IN THE WESTERN AUSTRALIAN ELECTRICITY REVIEW BOARD

No.1 of 2019

B E T W E E N :

ECONOMIC REGULATION AUTHORITY

Applicant

and

ELECTRICITY GENERATION AND RETAIL CORPORATION TRADING AS SYNERGY

Respondent

DECISION*

Date: 7 November 2022

Place: Perth

A. OVERVIEW

1 The respondent is a generator of electricity which it supplies to the South West interconnected system (SWIS), including into the Balancing Market.[1] The Balancing Market is a component of the Wholesale Electricity Market (WEM) in Western Australia.

2 The process of supplying electricity into the Balancing Market involves the respondent making offers to supply electricity in respect of each of the 48 half hour Trading Intervals into which each day is divided. In the case of the respondent, they are a series of offers to supply increasing quantities of electricity at increasing prices. The respondent offers up to 35 Price-quantity pairs for each Trading Interval.

* This is a redacted version of the Decision. Redactions were made to preserve the confidentiality of 'commercial in confidence' information provided by way of evidence to the Board.

[1] Terms which are defined in the *Wholesale Electricity Market Rules* are capitalized.

3 The applicant contends that the respondent contravened clause 7A.2.17 of the *Wholesale Electricity Market Rules* (Rules) by making offers in its balancing submissions to supply electricity into the Balancing Market at prices that were above its reasonable expectation of the short run marginal cost (SRMC) of generating that electricity and that this behaviour related to market power.

4 The allegedly contravening submissions are the respondent's submissions for each of the Trading Intervals between the Trading Interval commencing at 6.00am through to the Trading Interval commencing at 11.30pm on each day between 16 April 2016 and 10 July 2017 and for which the balancing prices offered by the respondent exceeded $40/MWh. There were 11,012 such Trading Intervals and 11,012 balancing submissions during the period from 16 April 2016 to 10 July 2017.

5 The applicant contends that the contraventions were the consequence of the respondent increasing the costs used when building up its balancing submissions. The increased costs figures are the costs attributed to starting up a gas fired generator and to the cost of gas consumed in generating electricity.

6 The applicant contends that the increased start-up and gas costs used by the respondent for the allegedly contravening Trading Intervals, inflated the prices offered by the respondent in its balancing submissions, so that at least one Price-quantity pair within each balancing submission was above the respondent's reasonable expectation of the SRMC. The applicant contended that the respondent's conduct was 'related to' its market power.

7 The applicant seeks findings that the respondent had contravened the Rules, the imposition of a penalties and other relief. This decision deals only with the question whether the alleged contraventions occurred.

8 For the reasons given below the Board is satisfied that, in respect of each of the balancing submissions the subject of these proceedings, the respondent offered a price which was in excess of its reasonable expectation of its SRMC and that its conduct related to market power.

9 The Board is satisfied that the respondent has contravened clause 7A.2.17 of the Rules in each of the relevant Trading Intervals.

10 The Board will:

(a) seek submissions from the parties as to the precise formulation of the declaration recording its findings; and

(b) make directions for further hearing of the matter, enabling imposition of a penalty and other relief.

B. INTRODUCTION AND ISSUES

11 Rule 7A.2.17 provides:

> 7A.2.17. Subject to clauses 7A.2.3, 7A.2.9(c) and 7A.3.5, a Market Participant must not, for any Trading Interval, offer prices in its Balancing Submission in excess of the Market Participant's reasonable expectation of the short run marginal cost of generating the relevant electricity by the Balancing Facility, when such behaviour relates to market power.

It is this provision which the applicant contends the respondent has contravened. Clauses 7A.2.3, 7A.2.9(c) and 7A.3.5 are not relevant.

12 The applicant contends that the Balancing Submissions the subject of these proceedings were overstated because the costs inputs which the respondent used to formulate its Balancing Submissions were overstated. The costs were:

(a) the start-up costs, being maintenance costs associated with starting up gas fired generators in order to produce electricity; and

(b) the cost of gas consumed in generating electricity.

The applicant contends that these overstated costs lead to prices in the Balancing Submissions that were in excess of the respondent's reasonable expectation of the SRMC and that this conduct related to market power.

13 Because demand and levels of production fluctuate within the course of a day, and because it is more expensive to produce electricity from gas fired generators, gas fired generators were only started as demand or anticipated demand required. The applicant did not pursue the respondent in respect of Balancing Submissions which related to

periods of time when gas generators were unlikely to be operational and there was only coal powered generation. Hence, the proceedings relate only to Balancing Submissions for Trading Periods between 6am and 11.30pm.

14 The relevant conduct started on 16 April 2016, when the respondent first used revised and increased start-up costs to derive its Balancing Submissions. Accordingly, the Balancing Submissions the subject of these proceedings run from 16 April 2016. The respondent used start-up costs calculated in the same way until 10 July 2017.

15 In addition, on 14 July 2016, the respondent increased the figure for the cost of gas which it used in deriving its Balancing Submissions.

16 The change in gas prices was associated with the cessation of its long-standing arrangement to buy gas from the Northwest Shelf under a contract dated 4 March 2004[2] (NWS Contract) and new arrangements to purchase gas from the Gorgon Gas project under two long term take or pay contracts (Gorgon Contracts) which were signed on 29 November 2011.

17 The respondent used increased gas costs derived from the Gorgon Contracts from 14 July 2016. The respondent priced its gas on the basis of the price payable per tera joule (TJ) of gas specified under the Gorgon Contracts.

18 However, delivery of gas under the Gorgon Contracts was delayed. The respondent continued to buy and use gas from the Northwest Shelf from 14 July 2016 until 30 November 2016. The price of gas from the Northwest Shelf was considerably less than the price under the Gorgon Contracts.

19 The start date of the Gorgon Contracts was deferred until 6 December 2016.[3] The respondent continued to price by reference to the nominal price in the Gorgon Contracts. It did so until 10 July 2017.

20 Although the gas consumed now came from the Gorgon project, the applicant contends that the (short run) marginal cost of gas did not depend on the amount of electricity

[2] See Annexure CC2 to the amended witness statement of Ms Clare dated 24 March 2021 (Document 76.2 in the electronic bundle of documents tendered at hearing. Documents are referred to by number in the Bundle.).
[3] Amended witness statement of Carole Clare dated 24 March 2021 (Clare) (Bundle 76) at [35].

generated because the respondent had to pay for the gas whether the respondent used the gas or not. The price of gas was not a measure of the short run marginal cost of producing electricity. The applicant contends that SRMC was properly calculated by reference to the opportunity of the gas consumed to produce electricity, which is the market price for the gas.

21 The period of time in which the contraventions are alleged to have occurred may be divided into three periods. Period 1 was the period when only the start-up costs were increased, although this practice continued to 10 July 2017. Period 2 and 3 used increased gas costs as well.[4]

Period	Dates	Start-up costs issue?	Gas Cost Issue?
Period 1	16 April 2016 to 13 July 2016	Yes	No
Period 2	14 July 2016 to 30 November 2016	Yes	Yes - Gorgon Contract pricing applied to Northwest Shelf gas
Period 3	1 December 2016 to 10 July 2017	Yes	Yes – Gorgon Contract nominal price used rather than opportunity cost

The nature of the gas cost issue in Period 2 is different from the nature of the Gas Cost issue in Period 3.

22 The increased start-up and gas costs were used by the respondent to build up the respondent's balancing submissions. The applicant contends that this had the consequence that prices offered in its Balancing Submissions were above the respondent's reasonable expectation of the SRMC.

23 The applicant contended that the pricing behaviour was related to the respondent's market power.

[4] These periods do not comprise the whole of the Investigation Period. The Investigation Period included 1 April 2016 to 16 April 2016. It is not alleged that contraventions occurred in this initial period.

24 In large part, the respondent's case was that the applicant had not proved the contraventions alleged, for a variety of reasons.[5]

25 The respondent also advanced positive arguments that:

(a) the respondent's estimates of its start-up costs were not unreasonable, because:

(i) the applicant had not demonstrated that the respondent used an unreasonable method to ascertain the start-up costs; and

(ii) the respondent had recovered more than its actual start-up costs; and

(b) it was reasonable for the respondent to use the price it paid under the Gorgon Contracts because the expression 'short run marginal cost' in clause 7A.2.17 should be interpreted to extend back to the making of those Contracts.

26 The issues which arise for determination are:

(a) were the start-up costs used by the respondent inflated?

(b) was the gas price used by the respondent excessive:

(i) during Period 2; and

(ii) during Period 3?

(c) if the costings were inflated, did that result in offer prices that were above the reasonable expectation of the SRMC?

(d) did the respondent have 'market power' and, if so, was the respondent's conduct 'related to' market power?

27 These issues will be addressed in turn after some generally relevant background is set out.

C. BACKGROUND

28 The facts set out below were not in dispute.

[5] Respondent's closing submissions at [5].

The parties

29 The Economic Regulation Authority (applicant) is a body corporate established under the *Economic Regulation Authority Act 2003*. The applicant is responsible for monitoring the effectiveness of the WEM.[6].

30 The respondent is a body corporate established under the *Electricity Corporations Act 2005*. It trades as 'Synergy'.

The SWIS

31 The SWIS is defined in the *Electricity Industry Act, 2004* as:

> the interconnected transmission and distribution systems, generating works and associated works —
>
> (a) located in the South West of the State and extending generally between Kalbarri, Albany and Kalgoorlie; and
>
> (b) into which electricity is supplied by —
>
> (i) one or more of the electricity generation plants at Kwinana, Muja, Collie and Pinjar; or
>
> (ii) any prescribed electricity generation plant; …

In broad terms, SWIS is the electricity network for the southwest of Western Australia.

32 The WEM is the market established under s 122 of the *Electricity Industry Act 2004* (*Electricity Act*) for the wholesale supply of electricity in the SWIS.

The Rules

33 The Rules are made under s 122 of the *Electricity Act*[7]and govern the operation of the WEM.

34 The Rules create a wholesale market for both electricity and generation capacity. The Rules do not apply to the retail market for electricity.

35 Clause 1.2.1 of the Rules sets out the objectives of the market:

> (2) The objectives of the market are —

[6] Clause 2.16.9 of the Rules.
[7] Section 123(2) of the *Electricity Act* provides that the Rules are not 'subsidiary legislation' for the purposes of the *Interpretation Act, 1984*.

(a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services in the South West interconnected system; and

(b) to encourage competition among generators and retailers in the South West interconnected system, including by facilitating efficient entry of new competitors; and

(c) to avoid discrimination in that market against particular energy options and technologies, including sustainable energy options and technologies such as those that make use of renewable resources or that reduce overall greenhouse gas emissions; and

(d) to minimise the long-term cost of electricity supplied to customers from the South West interconnected system; and

(e) to encourage the taking of measures to manage the amount of electricity used and when it is used.

36 The applicant may, following an investigation, and if it reasonably believes that a contravention has occurred, institute proceedings in respect of a breach of certain of the provisions of the Rules, including clause 7A.2.17.[8]

37 A 'Market Participant' is a person that is registered under Chapter 2 of the Rules as a Market Generator or a Market Customer.[9] Owners, controllers or operators of a generation system with a capacity of more that 10MW which forms part of or is electrically connected to the SWIS must be registered.

38 The respondent was registered as a Market Participant. It was both a Market Generator and a Market Customer.[10]

The respondent's generator fleet

39 The fleet of generators owned and operated by the respondent during the period 31 March 2016 to 16 July 2017 included the following:

(a) Collie Power Station, 1 unit generating 340 MW;

(b) Muja Power Station, consisting of 8 units generating about 1,094 MW;

[8] Respondent's SFIC at [25(a)]
[9] Rules, Chapter 11.
[10] Applicant's Further Amended Statement of Facts, Issues and Principal Contentions dated 31 May 2021 (Bundle 2D) at [2], Respondent's Further Amended Statement of Facts, Issues and Principal Contentions dated 9 May 2021 (Bundle 2C) at [2].

(c) Cockburn Power Station, 1 Combined Cycle Gas Turbine (CCGT), generating 240 MW;

(d) Pinjar Power Station, 9 Open-Cycle Gas Turbines (OCGTs), generating 581 MW;

(e) Kwinana Power Station, 3 OCGTs, generating 220 MW;

(f) Mungarra Power Station, 3 OCGTs, generating 112 MW;

(g) Kalgoorlie Power Station, 2 OCGTs, generating 62 MW;

(h) Albany and Grasmere Wind Farm, generating 36 MW; and

(i) Kalbarri Wind Farm, generating 1.6 MW.[11]

Two of the OCGTs operating at Kwinana Power Station are High Efficiency Gas Turbines.[12]

40 Mr Lou, Asset Performance Manager of the respondent's Generation Business Unit, gave evidence on behalf of the respondent. He described the types of generators as follows:

> a. Base load generators, such as Muja and Collie Power Stations. These usually run with a capacity factor (i.e. the actual generation as a proportion of potential generation of the generator; the lower the variable costs of production, then the higher the capacity factor will be) above 70-75% and typically have:
>
> i) high capital costs;
>
> ii) variable operating costs;
>
> iii) long start-up times and costs; and
>
> iv) limited stable range of operation.
>
> Base load plants are designed to be operated continuously for long periods at or near full capacity.
>
> b. Mid-merit or intermediate plants, such as Cockburn Power Station. These ordinarily have a capacity factor between 15% and 75%. Compared to a base load plant, they typically have:
>
> i) medium capital costs;
>
> ii) medium operating costs;
>
> iii) medium start-up times; and

[11] Further Revised Amended Witness Statement of Yanqui Lou dated 6 May 2021 ('Lou') (Bundle 77A) [6],
[12] Lou, (Bundle 77A) at [7].

iv) medium or higher ramp rates.

The ramp rate is the rate at which a power plant may increase or decrease the level of electricity which it generates. Mid-merit or intermediate plants usually stop generating during daily low demand troughs and do not operate to full load except during daily demand peaks.

c. Peaking plants, such as the OCGTs at Pinjar Power Station, Mungarra Power Station, and Kalgoorlie Power Station. These operate with a capacity factor below approximately 20%. Compared to other types of plants, they typically have:

i) relatively low capital costs;

ii) relatively high operating costs;

iii) higher ramp rates;

iv) fast start-up times;

v) lower individual start-up costs relative to baseload and mid-merit plant (however, naturally, start-up costs can be high if annualised costs are averaged over a low number of starts per year).

They are generally operated to meet peaks in demand. They run infrequently and have a relatively low level of capacity utilisation. Although the Kwinana HEGTs are technically peaking plant, they are often dispatched by AEMO as if they are mid-merit plant.[13]

41 The differing characteristics of the various generators operated by the respondent affect the relative costs of starting and operating the generators and is relevant to the respondent's calculation of the SRMC of generating electricity.

The markets

42 Market Participants who are Market Generators may earn income in a variety of ways under the Rules:

(a) selling electricity in:

(i) the Balancing Market;

(ii) the Short Term Energy Market (STEM);

(iii) bilateral contracts;

[13] Lou, (Bundle 77A) at [8].

(b) the Reserve Capacity Market;[14]

(c) the provision of Ancillary Services.[15]

43 In addition, the respondent received an 'operating subsidy' from the Western Australian Government in connection with losses sustained by the respondent through selling electricity on a retail basis at prices which are less than the cost of providing that service.[16]

44 Ancillary Services are dealt with in Chapter 3 of the Rules and comprise the Load Following Service, the Spinning Reserve Service, the Load Rejection Reserve Service, the System Restart Service and the Dispatch Support Service.[17]

45 The Reserve Capacity Market provides a payment to generators[18] for the provision of sufficient capacity to generate sufficient electricity to more than meet the forecast peak demand, plus an allowance for contingencies.[19] The Reserve Capacity Target is estimated on a yearly basis by the Australian Energy Market Operator (AEMO).[20]

46 Bilateral contracts are contracts between Market Generators and Market Customers for the sale and purchase of electricity. AEMO does not regulate these contracts. Bilateral contracts may be short or long term. The terms on which electricity is bought and sold under bilateral contracts, including price, is a matter for the parties. It is open to the parties to agree a fixed price, or a price determined by reference to a benchmark. The benchmark may be the Balancing Price, which varies from trading interval to trading interval.[21] (The Balancing Price is discussed further below.) Market Generators are required to inform AEMO of the quantities of electricity involved and the Market Participant which is purchasing the energy covered by the bilateral contract.[22]

[14] Rules, Chapter 4.
[15] See Rules cl 3.13.
[16] Balchin (Bundle 85) [82].
[17] Rules cl 3.9.
[18] Rules, cl4.29.1
[19] Rules 4.5.9.
[20] The Reserve Capacity Target for 2016-2017 was set by the Independent Market Operator, AEMO's predecessor.
[21] See also the definition of 'Balancing Price' in Chapter 11 of the Rules.
[22] Rules, Chapter 6, esp. Rule 6.7.

47 The Short Term Energy Market (or STEM) is an auction mechanism by which Market Generators and Market Customers may purchase or sell quantities of electricity in addition to the quantities of electricity to be bought and sold under the bilateral contracts. The process is, in effect, an auction, with Market Generators and Customers providing offers to AEMO, specifying the quantifies they wish to buy or sell through the STEM market and the prices at which they are prepared to transact. Bid quantity-price pairs which are above the clearing price calculated by AEMO are scheduled for dispatch the next day.[23]

48 The combined operation of Bilateral Contracts and the STEM Market produce a Net Contract Position, which is the net amount that the Market Participant has agreed to buy or sell in each of the Trading Intervals in the subsequent day. AEMO uses this information to identify a bilateral position for the whole of the market for each trading period.

The Balancing Market

49 These proceedings arise out of the operation of the Balancing Market.

50 The 'Balancing Market' is the subject of Chapter7A of the Rules and is defined in Chapter 11 of the Rules:

> Balancing Market: Means the market operated under Chapter 7A in which Facilities, including the Balancing Portfolio as a single Facility, can manage their contractual positions and meet supply and consumption deviations from contracted bilateral and STEM positions in each Trading Interval.

The Balancing Market might be seen as a response to discrepancies in the bilateral positions of Market Participants.

51 The Balancing Market has its own objectives which are 'subservient'[24] to the Objectives of the Wholesale Market objectives as a whole and include:

> 7A.1.3. The objectives of the Balancing Market are to:
>
> (a) enable Balancing Facilities to participate in the Balancing Market;

[23] Rule 6.9.
[24] Rules, cl 7A.1.4.

(b) dispatch the lowest cost combination of Facilities made available for Balancing;

(c) establish a Balancing Price which is consistent with dispatch;

(d) seek to ensure timely and accurate Balancing pricing and quantity information, including forecasts, and system security information, is provided to all Market Participants; and

(e) seek to ensure timely and accurate information relevant to the operation and administration of the Balancing Market is provided to affected Rule Participants

52 The Balancing Market, like the STEM Market, operates as an auction. Unlike the STEM Market, the Balancing Market does not operate on a day-to-day basis. Instead, it operates by reference to the 'Balancing Horizon'. The Balancing Horizon is the 38 hour period from 6pm to the end of the next trading day at 8am.[25] The respondent described it as a 'constantly contracting and expanding period that spans at least the remainder of the current Trading Day'.[26]

53 Market Generators offer to supply electricity into the Balancing Market by way of Balancing Submissions. Balancing Submissions are made for each half hour Trading Interval. The rule, for Market Generators other than the respondent, is that Balancing Submissions can be updated prior to the Balancing Gate Closure. The respondent's ability to update its Balancing Submissions is significantly more limited.[27]

54 A Balancing Submission is defined in Chapter 11 of the Rules:

Balancing Submission: Means:

(a) for a Balancing Facility, other than the Balancing Portfolio, that is:

i. a Scheduled Generator, for each Trading Interval or Trading Intervals, a ranking of Balancing Price-Quantity Pairs for each MW of its Sent Out Capacity from zero capacity to the maximum Sent Out Capacity, together with associated Ramp Rate Limit for each Trading Interval; and

…

[25] Rules, Chapter 11.
[26] 'Synergy's Response to the ERA's Note Concerning the "Coal/Gas" Boundary (at fn 2). See the definition of 'Balancing Horizon' in Chapter 11.
[27] Rule 7A.2.2, 7A.2.1(b) – 7A.2.1(c)6, 7A.2.2, 7A.2.6, 7A.2.9(d), and Respondent's SFIC at [9].

(b) for the Balancing Portfolio, the Balancing Portfolio Supply Curve together with the Portfolio Ramp Rate Limit.[28]

55 The 'Balancing Portfolio' mentioned in paragraph (b) refers to the respondent's generation facilities and includes the generators identified in paragraph [39] above. Rule 7A.1.11 provides that the Balancing Portfolio is to be treated as a single Balancing Facility for the purposes of Chapter 7A. Generation facilities of other Market Generators are treated on a standalone basis.

56 The Balancing Portfolio Supply Curve is a compilation of the various Price-quantity pairs submitted by the respondent, arranged in ascending price order, from lowest to highest.[29]

57 The definition of Balancing Submission refers to 'Balancing Price-Quantity Pair', which is also a defined term:[30]

> Balancing Price-Quantity Pair: Means
>
> (a) for a Scheduled Generator, the … MW quantity at which a Market Participant is prepared to operate a Balancing Facility as at the end of a Trading Interval and the … Price, in $/MWh, at which the Market Participant is prepared to provide that quantity by the end of that Trading Interval;
>
> …
>
> (c) for the Balancing Portfolio, the specified MW quantity at which Synergy is prepared to have the Balancing Portfolio dispatched at as at the end of a Trading Interval and the … Price, in $/MWh, at which Synergy is prepared to provide from the sum of all of its Sent Out Capacity for each Facility in the Balancing Portfolio by the end of the Trading Interval.

58 All Market Generators are required to offer all their generating capacity for each Trading Interval over the Balancing Horizon.[31]

59 It is implicit in these definitions and the definition of 'Balancing Facility' that Market Participants, other than the respondent, provide a separate Balancing Submission for each Balancing Facility. However, the respondent provides a single Balancing Submission in

[28] Rules, Chapter 11. The definition also refers to ''Non-Scheduled Generators'. Such generators are not relevant for present purposes.
[29] Rules, Chapter 11.
[30] Rules, Chapter 11.
[31] Rule 7A.2.1(b). 'Synergy's Response to the ERA's Note Concerning the "Coal/Gas" Boundary' at [3].

respect of all its facilities.[32] For the respondent, the Balancing Submission comprises a series of offers, specifying both a quantity of electricity, and a price.

60 The respondent may include up to 35 Price-quantity pairs in its submissions.[33]

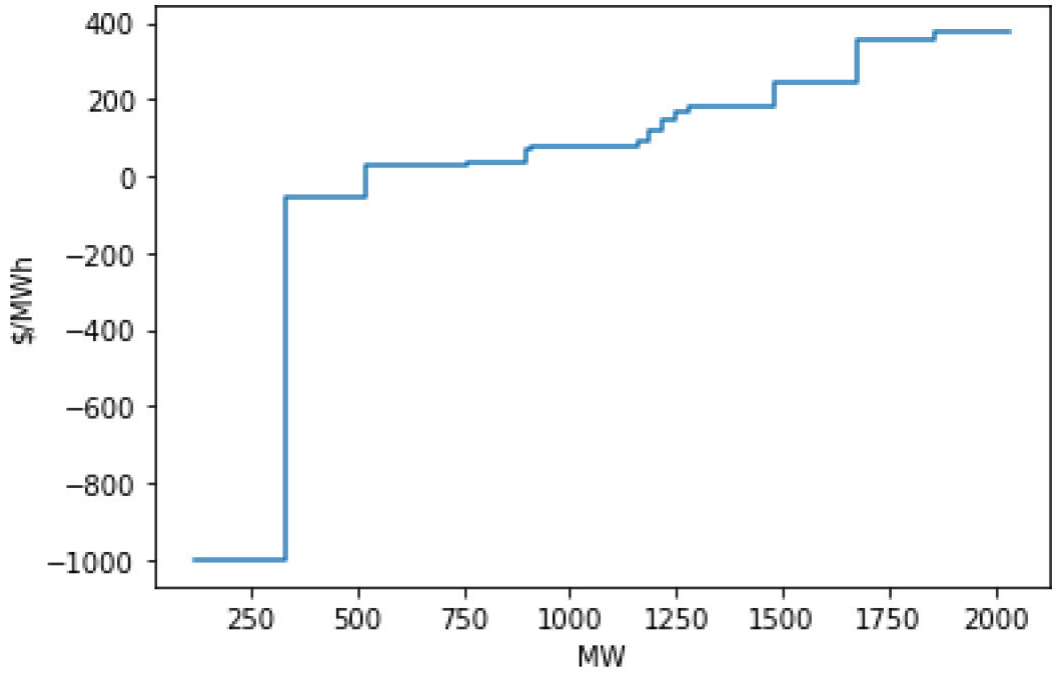
61 The prices in the Price-Quantity Pairs must be within the Price Cap. These is a minimum price, -$1000/MWh, and a maximum price of $240/MWh (for gas) and $371/MWh for liquid fuels) with are fixed administratively by AEMO.[34]

62 Importantly, prices offered by the respondent, must increase with increasing output. This appears to be because the Balancing Portfolio Supply Curve is a ranking of the Price-Quantity Pairs.[35] This was described as a requirement that prices must 'monotonically rise'.

63 The Price-quantity pairs submitted by the respondent can be represented graphically. Mr Layman provided such a graph:[36]

[32] Rules, cl 7A.1.14.
[33] Applicants SFIC at [15]. Respondent's SFIC at [15].
[34] Rules, 6.20,
[35] Rules, Chapter 11.
[36] Bruce Dean Layman, 'Report for MinterEllison: The Relationship between the Prices offered by Synergy in Balancing Submission and the Short-Run Marginal Cost of Generating the Relevant Electricity, 14 December 2020 (Bundle 81)) at p 10.

Chart 1: Synergy Offer Curve for a Single Trading Interval, 29 October 2016, 6:00 PM ($/MWh)[20]



A series of such curves can be prepared for each balancing submission made during each Trading Day. The curves will differ from the predecessors and successors because of the way in which the respondent formulates it balancing submissions and differing conditions, including likely demand, during the Trading Interval.

64 It will be recalled that the respondent's submission is described as the Balancing Portfolio Supply Curve. It is not a 'smooth' curve. As will be discussed later, the jumps in the 'curve' are associated with the need to start additional generators and the use of increasingly expensive generators.

65 The Balancing Submissions from all Market Participants are collated by AEMO. An example of the Balancing Submissions was provided to the Board.[37] It is for the Trading Interval starting at 8am on 1 December 2016 (Sample Trading Period). It contains roughly 70 Price-quantity pairs. Twenty-four Price-quantity pairs were submitted by the respondent (of which 6 are not balancing submissions). The respondent's Price-quantity pairs do not specify which of the respondent's generating facilities is linked to the particular Price-quantity pair. All are referred to as 'Portfolio'. The lowest of the prices

[37] Bundle 97.

was the minimum price, that is -$1,000/MWh. The highest of the prices was the maximum price of $240/MWh.

66 The negative price is associated with the respondent's base load generators, which are coal fired generators. As indicated above, coal fired generators are expensive and slow to start once they stop producing electricity. They have minimum levels of production below which they cannot operate stably. During periods of low demand, the respondent effectively pays Market Participants to take electricity to keep them running.

67 The Board was also provided with a version of the Balancing Submissions for the 1 December 2016 Trading Interval to which explanatory notes had been added for the purposes of these proceedings.[38] The annotated version is arranged in order of ascending price. As part of running the Balancing Market, AEMO is required to rank the various price quantity pairs in price order from lowest price to highest price.[39]

68 AEMO determines the Balancing Price for each Trading Interval in the day. The Balancing Price is the price of the price of the lowest priced Price-quantity pair required to meet the demand for the relevant Trading Interval.[40] Price-quantity pairs with a price which is less than the Balancing Price will be dispatched. More expensive Price-quantity pairs will not be dispatched.

69 In respect of each Trading Interval, AEMO then instructs the various generators who have submitted Balancing Submissions to dispatch sufficient electricity to meet the demand for electricity in that Trading Interval. Market Generators who offered to supply at a price less than the Balancing Price will be dispatched. Market Generators who submitted offers above the Balancing Price will not be dispatched. Dispatch decisions are made on a Trading Interval by Trading Interval by Trading Interval basis. AEMO need not instruct the dispatch of the entire amount of any particular Price-quantity pair.

70 AEMO uses the Balancing Price to settle the sales and purchases between the various parties in respect of the transactions which are in addition the Net Contract Position of the various parties. In summary:

[38] Bundle 98.
[39] Rule 7A.3.2 (after converting them to Loss Factor Adjusted Prices (see Rule 7A.3.1)).
[40] See Rule 7A.3.

(a) Bilateral Contracts are settled by the parties at the price they have agreed;

(b) the STEM Contracts are settled at the STEM clearing price;

(c) the balance of the electricity bought and sold in the WEM is settled by AEMO at the Balancing Price.

The Balancing Price applies to the balance of the electricity supplied, regardless of the price bid by the Market Participant.

71 The Balancing Price for the Sample Trading Period was noted on an annotated version of the balancing submissions. It was $42.68 MWh. The respondent had submitted a Price-quantity pairing at that price in respect of 270 MW of electricity. This price would also have applied to the other price-quantities pairs submitted by the respondent. For example, it submitted an offer to supply 30MW of electricity at $40.78 MWh. It would have received $42.46 for that 30MW.

Procedural matters

72 The applicant conducted investigations which took place between 26 June 2017 and 7 February 2019.[41] The investigation was in respect of Trading Intervals between 31 March 2016 to 10 July 2017.[42]

73 Proceedings were initiated by Application for Orders dated 31 May 2019 (Application). The Board was constituted effective 15 November 2019.

74 Clause 2.13.18 of the Rules provides that where the applicant reasonably believes that a breach of a Category C Market Rule (such as clause 7A.2.17), the applicant may bring proceedings before the Board.

75 Although the respondent denied that it had contravened clause 7A.2.17, it did not contend that the applicant's belief was unreasonable, or that the proceedings were otherwise procedurally defective.[43]

76 The Application sought an order that the respondent had contravened clause 7A.2.17 in respect of the 12,908 Trading Intervals during the Investigation Period commencing at

[41] The applicant conducted parallel investigations under clauses 2.16.9B(aA) and 2.13.10(b).
[42] Applicant's SFIC at [20] and [22].
[43] Respondent's SFIC at [25].

6am and ending at 11.30pm each day. These were trading periods where the Balancing Price did not exceed $40/MWh. The applicant subsequently amended the scope of the alleged contraventions so that contraventions were only alleged in respect of Trading Intervals during the period from 16 April 2016 until 10 June 2017, rather than for the whole of the period investigated by the applicant.[44]

D. START UP COSTS

Introduction

77 The first issue is whether the respondent included a component in its balancing submissions in respect of start-up costs that were inflated.

78 'Start up costs' are part of the maintenance costs component of the cost buildup of the balancing submissions and are maintenance costs occasioned by starting a generator to produce electricity. The respondent included start-up costs in its buildup of the prices offered in its Balancing Submissions.

79 The applicant contended that the respondent's approach to the start-up costs component of the SRMC:

(a) wrongly included third party charges for some start-based inspections of components of the generators. These charges were not made or incurred as they were included in the charges for more extensive inspections of the generators;

(b) wrongly failed to take into account the anticipated service life of generators and thereby included amounts in respect of maintenance that would probably not be incurred;

(c) included some maintenance costs which were time based and therefore not dependent on the amount of electricity produced; and

(d) included costs for maintenance by reference to the manufacturer's scheduled timetable, when it actually carried out maintenance less frequently than the manufacturer's guidelines suggested.

[44] Applicant's Amended Statement of Facts Issues and Contentions dated 5 November 2020.

80 The respondent did not dispute that some third-party charges had been wrongly included in the start-up costs. However, the respondent contended that:

(a) the applicant wrongly adopted a 'deterministic' approach to deciding whether a component in respect of start-based maintenance costs should be included in the buildup of costs;

(b) the applicant's complaint was essentially that it had used an inappropriate methodology and the respondent was not required to adopt a reasonable or any particular methodology for estimating start-up costs;

(c) there was no evidence that the respondent had recovered more than its actual maintenance costs; and

(d) there was no evidence that its conduct in relation to start-up costs was related to market power.

81 The question of the relationship between the respondent's behaviour and market power is dealt with at paragraph 285 and following.

82 This issue affects the Balancing Submissions during all three periods.

Factual background

83 Maintenance costs can be divided into two categories:

(a) maintenance costs incurred on a periodic time basis irrespective of how often the generator started and how much electricity is produced. Maintenance carried out every year or every 500 hours of operation may be said to be 'time based' maintenance costs. These costs do not properly form a component of the *marginal* cost of generating the electricity the subject of the balancing submissions because they are not related to any particular level of generation and do not increase if more electricity is generated; and

(b) maintenance costs which are dependent on the number of times a generator is started rather than on the number of hours the generator runs. These costs increase if an additional start is required to produce more electricity. The respondent described these costs as 'variable operating and maintenance costs'

(VO&M costs) and may be treated as ‘variable costs’ for the purposes of calculating the SRMC.

84 The applicant used the expression ‘start-up costs’, rather than 'variable operating and maintenance costs’. It appears that all the costs identified by the applicant as ‘start-up costs’ were treated as VO&M costs.

85 The approach taken by the respondent in preparing its balancing submissions was that VO & M costs were, in general, an appropriate component of the SRMC. The costs associated with time-based maintenance were not. The applicant did not argue with this approach.

86 A significant example of a VO&M cost is the cost of replacing the rotor of a gas turbine generator. Starting a gas turbine generator places extreme stress on parts of the gas turbine, which need to be replaced after a certain number of starts. A major component affected by starting a gas generator is the rotor blades of the turbine. Replacing the turbine blades of a gas turbine can cost about $4 to $5 million. The manufacturer recommended replacing the rotor after 5,000 starts.

87 The respondent also took the approach that start based VO & M costs should be ‘recovered’ progressively. So, with start-based maintenance costs a component of the start-based maintenance costs was attributed to each start and incorporated in the price build up in Balancing Submissions. The component of the costs was included in advance of the start-based maintenance being carried out and, therefore, in advance of the cost of that maintenance being occurred. So, if it was necessary to replace a $5 million set of rotor blades every 5,000 starts, there was a ‘cost’ of about $1,000 per start. The respondent did not claim $5 million after the 5,000th start.

88 In theory, this meant that the respondent received ‘compensation’ in respect of the items of expenditure equivalent to the full cost of the maintenance work by the time the maintenance was carried out. This can be justified on the basis that components of the generator were partly ‘consumed’ each time the generator started.[45]

[45] Lou (Bundle 77A) at [46] to [49]

89 The applicant did not take issue with this aspect of the respondent's approach to start-up costs.

90 On 11 May 2016,[46] the respondent informed the applicant that:

(a) it had recently undertaken a review of VM & O costs;

(b) the VM & O cost component of the balancing submissions would be calculated purely on the basis of the number of times a generator was started.

(c) the respondent indicated that the costs specified would apply from 16 April 2016.

(d) the start-up costs specified were:

(i) Kwinana GT2&3 [redacted] **[cost]**

(ii) Pinjar 1 [redacted] **[cost]**

(iii) Pinjar 2 [redacted] **[cost]**

(iv) Pinjar 3 [redacted] **[cost]**

(v) Pinjar 4 [redacted] **[cost]**

(vi) Pinjar 5 [redacted] **[cost]**

(vii) Pinjar 7 [redacted] **[cost]**

(viii) Pinjar 9 [redacted] **[cost]**

(ix) Pinjar 10 [redacted] **[cost]**

(x) Pinjar 11 [redacted] **[cost]**

(xi) Cockburn [redacted] **[cost] [The costs ranged from less than $1,000 per start up to more than $10,000 per start up.]**

91 It appears that these figures did not precisely reflect the costs that were used by the respondent in calculating the balancing submissions. The witness statement of Mr Yanqiu Lou dated 6 May 2021 records the actual estimated start-up costs as follows:

(a) Pinjar 1 and 2: [redacted] **[cost]**;

[46] Letter from the respondent to the applicant dated 11 May 2016 (Bundle 8).

(b) Pinjar 3, 4, 5 and 7: [redacted] **[cost]**;

(c) Pinjar 9, 10 and 11: [redacted] **[cost]**.[47] **[The costs were between $3000 and $7,500]**

The alleged errors

92 The costings notified on 11 May 2016 were calculated in accordance with the broad parameters outline above. However, the applicant identified 4 aspects of the respondent's start-up costs which it contended were wrong.

Double counting

93 The applicant contended that the respondent had wrongly calculated its start-up costs by including costs of certain inspections and maintenance work which the respondent was not going to incur because these costs would not be separately charged by the third-party providers of maintenance services.

94 As part of its maintenance work, the respondent carried out three relevant types of 'start based' inspections: 'major inspections', 'hot gas path inspections' and 'combustor inspections'.[48] The respondent's calculations proceeded on the basis that when 'major inspections' were carried out, the other two types of inspections were carried out as well and that the respondent paid separately for the 'hot gas path inspections' and 'combustor inspections'. Similarly, the respondent proceeded on the basis that, when the more frequent 'hot gas path inspections' were carried out, 'combustor inspections' were carried out and separately paid for. In fact, the charge for 'major inspections' was an all-inclusive price. Although a 'hot gas path inspection' and a 'combustor inspection' were carried out at the same time, there was no separate charge for those inspections. The same situation applied with 'hot gas path' and 'combustor' inspections. There was no separate charge for the 'combustor inspection' if it was carried out at the same time as the 'hot gas path inspection (or the 'major inspection'). In other words, these costs were not additional costs. To include them would be to double count these costs and therefore,

[47] Lou (Bundle 77A) at [41A].
[48] Lou (Bundle 77A) at [41A]. In his report (incorrectly) dated 27 April 2020, Mr Reid gives costings for the 'major inspections', 'hot gas path inspections' and 'combustor inspections' at a range between $200,000 and $1.5 million.

they could not be included in a calculation of the respondent's reasonable expectation of the SRMC.

95 Mr TR Reid gave expert evidence on behalf of the applicant in relation to maintenance costs. This issue was identified by Mr Reid in his report of 13 December 2019.[49] Mr Lou accepted that the error had been made.[50] Mr Lou provided corrected calculations.

Generator	Original Calculation	Corrected calculation
Pinjar 1	[redacted] **[cost]**	[redacted] **[cost – 89% of the Original Calculation]**
Pinjar 2	[redacted] **[cost]**	[redacted] **[cost – 89% of the Original Calculation]]**
Pinjar 3	[redacted] **[cost]**	[redacted] **[cost – 86% of the Original Calculation]**
Pinjar 4	[redacted] **[cost]**	[redacted] **[cost – 86% of the Original Calculation]**
Pinjar 5	[redacted] **[cost]**	[redacted] **[cost – 86% of the Original Calculation]**
Pinjar 7	[redacted] **[cost]**	[redacted] **[cost – 86% of the Original Calculation]**

[49] Bundle 82.
[50] Lou (Bundle 77A) at [41A].

Pinjar 9	[redacted] **[cost]**	[redacted] **[cost – 86% of the Original Calculation]**
Pinjar 10	[redacted] **[cost]**	[redacted] **[cost – 86% of the Original Calculation]**
Pinjar 11	[redacted] **[cost]**	[redacted] **[cost]**

96 Mr Lou said that the Gas Turbine and Distributed operating unit provided the original, erroneous, calculations. That unit is responsible for the operation and maintenance of the Open Cycle Gas Turbines (OCGTs). The respondent described this error as 'inadvertent' in its closing submissions.[51] There is no direct evidence to confirm this description.[52]

97 The applicant pointed out that the errors ranged from $500 to $1,300 per generator start. The applicant contended that these discrepancies were material, although the applicant conceded that not all gas generators started each day and the impact on the bid price for any particular Trading Interval varied because the start-up costs are averaged over the period in which a particular generator was operating.

Failure to carry out a life cycle assessment of need for maintenance

98 The main error identified by the applicant was that the respondent failed to consider whether particular items of maintenance would be carried out having regard to the anticipated lifetime of the generator. The applicant contended that it would not be appropriate to include a component for an item of start-based maintenance if it appeared that the generator would be retired before the generator reached the milestone for that item of maintenance.

99 By way of example, at paragraph 47 of his Responsive Report of 27 April 2021[53] Mr Reid considered [redacted]**[Synergy generation unit]**. As at the end of 2016, it had been

[51] Respondent's closing submissions at [176].
[52] Lou (Bundle 77A) at [[41A] and Mr Lou's oral evidence at pp 207 and 208 refer to an assumption that was incorrect.
[53] Bundle 87. The report is incorrectly dated 27 April 2020.

started 3,974 times. On one set of data provided by the respondent, it was expected to start a further 363 times and then be retired. The total number of lifetime starts would be 4,337. In this situation, the applicant contended that generator would not get to the 5,000-start milestone so the rotor would never be replaced. It contended that it was unreasonable to include the cost of replacing a rotor that would not be replaced as part of the cost build up in balancing submissions. The allowance for rotor replacement, per start of this generator, would have been one five thousandth of the costs of replacing the rotor – in the order of $800 to $1,000 per start.

100 Mr Reid applied this lifetime assessment approach to a range of other start-based maintenance costs in addition to replacement of the rotor: replacement of the combustion liner, the transition piece, nozzles, buckets, shroud blocks as well as the rotor. He applied the same approach to start-based inspections of the combustor, the hot gas path and the 'major' inspections. These items of work were carried out after differing start-up intervals.

101 Mr Reid accepted that there were occasions where it was anticipated that start-based maintenance would take place before the end of the operational life of the generator. In the case of [redacted] [**Synergy generation unit**], a combustor inspection was due to be carried out at 4,200 starts**.** That would need to be done before the [redacted] **[Synergy gernation unit]** was due to be retired. Mr Reid accepted it was reasonable to include a component in respect of the cost of this combustor inspection in the start-up component of the VO&M costs.

102 Mr Reid carried out an analysis of the scheduled maintenance and operational lifetime of each of the Pinjar 1 to 11 generators.[54] He broke down the start-based maintenance work into three categories:

(a) work which had been done for which the respondent had been fully compensated (the work having been done);

(b) work for which compensation was required (where the work would have to be done before the generator was retired); and

[54] Reid Report of 27 April 2020 at [40] to [68].

(c) work which would not have to be done during the anticipated lifetime of the generator.

The effect of Mr Reid's analysis was to show that the respondent's calculation would likely involve a significant 'over recovery' because the respondent's calculation included the cost of start-based maintenance work which would not have to be done during the anticipated service life of the generator.

103 Mr Aspinall, who gave expert evidence on behalf of the respondent on this issue, agreed in principle with the need for a lifetime assessment to avoid over recovery of VO&M costs and that the 'snapshot approach' of the respondent was not appropriate.[55]

104 However, Mr Aspinall considered that an entity in the position of the respondent should not select a single date for the retirement of a generator. The likelihood of a generator retiring by the number of starts required for maintenance to be carried out should, he said, be categorized as 'low', 'most likely' and 'high'. He considered that a component in respect of the item of maintenance work should be included in the VO & M costs unless there was a 'low' chance that the generator would be in service when the item of work needed to be done.[56] He regarded a 'low' chance as being 20%, so that if there was a greater than 20% chance that the generator would be in service at the scheduled maintenance milestone, a component for that replacement or inspection could reasonably be included.

105 Mr Aspinall justified this approach on the basis that it was difficult to identify precisely when a generator would be retired. Mr Lou gave evidence that was 'impossible' to forecast with accuracy when a facility will be retired'.[57] Mr Lou said that decisions of this nature were subject to 'external factors', including consultation with the State Government and AEMO.[58] The respondent prepared annual estimates of the number of times the Pinjar generators would be started before retirement. Some were provided to

[55] Joint Expert Report – Aspinall and Reid dated 4 May 2021 (Bundle 89) at p3, Transcript at p555.
[56] Joint Expert Report – Aspinall and Reid dated 4 May 2021 (Bundle 89) at p5, Transcript at p557.
[57] Lou, at [65].
[58] Lou (Bundle 77A) at [63].

the Board.[59] They differed from year to year, which is understandable and illustrated his point.

106 Mr Aspinall also referred to changes in the mix of means by which electricity was generated. He said that the increasing use of 'alternative' generation, meant that gas turbines were more commonly used to provide auxiliary services. As such, the gas turbines were more commonly used for frequency balancing than actual production of electricity for sale. Consequently, historical information based on starts to generate electricity would not be reliable.

107 Mr Aspinall also pointed out that, if one adopted Mr Reid's approach to modelling the end of lifetime of plant, and that the estimate of the lifetime turned out to be too short, so that the start-based maintenance was required after all, the respondent would be out of pocket. A generator could not retrospectively amend the calculations of the VO&M component which it used in past balancing submissions to make up for the 'missed' start-up component. He contended that, as a consequence, a commercial generator would not undertake maintenance work unless there was an 80% chance that the maintenance cost would be recovered.

108 The Board does not accept Mr Aspinall's approach.

109 But before dealing with why the Board does not accept Mr Aspinall's approach, it should be noted that Mr Aspinall's approach was not that adopted by the respondent. Even if one adopted the 20% cut off, the respondent's approach included a component in respect of 100% of future maintenance work, irrespective of the anticipated lifetime. The respondent's approach involved an unwarranted over recovery, even on Mr Aspinall's evidence.

110 One reason that the Board does not accept Mr Aspinall's approach is that the respondent operated a suite of gas turbine generators, so that Mr Aspinall's 80% requirement mean that it recovered for work that was not done in substantially more cases than it carried out work for which it did not recover. With a suite of generators, there might be underestimates of the life of a generator and over estimates of the life of a generator.

[59] Lou (Bundle 77A) YL-4, YL-5 and YL-6 (Bundle

Using a 20% cut off, there would be many more over-recoveries than under-recoveries. There is no mechanism for a Market Participant to repay amounts which it has recovered through the balancing market mechanism attributable to start up maintenance that was not in fact required.

111 Also, the impact of third-party involvement in determining the *date* at which a generator is 'formally' retired does not necessarily translate into significant uncertainty about the number of future starts. For example, in the case of [redacted] [**Synergy generation unit**], the operational life was anticipated to be 4782 starts. The greatest number of anticipated starts in a single year was 29starts.[60] At this rate, it would take 7.5 years to move from 4,782 starts to 5,000 starts. If it became uneconomic to start a generator, the number of times the generator starts each year may be expected to decline, whether it is formally 'retired' or not. However, towards the end of their operational life, generators do not start very often, so it would reasonably be expected to take substantially longer than 7.5 years to move to 5,000 starts.[61] Whether [redacted] [**Synergy generation unit**] was retired in one year or another would not make much difference to the likelihood that major start-based replacements or inspections would be carried out.

112 Further, like maintenance on a car, there is a degree of flexibility about the timing of start-based maintenance. An operator of a generation plant need not carry out a 5,000-start maintenance the day after the 5,000th start. An operator working in a commercial environment would be reluctant to undertake substantial, expensive maintenance work on a generator that was nearing the end of its operational life if that work could reasonably be deferred. As gas generators start less frequently towards the end of their operational lives, some maintenance could be deferred for a considerable period of time. Conversely, the need to spend a substantial sum on start-based maintenance would be relevant to the decision whether to retire that generator. A sensible generator would not spend $5million on replacing a rotor only to retire the generator the next week. Reverting to the car maintenance analogy, one would not spend a lot of money replacing the engine of a car that was soon to be scrapped and was only driven rarely.

[60] Lou, Annexure YL6 (Bundle 77.6)
[61] Reid, Transcript p 588, Joint Expert Report of Messrs Reid and Aspinall, (Bundle 89) at page 16.

113 As to the transition of gas generators to the provision of auxiliary services, a generator is separately compensated for the provision of auxiliary services.

Maintenance flexibilities

114 A further respect in which the respondent 'overclaimed' maintenance work was that the respondent carried out certain maintenance work less frequently than contemplated by the manufacturer's recommendations. The longer manufacturer's recommendations were, however, used to calculate the start-up costs.[62] This aspect of the applicant's case was not disputed.[63]

Time based maintenance

115 Mr Reid identified a number of items of maintenance that were included as VO&M maintenance which he considered were time-based maintenance, rather than depending on the number of starts because they did not vary despite the differing number of starts of Pinjar A, Pinjar B and KWGT.[64] Consequently, those costs were not related to the amount of electricity produced and were not 'marginal' costs. The Board accepts Mr Reid's analysis of these costs.

Over recovery

116 The respondent pointed out that:

(a) the Rules do not require a generator to have a reasonable methodology for estimating startup costs.[65]

(b) a generator can account for start-up costs as the generator sees fit; and

(c) no contravention of clause 7A.2.17 committed unless a price in its Balancing Submission exceeds 'a reasonable expectation of their SRMC' (in a way that is related to market power);[66]

[62] Reid (Bundle 87) at [69] to [78], and for example Bundle at 077.2, March 2016 Pinjar AB plus KGT are row 23, and the Further Report of Mr Reid at [9].
[63] Joint Expert Report of Messrs Reid and Aspinall, (Bundle 89) at page 13.
[64] See Reid's Report of 27 April 2020, (Bundle 87) at paragraphs [97] and [98], Annexure 077.2 to Mr Lou's statement, Workbook Mar 2016 Pinjar AB + KGT, at Row 48. See also Reid (Bundle 87) at [11(f)], Joint Expert Report of Messrs Reid and Aspinall, (Bundle 89) at page 12)
[65] Respondent's closing submissions, at [163].
[66] Respondent's closing submissions, at [164].

117 The crux of the respondent's argument in relation to start-up costs was the applicant had not established that the respondent's approach to start-up costs means that it would recover more than its actual start-up costs and, as a consequence, the applicant had not established that the allowance was unreasonable.

118 The respondent explained its position as follows:

> Consequently, having an "unreasonable" methodology for estimating start-up costs does not mean that Synergy contravened cl 7A.2.17 whenever that methodology was applied. At its highest for the ERA's true contention, the methodology may have produced some level of "over-recovery" at some point in the future (depending on various matters, some of which we identify below). But on any analysis, it would take a long time – often years – for any "over-recovery" to occur. And unless and until that time is reached, Synergy would not have included any allowance for start-up costs, in any Balancing Submission offer, that exceeded its actual start-up costs.[67]

119 This submission does not address two important matters,

120 First, the respondent did have a methodology which it used as part of the process of arriving at the prices in its balancing submissions. That methodology was used to ascertain the respondent's expectation of the SRMC. That methodology included costs in the buildup of the SRMC which it was not reasonable for the respondent to have included because they were systematically inflated. To the extent that the respondent's methodology incorporated cost components which could not reasonably be expected to be incurred the methodology caused a price in the balancing submission to be greater than they would have been apart from that element, the price may be said to be higher than the respondent's reasonable expectation of the SRMC. The impact of the inflated costs figures on the SRMC is dealt with below.

121 Second, clause 7A.2.17 is not directly concerned with whether a generator has 'recovered' more than it spends by way of start-up costs. The comparison is between the respondent's reasonable expectations at the date the balancing submission is made, and the price offered. The comparison occurs when the balancing submission is made, not when the expenditure is eventually incurred. Any contravention is complete when the Balancing Submission is made. It is not necessary to wait until maintenance expenditure

[67] Respondent's closing submissions, at [168].

is incurred, possibly many years later, to ascertain whether the respondent's anticipated expenditure was in fact correct. The estimate of the SRMC may be said to be reasonable or unreasonable at the time it is made. It is not necessary to wait until expenditure is incurred or a generator is retired so that one has the benefit of hindsight.

122 Thus, if a generator had included an allowance on account of start-up-based maintenance expenses and, for reasons beyond its control, the generator was destroyed so that the maintenance work was not carried out and it did not incur that expense, no contravention would have occurred, even though the amount 'recovered' exceeded the amount spent. The respondent reasonably anticipated the expenditure would occur. A component in respect of that expenditure was reasonable, even though it was not, eventually incurred.

123 The ambiguity in the respondent's submissions stems in part from the language of Mr Reid, which did discuss the matter in terms of over recovery. This was a way of indicating that the amount allowed for start-up costs was too high. If, for example, the respondent included a component in its balancing submission to account for a rotor that was not reasonably expected to be replaced, this would include in that balancing submission a cost that was not reasonably expected to be incurred and therefore lead to over recovery in due course. However, in the meantime, at the time the submission was made, the component for start-up costs was above the reasonable expectation of the start-up costs.

Conclusion

124 For these reasons, the Board considers that the component which the respondent included in its balancing submissions in respect of start-up costs was significantly inflated and did not reflect a reasonable expectation of costs when calculating start-up costs. This aspect of the respondent's conduct continued in all three Periods.

F. GAS COST

Overview

125 It will be recalled that the respondent increased the gas cost used in its price build up from 14 July 2016.

126 From 14 July 2016 until 10 July 2017, it used the nominal price payable under the Gorgon Contracts as the cost of gas in formulating its balancing submissions.

127 During Period 2 (14 July 2016 to 30 November 2016), the respondent continued to obtain gas under from the Northwest Shelf. The price it paid for gas under the NWS Contract was lower than the price payable under the Gorgon Contracts.

128 During Period 3 (1 December 2016 to 10 July 2017) the respondent used gas delivered under the Gorgon Contracts to generate electricity, the cost used by the respondent in its cost buildups reflected the price per TJ of gas identified in the Gorgon Contracts.

129 However, the applicant pointed out that the Gorgon Contracts had a substantial take or pay component, so the respondent was obliged to pay for this gas whether the gas was used or not. It argued that the nominal price for the gas did not form part of the 'marginal cost' of producing electricity. The applicant contended that the cost of gas delivered under the Gorgon Contracts should be calculated by reference to the opportunity cost of this gas, that is, the price for which the gas could be sold on the market.

130 The respondent disagreed and contended that it was permissible to use the nominal price under the Gorgon Contracts.

131 For the reasons given below, the Board considers that the cost of gas during Period 3 should be bounded by the opportunity cost, in this case, the market price of the gas, rather than the nominal price under the Gorgon Contracts.

132 The gas costs used by the respondent were above the opportunity cost of gas and were therefore above a reasonable expectation of the gas component of the SRMC.

Factual background

133 The respondent was a party to the following contracts as at 31 March 2016:

(a) the NWS Contract. The end date of that contract was 29 November 2016; and

(b) the Gorgon Contracts, which were two contracts (one for [redacted] TJ/day and one for [redacted] TJ/day) **[for a combined total quantity of 125 TJ/day]** which had been

entered into in November 2011 for the supply of gas from the Gorgon Gas Project in preparation for the expiry of the NWS Contract.[68]

One of the Gorgon Contracts had been entered into by Energy Generation Corporation (which was known as Verve Energy at the time). It was for [redacted] TJ. The other contract was entered into by Electricity Retail Corporation. It was for [redacted] TJ. Verve Energy and Electricity Retail Corporation merged to form the respondent. The contracts [**for a combined total quantity of 125 TJ/day**] vested in the merged entity. Both Gorgon Contracts were for 20 years from the start date.

134 As of 31 March 2016, the respondent 'applied" a gas input price for gas supplied under the North West Shelf contract of $[redacted] **[price]**'as its price model input in preparing its balancing submission.[69]

135 The Gorgon Gas Project was scheduled to deliver gas to the respondent from 31 December 2015. However, by a series of notices given under the Gorgon Contracts**,** the start date for delivery of gas was deferred to 6 December 2016. Gas was not delivered under the Gorgon Contracts until then.[70]

136 During the period from 14 July 2016 until 30 November 2016 (Period 2), the respondent adopted the price per TJ payable under the Gorgon Contracts, [redacted] **[price – being an amount substantially above the NWS Contract price]**/GJ (delivered) as the gas price modelling input in preparing its Balancing Submissions.[71]

137 Both Gorgon Contracts had a 'take-or-pay' component. The take or pay component was [redacted] **[quantity]**% for the [redacted] **[quantity]**TJ/day contract and [redacted] **[quantity]**% for the [redacted] **[quantity]**TJ/day contract (ie [redacted] **[quantity]** TJ per day for the [redacted] **[quantity]**TJ/day contract and [redacted] **[quantity]**TJ per day for the [redacted] **[quantity]**TJ/day contract). There was a total take or pay component of [redacted] **[quantity]*** TJ per day.[72]

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[68] Applicant's ASFIC at [40]; Respondent's SFIC at [40].
[69] AASFIC [41], RSFIC 41.
[70] AASFIC at [42], RSFIC at [42].
[71] See letter dated 8 August 2016 from the respondent to the applicant (Bundle 11).
[*] The take or pay component was more than 80% of the contracted quantity.
[72] Clare, Doc 76 at [33].

138 The 'take or pay' obligation is more accurately described as an obligation either to take *and* pay for a quantity of gas or, alternatively, to pay for that quantity of gas but without taking delivery of it. The obligation to pay for the 'take or pay' component is not dependent on whether gas is delivered.

139 While part of the quantities of gas identified in the Gorgon Contracts was 'discretionary', the effect of the Gorgon Contracts was that the respondent was obliged to make substantial payments over the life of the contract, irrespective of whether it received the corresponding gas.

140 The Gorgon Contracts specified a price that would be paid when deliveries commenced under those contracts, calculated by the application of a formula to the [redacted] **[base reference price]** identified in the Contracts.

141 On the basis that price of gas under the Gorgon Contracts was [redacted] **[price]**/GJ,[73] the respondent was obliged to pay the Gorgon entities [redacted] **[price]** onthe first day that the Gorgon Contracts were operative, whether it took delivery of the full [redacted] **[take or pay quantity]**TJ of gas or not. It had the same obligation the next day and so on, until there was a review of the price and quantities or both.[74] The price per terra joule of gas taken would, of course, exceed the 'nominal' price, if the respondent chose not to take delivery of all or some of the take or pay component.

142 The gas input prices used by the respondent to calculate its SRMC during Period 3 varied between [redacted] **[price]** and [redacted] **[price]**/GJ undelivered ([redacted] **[price]** and [redacted] **[price]**/GJ delivered).[75] This was the price payable from time to time under the Gorgon Contracts.

143 The rationale given by the respondent in 2016 for the change in the 'gas price modelling input' was the 'revised' opportunity cost associated with changes to the respondent's gas

[73] This was given as the weighted average price of gas under the Gorgon Contracts during the Investigation Period in Respondent's Amended Statement of Facts Issues and Contentions, at [43].
[74] If the respondent took more than [redacted] **[the take or pay quantity]**TJ of gas, it would be obliged to pay more. Mr Balchin's evidence (Bundle 80) at [100], was that the respondent was substantially over contracted for gas.
[75] AASFIC [55], RSFIC [55]

supply arrangements, 'particularly the advent of the new Gorgon gas supply and end-of-life Northwest Shelf Gas supply constraints'.[76]

144 Expert evidence in relation to this issue was given by Mr Jeff Balchin of Incenta Economic Consulting on behalf of the applicant and by Professor Christopher Knittell of the Sloan School of Management at the Massachusetts Institute of Technology on behalf of the respondent.

The parties' arguments

145 The applicant contended that:

(a) it was not permissible to use the price per TJ under the Gorgon Contracts because the amount payable by the respondent for gas was not affected by the quantity of electricity produced and quantity of gas thereby consumed. The amount payable under the Gorgon Contracts was not, therefore, a 'marginal cost' and did not relevantly vary depending on how much electricity was produced during the 'short run';

(b) the 'opportunity cost' associated with gas consumed in the production of electricity should be used to determine the gas cost for the purposes of the SRMC of gas the subject of the balancing submissions. The opportunity cost is the value of the best alternative to burning the gas to produce electricity;

(c) in the present case, the best alternative to burning the gas to produce electricity was to sell it, so that the opportunity cost was appropriately ascertained by reference to the 'market price' from time to time for gas; and

(d) the market price during Period 3 was substantially less than the price per TJ payable under the Gorgon Contracts, so that figure for the gas cost which the respondent used in it price build up was excessive.

146 The respondent's position may be summarised as follows:

[76] Letter from the respondent to the applicant dated 8 August 2016 (Bundle 011)

(a) there are several different definitions of 'short run' depending on which or how many of the costs of production were permitted to vary. An interpretation of 'short run' should be adopted which furthered the objectives of the Rules;

(b) an interpretation of 'short run' should be adopted which extended the 'short run' beyond the respondent entering into the Gorgon Contracts because:

(i) long term take or pay contracts (LTTOPs) are necessary and useful for electricity generators who use gas generators, such as the respondent;

(ii) LTTOPs are 'economically efficient';

(iii) asymmetries in the Rules mean that generators who enter into LTTOPs would not, in the long term, completely recover their gas costs, creating a 'missing money' problem, unless the respondent's interpretation of 'short run' was adopted;

(iv) the applicant's approach to the meaning of 'short run' is an extreme one, which did not avoid the 'missing money' problem;

(v) the approach taken by the applicant to the definition of the 'short run' in this context is not consistent with the approach taken by the applicant in the context of startup costs.

(vi) the price payable under the Gorgon Contracts for gas was therefore a marginal cost of producing electricity;

(vii) it is not practical to adopt the applicant's position because of the difficulty of determining the 'market price' of gas.

147 The respondent's points will be dealt with in turn. It will then be necessary to reach a conclusion about the meaning of 'short run marginal costs' and to consider whether the gas costs used by the respondent were excessive.

Multiple 'short runs' and the objectives of the Rules

148 A crucial expression in clause 7A.2.17 is 'short run marginal cost'. It is not a defined term. It is an economic term.

149 In general, the 'marginal cost' of producing a good is the cost of producing an additional unit of the good. In the case of electricity, the marginal cost is the cost of producing additional electricity.

150 It was agreed by Professor Knittel and Mr Balchin that a 'short run' is a period of time over which certain costs are treated as fixed costs, which has the consequence that other costs are treated as 'variable'. They also agreed that, in the 'long run', all costs are 'variable costs'.

151 The dispute between the parties on this issue was essentially about how long or short the run should be.

152 The respondent identified 6 different costs associated with the production of electricity using gas.[77] They were:

(a) capacity (eg generation plant);

(b) long-term labour contracts;

(c) long-term fuel contracts;

(d) operation and management costs;

(e) short-term fluctuations in labour hours; and

(f) fuel purchases.

153 The respondent argued that there could be at least five different 'runs', where between one and five of these inputs were fixed and the other inputs varied. This would have the consequence that each of these runs could still be described as a 'short run'.

154 The respondent argued that it was a matter of interpreting the definition of 'short run marginal cost' to identify the costs which might be 'allowed' to vary, thereby identifying the 'short run' for the purposes of clause 7A.2.17.

155 The respondent argued that regard should be had to the objectives identified in clause 1.2.1 of the Rules in interpreting Rule 7A.2.17. Objectives identified as relevant by the

[77] Respondent's closing submissions at [122], Knittell report at [95].

respondent[78] were those set out at clause 1.2.1(a) and (d), which involved promotion of 'economically efficient' electricity and 'minimizing the long-term cost of electricity.

156 The respondent contended that an appropriate definition of the 'short run' would be one which included the period prior to signing of Gorgon Contracts because it would produce results which furthered these Rule objectives.

157 This, it said, would have has the consequence that the 'short run' for the purposes of the respondent's balancing submissions would extend from 2016, when the Balancing Submissions were made, back to 2011, when the Gorgon Contracts were made.[79] If this approach was adopted, the costs of gas acquired under the Gorgon Contracts, would form part of the 'short run marginal costs' within clause 7A.2.17.

158 The respondent contended that the applicant had adopted an 'ultra-short-run' for determining the SRMC. In the 'ultra-short-run', the only variable cost is the instantaneous fuel requirements.

159 The reasons advanced by the respondent why the respondent's definition of 'short run' would advance the Rule Objectives and should be adopted are dealt with below.

LTTOPs

160 The respondent argued that the applicant's interpretation of the 'short run' created problems for Market Participants who used gas to generate electricity.

161 The respondent said that generators 'would (practically) be forced into entering into long-term [take or pay] contracts' (LTTOPs).[80]

162 The respondent tendered evidence from Ms Carole Clare, the Fuel Contracts Manager in the Wholesale Business Unit of the respondent. She was responsible for negotiating gas supply and transport arrangements and for managing the respondent's take or pay positions under its long-term gas contracts.[81] She was not cross examined by the applicant.

[78] Respondent's closing submissions at [126].
[79] Respondent's written closing submissions at [139].
[80] Respondent's closing submissions at [134].
[81] Clare, witness statement (Bundle 76) at [3] to [12].

163 She gave evidence that the respondent purchased gas under long term gas supply contracts to have certainty over price and supply volumes.[82] She also gave evidence that gas producers usually seek to have at least 75% of the annual minimum quantity of gas supplied on a take or pay basis.[83]

164 The respondent contended that recourse to the short term or spot markets, for gas was not commercially satisfactory for electricity generators such as the respondent. There is no open 'spot' market for gas in Western Australia.[84] The 'spot' price varies widely. Further, the respondent requires a lot of gas for its turbines. Only limited amounts of gas are traded on gas trading platforms, although participants may transact bilaterally with other industry participants. It is likely that the respondent could not have procured enough gas on the spot market to meet its needs at economically viable prices.

165 Additionally, contracts on the 'spot' market, and the short-term contracts which the respondent entered into during July 2016 to December 2016, were 'interruptible', meaning that gas would only be supplied if gas available to the vendor.[85] The respondent requires reliable or 'firm' supplies of gas to reliably generate electricity. At all material times, to qualify for capacity payments under the Reserve Capacity Mechanism, generators were required to have firm fuel procurement contracts sufficient to run their generators for 14 hours consecutively for the period from 8am to 10pm on Business Days from 1 October to 31 July of a Capacity Year.

166 Consequently, it was not commercially feasible to rely on the spot market or other interruptible sources of gas supply to meet the respondent's gas supply requirements.

167 The Board accepts that the commercial reality was that generators such as the respondent needed to enter into LTTOPs to obtain firm supplies of gas for electricity production.

[82] Clare at [17].
[83] Clare at [19].
[84] Clare at [53]. Knittel (Bundle 83) at [73].
[85] Clare at [37].

'Efficient' LTTOPs

168 In its submissions, the respondent used the expression 'efficient' to describe LTTOPs in general[86] and, by extension, the Gorgon Contracts

169 Professor Knittel described 'economic efficiency' in an economy as follows:

> means that all goods and factors of production are distributed or allocated to their most valuable uses and waste is eliminated or minimized.[87]

170 Professor Knittel contended that the Gorgon Contracts appeared to be efficient at the time they were signed in 2011 and that 'the reasonableness' of the Gorgon Contracts should be considered 'at the time the contracts were negotiated and signed and not with perfect hindsight'.

171 Professor Knittel concluded:

> the commercial provisions, prices, and quantities agreed to in the Gorgon Contracts were reasonable and economically rational *at the time they were signed*, given the expectations of the contracting parties.[88]

172 This description was not disputed by the applicant. Professor Knittel did not define the term 'economically rational'. The Board understands it to mean contracts that might be entered into by an entity acting reasonably and rationally in its economic self-interest.

173 A submission to the Board of Synergy Retail on 29 March 2010 indicated that its bid for the Gorgon gas supplies would 'ensure that Synergy will have low cost and long-term supplies" when its existing arrangements terminated.[89] The submission of August 2011 to the Board of Synergy expected a net present benefit of $[redacted] [**amount**] million.

174 Professor Knittel noted that, when construction of the Gorgon project began, demand for gas was anticipated to grow.[90] The decision to enter into the Gorgon Contracts was based on the view that 'market prices for gas are expected to be in the order of $8 – 9 /GJ, while

[86] Respondent's written closing submissions at [135], [136] and [139].
[87] Knittel, Bundle 83 at [101].
[88] Knittel, Bundle 83 at [126]. Emphasis added.
[89] Submission to Synergy Board of Directors, Gas Procurement Emerging Opportunities, 29 March 2010 (Bundle - 79.4).
[90] Knittel, Bundle 83 at [68].

[arrangements under the Gorgon Contracts] are CPI indexed from $[redacted] and $[redacted] (June [redacted] dollars').[91] **[substantially lower figure]**.

175 The Board accepts that, at the time the respondent's predecessor entities entered into the Gorgon Contract, they thought the Gorgon Contracts were in their commercial best interests. It appears, however, that the market price for gas did not meet the expectations of the respondent in 2011. The CEO of the respondent reported to its Board in April 2017:

> WBU [Wholesale Business Unit] obtained forward gas supply price quotations from 5 producers for volumes of between 10 and 15 TJ/d over terms of 2 years and up to 5 years, from 2018.
>
> The solicitation was undertaken in conjunction with RBU's [Retail Business Unit] gas sales proposals to large industrial buyers and market price discovery. Producer prices were provided on a nonbinding basis.
>
> Four producers offered 2 year supplies between $4/GJ and $5/GJ, and 3 producers offered higher prices ranging from $4.85/GJ to $5.80/GJ in later years.
>
> One producer offered prices only for supply in 2018 and 2019, of between $5.35 and $5.50/GJ.
>
> [redacted] [**Producer name**] offered a price of [redacted]GJ [**price**] in 2018 and 2019, and [redacted]/GJ [**price**] for the following 3 years.
>
> The above prices supports the view that current producer pricing is lower than the Synergy Gorgon gas supply contracts price of [redacted]/GJ [**price**] [92]

176 It is too early to say whether the Gorgon Contracts would, apart from this dispute, have been beneficial overall to the respondent: the contracts have not been closed out. The gas price might spike, so that the market price is much more than the price payable under the Gorgon Contracts. However, in December 2016, Synergy had information that showed that the Gorgon Contract price adopted in its balancing submissions was above the market price. A decision in December 2016 to enter into LTTOPs at a price of around $[redacted] [**price***] and otherwise on the terms of the Gorgon Contract would likely not have been 'reasonable and economically rational'.

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[91] Submission to the Synergy Board of Directors, Gas Procurement from Gorgon, 29 August 2011 (Bundle 79.5).
[92] Bundle 79.30.
* The price identified in this paragraph is within the range of prices used by the respondent in building up its submissions and referred to at [142] above.

177 The Board accepts that LTTOP contracts are a key source of gas supply. However, a contract that might be regarded as 'efficient' at one time, would not necessarily be regarded as 'efficient' at another. Therefore, LTTOP contracts should not form the basis of short run marginal cost regardless of other information available on the efficient market price or opportunity cost of gas which is directly relevant to reasonable expectations of short run marginal cost and the input in balancing submissions.

178 Merely labelling LTTOPs as 'efficient' contracts, does not provide a reason for concluding that using the nominal price specified in an LTTOP is a reasonable expectation of the gas price component of the SRMC.[93]

The 'missing money' problem

179 The respondent contended that its approach to the duration of the 'short term' in clause 7A.2.17 should be adopted because the applicant's 'ultra-short run' approach created a 'missing money' problem.

180 The respondent identified the missing money problem as a situation in a controlled market which prevented generators from being able to pay down their fixed costs over time.[94]

181 Professor Knittel contended that it would not be desirable if market design created a situation in which capacity suppliers do not have an opportunity to recover their total fixed and variable costs.[95] He referred to this as a 'missing money' problem.

182 The characteristic of the Balancing Market which the respondent identified as giving rise to a missing money problem was the cap on the price that could be offered in Balancing Submissions.[96] At all material times the cap was $240/MWh. The respondent argued:

> … without the price caps, generators would expect to lose money during low-load, low-price trading intervals but profit during high-load, high-price trading intervals, such that on average, over time, they would expect to recover their (actual) cost of gas. But with the price caps, gas generators' ability to profit during high load, high-price intervals is impaired. Gas generators face all of the downside risk of entering into an efficient TOP contract, but only some of the

[93] The problem may not, of course, arise, if the LTTOP sets price by reference to the market price.
[94] Respondent's closing submissions at [120].
[95] Expert Report of Mr Balchin, Mr Layman and Prof Knittel (Bundle 85) at [18].
[96] Respondent's closing submissions at [134].

> upside benefit. And on average, over time, they would expect not to recover their (actual) cost of gas, and therefore to lose money.[97]

183 The respondent said that this problem was particularly acute with the higher priced gas generators. The respondent did not provide any evidence that the cap on the price would prevent it from charges that would recover those whole of any losses incurred in purchasing gas at the price under the Gorgon Contracts. It is also possible that, over time, or in a gas pricing crisis, the cap might be changed.

184 The theoretical impact of the capped balancing price must be considered in light of the fact that the bid price in balancing submissions is the SRMC of the respondent's most marginal (ie, most costly) generator necessary to produce the required quantity of power. Once the Balancing Price has been determined by AEMO, the Balancing Price applies to electricity produced by all the respondent's generators, including the generators which produce electricity at less than the Balancing Price. These were described as 'infra-marginal' generators. Thus, on [redacted] **[Date during Period 3]** the respondent had placed a bid that involved it supplying 270MW at $42.68 /MWh. This became the Balancing Price for that trading period. The 270MW of electricity supplied involved the supply of quantities of electricity from other generators in the respondent's suite of generators. The prices for those quantities of electricity were $30.91, $31.51, $31.98, $32.51, $39.73 and $40.78.[98] This is an asymmetry which favours electricity producers, including gas producers with LTTOPs. Further, the balancing price was applied to the quantities of electricity produced by the respondent's suite of coal fired generators. Its coal fired generators produce electricity at substantially less cost than the respondent's gas fired generators. On those occasions when the demand for electricity was such that the price cap of $240/MWh was reached, the respondent would be producing between 1,000 and 1,100 MWh of electricity using its cheaper, coal fired generators.

185 It was not demonstrated that $240/MWh was less than the average cost of producing electricity at the volumes associated with that Balancing Price. It was not demonstrated, therefore, that the cap on the Balancing Price prevented the Market Generators paying

[97] Respondent's closing submissions at [135].
[98] Transcript at p353 (cross examination of Prof Knittel.).

down their fixed costs over time. The Board also notes that Market Generators can earn additional revenue through participation in the Reserve Capacity Market.

186 The Board considers that any asymmetry resulting from the cap on the balancing submissions should be given little or no weight in considering whether the nominal price under the Gorgon Contracts should be accepted as a reasonable expectation of the SRMC.

A pricing compact

187 Prof Knittel justified the use of a 'pre-Gorgon Contract' time period to identify the length of the 'short run' by hypothesizing a commitment by a Market Generator to the regulator that the prices under an LTTOP would be used of the duration of the LTTOPs' term. During the opening remarks of his oral evidence, Prof Knittel said:

> So in my opinion, the most efficient definition of the short-run marginal cost is the time period right before signing a long-term firm natural gas contract, in which case the opportunity cost, because it's before they've signed it, the opportunity cost of gas is actually the contracted price.
>
> Now, we – this isn't a free lunch. In defining it this way, any generation company would commit to using that gas contract in all of their bids for the duration of the contract. So they would not enjoy the windfall profits and they would limit the downside risks associated with that and that would again meet the WEM's objectives of trying to minimize long-term costs for consumers.[99]

188 There is no warrant in the Rules for the suggestion that the regulator and a Market Participant could agree on the length of a 'short run' for the purposes of clause 7A.2.17.

189 In any event, no such commitment was given in this case. In fact, the respondent had previously priced based on the opportunity cost of gas consumed, rather than the prices it paid under the gas supply contracts pursuant to which it procured the gas.[100]

Inconsistency with the approach to start-up costs

190 The respondent argued that the applicant's approach to the 'short run' in the context of gas prices was inconsistent with the approach to the 'short run' in the context of start-up costs.

[99] T 265.
[100] Email from respondent to applicant dated 20 July 2012 (Bundle 6).

191 In the context of the gas price, Mr Balchin saw the 'short run' as no longer than the trading period. He may have considered that the short run was the period it might take the respondent to alter its output by a megawatt. However, in the context of startup costs, the applicant did not complain about the respondent's practice of using startup costs which had regard to more than one Trading Interval.

192 The Board does not have difficulty with the slightly different treatments of gas cost and start-up costs. Clause 7A.2.17 refers to a reasonable expectation of the SRMC. In the case of start-up costs, the costs are associated with starting the generator. It is difficult to predict the precise Trading Interval in which the respondent will be required to start any particular generator. In the circumstances, it is reasonable for the applicant to permit the respondent some flexibility in identifying its expectation of the startup cost component of any particular Trading Interval.

Difficulties with market price

193 The respondent also argued that the approach of the applicant was not suitable because of difficulties in ascertaining the 'market price' of gas. The applicant proceeded on the basis that the opportunity cost would ordinarily reflect the market price for the gas.

194 The respondent raised the following difficulties with costing by reference to the 'market price':

(a) the 'spot' market for gas in Western Australia was not one that was suitable for identifying the price at which a generator might buy gas. It contended, in effect, that gas traded in the spot market was not a substitutable product for gas purchased by generators using LTTOPs. In particular, the respondent required large quantities of uninterruptible supplies. The quantities traded in the 'spot' market were not sufficient to meet the respondent's needs and were interruptible;

(b) the involvement of gas generators, including the respondent, on the spot market would have the effect of distorting spot prices, considering the limited volumes traded on spot market in Western Australia and

(c) it is not practical to determine the 'market price' of gas by reference to other contracts. Supply contracts in Western Australia are confidential. Spot prices in Western Australia are for interruptible supply.

195 These matters do not provide any sufficient reason to reject the applicant's approach.

196 First, the opportunity cost is not concerned with whether a Market Generator can purchase enough gas to meet daily requirements. The relevant opportunity cost relates to what a Market Generator could do with gas if it did not burn the gas to make electricity. In this context, the generator is notionally a seller of gas, not a buyer. The respondent does not have to *procure* the firm supplies of large quantities of gas. It has already bought them under the Gorgon Contracts. It is not clear that the interruptible nature of a sale and purchase on the spot market would preclude the respondent selling gas on the spot market.

197 Second, it may be accepted that attempts by a generator to sell large quantities of gas might have the effect of distorting the market. It is not clear, however, that there is any requirement for the opportunity cost to be determined having regard to a sale of the entire amount of the take or pay obligation of a generator. The opportunity cost might be determined by reference to the quantity of gas required the subject of the balancing submission. Alternatively, it might be reasonable to extrapolate quantities commonly sold on the market to the quantity relevant to production of electricity by Market Generators.

198 Third, clause 7A.2.17 refers to bids above the generator's 'reasonable expectation' of the SRMC. There may well be difficulties in identifying the 'market price' for gas, given the limited information about the market in Western Australia. In arriving at a 'reasonable estimate' a generator would no doubt make reasonable efforts to obtain information about the price and the circumstances of comparable sales.

199 Fourth, the difficulties which the respondent identified in forming an opinion as to market price do not appear to be insurmountable in practice. This is shown by the following:

(a) The Gorgon Contracts contemplated that there would be a price reset in [redacted] to [redacted] [**confidential contract term**].[101] While the process and criteria to be applied under the Gorgon Contracts are specifically defined in those Contracts,[102] the notion of a market price is not alien to purchasers and vendors of gas. Gas price arbitrations are common;

(b) the respondent used the opportunity cost based on market price to calculate its gas fuel cost during the period from around July 2012 to 13 July 2016. In an email from Verve Energy to the applicant on 20 July 2012,[103] the respondent said:

> As previously noted, Verve Energy is entitled to set its gas price between the contract gas price and a reasonable expectation of the gas spot price (market price). The gas commodity cost includes the concept of "opportunity cost". This is consistent with the Economic Regulation Authority's SRMC Discussion Papers (both the 2008 Discussion paper and the 2009 Simplified Paper). From the 2008 Discussion Paper "the past purchase price or past contract price of fuel does not represent a short run economic cost. Rather, the current price that can be obtained by on selling a quantity of fuel represents what is given up by using it to produce electricity. It follows that if the fuel cannot be immediately on-sold then the opportunity cost of that fuel for a firm in a competitive market may be zero unless there exists a real prospect to either: (a) sell the fuel at some point in the future; or (b) use the fuel in the future production of electricity at higher than current market values. In either case, the current spot price, or alternatively the current market price for fuel contracts, still provides the best basis for the opportunity cost of fuel because the current price reflects the rational expectations (based on the latest information available to the market) of all future prices for the resource"

The respondent continued this approach until 13 July 2016.

(c) The 'opportunity cost' approach to short run marginal cost adopted up to 13 July 2016 reflected economic advice which the respondent obtained from Frontier Economics about the calculation of its gas and coal price inputs into SRMC calculations.[104] That advice proceeded on the basis that the opportunity cost was the appropriate benchmark for the costs of gas under a LTTOP. The explanations by Frontier Economics were complicated because the respondent had entered into

[101] Submission to Board of Directors, 29 August 2011 (Bundle 79.5).
[102] Annexure CC3 to the witness statement of Carole Clare, clause 14.6.
[103] Bundle 6.
[104] Frontier Economics, SRMC estimates for Synergy's gas and coal position' (Bundle, 23.9) at [1.2].

gas storage arrangements. Frontier Economics did not suggest that the complications were insurmountable.

(d) Ms Clare gave evidence of transactions involving the sale and purchase of gas (and the transportation and storge of gas). These transactions would have required the respondent to form and act on an opinion of the market price of gas.

200 Fifth, the respondent justified its approach, in part, by reference to 'economic efficiency'. Although there may be practical difficulties in ascertaining the 'market price' of gas from time to time, in economic theory, the 'market' is the font of economic efficiency. An approach which contemplates determination of the costing by reference to the market price of gas is consistent with the objective of promoting the 'economically efficient' production and supply of electricity. Indeed, to adopt a price that was clearly above the market price could only be contemplated by a market participant that had no concern for avoiding losses. It is apparent that, in 2011, the respondent formed an opinion as to the future market price and acted upon it in entering the Gorgon Contracts. As indicated above, it appeared in April 2017 that the respondent's views about the future market price were incorrect. It is important to the efficient functioning of markets that participants bear the financial consequences of their decisions, including adverse economic consequences. Adopting an interpretation of the 'short run' which facilitates the respondent incorporating gas costs based on the opportunity cost when the opportunity cost was high and allowing it to cost on the basis of the contract price when the opportunity cost was lower does not reflect or encourage an efficient market or the objectives of the Rules.

Clause 7A.2.17

201 The fundamental difficulty with the respondent's position is that it is not consistent with clause 7A.2.17.

202 Clause 7A.2.17 refers to offer prices 'for any Trading Interval'. The prohibition in clause 7A.2.17 is in respect of the short run marginal cost of 'generating the relevant electricity'. The 'relevant electricity' is the electricity to be generated in the Trading Interval to which the price relates. This leads to the inference that, in clause 7A.2.17, the expression 'short run' refers to the relevant Trading Interval.

203 This interpretation has the advantage, compared to the interpretation proposed by the respondent, that the length of the run is the same for all market participants and for all means of producing electricity. Prof Knittel's approach suggests that the 'run' would have different chronological durations for Market Participants because not all Market Generators would enter into LTTOPs of the same duration. Furthermore, Prof Knittel's approach suggests that the length of the 'short run' for quantities of electricity produced using only its coal fired generators and would be different from the 'short run' for quantities of electricity where the marginal generator was a gas fired generator. This discrepancy would exist within each balancing curve.

204 More generally, the Balancing market is a mechanism by which the Market Position of the Market Participants can be adjusted during a day. Balancing Submissions need to be submitted daily. As Professor Knittel acknowledged, 'wholesale electricity markets are designed to set market clearing prices over timeframes that are less than one hour'. A 'short run' which stretches for years does not reflect this aspect of the design of the market and is not appropriate. It does not reflect the time scale in which generators are selected for dispatch or the Balancing Price is set. It is not a 'short' run.

205 The marginal cost is to be determined by reference to the additional cost of producing gas during the relevant Trading Period. The amount the respondent paid for gas under the Gorgon Contracts did not vary depending on the level of production during a day in 2016. The amount paid by the respondent for gas did not increase if the production increased or decreased by a megawatt hour, either during a Trading Period or over the course of day. The nominal price of gas under the Gorgon Contracts is not, therefore, relevant to estimating the SRMC. It is not a 'marginal cost'.

206 This does not mean, of course, there was no gas 'cost' to the respondent which should be taken into account in its buildup of the SRMC. The marginal cost was the opportunity cost, as both the applicant and Frontier Economics, contended. The opportunity cost is the value to the best alternative to burning it to produce electricity, which is to sell it at the market price.

Was the gas cost used by the respondent excessive?

207 It is necessary to consider whether the gas prices used during Periods 2 and 3 were excessive.

208 The issue is straightforward during period 2. Ms Clare's evidence was that the weighted average price of gas it purchased under the NWS Contract during the period 1 January 2016 to 29 November 2016, which included Period 2, was approximately $[redacted] **[price]**/GJ.[105] During this period, gas was costed at $[redacted] **[price being an amount substantially above the NWS Contract price]**/GJ. The respondent offered no justification for this discrepancy. The gas cost applied by the respondent during Period 2 was excessive. It bore no relationship to the cost to the respondent of gas, whether that cost be described as 'real', 'market' or 'opportunity'.

209 During Period 3, the respondent used a gas cost which ranged between $[redacted] **[price*]** and $[redacted] **[price]**/GJ. The following evidence is relevant to the market price for gas during Period 3:

(a) the respondent's own industrial sales of gas. the respondent entered into 11 contracts for the sale of gas during the Investigation Period, with prices generally ranging between $[redacted] **[price substantially below the 'Gorgon price']**/GJ to $[redacted] **[a price – substantially below the Gorgon price]**/GJ.[106] The evidence of Ms Clare [107] in these proceedings was that the industrial sales of gas were based on the prevailing price, in the sense that if the respondent did not price at those levels supply would have been lost to competitors. It is reasonable, therefore, to conclude that these were the best prices the respondent could get for its gas;

(b) the spot price of gas reported from the Gas Trading Australia service averaged $4.29 per GJ over the Investigation Period, with a peak of $4.93/GJ;[108]

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[105] Clare (Bundle 76A) at [30].

[*] The reference to the 'Gorgon price' in connection with the redacted prices refers to the gas price submitted by the respondent in the period 1 January 2016 to 29 November 2016. This is referred to as the 'Gorgon price' in the notes to the redactions.

[106] Balchin (Bundle 80) at [125].

[107] At [51] to [52] of her statement.

[108] Balchin, December 2020 (Bundle 80) at [122]. The price reported by Gas Trading Australia was said by the operators of that platform to be used to determine the price of other, 'off platform', transactions (see Balchin at [122].

(c) a swap arrangement with [redacted] lasting from November 2016 to 2020, which assumed a gas price for GST purposes of $[redacted] **[a price – substantially below the Gorgon price]**/GJ, with a fee of $[redacted] **[price]**/GJ for delivery and $[redacted] **[price]**/GJ for receipt, which means a net delivery price of $[redacted] **[a price – substantially below the Gorgon price]**/GJ and a receipt price of $[redacted] **[a price – substantially below the Gorgon price]**/GJ.73;[109] and

(d) the price of the NWS Contract was reviewed in 2015. The outcome of this review was that the volume weighted average price under the NWS Contract was $[redacted] /GJ between 1 April 2015 and 31 December 2015[110] and $[redacted] **]**/GJ **[a price range substantially below the Gorgon price]** between 1 January 2016 and 29 November 2016.[111]

210 The report to the Board by the CEO of the respondent in April 2017 set out above, also supports a market price that was substantially lower than the costs applied by the respondent.

211 These materials suggests that, during Period 3, the market price of gas was closer to $4/GJ than to $5/GJ.

212 This price was justified based on the basis of an opportunity cost and, indeed, the respondent received advice from Frontier Economics in relation to the opportunity costs of the gas. The respondent largely abandoned this approach. It sought to justify the cost which it used in its balancing submission on a basis which was inconsistent with its prior practice and advice. The approach adopted to calculate the short run marginal cost of gas was inconsistent with clause 7A.2.17 and provided no reasonable justification for the costs which the respondent used during Period 3.

213 For the reasons given above, the Board considers that costing the gas fuel component on the basis of the contract price per GJ of gas payable under the Gorgon Contracts during Periods 2 and 3 did not reflect a reasonable expectation of short run marginal cost regardless of the run or interpretation of opportunity cost given the market information

[109] Balchin, Bundle 80, at [127].
[110] Clare (Bundle 76) at [29].
[111] Clare (Bundle 76) at [30].

available and that it resulted in a balancing submission that included a gas cost which was above the respondent's reasonable expectation of the short run marginal gas cost.

G. PRICE EFFECT

214 The next issue which arises is whether the overstated start-up and gas price components lead to offer prices in the respondent's balancing submissions that were in excess of its reasonable expectation of the SRMC.

215 The applicant contended that at least one of the balancing pairs in each of the submissions the subject of these proceedings was in excess of the respondent's reasonable expectation of the SRMC of producing the relevant gas.[112]

216 The applicant relied on evidence of Mr Bruce Layman, who was at the time he gave evidence, the Chief Economist of the applicant. The respondent relied on the evidence of Prof Knittel on this issue as well.

217 The respondent contended that the applicant had not established this component of the contravention of the clause 7A.2.17. It contended that defects in and limitations of a pricing model which Mr Layman prepared of the effect of increased costs were such that applicant had not established its case on this point.

218 The respondent contended that there were the following defects and limitations and defects which the respondent identified in the applicant' case:

(1) Mr Layman's modeling did not replicate results obtained from the software which the respondent used in preparing its Balancing Submissions, known as 'PowrSym';[113]

(2) Mr Layman's modelling did not say anything about the respondent's Balancing Submissions;[114]

[112] The respondent contended that the applicant's primary case was that the whole of the balancing curve was above the SRMC. The applicant disputed that this was its primary case. The applicant did not pursue the contention that each of the price quantity pairs was above the respondent's reasonable expectation of the SRMC. The Board accepts that it was not necessary for the applicant to establish that all prices were excessive in that sense. The Board accepts that a contravention occurs if a single price in a balancing submission is above the reasonable estimate of the SRMC by virtue of Rule 1.4.1(d).
[113] Respondent's closing submissions at [85] to [94].
[114] Respondent's closing submissions at [95] to [98].

(3) even if Mr Layman's model established that at least one offer that was increased because of the respondent's excessive cost inputs, it did not establish that the increased offer was in a portion of the balancing curve that was above the respondent's reasonable expectation of the SRMC; [115]

(4) Mr Layman used assumptions about the gas and start-up costs in his modelling of the comparator prices which might not have been used by the respondent;[116]

(5) in preparing his model, Mr Layman assumed that 'everything else' would remain the same, which was unrealistic.[117]

219 In addition, the respondent argued that:

(a) increases in the costs of components of gas generation might result in some bids that were lower than would otherwise have been the case; and

(b) limited increases in small portions of balancing curve would not have affected the balancing price, so that there would be no link to market power.[118]

The respondent's bid formulation process

220 It is first necessary to outline the respondent's bid formulation process.

221 Mr Layman described this process in his report of 14 December 2020.[119] His description was based on information provided by the respondent.[120] The respondent led no evidence of its own on this point. The respondent did not cross examine Mr Layman on this aspect of this evidence. The following is a summary of Mr Layman's evidence about the bid formulation process.

First stage

222 The respondent prepared a base forecast of demand for a period of 168 Trading Intervals (or 3½ days). The respondent usually prepared one or two such demand forecasts per

[115] Respondent's closing submissions at [99] to [104]
[116] Respondent's closing submissions at [105] to 109]
[117] Respondent's closing submissions at [110] and [111].
[118] Respondent's written closing submissions at [112] to [115].
[119] Bundle 81.
[120] Layman (Bundle 81), [16].

day. The forecasts were overwritten as time went by. Only parts of the base demand forecast were used for particular balancing submissions.

Second stage

223 The respondent created a range of deviations in demand above and below its base demand forecast. The alternative demand scenarios were created by changing the load as a fixed MWh step up or down from the expected demand scenarios for each half hour trading period.[121] Some of the deviations were 10 MWh different from the base forecast, some were up to 1,580 MW above or below the base forecast.[122] Demand forecasts are bounded by maximum capacity, the 'must run' capacity and the load following service capacity. The deviations were concentrated near the forecast demand. This process resulted in 41 separate demand scenarios for each of the 168 Trading Intervals the subject of the 168 Trading Interval forecast.

Third stage

224 The respondent then used software, known as 'PowrSym' to ascertain a generator dispatch combination. The respondent described PowrSym as an 'energy market model that provides the least cost dispatch given its assumptions'.[123] Costs are minimized over the 168-Trading Interval period (rather than by reference to discrete Trading Intervals). PowrSym identifies a series of power dispatch combinations to meet the identified demand for each of the Trading Intervals for each of the scenarios. PowrSym is no longer used by the respondent.

225 Mr Layman indicated that minimizing costs for an electricity generation portfolio is complicated process and subject to several constraints. The respondent indicated in materials provided to Mr Layman that cost minimization is subject to:

(a) its load/bilateral trading position;

(b) generator availability;

[121] PowerPoint presentation by the respondent titled 'Portfolio pricing in the WEM – Wholesale Business Unit (provided to the applicant at a meeting on 1 February 2017 at 2.00 pm) (Bundle 051), p5.
[122] Layman (Bundle 81) at [32].
[123] PowerPoint presentation by the respondent titled 'Portfolio pricing in the WEM – Wholesale Business Unit (provided to the applicant at a meeting on 1 February 2017 at 2.00 pm) (Bundle 051), p4.

(c) fuel availability and prices;

(d) generating operating costs (including starts);

(e) the operating characteristics of the particular generators; and

(f) its ancillary service commitments.

226 Cost minimization was also complicated by the following:

(a) the respondent had several generators, and, generally, more generation capacity than demand;

(b) thermal generators, including gas fired generators, have minimum levels of generation, below which they cannot be operated stably;

(c) thermal generators incur material costs to start from idle. These are the 'start-up costs'. The impact of the start-up costs depends on how long the generator runs, (assuming that the start-up costs are averaged over the trading periods for which the generator is running continuously);

(d) generators have maximum rates at which the level of generation can change (ramp rates). It may not, therefore, be possible to alter the rate of production quickly enough to minimize costs in each particular level; and

(e) thermal generators are typically more efficient as the level of production increases. In the jargon, the average heat rate required to produce one MWh of electricity declines as generators increase production.

227 In addition, there is a cost associated with having generators available, even if they are not dispatching electricity at the time.[124]

228 Mr Layman indicated that the respondent had stated that its marginal costs for a particular Trading Interval is the Average Operating Cost of the marginal generator (AOCMG) for each Trading Interval during that demand scenario.

229 Mr Layman set out a formula by which the AOC may be calculated.[125] It is:

[124] Layman (Bundle 81) at [37].
[125] Layman (Bundle 81) at [44].

$AOC_{g,I} = [FC_{g,i} + VOM_{g,i} + AFC_{g,i} + SUC_g/TotalTradingIntervalsRun]/MWh_{g,i}$

where: $AOC_{g,i}$ is the expected AOC of any generator g in trading interval i

$FC_{g,i}$ are the expected fuel cost incurred by generator g in trading interval i. It is equal to fuel cost per MWh multiplied by the MWh produced by generator g in that trading interval ($MWh_{g,i}$)

$VOM_{g,i}$ are expected load dependant variable operating and maintenance costs incurred by the generator in producing electricity.

AFC_g are expected avoidable fixed costs, which are incurred when a generator is operating, but do not vary with production.

SUC_g is the generator's expected start-up costs, or the cost to move the generator from idle to minimum generation

$MWh_{g,i}$ is electricity expected to be generated by generator g in MWh during trading interval i. It is the MW that the generator is expected to operator for divided by two[126]

230 Mr Layman commented that, in this formula:[127]

> Fuel costs and variable operating and maintenance costs are allocated on a per MWh basis as incurred;
>
> …
>
> Per unit time (e.g. $/hour) avoidable costs are allocated on a per trading interval basis. So that, it a generator incurs $20/hour in AFCs, … its AFCs per trading interval will be $10/trading interval.
>
> …
>
> Start up and shut down costs are allocated equally across the trading intervals for which a generator runs. For example, a generator that incurs a $3,000 per start-up cost and runs for 10 trading intervals, $300 is allocated to each trading interval.

231 At paragraph 48 of his report of 14 December 2020,[128] Mr Layman said that he would refer to the Average Operating Cost of the Marginal Generator as the SRMC in the rest of that document. The document provided to Mr Layman by the respondent about its bid

[126] There are two trading intervals in every hour.
[127] Layman (Bundle 81) at [45].
[128] Bundle 81.

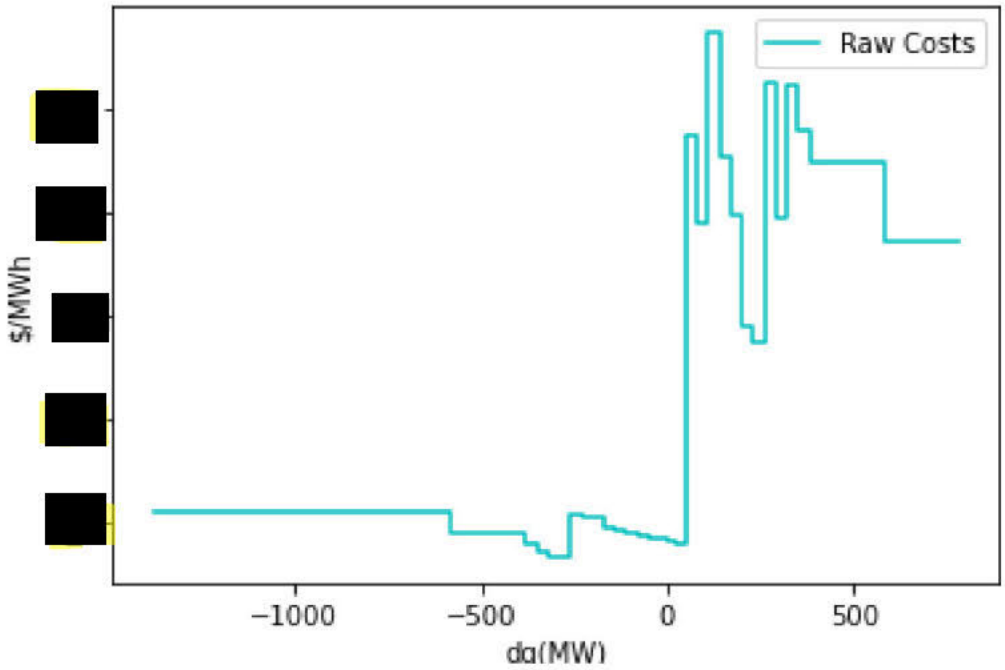
formulation process does not separately identify the stage at which the SRMC is produced. [129]

232 The average operating cost of the generator identified by PowrSym as the marginal generator for each of the half our trading periods making up the 168-hour demand forecast for the 41 PowrSym runs is then extracted. The respondent does this using a further program written in 'VBA/Excel'.[130]

233 Mr Layman produced a number of graphs showing parts of the process.

234 The first, chart 7, shows the 'raw costs', that is to say the result of the process up to the end of Stage 3.

Chart 7: Stylised Synergy Raw Costs for 15 January 2017 ($/MWh), Synergy Input Cost Assumptions, 17:00 Trading Interval,15 January 2017 ($/MWh)[51]



Fourth Stage

235 The extracted AOCs are then arranged in a matrix and the respondent's final manipulation of the data commences. The first stage is to apply a 'moving 3-point

[129] PowerPoint presentation by the respondent titled 'Portfolio pricing in the WEM – Wholesale Business Unit (provided to the applicant at a meeting on 1 February 2017 at 2.00 pm) (Bundle 051), p6.
[130] Bundle 051, p6.

average across' three consecutive half hourly Trading Intervals.[131] A second stage is to apply a 'smoothing' within different load steps for a single Trading Interval. This is done for 4 'load steps'[132].

236 It appears that the load steps start at the base forecast and move up three deviations. An extract from figures in a PowerPoint presentation given by the respondent about its pricing[133] is:

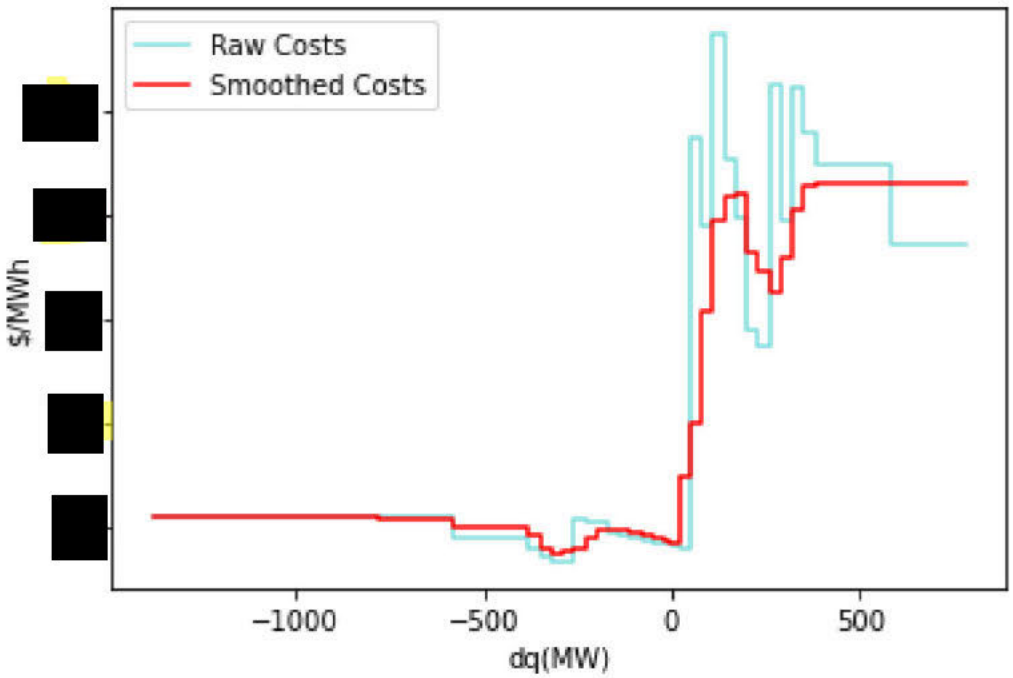
Half hour	Marg Cost -55		Marg Cost 0	Marg Cost 5	Marg Cost 10	Marg Cost 25
16.00	87.07					
16.30	94.13		88.53	91.65	91.08	94.89
17.00	74.38					

The 3 figures in the 'Marg Cost -55' column (in green) were averaged in the first stage. This averaging occurs across trading periods. The figures in the 16.30 row for the figures Marg Cost 0, 5, 10 and 25 (in blue) were also averaged. It is understood that the 'Marg Cost 0' is the 'base case' demand scenario and that the figures -55, 5, 10 and 25 reflect deviations in demand (in MWh) from the base case scenario.[134]

[131] PowerPoint presentation by the respondent titled 'Portfolio pricing in the WEM – Wholesale Business Unit (provided to the applicant at a meeting on 1 February 2017 at 2.00 pm) (Bundle 051), p7.
[132] Ie the alternative scenarios where demand is increased or decreased above the anticipated demand scenario. Layman (Bundle 81) at [61a].
[133] PowerPoint presentation by the respondent titled 'Portfolio pricing in the WEM – Wholesale Business Unit (provided to the applicant at a meeting on 1 February 2017 at 2.00 pm) (Bundle 051), p7.
[134] It is noted that the output in the Presentation is defined by reference to the deviation from the bilateral position, rather than by reference to the output in absolute terms. Thus, at p7 of the Presentation, it is not clear from the array of whether demand above the bilateral position has risen or not. To illustrate, the 'raw operating cost' in the 'Marg Cost 0' column is $[redacted] [**cost**] for the 8am trading interval and $[redacted] [**cost**] in 8.30 trading period. The change in cost may have been because demand decreased in the second period. Mr Layman gives similar figures in Table 4 of his report, but they are by reference to the demand in MW.

237 Chart 8 shows both the 'Raw Costs' and the 'smoothed costs', that is the numbers after the fifth stage.

Chart 8: Stylised Synergy Smoothed Costs ($/MWh), Synergy Input Cost Assumptions, 17:00 Trading Interval,15 January 2017 ($/MWh)[52]



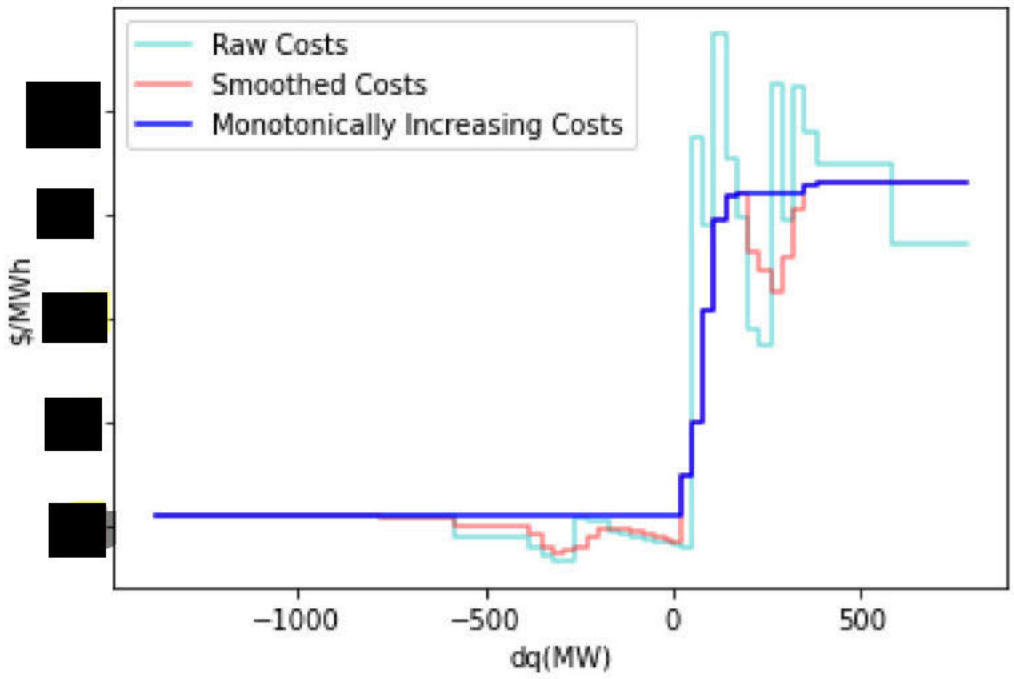
Fifth stage

238 The final step is to ensure that the prices in the Price-quantity pairs are monotonically rising ie that bids which involve higher quantities are more expensive than bids which involve lower quantities of gas. Mr Layman described this as being carried out by 'replacing any cost lower than the previous cost with previous cost.'[135]

239 The third chart below incorporates the effect of the sixth stage, that is making the 'offers' monotonically rising. This is Chart 9 in Mr Layman's report.

[135] Layman (Bundle 81) at [64].

Chart 9: Stylised Synergy Monotonically Increasing Offer Curve[54] for ($/MWh), Synergy Input Cost Assumptions, 17:00 Trading Interval,15 January 2017 ($/MWh)[55]



240 The range of Price-quantity pairs is then submitted for that Trading Period. The set of ranked Price-quantity pairs makes up the Balancing Portfolio Supply Curve.

241 The applicant does not have any particular problems with the respondent's bid formulation method and the models used to ensure compliance with the requirements, for example, to ensure the bid prices are monotonically increasing as such. Its complaint is as to the inputs used in the formula outlined in paragraph [229].

Mr Layman's evidence

242 Mr Layman investigated the impact which changes in the cost inputs had on the respondent's SRMC and offers.

243 Mr Layman carried out this investigation in part by constructing a computer model which compared the offer prices calculated using the applicant's figures for start-up costs and gas prices with offer prices calculated using the figures for start-up costs and gas prices used by the respondent in calculating its bids. While these key parameters were different, there was a deal of data (eg minimum levels of generator operation) that was common to

both models. The logical structure of the exercise is shown at Attachment 3 of the 14 December 2020 report.[136]

244 Offer prices were not calculated in respect of all the deviations from demand used by the respondent in calculating its Price-quantity pairs within any particular balancing curve. Demand deviations were limited to 780 MW above the forecast base demand, demand was capped at 400MW below (with the last 400 MW priced at the Alternative Maximum Stem Price).[137]

245 The simulated offers were divided up into 10MW bands to carry out the comparison because the sizes of the tranches the subject of the respondent's offers varied from one offer to another.[138]

246 At [88b] of his 14 December 2020 Report,[139] Mr Layman said:

> If one tranche was offered with a higher SRMC under Synergy's start-up cost assumptions in a balancing submission, I consider this to be Synergy offering electricity in that trading interval at a higher SRMC, than would be the case under the ERA's start-up cost assumptions.

247 Mr Layman's report of 14 December 2020 gave the following results:[140]

Table 9: Trading Intervals under investigation and count of trading intervals where Synergy offered prices above its SRMC, 16 April 2016 until the end of Investigation Period

	Number of Trading Intervals Under Investigation	Synergy modelled offer above ERA estimate of reasonable expectation of SRMC
Period_1	2,542	2,473
Period_2	3,140	3,140
Period_3	5,330	5,325
Total	11,012	10,938

[136] Bundle 81.
[137] Layman (Bundle 81) at [113].
[138] Bundle 81, at [88a].
[139] Bundle 81.
[140] Bundle 81, at [111].

248 Some further work was carried out, with additional information obtained from the respondent The results of Mr Layman's modelling is set out at paragraph [24] of 'Bruce Layman Response to Dr Knittel's Report':[141]

Table 1: Trading Intervals under investigation and count of Trading Intervals where Synergy offered prices above its SRMC, 16 April 2016 until the end of the Investigation Period

	Number of Trading Intervals Under Investigation	Synergy Modelled offer above ERA estimate of Synergy's Reasonable Expectation of SRMC -My Report	Synergy Modelled offer above ERA estimate of Synergy's Reasonable Expectation of SRMC - Updated
Period_1	2,542	2,473	2,473
Period_2	3,140	3,140	3,140
Period_3	5,330	5,325	5,326
Total	11,012	10,938	10,939

249 It will be observed that not all 'Trading Intervals Under Investigation' have a 'Synergy Modelled offer above the ERA Estimate of Synergy's Reasonable Expectation of SRMC'. In total there is a shortfall of 73 Trading Intervals. In his response to Dr Knittel's Report, Mr Layman stated that he considered this shortfall to be the result of 'decisions made to save model runtime, rather than an indication that the respondent's offer formulation method might result in lower prices being offered in some Trading Intervals.'[142] The respondent did not challenge Mr Layman's conclusion on the basis of this discrepancy. The Board accepts that it does not invalidate his conclusions.

250 Mr Layman dealt with the impact of start-up costs and the impact of fuel prices separately. At [72] of his report of 14 December 2020[143] he said:

> It is my opinion that the application of Synergy's revised start-up costs raised Synergy's SRMC expectation and its Balancing Market offers for most trading intervals under investigation, as defined by at least some energy offered for prices calculated with Synergy's start-up cost assumptions being higher than the equivalent energy priced under the ERA's start-up cost assumptions.

At [95] of that report, he said:

[141] The updated results in the right-hand column differ slightly from the results adjacent column and were updated because of missing data in the output csv file (see Layman (Bundle 86) at [24].
[142] Layman, Bundle 86, at [18]. See also Bundle [81] at [91], [114] and [116].
[143] Bundle 81.

In my opinion the application of Synergy's revised gas input price from 8:00 AM 14 July 2016 raised Synergy's SRMC and its balancing market offers during the investigation period relative to if it had used the ERA's gas input price assumptions.

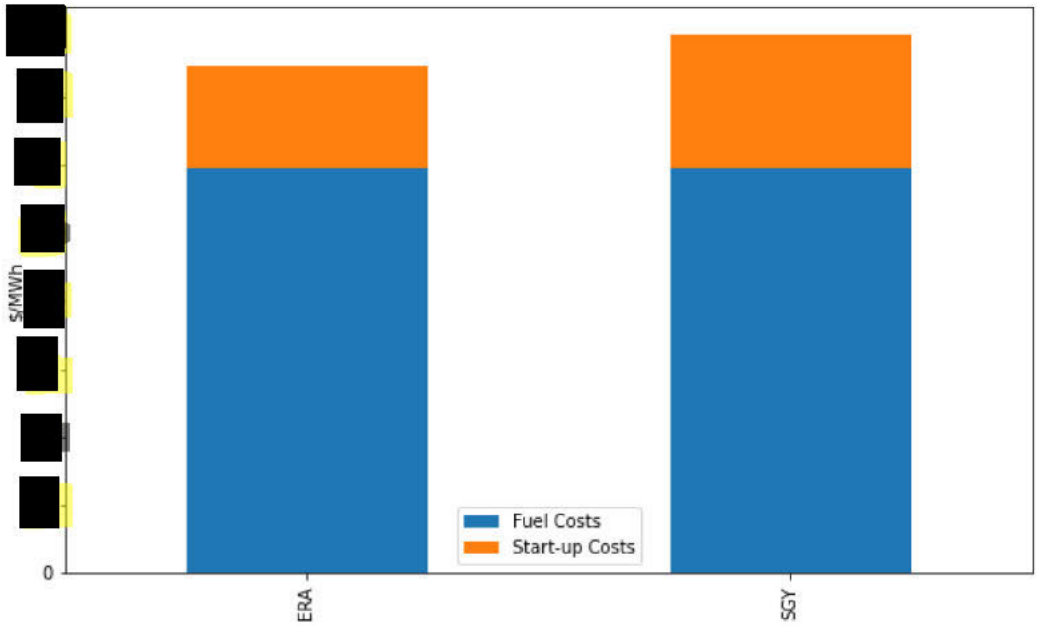
251 Mr Layman's conclusion was also expressed at [115] to [117] of his response to Prof Knittel:

> 115 Therefore, based on my examination of the operating costs of the individual generators in Synergy's portfolio, I conclude that higher generator costs in Synergy's portfolio arising from Synergy's gas input price relative to the ERA's gas input price assumptions will, all other things being equal, increase Synergy's estimate of its SRMC of generating the relevant electricity.
>
> 116 I also conclude based on modelling replicating Synergy's offer formation method that Synergy's gas input price relative to the ERA's gas input price assumptions will, all other things being equal, increase Synergy's estimate of tis SRMC of generative the relevant electricity.
>
> 117 Therefore, in my opinion Synergy's use of its revised gas input price from 8.00 AM on 14 July 2016 to 10 July 2017 raised Synergy's estimate of its SRMC and its balancing market offers during the investigation period relative to if it had used the ERA's gas input price assumptions.[144]

252 Mr Layman's conclusion about the effect of increasing input costs was also supported by other aspects of his report. Mr Layman carried out a comparison of the effect of the increased start-up costs on costs of generating electricity. The outcome was shown graphically below:

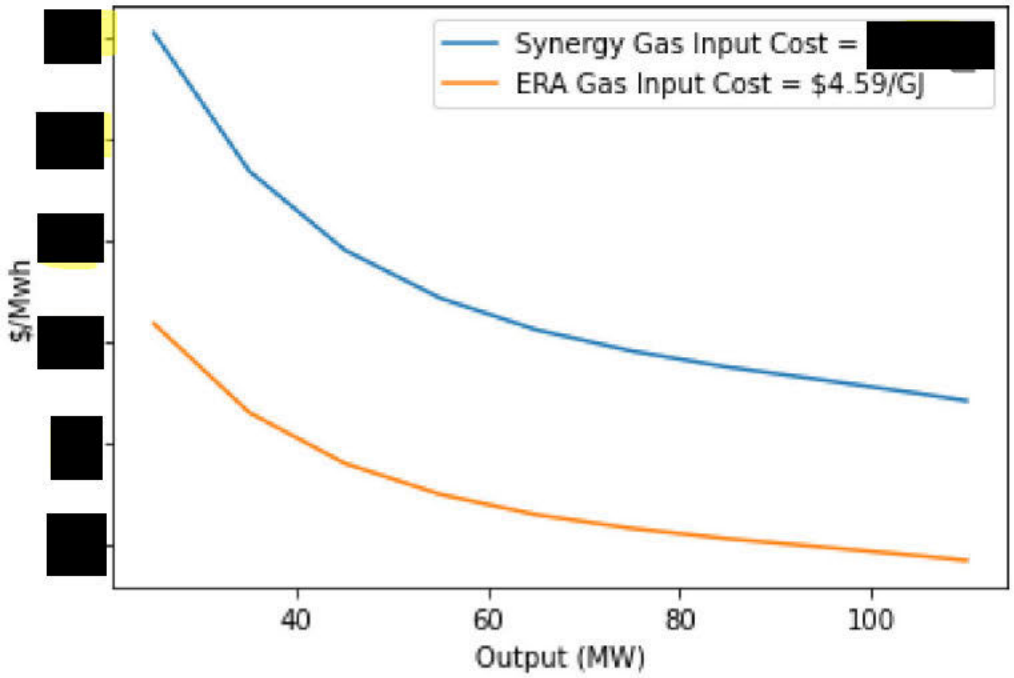
[144] Bundle 86.

Chart 11: Impact of Synergy's Increase in PINJAR_GT9's Start-up Cost ($/MWh, 95 MW dispatch, run for 8 trading intervals)



253 A similar exercise was carried out in relation to the impact of increased fuel costs. That was charted below. The impact on cost of an increase in cost is stark.

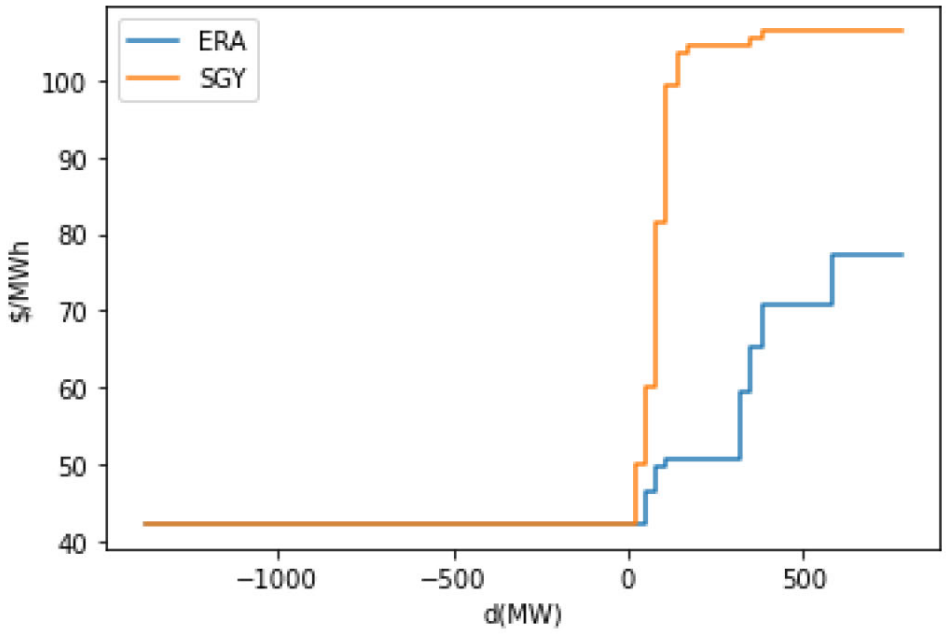
Chart 13: PINJAR_GT9 AOC for fuel[68] Synergy gas input price versus the ERA's gas input price assumptions



254 This graph relates to only one of the respondent's generators, Pinjar GT9, but Mr Layman considered that the results could be extended to the respondent's other generators.

255 Mr Layman also provided a graph showing a comparison of a balancing curve for a particular trading period using the respondent's costs assumptions and the applicant's.

Chart 10: Modelled Synergy Monotonically Increasing Offer Curve, ERA vs Synergy Input Cost Assumptions, 5:00 PM, 15 January 2017 ($/MWh)[56]



256 In the above chart, the ERA balancing curve is much lower that the curve produced using the respondent's costs figures. The intervals between price jumps is also different from the intervals in the ERA balancing curve.

257 While it may be accepted that the process of optimizing electricity production is a complicated one, the proposition advanced by the applicant might also be described as obvious. An increase in the costs used to calculate the SRMC would lead to an increase in the SRMC. When the input cost increase is unreasonable, it would not be reasonable to expect the calculated SRMC to be a reasonable expectation of the SRMC. This intuition is confirmed by a consideration of the formula for the AOC set out above:

$AOC_{g,I} = [FC_{g,i} + VOM_{g,i} + AFC_{g,i} + SUC_g/TotalTradingIntervalsRun]/MWh_{g,i}$

If F (fuel costs) and SUC (start-up costs) are increased, then AOC of each generator will increase as well. It will be recalled that the third stage of the respondent's bid

formulation process is for the respondent to select the marginal generator by reference to the AOC of generators in the respondent's suite of generators. Increasing the fuel cost and the start-up costs increases the AOC across the board, albeit that the increases may be greater in some areas than others. The selection of the marginal generator will be from a pool of generators whose AOC has been increased by the increased costs.

The respondent's objections

258 The Board turns now to the contentions raised by the respondent.

Contention 1

259 The respondent contended that the results of the model were unreliable because the prices produced by the model using the Synergy estimates (ie the figures for start-up costs and gas costs used by the respondent) did not match the prices produced by 'PowrSym'.

260 Mr Layman discussed the decision to not use or require the respondent to use PowrSym to examine the effect of the changed cost assumptions on the balancing prices. It appears that the respondent had stopped using PowrSym at the time.[145] It also appear that using PowrSym would have involved a considerable resource cost to the respondent.[146] The Board considers that the decision to develop a model rather than use PowrSym was reasonable.

Contention 2

261 The respondent contended that the information produced by Mr Layman using the model 'says nothing' about the respondent's balancing submissions.

262 It may be accepted that Mr Layman's model does not replicate the prices produced by PowrSym. There was a wide discrepancy between prices produced by PowerSym and the Mr Layman's model.[147] This is perhaps an inevitable consequence of not using PowrSym. The Board understands that PowrSym is proprietary software, so elements of the program may not have been available to Mr Layman.

[145] Layman (Bundle 81) at [17a].
[146] Layman (Bundle 81) at [17a].
[147] See Figure 23 in Prof Knittel's Report (Bundle 83) at p142.

263 It does not, however, follow that Mr Layman's model 'says nothing' about the balancing prices produced using PowrSym. Mr Layman's contention was that the model showed the balancing prices produced by PowrSym using the respondent's start-up costs and gas prices would be higher than the balancing prices produced by PowrSym using the lower start-up and gas price costs identified by the applicant. The object of Mr Layman's use of his model was to provide comparative information, rather than to replicate, in absolute terms, the PowrSym prices for either the respondent's cost parameters or the applicant's. Mr Layman's model does not need to replicate the PowrSym prices, to show that increasing costs would increase prices.

264 The link between costs and prices follows, to some extent, from the nature of the software product. PowrSym is software intended to produce the least cost choice of generators for producing the electricity required. The respondent used it in a context where balancing prices were intended to recover the marginal cost of producing the relevant electricity. In this context, it must be expected that increasing the costs inputs associated with gas powered electricity generation would result in increases in modelled Balancing Prices. If increasing costs resulted in the same or lower prices, it may be assumed that the respondent would not be recovering even its marginal costs on those bids and the software could be described as defective.

Contention 3

265 The respondent also noted there were points on the balancing curve where the balancing prices offered by the respondent fell below the 'raw costs'. It will be recalled that the 'raw costs' were identified by the blue line on Chart 9 at paragraph [239] above, and as the 'SRMC' by Mr Layman at paragraph 48 of his report of 14 December 2020.

266 The respondent argued that, if Mr Layman's model established merely that there was only one 10MW band in the balancing curve at which the balancing price was inflated, that area of inflation might be at a point on the balancing curve where the balancing price offered (ie the dark blue curve on chart 9) was below the 'Raw Cost'. Although the respondent submitted that the Raw Costs were its reasonable expectation of its SRMC, it lead no evidence to that effect. In such circumstance, the inflation of costs might not

result in the submission of a balancing price that was above the Raw Cost. This would not be a balancing submission which contravened cl 7A.2.17.

267 The applicant dealt with this argument in two ways.[148]

268 First, it contended that 'raw costs' (produced after stage 3) should not be regarded as a calculation of the SRMC. Both stage 3 and the stage 4 of the bid formulation process involved an element of 'averaging' or 'smoothing'. The formula for the AOC given at paragraph [229] above averages the start-up costs over the anticipated run of the generator. After the raw costs are identified, there is further modification of the prices to produce the 'smoothed costs'. The 'stage 4' processes appear designed to deal with operational contingencies. It may be, for example, that the demand for electricity differs from the forecast demand, so that a particular generator is operating at a higher or lower output (and hence a higher or lower 'heat rate') or than a particular generator did not need to start in the trading period immediately prior. It would be appropriate to take these contingencies into account in identifying the 'reasonable expectation' of the SRMC. The stage 3 and stage 4 'smoothing' processes are quite different from the production of a monotonically rising offer, which is the application of an external rule. Although Mr Layman used the expression 'SRMC' to refer to the outcome of the stage 3 processes, his analysis of the process was based on material provided by the respondent. That material described the entire bid process, but without explicitly identifying the point at which the respondent's expectation of the SRMC crystalised.[149] The respondent did not give evidence identifying the particular stage of the bid formulation process at which its expectation of the SRMC was complete. The bid formation process was largely automated. The applicant pointed out that the respondent offered to supply quantifies of gas over a Trading Interval of half an hour, whereas the peaks in costs associated with generator start-ups were discontinuous. The Board considers that there is no difference in principle between the stage 3 and stage 4 processes and that the 'smoothed costs' may be treated as the reasonable expectation of the SRMC.

[148] Transcript of closing submissions on 6 June 2021, at page 65 onwards.
[149] Bundle 51.

269 Second, the applicant emphasized the magnitude of the discrepancy between the prices resulting from the use of the differing start-up and gas costs. The magnitude of the difference in the gas cost costs is shown at Chart 13.[150] Gas costs are highest at low loads when a generator is starting to produce. The differences in the start-up costs are shown at Chart 11 at paragraph [252] above. The effect of the differences in gas costs and start up costs is shown at Chart 10 at paragraph [255] above. The applicant pointed out that the balancing curve that would have been produced using the applicant's start-up and gas costs was much lower than the prices produced using the respondent's start-up and gas costs. In addition, the 'steps' in the curve were different.

270 The applicant also pointed out that the respondent had not provided an example where the use of the applicant's figures for start-up and gas costs would produce a balancing curve that was entirely beneath the SRMC calculating using the applicant's start-up and gas cost assumptions. While the respondent is not obliged to produce counter examples, the lack of counter examples enables the Board to draw inferences more readily from evidence which is available.

271 The Board accepts the applicant's arguments on this point.

Contention 4

272 The respondent noted that in running the Layman model Mr Layman used two sets of assumptions for the start-up and gas costs. These were described as

(a) 'the Synergy estimates' being the gas and start-up costs that the respondent used in the formulation of the relevant Balancing Submissions;

(b) 'the ERA assumptions', which were the start-up and gas costs which the respondent has used prior to 16 April 2016 (the start of the Investigation Period).[151]

273 The respondent argued:

[150] Although the Board notes that ordinate axis starts at about $50/MWh, rather than $0, which exaggerates the visual impact.
[151] Respondent's written closing submissions at [80]. The figures are given at Layman (Bundle 81) at pp 39 and 40.

> Synergy may have been able to use lower estimates, and possibly higher estimates, and still have made Balancing submission offers that were below a reasonable expectation of its SRMC.

274 The respondent pointed out that the applicant did not identify inputs which were appropriate.[152]

275 However, the respondent did not provide figures for the gas and start-up costs which had this effect. It did not provide evidence that it would have used different figures, if it had abandoned what are described as the 'Synergy estimates' above.

276 It was reasonable for Mr Layman to use the gas and start-up costs which the respondent had been in the practice of using before it increased the gas and start-up cost inputs for the purpose of showing that increased start-up costs and gas costs tended to increase offer prices.

Contention 5

277 The respondent complained that Mr Layman had assumed in his modeling that variables other than start-up and gas costs remained constant. It is a reasonable assumption to focus on the factors relevant to determining the balancing price which are in dispute when running a model of this nature. Further, if other variables had changed and had resulted in changes to the offer prices, this would not negate the effect on the offer prices of increasing the start-up and gas costs.

Additional issues

278 A question also arose whether increasing the start-up and gas fuel costs might have the effect of decreasing the bid prices at some points on the balancing curve.

279 This issue arose primarily along the so-called coal/gas boundary, that is, the area in the balancing curve where generation changed from coal fired generators to gas fired generators. It will be recalled from Chart 8 above that starting up gas fired generators sharply increased the costs of generation. There was some debate where the boundary fell. Mr Layman said 1,000MW – 1,100MW range in his oral evidence.[153] The

[152] Respondent's written closing submissions at [106].
[153] Transcript, p464.

respondent contended that it might vary from below 700MW to about 1,100MW.[154] It was hypothesized that with the respondent's high start-up and gas cost figures, it would have been economical to increase production from the coal fired 'base load' generators, rather than to start-up gas fired generators. Conversely, with lower start-up and gas price costs, the transition to gas would have taken place at a point on the balancing curve reflecting a lower demand. The respondent argued that this would have had the effect of producing lower Price-quantity pairs at the coal/gas boundary than the prices offered by the respondent,

280 The Board notes that this effect is not apparent from the comparison of the offer curves shown in Chart 10 above. The price jumps at a lower demand using the respondent's costs assumptions, rather than the applicants.

281 The applicant also argued, and the Board accepts, that even if the transition to gas occurred at a lower demand, where gas costs were exaggerated it would still have been necessary in each balancing curve to include balancing prices for which the marginal generator was a gas-powered generator. When that point was reached, gas generation 'kicked in', so balancing price associated with that gas generation would have been above the reasonable expectation of the SRMC. The effect of this argument is to move the point at which inflated gas prices occur, rather than to eliminate them. The respondent was required to bid in the whole of its generation capacity in its balancing submissions.

282 The respondent argued that there might be a similar effect with individual generators within the respondent's fleet of gas-powered generators. For example, dispatch of a generator with particularly high and inflated start-up costs might have been postponed in favour running an existing (gas) generator, resulting in a lower figure. The respondent did not point to an example where this had occurred. Again, the respondent was required to bid in all its generating capacity for each Trading Interval, so this issue would not have had the effect that the whole of the balancing curve was reduced. There would still come a point where the next cheapest generator would need to be run and its inflated costs would lead to excessive prices.

[154] Synergy Response to the ERA's Note Concerning the 'Coal/Gas Boundary' at [11] dated 22 June 2021.

283 The final respondent's argument responded to the assertion that it was sufficient if only a single quantity-price pair in a submission was more than the reasonable expectation of the SRMC. The respondent argued that if there was only a single contravening quantity price pair, it had not been shown that the conduct was related to market power. The contravening quantity-price pair might have been in a part of the curve that would not have had any impact on the balancing price, so there would be no market advantage in inflating such a quantity-price pair. This argument is dealt with in the next section, which deals with market power at paragraph [339].

Conclusion

284 The Board is satisfied that the balancing submissions for each of balancing submissions contained at least one price that were above the respondent's reasonable expectation of the SRMC for the relevant quantity of gas.

H. MARKET POWER

Introduction

285 Clause 7A.2.17 of the Rules applies where the conduct of the Market Participant in making excessive offers 'relates to market power'.

286 The respondent contended that its conduct did not fall within clause 7A.2.17 because:

(a) market power is the 'the ability of a firm to profitably sustain prices above competitive levels';[155]

(b) there was no evidence that the impugned conduct was likely to be profitable;[156] and

(c) even if the respondent did have market power, it was not established that its conduct 'related' to that power.[157]

287 It is convenient to deal with these issues in turn, although the first and second contentions are related.

[155] Respondent's closing submissions at [179] to [189].
[156] Respondent's closing submissions at [180] to [196].
[157] Respondent's closing submissions at [197] to [192].

Background

288 There was no dispute between the parties that:

(a) the product dimension of the market is electricity;

(b) the geographical dimension of the market is the region served by the SWIS; and

(c) the functional dimension of the market is the generation of electricity.[158]

What is market power?

289 The respondent contended that the meaning of 'market power' in clause 7A.2.17 required that generators have the ability to raise prices profitably above competitive levels for a sustained period.[159] This meaning was not in dispute.[160]

290 The respondent referred to and relied upon what it described as a 'definition' of market power by the Australian Competition and Consumer Commission in its 2016 'Guidelines on the Misuse of Market Power'.[161] That document deals with s.46 of the *Consumer and Competition Act, 2010*. It discusses key terms, one of which is 'market power'. The Guidelines say:

> 2.13. A firm may only contravene s. 46 if it has a substantial degree of market power.
>
> 2.14. Market power comes from a lack of effective competitive constraint. A firm with market power is able to act with a degree of freedom from competitors, potential competitors, suppliers and customers. The most observable manifestation of market power is the ability of a firm to profitably sustain prices above competitive levels. Substantial market power may also enable a firm to raise barriers to entry, profitably reduce the quality of goods or services or slow innovation.
>
> 2.15. There are a range of factors that can influence the degree of competitive constraint faced by a firm which are likely to be relevant to the ACCC's assessment. These factors can include those outlined by the *Trade Practices Tribunal in Re Queensland Co-Op Milling Association Limited and Defiance Holdings Limited:*

[158] Joint Expert Report of Mr Balchin, Mr Layman and Prof. Knittel (Bundle 88), at [12].
[159] Respondent's closing submissions at [189].
[160] Joint Expert Report of Mr Balchin, Mr Layman and Prof. Knittel (Bundle 88), at [10].
[161] Respondent's closing submissions at [181]. Prof Knittel referred to other authorities which refer to profitability at (Bundle 83) at [160].

a) the number and size distribution of independent sellers, especially the degree of market concentration

b) the height of barriers to entry, that is the ease with which new firms may enter and secure a viable market

c) the extent to which the products of the industry are characterised by extreme product differentiation and sales promotion

d) the character of 'vertical relationships' with customers and with suppliers and the extent of vertical integration

e) the nature of any formal, stable and fundamental arrangements between firms which restrict their ability to function as independent entities.

The passage identified by the respondent as the 'definition' of 'market power' is underlined. It is not definitive. The Guidelines make it clear that a multi-factorial approach may be adopted. The applicant did not dispute that the matters identified in the Guidelines were relevant.

291 A definition of 'market power' was provided by the High Court in *Melway Publishing Pty Ltd v Robert Hicks Pty Ltd*:[162]

> As Dawson J explained, in *Queensland Wire*, market power means capacity to behave in a certain way (which might include setting prices, granting or refusing supply, arranging systems of distribution), persistently, free from the constraints of competition. This is the generally accepted meaning of the concept …

292 The passage from *Queensland Wire* to which the plurality in *Melway* referred was:[163]

> In truth, the need to define the relevant market arises only because the extent of market power cannot be assessed otherwise than by reference to a market. The term "market power" is ordinarily taken to be a reference to the power to raise price by restricting output in a sustainable manner. …But market power has aspects other than influence upon the market price. It may be manifested by practices directed at excluding competition such as exclusive dealing, tying arrangements, predatory pricing or refusal to deal. … The ability to engage persistently in these practices may be as indicative of market power as the ability to influence prices. Thus Kaysen and Turner define market power as follows:
>
> > "A firm possesses market power when it can behave persistently in a manner different from the behaviour that a competitive market would

[162] [2001] HCA 13; (2001) 205 CLR 1, at [67] (Gleeson CJ, Gummow, Hayne and Callinan JJ).
[163] *Queensland Wire Industries Pty Ltd v Broken Hill Proprietary Co. Ltd* (1988) 167 CLR 177 at p200. Citations omitted.

> enforce on a firm facing otherwise similar cost and demand conditions." (Kaysen and Turner, Antitrust Policy (1959), p. 75)
>
> … Market Power is thus the advantage which flows from monopoly or near monopoly

293 The passages from *Melway* and *Queensland Wire* do not refer to 'profitability'. They use the expression, 'persistent', which connotes behavior over a period of time, rather 'profitable' which refers to a financial outcome. The references to 'persistent' behavior in *Melway v Robert Hicks* and Kaysen and Turner and the reference to 'profitably sustain' in paragraph 2.14 of the Guidelines may perhaps be reconciled by the observation that market participants will likely not persist with behavior unless it is seen as being or likely to be profitable. Prof Knittel accepted the proposition that a firm increasing prices for a sustained period would only occur if it was profitable, an experiment or a mistake. [164]

294 The Board does not accept that the ability to raise prices 'profitably' above competitive levels is an essential element of 'market power'. Rather it is one observable manifestation of market power. The context of clause 7A.2.17 does not require a definition of 'market power' which focusses on only one aspect of the range of factors identified in the Guidelines.

Proof of market power

295 The respondent contended that the applicant did not provide evidence and had not proved that the respondent 'was able to raise prices profitably for a sustained period' because it had not analyzed the respondent's profitability. Mr Balchin said that he had not investigated profitability 'in detail'.[165] The respondent argued that an analysis of profitability was required to establish that the respondent was able to raise prices above competitive levels profitably.[166]

296 The ability to raise prices profitably above competitive levels is identified by the ACCC as one *observable manifestation* of market power. The degree of competitive constraint on a market participant, and hence the market power of that participant and the ability of that participant to manifest its power by raising prices can be assessed by a consideration

[164] Applicant's closing submission [para 162]
[165] Balchin 2020 (Bundle 80) at [32].
[166] Respondent's closing submissions at [190] and [191].

of the characteristics of the market, and the behaviour of the participant in that market, compared to the behaviour that might be expected if constrained by competitive rivalry. Indeed, in the context of considering the anti-competitive effect of proposed mergers under the *Competition and Consumer Act, 2010* that will inevitably be the process adopted, because the merger has not occurred, and any profit is in the future.

297 The ACCC Guidelines go on to refer to the factors considered in *Trade Practices Tribunal in Re Queensland Co-Op Milling Association Limited and Defiance Holdings Limited* (*QCMA*),[167] a case to which the respondent referred.[168] The Trade Practices Tribunal did not, in *QCMA*, conduct a profitability analysis. It conducted the review of the Commission decision by reference to the impact of the proposed merger on the markets in which the participants participated using the factors identified in the ACCC Guidelines.

298 The ability to profitably raise prices above competitive levels for a sustained period may be inferred if it appears that there are no or insufficient market constraints on the conduct of the market participant. But it is not necessary for the applicant to prove that the conduct of the respondent the subject of these proceedings was 'profitable'. This is the case whether profitability is an essential element of the definition of 'market power' in clause 7A.2.17 or not.

299 The Board does not suggest that evidence of profitability (or unprofitability) is irrelevant. Nor does the Board seek to exclude evidence of commercial considerations which might negate apparent market power or its exercise.

300 We turn now to the evidence that the respondent had market power.

301 The applicant identified several features of the market which, it said, indicated that the respondent had power in the market.

302 The applicant contended that the relevant market was a highly concentrated one and that the respondent had a substantial share of the total generation capacity.[169] The respondent controlled over half the capacity credits in 2016 and 2017 and generated much the same

[167] (1976) 25 FLR 169; (1976) ATPR 40-012.
[168] Respondent's closing submissions at [185].
[169] Balchin 2020 (Bundle 80) at [190].

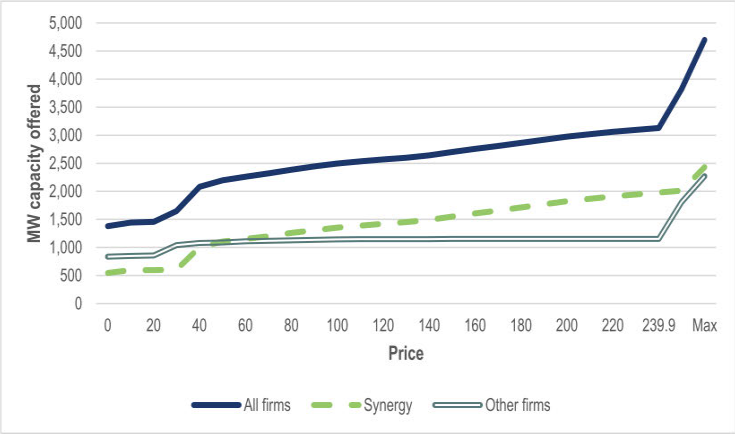
proportion of the electricity produced during investigation period.[170] Mr Balchin also calculated a Herfindal-Hirschman Index (HHI) in respect of the WEM. The HHI is a widely accepted test of market concentration. Mr Balchin arrived as a figure for the whole Investigation Period of 3,353, with a figure above 2,500 indicating a 'highly concentrated market'. Mr Balchin's analysis indicated that in some Trading Intervals, the concentration was higher, particularly when demand was higher.[171] Prof Knittel raised some qualifications about the conclusiveness of the HHI, particularly in the context of electricity generation and the appropriateness of including generation capacity.[172] The Board accepts that the existence of market power cannot be assessed based on HHI alone.[173] It remains an indicator that the respondent had market power.

303 A further indicator identified was a 'pivotal and residual supplier analysis'. The pivotal supplier analysis considers whether the total demand can be met in the market without the largest supplier and the residual supplier index considers the extent to which a supplier is the pivotal supplier. Mr Balchin concluded that the respondent was required to meet total demand in 90% of the Trading Intervals (where demand response is excluded) and in almost all Trading Intervals if substantially higher cost capacity is ignored.[174]

304 The exclusion of higher cost capacity is linked to Mr Balchin's merit order analysis. This was a telling aspect of the applicant's evidence. Mr Balchin's considered the impact of the merit order on the existence of material competition to the respondent. Mr Balchin created an average Balancing Market supply curve for the investigation period, broken down by reference to all supplier firms, the respondent and other firms. It is set out below:[175]

[170] Balchin 2020 (Bundle 80) at [191], [192].
[171] Balchin 2020 (Bundle 80) at [197].
[172] Knittel (Bundle 83) at [178] to 183].
[173] Knittel (Bundle 83) at [183].
[174] Balchin 2020 (Bundle 80) at [199] – [206].
[175] Balchin 2020 (Bundle 80) at [209]

Figure 4 – Average balancing market supply curve during the investigation period



305 The information in Figure 4 was reflected in a table:[176]

Table 5 – Components of the balancing market average supply curve

Price band for offers	Synergy		Remaining firms	
	Average offer (MW)	*Per cent*	Average offer (MW)	*Per cent*
$40/MWh and below	605	*25%*	1,042	*46%*
Above $40/MWh and below $240/MWh	1,375	*57%*	110	*5%*
$240/MWh and above	452	*19%*	1,116	*49%*
Total	**2,432**	***100%***	**2,267**	***100%***

Note: Totals made not add due to rounding.

306 The conclusion which Mr Balchin drew, and which the Board accepts, was that the respondent was almost alone in offering capacity to the market in the price range between $40/MWh and $240/MWh. In other words, it had no, or virtually no, competitors in this price range.

307 This band is particularly relevant to these proceedings, as Trading Intervals during the period 11.30pm and 6.30am have been excluded. Those time are typically periods when the price is below $40/MWh and demand for electricity is low.

308 The impact of the merit order analysis was reinforced by an analysis carried out by the applicant of the effect which an increase of 5% in price would have on the demand for

[176] Balchin (Bundle 80) at [210].

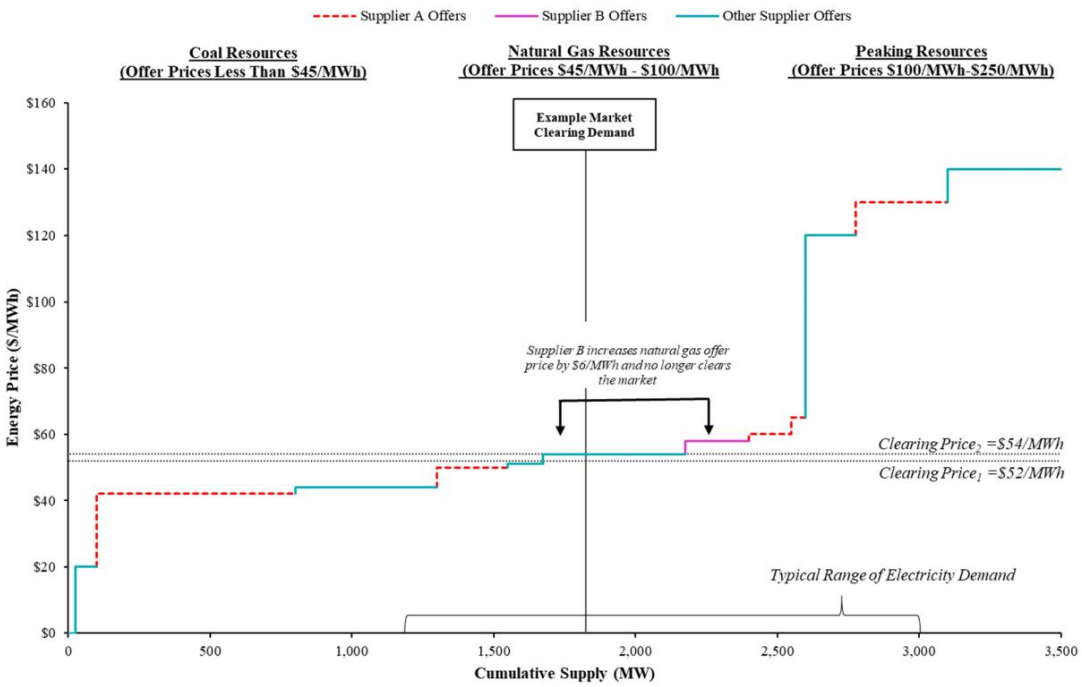
electricity.[177] This showed that an increase of 5% would have resulted in loss of only 0.30% of its sales, with the implication that revenue would increase dramatically.[178]

309 The conclusion to be drawn from this analysis is that increasing the respondent's balancing price submissions for this price range would be profitable. The applicant's costs to generate would be unchanged but the price would be higher. The respondent would not suffer significant loss of sales to competitors in this price range because there were virtually no other market participants at this price.

310 Prof Knittel contended that, although a market participant might have a large market share, that participant might not be able to raise market prices beyond a competitive level[179] and, additionally, if it did so, it might end up selling less electricity.[180] He also produced a table of an electricity Market Supply Curve, to illustrate this contention, which is set out below:[181]

[177] Mr Balchin noted that the analysis was described by the applicant as a 'SNIPP test'. He characterised it as an estimate of the price elasticity of the respondent's residual demand curve (at [213]).
[178] Balchin 2020 (Bundle 80) at [212] – [213].
[179] Knittel (Bundle 83) at [184].
[180] Knittel (Bundle 83) at [187].
[181] Knittel (Bundle 83) at [185].

Figure 15: Illustrative Electricity Market Supply Curve with Increased Offer for Supplier B



Prof Knittel suggested that, in the scenario illustrated by this diagram, Supplier A would not have an incentive to increase beyond the point where its balancing submission set the balancing price. In the scenario hypothesized, that price was $52/MWh. Supplier A's behavior would be constrained by the balancing price submission of the 'Other Supplier Offers' at $54/MWh.[182] Prof Knittel made the further point that, if the Other Supplier's offer set the market, Supplier A would lose the sale at $52/MWh and would be worse off.[183]

311 However, the market illustrated by Prof Knittel does not reflect the market in which the respondent operated. Within the price range $40 to $240/MWh, there was virtually no 'Other Supplier' positioned in the market, poised to secure sales the respondent would otherwise make. The specter of another supplier bidding $2 more than the respondent's mid-order bid and the prospect of the respondent losing a sale to another generator in the $40 to $240/MWh price band was remote. For these reasons, the respondent's

[182] Knittel (Bundle 83) at [186].
[183] Knittel (Bundle 83) at [188] to [194].

submission[184] that raising the respondent's offer prices would have caused the respondent to lose revenue and profit was not a realistic prospect in the $40 to $240/MWh range.

312 A further difficulty with Prof Knittel's example is that an inflated Balancing Price applies to all generators which were 'in merit' not just the quantity of electricity that was the subject of the successful bid. This may offset the impact of any 'lost sale'. The point can be illustrated by an amplification of Prof Knittel's scenario, if:

(a) Supplier A bid to supply:

(i) at total of 900 MW at $50/MWh (over a half hour trading interval); and

(ii) a total of 920 MW at $55/MWh; and

(b) Supplier B had bid to supply a total of 40MW at $52/MWh,

then the respondent would only 'lose the sale' of the 'final' 20MW. It might still make a sale of 900 MW, at the Balancing Price of $52/MWh because the Balancing Price applies to all electricity dispatched during the Trading Period. The respondent's income at the inflated price of $52/MWh is $46,800, which is slightly more than it would have been had it had sold the entire 920 MW at $50/MWh ($46,000). In addition to greater net revenue, the respondent has not incurred the costs of producing the final 20 MW of power. It cannot be said, therefore, that a 'successful bid' from a competitor is necessarily disadvantageous for the respondent. [185]

313 The respondent's analysis discussed above is insufficiently related to the conditions that existed to have any value at all in supporting a conclusion that an increase in the balancing price offered by the respondent in the $40 to $240/MWh band would have been unprofitable.

314 The applicant also relied on aspects of the respondent's behavior during the Investigation Period.

315 The applicant contended the conduct of the respondent in pricing above its SRMC was conduct that would not be engaged in by a firm that participated in a competitive market.

[184] Respondent's closing submissions at [192].
[185] The outcome of this example depends, of course, on the figures and quantities chosen. It is intended as an illustration only.

The Board has found that the respondent's balancing submissions were above a reasonable expectation of SRMC and accepts that this is an indicator of market power.

316 The way the respondent carried out the increase in its costings is also indicative of market power. Gas prices and its balancing submissions prices were increased without any apparent consideration of the effect that the increases might have on its overall profitability. It will be recalled that, in Period 2, the respondent used gas prices of $[redacted]/GJ [**price**] at a time when it was paying nearly $[redacted]/GJ [**a price significantly**] less than that. It did not ascertain the balancing price in the absence of its inflated bids or carry out the analysis of possible competing bids on the balancing price or its sales, as illustrated by Prof Knittel. This is an indication that it did not regard itself as relevantly constrained by competition. As a substantial long-term player in the market, the respondent's apparent lack of concern about competition is evidence that there were no effective competitive constraints on its pricing behavior (in the $40 to $240/MWh range) and, hence, that it had market power.

317 The applicant also pointed to the discrepancy between the price at which the respondent sold gas in the gas market and the cost respondent's sales of gas as evidence of its power in the electricity market. Evidence of the respondent was to the effect that sales of gas in the gas market were lower than the price it paid for gas under the Gorgon Contracts.[186] However, during Period 3 it priced the gas, for the purposes of its balancing submissions, at a higher price. There was no suggestion that the respondent had market power in the gas market. On the contrary.[187] The Board infers that the ability to price gas into its balancing submissions at a higher price was due to power in the electricity market.

318 The applicant also pointed out that there was little prospect of new entry into the generation market and consequently, little prospect that the exercise of market power by the respondent would be 'disciplined' by that means.[188] The Board accepts this analysis.

319 The respondent raised the fact that the respondent was not only a generator of electricity but a retailer of electricity as well. It sold electricity to retail customers pursuant to its

[186] Clare (Bundle 76) at [50] to [52].
[187] Clare (Bundle 76) at [52(a)].
[188] Balchin 2020 (Bundle 80) at [212] to [216].

obligations under Electricity Corporations Act. The price at which the respondent sold electricity is fixed by Government fiat and not determined by the balancing price at which the respondent effectively buys gas for retail. If this dual role is seen as the respondent selling electricity to itself at the balancing price for on sale at the lower fixed retail price, an increase in the balancing price could be seen as resulting in losses or increased losses on those transactions. Prof Knittel raised this issue in support of the proposition that the respondent did not have an 'incentive' to increase prices and that its conduct was not profitable.[189]

320 There are several difficulties with this approach:

(a) whether a market participant has an *incentive* to increase prices is not the same as the question whether a market participant has the *power* to do so'. The exercise of market power does not require an 'intention' on the part of the market participant;[190]

(b) it is not clear that the respondent's retail obligations are a market constraint on the respondent. On the contrary, it is more likely that taking into account retail obligations in developing offer prices could only occur if there was no expectation of a competitive response. In other words, as a matter of self-interest, the respondent might consider retail sales in deciding whether to exercise whatever market power it has;

(c) there was no evidence about how the respondent accounted for the costs of its retail electricity. The respondent did not provide evidence that the increases in its costings forming part of its balancing price calculations had an adverse effect on its profitability. This analysis would be expected if a competitive response was considered remotely possible;

(d) it is not apparent that 'cost' of electricity for retail sales was a relevant consideration for those persons making decisions about the balancing prices. The respondent conspicuously did not call evidence from those persons involved in determining the balancing price submissions. Mr Balchin pointed out that the

[189] Prof Knittel (Bundle 83) at [187].
[190] *Queensland Wire Industries*.

respondent receives an operating subsidy from the Government associated with the provision of retail electricity. Therefore, losses associated with retail sales may have been offset by additional profits in wholesale electricity sales or not have been relevant at all in decision making around balancing price submissions.[191] Ms Clare gave evidence that the Wholesale Business Unit was 'operationally, financially and physically' separated from the Retail Business Unit.[192] If the Wholesale Business Unit was run as a business separate from the Retail Business Unit, then the consequences for the Retail Unit might not have been a matter of concern for the executives responsible for decisions about balancing submissions; and

(e) the conduct that is the subject of these proceedings continued for more than a year. The respondent is a substantial, no doubt commercially sophisticated entity. Its 2016 Annual Report recorded a total income of $3.1 billion and gross profit of $568.4 million. If the conduct were unprofitable, the respondent would have put a stop to it within that period even if it was an experiment or a mistake.

321 On the basis of the evidence available to it, the Board is satisfied that the respondent had 'market power' and, if the ability to sustainably raise prices above competitive levels is a necessary element of 'market power', the respondent had the ability to sustainably raise prices above competitive levels.

322 As has been found above, the conduct the subject of these proceedings involved prices in the respondent's balancing submissions that were above its reasonable expectation of the SRMC. The conduct continued from 1 April 2016 to 10 July 2017. Conduct over that period of time counts as 'persistent' behavior, within the definition of market power adopted by the High Court in *Melway* and *Queensland Wire Industries.* It also satisfies the multi-factorial approach in the Guidelines.

[191] If, as the respondent contends, the definition of market power involves an ability to raise prices *profitably*, that definition may require qualification where a market participant is a body not governed entirely by commercial considerations or entirely subject to commercial constraints.
[192] Clare (Bundle 76) at [10].

323 The Board is satisfied that the respondent had 'market power' on every meaning of market power considered in these proceedings and reasons.

Did the conduct 'relate to' market power?

324 The respondent contended that the applicant had not established that respondent's conduct was related to market power.[193]

325 The respondent made three points in this context:

(a) Mr Balchin was asked to assume that the respondent's gas and start-up inputs were above its reasonable expectations of the SRMC and that at least some prices in each of the relevant Trading Intervals was above its reasonable expectation of the SRMC and these assumptions were not correct;

(b) to show that the conduct related to market power, the conduct must have been reasonably likely to cause prices to increase (otherwise the conduct would have had nothing to do with market power); and

(c) in relation to the start-up methodology, there is no evidence that adopting a particular methodology can be related to market power.

326 The respondent had pointed out in other contexts that Mr Layman's evidence might establish merely that there was a single Price-quantity pair that was in excess of the SRMC and that the offending Price-quantity pair might occur in a segment of the balancing curve that would affect the Balancing Price set for the Trading Interval.

327 The applicant contended that the fact that prices were above the SRMC coupled with the fact that the respondent has market power are sufficient to conclude the pricing behavior 'relates to' market power.

328 The applicant pointed out that the expression 'relates to' is one of 'wide and general import' and that its meaning is determined by the context in which the words appear.[194]

329 The applicant contended that one could infer from the fact that excessive prices were submitted and the existence of market power that the submission of excessive prices

[193] Respondent's closing submissions at [197].
[194] *See Oceanic Life v Chief Commissioner Stamp Duties* [1999] NSWCA 416; (199) 154 FLR 129 at [56] (Fitzgerald JA)

'related to' the market power. If the respondent did not have market power, the respondent would not have been able to persist with its unreasonably high offer prices. A competitive market would have constrained it.

330 The Board does not accept the respondent's propositions and instead accepts the applicant's propositions.

331 The context of clause 7A.2.17 provides no reason to limit the natural, broad meaning of the expression, 'relates to'. The Rules were drafted in conjunction with the privatization of the hitherto Government owned infrastructure for the generation, distribution and sale of electricity. It was anticipated at the time that the entities which emerged as a result of that privatization would have a substantial presence in the electricity market. Clause 7A.2.17 performs an important role in preventing entities with market power undermining competition within the electricity market. It is not necessary for a market participant to have a specific intent or for its conduct to be reprehensible in order for its conduct to 'relate to' market power.[195]

332 There are circumstances in which excessively priced submissions might not 'relate to' market power. Prof Knittel mentioned two scenarios in cross examination. He suggested that that a firm might be experimenting with prices or have made a mistake. However, there was no evidence from persons who were involved in the costs build up that either of these explanations applied in this case.[196] The possibility that the respondent's excessive pricing was a mistake or experimentation is excluded by the persistence of the respondent's conduct.

333 The duration of the respondent's conduct suggests that the conduct was causally linked to the respondent's market power: if the respondent was subject to competitive market constraints, then those constraints would have caused the respondent to modify its behaviour and reduce its balancing prices. This observation is applicable even to the double counting of maintenance costs discussed at paragraphs [93] to [97]. A

[195] *QWI.*

[196] Mr Lou said that one aspect of the startup costs was a mistake, but no evidence was given about how the error occurred. A mistake which was reckless as to the competitive impact might not be unrelated to market power. The error in relation to start-up costs is not crucial. The start-up costs exceeded reasonable expectations in other respects as well.

competitive environment would have seen these costs scrutinized and eliminated. Persistent pricing at above the reasonable estimate of the SRMC can be reasonably concluded to be conduct which 'related to' market power.

334 The circumstances in which both the gas cost and the startup methodology were implemented are also relevant. The respondent did not, apparently, take steps to ascertain the effect of the changes in its pricing methodology on its sales of electricity even after analysis suggested that the prices in the Gorgon Contracts were above reasonable expectations of market prices[197]. Had the respondent been in a competitive environment, steps would have been taken to ascertain the impact of the change in the buildup of the bid prices on its sales. Balancing price submissions of other generators were publicly available. The respondent would have been aware of the level of completion in the $40 to $240/MWh band. In a competitive market, steps would have been taken to ensure that the components in respect of startup costs and gas costs were not overstated. Management would have anticipated avoidable losses of sales if offer prices were unnecessarily above the SRMC.

335 Further, the respondent provided no justification for its departure from both its previous practice of pricing by reference to the opportunity cost for gas and the advice provided to it by Frontier Economics discussed at paragraph [199(c)] above.

336 In further response to the respondent's specific contentions about market power:

337 First, the Board has found that the respondent's balancing submissions were above its reasonable expectations of the SRMC and at least some offer prices were above its reasonable expectation of the SRMC, so the assumptions Mr Balchin's was asked to adopt, and on which his opinions and conclusions were based, are correct.

338 Second, the Board agrees with Mr Balchin that it is not necessary to demonstrate an 'incentive' to find that conduct relates to market power; it is the ability to cause prices or other outcomes to diverge from that expected in the competitive market that is relevant.

339 Third, the Board is satisfied that there was an 'incentive' to engage in the offending conduct, as the respondent's conduct was reasonably likely to inflate prices, lead to an

[197] Bundle 79.30.

over recovery of costs and higher profits. It is not necessary for *each* of the respondent's balancing submission to have resulted in an increased Balancing Price for the respondent to have an incentive to engage in the conduct. Not every balancing submission needs to be a 'winner'. [198] It would be sufficient if there was a real possibility that the balancing price would be set by an inflated Price-quantity pair and there was little or no perceived downside. It may be accepted that there probably would have been Trading Intervals when the Balancing Price was not be set by one of the respondent's excessive Price-quantity pairs. However, there would be no disadvantage to the respondent if the Balancing Price was set by one of the respondent's Price-quantity pairs that was not unreasonably inflated eg a quantity of electricity produced by one of the respondent's coal fired generator. In such circumstances, the respondent would be paid what it was entitled to for generating that electricity. There was little prospect that the Balancing Price would be set by another supplier in the 'mid-range'. And even if the Balancing Price was set by another supplier's bid, it does not follow that the respondent would be worse off because a higher Balancing Price set by a bid from a competitor would apply to electricity generated by the respondent (as discussed at paragraph [311]). Increased electricity prices have only a minimal effect of electricity consumption, as discussed at [308] above.

340 Although Mr Layman conceded that there might be balancing submissions in which only a small part of the balancing curve was inflated, he also gave evidence that there were many balancing submissions where the areas of inflation were much greater.[199] Even if an inflated Balancing Price was not the universal outcome of each balancing submission with an inflated component, it was an outcome that would reasonably have been expected. The proceedings relate to more than 11,000 separate balancing submissions over about 14 months. Because the respondent was required to make so many Balancing Submissions, it must be doubted whether even a substantial entity like the respondent would have been able to make individual decisions about individual Price-quantity pairs. The evidence was that it did not, and that Price-quantity pairs were generated by computer, based on cost parameters chosen by the respondent. A consequence is that

[198] See *Ivey v Genting Casinos (UK) Ltd t/a Crockfords* [2017] UKSC 67; [2018] AC 391.
[199] Transcript at p474.

selection of costs parameters that related to market power, because they produced higher prices in a significant number of Trading Intervals, but which formed the basis of the Price-quantity pairs in all Trading Intervals would be an exercise of market power in relation to all trading intervals., even Trading Intervals in which the affected Price-quantity pair did not set, or affect, the Balancing Price.

341 The Board is satisfied that the respondent's conduct, persisting over time, could only be expected if it related to market power.

342 As to the third argument, it may be accepted that adopting a particular methodology does not, of itself, 'relate to' market power. In this case, however, the particular methodology chosen was to included costs that were not reasonably expected to be incurred at all. This methodology would not have been sustained in the absence of market power, and the persistent application of the methodology that may have continued if it had not provoked a regulatory response, demonstrates that the conduct related to market power. It should be borne in mind that the bidding process was substantially automated. Human intervention occurred in the selection of inputs and adoption of the methodology.

343 The Balancing Offers above Synergy's reasonable expectations of SRMC related to market power because Synergy had market power, was able to profit from market power and did not appear to consider the commercial consequences in advance of or after the fact of changing input prices or including costs that were above its reasonable expectation of SRMC. This would indicate that it had no expectation of a market response that would be expected if the same conduct did not rely on market power.

344 The Board is satisfied that the conduct of the respondent in submitting bids in excess of its reasonable expectation of the SRMC 'related to' market power.

I. SUMMARY

345 The Board considers that the respondent contravened Rule 7A.2.17 as alleged.

346 The costs used by the respondent in building up its balancing submissions were inflated in two respects.

347 First, the start-up costs were inflated. They included charges that were not levied by third party suppliers and included maintenance based on start-based milestones that would not

be reached and so would never be carried out. In addition, the respondent deferred start-based maintenance and included some time-based maintenance charges that were not properly marginal costs.

348 Second, the gas costs used by the respondent were inflated.

349 During Period 2, the respondent used the gas price under the Gorgon Contracts, which were in excess of $[redacted]/GJ [**price**], when buying gas at an average of $[redacted]/GJ [**a price significantly less than the price**] under the NWS Contract. No material was provided to refute the obvious inference that this input cost was not a reasonable expectation of the gas component of the SRMC.

350 During Period 3, the respondent contended that the use of the nominal price under the Gorgon Contracts was permissible because the 'short run' in the SRMC should be treated as extending back to the entry into of the Gorgon Contracts. The respondent justified this approach on the basis that it avoided a 'missing money' problem flowing from the cap on the price for electricity. This argument ignores the fact that the balancing price determined by AEMO under the Rules applies to all electricity produced, including the generators that produce electricity at a cost that is less than the Balancing price (described as 'infra-marginal generators'). There is no 'missing money' problem. Further, the 'missing money' argument is contrary to approach previously adopted by the respondent (supported by advice from its consultant[200]) that the gas cost used in the SRMC calculation can be higher than the contract price where the opportunity cost is higher. This could occur where the market price of gas was higher than the contract price. The market price of gas was lower than the contract price during Period 3.

351 On a proper construction of Rule 7A.2.17, the short run relates to the Trading Period the subject of the balancing submission, although a Market Generator may take into account matter occurring or likely to occur outside the particular Trading Period in making a reasonable estimate of the SRMC.

[200] Frontier Economics, *SRMC Estimates for Synergy's Gas and Coal Position: Final Report Prepared for Synergy* February 2016 (Bundle 23.9).

352 The Board finds that gas purchased by the respondent under the Gorgon Contracts and used to produce electricity should have been costed based on the opportunity cost of that gas. In this case, the opportunity cost was the market price for the gas. During Period 3, the market price was substantially less than the price which the respondent used as the cost of gas in its build of its balancing submissions. This resulted in unreasonably inflated gas costs.

353 The costings used by the respondent were not consistent with preparing a calculation of a reasonable expectation of SRMC.

354 The inflated start-up and gas costs used by the respondent had the effect that at least one of the prices in the respondent's balancing curves for the Trading Period the subject of these proceedings was above the reasonable expectation of the SRMC. The effect of increased costs on balancing prices is obvious. It can also be seen to be a consequence of how the prices are calculated. The effect was also shown by Mr Layman's modelling.

355 The Board is satisfied that the respondent had market power. This is evident from Mr Balchin's analysis of the market. Importantly, the respondent had virtually no competition in the $40 to $240/MWh pricing range in which gas generators operate and which is relevant to the Trading Intervals the subject of these proceedings. If it is necessary to establish profitability to establish that the respondent had market power, the Board is satisfied the conduct in question was 'profitable' because it likely had the effect of increasing the price at which sales were made, without increasing costs or significantly decreasing the amount of electricity sold. The respondent persisted in the conduct for a substantial period.

356 The Board is also satisfied that the respondent's conduct 'related to' market power because it inflated the input costs used in building up its SRMC and hence the prices in its balancing submissions without consideration of the impact of those changes on its profitability or the market and for a substantial period of time.

357 The Board considers that the respondent has contravened Rule 7A.2.17 as alleged by the Applicant.