unrealistic – and probably unnecessary – to expect that the antitrust enforcement agency reviewing the merger prove, as a precondition for challenging a merger, that the transaction actually would cause the relevant firms to engage in coordinated interaction. Still, it is and should be necessary for the reviewing agency to spell out the mechanism of coordination and explain how the various elements of market conditions before and after the merger are related to the likelihood of coordinated effects through their impacts on terms of coordination, detection, and punishment.⁶⁷

156 In 2004, Dick described the so-called ‘new’ approach to demonstrating coordinated effects as follows:

[T]he agencies’ approach now places greater emphasis on articulating and empirically demonstrating the specific mechanisms by which a particular merger would make coordination easier to arrange or sustain. While some commentators have described this approach as “new,” in fact, it simply harkens back to the Guidelines’ recognition that successful coordination requires reaching an agreement, monitoring compliance, and (when necessary) punishing deviations. What makes the

⁶⁴ Ordover, p.1363.

⁶⁵ Ordover, p.1375.

⁶⁶ Ordover, pp.1373-74.

⁶⁷ Ordover, pp.1361-62.

current approach “new” is that the agencies have acknowledged the need to articulate and demonstrate the mechanisms by which they believe a merger would facilitate reaching and enforcing an anticompetitive agreement.⁶⁸

157 Dick noted that the Federal Trade Commission’s failure to adequately explain and justify its reasoning contributed to its failure to successfully block the Arch Coal merger.

158 Dick describes the ways in which a merger could make coordination more likely as follows:

- ***By reducing the number of competitors***, a merger will tend to increase the incentives for firms to coordinate and reduce the organisational task of reaching an understanding about price, output and market allocation and then to monitor each other’s compliance with that understanding.⁶⁹
- ***By narrowing asymmetries between suppliers*** – such as product attributes, cost structures, planning horizons, geographic coverage or excess capacity holdings – a merger could facilitate collusion.

Homogenization along such dimensions can align more closely suppliers’ incentives and abilities and can make it easier for the surviving suppliers to reach and defend a consensus on price, output, or market allocation.⁷⁰

- ***A merger could reduce opportunities for ‘maverick’ firms to disrupt coordination*** by acting on their differential incentives and being able to conceal their disruptive competitive behaviour from view.
- ***A merger can increase informational transparency***, which can facilitate coordination. One way that a merger could have this effect is by consolidating the market information to which two suppliers have access.

Dick notes:

In its review of Premdor’s proposed acquisition of Masonite, for example, the Antitrust Division alleged that the merger would enhance transparency by combining Premdor’s information about the downstream residential doors market with Masonite’s information about the upstream doorskins market. The Division alleged that one effect of the merger would be to enable the merged supplier to better detect price deviations by its sole remaining competitor in those two markets.⁷¹

⁶⁸ Comments of Andrew Dick as published in “Coordinated Effects Analysis: The *Arch Coal* Decision, An ABA Section of Antitrust Law Brown Bag Program (October 27, 2004)”, *The Antitrust Source*, March 2005, p.3.

⁶⁹ Dick, A.R., “Coordinated Interaction: Pre-Merger Constraints and Post-Merger Effects”, (2003) *George Mason Law Review*, Vol.12:1, pp.65-88 (Dick), pp.67, 70-72.

⁷⁰ Dick, p.73.

⁷¹ Dick, pp.85-86.

- 159 Both Ordover and Dick are dismissive of the ‘checklist’ approach to deciding if coordinated effects are likely to arise and cause harm. The checklist approach involves linking sellers’ propensity to collude to an assortment of market factors, such as market concentration, product homogeneity, transparency of pricing and the level of spare capacity. Both Dick and Ordover contend that the checklist approach frequency yields false positives as well as false negatives.⁷²
- 160 We discuss the scope for vertical mergers to increase the scope for coordination in Section 6.

5.3 Horizontal efficiencies

- 161 The classic sources of efficiency that may arise from a horizontal merger are from firm economies of scale.⁷³ Economies of scale for a homogeneous product may be defined as reductions in average cost resulting from an increase in scale of operations.
- 162 An acquisition of separate plants can give rise to economies of scale consistent with multi-plant operations.⁷⁴ Multi-plant operations can yield a number of economies. The first is that there may be inputs required by each plant that can be provided from a common pool of labour. A classic example is research and development; and exactly the same issue may arise with any knowledge or systems that can be shared across an enterprise.
- 163 The second standard source of multi-plant economies of scale is the reduction in risk associated with multi-plant operations.⁷⁵ Multi-plant generators can reduce risks in the following ways:
- They can reduce outage risk by creating the potential to self-insure. Section 5.2.3 of the General Industry Report noted that under a firm contract a generator is required to make difference payments, even if they are not generating (and therefore not earning spot revenue). Generators can seek to manage this risk by entering into a ‘back-up’ contract with another generator (often known as ‘coinsurance’) or keeping enough uncontracted capacity within their own portfolio to manage outage risk using their own capacity. The extent to which contracting or self-insurance is most effective depends

⁷² Ordover, pp.1369-70; Dick, pp.67-68.

⁷³ The classic reference is Oliver E Williamson, “Economies as an antitrust defense, the welfare tradeoffs” *American Economic Review*, Vol 58 (1968) pp 18-36.

⁷⁴ See F M Scherer, Alan Beckenstein, Erich Kaufer and R D Murphy, *The Economics of Multi-Plant Operations; An International Comparisons Study*, Harvard University Press (1975).

⁷⁵ See Bjorn Wahlroos, “On the Economics of Multiplant Operation: Some Concepts and Extensions”, *Journal of Industrial Economics*, Vol 29 (1981) pp 231-245.

on a range of factors including, for example, the characteristics of the generating portfolio (the number and relative sizes, costs and reliability of generating units), the extent of spare capacity in the market, the firms' risk preferences, and the availability and price of coinsurance contracts. Horizontal integration facilitates the potential for generators to self-insure and in the process they are able to make proportionally more of their capacity available for firm contracting (either to customers or as hedging contracts to third parties);

- They can reduce inter-regional hedging risks. Section 2.4.4 of the General Industry Report explained that participant settlement in the NEM is based on a limited number of RRPs, reflecting the different marginal cost of electricity at various locations. Writing contracts with counterparties in other NEM regions results in basis risk for market participants if the price at their local RRN differs from the price at the RRN at which the contract is settled. Creating a portfolio of generators in a number of market regions may facilitate the management of inter-regional price risk for a portfolio. Similar outcomes can be achieved through various forms of contracting. The relative merit of these broad options are dictated by the costs of securing inter-regional hedging products and/or the expected costs associated with being exposed at times the RRPs 'separate'; and
- They can reduce environmental risk by diversifying fuel sources. There has been considerable focus in recent years on the introduction of environmental policies, with the intent of reducing greenhouse gas emissions. The introduction of such policies could have a substantial revenue impact for particular generators in the NEM. In particular, coal fired generators may suffer relative to less emissions intensive gas fired plants. The creation of a generation portfolio with a number of fuel sources can assist in managing the potential downside associated with a change in environmental policies.

164 Another classic source of multi-plant economies of scale is the sharing of corporate overheads.

165 The efficiencies gained from a horizontal merger will depend on the magnitude of the portfolio whose size is being increased as a result of the merger. Past studies have shown that the minimum efficient size for a portfolio of generators is around 5,000MW.⁷⁶

⁷⁶ Queensland Electricity Industry Structure Task Force (1996), *Reform of the Queensland Electricity Supply Industry*, December, p104.

5.4 Horizontal considerations of the proposed merger

166 There are several different ways in which that the effects of a horizontal merger between firms producing homogeneous products can be considered in coming to a view as to the extent to which the merger is likely to decrease competitive constraints on the parties. These are:

- Concentration measures – as discussed above in Section 5.2.1, concentration measures such as the HHI can be used to evaluate the potential effects of a merger on horizontal competition. This is because, as noted above, economic theory indicates that in a Cournot-type market, the mark up on marginal cost will depend in part on the HHI. However, wholesale power markets have some special features that make it different to other markets (such as short term price inelastic demand, supply and demand must continually balance, prices can increase and fall by 100's of times within a few minutes), which make HHI and other concentration measures less informative than in some other markets. The HHI results for the acquisition, using both a NEM and NSW geographic market definition are computed and presented below.
- Cournot market modelling – participants in the NEM rely heavily on using market simulation models to assist them in developing and testing their commercial strategies, evaluating investments and making price forecasts. These models have been developed over the past 20 years and aim to produce similar outputs such as prices, production patterns of individual generators, generator profitability, interconnect flows, and transmission constraints. While there are many types of these models they basically fall into three categories:
 - simulation models – these rely on heuristic rules that govern the way the model determines price and production patterns, etc
 - mathematical optimisation models – these are based on mathematically optimising an 'objective function' (e.g. minimising production costs) subject to a number of 'constraints'. These constraints include, for example, the technical limitations of the power system (generation and transmission) and the market rules. In this way these models attempt to replicate the way the actual NEM is dispatched using the centralised dispatch software known as NEMDE (NEM Dispatch Engine).⁷⁷ Within this category of market models, further categorisation is possible. For example, while most market models claim to be able to show 'gaming' within the NEM, they do this in various ways. Most of the models that

⁷⁷ AEMO Weblink: <http://www.aemo.com.au/Electricity/Policies-and-Procedures/Dispatch>

use a ‘gaming’ routine are based on a residual demand approach which does not test whether a participant’s bids are optimal having regard to the behaviour of other generators. In many cases, it may be profitable for a generator to change its bidding strategy in response to the strategy of another participant by bidding a lower price to increase market share or by bidding a higher price to increase profitability. Often, residual demand models are described as Cournot models because they involve the model changing quantities offered into the market. However, these models fail to take account of the incentives and opportunities participants face in real-world markets.

- The other type of optimisation model is one based on the NEMDE but which incorporates the concept of a reaction function and computes Nash Equilibria. The modelling undertaken to investigate the proposed merger in this report is based on this third type of model.

167 The remainder of this section is devoted to describing these two approaches in more detail. In addition, Section 0 below discusses the empirical evidence regarding market outcomes in light of past horizontal and vertical mergers in the NEM.

5.4.1 Market concentration measures approach

168 The ACCC Merger Guidelines indicate that measures of market concentration can provide a snapshot of market structure and the size of parties involved in a merger or acquisition, and that this can be used to evaluate impacts on competition.⁷⁸

169 The relevant measure of market concentration for the national electricity market is the Herfindahl-Hirschman Index (HHI) as discussed in Section 5.2.1. The HHI is calculated by adding the squares of the market shares of all companies in the market. In a Cournot-type market, a higher the HHI indicates a more concentrated market and a larger mark up of prices over marginal cost.

170 We report below the HHI results for the acquisition in both a NEM-wide market and in a market confined to New South Wales. The ACCC Merger Guidelines state that the ACCC is less likely to identify competitive concerns if, following the merger or acquisition, the HHI is lower than 2000; or if it is greater than 2000, the change in the HHI is less than 100⁷⁹. The reported results show that acquisition yields results that are within these limits when the HHI index is applied to both the NEM and NSW markets across three indicators of market share: annual energy dispatch, installed capacity and annual pool revenue.

⁷⁸ ACCC (2008) *Merger Guidelines*, at 7.12 p 36

⁷⁹ ACCC (2008) *Merger Guidelines*, at 7.14 p 36

171 Conversely, in a counterfactual involving Macquarie Generation and Delta Coast being merged, the market HHI for a NSW market definition on a capacity market share is 2,805. This falls by 716 to 2,089 under the acquisition case that results in AGL acquiring Macquarie Generation and Delta Coast either remaining under Delta’s ownership or being sold to a new entrant.

Table 1: HHI results for the transaction

| Market share definition | State of the World | Geographic market definition | |
|-------------------------|--------------------|------------------------------|-------|
| | | NEM | NSW |
| GWh dispatch (FY2013) | Pre | 943 | 2,448 |
| | Post | 1,206 | 2,448 |
| | Change | 262 | 0 |
| MW capacity (current) | Pre | 887 | 2,089 |
| | Post | 1,115 | 2,089 |
| | Change | 228 | 0 |
| Pool revenue (FY2013) | Pre | 930 | 2,428 |
| | Post | 1,173 | 2,428 |
| | Change | 243 | 0 |

Source: Frontier analysis of AEMO dispatch, price and capacity data. Various public reports to attribute portfolio ownership

Notes: Installed capacity is current. Annual GWh and pool revenue is for the 2012/13 financial year.

172 Although higher HHIs indicate more market power in a Cournot-type market, they do not indicate whether this market power can be sustained. This will depend on the conditions of entry into the market. The HHI does not account for various factors that influence pricing behaviour in the national electricity market such as transmission constraints, varying demand and generator outages. Furthermore, the HHI does not take into account demand elasticity⁸⁰, which is an important consideration in the NEM where demand is highly inelastic in each trading interval.

⁸⁰ Stoft, S. (2002), *Power System Economics, Designing Markets for Electricity*, IEEE Press, p 342.

5.4.2 Market modelling approach

173 Given the complexity of the NEM, it is not possible to wholly rely on a qualitative assessment of the effects of a horizontal merger. This sub-section sets out our approach to modelling the effects of the proposed transaction to provide insights into the likely effects of the horizontal merger on competition and prices in the NEM.

174 A large number of factors contribute to the pricing behaviour of market participants in the national electricity market. As structural measures of concentration, such as the HHI, provide no information about the relative importance of the range of market factors on pricing behaviour, we have adopted a detailed modelling framework in order to understand the market outcomes associated with the merger.

175 To model the effect of the proposed merger, a two stage modelling approach has been adopted. The first stage involves forecasting NEM wide investment over the relevant time horizon with an optimal least-cost investment model. The second stage involves taking the existing and forecast investment market structure and applying a Cournot model of competition to forecast spot prices.

Stage 1 – Optimal least-cost investment forecast

176 The optimal least-cost investment model adopted for this modelling task is a mathematical optimisation model using a mixed integer linear programming (MILP) approach. This MILP approach is used because it allows the model to use both continuous and integer type variables. This is important because not all variables that need to be modelled in the NEM are either integer or continuous. As described above the model optimises the development and operation to achieve a certain objective function – in this case to minimise total generation costs. It achieves this objective function subject to meeting a range of regulatory and technical constraints, including:

- physical interconnect and generation limits cannot be breached;
- supply must equal demand or otherwise incur the Market Price Cap (or the market price floor if there is surplus demand);
- minimum reserve requirements must be met; and
- key policies, such as the Renewable Energy Target and the Carbon price, must be met.

177 The variables include new investment levels and individual generator dispatch levels. The model is allowed to decide when and how much to invest and what technology type to build. The model is also allowed to choose how much electricity to dispatch from each generator for each level of demand modelled. Hence the model simultaneously determines least-cost investment and dispatch in the NEM for the forecast period.

178 In order to reflect the outcomes in the NEM, the model adopts detailed estimates of its key parameters. Demand levels are specified for each of the five NEM regions. A distribution of demand levels is modelled within each forecast year and this accounts for both the volatility of demand within each region and the correlation of demand between regions. Every generator in the NEM is modelled, which involves incorporating key operating characteristics of each existing generator such as forecast available capacity, annual capacity factors, expected outage rates, auxiliary rates, thermal efficiencies and operating costs. The six major interconnects are modelled and the model accounts for the key characteristics of each interconnect including line limits, losses and planned upgrades. Investment options include both renewable and thermal technologies and the model accounts for the operating characteristics, operating costs and capital costs incurred of these new technologies.

Stage 2 – Cournot competition price forecast

179 Price formulation in the national electricity market is the product of rivalrous behaviour by competing firms. In the NEM firms are bound to offer a supply function (how much they are prepared to produce for a given price) in up to 10 bands (as discussed in Section 2.4.3 of the General Industry Report). These bands are to be submitted as part of a generator’s offer on the day before the trading day and while the prices that are offered have to remain the same throughout the trading day, generators can alter the quantity they offer in each price band up until just before the relevant dispatch interval. This is one of the reasons that pre-dispatch prices are not a fair reflection of likely prices. Differences also occur because any number of changes to the power system can occur between and within a dispatch interval which affects the production trajectory of individual generators.

180 In simplified terms, this strategic situation faced by firms in the NEM is a trade-off between offering less capacity and raising prices on one hand, and a reduction in output sold on the other. How this trade-off is resolved, and in particular whether it is profitable for any firm to reduce output in order to raise prices given a specified level of demand, also depends on the responses of rival firms in the market.

181 As discussed above the standard model for analysing competition in the national electricity market is the Cournot model. The standard features of Cournot models are that competition comes from within the market (i.e. no new entry is assumed) and that:

- firms select quantities, given prices for these quantities and quantities selected by other firms; and
- each firm prices on a residual demand curve i.e. total demand less the demand that is met by other firms.

- 182 The combination of both these assumptions means that each firm has a reaction function, which shows how its decision on output varies as a consequence of the decisions of other firms. Hence, in this model the profit maximising behaviour of a firm takes explicit account of the decisions and behaviour of its rivals. The result of the Cournot model is the set of quantities selected by all firms where, at these selected quantities, no firm can increase its profits by changing its selected quantity. In other words, it is choosing the best quantity given the quantities selected by its rival firms. This result is also known as a Nash Equilibrium.
- 183 A Nash Equilibrium is a set of actions taken by all players such that the action taken by any one player is the best one given the actions of the other players. It is an equilibrium because no party can improve its payoff by unilaterally changing its actions (see below for a more detailed description of the Nash Equilibrium).
- 184 The model adopted to analyse the merger allows firms to select the quantity to supply from a set of discrete quantity bids. All supply is priced at the generator's short-run marginal cost of production, therefore for each set of potential quantity bids the spot price is equal to the short-run marginal cost of the firm supplying the marginal unit of demand. Spot prices are determined for each NEM region simultaneously. The Nash Equilibrium solution concept is adopted for determining dispatch and pool price outcomes.
- 185 Like the optimal least-cost investment model, this model is configured to the current and forecast NEM system. It incorporates the constraints adopted in the least-cost investment model including generation capacity limits as well as constraints that ensure supply equals demand, or otherwise incurs the Market Price Cap, for each half hour modelled. In addition, this model incorporates the publically available version of AEMO's constraint equations in order to best reflect the physical limitations of the network. It also adopts detailed estimates of the short-run marginal cost of all generators in the NEM.

Nash Equilibrium Solution Concept

- 186 A Nash Equilibrium is an outcome from a strategic game where each player is choosing their best strategy given the strategies that other players have chosen.
- 187 A famous example of the Nash Equilibrium solution concept is the "chicken game". In this game, there are two drivers, both headed for a single lane bridge from opposite directions. The first to swerve away yields the bridge to the other. If neither player swerves, the result is a potentially fatal head-on collision. It is presumed that the best thing for each driver is to stay straight while the other swerves (since the other is the 'chicken' while a crash is avoided). A crash is presumed to be the worst outcome for both players. This yields a situation where each player, in attempting to secure his best outcome, risks the worst.

Figure 5: Chicken game payoffs

| | Swerve | Straight |
|----------|--------|----------|
| Swerve | 0, 0 | -1, +1 |
| Straight | +1, -1 | -10, -10 |

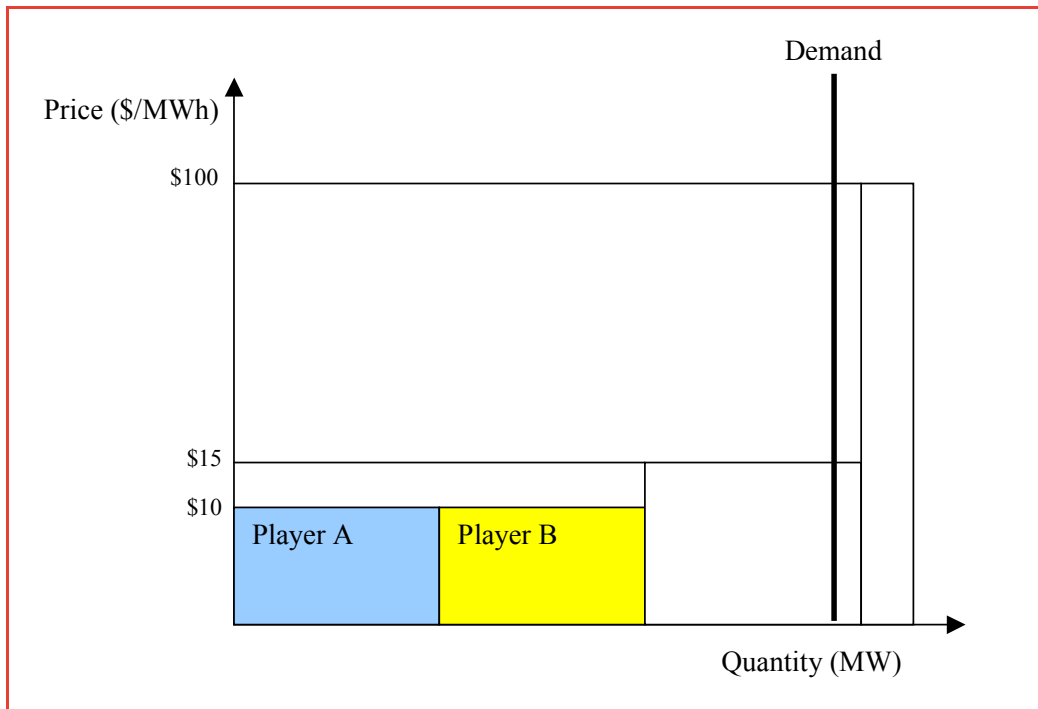
188 The chicken game has two Nash Equilibria: in each equilibrium, one driver swerves and the other stays straight. Knowing that the other driver will swerve, the best course of action for the first driver is to go straight and vice versa. In each case, neither driver (or ‘player’) can gain by changing his/her course of action given the action of the other player – in other words, neither player has an incentive to unilaterally deviate from what he/she is doing. This quality of stability is why the Swerve/Straight and Straight/Swerve combinations can be described as equilibria. The ‘multiple equilibria’ that arise in the chicken game are commonly found in Nash Equilibrium modelling of the NEM.

Applying game theory to the electricity market

189 To illustrate how the Nash Equilibrium is applied in modelling the NEM, consider a simple example of an electricity market. The market is a single regional market, with 2 Players, A and B. Players A and B are of equal size (say, 100MW) and have equal costs (say, \$10/MWh). There are also other generators in the market, with higher costs (one at \$15/MWh and another at \$100/MWh). An aggregate supply and demand diagram for this simply market is shown in Figure 6.

190 In this example, demand is at a level above the combined capacities of Players A and B, intersecting with the first higher cost generator. The result is that the market price is determined by the bids of the first higher cost generator, at \$15/MWh. Both Player A and Player B make a small profit equal to \$5/MWh, multiplied by their output of 100MWh, giving \$500 each.

Figure 6 Example supply/demand diagram



191 Under these conditions, either Player A or Player B could withdraw a small amount of capacity to push the price up to the cost of the second higher cost generator (\$100/MWh). Assume Player A withdraws 10MW, and that this is sufficient to set the price at \$100/MWh. This results in the following profit outcomes:

- Player A's profit becomes $90\text{MW} * (\$100 - \$10) = \$8,100$.
- Player B's profit becomes $100\text{MW} * (\$100 - \$10) = \$9,000$.

192 Conversely, Player B could withdraw 10MW, and the profit results would be reversed. If both Player A and Player B withdrew 10MW, the price would be set at \$100/MWh, resulting in the following profit outcomes:

- Player A's profit becomes $90\text{MW} * (\$100 - \$10) = \$8,100$.
- Player B's profit becomes $90\text{MW} * (\$100 - \$10) = \$8,100$.

193 Using these results, we can construct a game payoff matrix as shown in Figure 7.

| | | Player B | |
|----------|-----------|------------------|------------------|
| | | Bid 100MW | Bid 90MW |
| Player A | Bid 100MW | \$500, \$500 | \$9,000, \$8,100 |
| | Bid 90MW | \$8,100, \$9,000 | \$8,100, \$8,100 |

Figure 7: Payoff matrix (Player A, Player B)

Note: Payoffs are in Player A, Player B order.

194 Now consider Player A’s incentives:

- If Player A thought Player B would bid 100MW, Player A would do best by bidding 90MW for a profit of \$8,100 (compared to \$500 by bidding 100MW).
- If Player A thought Player B would bid 90MW, Player A would do best by bidding 100MW for a profit of \$9000 (compared to \$8100 by bidding 90MW).

195 As the game is symmetric, which is the case in this example because the marginal costs of these generators are the same, Player B faces the same incentives. In this example, we have two equilibria, (A=90MW, B=100MW) and (A=100MW, B=90MW). At either equilibrium point, no player can increase its profits by unilaterally changing its bid – that is, both these points are Nash Equilibria and are consistent with the stylised Nash Equilibria arising in the chicken game.

5.4.3 Modelling the proposed merger

196 This section quantifies the impact of the merger on wholesale spot prices across the NEM using the two stage modelling process described in Section 5.4.2. The impact on wholesale spot prices is an indicator of the competitive impact of the merger. Wholesale spot prices have been forecast for FY2015 to FY2017.

Modelling cases, merger scenarios and assumptions

197 Pricing outcomes have been quantified for two future states of the world: the Base Case and the Green Case. These cases reflect AGL’s view of the most likely future outcomes. They differ by three key factors:

- Renewable Energy Target (RET) trajectory:
 - In the Base Case, the target reaches 35TWh by 2020 and 41TWh by 2025
 - In the Green case, the target is in line with the current legislation

- Carbon scheme:
 - c. In the Base Case, the carbon price scheme remains and the carbon price ranges from \$6.66/t to \$7.16/t in the forecast period
 - d. In the Green Case, the carbon price scheme remains and the carbon price ranges from \$15.44/t to \$16.61/t in the forecast period
- Rooftop solar PV uptake:
 - e. In the Base Case, the rooftop solar PV uptake is a blend of the three forecast series (Slow, Moderate and Rapid) from AEMO's 2013 National Energy Forecast Report (NEFR). This blended rate adopts the NEFR series in the following proportions: 30% Slow uptake, 60% Moderate update and 10% Rapid uptake
 - f. In the Green Case, the rooftop solar PV uptake is in line with the NEFR Rapid uptake series

198 While the Base Case is the expected future state of the world, the Green Case reflects a worst case outcome for thermal generators due to its combination of relatively high RET target, carbon price and rooftop solar PV uptake rate.

199 Pricing outcomes of each case for two merger scenarios are also examined. The first is a Counterfactual scenario where an independent participant with no other generation capacity acquires Macquarie Generation. The second is an Acquisition scenario where AGL acquires Macquarie Generation

200 The modelling assumptions are mainly based on publicly available information released by AEMO for modelling assumptions including forecast demand, operating costs and existing plant characteristics. Table 2 summarises the key assumptions adopted in these two cases. In particular, there are two key publications:

- AEMO, National Electricity Forecasting Report, 2013 (NEFR). This is the starting point for demand forecasts used in the modelling; and
- AEMO, National Transmission Network Development Plan, 2013 (NTNDP) is the source for operating costs and existing generation plant information. For information that has not been updated in the 2013 publication, Frontier Economics has used the most recent NTNDP where such information is available.

201 Modelling assumptions for new technologies come from a mixture of the NTNDP, Frontier Economics' in-house data and AGL's in-house data. For entrant capital costs, operating costs and key operating parameters, the modelling is based on information from Frontier Economics' detailed global database with some additional inputs from AGL. Frontier Economics' global database is populated with publicly available cost estimates and operating parameter estimates from a wide variety of sources, primarily company reports, reports

from the trade press, industry and market analysis, and engineering reports. The final estimates are reasonably consistent with current estimates from other public sources including the NTNDP.

202 Details and values of all modelling assumptions were provided to the ACCC during its previous consideration of the proposed acquisition.

Table 2: Modelled Scenarios

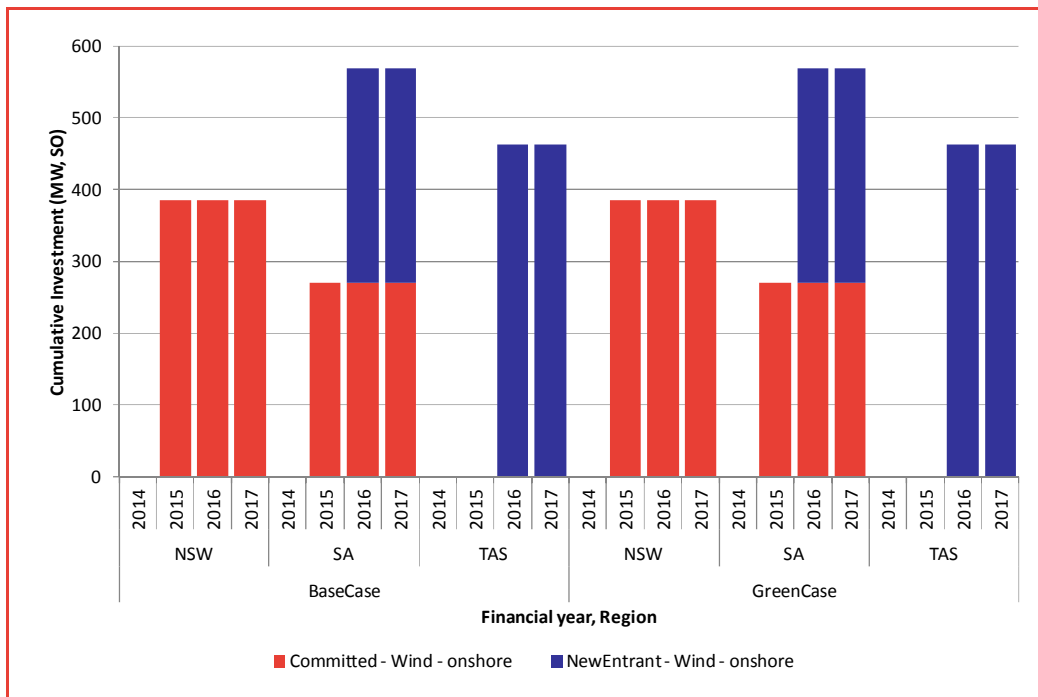
| Parameters | Base Case | Green case |
|-------------------|--|--|
| RET Trajectory | 35TWh by 2020, 41TWh by 2025 | No change to current RET structure |
| Small scale solar | Blended uptake rate based on NEFR projections in the following proportions: 30% slow, 60% moderate and 10% rapid | NEFR Rapid uptake case |
| Plant Closure | Playford mothballed 700MW Tarong mothballed in FY2015 | As base |
| Carbon Scheme | \$6.66/t to \$7.16/t for FY2015 to FY2017 | \$15.44/t and \$16.61/t for FY2015 to FY2017 |
| Demand | NEFR low scenario | As base |
| Gas prices | NTNDP 2013 Scenario 3 market prices | As base |
| Coal prices | NTNDP 2013 Scenario 3 market prices with the exception of brown coal plant who receive contract prices | As base |
| Contract level | 60% Swaps, 20% Caps | As base |
| Quantity bids | Quantity bids available to strategic firms: <ul style="list-style-type: none"> • 90% of capacity (de-rated at the expected outage rate) • 80% of capacity (de-rated at the expected outage rate) | As base |

Stage 1 – Optimal least-cost investment forecast

203 Figure 8 presents the NEM-wide forecast cumulative investment path for the Base Case and the Green Case by region (noting that ownership structure is not an input into the optimal least-cost investment model therefore forecast investment is the same in the Counterfactual and Acquisition scenarios). Figure 8 also shows committed new wind investment in NSW and SA as reported by AEMO.

204 Figure 8 indicates that no additional supply of thermal generation is required until FY2017 as the current level of generation capacity is sufficient to meet the small levels of short term demand growth. Wind farms are built to satisfy the Renewable Energy Target (RET) – see Section 4.2.3 of the General Industry Report. Whilst the RET trajectory is different across cases, the trajectories are largely the same until FY2017. The modelling tends to locate wind investments in South Australia and Tasmania due to the assumption of better quality wind resources in these states.

Figure 8: NEM wide forecast investment path



Source: AEMO (committed investment), Frontier Economics (forecast)

Stage 2 – Cournot competition price forecast

205 The Cournot modelling produced very small changes to prices in the wholesale market in all years modelled. Given that, according to the AEMC, the wholesale

component of a customer's retail electricity bill comprises on average about 20% of the total costs, the small changes in the wholesale price will mean that the merger will have an even smaller effect on the prices that customers face in the NEM.⁸¹

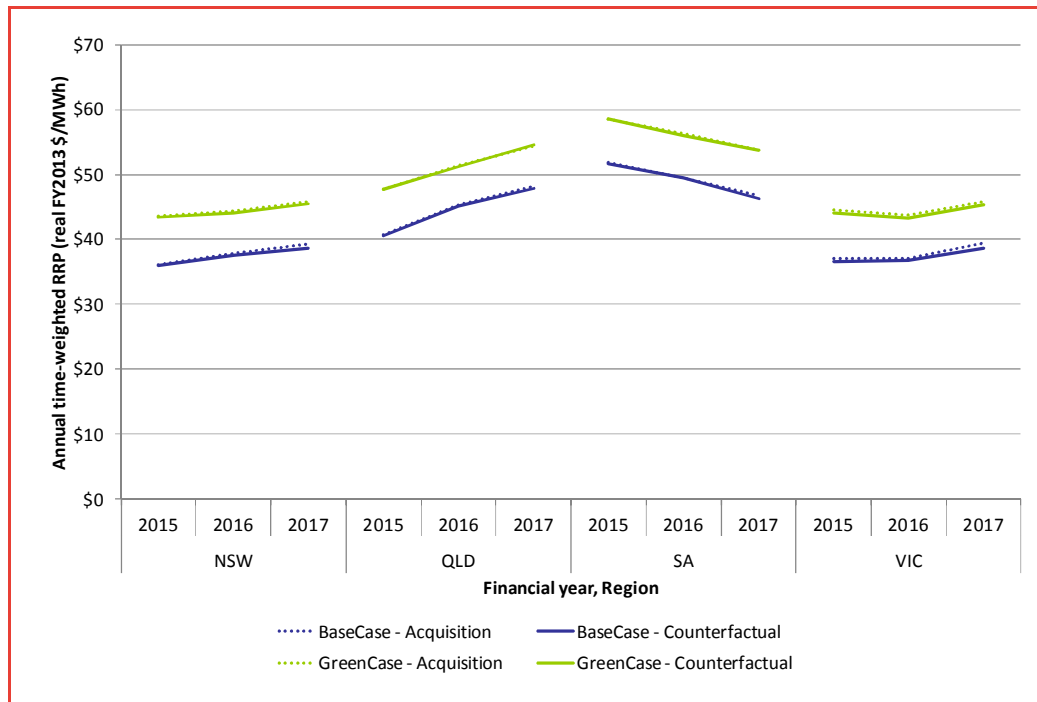
206 The reason for the very small impact of the merger on wholesale prices is that the NEM, as explained in the General Industry Report, is significantly oversupplied and is likely to remain this way for some years (Section 6.1). This oversupply is reflected in highly competitive wholesale prices (as explained in Section 6.4.2 of the General Industry Report). This Cournot modelling result is also consistent with what would have been expected given the small changes in the HHI measures based on a NEM market definition and no change in HHI given the NSW market definition presented in Section 5.4.1. The small impact on prices is also consistent with the apparent lack of any (cumulative or otherwise) effect of other mergers that have occurred in the NEM – see Section 7.

207 The modelling results must be considered in light of the limitations of the Cournot modelling approach used (as discussed in the following sub-section). In brief, some of these limitations of the Cournot modelling approach mean that the modelling will, on balance, tend to overstate the price impacts of a merger because of the perfect information available to the model and its lack of regard to the risks of various strategies versus the rewards. If the very small changes to wholesale prices represent an overstatement, this fortifies the conclusion that the results are genuinely immaterial (see Figure 9).

⁸¹ AEMC (2013), Residential Electricity Price Trends, 13 December, p 12, Weblink: <http://www.aemc.gov.au/market-reviews/completed/retail-electricity-price-trends-2013.html>.

This estimate is based on the AEMC's estimate of the wholesale cost component in 2012/13 of 5.29 c/kWh divided by the total average per unit of 27.11 c/kWh.

Figure 9: Acquisition vs Counterfactual spot price forecasts



Source: Frontier Economics

Limitations of the Cournot competition model

208

Whilst the simulation model provides a more detailed analysis of competition in the national electricity market, it is limited in its ability to perfectly forecast market outcomes. The key limitations of this modelling approach are:

- The model is deterministic, which means that firms do not face uncertainty in the market. The firms know the exact level of demand and dispatch from wind generation when they select their optimal quantity bid/s. They are also aware of the level of transmission and generation outages at the time they select their bid. As discussed in detail in Section 5 of the General Industry Report, in reality, market participants face a great deal of uncertainty regarding their prices and volumes. As a result of ignoring uncertainty, the modelling will tend to overstate price increases relative to actual outcomes because generators will, in reality, be sensitive to the stochastic nature of both supply and demand and will be less willing to withhold capacity to increase pool prices. In particular they will be sensitive to the risk that thermal generation could be displaced if wind capacity is unexpectedly available;
- The model does not have regard to each player's risk preference. Generators may have a higher degree of risk aversion than the model assumes. This is because the model implements strategies that maximise pay-offs without regard to uncertainty. For example, while the model might choose to

economically withhold 20% of capacity for an increase in profits of 1%, however, a generator that is risk averse is unlikely to pursue such an approach in practice. Ignoring risk would tend to overstate price increases since withholding capacity at moderate price levels is financially risky in practice and generators tend to bid conservatively to ensure their generators remain dispatched. At moderate price levels, large withdrawals of capacity are required to elevate pool prices (due to the relative flatness of the supply curve at moderate price levels). In addition, there is considerable uncertainty in real-time demand and supply levels making it difficult for any portfolio to know the exact demand-supply balance at any point in time. Hence, strategically withholding significant quantities of capacity under uncertainty makes strategic bidding at moderate demand levels highly risky;

- It is a model of "single-shot games" that do not account for learning over time. For every level of demand considered in the analysis, generators are assumed to play a stand-alone game without reference to prior or future games. This is in contrast to "repetitive games" where players strategies are defined over multiple periods and players can learn over time as well as factor in outcomes in future time periods in their current decisions. However, given the combination of a highly dynamic environment in a competitive power market, and the fact that the physical conditions of the power system changes continually, it is doubtful that not capturing learning will detract from the model used. As noted by Frank Wolak and quoted by French J:

A competitive electricity market is an extremely complicated non-cooperative game with a very high-dimensional strategy space.⁸²

- This is a model of short-run prices that does not consider entry. Whilst we model new entry in Stage 1 of the modelling framework with the optimal least-cost investment model, the behaviour of generators in the second stage Cournot competition model does not account for the threat of new entry. Therefore this model cannot fully assess the ability to sustain market power in the long run; and
- The model requires a large degree of computational capacity. In order to configure a model that is manageable, certain simplifications must be adopted. One such simplification is the number of discrete quantity bids that each firm is allowed to select from. In this modelling we have allowed each firm to select from two discrete quantity bids. This set of bids alone results in a problem that evaluates over 8000 potential Nash Equilibrium outcomes for each level of demand modelled, and we have modelled over 120 demand levels for each forecast year.

⁸² at [503]

209 As indicated in paragraph 188 above the modelling results in multiple Nash Equilibria for a given game. The problem is whether to select certain equilibria or to use all identified equilibria. A given Nash equilibrium result is, by definition, a combination of sustainable bidding strategies across all players in the market from which no single player has an incentive to deviate. Given this definition, it is difficult to rank Nash equilibria by some preference criteria without that selection process distorting the conclusions. Frontier Economics' approach is to treat the equilibria as equally likely (in the absence of better information) and analyse the distribution of results when assessing competition issues in electricity markets. In our experience, modelled outcomes are often best understood by changes in the distribution of Nash equilibrium outcomes as this best reflects the uncertain environment that market participants operate in. This approach also reduces the opportunity to be selective about equilibria that supports a particular view about the performance of the market.

6 Vertical considerations

6.1 ACCC's concerns

6.1.1 Vertical foreclosure

- 211 As noted above, the ACCC's SoI raised concerns about the vertical competition implications of the proposed transaction. These concerns are based on fears about increased barriers to entry and expansion in the retail supply of electricity in NSW as a result of:
- A significant reduction of liquidity in the supply of hedge contracts due to the reduced volume of hedge contract trading as AGL's retail load will be supported with a natural hedge; and
 - The increased ability and incentive of AGL to withhold competitively priced and customised hedge contracts to independent retailers.
- 212 Specifically, the ACCC is concerned that the proposed acquisition would remove the largest source of independent (non-vertically integrated) generation capacity in the NEM. Following an AGL acquisition of Macquarie Generation, a significant volume of its available generation will form a natural hedge with AGL's retail load. Origin and EnergyAustralia are each 'long' in retail and may not represent a firm source of hedging for independent retailers in NSW. Further, approximately 70 per cent of generation capacity and approximately 80 per cent of generation output would be controlled by the three major vertically integrated retailers.
- 213 The SoI (para [66]) contends that the resulting decrease in volume of hedge contracts may reduce liquidity in trading markets to such an extent that they could cease to function as an effective source of hedge contract cover. The ACCC suggests that if hedge trade volumes fall below a certain critical mass, which it believes may happen with vertical integration, trades may decrease even further as financial intermediaries which engage in hedge contract trading (speculators) leave the market where the volume of trades does not exceed their minimum liquidity thresholds. This could have a 'spiral effect' on the level of liquidity, as the participation of speculators in the hedge contract markets is dependent on there being sufficient market depth. Ultimately, this could represent a barrier to entry or expansion for independent retailers.
- 214 The SoI (para [68]) expressed concern that while Snowy Hydro and Delta Electricity would remain 'long' generation:
- Snowy Hydro (and Colongra) are mainly sources of cap contracts, which may not be suitable for a new entrant retailer to hedge its load; and

- Delta Electricity’s Vales Point power station “is unlikely to provide a sufficient level of liquidity for hedging contracts required to facilitate competitive entry conditions for new and expanding retailers in NSW”. Further, the ACCC is concerned that there may be limitations on the volume of hedge contracts that Delta Electricity can make available having regard to the reliability and costs of its generation, as well as the remaining economic life of the Vales Point power station

215 For these reasons, the ACCC is concerned that the proposed acquisition will have a material deterrent effect on the prospect of substantial new entry and expansion in NSW, relative to the possible future counterfactual environments.

6.1.2 Coordinated effects – vertical

216 As noted in Section 2.1.2, the ACCC has also expressed concern that the proposed transaction could also give rise to an increased risk of ‘coordinated effects’. Some of these coordinated effects could be categorised as vertical competition issues. In particular, the ACCC suggested that the merger could lead to the gentailers’ interests becoming more ‘aligned’, and hence the gentailers having a common incentive to, *inter alia*, “decrease the availability of competitively-priced hedge contracts”.

6.2 Principles for vertical merger analysis

6.2.1 Traditional concerns – foreclosure

217 In the 1970s and 1980s many economists were persuaded that vertical mergers could not increase market power.⁸³ The argument that dominated the economics of the time was based on reasoning that assumed an upstream monopolist selling an input to a downstream competitive market. In those circumstances, the conclusion is sound: a vertical merger cannot increase market power. The upstream monopolist can extract all possible monopoly profit by means of charging a monopoly price upstream; and no more monopoly profit can be generated by vertically integrating into downstream production.

218 Since the late 1970s, many papers have demonstrated that, providing both the upstream and the downstream enterprises have some market power, it is at least possible for vertical integration to be profitable through a strategy of foreclosure by the upstream enterprise.

219 However, for the argument to apply to a particular merger, certain conditions must apply. These conditions can be explained by considering two vertically-related markets in which firms are producing homogeneous products and prices

⁸³ A key reference is R. Bork, *The Antitrust Paradox*, Basic Books (1978).

are set by an impersonal market mechanism. In order to consider the effects of the vertical merger, we shall consider a merger between these two enterprises and the circumstances in which they might gain through a strategy of foreclosure.⁸⁴

220 The first condition that must apply is that the upstream enterprise must have substantial market power. That is, it must be able to increase the prices at which it sells its output by reducing the rate at which it produces that output. As noted when discussing horizontal considerations, this will require: (i) that entry into the upstream activity is difficult; and (ii) that the activity of selling in the upstream market is reasonably concentrated. Given these conditions, the upstream enterprise will be able to increase prices in the upstream market by reducing its rate of output. However, this restriction of output will reduce the profit that the upstream enterprise is generating in the upstream market. If it were maximising profit in the upstream market prior to its reduction in output, the reduction in output must decrease the profit that it is earning in the upstream market.

221 The second condition that must apply is that the resulting increase in the price of the upstream output (when the upstream output is an input in the downstream market) must cause an increase in the price of output in the downstream market. This suggests that the downstream enterprises cannot substitute to other inputs without any cost. Although this condition is likely to be fulfilled, we note that the more readily this substitution can occur, the less will be the increase in the price of the downstream product.

222 The third condition that must apply is that the increased profit that the merged enterprise gains from the increase in the price of the downstream market more than compensates the merged enterprise for the reduction in its profit in the upstream market.

223 Although this argument and these conditions might apply in particular circumstances, this reasoning ignores the effect on prices of any efficiencies that might occur as a result of the vertical merger. These efficiencies may offset the effect of any tendency for the vertical merger to increase (upstream and downstream) prices.

6.2.2 Coordinated effects – vertical

224 In addition to the literature regarding the scope for horizontal mergers to increase coordination, there is also literature on the scope for vertical mergers to increase coordination.

⁸⁴ For a similar exposition, see Massimo Motta, *Competition Policy, Theory and Practice*, Cambridge University Press (2004) pp 372-374.

European Merger Guidelines

225 The European Commission’s non-horizontal merger guidelines distinguish between:

- ‘Non-coordinated effects’ – which principally arise when non-horizontal mergers give rise to *foreclosure*. Foreclosure is described as:

...any instance where actual or potential rivals’ access to supplies or markets is hampered or eliminated as a result of the merger, thereby reducing these companies’ ability and/or incentive to compete. As a result of such foreclosure, the merging companies—and, possibly, some of its competitors as well—may be able to profitably increase the price charged to consumers.⁸⁵

- ‘Coordinated effects’ – which arise where the merger changes the nature of competition in such a way that firms that were previously not coordinating their behaviour are now significantly more likely to coordinate to raise prices or otherwise harm effective competition, or are able to coordinate more easily or effectively.

226 The non-horizontal guidelines note that vertical mergers may give rise to coordinated effects in so far as the merger makes it easier for firms in the upstream or downstream market to reach a common understanding on the terms of coordination. For example, to the extent that a vertical merger leads to foreclosure, it can reduce the number of effective competitors in the market. This may make it easier for the remaining firms to coordinate their behaviour.

227 Vertical mergers may also increase the degree of symmetry between firms active in the market. This may increase the likelihood of coordination by making it easier to reach a common understanding on the terms of coordination. Likewise, vertical integration may increase the level of market transparency, making it easier to coordinate among the remaining market players.

228 The guidelines highlight the three key requirements for coordinated effects to arise:

- coordinating firms must be able to *monitor* to a sufficient degree whether the terms of coordination are being adhered to.
- discipline requires that there is some form of *deterrent* mechanism that can be activated if deviation is detected; and
- the *reactions of outsiders*, such as current and future competitors not participating in the coordination, as well as customers, should not be able to jeopardise the results expected from the coordination.

⁸⁵ “Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentrations between undertakings”, *Official Journal of the European Union* (2008/C 265/07) 18.10.2008, para 18, p.C265/8. See also Part IV, section A.

US Merger Guidelines

229 Coordinated effects are only mentioned in the US horizontal merger guidelines; the non-horizontal guidelines were published in 1984 and have not been updated.⁸⁶

6.3 Vertical efficiencies between generation and retailing

230 Historically, the process of capturing and processing customer information such as customer details, energy consumption and demand, were functions undertaken by the entities responsible for developing, maintaining and operating the low voltage distribution network - distributors.

231 As electricity reforms progressed to support the introduction of electricity retail competition, these retailing functions of provision of customer information and billing could be separated from the distribution function. The separation of these functions allowed the creation of stand-alone retail businesses. The ability to separate the retailing and distribution functions has opened opportunities for businesses to, fairly rapidly, create new energy marketing businesses by combining the supply and demand sides of the competitive activities in the broader energy market.

232 This vertical integration between generators and retailers has become a contentious issue in the NEM and indeed in many other liberalised electricity markets. There are concerns that vertical integration has resulted in a loss of competitiveness in both the wholesale and retail markets. Indeed, the key reason that the ACCC has stated that it would oppose AGL's acquisition of Macquarie Generation is due to the competition issues that arise from the vertical relationship between AGL and Macquarie Generation.

233 The ACCC has previously claimed that the original design of the NEM was based on structural separation of generators from retailers⁸⁷ while also noting that "... there was no explicit stated national policy requiring vertical separation, in each jurisdiction vertical separation was adopted."⁸⁸

234 Danny Price's experience in designing and implementing electricity reforms over 25 years is that:

⁸⁶ *Non-Horizontal Merger Guidelines*, Originally issued as part of U.S. Department of Justice Merger Guidelines, June 14, 1984, available at: <http://www.justice.gov/atr/public/guidelines/2614.pdf>.

⁸⁷ ACCC/AER (2006), "Energy Reform Implementation Group, Response to Issues Paper. ACCC/AER Submission", August

⁸⁸ *ibid*, p 17

- the key reason retailing was separated from the generation activity was because it was too difficult and time consuming to separate the retailing function from the distribution function;
- it was never considered to be axiomatic that retailing and generation should forever be separated or that stand alone retailers was the preferred model; and
- the stand-alone retailing model was only one structure that was contemplated very early in the development of the NEM arrangements.

235 The idea that generators and retailers could combine into a vertically integrated business was contemplated from the very beginning of the development of the NEM arrangements. For example, the National Grid Management Council, the body established by the Commonwealth and NEM States to develop what was known then as the “common trading arrangements”, which would become the NEM, stated five years before the commencement of the NEM that:

Retail supply is the energy trading business. It involves acquiring bulk energy and packaging it to meet the needs of end users. Such packaging would be expected to include tariffs similar to existing arrangements. A retail supplier may source its energy from its own generation or purchase through the market arrangements.

A retail supplier could be a separate organisation such as a City Council or Electricity County Council, a distribution board, an association of buyers acting as one for the mutual benefit of buyers, or the ring fenced retail supply arm of a generation business.⁸⁹

236 The NGMC reiterated this view about the potential for vertically integrated entities in numerous documents. For example, in the first version of outline and rationale of what was then known as the National Electricity Code (now the National Electricity Rules) the NGMC noted under the section dealing with the roles and obligations of market participants:

While functions such as Participant Generator, Participant Retailer, Participant Customer and Participant Trader are referred to, participants may actually perform more than one of these functions.⁹⁰

237 Similarly, in setting out the transition to the NEM the NGMC said the following about the definition and scope of retail supply:

The NGMC proposal for a National Electricity market have identified specific roles for parties facilitating the market mechanisms. In particular, the retail supply role has been defined as the electricity trading business. It involves acquiring bulk electricity and packaging it to meet the needs of end users.

⁸⁹ NGMC (1993), National Electricity Market and Common Trading Arrangements, An Information Paper, January, p 13.

⁹⁰ NGMC (1996), National Electricity Code Outline & Rationale, Document No. CCWG016, Version 1, Final, 1 March. p 12.

These packages would include gazetted tariffs as they currently apply to distribution authorities plus other bulk supply arrangements. A retail supplier may source its electricity from its own generation or purchase it through the market arrangements. A retail supplier could be a separate organisation such as a distribution authority, an association of buyers acting as one for the mutual benefit of buyers, or the ring fenced retail supply arm of a power utility.⁹¹

238 Following the introduction of FRC in 2001 in NSW, there has been a trend towards vertical integration in the NEM. The AER notes:

“While governments structurally separated the energy supply industry in the 1990s, the subsequent vertical integration of retailers and generators to form ‘gentailers’ has been significant”⁹²

The AER has documented the retailer-generation mergers or expansions in the NEM since 2006 in Table 3 below.

Table 3: Vertical integration activity in NEM jurisdictions 2006-12

| Year | Vertical integration activity |
|------|--|
| 2012 | AGL acquired full ownership of 2080 MW Loy Yang A power station in Victoria Origin Energy commissioned 518 MW Mortlake power station in Victoria AGL Energy commissioned 63 MW Oaklands Hill wind farm in Victoria and 33 MW The Bluff wind farm in South Australia |
| 2011 | TRUenergy announced two 500 MW power plants in Queensland Alinta Energy entered retail market in South Australia (and Victoria in 2012) AGL Energy commissioned 82 MW North Brown Hill wind farm in South Australia TRUenergy acquired 111 MW Waterloo wind farm in South Australia AGL Energy (with Meridian Energy) committed to 420 MW Macarthur wind farm in Victoria 2010 Origin Energy acquired Integral Energy and Country Energy (retail) and trading rights for Eraring and Shoalhaven power stations from New South Wales Government TRUenergy acquired EnergyAustralia (retail) and trading rights for Mount Piper and Wallerawang power stations from New South Wales Government |

⁹¹ NGMC (1993), Transition to a National Electricity Market, July, p 27.

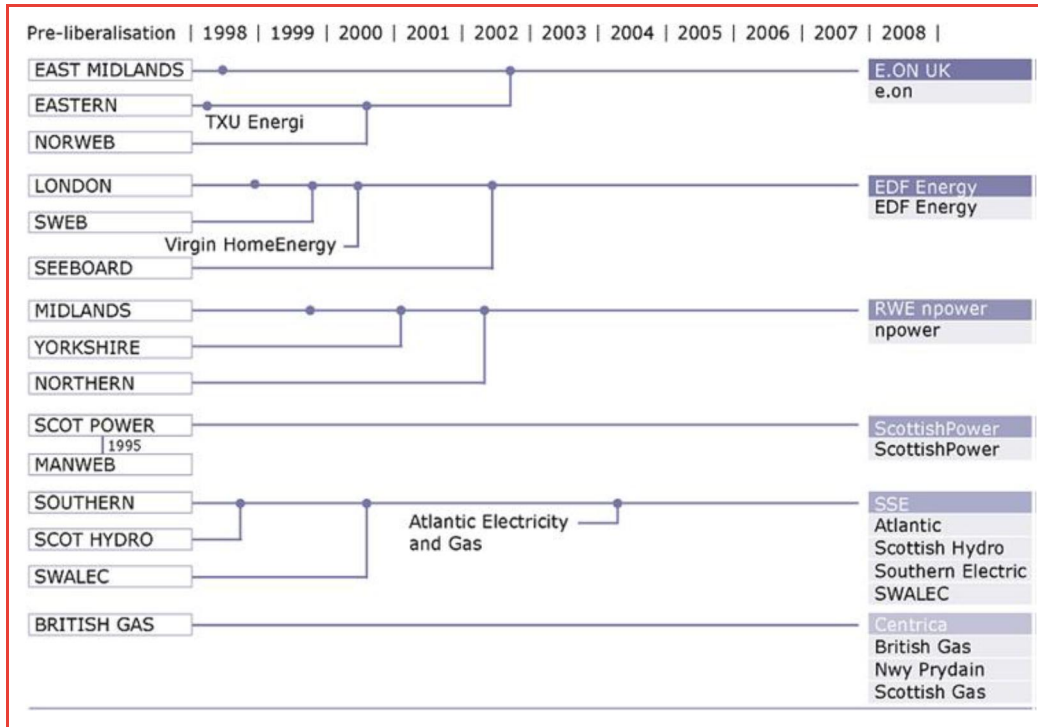
⁹² AER (2013), *State of the energy market*, p123

| | |
|------|---|
| 2009 | <p>Origin Energy commissioned 605 MW Darling Downs power station in Queensland</p> <p>Origin Energy commissioned 648 MW Uranquinty power station in New South Wales</p> <p>Origin Energy completed a 131 MW expansion of Mount Stuart power station in Queensland Origin Energy completed a 128 MW expansion of the Quarantine power station in South Australia AGL Energy commissioned 71 MW Hallett 2 wind farm in South Australia</p> <p>AGL Energy commissioned 140 MW Bogong Hydro power station in Victoria</p> |
| 2008 | <p>TRUenergy commissioned 435 MW Tallawarra power station in New South Wales</p> <p>Hydro Tasmania acquires controlling interest in Momentum Energy (full acquisition occurred in 2010)</p> |
| 2007 | <p>AGL Energy acquired Torrens Island power station (40 per cent of South Australian capacity) from TRUenergy in exchange for the 150 MW Hallett power station and a cash sum</p> <p>Origin Energy commissioned 30 MW Cullerin Range wind farm in New South Wales</p> <p>AGL Energy commissioned 95 MW Hallett 1 wind farm in South Australia</p> <p>Origin Energy acquired Sun Retail from Queensland Government</p> <p>AGL Energy acquired Powerdirect from Queensland Government</p> |
| 2006 | <p>Infratil entered retail market (now trading as Lumo Energy)</p> <p>International Power entered retail market (now trading as Simply Energy)</p> |

Source: AER (2012), *State of the energy market*, p 122.

239 This vertical integration trend in the NEM followed the same trend that emerged earlier in the England and Wales power market. The England and Wales market started off with 12 electricity retailers and three main generators. The market is now primarily served by six large vertically integrated generator/retailers, including a predominantly gas company (see Figure 10).

Figure 10: Generation-retail mergers in the England and Wales market



Source: OFGEM Energy Supply Probe - Initial Findings Report (6 October 2008) p. 27

240 Similarly, in New Zealand, soon after the retailing function was separated from
the distribution function the generators and retailers quickly merged. Currently,
the market is primarily served by five vertically integrated generator/retailers.⁹³

241 Given the strength of this trend towards vertical integration, in the context of
liberalised power markets, it seems important to understand the incentives that
are driving this union between generators and retailers. This will help understand
whether preventing vertical mergers between existing businesses is likely to
prevent the progression towards a vertically integrated since if the incentives to
integrate are sufficiently powerful, absent any regulatory restriction, generators
will develop their own retail businesses and retailers will build their own
generators, thus avoiding any merger restrictions. If a vertically integrated
structure is inevitable because of the incentives created by the NEM (such as the
incentive to reduce costs) then all merger restrictions will do is to cause
participants to incur costs developing their own upstream/downstream
capability.

⁹³ Genesis Energy, Contact Energy, Mighty River Power, Meridian Energy and Trustpower.

242 The AER has attempted to explain this trend in their recent State of the Energy Markets Report:

“Vertical integration provides a means for retailers and generators to internally manage the risk of price volatility in the electricity spot market, reducing their need to participate in hedge contracts can reduce liquidity in contract markets, posing a potential barrier to entry and expansion by generators and retailers that are not vertically integrated”.⁹⁴

243 Unfortunately the AER’s observations do not help to understand *why* some businesses prefer vertical integration to the use of financial contracts to manage electricity purchase cost risk in a liberalised energy market.

244 Fortunately there has been a growing literature on the economics of vertical integration in the electricity sector, particularly as between generators and retailers. Some of this literature has explored the reasons why generators and retailers are vertically integrating.

245 For example, based on a review of the recent literature, Meyer (2012) recently concluded that separation of the electricity retail and generation functions in the US context may lead to “a permanent cost increase of 20 percent or more due to significant risk increase”⁹⁵ Businesses have an incentive to reduce costs as this will increase profits – indeed, unleashing this profit motive was the aim of the past 20 years of electricity market reform. This incentive to minimise costs to maximise profits is particularly strong in a competitive market as a business that has a relatively high cost structure will lose market share and profits, and ultimately may not survive unless it can restructure to ensure it is cost competitive. If a combined generator/retailer is more cost competitive than a stand-alone business it stands to reason that these businesses will tend to merge in some form to secure the available cost savings – either through acquisitions/mergers or by developing their own upstream/downstream capability.

246 According to Meyer the source of this cost increase is a loss of “co-ordinated economies” and “market risk economies”. Meyer describes co-ordinated economies as technological interdependency which he considers to be important in a power system where all elements of the power supply system has to operate in harmony in every instant to ensure the system remains reliable and secure.⁹⁶ Meyer sees this issue as being most important in the interaction between the generation and transmission system.

⁹⁴ ibid p 123.

⁹⁵ Meyer, R. (2012), “vertical Economies and the Costs of Separating Electricity Supply – A Review of Theoretical and Empirical Literature”, *The Energy Journal*, Vol 33, No 4.

⁹⁶ ibid p166-167

- 247 In the context of the inter-relationship between generation and retail Meyer’s “market risk economies” plays a more important role in determining the relative efficiency of integrated *vs* stand alone generation and retailing businesses. Meyer notes that stand alone retailers are likely to face greater transaction costs in having to constantly haggle to build a book of financial contracts to manage their energy purchase cost risk and also notes that in any case a portfolio of financial contracts is unlikely to completely manage a retailer’s market risk, at least without incurring “exorbitant transaction costs”.⁹⁷ According to Meyer the reason why there would be a residual market risk if generators and retailers relied on contracting with one another is that the commercial interest of stand-alone generators differs from that of the stand-alone retailers in that generators “aim for constant utilization of their capacity, retailers prefer contracts with flexible energy volumes due to load fluctuations in order not to rely on spot markets”. The pressures of operating in a competitive market creates a strong incentive for these businesses to overcome the costs associated with this residual exposure to market risk or avoiding the costs of closing these contracting gaps by vertically integrating.
- 248 In the present case, AGL’s hedging costs would be likely to fall as a result of a reduced need to engage in costly and ongoing contracting and recontracting processes with generators. These transactions costs are higher for load-following hedges due to their bespoke nature; which is part of the reason retailers prefer to expand their customer base with standard swap and cap contracts rather than load following contracts.
- 249 Lower transactions costs represent a real gain in productive efficiency in the electricity supply chain. Given competitive conditions in the NSW retail market, most of the benefits of these efficiencies are likely to be passed-through to NSW electricity consumers.
- 250 This concept of “misalignment of interests” driving vertical integration between generators and retailers operating in competitive power markets has also been explored by Boroumand and Zachmann (2009) – “B&Z”.⁹⁸ The thesis of B&Z is that being a stand-alone retailers is not a sustainable business model because “... in contrast to physical assets, purely contractual portfolios are not efficient risk management devices for hedging uncertain delivery obligations of retailers.”⁹⁹ Similar to Meyer, B&Z believe that there is a fundamental misalignment between stand-alone generators and retailers which means that contracting with one

⁹⁷ *ibid* p 169

⁹⁸ Boroumand, R, and G. Zachmann (2012), “Retailers’ risk management and vertical arrangements in electricity markets”, Working Paper No. 22, May, Larsen.

⁹⁹ *ibid*, p 3.

another will result in inefficiency and ultimately drive the two businesses together. B&Z frame this misalignment in terms of both a price and quantity risk whereas Meyer concentrates on the quantity risk.

- 251 In respect of the price risk, B&Z contend that retailers are reluctant to sign long term financial contracts with generators because retailers are concerned about the possibility of extended periods where spot prices are lower than their contract price which could induce entry by opportunistic retailers. This opportunistic entry by retailers would result in the retailer with the long term financial contract having to compete with the new entrants pricing short term contracts off a low spot price. This could result in the retailer with the long term contract incurring a potential cash loss on its contracted position with the generator – that is, the long term contract is stranded. B&Z suggest that one strategy for the retailer to manage this stranding risk of entering into a long term is to renege on a contract upon becoming stranded. Anticipating this possibility, generators would then build in a risk premium into the price of a long term contract, resulting in the long-term contract being unattractive to the retailer because of its high price.
- 252 In respect of the quantity risk, B&Z make the same argument as Meyer – that generators prefer fixed quantities to ensure that their (largely) fixed costs are met, while retailers prefer variable quantities to match the usually highly variable load of their customers.¹⁰⁰
- 253 A vertically integrated business overcomes these price and quantity risks a number of ways. Firstly, in a vertically integrated business the generator and retailer does not face the risk of ‘hold out’, where one business uses the threat of non-supply or payment under a contract to bargain for a better deal if the market moves in a way to strand the contract for the other party. This means that the risks and uncertainties of a potential hold-out are avoided, and this is likely to result in both businesses being more competitive as they will not have priced this risk into their cost structure and hence, prices.
- 254 The second benefit of a vertically integrated business is that the retailer will have more of its energy purchase cost risk covered, especially where the generator has a portfolio of plant types including generators that can change their level of output to match the variations in customer demand. This way a vertically integrated business will always, at the very least, be buying and selling the same quantity of power at the same price – this is referred to as a natural hedge. Better still, a vertically integrated business can choose between buying power from the spot market if it is cheaper than incurring the costs of generating from their own plants. This is not an option that can be easily exploited by a stand-alone retailer as it is difficult and expensive to acquire such flexible financial contracts from generators for the reasons described above.

¹⁰⁰ *ibid* p 6.

255 The third reason that vertical integration between generators and retailers is attractive is that this structure better aligns the long term incentives of both arms of the business as they have eliminated or substantially reduced the risk of long term contracting described above. This allows both arms of the business to plan for the longer term. This is important for generators who face large fixed and sunk costs when they make an investment. If generators cannot sign long term contracts with retailers (for the reasons described above) they face the risks that their investment will be stranded if the spot and, hence, contract price falls, *ex-post* entry. If a generator can be assured that they will be able to sell their output (effectively through their retail arm), provided their avoidable costs remain competitive, then there will be less chance that the generation investment will be stranded, thereby encouraging more timely, efficient investment in new generation plants. Similarly, if retailers are more confident that they will have access to long term secure prices they will be in a better position to meet the demands of retail customers who prefer to sign long term contracts rather than a series of short term contracts, which would otherwise make it difficult for those customers to make long term commitments.

6.4 Vertical considerations of the proposed merger

256 The key question regarding the vertical implications of the proposed transaction is whether the transaction is likely to facilitate vertical foreclosure or increase the scope for coordination. These questions are considered separately.

6.4.1 Risks of vertical foreclosure

257 As discussed in Section 6.2.1, for a vertical merger to give rise to foreclosure, three conditions need to hold:

- The upstream enterprise must have substantial market power. This, in turn, will require that: (i) entry into the upstream activity is difficult; and (ii) the activity of selling in the upstream market is reasonably concentrated.
- The resulting increase in the price of the upstream output (when the upstream output is an input in the downstream market) must cause an increase in the price of output in the downstream market. This suggests that the downstream enterprises cannot substitute to other inputs without any cost; and
- The increased profit that the merged enterprise gains from the increase in the price of the downstream market more than compensates the merged enterprise for the reduction in its profit in the upstream market.

258 We have applied this framework to derive the four facts that would need to be established for the ACCC's concerns about the vertical impacts of the proposed

transaction as expressed in the SoI to have merit. This section goes on to assess the likelihood of each of these four facts being established.

259 The four facts that would need to be established for the ACCC's vertical concerns to have merit are:

- 1) That access to baseload swap contracts settled at the NSW regional reference node (RRN) (or ownership of a baseload power station located in NSW) is a pre-condition of entry to, or expansion within, the NSW retail electricity market. This is implied by the statements in paragraphs 28, 29 and 64 of the SoI. This goes to the first condition noted above – the need for the upstream firm to have substantial market power.
- 2) Presuming (1) to be correct, Macquarie Generation is the only supplier of sufficient volumes of baseload swap and customised hedge contracts necessary to support the entry or expansion of non-vertically integrated retailers in NSW. This is implied by the statements in paragraphs 64 and 68 of the SoI. Like, (1), (2) goes to the first condition noted above – the need for the upstream firm to have substantial market power.
- 3) Presuming (1) and (2) to be correct, Macquarie Generation – if acquired by AGL – will refuse to supply swap contracts to non-vertically integrated retailers. This is implied by the statements in paragraphs 61 and 69 of the SoI. This goes to the first and second conditions noted above – the need for the upstream firm to have market power and increase the price of (or refuse to supply) the upstream output.
- 4) Presuming (1), (2) and (3) to be correct, AGL could profitably increase retail prices to benefit from the absence or exit of small retailers. This goes to the second and third conditions noted above – the need for downstream prices to rise and for the foreclosure behaviour to be profitable.

Fact 1

Access to NSW RRN-settled baseload swap contracts (or ownership of a NSW baseload power station) is a pre-condition of entry to, or expansion within, the New South Wales retail electricity market

260 The first condition effectively implies that a non-vertically integrated retailer cannot sustainably serve its customers without acquiring a corresponding volume of swap hedging contracts settled at the NSW RRN.

261 The ACCC notes in its SoI¹⁰¹:

The ACCC understands that a retailer seeking to manage price risk associated with its customer load in one region of the NEM will very rarely (if ever) enter into a hedge contract under which payments are calculated by reference to the spot price in a

¹⁰¹ para 29.

different region of the NEM, since this is not an effective way to manage the risk of price divergences between regions of the NEM.

This view is based on¹⁰²:

... the fact that at times of high demand in a NEM region (and hence a high regional reference price), there is often a significant divergence from the spot price in other NEM regions. Purchasing inter-regional settlement residues is not typically viewed as an effective tool to facilitate inter-regional hedging given flows on interconnectors can be limited (i.e. they do not facilitate entering into hedge contracts under which payments are calculated by reference to a spot price in a different region of the NEM).

- 262 However, this need not be the case. Non-vertically integrated retailers in NSW can and do hedge their retail load with the aid of baseload power located in other regions.
- 263 Specifically, a strategy involving:
- baseload swap contracts referenced to either the Victorian or Queensland RRNs; combined with
 - IRSR units across the relevant interconnectors (V_N or QNI/ Terranora); combined with
 - cap contracts referenced to the NSW RRN;
 - is likely to provide a close substitute to hedging with NSW-referenced swap and cap contracts alone. This is because Victorian and Queensland RRs generally move together with the New South Wales RRP at times when the NSW RRP is relatively low. Temperature and hence peak price volatility in Victoria also tends to be greater than that of New South Wales, and at those rare times when the NSW RRP does jump unexpectedly, the acquisition of NSW RRP-referenced caps (from Snowy Hydro or Colongra for example) would enable the retailer to manage any material wholesale purchase costs risks.
- 264 Indeed, the ACCC's statement that retailers rarely (if ever) rely on inter-regional hedging is at odds with AGL's own current practice of hedging its relatively large retail load position in NSW with a combination of contracts referenced to the NSW RRN (these are insufficient to completely hedge AGL's NSW load) plus its generation capacity in another State – for example, see paragraphs 126 to 128 and 136 of the Fowler statement, as cited in Section 4.2.3 above.
- 265 Further, as noted in Section 4.2.3 above, the ACCC's concerns regarding horizontal aggregation and a merged AGL-Macquarie Generation engaging in economic withholding – which are based on alignment between NSW and Victorian RRs – are not consistent with the ACCC's proposition that potential

¹⁰² *ibid.*

new retailers cannot use contracts settled at other RRP's combined with IRSR units to hedge their loads. If a merged AGL-Macquarie Generation engaged in economic withholding without causing Victorian and NSW RRP's to separate, then NSW entrant retailers would be able to hedge their exposures by entering financial contracts settled at the Victorian RRP, with or possibly even without acquiring Victoria to NSW IRSR units.

- 266 In summary, we consider that the ACCC's contention that access to hedge contracts referenced to the NSW RRN is a pre-condition of entry to the NSW retail electricity market is false. An entrant retailer in NSW who did not own any generation capacity in NSW or Victoria could employ the same strategy as AGL currently does, which would involve:
- purchasing baseload swaps referenced to the Victorian RRN (possibly accompanied by IRSRs to increase the firmness of the inter-regional hedge); and
 - purchasing caps referenced to the NSW RRN.
- 267 This strategy would provide a substitute for baseload swap and cap contracts referenced to the NSW RRN.

Fact 2

Macquarie Generation is the only viable supplier of sufficient volumes of baseload swap and customised hedge contracts necessary to support entrant retailers in NSW

- 268 Presuming (1) to be correct, the ACCC's SoI states that Macquarie Generation is the only viable supplier of sufficient volumes of baseload swap and customised hedge contracts necessary to support entrant retailers in NSW.

Availability of Snowy contracts

269 The ACCC's SoI states in reference to Snowy Hydro's ability to supply hedge contracts required to support an entrant retailer in NSW¹⁰³:

Snowy Hydro as a hydro-electric plant has a much less significant share of output (GWh) relative to its capacity (MW) and is primarily a source of cap contracts for peak demand periods (such as for hedging against spot prices in excess of \$300). The ACCC is considering the extent to which Snowy Hydro is likely to represent a firm source of hedging for the requirements of a new entrant or expanding retailer.

270 While it is true that Snowy Hydro is an 'energy constrained' generator which tends to operate at a much lower capacity factor than a baseload coal-fired power station, Snowy's size and unique ability to rapidly dispatch into the NEM at times of high spot prices make it an ideal counterparty for an entrant retailer who might seek to hedge exposure to the NSW RRN.

271 As is noted by Snowy Hydro in its 2013 annual report¹⁰⁴:

Snowy Hydro performs a market-making role in the development and tailoring of structured products that have features such as:

- reference to more than one strike price;
- nested options;
- reference to exercise triggers other than [sic] the National Electricity Market price (for example, the system demand);
- reference to more than one commodity price (typically gas as well as electricity); and
- sequential call options able to be exercised by both counterparties.

272 Snowy Hydro's 2013 annual report also provides information on the impact to net profit before tax of changes to the fair value of the price of "electricity and gas swaps and swap-like instruments" under AASB139 accounting standard requirements (p.45-46).

273 The structured products referenced above, combined with vanilla cap and swap-like products, indicate that Snowy Hydro is a large and diverse potential counterparty for entrant retailers looking to hedge spot exposure to the NSW RRN.

¹⁰³ para 68.

¹⁰⁴ Snowy Hydro (2013), Consolidated Financial Report for the Reporting Period 1 July 2012 to 29 June 2013, p.47, Weblink: <http://www.snowyhydro.com.au/wp-content/uploads/2011/11/Snowy-Hydro-Pty-Ltd-Signed-Financial-Statements-29-June-2013.pdf>

Availability of Origin and EnergyAustralia contracts

- 274 The ACCC's SoI states that because Origin Energy and EnergyAustralia are likely to be net short in generation, these participants "may not represent a firm source of hedging for independent retailers in NSW" (para 67). The ACCC goes on to state that vertically integrated generators would have an incentive to hedge with competitor retailers when the generation market is oversupplied (para 69).
- 275 While it is likely that both these businesses will be net short in generation at certain times, it is unlikely that they will be short at all times. Indeed, given the relatively peaky load shape of both Energy Australia and Origin Energy (who both serve large shares of the NSW mass market), at times of non-peak demand both of these participant are likely to have surplus generation capacity (i.e. are likely to be net long).¹⁰⁵ At times where generators are exposed to the spot market, these vertically integrated generators will be keen to have contracts in place.
- 276 Indeed, AGL's growth in the NSW retail sector has been supported in part by these vertically integrated competitors by their sale of contracts to AGL. This evidence was presented to the ACCC during its previous consideration of the proposed acquisition. Generators have strong incentives to contract with anybody, whether they are a competitor retailer or not, in order to help meet their largely fixed costs. [REDACTED]

Availability of Delta contracts

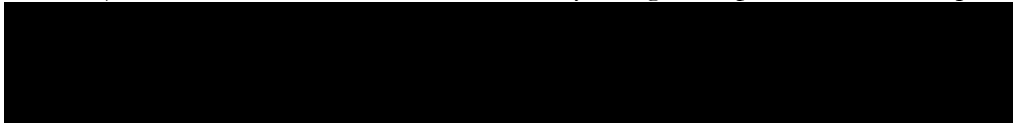
- 277 In relation to Vales Point's ability to supply hedge contracts required to support an entrant retailer in NSW the ACCC's SoI states¹⁰⁶:
- The ACCC is concerned that Vales Point, as a sole independent base load generator with a relatively small generation capacity (relative to Macquarie Generation, 4,740 MW) is unlikely to provide a sufficient level of liquidity for hedging contracts required to facilitate competitive entry conditions for new and expanding retailers in NSW... The ACCC also understand that there may be limitations on the volume of hedge contracts that Delta Electricity can make available having regard to the reliability and costs of its generation, as well as the remaining economic life of the Vales Point power station.
- 278 Data provided by AGL's lawyers about AGL's contracting with Delta indicates that Delta is willing and able to sign significant volumes of swap contracts – [REDACTED]

¹⁰⁵ IPART (2013), *Review of Regulated Retail Prices and Charges for Electricity from 1 July 2013 to 30 June 2016*, Final Report – Electricity, June, p 59, Weblink: http://www.ipart.nsw.gov.au/Home/Industries/Electricity/Reviews/Retail_Pricing/Review_of_regulated_electricity_retail_prices_2013_to_2016/17_Jun_2013_-_Final_Report/Final_Report_-_Review_of_Regulated_Retail_Prices_for_Electricity_-_From_1_July_2013_to_30_June_2016

¹⁰⁶ para 68.



279 Irrespective of the actual volume of swap contracts that Vales Point can offer to retailers (let us call this quantity 'X' MW), the acquisition of Macquarie Generation by AGL would not reduce the volume of swaps that Vales Point could sell. In fact, assuming that the ACCC's contention that an AGL-owned Macquarie Generation would refuse to sell swaps to non-vertically integrated retailers in favour of Origin and EnergyAustralia is correct (see Condition 3 below), the proposed acquisition ought to result in AGL, Origin and EnergyAustralia collectively acquiring fewer (if any) contracts from Vales Point than in the base case. Accordingly, whatever X was, a larger proportion of X (or all of X) would be available to non-vertically integrated purchasers to acquire.



| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
|------------|------------|------------|------------|
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |
| [REDACTED] | [REDACTED] | [REDACTED] | [REDACTED] |



280 Finally, the ACCC's suggestion that the 'remaining economic life' of Vales Point is limited begs the question of what its remaining economic life actually is. The economic life of a plant is partly a function of its age and maintenance costs, but largely a function of whether there is demand for the energy and related services

it offers. If non-vertically integrated retailers can only contract with Vales Point, then there is every reason to believe that it will continue to operate.

Summary

281 In summary, the ACCC's contention that Macquarie Generation is the only viable supplier of sufficient volumes of baseload swap and customised hedge contracts necessary to support entrant retailers in NSW appears to be incorrect:

- Snowy Hydro is an active seller of structured derivative products – including swap-like products – and is a natural counterparty for entrant retailers in NSW seeking to reduce their spot price exposure to the NSW RRN.
- Both Origin Energy and EnergyAustralia have the willingness and ability to sell contracts referenced to the NSW RRN. At times of non-peak demand both of these participants are likely to have surplus generation capacity. AGL's growth in the NSW retail sector has been in part supported by these vertically integrated competitors by their sale of contracts to AGL.
- If AGL acquires Macquarie Generation, it will not require the hedges it currently purchases to support its NSW load (including those it currently purchases from Delta). These hedges will become available for other retailers to purchase. The proposed transaction is likely to, if anything, *increase* the volume of swap contracts that Vales Point is willing to offer to non-vertically integrated retailers.

Fact 3

Macquarie Generation – if acquired by AGL – will refuse to supply hedge contracts to entrant retailers

282 The first point to note is that the likelihood of this condition being true is not supported by observed behaviour of AGL to date in Victoria with respect to its complete acquisition of the Loy Yang A power station in 2012.

283 The ACCC notes that market participants they interviewed claimed that AGL would use its long generation position to support the other two vertically integrated businesses – Origin and EnergyAustralia – at the expense of other independent retailers in order to 'maintain the current retail market structure' (para 69).

284 Assuming that condition 1 holds, the ACCC has not justified why it would be profitable – and hence likely – for an AGL-owned Macquarie Generation to offer swap contracts to Origin and EnergyAustralia but not to non-vertically integrated retailers. The claim that AGL would continue to supply contracts to Origin Energy and EnergyAustralia to maintain the current retail market structure is at odds with rational behaviour **presuming** condition (1) holds.

- 285 No theory as to why this behaviour might be profit-maximising and rational for AGL has been offered or developed, and in any case any such theory is likely to be misconceived given the starting premise that condition (1) holds.
- 286 Any theory of harm that presumes it would be profitable for AGL-Macquarie Generation to withhold contracts from a non-vertically integrated retailer – because Macquarie Generation is a monopoly seller of swaps in NSW – must likewise presume it would be profitable for AGL-Macquarie Generation to withhold swaps from Origin and EnergyAustralia, who are both short generation in NSW at peak demand times (or will be following the announced unit closures at Wallerawang).
- 287 If Macquarie Generation were truly the only real present source of swaps in NSW and such swaps were a prerequisite for serving retail load, then it would appear logical for an AGL-owned Macquarie Generation to refuse to supply swaps to Origin and EnergyAustralia in order to force both of them to relinquish that proportion of their NSW retail customers that they could not themselves hedge with their own NSW generation assets or other extant NSW-reference swap contracts.
- 288 Yet the very fact that EnergyAustralia has announced unit closures at Wallerawang power station strongly suggests that EnergyAustralia has few if any concerns as to the availability of NSW contracts, even assuming the merger proceeds.
- 289 When it is clearly not profitable for an AGL-owned Macquarie Generation to seek to force Origin and EnergyAustralia to relinquish their customers in this way, there is little basis for presuming that an AGL-owned Macquarie Generation would find it profitable to deny contracts to a non-vertically integrated retailer.
- 290 The revealed behaviour of EnergyAustralia in announcing the closure of units at Wallerawang suggests that the gentailers hold no concerns about the availability of swaps in NSW.¹⁰⁷ This, in turn, suggests that non-vertically integrated retailers – and consequently the ACCC – likewise need hold no concerns about their ability to procure such contracts.

107 AEMO, General Planning Related Information, Weblink:
<http://www.aemo.com.au/Electricity/Planning/Related-Information/Generation-Information>

In that document AEMO states “EnergyAustralia advises that Wallerawang C unit 7 (500 MW black coal) has been removed from service in January 2014. Unit 8 (500 MW) will remain available until the end of March 2014, and will then be placed on a three-month recall should market conditions change”

Fact 4***AGL could increase profitably retail prices to benefit from the absence or exit of small retailers.***

291 In the present case, the NSW retail electricity market, as determined recently by the AEMC, is competitive.¹⁰⁸ Relevantly, the AEMC found, in respect of the competitiveness of electricity retailing competition in NSW, that:

1. Competition in the retail electricity market is delivering discounts and other benefits to small electricity consumers through effective choice of their retailer and electricity products.
2. Many urban consumers can choose from up to 50 different offers from 12 different retailers. In regional areas consumers can choose from over 34 offers from 9 retailers.
3. Consumers are increasingly taking advantage of these choices. Around 60 per cent of small NSW electricity consumers have already chosen a market offer, and 21 per cent of consumers switched their retailer in 2012 in pursuit of a better deal.
4. There are no significant barriers to retailers entering, expanding or exiting the retail electricity market.
5. While market concentration is high, smaller retailers are winning market share and competition is intense between the three largest retailers. The incumbent retailers, Origin Energy and EnergyAustralia, both of which purchased the NSW government retail businesses in 2011, have lost significant market share as customers moved to other retailers.
6. The majority of consumers surveyed are generally satisfied with the quality of service they receive. However, these consumers are demanding more transparent and meaningful information that helps them to understand and compare offers.
7. Profit margins are consistent with a competitive market. There is evidence of price-based competition with new and established retailers offering discounts.

292 This level of retail competitiveness in NSW, even if AGL could increase input costs to small independent retailers, it is likely to be constrained by other, larger retailers such as Origin, EnergyAustralia and Snowy Hydro/Red Energy. This suggests that the benefits to a merged AGL-Macquarie Generation from engaging in vertical foreclosure are likely to be limited and unlikely to justify the costs.

293 In the present case, there are good reasons to believe that raising the price or restricting the supply of hedge contracts to independent NSW retailers would

¹⁰⁸ AEMC (2013), *Review of Competition in Retailing Electricity and Natural Gas Markets in New South Wales*, 13 October, p V. Weblink: <http://www.aemc.gov.au/market-reviews/completed/nsw-retail-competition-review.html>

require a merged AGL-Macquarie Generation to forego considerable profit. This is because any independent firm would serve at least a partially different customer base to AGL. If AGL did not supply independent retailers, it would be likely to offer some or all of its surplus energy – unhedged – in the wholesale spot market. AGL would likely earn a higher price on its surplus power by entering hedges with an independent retailer.

Concerns about contract liquidity

- 294 This sub-section responds specifically to those parts of the ACCC's SoI that raise concerns about the effect of the proposed transaction on contract liquidity.
- 295 The ACCC's SoI provides no evidence to support the assertion that speculators are an essential ingredient for a liquid and competitive contract trading market.
- 296 In essence, the ACCC's contention implies that the emergence of a competitive price for hedging contracts is predicated on a centralised, organised and liquid market for hedging contracts. As speculators tend to trade electricity using exchange-traded swaps and caps, the ACCC's view implies that over-the-counter (OTC) hedge trading – which typically occurs between NEM participants seeking to hedge their spot wholesale exposures – is not, in itself, sufficient to facilitate retail entry or expansion.
- 297 The first point to note is that so long as there exists a willing buyer of hedging contracts and a willing seller, there is no reason why the parties would not contract with one another to their mutual benefit irrespective of the absence of speculating traders. If, say, generators attempted to raise hedge contract premiums and prices to new entrant retailers such that entrant retailers could not compete with incumbent vertically-integrated participants, the generators would find themselves without a counterparty and exposed to the spot price. In this way, the vertically-integrated participants would exert indirect competitive pressure on stand-alone generators and net long gentailers that were seeking additional hedging.
- 298 Second, the proposition that a high degree of participation by speculators is necessary for a competitive and liquid contract market appears to be contradicted by the evolution of electricity retail competition in South Australia. While we have no data on the involvement of speculators in South Australia, it is clear that the volume of exchange-traded contracts in that region is significantly lower than in Victoria, NSW and Queensland.¹⁰⁹ Yet the AER's own *State of the Energy Market* publications record how the small customer market share of non-vertically-integrated retailers has risen in South Australia. As at 30 June 2007, the market

¹⁰⁹ See, for example: AER, *State of the Energy Market 2009*, Table 6.3, p.173;
Weblink: https://assenergy.com.au/market_wrap

share of all non-vertically-integrated retailers was 5.3%.¹¹⁰ As at August 2013, the market share of Lumo Energy alone (which owns no baseload power stations in South Australia) appeared to be well over 5%.¹¹¹ This would not have occurred if small non-vertically-integrated retailers could only source competitive contracts from a hedge market with high levels of participation from speculators.

- 299 Third, taking the ACCC's concerns at face value would suggest that non-vertically-integrated retailers faced major barriers to entry and expansion prior to 2006/07 when d-cypha trading volumes began to explode. (In 2005/06, the volume of exchange-traded contracts across the NEM was just 55 TWh. The volume rose to 243 TWh in 2006/07.¹¹²) However, while the 2007 *State of the Energy Market* report remarked on the trend towards vertical integration in Victoria,¹¹³ it also noted that retailers apart from AGL, Origin and TRUenergy (now EnergyAustralia) had increased their collective market share of small retail customers from 5% in 2004 to "over 13%" by 30 June 2006.¹¹⁴ This would not have been possible if either vertical integration or mature exchange-traded contract markets – incorporating high participation by speculators – were necessary prerequisites for smaller retailers to expand.

'Critical mass' threshold for contract trading

- 300 The SoI suggests that the proposed transaction would likely cause a reduction in contract trading volumes below a 'critical mass' threshold, leading speculators to exit the market and thereby causing a downward spiral in contract volume and liquidity.
- 301 The SoI provides no analysis or evidence about the magnitude of the "critical mass" necessary to maintain the participation of speculators. Likewise, the SoI does not explain whether the critical mass threshold is:
- An *absolute* threshold – as in, exchange-traded contract open interest in any region must remain above a fixed volume of GWh or TWh irrespective of the level of regional energy consumption or
 - A *relative/proportional* threshold – as in, exchange-traded contract open interest must remain above a particular proportion (%) of regional electricity consumption.
- 302 For example, the SoI does not say whether the current volume of exchange-traded contracting in South Australia is above or below the critical mass

¹¹⁰ AER, *State of the Energy Market 2008*, Table 6.3, p.173.

¹¹¹ AER, *State of the Energy Market 2013*, Figure 5.1, p.122.

¹¹² AER, *State of the Energy Market 2008*, Table 3.3, p.106.

¹¹³ AER, *State of the Energy Market 2007*, pp.110-111.

¹¹⁴ AER, *State of the Energy Market 2007*, pp.173-174.

threshold for that region. Despite a high degree of vertical integration and a relatively low absolute volume of open interest in base swaps (approximately 2.1 TWh as at 17 February 2014¹¹⁵), South Australia sustains a 5.6% share of open interest in base swaps across the mainland NEM.¹¹⁶ This is only marginally less than South Australia's share of mainland NEM consumption of approximately 7.3%.¹¹⁷

- 303 If South Australian contract trading falls below the critical threshold, there does not appear to have been much of a “downward spiral” of contracting taking effect in that region as a result. One would assume that a true downward spiral of contracting in a region such as South Australia would lead to a level of open interest in base swaps well below South Australia's share of mainland NEM electricity consumption. Indeed, it is not clear why a true downward spiral in a relatively small region like South Australia would not lead to the elimination of the exchange-traded contract market altogether.
- 304 If South Australian contract trading sits above the critical mass threshold, it suggests that contract trading in NSW has a substantial buffer before it breaches the threshold. This leads to our final point in response to the contract liquidity contentions.

Transaction would cause ‘critical mass’ threshold to be breached

- 305 Even assuming that there is some ‘critical mass’ threshold of contract trading, the question is whether the proposed transaction would cause the critical mass threshold to be breached.
- 306 In this context, the relevant type of threshold (absolute or proportional) has important implications for whether the threshold is likely to be breached in NSW as a result of the proposed acquisition.
- 307 The current volume of open interest on exchange-traded base swaps in NSW is more than 15.6 TWh. This is approximately 50% higher than in Victoria and nearly two-thirds higher than Queensland. Assuming that exchange-traded contract trading in those regions is above the critical mass threshold, NSW enjoys a substantial absolute volume buffer before any reduction in exchange-traded contract trading could conceivably breach any critical mass threshold. Further, being by far the largest region by electricity consumption, it is difficult to see how even a significant reduction in NSW exchange-traded contract open

¹¹⁵ See ASX Energy Market Wrap at Weblink: https://asxenergy.com.au/market_wrap.

¹¹⁶ See ASX Energy Market Wrap at Weblink: https://asxenergy.com.au/market_wrap.

¹¹⁷ See AEMO, *2013 National Electricity Forecasting Report Update for the National Electricity Market*, November 2013, Table 1, p.2.

interest as a proportion of regional electricity consumption could cause the regional exchange-traded contract market to enter a secular downward spiral.

- 308 Finally, even if the exchange-traded market for contracts in NSW becomes thin and this results in a decline in liquidity such that significant contract trades cause market prices to fluctuate, this is only likely to provide opportunities for speculators to re-enter the market to arbitrage the resulting inter-temporal differences in contract prices. Speculators face few barriers to re-entering the exchange-traded electricity contract market and their return would have the effect of increasing liquidity and stabilising the prices and premiums of hedge contracts. This stabilising effect on price would ease the more variable contract trading conditions for stand-alone generators and retailers that the ACCC claims deters new entrant retailers.

Conclusion

- 309 The proposed transaction is unlikely to lead to a significant reduction in the liquidity and competitiveness of wholesale contract trading in NSW. Small retailers have in the past been able to enter and expand without either being vertically-integrated or acquiring exchange-traded hedges. Certainly, any reduction in the liquidity of exchange-traded hedges is likely to be at the margin and would not be likely to cause any pronounced or sustained ‘downward spiral’ of contracting.
- 310 Even if the transaction did lead to a large reduction in contracting – and we are highly sceptical that it would have this effect – this is unlikely to harm retail competition. Indeed, the lack of importance of the liquidity of the wholesale contract market to retail competition was explained by the ACCC’s current Chairman himself in 2005:

“Further, I do not believe that “thin” hedge markets are a problem in themselves. If there were four to five vertically integrated players they would not need to hedge much and therefore the market would be thin. The key issue is the energy prices being offered to consumers and I cannot see how it matters whether that energy has been purchased through the hedge market or has been supplied directly by the generation capacity owned by the relevant retailer.”¹¹⁸

- 311 We agree with the current Chairman’s previous comments and can see no basis in the SoI for why his views should have changed since 2005.

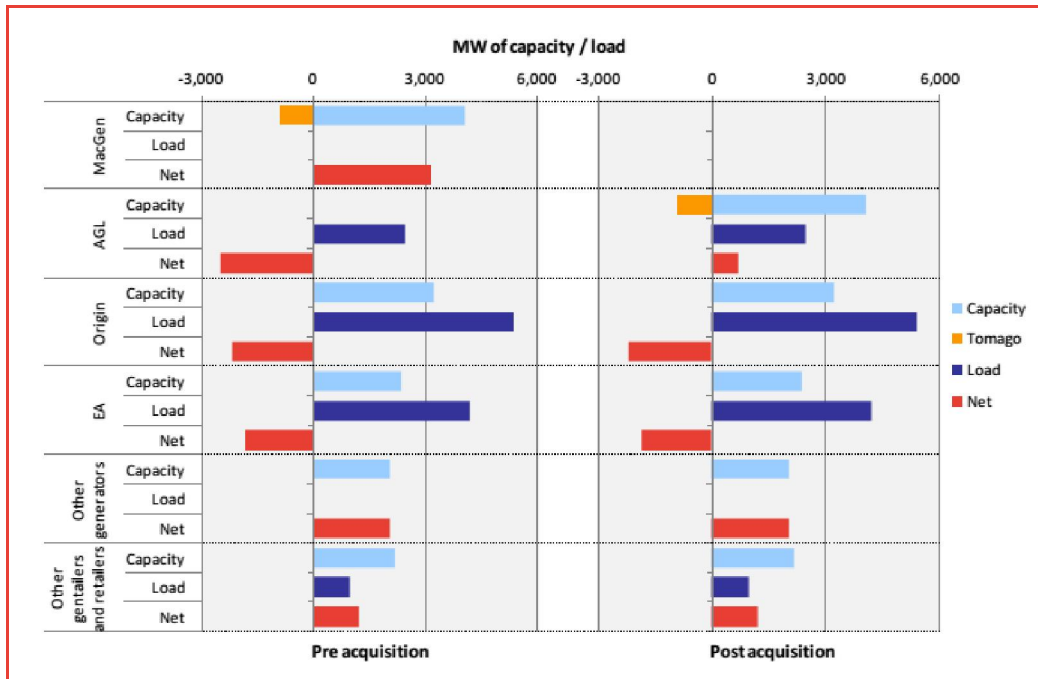
6.4.2 Risks of increased coordination

- 312 In the present case, the proposed acquisition could be said to increase the alignment of the geographic coverage of the large gentailers – AGL, Origin and EnergyAustralia – by leading to all of them having significant retail and

¹¹⁸ Sims, R (2005), Port Jackson Partners submission to the National Competition Policy Review, 7 January

generation interests in NSW in addition to Victoria and South Australia. However, this increased geographic commonality of the gentailers *will not align their incentives* in any meaningful sense Frontier Economics' analysis (see Figure 11) suggests that the transaction would lead to AGL becoming net long in generation in NSW while Origin and EnergyAustralia remain net short. If anything, by shifting AGL from being net short generation in NSW to net long, the proposed transaction could contribute to the three gentailers' interests diverging.

Figure 11: Estimated equilibrium contract balance in NSW



Source: Frontier Economics internal analysis

313 Further, it is not clear how, following the proposed acquisition, the three requirements for coordinated effects would be satisfied, given that:

- the three gentailers would not have any means of monitoring other gentailers' hedge contract transactions with small independent retailers
- the three gentailers would not have any clear means of punishing – and hence deterring – other gentailers' contract trading with small independent retailers; and
- the availability of uncommitted capacity from other unaligned generators in NSW and elsewhere would undermine any attempt to coordinate foreclosure or substantially increase spot prices or spot price volatility.

314 In the present circumstances, it would be extremely different, post-transaction, for the gentailers to tacitly collude on either the volume of contracts to sell to

independent retailers or the nature of punishment strategies for no other reason than the lack of published information on over-the-counter contract transactions and the lack of identifying information on exchange-traded contracts.

315 It may be suggested that the ACCC concerns raised in its 15 January letter can be characterised as involving coordinated effects because the acquisition would not only reduce the willingness of an AGL-owned Macquarie Generation to reduce the supply of competitively-priced hedges, but also reduce the willingness of the other gentailers (Origin and EnergyAustralia) to supply contracts to small unaligned retailers. However, the European Union definition of foreclosure above notes that foreclosure may result in not only the merging companies, *but also some of its competitors*, profitably raising the price charged to consumers. This means there is no need to look beyond the concept of foreclosure to describe the ACCC's concerns. In any case, with Origin and EnergyAustralia being substantially short in generation in NSW, it appears highly unlikely that they would sell contracts to independent retailers with or without the proposed acquisition proceeding.

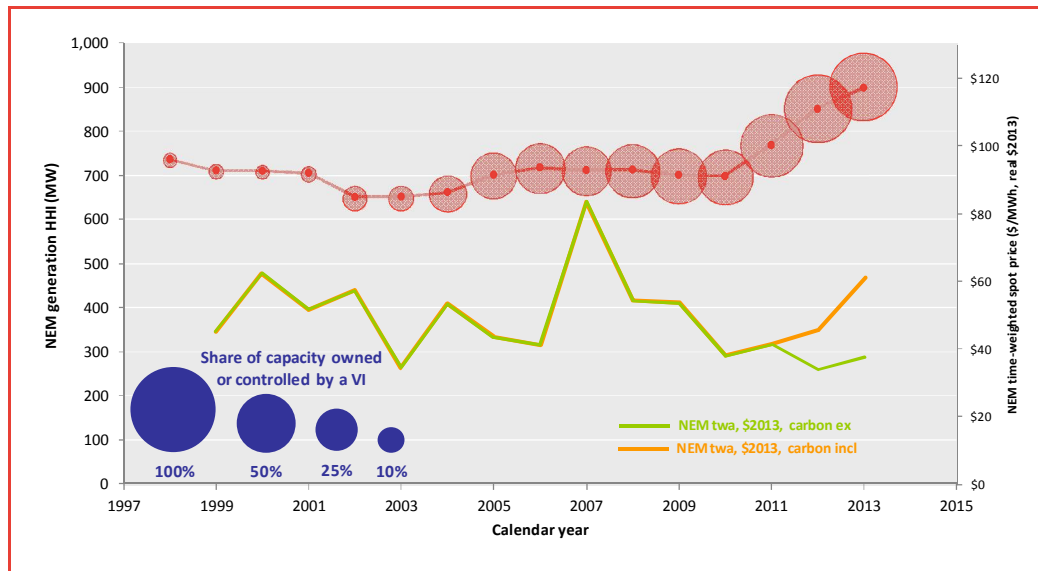
7 Empirical evidence regarding previous mergers

316 In our view, it is worthwhile to track the historical record of wholesale prices as the market has experienced both horizontal and vertical mergers. Over the past 15 years the NEM has witnessed several key forces of industrial organisation emerge:

- First, from the start of the NEM to around the earlier 2000's the NEM experienced increasing horizontal disaggregation at the generation level. This was largely due to the entry of several new generation players in response to rising demand, including InterGen (Callide C) and AGL (Hallet GT).
- From the mid-2000s to around 2010 the NEM's horizontal generation market structure remained relatively stable, at least as measured by a NEM-wide HHI using installed capacity as the basis for market share. The period saw a very slight increase in horizontal aggregation, as incumbents built or expanded capacity. Over this same time period however, the vertically-integrated model began to gain traction. This started with in 2004 with Snowy Hydro/Red Energy. The trend continued with International Power launching Simply Energy in 2005, AGL acquiring Southern Hydro in 2006 and Origin commissioning Uranquinty in 2009.
- From 2011 to 2013, there was a surge in the extent of both horizontal and vertical integration. This was driven largely by the New South Wales GenTrader process, which saw existing gentailers Origin and EnergyAustralia acquire additional generation capacity and retail market share. AGL's complete acquisition of Loy Yang in 2012 further increased the extent of vertical and horizontal aggregation in the market, as did Alinta's entry into the retail market backed by its South Australia capacity.

317 A graphical representation of the changing landscape of the NEM over the last 15 years is outlined in Figure 12.

Figure 12: Historical intensity of vertical integration



Source: Frontier analysis

Notes: CY2013 price is year-to-date as of end of October 2013

The chart shows the following:

- the red line (LHS axis) shows the extent of horizontal generation aggregation over time in the NEM, as measured by the NEM-wide HHI using installed capacity as the basis for market share.
- the size of each red bubble reflects an approximate metric for the intensity of vertical integration at that point in time in the NEM. The extent of vertical integration is measured by the share of NEM capacity owned or controlled partially or fully by a vertically-integrated participant. This measure will tend to over-state the extent of vertical integration, however due to a lack of detailed information on each retail participant's particular load shape it is possible to only make a 'best guess' approximation of the extent of vertical integration in the NEM; and
- NEM-wide time-weighted average spot prices for each year, expressed in real terms have been included (orange and green lines). The orange line represents carbon-inclusive spot prices, while the green line represents an estimate of carbon-exclusive prices, assuming that the prevailing carbon price was passed through at an average-marginal intensity of 1tCO₂-e/MWh.

318 The analysis indicates that despite a persistent trend towards increasing vertical integration in the NEM – combined with a recent increase in the extent of horizontal aggregation at the generation level – NEM-wide average spot prices in real terms are near their lowest level since market start once accounting for the

impact of carbon.¹¹⁹ While a multitude of factors in addition to increasing vertical and horizontal integration have affected spot prices over this time period – including the recent drop-off in demand and the rising share of renewables driven by the LRET leading to high levels of RPM (see Section 6.1 of the General Industry Report) – the data are consistent with the hypothesis that the mergers that have occurred to date have not had a dramatically negative effect on wholesale price outcomes.

¹¹⁹ As confirmed by French J and, more recently, the AEMC, wholesale prices in the NEM have been and continue to be well within the range of long run efficient, competitive costs – see Section 6.4.2 in the General Industry Report.

8 Governance considerations

8.1 Principles

319 One of the striking features of the proposed acquisition is that ownership of the enterprise will be transferred from the State (which owns a number of generators) to private ownership. This will have important implications for economic efficiency that have been explored in an extensive literature concerned with governance of enterprises.

320 A leading work on the law and economics of corporate governance defines ownership in terms of two key rights:

A firm's "owners", as the term is conventionally used and as it will be used here, are those persons who share two formal rights: the right to control the firm and the right to appropriate the firm's profits, or residual earnings (that is, the net earnings that remain with the firm after it has made all payments to which it is contractually committed, such as wages, interest payments, and prices for supplies).¹²⁰

321 We do not wish to enter into any debate about the merits or disadvantages of ownership by the State compared with ownership by private individuals. However, the law and economics literature on corporate governance does point to two key ways in which economic efficiency is likely to be increased as a result of transferring the governance of an enterprise from the State to a group of private persons.

322 The first of these ways is that a privately-owned enterprise is likely to be more efficient at minimising the cost of producing something because owners stand to gain more as a result of cost-reducing innovations.¹²¹ This argument concerns the concentration of benefit in the hands of a few. The more-concentrated the benefit the more likely it is to create an incentive for persons to make efforts to secure that benefit. If the benefits of cost-reducing innovation are dispersed among all the citizens of the State, they will have a weaker incentive to undertake those innovations than if the benefits are more concentrated.

323 Economic efficiency is promoted if the surplus of willingness to pay over the cost of production is increased. In the case of a homogeneous product such as wholesale electricity, economic efficiency will be promoted by reductions in the cost of production. To the extent that transferring assets from the State to

¹²⁰ Henry Hansmann, *The Ownership of Enterprise*, Harvard University Press (1996) p 11. Hansmann stresses the importance of the formal nature of the rights he refers to. In many large businesses, the right to control the firm is a formal right and, in a large corporation, the owners may have formal control but no effective control.

¹²¹ Oliver Hart, Andrei Shleifer and Robert W Vishny, "The Proper Scope of Government: Theory and an Application to Prisons," *Quarterly Journal of Economics*, Vol 112 (1997) pp 1127-1161.

private hands increases incentives to reduce costs, economic efficiency will be enhanced.

324 The second key reason why private ownership is likely to promote economic efficiency compared with ownership by the State is that private owners are more likely to aim at minimising costs than government-owned enterprises. In particular, government-owned enterprises have an incentive to channel resources to their supporters rather than to minimise costs.¹²²

325 These two reasons taken together suggest that businesses that are privately owned are both more likely to seek to minimise costs of production and are more likely to pursue cost-minimisation with vigour than are businesses that are owned by the State. For both these reasons, businesses producing homogeneous products in are more likely to be economically efficient if they are privately owned than if they are owned by the State.

326 An exception to this theory may arise in the case of an industry that had strong tendencies to monopoly control. In that case, economic efficiency may be promoted by State ownership of the single-firm monopoly so as to guard against the inefficient reduction in output that a privately-owned monopolist might undertake. However, in the case of a homogeneous product produced by a mix of privately-owned and State-owned enterprises, this consideration will be irrelevant – and the transfer of an enterprise from State ownership to private ownership is likely to increase economic efficiency.

8.2 Discussion

327 The types of governance issues described above give rise to special problems when a government is the sole shareholder of multiple businesses competing in the same market, as it is in this case. At present, the NSW Government is the shareholder of two remaining competing generators – Macquarie Generation and Delta Coast. Indeed, prior to the sale of the generating trading rights in NSW in 2011 to Origin and EnergyAustralia, the NSW Government was the sole shareholder of four competing generators.

328 There are two key governance problems with this model. The first is that the NSW Government has been particularly concerned not to interfere in the commercial decisions of the businesses beyond what they are formally allowed through the provisions of the NSW State Owned Corporations Act (1989). This concern has arisen because the NSW Government has wanted to avoid any

¹²² Andrei Shleifer and Robert W Vishny, “Politicians and Firms,” *Quarterly Journal of Economics*, Vol 109 (1994) pp 995-1025; and Andrei Shleifer and Robert W Vishny, *The Grabbing Hand: Government Pathologies and their Cures*, Harvard University Press (1998).

criticism from other market participants or regulators that the Government has used its common shareholding to coordinate their generators to ‘rig’ their bidding to increase the profitability of their businesses. These suspicions about the Government coordinating the behaviour of its businesses are reinforced by the provisions of Section 11 of the Act that allows the shareholding Minister the right to require the business to undertake non-commercial activities (providing the Board is given a Direction by the relevant Minister).

329 However these suspicions are not well founded in relation to generators owned by the NSW government, which has historically been so fearful of any criticisms that it is coordinating its businesses that it tends to operate as a ‘hands-off’ shareholder. This hands-off approach has reduced the commercial accountability of the Boards of the NSW government-owned generators. The resulting lack of commercial accountability has led to productive, allocative and dynamic inefficiency.

330 Another governance problem the NSW Government faces is how it resolves the conflict it faces when it is presented with an investment option by a generator that requires shareholder approval. In the past, these proposals would often have improved the position of the proponent but at the expense of competitor Government generators. In the past, the Government has tended to be paralysed by these problems, resulting in delays to potentially worthwhile investments. This inability to make a decision can exacerbate the lack of Board accountability, because the management and Board can claim that they cannot manage the risks they face in the market without the commercial freedom to make necessary operational and investment decisions.

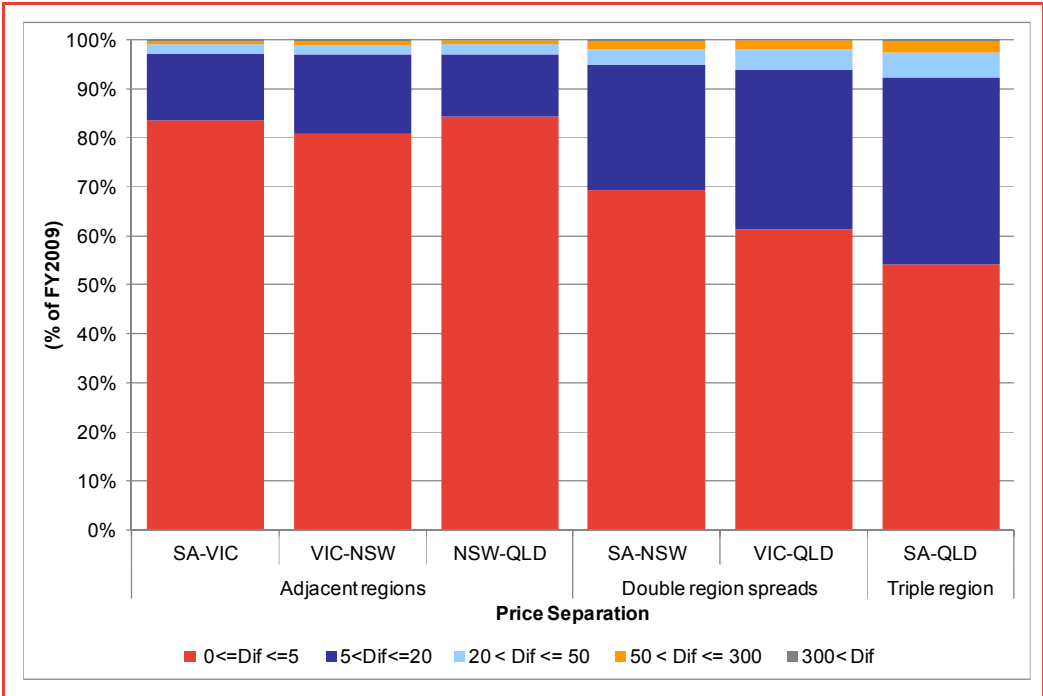
331 In contrast, the fundamentally different ownership structure and corporate accountability of privately-owned generation portfolios means that the same types of governance issues do not typically arise in relation to the management of and investment in privately-owned generators.

Annex A

Price correlation - 2009

332 In FY 2009, the percentage of time when spot price differences were no more than \$5/MWh between two adjacent regions was at least 80.8%. The percentage of time when price differences were no more than \$50/MWh between any region-pair was at least 97.4%. The percentage of time when price differences were no more than \$300/MWh between any region-pair was at least 99.6%.

Figure 13: Percentage of price separation across the NEM in FY2009



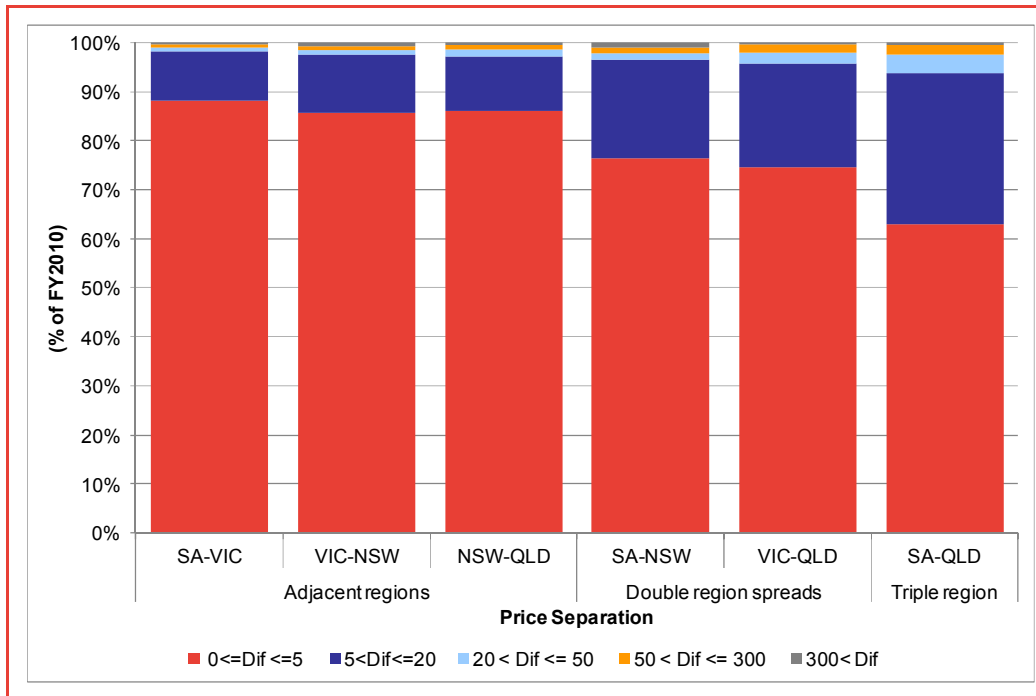
Source: Frontier Economics

Price correlation - 2010

333

In FY 2010, the percentage of time when spot price differences were no more than \$5/MWh between two adjacent regions was at least 85.6%. The percentage of time when price differences were no more than \$50/MWh between any region-pair was at least 97.5%. The percentage of time when price differences were no more than \$300/MWh between any region-pair was at least 99.1%.

Figure 14: Percentage of price separation across the NEM in FY2010

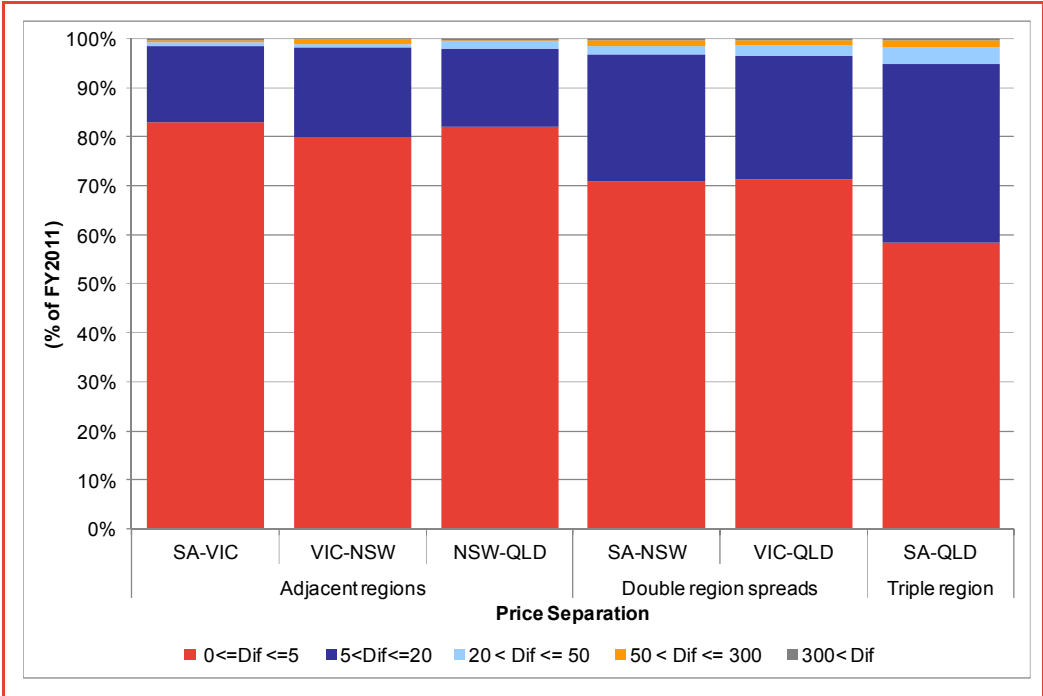


Source: Frontier Economics

Price correlation - 2011

334 In FY 2011, the percentage of time when spot price differences were no more than \$5/MWh between two adjacent regions was at least 79.8%. The percentage of time when price differences were no more than \$50/MWh between any region-pair was at least 98.2%. The percentage of time when price differences were no more than \$300/MWh between any region-pair was at least 99.6%.

Figure 15: Percentage of price separation across the NEM in FY2011

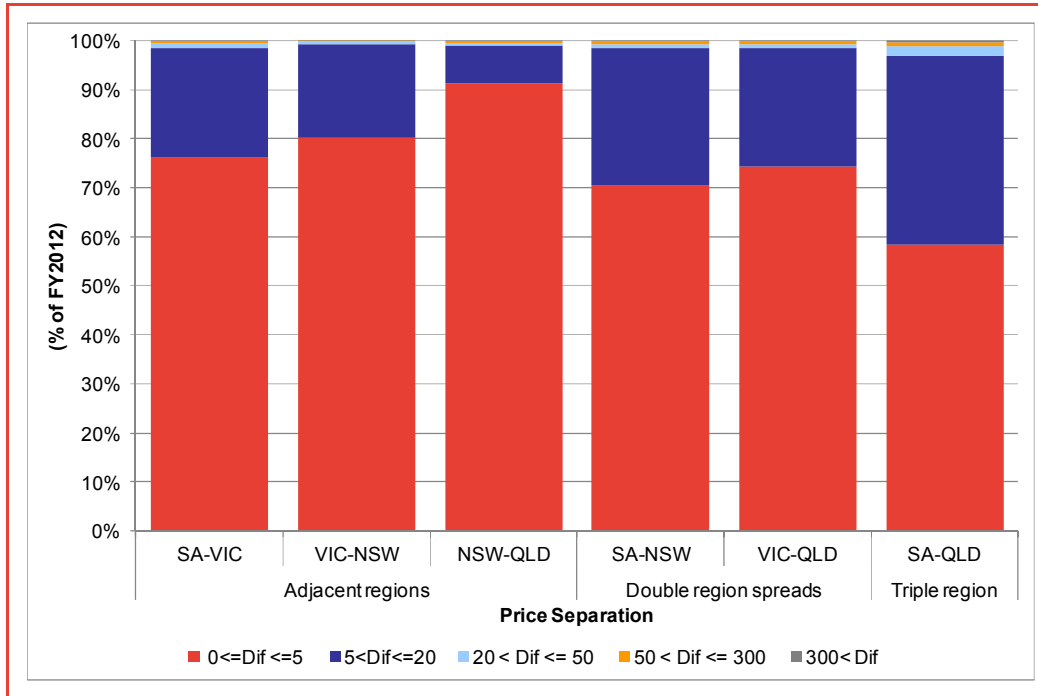


Source: Frontier Economics

Price correlation - 2012

335 In FY 2012, the percentage of time when spot price differences were no more than \$5/MWh between two adjacent regions was at least 76.2%. The percentage of time when price differences were no more than \$50/MWh between any region-pair was at least 98.8%. The percentage of time when price differences were no more than \$300/MWh between any region-pair was at least 99.8%.

Figure 16: Percentage of price separation across the NEM in FY2012



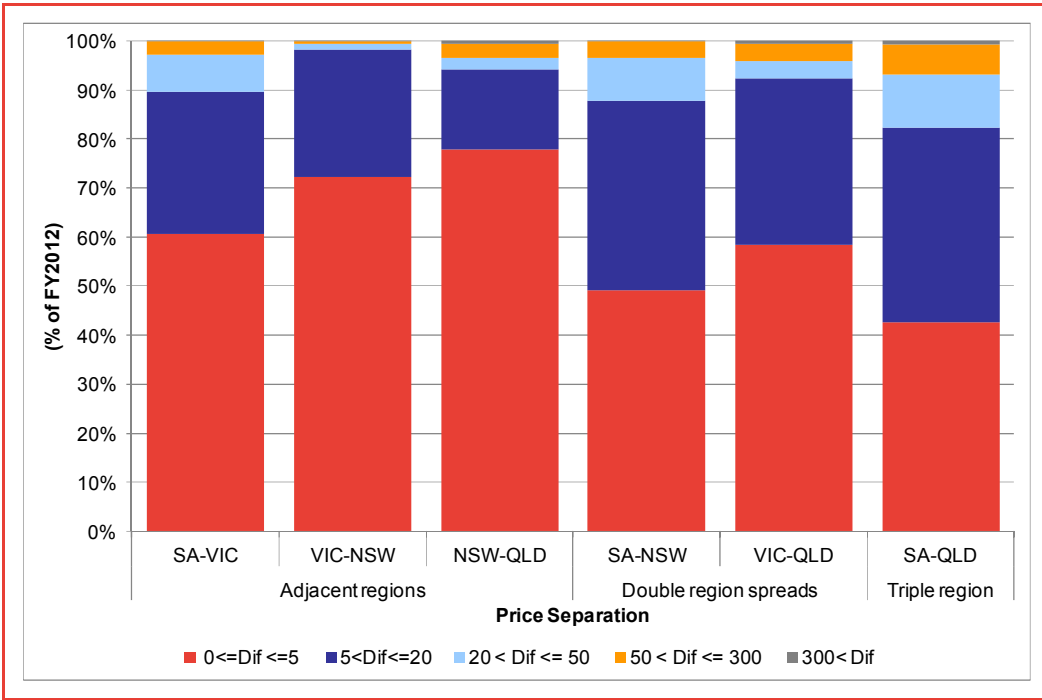
Source: Frontier Economics

Price correlation - 2013

336 In FY 2013, the percentage of spot price differences no more than \$5/MWh between two adjacent regions is at least 60.8%. We consider it likely that the introduction of a fixed price on carbon in FY 2013 has reduced the frequency of price differences less than \$5/MWh as this amount is less than the difference in carbon liability of gas versus coal fired generation. That is, the introduction of carbon results in changes to generator's marginal bids that exceed \$5/MWh in many cases. Price differences above \$50/MWh are unlikely to be primarily due to changes in generator's marginal carbon costs, the frequency of such events is similar to previous, ex-carbon, years.

337 The percentage of price difference no more than \$50/MWh between any region-pair is at least 93.1%. The percentage of price difference no more than \$300/MWh between any region-pair is at least 99.3%.

Figure 17: Percentage of price separation across the NEM in FY2013



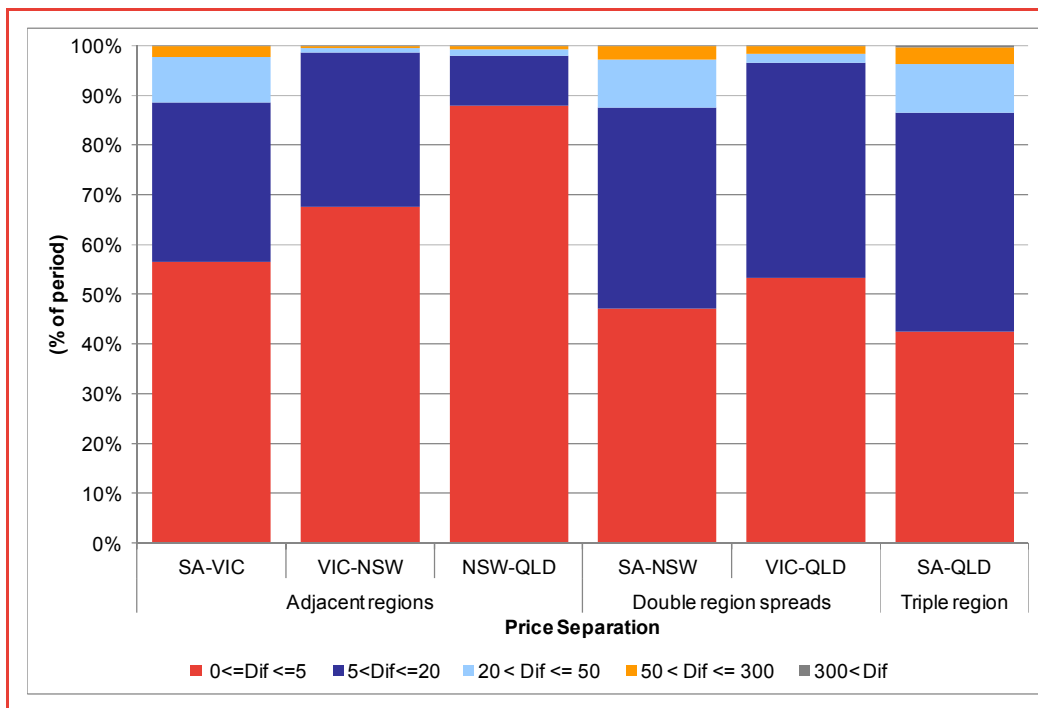
Source: Frontier Economics

Price correlation - 2014 to date

338 In FY 2014, the percentage of spot price differences no more than \$5/MWh between two adjacent regions is at least 56.5%. As with FY 2013, we believe the reduced frequency of price differences below \$5/MWh in FY 2014 to date is due to the presence of a price on carbon and the impact this has on marginal bids in the NEM.

339 The percentage of price difference no more than \$50/MWh between any region-pair is at least 96.3%. The percentage of price difference no more than \$300/MWh between any region-pair is at least 99.7%.

Figure 18: Percentage of price separation across the NEM in FY2014 to date



Source: Frontier Economics

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