Electricity Generation and Retail Corporation regulatory scheme: 2020 effectiveness review

Discussion paper

31 August 2021

Economic Regulation Authority
WESTERN AUSTRALIA

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Invitation to make submissions

Submissions are due by 4:00 pm WST, Tuesday, 28 September 2021

The ERA invites comment on this paper and encourages all interested parties to provide comment on the matters discussed in this paper and any other issues or concerns not already raised in this paper.

We would prefer to receive your comments via our online submission form https://www.erawa.com.au/consultation

You can also send comments through:

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Please note that submissions provided electronically do not need to be provided separately in hard copy.

All submissions will be made available on our website unless arrangements are made in advance between the author and the ERA. This is because it is preferable that all submissions be publicly available to facilitate an informed and transparent consultative process. Parties wishing to submit confidential information are requested to contact us at info@erawa.com.au.

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1. Executive summary

In 2014, the State Government merged electricity retailer Synergy and generator Verve Energy to create the Electricity Generation and Retail Corporation, which trades as Synergy. At the same time, it implemented a regulatory scheme intended to limit Synergy's ability to exercise market power in the wholesale electricity market. The ERA reviews the effectiveness of this scheme each year, and this is the ERA's fifth review of the effectiveness of the regulatory scheme. To date, the ERA's reports to the Minister have concluded that the scheme is not effective in preventing anti-competitive behaviour, because of deficiencies in the regulations.

In previous reviews, the ERA recommended placing greater constraint on Synergy's pricing of the "standard products" it is required to offer in the Wholesale Electricity Market (WEM). Standard products are small parcels of electricity, to be supplied in the future at published prices.

Market participants may use standard products to hedge against price variation in the electricity spot market and as a means of price discovery when negotiating wholesale electricity contracts and when making operational decisions. The regulated maximum difference, or spread, between Synergy's buy and sell prices for standard products places some constraint on Synergy taking advantage of its dominant position in the short-term to medium-term contract market.

In 2019, the Minister for Energy acted on the ERA's recommendation and reduced the maximum buy-sell spread for standard products from 20 per cent to 15 per cent for 2020. The State Government recognised that by offering to buy and sell standard products in a small and illiquid market, Synergy bears the risk of price movements above and below its forecasts. The government set the spread at a level that it considered would still allow Synergy a reasonable probability of making a profit on standard product transactions.

In this review, the ERA is assessing the operation of the maximum standard product spread, including any effect of the reduced spread in 2020, by considering first whether the standard product regime allows Synergy to set prices that cover the cost of its risk, and second whether Synergy would have a reasonable likelihood of making a profit on standard product transactions at a lower buy-sell spread.

The ERA's preliminary analysis is focussed on the accuracy of Synergy's spot price forecasts and any margin Synergy includes on top of these forecasts to inform standard product prices. The results show that, between 2015 and 2020, Synergy would have recovered its margin 86 per cent of the time by applying a spread less than the maximum spread to its buy and sell prices. In addition, given Synergy's accuracy at forecasting spot prices, a buy-sell spread below 15 per cent would have provided Synergy with a sufficient likelihood of making a profit on standard product trades.

The ERA is also considering how the operation of other elements of the scheme mitigate the possibility for Synergy to exploit its market position. Standard products with different specifications - including volumes, contract terms, definition of peak periods and flexible commencement dates - may provide private entities more opportunity to participate in the WEM. In addition, improved transparency measures such as more detailed segmented financial statements and publication of Synergy's internal transfer price may give market participants greater confidence in the operation of the EGRC scheme. The ERA is interested in stakeholders' views on these and other related matters.

2. Introduction

The purpose of this discussion paper is to present the initial findings from the ERA's 2020 review of the effectiveness of the Electricity Generation and Retail Corporation Regulations. The ERA is seeking stakeholders' views on the findings presented in this report and on the effectiveness of the regulations more generally.

The ERA will consider stakeholders' comments when preparing the report on the scheme's effectiveness for the Minister for Energy.

A previous version of this paper was published on 4 August 2021. Synergy contacted the ERA to express concerns with the inclusion of Synergy's pricing method. The ERA withdrew the paper while these concerns were addressed. The paper has been revised to remove specific references to Synergy's pricing method.

2.1 Overview of the EGRC scheme

The Electricity Generation and Retail Corporation (EGRC), trading as Synergy, was created by a merger of the State Government-owned electricity generator Verve Energy and electricity retailer Synergy in January 2014.

The State Government implemented a regulatory scheme, recognising that the new entity was the dominant retailer for households and businesses and controlled three quarters of wholesale electricity supply in the Wholesale Electricity Market (WEM) through its own generation and contractual arrangements with third-party generators.

The State Government noted that the primary purpose of the EGRC scheme was "to mitigate the increased potential for market power that arises due to the merger to ensure a level playing field for competitors and new entrants in order to facilitate competition."[1]

The scheme comprises the:[2]

- Electricity Generation and Retail Corporation Regulations 2013
- Segregation and Transfer Pricing Guidelines 2013
- Electricity (Standard Products) Wholesale Arrangements 2014.

The EGRC regulations compel Synergy to internally separate its different business activities and control the flow of commercially sensitive information between business units.

Under the Segregation and Transfer Pricing Guidelines, Synergy must establish transfer pricing arrangements for trading wholesale electricity supplies between its wholesale and retail

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[1]   Public Utilities Office, 2019, Electricity Generation and Retail Corporation Regulatory Scheme – Response to 016 Report to the Minister for Energy on the effectiveness of the Scheme, p. vi. (online) [accessed 12 July 2021].

[2]   Electricity Corporations (Electricity Generation and Retail Corporation) Regulations 2013 (WA)

Segregation and Transfer Pricing Guidelines 2013, Western Australia, Western Australian Government Gazette, No 243, 30 December 2013, 6525

Electricity (Standard Products) Wholesale Arrangements 2014, Western Australia, Western Australian Government Gazette, No 73, 19 May 2014, 1577

Segregation and Transfer Pricing Amendment Instrument 2019, Western Australia, Western Australian Government Gazette, No 111, 23 July 2019, Government Gazette No. 111 of 2019

business units. Transfer pricing arrangements are intended to ensure that internal pricing and sales are at arm's length, similar to trading arrangements between independent parties.

In 2019 the Minister changed the regulations to require Synergy to publish the foundation transfer price mechanism and any replacements or revisions. Synergy objected to this proposal on the grounds that "commercial arrangements between the RBU [Retail Business Unit] and WBU [Wholesale Business Unit] that are not contrary to the EGRC Regulations should not be made publicly available, as this will detrimentally affect Synergy's legitimate business interests."[3]

The State Government did "not agree that publication of the method used to determine the foundation transfer price would be detrimental to Synergy's legitimate business interests, provided it does not reveal the foundation transfer price itself or the forward energy curve used to calculate it."[4]

The State Government required Synergy to publish its updated foundation transfer pricing mechanism. Now in the public domain, this information identifies that Synergy has based its foundation transfer price on its forecast of market prices, called the energy forward curve.[5] Synergy's published wholesale pricing arrangements confirm that the same energy forward curve is used to price wholesale supplies between Synergy's wholesale and retail business units, as well as standard products.[6]

Synergy's terms and conditions for supplying customised products are governed by a separate and published wholesale supply arrangement.[7] The scheme requires Synergy to not discriminate between its own retail business and private retailers when supplying wholesale electricity. The non-discrimination requirements also oblige Synergy to determine the terms and conditions of a wholesale supply to a possible competitor without regard to the financial interests of its retail business unit.[8]

Under the Electricity (Standard Products) Wholesale Arrangements, Synergy must provide specified wholesale energy products.[9] These standard products are small parcels of energy for quarterly, calendar and financial year terms that can be bought or sold as:

- "Flat" products (contract prices are fixed in all trading intervals over a 24-hour period).
- "Peak" products (contract prices are fixed for all trading intervals between 8:00am and 10:00pm on business days).[10]

Standard products must be offered in increments from 0.5 MWh per trading interval to a minimum aggregate weekly supply of 2.5 MWh per trading interval. For each product, Synergy must offer to sell 150 MW and purchase 100 MW.

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3 Public Utilities Office, 2019, Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme, p.16. (online) [accessed 12 July 2021].

4 Ibid p.17

5 Synergy, 2020, Internal Synergy Wholesale Agreement, p5 and 8 (online)

6 Synergy, 2020 The Electricity Generation and Retail Corporation, trading as Synergy Internal Synergy Wholesale Arrangement (ISWA) between Synergy Wholesale Business Unit and Synergy Retail Business Unit, p. 13 (online)

7 Synergy, 2021, Wholesale electricity supply policy, pp. 4-5 available to download online

8 Electricity Corporations (Electricity Generation and Retail Corporation) Regulations 2013 (WA) s 22

9 Electricity (Standard Products) Wholesale Arrangements 2014, Western Australia, Western Australian Government Gazette, No 73, 19 May 2014, 1577

10 Flat and peak standard product prices are subject to escalation by the Consumer Price Index as described on Synergy's website (online)

Standard product contracts commit Synergy to buying or selling an agreed quantity of energy in the future at the current published price.[11] Having a guaranteed future electricity price allows retailers and generators to hedge against variable prices in the electricity balancing market.

Synergy must publish standard product prices and anonymised transactions. This price discovery mechanism indicates Synergy's electricity spot market forecasts that market participants can use with their own price expectations to, for example, inform their negotiations with Synergy and others for customised contracts to supply energy to customers or hedge against price variations in the balancing market.

In addition to providing price discovery to inform contract negotiations, the standard products regime was also intended to expose Synergy's internal prices to competition:

> We are requiring the wholesale unit to expose the transfer pricing it provides to the retailer to competition from the wholesale market, both into the sell and the buy. For instance, there will not be the totality of the industry; there will be certain volumes and types of products. It is actually a price disclosure mechanism that puts the entity under pressure to show whether its costs and pricing are competitive.[12]

There are four main contractual arrangements covered by these guidelines as illustrated in Figure 1.

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[11]   Synergy may update its advertised standard product prices up to a month before the relevant supply period commences. Transaction prices are the published standard product prices on the date of the transaction.

[12]   Western Australia, Parliamentary Debates, Legislative Assembly, Electricity Corporations Amendment Bill 2013: Introduction and First Reading, Second Reading, Legislative Assembly, 16 October 2013, p.28 (Hon Dr Mike Nahan MLA). (Online)

Figure 1: **Bilateral wholesale supply arrangements**
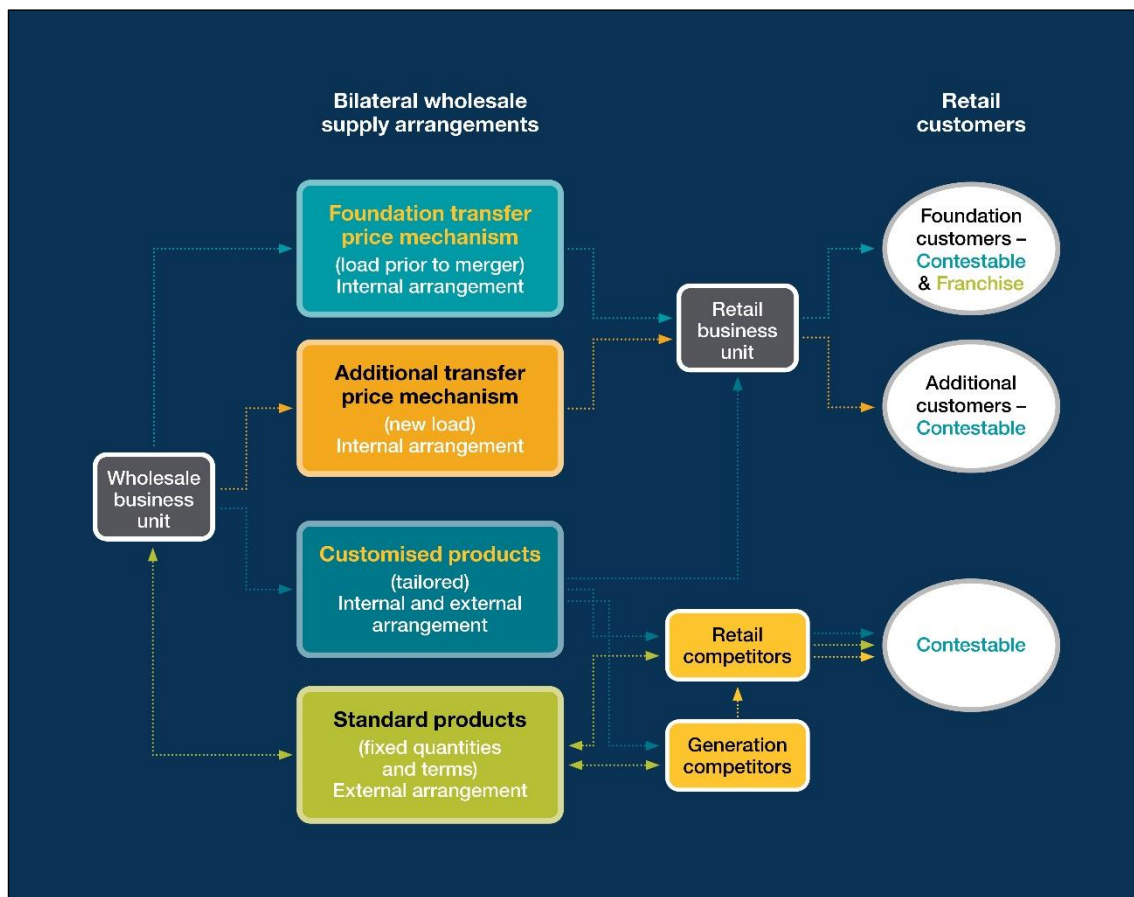
Third-party retailers and generators can contract for wholesale supplies of electricity from Synergy's wholesale business unit through customised or standard products. Customised products are tailored to suit the requirements of the counterparty trading with Synergy, including Synergy's retail business.

Synergy's retail business unit also contracts for wholesale supplies of electricity to supply Synergy's retail customers through the foundation transfer pricing mechanism or the additional transfer pricing mechanism. The foundation transfer pricing mechanism governs the terms and conditions of electricity used to supply Synergy's foundation customers. These were Synergy's customers at the time of the merger that have chosen to stay with Synergy.

2.2   The ERA's role reviewing the EGRC scheme

The EGRC regulations require the ERA to "carry out a review of the operation of the EGRC regulatory scheme for the purpose of assessing its effectiveness."[13] When conducting its review, the ERA can also consider any prevailing circumstances in the South West Interconnected System and any other matters the ERA considers are relevant to the review.

As the regulations do not contain an objective to review the scheme's effectiveness against, the ERA identified the following objective in its last review:

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[13]   *Electricity Corporations (Electricity Generation and Retail Corporation) Regulations 2013* (WA) s48.

> To mitigate the potential for Synergy to exploit its market position as a dominant, vertically integrated electricity business, for the purposes of engaging in anticompetitive conduct, to the detriment of competing electricity generation and retail businesses and electricity customers.[14]

To assess the effectiveness of the scheme against this objective, the ERA focusses on what behaviour the elements of the scheme allow and incentivise, and whether this is consistent with the original intent of the scheme.

The ERA does not assess compliance as the Office of the Auditor General conducts regular audits of Synergy's compliance with the scheme.

2.2.1 Focus for the 2020 review

The ERA's EGRC scheme reviews to date have concluded that the scheme is not effective. In 2019, the Minister for Energy responded to the ERA's recommendations from the 2016 review of the scheme.

The Minister for Energy reduced the maximum spread between the price at which Synergy sells and buys standard products from 20 per cent to 15 per cent for one year, 2020, after which the spread increased back to 20 per cent. When making this change, the State Government cited the ERA's analysis that a 69 per cent chance of profiting on a single trade provides a reasonable balance between managing Synergy's risk and achieving efficient pricing outcomes, noting that "a reduced maximum buy-sell spread of 15% will still allow Synergy a reasonable probability of making a profit on Standard Product transactions."[15]

When making this change, the State Government considered the effect of standard product prices on other contractual arrangements in the market. Standard products prices are based on Synergy's energy forward curve of market prices "and therefore the proposed reduction in the buy-sell spread for Standard Products should also lead to a reduction in the foundation transfer price" for wholesale electricity supplies between Synergy's business units.[16]

The implications of the 2020 reduction in spread are discussed further in section 3. The ERA's initial analysis has considered whether the reduction in the maximum spread during 2020 increased the effectiveness of the scheme. The ERA has looked for changes in the following indicators of effectiveness:

- the returns that Synergy and market participants made on trades
- the number of transactions and the volume of trades
- how standard product prices provide price discovery by revealing Synergy's forecasts.

The ERA is seeking feedback on the findings of this initial analysis, which indicates that the effectiveness of the scheme would be improved by changes to the standard products regime, in particular by a further reduction in the buy-sell spread.

The spread is significant because it influences how standard product prices are set by Synergy and how the prices are perceived by market participants. Section 3 sets out the intent of the standard products regime, how the scheme allows Synergy to price standard products and

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14   Economic Regulation Authority, 'Report to the Minister on the Effectiveness of the Electricity Generation and Retail Corporation Regulatory Scheme 2017', (online)

15   Public Utilities Office, 2019, *Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme,* pp. 11 and 14. (online) [accessed 12 July 2021].

16   Ibid p.16, footnote 20

the effect this has on price discovery and the ability of market participants to hedge their positions in the market.

The Minister's changes to other aspects of the EGRC scheme, publication of changes to the foundation transfer pricing mechanism and the frequency of reviews are covered in section 4.

3. Maximum buy-sell spread for standard products

The WEM involves participants (mainly generators) selling electricity to buyers that are largely retailers, who then on-sell the electricity to businesses and consumers.

The primary electricity market in the WEM is the balancing market, into which generators must offer all available capacity and buyers submit all demand. The resultant balancing price varies over time with daily, seasonal and long-term variations in demand and supply.

Market participants are able to enter into bilateral contracts for energy, which enables them to fix prices for their future electricity sales or purchases, hedging against future movements in the balancing price.[17]

Unlike the balancing market, most of the contract market is not centralised and public quantities and prices are not published.

Without regulation, transactions in the contract market could result in a premium paid by buyers, or a discount accepted by sellers, over the expected balancing price depending on participants' risk preferences and the market power of various participants.

Standard products formalise and centralise part of the WEM contract market. The standard product specifications, the maximum buy-sell spread, contract timeframes and product sizes were developed by the Merger Implementation Group, which was set up by the State Government to provide governance and oversight of the merger. The Merger Implementation Group considered that the primary objectives of the standard product regime were to:

- Function as a price-discovery mechanism to provide greater transparency and predictability for short-to-medium dated energy contracts.
- Provide a simple alternative to other short-to-medium term contracts, called customised products, by:
  - Facilitating new entrants in the market with simple products and lower barriers to entry.
  - Enabling market participants to rebalance their portfolios (at the margins) with simple products.[18]

Given its market power in generation, Synergy could, if left unregulated, profitably offer prices in the contract sell market at levels higher than what would have occurred had Synergy and Verve not merged.

Consequently, the standard product sell price fulfills the dual role of constraining Synergy's market power in electricity contracts sales and providing a publicly transparent indicator of sell contracts in the market.

In contrast, the Western Australian contestable retail market is trending toward a more competitive market.[19] Synergy's share of the contestable retail market in 2020, for customers who can choose their electricity supplier, was 27 per cent.

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[17]   Capacity contracts are also common.

[18]   Public Utilities Office, 2019, *Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme,* p. 8. (online) [accessed 12 July 2021].

[19]   Refer to Appendix 4 and also Economic Regulation Authority, 'Report to the Minister on the Effectiveness of the Electricity Generation and Retail Corporation Regulatory Scheme 2017', p. 6 (online)

Standard product buy products can be a public indicator of buy offers in the market, but only if they are priced so that third parties find it attractive to sell standard products to Synergy to hedge against variable balancing prices.

One way to constrain standard product prices would be to regulate the price at which Synergy must offer and purchase these products. However, the ERA considers that this would result in a large regulatory cost and burden on Synergy.

Consequently, standard product prices are regulated through the maximum spread between the standard product sell and buy price. The maximum spread is set by the Minister for Energy and stated in the EGRC scheme.

3.1   Purpose of the standard product spread

The standard products regime enables Synergy to set the percentage difference between standard product sell prices and buy prices anywhere up to the maximum spread. Through the spread, the buy price anchors the sell price – if Synergy raises its standard product sell price, it must also raise its buy price to ensure that its prices do not exceed the maximum spread.

For example, if the spread is 20 per cent and Synergy sets its standard product sell price at $100/MWh, then it must set its standard product buy price no lower than $80/MWh.[20] The operation of the spread is shown in Figure 2.

Figure 2 shows the effect of the spread on three different Synergy pricing strategies. In each strategy, the spread is represented by the red dot (standard product sell price) and the green dot (standard product buy price). The future average balancing price expected to occur during the period in which the standard products will apply is shown by the grey line.

Figure 2:   Operation of the buy-sell spread
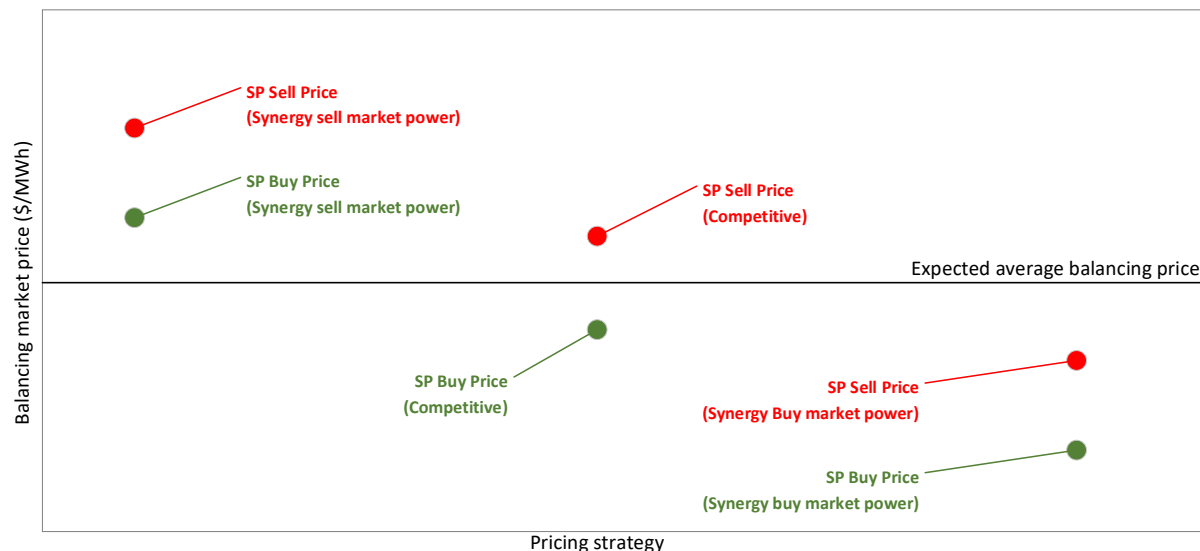
On the centre of the chart, Synergy sets its standard product sell price just above the expected future average balancing price and standard product buy prices just below its expected average balancing price. This might occur if the WEM contract market was competitive (see section 3.2). In this case, Synergy would not be forced to unprofitably purchase electricity

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[20] $80/MWh is 20 per cent below $100/MWh.

through standard product buy contracts, assuming that other market participants have no greater insight into the future than Synergy.

However, if as in the left of Figure 2 Synergy opts to set its standard product sell price well above the level that would occur if the market were competitive, leading to reduced standard product sell trades, the spread means that the standard product buy price must also be higher. If the standard product buy price rises above the expected balancing price, it could force Synergy to unprofitably purchase electricity in the standard product market.

Unless Synergy is able to find a buyer for the electricity it purchased under this standard product buy contract, it will be exposed to the balancing price for this electricity, which is expected to be lower than the buy contract price. This sees Synergy risk losing on the buy contract.

However, if the spread is large, third-party generators would be better off, if they are able, to sell this electricity to generators willing to pay just less than Synergy's standard product sell price.[21]

The reverse is true if Synergy opts to price its buy price too low as in the right of Figure 2. In this case the spread would mean that Synergy would be forced to enter into unprofitable sell contract sales.

The standard product buy price could be a public representation of Synergy's willingness to pay for electricity in the contract market. A small spread could raise the standard product buy price high enough to encourage a limited number of private-sector generators to sell standard products to Synergy, rather than seeking out alternative customers for their electricity supplies.

Setting the spread is not straightforward.

The maximum spread is currently 20 per cent but has varied since the EGRC scheme began. The spread was initially set at 25 percent and reduced to 20 per cent from 2015 to 2019. The Minister for Energy reduced the spread to 15 per cent for 2020 only. The ERA has previously recommended that the spread should be reduced to 10 per cent.

Synergy has always set its buy and sell prices at the maximum spread. Reduction of the spread to 15 per cent over 2020 provides an opportunity to examine the effect of a reduction in the level of the spread. The ERA's preliminary findings on the implications of this reduction are outlined in section 3.4.2.

The ERA considers that a spread could be set just wide enough to allow Synergy to operate as if it were in a competitive market. This would impose sufficient constraints on Synergy's standard product sell pricing, but not cause it to purchase consistently unprofitable standard product buy contracts.

This is examined in detail below.

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[21] That is, those buyers on the standard product demand curve to the right of Synergy's standard product sell price.

3.2 The WEM contract market

There is little competition in the bilateral contract market for standard products and little competition for customised products.[22] Retailers advised the ERA that they have limited opportunities for trading forward contracts with entities other than Synergy.

The concentration of the bilateral contract market in the WEM may be due to the high concentration in the generation market. The analysis presented in Appendix 3 shows that Alinta Energy, Summit Southern Cross Power and Synergy together have about 87 per cent of the generation share in the WEM.

Due to the small number of participants in the WEM, liquidity in the standard product market cannot be expected to be as high as competitive markets with higher volumes and more buyers and sellers, like the National Electricity Market that covers most of eastern Australia, and the New Zealand market.

According to the Electricity Authority New Zealand, "the exchange traded New Zealand electricity futures market performs two key functions: electricity market participants use it directly and indirectly to manage their spot price risk, and participants and other interested parties use the forward price curve that the futures market creates to inform a wide range of investment and operational decisions."[23] The four largest gentailers, generators that also have retail businesses, voluntarily provide a "market making" service that promotes liquidity through transparent pricing and competition.[24]

While an illiquid market can be competitive, illiquid markets may reduce competition if the low liquidity is self-reinforcing. This leads to a limited availability of products and weak price signals reducing market participation and a further reduction in liquidity.[25]

3.3 How Synergy uses the spread to set prices

The ERA has previously explained that expected balancing prices underpin forward contract prices in the WEM, including standard products:

> The balancing market is a gross pool market, meaning that suppliers must offer their entire supply to the market, including bilateral contracts and self-consumption for vertically integrated entities. Participants' expectation of future balancing prices underpins the price of energy in the short-term energy market (STEM), customised bilateral contracts, and standard products offered by Synergy.[26]

The ERA has also previously described Synergy's pricing of standard products, which is based on Synergy's forecast of energy market prices and a margin to account for uncertainty about future energy market prices. The ERA's 2017 report to the Minister stated:

> Synergy sets prices for standard products based on a forward energy curve representing its expectation of future energy market prices. The uncertainty about future energy market prices is captured in the product price that is offered to the market in the

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[22] Alinta previously offered standard products but these trades are currently on hold

[23] Electricity Authority New Zealand, *Request for information – Commercial market making scheme.* January 2021 (online)

[24] Ibid p. 5

[25] Ofgem, 2009. *Discussion paper: Liquidity in the GB wholesale energy markets.* (online) [accessed 12 July 2021]

[26] ERA, (2020) Report on the effectiveness of the Wholesale Electricity Market 2020, ERA, (online), p47

form of a risk premium that adjusts the expected energy curve. This risk premium is included regardless of whether the market is liquid or illiquid and irrespective of the term, including for two-year forward products.[27]

A risk premium is included in bilateral prices to compensate Synergy for risks and costs from the provision of firm contract cover at fixed prices. As explained in section 3.4.1, in principle, the risk premium can vary depending on several factors.

Synergy's contract pricing for wholesale customers is contained in its 'Internal Synergy Wholesale Arrangement (ISWA) between Synergy's wholesale business unit and retail business unit'. This document, which is published on Synergy's website, identifies that Synergy' pricing is based on an energy forward curve.[28]

> Energy Forward Curve means the EGRC's forecast of the future market energy price for each Trading Interval in each Trading Day in the period covered by the curve used by EGRC for the standard products created under the Electricity (Standard Products) Wholesale Arrangements 2014 approved by the Minister for Energy under section 26(1) of the Regulations.[29]

Under its ISWA, Synergy settles the payment for the sale of energy to the retail business unit based on an energy price (determined for peak and off-peak trading intervals separately) that is an average of Synergy's forecast market price over a settlement period as determined by the energy forward curve. Synergy uses the same energy forward curve to derive the flat sell standard product prices over the same forward period.

The ERA compared Synergy's pricing of standard products to general principles that underpin the pricing of financial hedge products. This was to assess if Synergy's advertised prices aligned with prices that could be expected to occur in a competitive market for standard products, as outlined in the Explanation box below.

This comparison included Synergy's accuracy in forecasting average spot prices and Synergy's required margin to account for the cost of taking risk in selling energy forward at fixed prices and if the maximum spread set under the regulations is providing the opportunity to Synergy to recover its costs when offering standard products. As explained in section 3.4.1, to undertake this analysis, the ERA used the margins provided by Synergy for standard product prices, and the forecast error calculated by the ERA from Synergy's spot price forecasts.

The ERA included forecast accuracy in its analysis given Synergy's past public statements on its spot market price forecast accuracy in response to a previous ERA recommendation to reduce the standard products buy-sell spread. In the 2017 review of the scheme the ERA recommended the maximum spread to be reduced to 10 per cent. In response, Synergy stated that:

> Synergy also brings to the ERA's attention the forecast for the standard product prices is made quarterly on a two-year ahead basis, which makes it difficult to form accurate estimations of the future pricing. Standard product sell prices tend to fluctuate due to volatility in the forecast and the market dynamics and, therefore, cannot always be higher than the prices in the STEM and balancing markets. The future price forecasts are highly impacted by temperature dependent load forecast variability. It is highly unreasonable to suggest that Synergy is capable of forecasting a spot price two years

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[27] ERA, 2019, Report to the Minister on the effectiveness of the Electricity Generation and Retail Corporation regulatory scheme, p.12 (online)

[28] Including Synergy's retail business unit and third-party generators and retailers.

[29] Synergy, 2020, Internal Synergy Wholesale Agreement, p . 8 (online)

out with an accuracy of + or – 5%. Therefore, suggested 10 percent spread between the buy and the sell price is not a viable option.[30]

Synergy reiterated concerns about forecasting during the State Government's consideration of a lowered spread for 2020. The State Government explained:

> Given historic volatility in the Balancing Market, Synergy considers it to be unreasonable to expect the business to forecast future market prices within tight boundaries.[31]

The ERA analysed Synergy's standard product pricing calculations between 2014 and 2020 to understand how Synergy applied its pricing method.

Forward electricity contract pricing principles suggest prices are set based on a forecast of average spot prices over the term of a contract plus a risk premium to account for the cost of risk. Typically, contract providers are as likely to over-forecast average spot prices as they are to under-forecast. Consequently, sell and buy prices are set symmetrically around the forecast average spot price. This is explained in more detail in the Explanation box below.

The ERA's preliminary analysis found that in almost all instances, Synergy's forecast average spot price was closer to the standard product sell price than the buy price. This is contrary to principles of forward pricing where the forecast falls in the middle of the buy and sell price. The ERA found that the standard product sell price reflects Synergy's forecast spot price plus a margin. In contrast, the buy price is set as low as permitted by the scheme. Although inconsistent with forward contract pricing principles, this approach to pricing standard products is allowed under the scheme.

This means that Synergy has been setting the buy price lower than it required to cover its margin. This is inconsistent with the approach expected from a 'market maker' that is indifferent between buying or selling energy forward. There are some circumstances that may explain asymmetrical prices being offered in a competitive market for standard products. The ERA considered if these conditions that might justify Synergy's asymmetrical pricing of buy and sell contracts around the expected average spot price. As explained in sections 3.4.1 and 3.4.2.2, the ERA currently has no evidence to explain this asymmetrical pricing.

This may be deterring market participants from selling standard products to Synergy, making the standard product market very illiquid.

The pricing bias toward sell products may explain the very low number of buy transactions over the history of the standard products regime.[32] This provides context for informal comments from retailers to the ERA in 2021. Retailers are reluctant to purchase a greater quantity of electricity through standard products than they can sell to retail customers, as the price to sell any surplus (the buy price) is so far below the forecast average balancing price that they are most likely to make a loss on the transaction.

The Explanation box provides a stylised diagram showing the principles underpinning bilateral contract pricing in a competitive market.

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[30] Synergy, 2017, "Submission to the Economic Regulation Authority, Discussion paper: 2016 Report to the Minister for Energy on the effectiveness of the EGRC Regulatory Scheme". p.8 (online)

[31] Public Utilities Office, 2019, *Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme*, p. 14, (online)

[32] From 2014 to 2020, Synergy traded 93 standard products, 85 were 'sell' and 8 were 'buy'.

Explanation – Principles and parameters for forward pricing

For a hypothetical entity, the diagram below illustrates the relationship between the expected average balancing price over a contract period, the uncertainty in forecasting the average balancing price, the contract lead time and the risk premium required to account for uncertainty in forecasting the average balancing price.
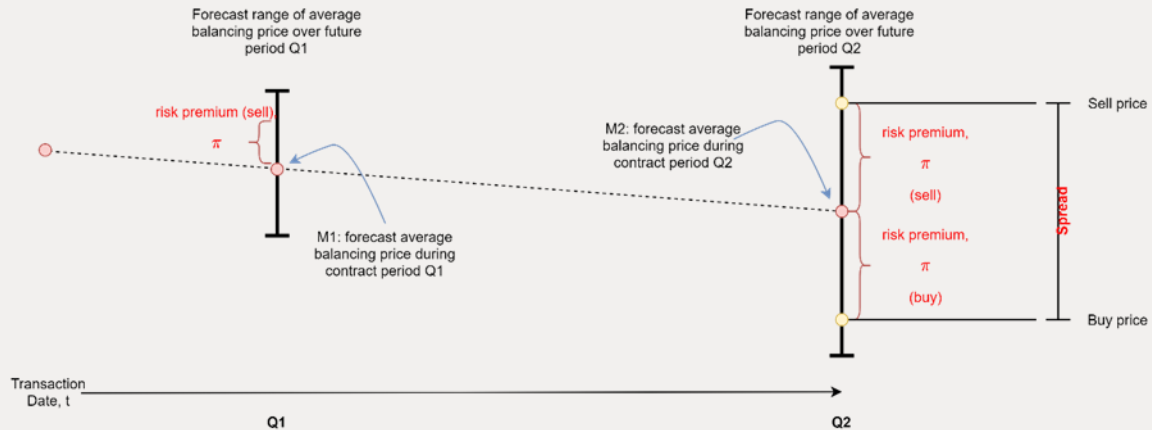
In the diagram above at the current time t, the entity advertises standard products for the quarters, Q1 and Q2. This is done by forecasting the average balancing price for quarters Q1 and Q2 (denoted by points M1 and M2), with the expectation that there will be some forecast error. The vertical black lines depict the entity's expectation of the range of uncertainty and the size of the error.

In this example, the period Q2 has a larger expectation of forecast error because it is further ahead in time. In this example, there is greater uncertainty around forecast balancing prices between the forecast time and the forecast horizon when the forecast lead time is longer.

To account for uncertainty in forecasting the average balancing price, the sell prices for periods Q1 and Q2 are set above the expected average balancing prices M1 and M2. The buy prices are set below and at the same distance from the expected average balancing price as the difference between the sell price and the expected average balancing price.

The differences between the expected average balancing prices and contract prices reflect the risk premia included in the contract price.

In this example, the risk premia provide the entity with a greater than 50 per cent chance of making a profit on this transaction, compensating the entity for taking the risk of selling a fixed price contract lower than the average balancing price, or of buying the energy forward at a fixed price higher than the average balancing price.

This example shows that, in theory, the spread is derived by setting the risk premium symmetrically around the average forecast price for the product, assuming that the distribution of forecasting error is symmetrical around the expected average balancing price. This means the actual average balancing price is expected to be equally likely to be above the expected average balancing price as it is to be below the expected average balancing price by the same amount.

Secondly, the symmetrical pricing in this example is also underpinned by the assumption that the entity does not perceive any hedging benefit from the sale of sell products.

3.4   ERA analysis

The reduction of the spread to 15 per cent did not improve the scheme's effectiveness. At 15 per cent the spread is still too wide to constrain Synergy's pricing of standard products to a level consistent with its costs of operating the standard products regime.

To date, the maximum spreads have prevented the advertised standard product prices from operating to its full capacity as a price discovery signal for private sector market participants.

Given the standard product pricing enabled through the scheme, Synergy is likely to make a return that exceeds its costs (a nominal profit) on each standard product transaction. This means that counter-parties – typically small retailers – are likely to make a nominal loss on standard product transactions with Synergy.

The preliminary findings on the standard product regime extends into bilateral contract pricing, through the non-discrimination requirements in the scheme, to other internal bilateral contracts to supply its own customers and customised products.

The section describes the ERA's analysis and findings in more depth and seeks stakeholder feedback on its findings in section 3.4.4.

3.4.1   Background

The ERA sought to understand the pricing behaviour enabled by the standard products regime and how this differs from a competitive market. For 2014 to 2020, the ERA considered Synergy's method of setting forward contract prices, published standard product transaction prices, Synergy's spot price forecasts and Synergy's margin.

The ERA compared Synergy's spot price forecasts with observed balancing prices to calculate forecast error and consider how the size of the forecast error contributes to the spread required by Synergy. References to forecast error in this paper refer to the ERA's calculation.

In the absence of information from Synergy on how it determined margins included in the price of standard products, the ERA assumed that the margins provided by Synergy only include the four factors that typically influence the size of the risk premium in forward contracts. [33,34]

- The greater the expectation of error in forecasting the average balancing price over a contract period, the higher the risk premium.

- The higher the level of risk aversion, the higher the risk premium required.

- The higher the risk of financial distress (due to expected variation in balancing prices), the lower the required risk premium.

- The higher the liquidity of the standard products market, the lower the risk premium.

The ERA will consider any new information received from Synergy on the pricing of standard products to inform its report to the Minister in late 2021 on the effectiveness of the scheme.

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[33] For a discussion of factors influencing risk premia included in electricity forward contracts refer to Benth, Fred Espen and Cartea, Álvaro and Kiesel, Ruediger**,** *Pricing Forward Contracts in Power Markets By the Certainty Equivalence Principle: Explaining the Sign of the Market Risk Premium* (December 14, 2007). Journal of Banking and Finance 32, Issue 10, (2008), pp. 2006-2021, (online).

[34] Prior to publishing this paper, and after the ERA finalised the analysis for this discussion paper, Synergy provided information about how it determines these margins. Initial analysis of Synergy's information shows that Synergy's margins can also include adjustments for factors other than mentioned in section 3.4.1.

3.4.2 Preliminary findings

The ERA's preliminary findings are grouped into observations on the number and volume of standard product trades over time and on how the scheme enables Synergy to price standard products above the costs it incurs in operating the scheme.

The ERA then draws conclusions from these observations on the effectiveness of the standard product regime and seeks stakeholder feedback on its findings in section 3.4.4.

3.4.2.1 Standard product transactions remain limited

From the start of the standard product regime in 2014 to the end of 2020, Synergy traded 102 standard products, with a total volume of 360 MW: 94 were sell transactions and eight were buy transactions. Over two thirds of the sell transactions were flat products[35]. The eight buy transactions were for a total volume of 40 MW. Five of these contracts were traded in 2015 and three were traded during 2019.

There was no increase in the number of standard product transactions when the standard product spread was reduced to 15 per cent in 2020. The total volume of standard product trades in 2020 was 108 per cent higher than 2019 but only 30 per cent above 2017, the previous highest volume year. This was mostly driven by the purchase of 25 financial year products by just two counterparties. The overall volume of standard product trades remains low compared to the average annual electricity demand in the WEM, approximately 1,900 MW.

In early 2021, the ERA held a series of conversations with retailers about their experience of the standard products market and the 2020 reduction in spread.[36] Retailers advised that the standard products regime was limited in how it met the intent of the scheme.

Retailers noted that despite a low number of transactions, there is demand for standard products and that the contracting process was simple compared to contracting with Synergy for customised products. Some retailers noticed that the gap between standard product prices narrowed slightly during 2020, while others observed no difference.

Retailers also noted that the standard product specifications could better meet their needs. The introduction of standard products that cover peak afternoon periods, when balancing prices typically rise as rooftop solar generation reduces, and products that are available three years into the future would provide greater price certainty and simplify the process for retailers to secure supply for their customers.

The ERA considers, and is seeking feedback on, standard product specifications and terms and conditions in section 4.4.

3.4.2.2 The standard product spread is wider than required

To understand the effect of the maximum spread on Synergy's pricing approach the ERA's analysis has considered Synergy's pricing of standard products from 2014 to 2020. This includes Synergy's margin for standard product prices and the ERA's calculation of:

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[35] "Flat" products are those where contract prices are fixed in all trading intervals over a 24-hour period.

[36] Synergy was also invited to informally share their perspective on the standard products market with the ERA, in particular how they were affected by the reduction in spread during 2020. Synergy elected to wait until the publication of this discussion paper to share their views.

- Synergy's accuracy in forecasting spot prices, as measured by the difference between Synergy's forecast of spot price used in the determination of standard products and the observed balancing price related to those forecasts.

- Nominal profits Synergy earned on historical trades and would have earned on advertised standard product prices.[37]

Taking each of these in turn

Margins

The ERA considered if the maximum spread was sufficiently large for Synergy to recoup its margins. However, the ERA's analysis revealed that Synergy's margins were stable across most years and that Synergy could recover its margins with a spread lower than the regulated maximum spread, most of the time. The exception was 2020, when Synergy's margins varied considerably more than in any prior years. ERA could not determine why this variation occurred based on the information provided by Synergy.[38]

To explore this further, the ERA next considered forecast accuracy in setting future standard product prices. Synergy's chance of making a profit or loss on a future standard product trade depends on how accurately it can forecast balancing prices during a contract period. Synergy's expected forecast accuracy is assumed to be reflected in its margins. A lower expected forecast accuracy requires a higher margin to maintain Synergy's likelihood of making a profit on the trade. The ERA considered whether a reduction in forecast accuracy was behind the larger margins observed in 2020.

Forecast error

The ERA's analysis indicated that forecasting error has decreased since 2017. This finding is consistent with Synergy's annual report that indicates since about 2018, Synergy has used Plexos as its market simulation tool for forecasting "providing the business with an improved level of forecasting accuracy". [39]

The range of forecast error for annual standard product prices was generally lower than for quarterly prices. This suggested that Synergy would require a lower risk premium for the pricing of annual products compared to quarterly products.

The analysis also considers whether forecasting error changes with forecast lead time. The Explanation box in section 3.3 provides an example where the period further ahead in time has the larger expectation of forecast error because of the greater uncertainty around forecast balancing prices when the forecast lead time is longer.

The ERA's results show that there was not a substantial decrease in forecasting error range with a decrease in forecast lead time.

The ERA finds that:

- Synergy provided margins that were not dependent on the type of transaction (buy or sell). These margins were low and stable in all years except for 2018 and 2020. The variation in margins in 2020 was greater than that observed in 2018.

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[37] A nominal profit for Synergy on a standard product transaction is where the return exceeds the cost of holding the contract, expressed in the margin.

[38] Figure 20 in appendix 5 shows the margins applied in 2020 indexed to the most commonly used value (the mode).

[39] Synergy, 2019, *Annual Report,* p. 17. (online).

- There was no obvious relationship between margin and term of standard product. For example, if forecast error for quarterly standard products was greater than for annual products, a higher margin would be expected for quarterly products.

The ERA then considered what may be causing Synergy to apply the standard product spread asymmetrically around it forecast spot price.

Asymmetric pricing

Synergy is able to use the maximum spread allowed under the scheme as the difference between its standard product sell and buy prices. As described in section 3.3, Synergy has used the maximum spread to set buy prices.

Example: buy product pricing

From data on Synergy's website, the following numerical examples demonstrate that standard product buy prices are lower than sell prices as determined by the maximum spread:

- The sell flat standard product price posted on August 28, 2019, for quarter 4 2019 was $44.96. The corresponding buy price of $35.97 was 80 per cent of the sell price – a 20 per cent spread.

- A year later to the day, Synergy posted the quarter 4 2020 buy price at $34.27 or 85 per cent of the corresponding sell price $40.31 – a 15 per cent spread.

In considering Synergy's pricing approach, the ERA looked at how a typical provider of standard products would price if it also had interests in electricity generation. There are two reasons why such a provider would price asymmetrically:

1. An standard product provider will set its margins to accommodate its differing likelihood of future average spot prices being higher or lower than its expected average spot price. For example, if the provider perceives future average spot prices to be more likely to be higher than its expected average spot price (than being lower), it might include a larger risk premium in its sell price.

2. A provider might consider reducing its standard product sell price if it valued the revenue certainty from the sale of standard products as a hedge against variability in balancing market prices.

The ERA's analysis of Synergy's data showed that neither of these two reasons were relevant to Synergy and cannot be used to explain Synergy's asymmetric pricing.

The pricing of buy products using the maximum spread means that buy prices were often lower than would have been the case had Synergy used its margin (except for the occasions in 2020 when the margin exceeded the spread).

The analysis in Appendix 5 shows that forecast errors, as defined by the difference between Synergy's forecast electricity spot price and the balancing market price, were generally symmetrical around Synergy's expected average market price, meaning that the risk of a forecast being too high is just as likely as it being too low. When Synergy's forecast risk is considered, there is no indication that buy transactions would be more risky than sell transactions. Therefore, the higher margins Synergy included in prices for buy products cannot be explained by the magnitude of Synergy's forecast error.

Given the ERA's findings on how Synergy prices standard products, the ERA then reviewed how this pricing affected Synergy's profit on standard product transactions.

Nominal profits

Overall, Synergy has made a nominal profit on its obligation to offer standard products to the market. Just under 90 per cent of standard products traded and matured between 2014 and 2020 yielded a nominal profit to Synergy.

On quarterly transactions, Synergy made an average nominal return of 7.1 per cent, and an average nominal return of 11.9 per cent (on calendar year) and 13.1 per cent on (financial) full year products.[40]

The ERA's preliminary analysis for this review provides evidence that Synergy would have a reasonable chance of making positive nominal returns at a lower spread.

Given Synergy's forecasting accuracy, a spread of 10 per cent was sufficient to provide Synergy with a reasonable likelihood of making a profit on quarterly standard product trades, and a spread of 5 per cent was sufficient to provide Synergy with a reasonable likelihood of making a profit on calendar and financial year products from 2014 to 2020.

There were no buy transactions in 2020 when the spread was reduced to 15 per cent. Given that Synergy priced sell products according to its margins, this means a 15 per cent spread did not force Synergy to enter into any buy contracts, including those that may have been unprofitable. This indicates that reducing the spread to 15 per cent did not unduly increase Synergy's exposure to the risk of losing on buy transactions while limiting Synergy's ability to recover its cost of taking risk.

Retailers identified the large difference between the advertised buy and sell prices as the main barrier to standard product prices providing effective price discovery. Retailers assumed Synergy's transfer price was the mid-point between the buy and sell price, and that a narrower spread would provide a better view of Synergy's forecast and internal transfer price.

3.4.3   *ERA's calculation of alternative standard product spreads*

Based on the ERA's observations in sections 3.4.2.1 and 3.4.2.2, the maximum standard product spread could be reduced. In previous EGRC reports, the ERA used the Deloitte method for calculating the maximum standard product spread, along with observations on maximum spreads in other jurisdictions. The State Government used the same Deloitte method when determining that the spread should reduce to 15 per cent in 2020.[41]

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[40]   As many of the contracts struck in 2020 are not yet settled, the ERA has not considered the size of the nominal return received by Synergy in this year. Understanding Synergy's nominal return is complicated by the change in the margins Synergy used to calculate its standard product prices in 2020.

[41]   Public Utilities Office, 2019, *Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme,* pp. 11 to 14. (online) [accessed 12 July 2021].

> **The Deloitte method for calculating the maximum standard product spread**
>
> Deloitte based calculation of the maximum spread on the historical average price volatility in the Short Term Energy Market (STEM). This assumed the standard product market was illiquid so Synergy could not balance the sale of an electricity futures contract by purchasing a corresponding future contract, and instead would purchase electricity in the STEM to cover its obligations under futures contracts. Synergy's risk of making a profit or loss was dependent on the periodic average prices and their volatility in the STEM.
>
> Deloitte analysed STEM data from the beginning of 2011 to the end of 2015 and calculated the historical price volatility (or standard deviation) from the mean prices for each historical quarter, in each year across the 5-year period. Deloitte suggested allowing Synergy a 69 per cent (or one standard deviation) chance to profit from a standard product trade, given that a trader would expect a greater than 50 per cent chance of making a profit on any single trade in a competitive market. Using this approach, and after considering maximum spreads in other jurisdictions, the ERA recommended a maximum standard product spread of 10 per cent in its 2015 EGRC report.
>
> In 2019, when the Minister for Energy set the maximum spread to 15 per cent it used the Deloitte method with updated STEM data.

The ERA has revised the Deloitte method for this EGRC review. The ERA's new approach also considered the illiquidity of the standard products market. The ERA assumed that Synergy's wholesale business unit cannot close its trading position with a counterbalancing trade, and therefore, it must settle its buy or sell contract by selling or buying at the balancing market price to meet its obligations under the futures contracts it had traded.

Using this approach, the wholesale business unit's risk of making a profit or loss on a future trade depends on how accurately Synergy can forecast the average spot price during a contract period. The ERA's calculation of Synergy's historical forecasting error can thus be used to determine a maximum spread that would provide Synergy with a reasonable opportunity of profiting on a trade (a 69 per cent likelihood). The ERA has substituted Synergy's forecast error for historical price volatility in the STEM.[42]

Using this approach, the ERA has determined for:

- Quarterly products, a maximum spread of 10 per cent would provide Synergy with a 69 per cent chance of making a profit on possible trades.

- Calendar and financial year products, a maximum spread of 5 per cent would provide Synergy with a 69 per cent chance of making profit on possible trades.[43]

These results are detailed in Appendix 4.

The standard products regime was intended to impose pricing discipline on Synergy and expose its transfer price to competition. A smaller spread would give market participants a better indication of Synergy's forecast balancing price, which will improve the usefulness of standard product prices as a price discovery tool.

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[42] Public Utilities Office, 2019, *Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme,* p. 14. (online) [accessed 12 July 2021].

[43] Ibid. The State Government noted that a 69 per cent likelihood of making a profit on a trade was reasonable.

This will reduce the cost of hedging for market participants, providing the benefit of reduced costs to consumers. These benefits are likely to be enhanced if a narrower spread improves liquidity in the bilateral contract market.

The ERA is seeking feedback from market participants on the revised method for calculating the maximum spread and if it provides a useful basis for establishing a new maximum spread. The ERA is also interested in understanding what other factors it should consider when recommending a maximum spread, including how a revised spread is introduced to the market.

3.4.4   Conclusions and consultation

3.4.4.1   ERA analysis

Historically, there have been very few standard product buy transactions. Even during 2020, when the spread was reduced to 15 per cent, there were no buy transactions.

The maximum spread enabled Synergy to set standard product buy prices lower than suggested by Synergy's own margins that include an allowance for its cost of risk. Reducing the maximum spread to 15 per cent did not increase standard product buy prices to levels commensurate with Synergy's margins. On this basis the spread did not need to revert to 20 per cent at the beginning of 2021.

Based on the forward energy curve and margin information provided to the ERA the standard product spread could be reduced below 15 per cent as summarised in section 3.4.2.

However, this assumption is based on a retrospective review of Synergy's historic data. Synergy has not yet provided all the information on its margins requested by the ERA. Consequently, the recommended spread may be revised in the report for the Minister.

3.4.4.2   Implications for effectiveness of the scheme

The ERA's analysis shows that the maximum spread is unnecessarily high by allowing Synergy to include margins more than required to recover its costs. This makes the standard products regime less effective as it does not provide effective price discovery and it increases the cost of hedging in the market, which is eventually passed on to customers.

Retailers pass on the cost of hedging risk to contestable customers. Retailers that have to charge higher prices to supply wholesale electricity to customers are less able to compete with Synergy in the retail market. A reduced spread would increase the effectiveness of the regime, reducing the cost to retailers of hedging risk in contracts with Synergy and with other market participants.

If Synergy's wholesale prices are higher than necessary, costs are passed on to consumers, contrary to the WEM objective of minimising the long-term cost of electricity supplied to consumers.[44]

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[44]   Wholesale Electricity Market Rules (WA), 1 July 2021, Rules 1.2.1

Questions

1. What benefits do counterparties trading with Synergy anticipate would arise from changing the regulations to include lower maximum spreads for advertised standard products?

2. What costs and benefits does Synergy anticipate if the alternative spreads in section 3.4.3 are implemented?

3. What factors should inform the setting of a new maximum spread:

   a. the updated Deloitte method (see Appendix 5)

   b. the outcomes expected in a competitive market

   c. the risk to Synergy of offering standard products

   d. benchmarking with other jurisdictions

   e. any other factors?

4. How could a new maximum standard product spread by implemented to both minimise any additional risk to Synergy and increase the effectiveness of the standard products regime? This could be phasing in a lower spread over several years or reducing the minimum volumes of standard products available for the first year of a lower spread. For example lowering the total standard product volume for sale (150MW to 100MW). Can stakeholders suggest alternative options?

5. Are there any other factors the ERA should consider regarding the maximum standard product spread?

4. Other elements of the EGRC scheme

This section sets out commentary and questions on the remaining elements of the EGRC scheme including recommendations previously made by the ERA and the Minister for Energy's 2019 amendments.

The ERA invites comment from stakeholders on how the operation of these elements are contributing to the EGRC scheme's effectiveness.

4.1 Business segmentation

The EGRC scheme requires Synergy to prepare separate financial statements for each of its segmented business units and for these reports to be published by the Minister. [45]

The ERA's past reviews have found that Synergy's financial reports did not separate gas and electricity or contestable and non-contestable financial results. The reports varied in the information provided and the time periods covered. This limited the ability to scrutinise the revenues, costs and profits of each business unit's electricity activities and led to concern among other market participants about the possibility of cross-subsidisation and adverse effects on competition in the retail market. The ERA reported that this aspect of the scheme was not operating effectively because of a lack of detail in the regulations about the level of financial information required to be provided by Synergy and the need for the information to be presented consistently from year to year. [46]

Publishing details of the revenue, costs and profits of each business unit allows Synergy to demonstrate its compliance with the segregation and non-discrimination requirements of the scheme. Making segmented financial reports publicly available provides a level of transparency that gives market participants the confidence to trade with and compete with Synergy, despite its dominant position in the wholesale and retail markets.

Other jurisdictions require vertically integrated energy companies to publish detailed financial statements.

In the United Kingdom, since 2009, the six largest energy suppliers are required to produce independently audited annual consolidated segmental statements to show the costs, revenues and profits for the different segments of their generation and supply businesses. Ofgem – Great Britain's independent energy regulator – stated "this information increases transparency and understanding of the sector and supports consumer confidence around energy prices, costs and profits." [47]

To increase transparency, while responding to recent market changes that have reduced the market share of the six largest suppliers, Ofgem has proposed to expand the obligation to prepare consolidated segmental statements to more suppliers. By increasing transparency, this measure aims to encourage confidence and competition in the market.

The Electricity Authority in New Zealand is "considering whether mandating segmented retail profitability reporting specific to electricity would strengthen confidence in electricity

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[45] *Electricity Corporations (Electricity Generation and Retail Corporation) Regulations 2013* (WA), s 3, s 5-7.

[46] ERA, 2019, *Report to the Minister on the effectiveness of the Electricity Generation and Retail Corporation scheme 2017*, pp. 17-19, (online)

[47] OFGEM. 30 June 2021, *Final proposals and statutory consultation - Reviewing the Consolidated Segmental Statement*, paragraph 1.1, p. 1, (online)

markets."[48] In New Zealand, there is a statutory obligation for publicly listed, vertically integrated energy companies to provided segmented financial reports for their retail businesses. The Electricity Authority is consulting on whether to require vertically integrated energy suppliers to report on retail gross margins for all retail activity, all electricity activity and, within this, whether the electricity was generated internally or from other sources. Retail gross margins would be reported in nominal dollars and on a unit per MWh basis.[49]

When reviewing the ERA's past recommendations for changing Synergy's financial reporting requirements, the State Government stated "that the current structure of Synergy's financial reports may undermine the ERA's ability to investigate any concerns raised by other retailers, thereby undermining industry confidence."[50] The State Government suggested that, instead of changing Synergy's reporting requirements, the ERA could exercise its information-gathering powers to perform regulatory scrutiny and provide assurances to the industry regarding any anti-competitive behaviour.[51]

The challenge with implementing the State Government's suggestion is that the ERA is required to review the effectiveness of the operation of the EGRC scheme as it exists, not perform a financial audit function involving the regulation of accounts to check the accurate ringfencing of costs.

Even if the ERA were required to undertake a financial audit function, the reporting of any anti-competitive behaviour would occur many months after the behaviour happened. The Minister amended the EGRC scheme to reduce the frequency of the ERA's reviews from one year to two years. Therefore, if the ERA obtained detailed financial statements confidentially from Synergy, the ERA's analysis would be published in its two-yearly report to the Minister. This would provide market participants with information on the interaction between Synergy's segmented business units and between its contestable and non-contestable parts, up to two years after interactions occurred.

The ERA is interested in stakeholders' views on its previous recommendation for the regulations to require Synergy to provide more detailed period financial reports.

Questions

6. If Synergy were obliged to publish more detailed periodic financial reports, including separate financial results for its contestable and non-contestable customers, and gas and electricity:

   a. How would market participants use this information?

   b. Would having the information improve the effectiveness of the EGRC scheme? If so, how?

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[48] Electricity Authority, 2021, *Internal transfer prices and segmented profitability reporting: Consultation paper*, p. 21. (online)

[49] Ibid. p. 22.

[50] Public Utilities Office, 2019, *Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme*, p. 22, (online)

[51] Ibid.

4.2   Transfer pricing

Synergy's foundation transfer price mechanism covers the terms and conditions applying to the supply of electricity to foundation customers. Foundation customers are Synergy's customers at the time of the merger who have not moved to another supplier. The details of the original foundation transfer pricing mechanism were captured in the EGRC regulations. When Synergy changed this mechanism in 2017, it provided the Minister for Energy with a copy, but there was no requirement for Synergy to publish the new mechanism.

In 2017, the ERA recommended that Synergy should publish its foundation transfer price and the method it uses to calculate this price.[52] In 2019, the Minister for Energy amended the regulations to require Synergy to publish on its website the foundation transfer price mechanism and any replacements to the mechanism.[53] At the same time, the Minister updated the Segregation and Transfer Pricing Guidelines with a reference to the current mechanism.[54]

The State Government disagreed with the ERA's recommendation to publish Synergy's foundation transfer price and stated:

> The Public Utilities Office notes that the Second Reading Speech for the Electricity Corporations Amendment Bill 2013 states: 'In order to ensure transparency of the ring-fencing arrangements, the outcome of compliance and audit reports will be made publicly available. The high-level transfer pricing mechanism will likely also be made publicly available, although not the transfer price itself'. The publication of the replacement foundation transfer price mechanism, but not the foundation transfer price itself, would therefore be consistent with the original intent of the Scheme.[55]

In New Zealand, some electricity generators, that like Synergy are also retailers, voluntarily publish internal transfer prices. The New Zealand Electricity Authority believes that voluntary disclosure is insufficient for confidence in the market and is considering mandating public disclosure of internal transfer prices by these larger market participants.

> The Authority nevertheless recognises the benefits of requiring ITP [internal transfer price] disclosures by larger generator-retailers may contribute to other stakeholders levels of trust and confidence in the competitive operation of wholesale and retail electricity markets. Consumers benefit from increased trust and confidence in the relevant markets through increased competition – driving more efficient prices and innovative offerings.[56]

Public consultation on the Electricity Authority's proposal closed on 18 May 2021. The ERA will consider the Electricity Authority's decision on greater transparency of internal transfer prices in its report to the Minister.

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[52]   ERA, 2017, 2016 Report to the Minister for Energy on the effectiveness of the EGRC Regulatory Scheme, Pp. 16-17, (online)

[53]   The Foundation Transfer Price Mechanism is available on Synergy's website (online) [accessed 12 July 2021].

[54]   Public Utilities Office, 2019, Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme, p. vi, (online)

[55]   Ibid p. 16

[56]   Electricity Authority, 2021, Internal transfer prices and segmented profitability reporting: Consultation paper, p. I, (online)

4.3   Non-discrimination requirements

The EGRC requires Synergy to establish transfer pricing arrangements for trading wholesale electricity supplies between its wholesale and retail business units. Transfer pricing arrangements are intended to ensure internal pricing and sales are at arm's length, similar to trading arrangements between independent parties. This non-discrimination requirement applies to all of Synergy's wholesale supply arrangements, except the foundation transfer pricing mechanism.

In its 2017 scheme review, the ERA identified the opportunity for the wholesale business unit to discount prices for the retail business unit's contestable foundation customers. Such behaviour would maintain Synergy's retail customer base and also reduce the ability of third-party retailers to compete for foundation customers. Foundation customers are roughly one third of the volumes supplied by the wholesale business unit to the retail business unit.

The ERA's previous recommendation was for the non-discrimination requirements of the EGRC scheme be extended to the foundation transfer pricing mechanism. [57]

The State Government's 2019 changes to the scheme were in response to the ERA's 2016 review and not the 2017 review, published in early 2019. Consequently, the regulations do not prohibit Synergy from providing discounts to foundation customers, including those with large flat loads that are less costly to supply. The ERA is interested in understanding any concerns stakeholders may have about the non-discrimination requirements of the scheme not extending to the foundation transfer price mechanism.

4.4   Standard products

Section 3 explains how the pricing of standard products does not contribute to the effectiveness of the EGRC scheme. The following sections consider other aspects of the standard product arrangements.

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[57]   ERA, 2019, *Report to the Minister on the effectiveness of the Electricity Generation and Retail Corporation scheme 2017*, Pp. 15-16, ([online](#))

4.4.1 Terms and conditions

In submissions to previous EGRC reviews, market participants have stated that the credit requirements and force majeure provisions in standard product terms and conditions were the main barriers to trade in standard products.

To trade in standard products, a participant must first become an approved counter-party to Synergy, which requires the participant to provide its last two audited financial year statements. Synergy's Wholesale Energy Credit Policy then requires that a formal credit assessment is performed for every new counter-party. Synergy can also conduct a formal credit assessment at least every 12 months and may conduct credit assessments at its discretion where there are indications of a change in a counter-party's financial health. If standard product terms are a barrier, there is little opportunity for independent retailers to procure wholesale supplies and source hedge contracts, which can reduce competition.

In its response to previous reviews, Synergy considered that the standard product credit requirements did not prevent customers from purchasing standard products. Synergy noted that the credit requirements were a function of board-approved policies and were intended to protect Synergy from the risk of counterparty default.[58] In its 2019 report, the State Government agreed with Synergy and stated:

> The Public Utilities Office considers that Synergy's Wholesale Energy Credit Policy is properly targeted, with criteria indicating that credit ratings are only required when net exposure is likely to exceed $100,000 at any point in time. Given the information available, the Public Utilities Office does not consider that there is sufficient evidence that Synergy's credit requirements for Standard Product transactions are unreasonable. Accordingly, no regulatory amendments to enforce changes to Synergy's credit requirements are proposed.[59]

Questions

9. The ERA would like to understand if market participants are choosing not to enter into standard product contracts because of the associated credit requirements. If so, how do participants suggest Synergy's standard product credit requirements should be altered?

Concern about the asymmetry in standard product force majeure provisions was raised by stakeholders as part of the ERA's 2017 EGRC review. When Synergy is the seller in a standard product transaction, interruption to supply from any one of a list of generating units triggers the force majeure clause, and suspension of Synergy's obligations.[60] If supply from one of the generation units is interrupted, then it is likely that balancing prices will rise as a result as more expensive generating units are dispatched to meet demand. The counter-party is then exposed to the risk of high balancing prices even though it had previously entered into a contract to hedge against this risk, reducing the use of standard products as a risk management tool.

Given the extent of Synergy's portfolio and the low volume of standard product trades, the likelihood that Synergy is unable to supply electricity from another generating unit to honour the standard product contract is low. The ERA has previously recommended that the force

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[58] The ERA has requested information from Synergy on the number and magnitude of defaults on standard product contracts and will consider this for the final report.

[59] Public Utilities Office, 2019, Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme, p. 18, (online)

[60] The list of generation units includes Collie, four Muja units, both Bluewaters generators and NewGen Kwinana.

majeure clause in Synergy's standard product contracts should be less conservative and more symmetric.

The State Government noted that force majeure events, by definition, occur rarely, and most of the wholesale supply price rises that retailers would be hedging against do not occur due to force majeure events. To date, Synergy has not used the force majeure provisions to relieve its obligations under any standard product contract. The State Government concluded:

> If the Specified Plant clause was removed to make the Force Majeure provisions symmetric, only allowing the seller in a Standard Product transaction to suspend its obligations if a Force Majeure Event disrupted 20% of its aggregate generation capacity, then the Force Majeure provisions would provide negligible coverage to Synergy. This is because of the low likelihood of either a Force Majeure Event completely curtailing Muja C and Muja D simultaneously, or Force Majeure Events simultaneously disrupting generating units in multiple geographical locations. If the percentage of generation required to be affected was reduced from 20% there is the risk of smaller generators being able to use the Force Majeure provisions when there is an outage of a relatively trivial amount of energy. The Public Utilities Office therefore considers that removing the Specified Plant clause would be impractical.[61]

The State Government acknowledged that one plant in the specified list, the Worsley Cogeneration plant, had been deregistered.[62] The Minister for Energy has since announced the closure of the Muja C units in October 2022. As the number of plants on the specified list reduces, the risk that interruption from one of the specified plants will trigger the force majeure clause increases. The State Government's preferred approach was to "monitor the composition of Synergy's generating portfolio going forward, and not take any immediate action to amend the list of Specified Plant in the Wholesale Arrangements."[63]

Questions

10. Although Synergy has never used the force majeure clause to suspend its obligations under a standard product transaction, is the existence of the clause still a concern for participants?

11. If the force majeure clause were to be amended, what changes would participants recommend and why? Is the list of generation units still suitable? If not, then why not?

4.4.2   Specifications

In its 2016 review, the ERA noted that standard products with different specifications may better meet the diverse needs of WEM participants. These specifications may include different volumes and contract terms (both longer and shorter than a quarter) varying definitions of peak periods and flexible commencements dates.[64]

In response to the ERA's review, the State Government noted that "more flexible product offerings may provide market benefits."[65] However, the State Government decided to not make

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[61] Public Utilities Office, 2019, Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme, p. 21, (online)

[62] Ibid.

[63] Ibid.

[64] ERA, 2016, *Report to the Minister on the effectiveness of the Electricity Generation and Retail Corporation scheme 2016*, p. 23 (online)

[65] Public Utilities Office, 2019, *Electricity Generation and Retail Corporation Regulatory Scheme – Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme*, p. 19, (online)

any regulatory changes to standard product offerings as market participants can request customised products from Synergy when the standard products do not meet their requirements.

Although standard product transactions have increased since 2016, informal conversations with retailers in 2021 indicate a preference for standard products over customised products and a need for different standard product types to better meet the changing market dynamics.

Retailers advised they would find value in standard products which cover peak afternoon periods, when balancing prices typically rise as rooftop solar generation reduces, and which are available three years into the future. These would provide retailers greater certainty and simplify the process to secure supply for their customers.

Market participants trade in standard and customised products to meet the needs of retail customers who vary in the quantity of electricity required, the times of day electricity is consumed and the level of certainty they require about future prices. Retail customers, particularly those with large loads, use the standard product prices to benchmark their own contracts with Synergy and other retailers.

When first considered, standard products were expected to offer three-year terms.

> We are going to set up a bulletin board that states from Synergy and Verve Energy— the new Synergy—the price of the standard products going out in the short to medium term, six months and three years. That bulletin board will allow price transparency to the overall market.[66]

Questions

12. What specifications would market participants find useful in a new standard product?

13. The ERA is interested in hearing from Synergy if there are any costs and benefits to Synergy of making longer term standard products available?

4.5   Prevailing circumstances

The ERA will be monitoring developments in the Western Australian and Commonwealth jurisdictions as it finalises this review.

At the Commonwealth level, the *Treasury Laws Amendment (Prohibiting Energy Market Misconduct) Act 2019 (Cth)*, amended the *Competition and Consumer Act 2010 (Cth)* and these amendments took effect on 10 June 2020. The amendments prohibit three types of conduct by corporations in the electricity industry.[67] These are summarised in Appendix 2 along with detail on the interaction of the *Competition and Consumer Act 2010 (Cth)* amendments with the EGRC regulatory scheme.

The Commonwealth amendments apply to Western Australia and are not a replacement for the EGRC scheme. The amendment covers just three areas of behaviour, while the scheme is more detailed and covers a broader range of Synergy's activities. There may be

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[66]   Western Australia, Parliamentary Debates, Legislative Assembly, Electricity Corporations Amendment Bill 2013: 12 November 2013, 34 (Hon Dr Mike Nahan MLA). (online)

[67]   Australian Competition and Consumer Commission, 'Inquiry into the National Electricity Market September 2020 report' p. 8 (online) [accessed 12 July 2021].

circumstances where Synergy may be compliant with the EGRC scheme but in breach of the CCA amendments.

The Australian Competition and Consumer Commission (ACCC) is holding an inquiry into the prices, profits and margins in the supply of electricity in the National Electricity Market. [68] While the WEM is outside the scope of the ACCC's inquiry, findings from the inquiry may be relevant to understanding the effectiveness of the EGRC regulatory scheme.

Questions

14. What aspect of the new Commonwealth legislation or lessons from the ACCC inquiry need to be considered in the ERA's report to the Minister?

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[68] Ibid.

Appendix 1 **Overview of the EGRC Regulatory Scheme**

The requirements of the Electricity Generation and Retail Corporation (EGRC) Regulatory Scheme are set out in three main legislative documents:

- The Electricity Generation and Retail Corporation Regulations 2013 (regulations).[69]
- The Segregation and Transfer Pricing Guidelines 2013 (Segregation and Transfer Pricing Guidelines).[70]
- The Electricity (Standard Products) Wholesale Arrangements 2014 (Standard Product Arrangements).[71]

The regulations and the Segregation and Transfer Pricing Guidelines came into effect on 1 January 2014, whilst the Standard Product Arrangements were gazetted on 19 May 2014 under section 38(1) of the Electricity Corporations Act 2005 (WA) and s26(1) of the regulations. The Segregation and Transfer Pricing Amendment Instrument 2019 amended the regulations in July 2019.[72]

The three documents variously contribute to the EGRC Regulatory Scheme segregation and wholesale trading requirements and the compliance regime, as set out below.

Segregation requirements

Division of Synergy's operations into segments

The regulations require that Synergy divides its operations into the following:

- A Generation Business Unit (GBU), responsible for operations involving the construction or operation of generating works.
- A Wholesale Business Unit (WBU), responsible for the wholesale acquisition or supply of electricity and the acquisition or supply of wholesale products, including pricing.
- A Retail Business Unit (RBU), responsible for the pricing, sale, and marketing of electricity to customers served by the SWIS.[73]
- A shared services operations business unit.[74]
- Any other segment(s) approved by the Minister.

Synergy is required to prepare separate statements of financial performance for each business unit, on a quarterly basis and in the annual financial report.

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[69] Electricity Corporations (Electricity Generation and Retail Corporation) Regulations 2013 (WA) (online).

[70] Segregation and Transfer Pricing Guidelines 2013, Western Australia, Western Australian Government Gazette, No 243, 30 December 2013, 6525 (online).

[71] Electricity (Standard Products) Wholesale Arrangements 2014, Western Australia, Western Australian Government Gazette, No 73, 19 May 2014, 1577 (online).

[72] Segregation and Transfer Pricing Amendment Instrument 2019, Western Australia, Western Australian Government Gazette, No 111, 23 July 2019, (online)

[73] The SWIS includes the interconnected transmission and distribution systems, generating works and associated works, located in the South West of the State and extending generally between Kalbarri, Albany and Kalgoorlie.

[74] This unit handles operations relating to corporate planning and strategy, organisational development, accounting, financial and legal matters, human resources, information technology, regulations and compliance, communications, billing, and record keeping. It is also responsible for any other operations undertaken in connection with two or more business units, excluding generation operations, wholesale operations and retail operations.

Other segregation obligations

The regulations also impose segregation obligations relating to ring fencing and restrictions on information flows between the business segments, which require that:

- Retail restricted information must not be shown to retail staff and generation restricted information must not be shown to generation staff.[75,76]

- Synergy must develop, implement, and maintain controls that limit access to IT systems to ensure compliance with disclosure provisions.

- Staff who receive access to restricted information undergo training on the obligations imposed on Synergy at least once a year.

- Wholesale staff are physically separated from generation and retail staff in a secure location.

- Management roles are separated between the retail, wholesale, and generation business units.

Wholesale trading arrangements

The regulations set out the requirements for Synergy's differing wholesale supply arrangements. There are two internal transfer arrangements for supply to Synergy's own RBU, where:

- The WBU provides a wholesale supply of electricity to the RBU for retail supply to foundation customers. Synergy does this through its Internal Synergy Wholesale Arrangement (ISWA).[77]

- The WBU provides a wholesale supply of electricity to the RBU for retail supply to new contestable customers. Synergy does this through its New Load Wholesale Arrangement (NLWA).[78]

The Segregation and Transfer Pricing Guidelines (sections 4 and 5) impose obligations on Synergy's RBU when submitting foundation and new supply load forecasts. Section 4 also specifies that the RBU must not supply to the WBU, and section 5 details the records that Synergy must keep, and how variances should be settled.

Additionally, the regulations set out the requirements for the arrangements for a wholesale supply from Synergy to third parties, where:

- The WBU provides a wholesale supply of electricity as a customised product (tailored product) to the RBU or another retail or generation competitor. Synergy does this through its Bilateral Trade Agreement.

- The WBU provides a wholesale supply of electricity as a standard product to other retail or generation competitors or receives a wholesale supply of electricity as a standard

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[75] Retail restricted information is defined as information relating to a retail competitor that is obtained by or provided to wholesale staff during the conduct of wholesale business and might reasonably be expected to materially adversely affect the commercial interests of the retail competitor if disclosed to retail staff.

[76] Generation restricted information is defined as information relating to a generation competitor that is obtained by or provided to wholesale staff during the conduct of wholesale business and might reasonably be expected to materially adversely affect the commercial interests of the generation competitor if disclosed to generation staff.

[77] Foundation customers are contestable and non-contestable customers of Synergy's from prior to the merger.

[78] A new contestable customer arrangement is an arrangement between Synergy and a contestable customer that imposes a legal obligation on Synergy to retail electricity to the contestable customer and becomes legally binding on Synergy after the merger time.

product from other generation competitors. Synergy does this through its Bilateral Trade Agreement for Electricity (Standard Products).

The sections below explains each arrangement in more detail.

Internal Synergy Wholesale Arrangement

Regulations 9(1) and (2) require that Synergy has a written arrangement in place before any supply transaction occurs between the WBU and the RBU for a retail supply of electricity to a customer other than a new contestable customer. This written arrangement must:

- Comply with the segregation and wholesale arrangements.

- Say that the transfer price under this arrangement is the foundation transfer price.

To address this requirement, Synergy implemented the Internal Synergy Wholesale Arrangement (ISWA). The ISWA is referred to as the Foundation Transfer Price Mechanism (FTPM) in regulation 11(1) and sets out how the foundation transfer price is determined.[79,80] Synergy is able to prepare revisions to or replace the FTPM under regulation 11.

Original Foundation Transfer Pricing Mechanism

The regulations required that Synergy prepare the original FTPM and provide it to the Minister, at which time it came into force and remained in force until 30 June 2017. Under the Segregation and Transfer Pricing Guidelines, the original foundation transfer price mechanism (at the time of the merger) was required to:

- Establish terms and conditions to apply to supply transactions for the purposes of retail supply of the foundation load.[81]

- Establish a procedure that is consistent with the procedure for the RBU making foundation load trading interval forecasts in respect of the foundation load in a particular trading interval.

- Provide that the WBU may supply electricity to the RBU only for the purposes of retail supply of the foundation load, in accordance with a foundation load trading interval forecast.

- Provide for a foundation transfer price for electricity (in $/MWh) in a trading interval that is consistent with the modelled cost of electricity to the then Electricity Retail Corporation in that trading interval, based on:

    - existing contracts for the acquisition of electricity by the Electricity Retail Corporation, taking into account the terms and conditions of these contracts and including contracts with the Electricity Generation Corporation, and

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[79] The FTPM is published on Synergy's Standard Products Homepage (online)

[80] According to the Merger Implementation Group, the foundation transfer price mechanism covers franchise tariffs, contestable tariffs, and existing contestable contracts up to their expiry. This includes contracts signed prior to 1 January 2014, where supply had commenced; contracts signed prior to 1 January 2014, where supply had not yet commenced; formal contract offers made by Synergy prior to 1 January 2014, which the customer accepted prior to 1 April 2014; and any contractual options contained within the aforementioned agreements.

[81] In respect of a period, the foundation load is the aggregate quantity of electricity in MWh consumed during that period by the foundation customers.

- information contained in the Mid-Year Review prepared by the Electricity Retail Corporation in respect of the financial years ending in each of the calendar years 2013 to 2017.

- Provide a procedure to apply in wholesale force majeure events.

The first replacement foundation transfer price mechanism

Regulation 11(3) requires Synergy to prepare a replacement foundation transfer price mechanism and provide it to the Minister at least six months before the day on which the original foundation transfer price mechanism, or any replacement mechanism, is due to expire. This mechanism must comply with each applicable provision and comes into force on the day after expiry of the original foundation mechanism, remaining in place for a period of three years or longer if approved by the Minister.

Consistent with this, Synergy provided the Minister with the first replacement FTPM that was in place from July 2017 to June 2020. According to Synergy, the replacement mechanism provided for a foundation transfer price for electricity (in $/MWh in a trading interval) that:

- Was determined in a transparent manner between the RBU and the WBU.

- Reflected the RBU and WBU's view of a forecast market price for electricity (such forecast also being used by the WBU to determine the price for Standard Products).

Under the first replacement foundation transfer price mechanism, the on-peak and off-peak energy prices, were determined by applying an energy forward curve, which is Synergy's forecast of the future market energy price for each hour in each trading day in the period covered by the curve.

To calculate the applicable peak price the hourly forward energy price represented on the applicable energy forward curve was multiplied by the forecast load for the foundation customers in the relevant on-peak trading interval.[82] The product for each trading interval was then added together. This amount was then divided by the total forecast load for the foundation customers in all on-peak trading intervals occurring in the relevant month. This gave an average price for the month but also gave more weight to the price in the on-peak trading intervals where the load was higher. A similar approach was then used to determine the off-peak price.

The first replacement foundation transfer price mechanism specified that Synergy employs the same energy forward curve to calculate the additional transfer price. Therefore, the energy forward curve was used in the calculation of the standard product price, the foundation transfer price, and the additional transfer price. Given the non-discrimination requirements, the energy forward curve must also be used to calculate the customised product prices.

Later foundation transfer pricing mechanisms

Further replacement FTPM's came into effect for the periods 1 July 2020 to 10 August 2020, and 11 August 2020 to June 2023. It does not appear that any substantial changes were made to the first replacement FTPM.

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[82] For each on-peak trading interval in a month in the term (the period covered by the ISWA) or remainder of the term, as applicable.

New Load Wholesale Arrangement

Regulations 9(3) and 9(4) require that before the WBU and the RBU conduct a supply transaction for a retail supply of electricity to a new contestable customer, Synergy must have one or more written arrangements in place to apply to supply transactions of that kind. The written arrangements must include a mechanism for determining the transfer price, referred to as an 'additional transfer price mechanism' under the Segregation and Transfer Pricing Guidelines. Synergy implemented the New Load Wholesale Arrangement to address this requirement.

Bilateral Trade Agreements with Third Parties

Third-party retailers and generators can contract for wholesale supplies of electricity from the WBU through customised or standard products. Customised products are tailored to suit the requirements of the third party, and can include the bilateral trade of electricity, capacity credits or contracts for differences. In contrast, standard products are fixed quantities of energy that Synergy must advertise for sale and purchase at published prices.

The Standard Product Arrangements specify the products Synergy is required to offer and the minimum quantities that must be made available. Synergy must offer both flat and peak standard products on a quarterly and annual basis. Synergy is required to offer a minimum 150 MW for sale and 100 MW for purchase, across all product types and durations. Standard products must be offered in units of 1 MW (0.5 MWh per trading interval) and Synergy must offer to buy and sell 5 MW per week.

The Standard Product Arrangements specify the percentage spread between the buy and sell price. A maximum buy-sell spread of 25 per cent applied from 1 July 2014 to 31 December 2015. On 1 January 2015, the maximum spread reduced to 20 per cent and remained in place until the end of 2019. The maximum spread was then reduced to 15 per cent for the 2020 calendar year, reverting back to 20 per cent at the start of 2021.

Synergy is required to publish details of historic prices and update the details on each occasion that it enters into a transaction. Additionally, on a monthly basis, Synergy must publish and update information on price trends for transactions in standard products.

Synergy is also required to develop and publish details of its procedures for entering into a standard product agreement with an approved counterparty. A number of publicly available procedures have been produced by Synergy to address this requirement, including the:

- Standard Product Agreement, which outlines the process for entering into a standard product agreement and requires that, to transact in standard products, an interested party must (among other things) be a WEM market participant and an approved counterparty.

- Procedure for becoming an approved counterparty, which outlines the process that a party must comply with to become an approved counterparty to transact in standard products.

- Procedure for entering into transactions, dealing with limited availability and simultaneous offers.[83]

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83   Refer to Synergy's standard product homepage for access to these procedures. (online).

Details of the standard products offered by Synergy and standard product transactions are available on Synergy's website.[84] [85]

Regulation 9(6) requires that before any products transaction with third parties occur, Synergy must have one or more written arrangements in place that set out the terms and conditions that are to apply to those transactions. To address this requirement, Synergy has implemented two wholesale supply arrangements:

- the Master Bilateral Trade Agreement, which is used for trading in customised products.

- the Bilateral Trade Agreement for Electricity (Standard Products), which provides for trading in standard products, and addresses the requirements in the Electricity (Standard Products) Wholesale Arrangements 2014.[86]

Wholesaling obligations

Regulation 22 prohibits Synergy from:

- Discriminating between its RBU and competitors when offering wholesale supplies.

- Considering the financial interests of the RBU in determining the terms and conditions on which a wholesale supply of electricity is offered to retail or generation competitors.[87]

Regulation 23 requires Synergy to develop a policy for assessing the ability of a business to make payments for a wholesale supply of electricity, and for determining the terms and conditions for the wholesale supply of electricity is to be offered, taking into account its assessed ability. Synergy published a Wholesale Energy Credit Policy to address this requirement.[88]

Regulation 24 places obligations on Synergy in how it responds to a request for a wholesale supply of electricity from the RBU or a retail or generation competitor. Synergy must respond as soon as practicable to such requests and is required to prepare and maintain a written policy setting out standard processes for responding to these requests. Synergy has published a Wholesale Electricity Supply Policy to address this requirement.[89]

Synergy must ensure that the standard processes set out in the Wholesale Energy Credit Policy and the Electricity Supply Policy are not, having regard to all relevant circumstances, more favourable to the RBU than to a retail or a generation competitor, and Synergy must comply with both polices.

Synergy must keep records of each assessment of the ability of a retail business to make payments, each request for a wholesale supply of electricity, the response given to the request, and the documents or other material relied upon in giving the response. Synergy

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[84] Synergy, Historical prices. (online).

[85] Synergy, Transaction. (online).

[86] For the form of the agreement between the EGRC and an approved counterparty refer to the Bilateral Trade Agreement for Electricity (Standard Products) (online).

[87] In relation to this, the financial position of the RBU is to be taken to be the financial position of the EGRC, when assessing the ability of the RBU to make payments for wholesale supply, and the standard processes must not be more favourable to the RBU than to a retail or generation competitor.

[88] Synergy's Wholesale Energy Credit Policy sets out the credit processes to be followed for wholesale energy trading activities with approved counterparties, including activities between the WBU and the RBU (online). The objective of this policy is to safeguard Synergy's financial resources through implementing a credit risk management framework and credit risk control procedures, to minimize credit risk associated with Synergy's wholesale energy trading activities.

[89] Synergy, Wholesale Electricity Supply Policy. (online).

must also record its ability to offer a wholesale supply of electricity at the time of each request, taking into account any contracts, agreements or other supply arrangements entered into by Synergy.

Compliance

Under Part 4 of the regulations, the Auditor General is required to audit the scheme. The Auditor General is required to undertake:

- Financial year audits, which cover segmentation of Synergy's operations, financial administration, segregation arrangements, wholesaling obligations and wholesaling arrangements.
- A calendar year audit, which covers segregation obligations, such as disclosure of restricted information, information technology controls, training, separate work areas and separation of management roles.

The Auditor General must give the Minister a report on each of the required financial and calendar year audits and include the opinions formed, and details of any deficiency, failure or shortcoming in the matters referred to in the respective regulations.

The Auditor General must then give a copy of the reports to the Synergy Board and the ERA as soon as practical after it gives the report to the Minister. The Minister must table the report in each House of Parliament within 21 sitting days of that House, after the day on which the Minister receives the report. There are no provisions for the removal of commercially sensitive matters.

If the Auditor General forms an opinion that Synergy has not complied with one or more provisions of the scheme, the ERA must investigate the matter.

Following an investigation, the ERA is able to impose civil penalties for non-compliance with a limited number of regulations. Schedule 1 of the regulations specifies these regulations, with civil penalty provisions relating to:

- the division of Synergy's operations into segments
- the foundation transfer price mechanism
- disclosure of restricted information
- the maintenance of separate work areas
- discrimination between the RBU and competitors when offering wholesale supplies.

If the ERA considers that Synergy has contravened a civil penalty provision, it may give Synergy a warning notice. Alternatively, or in addition to a warning notice, the ERA may impose a civil penalty that does not exceed the maximum of $100 000 and, in addition, a daily amount of $20 000.

In determining the amount of a civil penalty, the ERA must have regard to all relevant matters including the nature and extent of the contravention and the circumstances in which the contravention took place. The ERA must credit civil penalties to the Consolidated Account. [90]

The ERA can apply to the Western Australian Electricity Review Board to order payment if Synergy does not pay the amount imposed. Additionally, the ERA can enforce an order of the

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[90] That is, they are returned to the Western Australian Treasury and not retained by the ERA.

Board by lodging a certified copy of it and an affidavit stating to what extent it has not been complied with in the Supreme Court.

Synergy trading risk policy

Synergy has developed a trading risk policy that is not required under the scheme but that applies to all employees undertaking trading activities, with the purpose of establishing effective and appropriate mechanisms for the governance and management of trading risk across Synergy. The requirements for how Synergy implements this policy are set out in a further policy document referred to as 'Synergy's Trading Risk Management Standard,' which documents such things as governance roles and responsibilities, risk metrics, limits and key risk indicators, the compliance framework, and reporting requirements.

Synergy ring fencing policy

Synergy has also developed an internal ring-fencing protocol that applies to all Synergy staff. The protocol is designed to ensure that information that relates to a competitor, that might reasonably be expected to materially adversely affect that competitor's commercial interests if the information were disclosed, is not passed to a business unit that could use that information to obtain an unfair advantage over its competitors. Among other things, this document defines restricted information and details such things as the consequences of a failure to comply, requirements for day-to-day conduct, reporting of suspected breaches and internal controls and compliance.

Appendix 2 **Amendments to the Competition and Consumer Act**

Legislative Developments – Competition and Consumer Act 2010 (Cth)

The Treasury Laws Amendment (Prohibiting Energy Market Misconduct) Act 2019 (Cth) amended the Competition and Consumer Act 2010 (Cth) (the Act) and came into effect on 10 June 2010.[91, 92]

The Act now includes a new Part XICA, which prohibits certain conduct by corporations in the electricity industry. The Commonwealth amendments apply to Western Australia and both the Act and relevant Western Australian laws apply in the Wholesale Electricity Market (WEM).

Part XICA (and related provisions of the Act) will expire on 1 January 2026, following the conclusion of the Australian Competition and Consumer Commission (ACCC)'s inquiry into the National Electricity Market (NEM).

In summary, Part XICA introduces three new prohibitions that apply to conduct by corporations in electricity markets:

1. Retail pricing prohibition (section 153E) – this requires retailers to pass on "sustained and substantial" reductions in costs to consumers. A corporation will contravene this section if it supplies, or offers to supply, electricity to small customers (which includes a residential customer or a small business customer) and fails to reasonably adjust the offered price to the price of the supplies, to reflect sustained and substantial reductions in its underlying cost of procuring electricity.

2. Electricity financial contract liquidity prohibition (section 153F) – this penalises generators that withhold electricity contracts for the purpose of substantially lessening market competition. A corporation, or related body corporate, will contravene this section if it generates electricity and does any of the following:

   - fails to offer electricity financial contracts or

   - limits or restricts its offers to enter into electricity financial contracts or

   - offers to enter into electricity financial contracts with the effect, or likely effect, of limiting or restricting those offers

   and it does so for the purpose of substantially lessening competition in any electricity market.

3. Wholesale prohibition and electricity spot markets (sections 153G and 153H) – this prohibits generators from manipulating the spot market, for example, by withholding supply to inflate prices. A corporation may contravene this section in a basic case or an aggravated case.

   - There will be a basic case contravention if a corporation bids or offers to supply electricity, or fails to bid or offer to supply electricity, in relation to an electricity spot

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91 Treasury Laws Amendment (Prohibiting Energy Market Misconduct) Act 2019 (online).

92 Competition and Consumer Act 2010 (online).

market, and the corporation does so fraudulently, dishonestly or in bad faith or for the purpose of manipulating prices in that electricity spot market.

- There will be an aggravated case contravention if a corporation bids or offers to supply electricity, or fails to bid or offer to supply electricity, in relation to an electricity spot market, and the corporation does so fraudulently, dishonestly or in bad faith and for the purpose of manipulating prices in that electricity spot market.

The purpose of the amendments is to create: "three prohibitions on conduct that, if engaged in by certain participants in the electricity markets, can be detrimental to competition or to consumer welfare".[93]

The ACCC is responsible for enforcing Part XICA. Information gathering powers have been granted to the Australian Energy Regulator to assist with the enforcement of Part XICA. In addition to existing remedies in the Act, the ACCC can enforce via a range of remedies including public warning notices, infringement notices, prohibited conduct notices and recommendations, contracting orders (in some circumstances) and, for the most egregious prohibited conduct, divestiture orders granted by the Federal Court.

Section 153C provides for the interpretation of terms used in Part XICA. The following definitions are noted:

> electricity financial contract: a contract is an electricity financial contract if:
> - rights under the contract are derived from or relate to the price of electricity on an electricity spot market; and
> - the operator of that electricity spot market is not a party to the contract.
>
> electricity market means any of the following:
> - a market in relation to the supply of electricity;
> - a market for electricity financial contracts.
>
> electricity spot market means a spot market for the supply of electricity.

The ACCC's May 2020 guidelines state:[94]

> Part XICA applies nationwide, to both NEM and non-NEM regions. However, as Part XICA is intended to support the ACCC's Electricity Monitoring Inquiry across the NEM between 2018 and 2025, the examples that have been provided in these Guidelines are of conduct arising in parts of Australia that are connected to the NEM. Western Australia and the Northern Territory are not connected to the NEM and the ACCC's view is that Part XICA currently only has limited potential application in those jurisdictions. The ACCC's approach to enforcement and compliance will be focused on conduct arising in the NEM, although the ACCC may investigate if there are regulatory changes or the ACCC becomes aware of conduct in non-NEM regions that give rise to concerns under Part XICA. These Guidelines will be updated if the ACCC's general approach to non-NEM regions changes.

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[93] Treasury Laws Amendment (Prohibiting Energy Market Misconduct) Bill 2019 Explanatory Memorandum, para 2.5 p. 11 (online)

[94] ACCC, Guidelines on Part XICA—Prohibited conduct in the energy market", para 1.6 (online)

Appendix 3 **Competition Analysis**

Wholesale competition

Figure 3 shows the generation market share by market participant in the wholesale electricity market. The line on the chart shows total generation by all market participants.

Figure 3: Electricity generation market share by market participant and total loss factor adjusted market generation
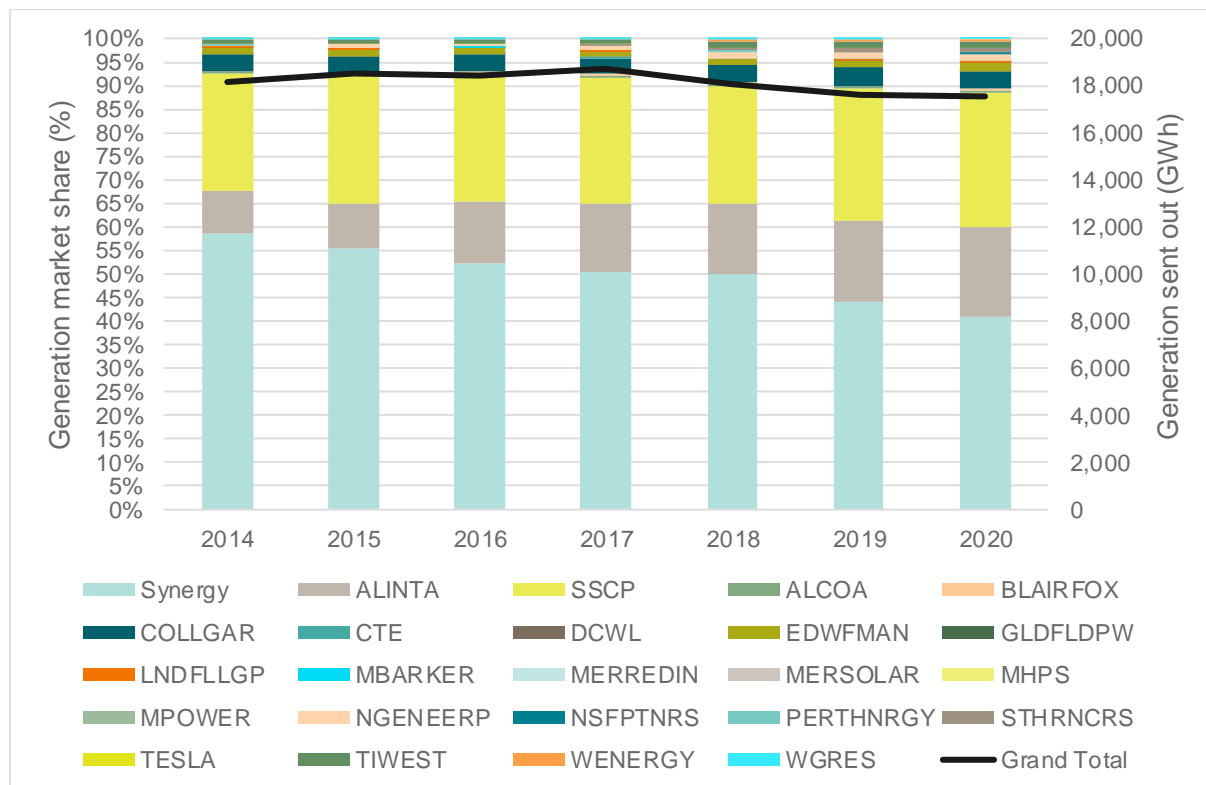

Total generation in the market has been declining year on year since 2016. Synergy's generation market share has also been declining and in 2018 it fell below 50 per cent. When the generation of the three largest generators (Synergy, Alinta, and Summit Southern Cross Power) is combined they have a substantial market share, with a modest downward trend over time.

Two measures are used to assess wholesale market concentration: the Herfindahl-Hirschman Index (HHI) and the Gini Index. The HHI is the sum of the squares of market share. The higher the HHI values, the higher the concentration in the market. A market with a HHI of less than 1500 is considered to be a competitive market. A market with a HHI of 1500 to 2500 is moderately concentrated and a HHI of 2500 or more is highly concentrated.

Figure 4 shows that, without the bilateral contracts, the wholesale market is on the border between a highly concentrated and moderately concentrated market. There is a downward trend in market concentration, which may in part be due to substitution of generation from the wholesale electricity market with rooftop solar generation, coupled with a shifting market share to less dominant entities. The hollowing of load in the middle of the day has reduced the opportunity for dispatch of inflexible thermal generators, like coal fired generators and may be

contributing to Synergy's reduced overall generation output. Synergy's coal fired generation has been falling, but there has been greater gas generator output. Synergy owns or has contracted, via long term power purchase agreements, the majority of coal fired generation in the market.

Figure 4 Herfindahl-Hirschman Index for the WEM, with and without bilateral contracts
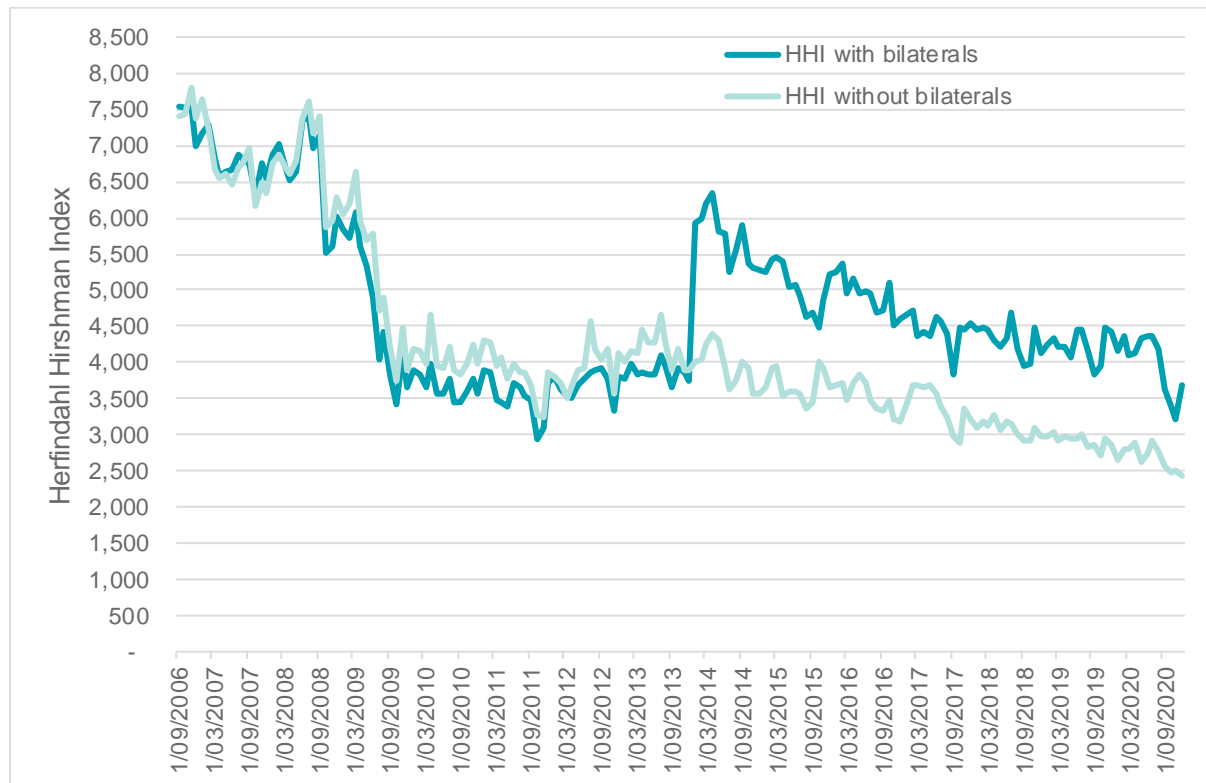

When the output from bilateral contracts is included, the market remains highly concentrated.[95] Around 90 per cent of generation has been consistently generated by three parties since the commencement of the balancing market in July 2012. These parties are Alinta Energy, Summit Southern Cross Power and Synergy. The HHI is less sensitive to changes in market share between large entities as it is to changes in market share from large to small entities.

Bilateral contracts do not need to be declared to the market operator. Of bilateral trades declared to the market operator through the settlement process, none of the suppliers of energy have involved parties that did not own generation assets.

The Gini Index is a measure of the unevenness or inequality between groups in a set of data. Originally developed to look at the wealth distribution in a population, it can be used to contextualise HHI. The Gini Index measures the relative area above and below the Lorentz curve relative to a perfectly even distribution of market share by market participant.

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[95]   Bilateral arrangements include those declared to the market and contracts known to the ERA settled outside the electricity market.

Figure 5: Lorentz curves for electricity generation in the wholesale electricity market
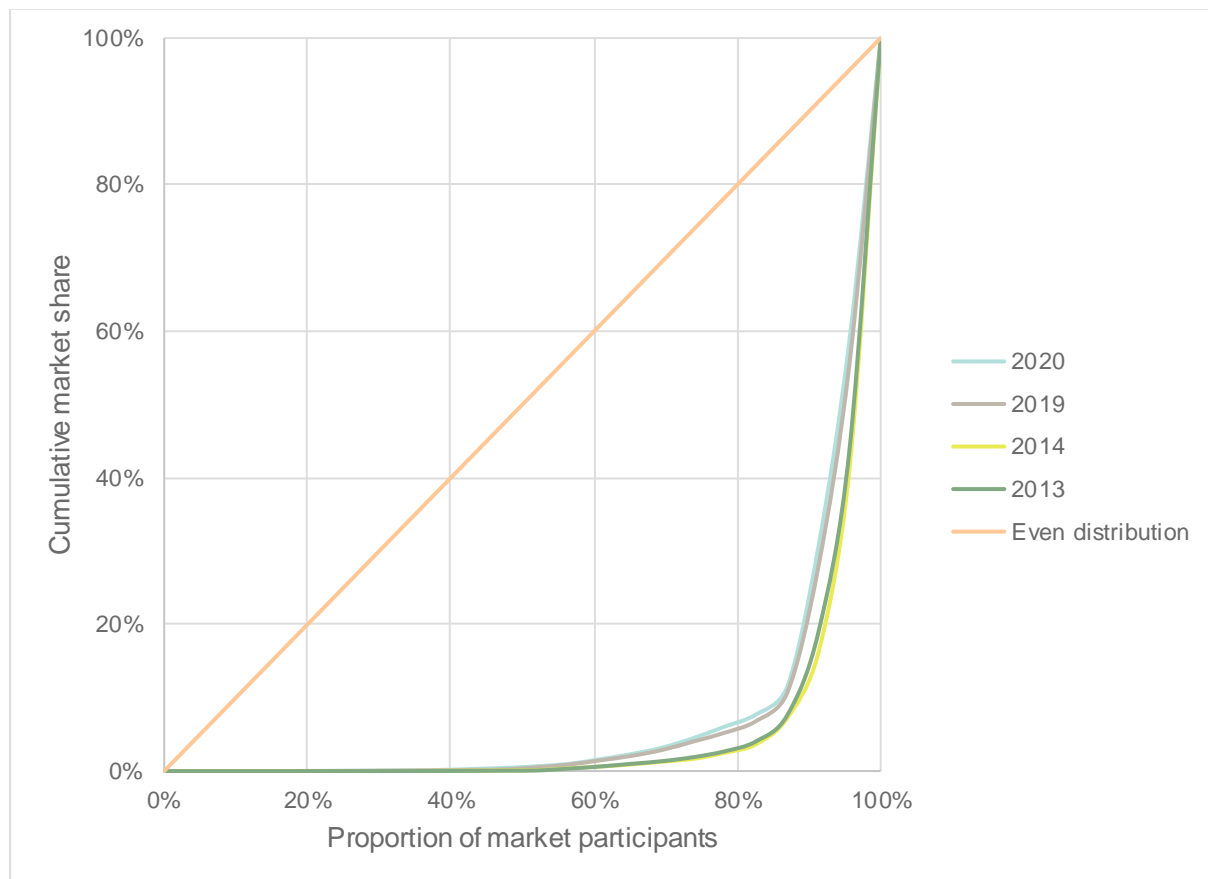
A Gini index of 0.5 indicates a perfectly even distribution of generation by market participants. The Gini index for generation in the WEM remains very high, at around 0.92 in 2020. By comparison, the Gini Index in 2014 was 0.937, indicating that there has only been a very marginal reduction in the distribution over time. While the HHI has been trending downwards since 2014, the overall distribution has shifted little. This suggests that the loss in wholesale market share (generation output) by Synergy has largely been captured by other dominant generators such as Summit Southern Cross Power or Alinta, as shown in Figure 3.

Retail competition

The retail market is divided into two separate markets: a retail monopoly 'franchise' market and a 'contestable' market open to retail competition. The franchise market consists of residential consumers and small businesses, with an annual consumption of 50MWh or less per year. The contestable market serves commercial and industrial consumers with an annual consumption exceeding 50MWh per year.

Despite declining demand for electricity, largely driven by substitution of market electricity with solar, and a declining share of generation, Synergy has maintained its overall retail market share (across both the franchise and contestable markets) since 2017. In isolation, the contestable market is just above the lower threshold of a moderately concentrated market with a HHI of around 1,500. Figure 6 shows the HHI for the contestable retail market and for the retail electricity market as a whole.

Figure 6: HHI total retail market and contestable retail market
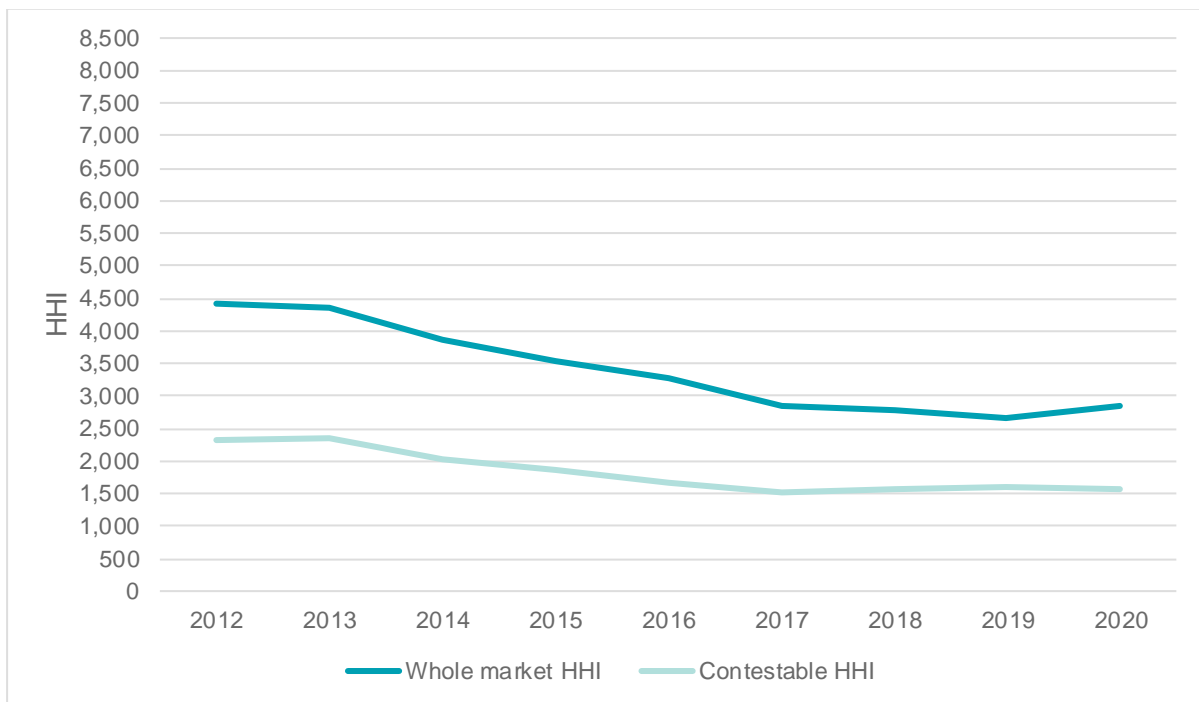
The HHI has remained largely unchanged since 2017. The whole retail market is highly concentrated (due to the monopolistic franchise market) but is on the threshold of a moderately concentrated market. Effectively though, it is two markets, one with a HHI of 10,000, being the monopoly, and the other sitting just within the moderately concentrated range.

The market's Lorentz curves have changed little since the commencement of the balancing markets shown in Figure 7.

Figure 7: Retail market Lorentz Curves
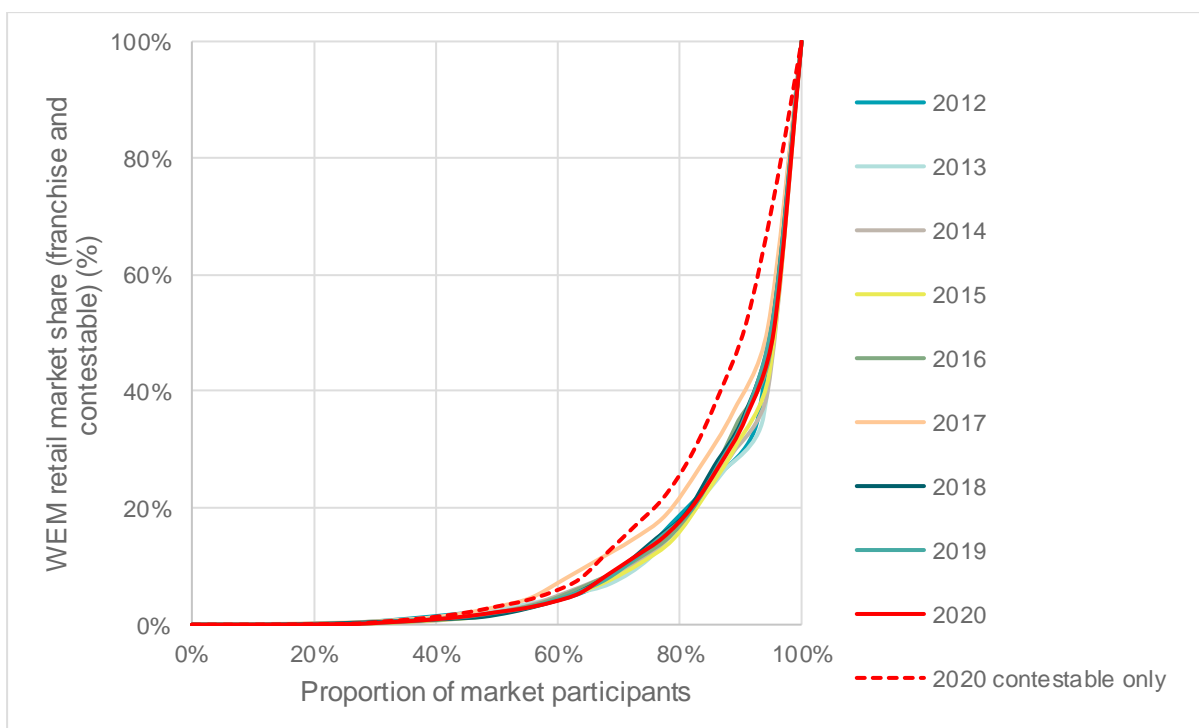
For the whole of the market, the Lorentz curves are marginally more evenly distributed, however, there are a larger number of smaller retailers with a collectively modest market share in the contestable retail market.

Status of competition in the WEM

The wholesale market (generation and associated bilateral trades) remains highly concentrated, and the Gini index is very high. The top three generators have substantively maintained their collective market share by owning much of the new generation capacity that has entered the market.

The retail market, where it has been exposed to competition, is trending towards an unconcentrated market with what appears to be a reasonable level of competition. Some of the larger contestable customers source their supply directly from the wholesale market, which may alter the competition indicators. The franchise market remains a monopoly. The number of active entities in the retail market remains unchanged since 2019 at 22.

Appendix 4 Analysis of actual and possible standard product transactions

As part of the current review of the effectiveness of the EGRC Regulatory Scheme, the ERA will consider the effectiveness of the standard product regime and the effect of the change in the maximum spread from 20 per cent to 15 per cent in 2020.

This appendix presents preliminary analyses using publicly available data to examine the actual standard product transactions and possible standard product transactions – that is, if transactions occurred for all advertised products at the advertised prices – to address the following question:

Given the actual and possible standard product transactions between 2014 and 2020, and the changes in the maximum spread, did Synergy have a reasonable[96] likelihood of making a profit on transactions from the published standard product prices?

Actual standard product transactions

All transactions since the June 2014 commencement of the standard product regime are available on Synergy's standard product website.[97],[98] These data were used to examine outcomes in the standard product market, including changes in the number and volume of standard product transactions over time.

Since June 2014, Synergy has traded 93 standard products, with a total volume of 379 MW. Out of all trades, 85 were sell products and 45 of these were flat products. Synergy traded only eight buy standard products, all of which were flat products, with a total volume of 40 MW. Five of these contracts were traded during 2015, two of which had quarterly supply periods and the rest had calendar year supply periods. Three were traded during 2019, all of which had quarterly supply periods.

Figure 8 depicts the count and volume of quarterly and annual sell products, traded in each year from 2014.

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[96]   In the ERA's Review of Synergy's Regulatory Scheme 2015, available (online) it considered that a spread that provided Synergy with a 69 percent chance of making a profit was 'reasonable'. Refer also to Appendix 5, section titled 'Review of previous method for setting the maximum spread' for discussion of this topic.

[97]   In 2014, when the EGRC Regulatory Scheme was first implemented, the maximum spread was set at 25 per cent. This was reduced to 20 per cent at the start of 2015 and remained at this level until 2020.

[98]   Synergy's standard products website, (online).

Figure 8.   Volume (top) and count (bottom) of quarterly and annual sell standard product transactions from 2014 to 2020
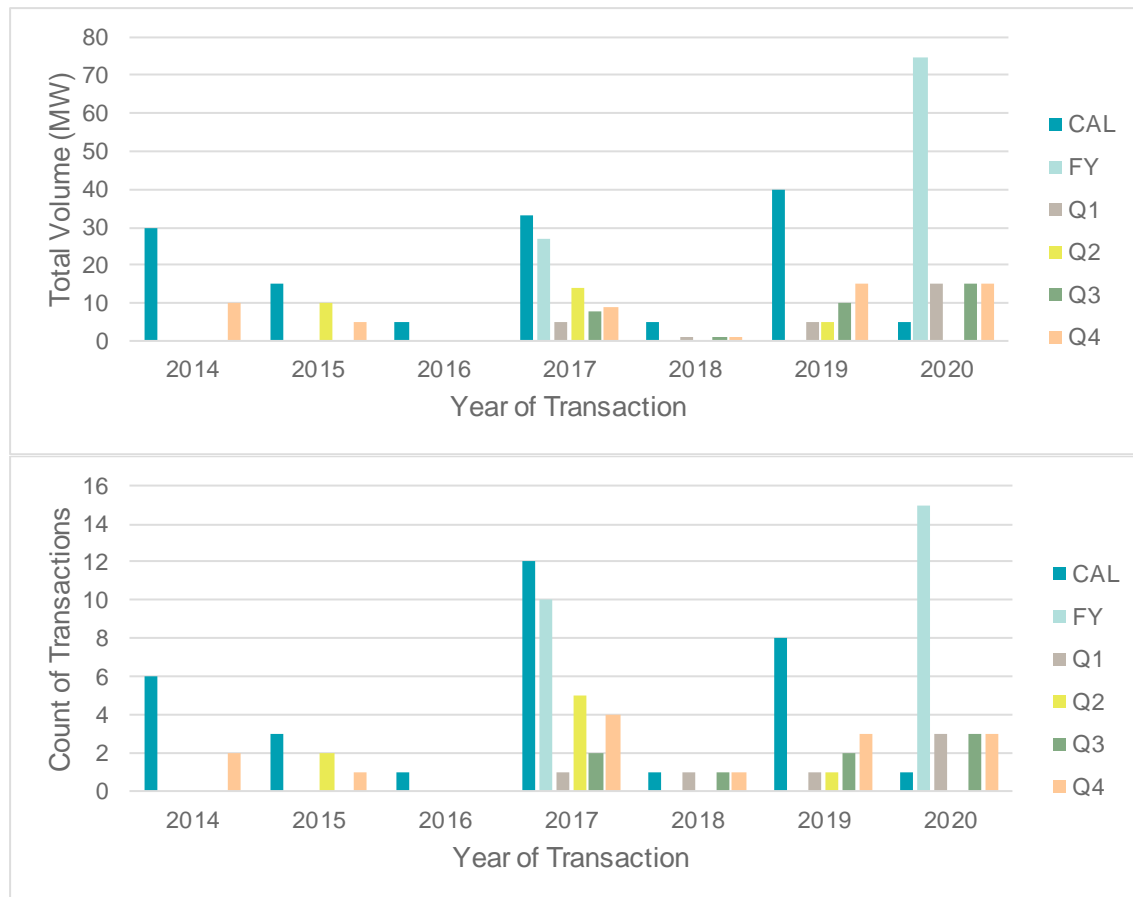
As shown in Figure 8, a large volume and number of calendar year sell transactions occurred in 2014, 2017 and 2019. However, the greatest volume and number of sell standard product transactions occurred in financial year products in 2020. All transactions entered into in 2020 were sell transactions.

Realised nominal returns on matured standard product transactions

Synergy would make a nominal profit on a sell standard product trade if the average balancing price during the contract period fell below the product price.[99] Similarly, Synergy would make a nominal profit on a buy standard product trade if the average balancing price over the contract period cleared above the buy standard product price.

To account for changes in electricity prices in the WEM over time, the analysis in this section measures profit or loss on standard product trades as a percentage of the product price, herein

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[99]   The settlement of standard product trades is subject to an escalation of the contract price based on the change in Consumer Price Index (CPI) between the contract date and the settlement date as specified in Synergy, Standard Products – CPI adjustment mechanism ([online](#)). Synergy makes a nominal profit on a sell standard product when the CPI adjusted contract price is greater than the average balancing price over the trading intervals covered by the product.

referred to as nominal return.[100] A positive nominal return reflects a nominal profit on a trade. A negative nominal return reflects a nominal loss on a trade. The percentage return reflects the magnitude of profit or loss in terms of the contract price.

A nominal return would be sufficient to compensate Synergy for the risk of selling or buying energy forward at a fixed price when it is equal to or greater than Synergy's required return. Synergy's required return would account for Synergy's cost of risk. Synergy would require a nominal return of more than zero per cent to cover for its risk of selling or buying energy forward at a fixed price.

Accordingly, the following analyses compare the prices at which products were sold to average balancing prices during the contract period to determine whether Synergy, on average, made a nominal profit on actual standard product trades between 2014 and 2020.

Figure 9, Figure 10, and Figure 11 show Synergy's nominal return on historical sell standard product transactions for quarterly and calendar year contracts matured by the end of 2020, and for financial year products matured by the end of June 2020.

Figure 9. **Histogram of nominal return on traded quarterly sell products matured by the end of 2020**

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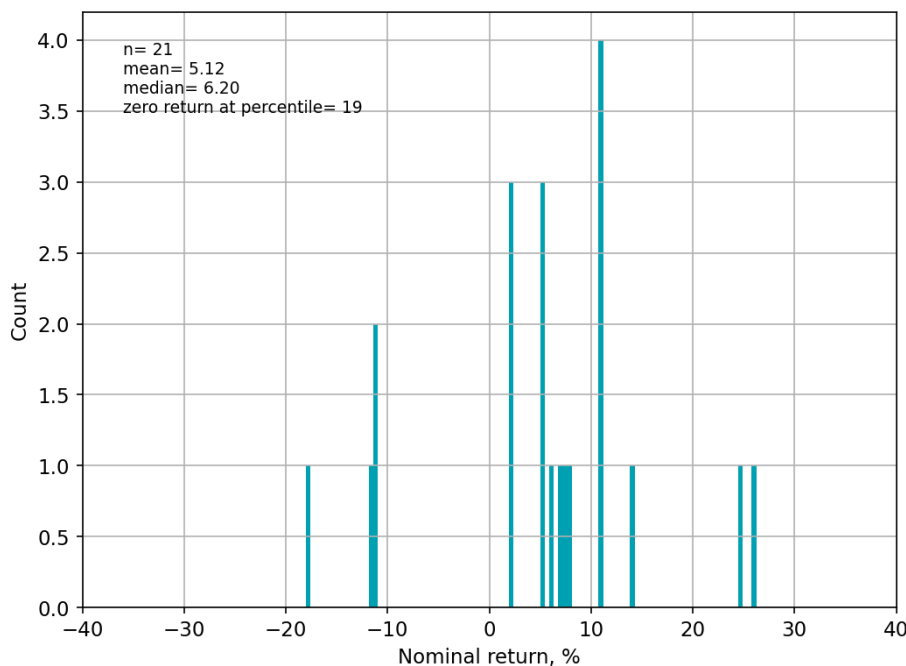
[100] A nominal return for a sell product is calculated as (CPI adjusted contract price – average balancing price during trading intervals covered by the contract)/CPI adjusted contract price. For buy products, the nominal return is calculated as the negative of the formula used for sell products. The settlement of a standard product contract is based on the CPI adjusted contract price. The calculation of nominal return is to account for the escalation of the contract price that was confirmed at the time of the transaction based on the CPI adjustment mechanism specified for standard products.

Figure 10.   Histogram of nominal return on traded financial year sell products matured by the end of financial year 2019/2020
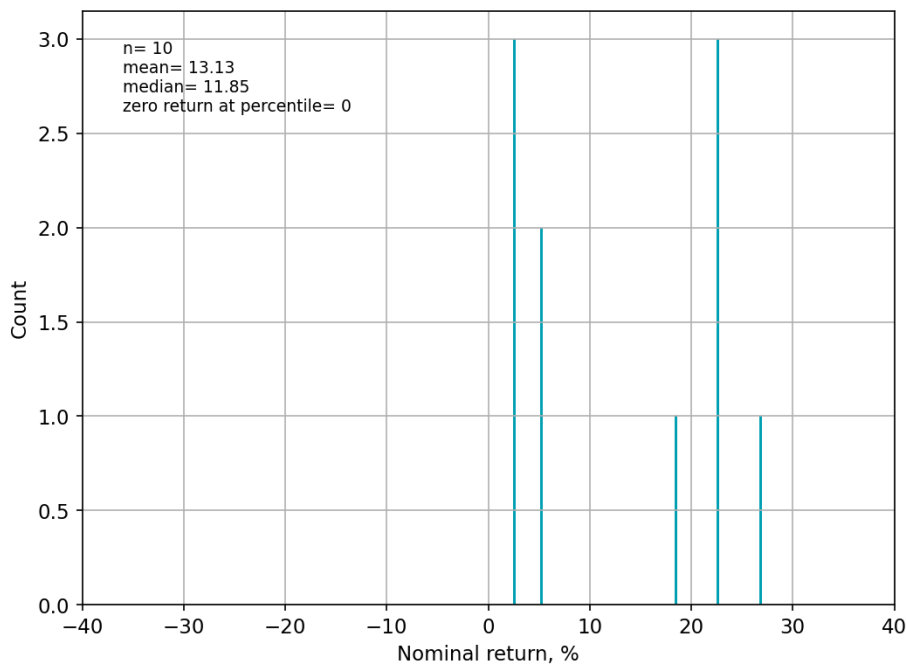

Figure 11.   Histogram of nominal return on traded calendar year sell products matured by the end of 2020
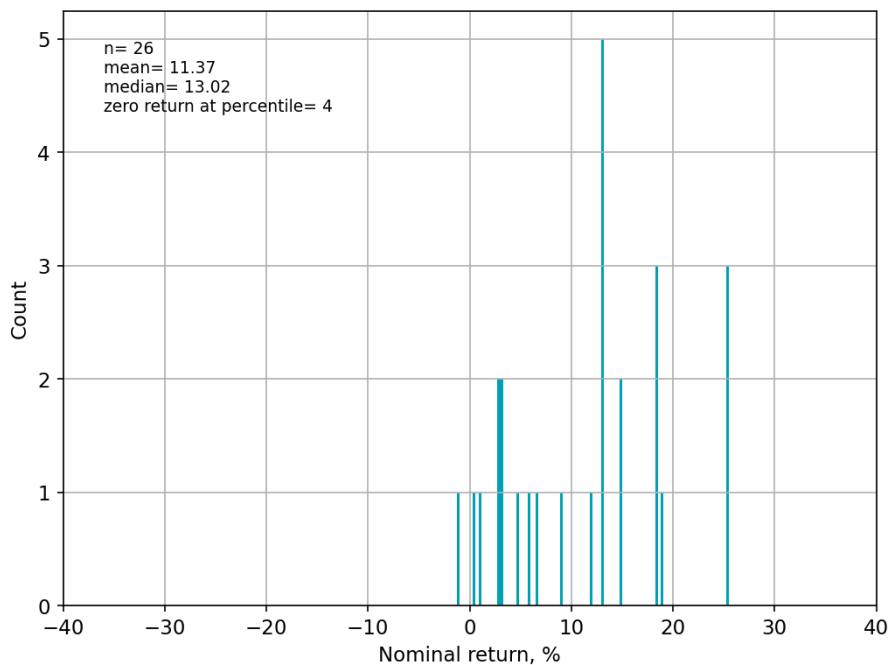

Figure 9, Figure 10, and Figure 11 show a positive nominal return for Synergy in many matured trades. For example, out of 21 quarterly products traded and matured by the end of 2020, 17 transactions provided a nominal profit to Synergy. Synergy, on average, made a nominal return of 5.1 per cent on each megawatt of energy traded through quarterly contracts (Figure 9).

There were 36 sell transactions with a supply period of one year that matured by the end of 2020; ten were financial year contracts and 26 were calendar year contracts. All financial and

calendar year sell transactions, except for one, yielded a nominal profit for Synergy. Synergy made an average nominal return of 13.1 per cent on financial year products (Figure 10) and an average nominal return of 11.4 per cent on calendar year products (Figure 11).

Analysis of the outcomes for the small number of buy transactions (8 out of 102 transactions), that matured by the end of 2020, revealed a high likelihood and magnitude of profit for Synergy:

- The three calendar year buy standard products yielded a nominal return of between 13.4 per cent and 21.7 per cent for Synergy.

- The five quarterly buy standard products yielded a nominal return of between negative 0.6 per cent and 30.2 per cent for Synergy. Only two transactions produced very small losses for Synergy.

Given that Synergy always applied the maximum spread set in the scheme, the positive nominal returns realised by Synergy in such a high number of transactions suggests that the maximum spread set in the standard products arrangements may be higher than Synergy requires to cover its costs.

Possible standard product transactions

To examine the outcomes for Synergy and its counterparties if transactions occurred for all advertised standard products at the advertised prices, the ERA first considered changes in Synergy's historical advertised standard product prices over time and how they compared to average balancing prices during each advertised contract period.

Figure 12 and Figure 13 present the last advertised prices for flat and peak quarterly products (respectively), the realised quarterly average balancing prices, and trade volumes for standard products.

Figure 12. Last advertised price for flat quarterly products, respective realised quarterly average balancing price, $\bar{p}_{qtr}$, and trade volumes
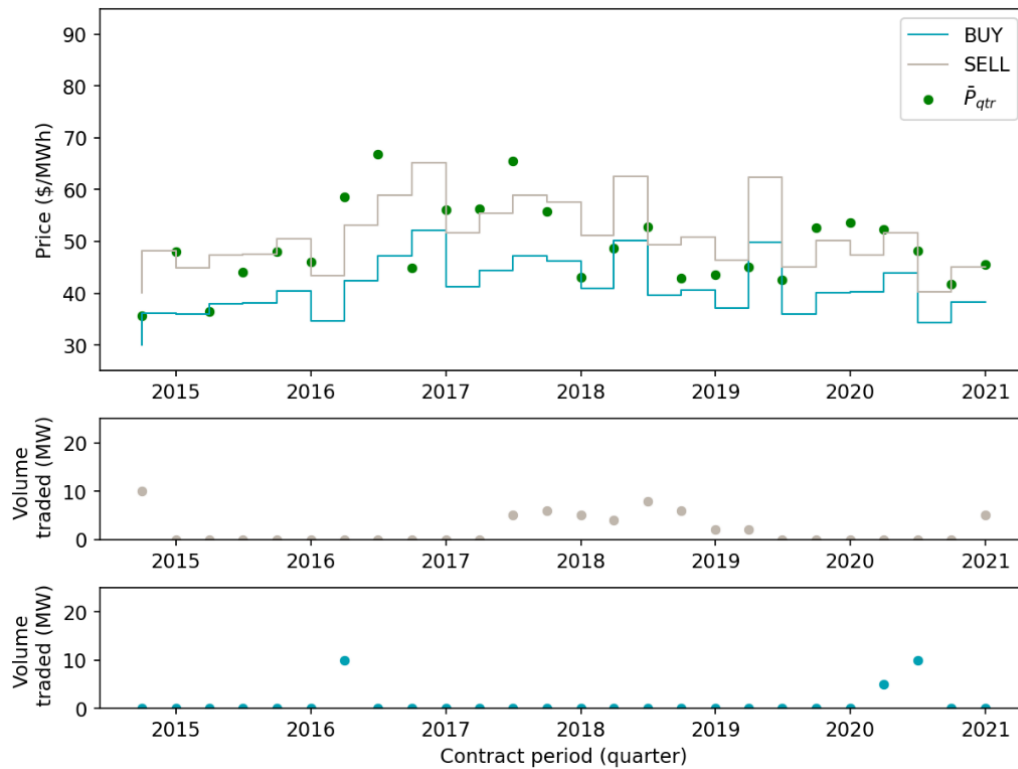

Figure 13. Last advertised price for peak quarter products, respective realised quarterly average balancing price, $\bar{p}_{qtr}$, and trade volumes
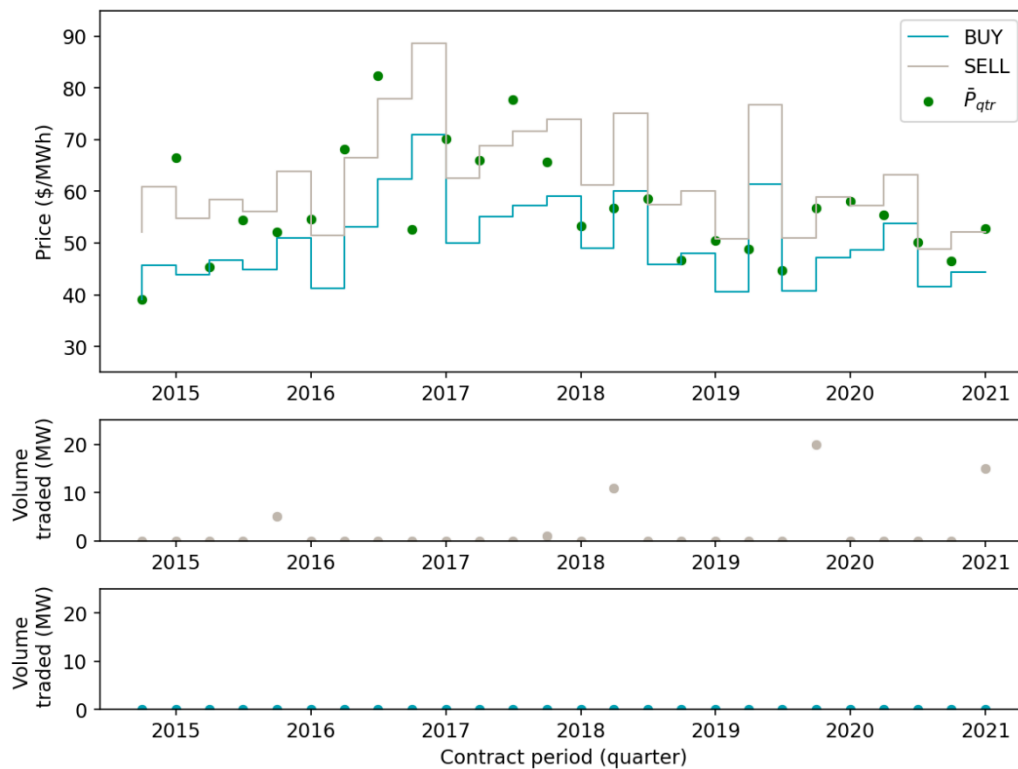
Figure 12 and Figure 13 show that the last advertised prices for each quarterly product and the average balancing prices over respective product quarters followed the same path. Since the end of 2017, Synergy's last advertised quarterly contract prices have been more aligned with the realised quarterly average balancing prices. The variation in historical quarterly average balancing prices has also decreased over the years.

When advertising standard product prices, Synergy always used the maximum possible spread between buy and sell prices allowed under the regulations. Many realised quarterly average balancing prices fell between the last advertised buy and sell prices.

The last advertised price for buy products was above the observed historical quarterly average price for the respective quarter only once. If a transaction had occurred at this advertised price, it would have represented a nominal loss to Synergy and a nominal profit to the counterparty, reflecting the fact that the counterparty was able to sell energy at a higher price to Synergy than the average price cleared in the balancing market.

In comparison, there were several instances in the past where quarterly average balancing prices resolved higher than the last advertised sell prices for the respective quarters. Again, if transactions had occurred at these advertised prices, they would have represented a nominal loss to Synergy and a nominal profit to the counterparty, reflecting the fact that the counterparty was able to lock in contracts at prices lower than in the balancing market.

Given the observed last advertised prices, Synergy was more likely to make a nominal loss on trading sell products than on trading buy products. Nevertheless, the possibility of making a nominal loss on standard product transactions occurred in very few instances.

Realisable returns on advertised standard products

To further investigate the possibility that the maximum spread is set higher than necessary, the distribution of possible returns to Synergy - if transactions occurred for all advertised products at the advertised prices - was examined for the period 2014 to the end of 2020.

Figure 14 presents the frequency of possible returns for advertised quarterly buy and sell products combined.

Figure 14. Histogram of possible returns for advertised quarterly products from mid-2014
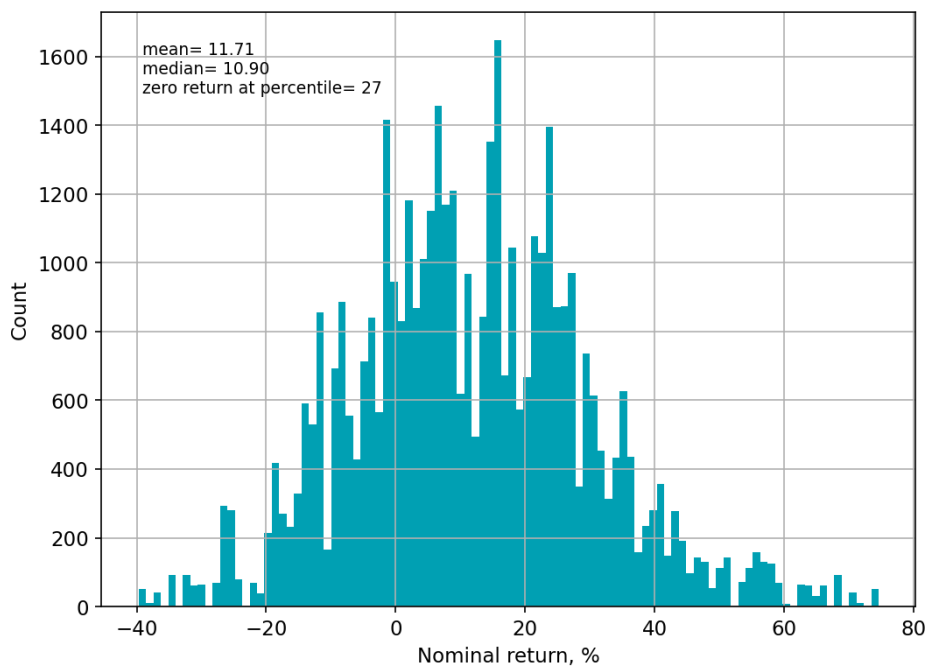
When considering advertised buy and sell products combined, the distribution of possible nominal returns for standard products had a mean return of 11.7 per cent. The average possible nominal return on quarterly contracts is larger than that for historical trades in quarterly contracts (shown in Figure 9). This indicates price sensitive demand for standard products. That is, counterparties trade with Synergy when they consider prices for products are closer to expected average balancing prices over contract terms, that is, the included risk premium in product prices is lower.

Figure 15 presents the distribution of possible nominal returns, represented independently for both buy and sell products.

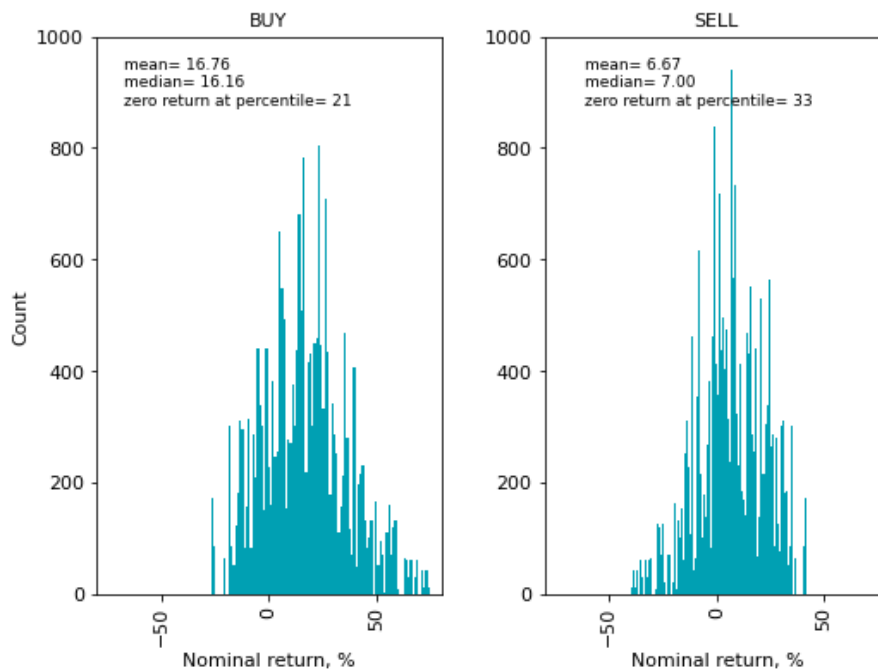**Figure 15. Histogram of possible returns for advertised quarterly buy and sell products since 2014**

Figure 15 shows distributions of nominal return that are centred to the right of zero per cent return for both buy and sell products, though this trend is greater for buy products.

If each quarterly buy contract advertised since 2014 had become a trade, Synergy would have made a nominal return of 16.8 per cent, on average. Synergy would have made nominal returns on possible buy transactions of about 70 per cent, while being exposed to nominal losses of almost 25 per cent. However, the possibility of extremely large profits for Synergy was much higher than that of extremely large losses. About 80 per cent of the possible buy transactions would have yielded a profit for Synergy.

If each quarterly sell contract advertised since 2014 had become a transaction, Synergy would have made a nominal return of about 6.7 per cent on average, which is close to that for historical sell standard product trades. About 67 per cent of those possible trades would have yielded a profit for Synergy.[101]

Given the observed possible nominal return on buy standard products, a counterparty faced an almost 80 per cent chance that it would lose 17 per cent on average in a buy transaction. As noted in the previous section, this high likelihood and magnitude of profit for Synergy for advertised buy products was also observed in realised returns in historical buy trades.

The observed bias in the distribution of possible return for buy and sell products indicates that Synergy:

- includes a larger risk premium in advertised prices for buy standard products when compared to sell standard products, and/or

- generally, under-forecasts quarterly average balancing prices.

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[101] This value was close to the value (69 per cent) that the ERA and Deloitte agreed provided Synergy with a reasonable chance of making a profit on a standard product trade in the 2015 review of the EGRC Regulatory Scheme (see Appendix 5, section titled 'Review of previous method for setting the maximum spread').

The ERA's analysis of Synergy's forecast errors showed that Synergy did not generally under forecast quarterly average spot prices. However, Synergy included larger premiums in the price of buy products than in the price of sell products. Appendix 5 provides details on Synergy's margins and forecast errors.

## *Reduction in the maximum spread during 2020*

During 2020, the maximum spread allowed under the regulations was 15 per cent, which was down from the 20 per cent maximum spread allowed previously. As was shown in Figure 8, when compared to 2018 and 2019, the count and volume of trades in sell standard products increased in 2020. During 2020, Synergy traded 25 sell standard products. These trades were with two counterparties. A majority (15) of these trades had a term covering financial year 2021/22.

No buy transactions occurred during 2020 in either quarterly or annual standard products. The lack of buy standard product trades might indicate that the buy price was lower than Synergy's counterparties were willing to accept.

Given the limited specifications and availability of standard products, it was possible that the reduction in the maximum spread could influence demand for customised contracts. However, the ERA could not identify any substantial change in the trades for customised contracts traded during 2020.

Many standard products traded during 2020 had not matured at the time of writing this paper, so it was not possible to determine the distribution of nominal return on these trades and to assess Synergy's profits or losses on these contracts. However, Figure 16 shows the possible nominal return on advertised standard products that have matured during 2020.

Figure 16.   Distribution of possible returns for matured buy and sell standard products advertised during 2020*
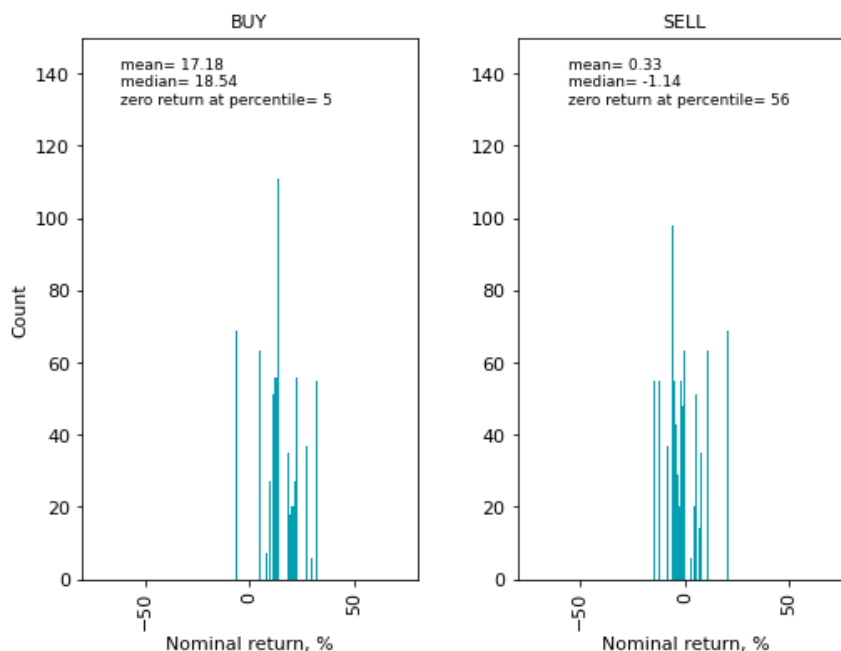
* Note: the possible return on 2020 advertised products is for those products for which historical balancing prices are available at the time of writing this paper. This, therefore, only includes the possible return on quarterly products Q2 2020 to Q1 2021 advertised during 2020.

When compared to the distribution of possible nominal returns on advertised sell products between 2014 and 2020, the average possible nominal return on advertised sell products (0.33 per cent) during 2020 is substantially lower. The average possible nominal return on advertised buy products during 2020 (17.2 per cent), however, was comparable to that for the 2014 to 2020 period.

These distributions of possible returns to Synergy indicate that either:

- Synergy under forecast average spot prices when compared to quarterly average balancing prices, and/or
- Synergy included substantially larger margins in advertised buy prices than in the advertised sell prices.

To understand which reason applied, the ERA analysed the forecasts and margins used by Synergy in 2020. This analysis showed that Synergy generally under forecast spot prices.

Appendix 5 **Review of the maximum buy sell spread**

The maximum difference between the buy price and the sell price Synergy can apply, referred to as the maximum buy-sell spread, is set in the EGRC Regulatory Scheme. The standard product buy price is set lower than the sell price. The maximum spread was set at:

- 25 per cent until 1 January 2015,

- 20 per cent from 1 January 2015 to 1 January 2020,

- 15 per cent from 1 January 2020 to 1 January 2021, and

- 20 per cent from 1 January 2021.

As part of the current review of the scheme, the ERA will review the effectiveness of the maximum buy-sell spread in the standard product regime.

This appendix presents preliminary analyses of forecast spot price and margin data provided to the ERA by Synergy to examine the spread previously employed in standard product pricing, and whether it has influenced the effectiveness of the standard product regime. Synergy's margins are referenced in this appendix but not revealed.

Following this analysis, the previous method used to set the maximum buy-sell spread, referred to as the Deloitte method, is reviewed, and a new method is developed for setting a suitable maximum buy-sell spread. This new method is then applied to Synergy's data to recommend two new maximum spreads of 10 per cent for quarterly and 5 per cent for annual standard products.

## *Scenarios to explain Synergy's use of the maximum spread*

Although Synergy can offer buy-sell prices with a spread lower than the maximum allowed under the scheme, to date Synergy has always priced related buy and sell products at the maximum spread allowed.[102]

Two scenarios might explain why Synergy always used the maximum spread possible:

- Scenario (1): The maximum spread set under the regulations did not allow Synergy to recover its required risk premium. This could, for example, be due to the large range of uncertainty in forecasting the average balancing prices. Therefore, Synergy had to raise its required buy prices and/or reduce its sell prices to meet the requirements of the scheme.

- Scenario (2): The maximum spread set under the regulations did not limit Synergy in recovering its required risk premium. Synergy therefore lowered its required buy price and/or raised its sell price to the extent allowed by the maximum spread.

These two scenarios are illustrated in Figure 17.

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[102] Clause 5.2(e), Electricity (Standard Products) wholesale arrangements 2014, (online).

Figure 17. Two scenarios to explain use of the maximum buy-sell spread
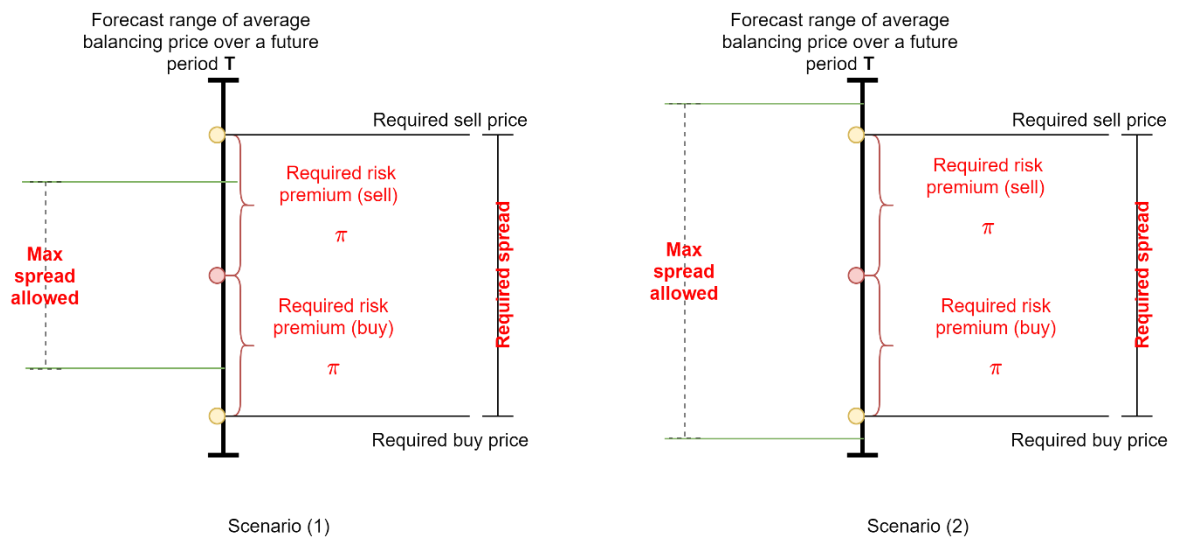
The ERA reviewed Synergy's pricing of the standard products, by analysing spreadsheets of pricing calculations between 2014 and 2020, provided to the ERA by Synergy. The ERA found that Synergy reduces the sell price by the maximum allowable spread under the regulations (rather than by its margin). This way the spread is set asymmetrically around the forecast average electricity market spot price. Where the risk, and therefore the margin, is relatively low ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮, Synergy's sell prices are closer than the buy prices to Synergy's expected average market price for the respective contract period.

The ERA's understanding of Synergy's pricing of standard products is illustrated in Figure 18.

Figure 18: The ERA's understanding of Synergy's standard product pricing method.
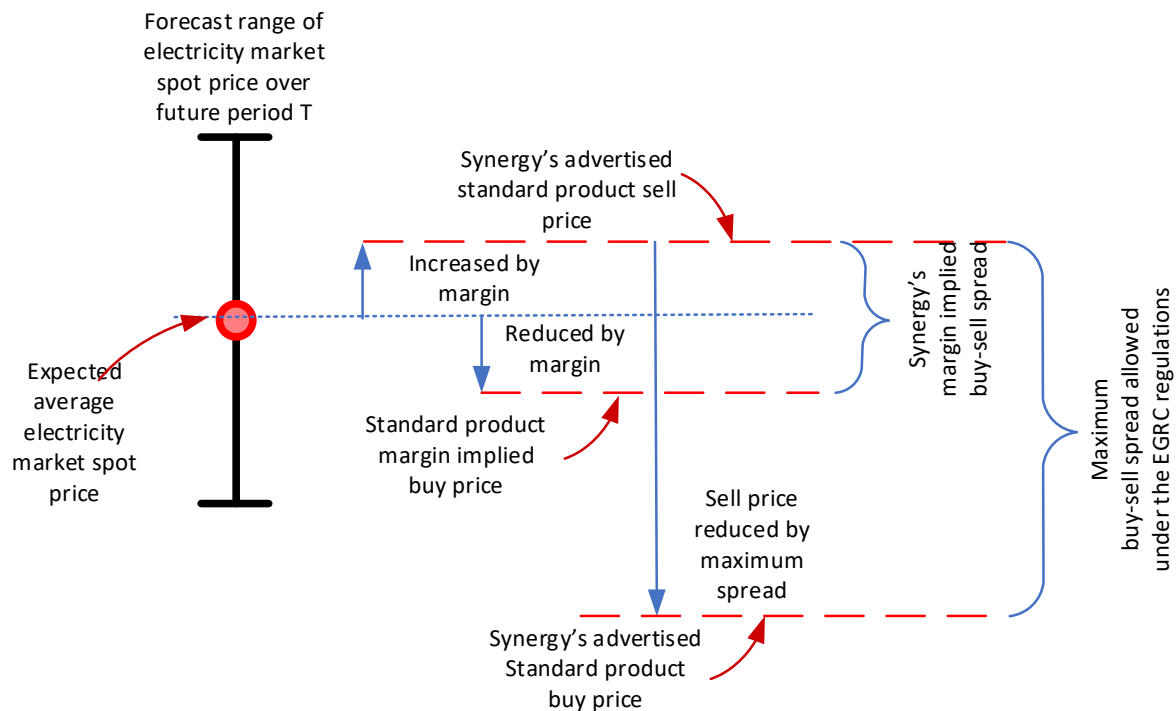
Margins and standard product pricing

This section examines whether scenario 1, described in the previous section, can also explain Synergy's pricing of standard products (as described above), by considering the question:

> Is the spread allowed under the regulations sufficient to provide Synergy with the opportunity to recover its required risk premium?

To address this question, analyses were conducted on the spreadsheets of standard product pricing calculations between 2014 and 2020 that Synergy provided to the ERA. These calculations included a margin that the ERA understands includes risk premia and other factors, but the risk premium proportion of the margin is not clear.[103] Consideration was given to whether forecast (contract) lead times influence margins, and to the outcomes in 2020, when there was a reduced maximum spread of 15 per cent.[104]

Figure 19 and Figure 20 show the ERA's analysis of change in margins based on forecast (contract) lead time for peak and off-peak periods, respectively. 'Lead times' refers to how many days the forecast product price leads product currency or delivery.

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[103] Prior to publishing this paper, and after the ERA finalised the analysis for this discussion paper, Synergy provided information about how it determines these margins. Initial analysis of Synergy's information shows that Synergy's margins can also include adjustments for factors other than mentioned in section 3.4.1.

[104] A forecast lead time is the lead time between producing a forecast of spot price for a future period (for example, a future quarter) and the start of the future period.

Figure 19:   Peak forecast lead times and indexed margins, 2014 to 2020
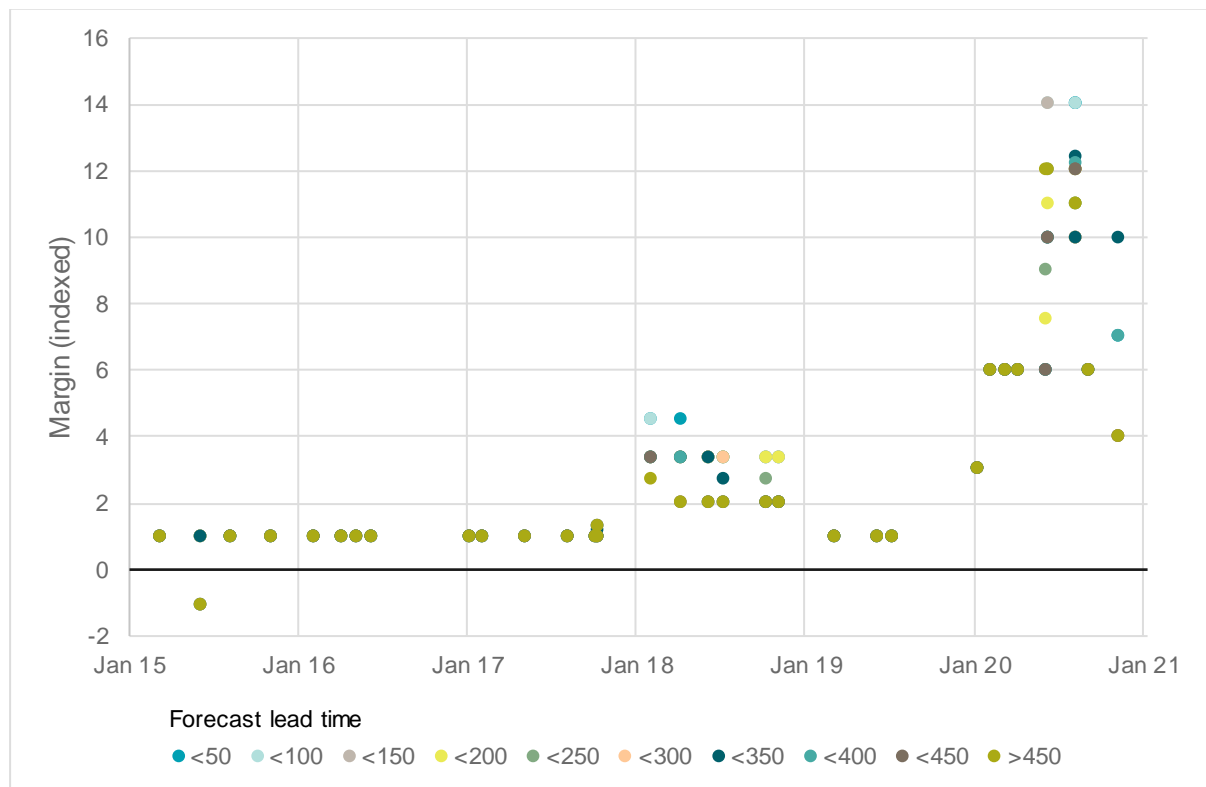
Figure 20:   Off-peak forecast lead times and indexed margins, 2014 to 2020
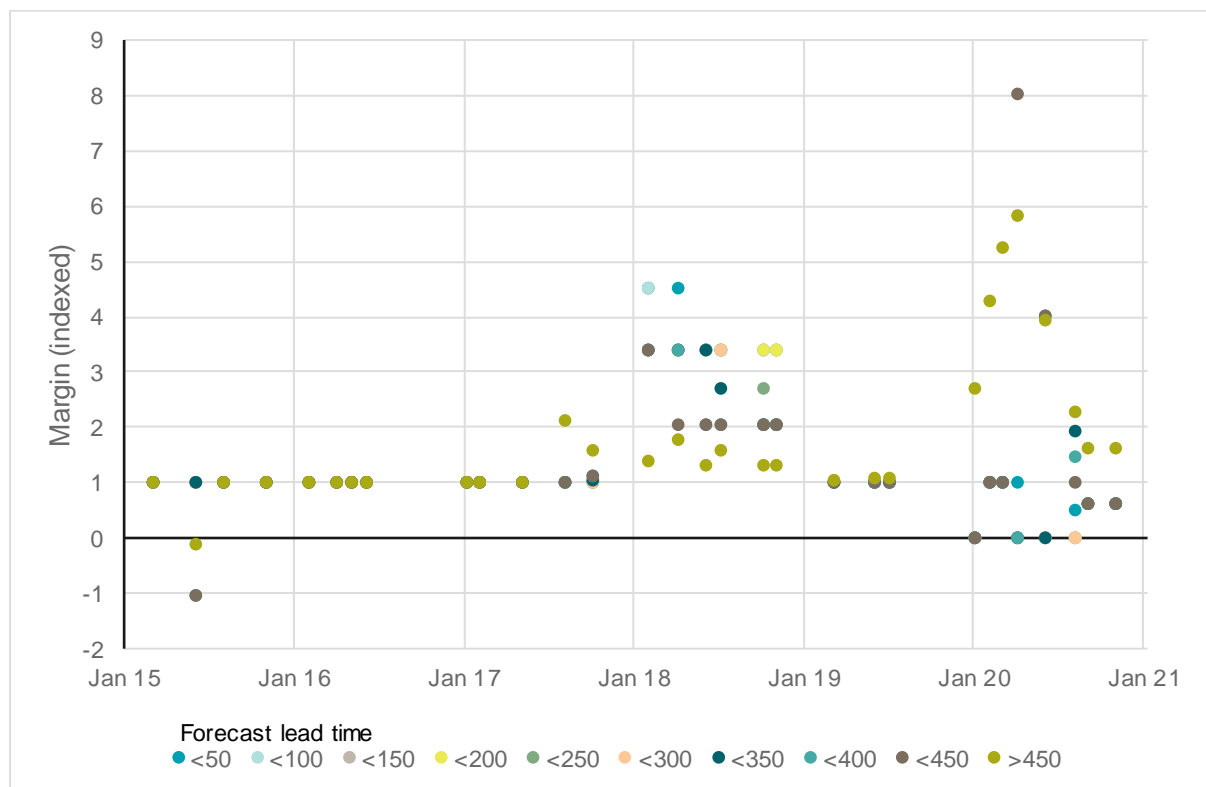
From 2015 through to 2017, and in 2019, the ERA's analysis suggests that margins were insensitive to the forecast lead time, meaning margins did not change for longer lead times (in excess of a year for example) or shorter lead times.

The ERA's analysis demonstrates that Synergy's margins are subject to change, this magnitude can be substantial and that past margins may not be a good indicator of current or future margins.

In Synergy's margins, the ERA sought to identify normally expected patterns such as seasonality and positive correlation with contract lead time and periodic average balancing price. For example, if there was a period (such as the third quarter of the year, when many planned outages occur) where risks of forecast error were substantially higher or market volatility was high, one might expect to see an increase in risk moving through the forecasts as the period drew closer. This was not observed in Synergy's data.

The ERA has used Synergy's margin to set the spread symmetrically around the average forecast market price for the product.[105] The difference between the sell price and the implied buy price would yield a 'margin implied spread'.

To illustrate the ERA's analysis, Figure 21 shows the margin implied spread for peak products. The line shows the average margin implied spread. The top and bottom of the vertical bars indicate the maximum and minimum margin implied spread. The primary vertical axis for Figure 21 has been redacted to prevent the release of information on Synergy's margins. The chart is illustrative of the change in margin implied spread over time.

Where the margin was relatively low (as was the case for most years), the maximum spread tended to be much wider than the margin implied spread. Where the margin was very large and resulted in an implied spread larger than the maximum buy-sell spread, Synergy set the buy price above its forecast average electricity market spot price. This may have exposed Synergy to arbitrage risk for the buy product.

If during 2020 Synergy increased its margin to compensate for known under forecasting (for example, known omissions in forecasts), there may have been no arbitrage opportunity.

The following section shows that the variation in quarterly average balancing prices decreased in recent years and Synergy's forecasting error decreased over the respective period.[106] So, it is not clear why Synergy increased its margins, despite less variation in observed forecast errors.[107]

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[105] Given information available, the ERA was not able to find any evidence or rationale for why Synergy should charge a margin in the buy price that is any different to that included in the sell price.

[106] Synergy's spot market forecasting accuracy was measured by the difference between Synergy's electricity market spot price used to determine standard products and the observed balancing price related to those forecasts.

[107] Prior to publishing this paper, and after the ERA finalised the analysis for this discussion paper, Synergy provided information about how it determines these margins. Initial analysis of Synergy's information shows that Synergy's margins can also include adjustments for factors other than mentioned in section 3.4.1.

Figure 21:   ERA derived margin implied spread for peak products
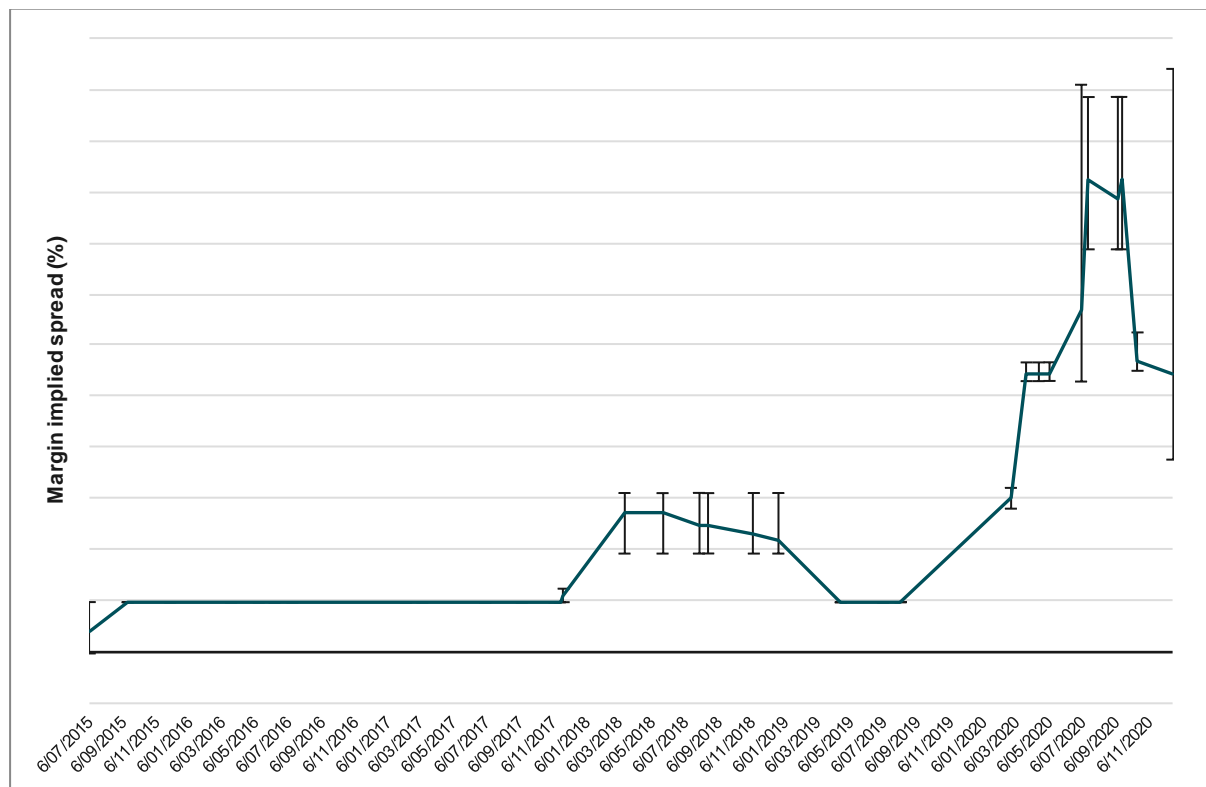
The ERA's analysis also found that implied spread increased during 2018 and 2020, although the implied spread for 2018 was, for the most part, substantially less than the maximum buy-sell spread under the regulations. In 2020 the implied spread exceeded the maximum buy-sell spread for both peak and flat products.

Based on the information available, the ERA could not find any reason for Synergy to charge a higher margin for buy products than for related sell products. Synergy took the opportunity allowed by the scheme to decrease its buy prices to the maximum spread, as described in scenario 2, above. This method of setting buy standard product prices may explain the findings in Appendix 4, that Synergy had a very high likelihood of making a profit on buy standard product transactions, and that buy standard product transactions have seldom occurred.

Setting a suitable maximum spread

The analyses presented in this section address the following question:

> Given the ERA's calculation of Synergy's forecasting accuracy in recent years, what level of spread would be sufficient to provide Synergy with a reasonable likelihood of making profit on standard product trades?

To address this question, the sub-section below first reviews the previous method used to determine an appropriate maximum spread in the standard product market. In the following sub-section, this review is then used to inform the development of an improved method for determining a level of spread that would provide Synergy with a reasonable likelihood of making profit, given its forecasting accuracy, as calculated by the ERA.

Review of previous method for setting the maximum spread

For the 2015 review of the EGRC regulatory scheme[108], the ERA engaged Deloitte Access Economics (Deloitte) to determine a method for estimating a suitable maximum buy-sell spread for the standard product regime. The main assumptions that underpinned Deloitte's approach were:

- The buy-sell spread should reflect the spread that would prevail in the WEM if the standard products were offered competitively to fulfil the objectives of the standard product regime.

- The spread represents the risk that Synergy's Wholesale Business Unit incurs through offering products in a perfectly illiquid market, where it cannot balance the sale of an electricity future by purchasing a corresponding future and must purchase or sell electricity in the spot market to fulfill its contract.

- The WBU's risk of making a profit or loss on a trade is therefore dependent on the prices and volatility in the balancing or STEM markets, which could thus be used to determine a spread that would provide the trader with a reasonable opportunity to profit on a trade. Deloitte recommended setting the spread with reference to historical price volatility in the spot market.

- Retailers would prefer to purchase electricity from the STEM rather than the balancing market because they can plan their purchases and buy electricity based on their bids.

The ERA agreed with Deloitte's assumption that the buy-sell spread should reflect the spread that would result if the standard products were offered competitively. However, Synergy can sell counterbalancing customised contracts. Synergy is also able to reduce the spread from its maximum to increase its offered standard product buy price and has entered into buy transactions in the past.[109] Despite this, the majority of transactions in standard products (91 per cent) are sell transactions.

In contrast to Deloitte's assumption that the historical volatility of the spot market is a good predictor of the required spread, the ERA's analysis of historical volatility does not necessarily predict Synergy's range of forecasting error, and spot prices underpin the pricing of standard products, rather than STEM prices. It is Synergy's error in forecasting average market prices during a future period that determines the amount of the spread required.

Finally, a limitation of Deloitte's approach was that it did not recognise the relationship between forecasting uncertainty and the width of the maximum spread; spreads widen as a function of increased uncertainty. In a competitive market for selling standard products, given normal market conditions, the risk premium charged for shorter lead time contracts, and so, the spread between buy and sell prices would be typically lower than those for the same quarters in future years because there is less uncertainty in forecasting near future periods.[110]

The difference in spreads across products with varying lead times provides an important signal about expectations of future prices and the level of certainty that underlies these prices. In principle, Synergy would be able to forecast average market prices for quarters that have

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[108] Refer to the Review of Synergy's Regulatory Scheme 2015, available online.

[109] Synergy entered into a total of five 5MW buy transactions in 2015 (on 30 March 2015, 7 April 2015, 26 June 2015, 29 June 2015 and 21 August 2015) and three 5 MW buy transactions in 2019 (two on 16 December 2019 and one on 26 December in 2019).

[110] Sometimes when scarcity events occur in a competitive market, the spread of shorter lead time products during that period can increase beyond that of longer lead time products as a function of increased uncertainty of future spot prices during that period. For example, see: Electricity Authority (2019). Hedge Market Enhancements (market making): Ensuring market making arrangements are fit for purpose over time. Discussion Paper, (online).

shorter lead times with greater accuracy and a higher level of confidence than when forecasting the average market prices for the same quarters in future years.

Deloitte recommended setting the spread with reference to a standard normal curve. Deloitte suggested allowing Synergy a 69 per cent (1 standard deviation higher than the mean of 50 per cent) or 77 per cent chance (1.5 standard deviations higher than the mean of 50 per cent) that it would profit from a standard product trade, given that a trader would expect a greater than 50 per cent chance of making a profit on any single trade in a competitive market.

Deloitte's approach to determining the maximum spread in the STEM (or balancing market) for quarterly products[111] was to:

- Determine the average historical quarterly price from the mean prices for each historical quarter, in each year across the review period.

- Determine the historical price volatility (the standard deviation) from the mean prices for each historical quarter, in each year across the review period.

- Use the standard normal distribution to select the desired number of standard deviations away from the mean that would allow the WBU a 69 per cent chance of not losing money on a trade; 1 standard deviation or ±0.5 deviations around the mean allowing for profits on both buy and sell products.

- Calculate the spread as the historical standard deviation divided by the result of the average historical quarterly price added to the accepted probability standard deviation from the standard normal distribution (0.5), multiplied by the historical standard deviation. Multiply the obtained value by 100 to produce the spread as a percentage.[112]

The implied spreads derived from Deloitte's analysis for flat and peak products are presented in Table 1.

Table 1. Average quarterly implied spreads found by Deloitte (2015) for different product types based on historical volatility in the STEM.

	69% chance of making a profit		77% chance of making a profit	
Product type	Flat	Peak	Flat	Peak
Average of quarterly spreads	10.6%	11.5%	15.4%	16.7%

Deloitte concluded that providing the WBU with a 69 per cent chance of making a profit was a reasonable starting point that may begin to promote more liquidity and considered that the spread could be progressively reduced if liquidity were to increase in the trade of standard products.

The ERA considered that setting the maximum spread based on Deloitte's approach would:

- Result in a reasonable balance between managing Synergy's risk due to the uncertainty of predicting future energy prices and achieving efficient pricing outcomes.

- Provide a useful stepping-stone to eventually transition to a more competitive spread.

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[111] Deloitte considered that the same approach could be employed for determining the spread for annual contracts.

[112] For example, in the STEM, the maximum spread = (historical standard deviation in the STEM/ (historical average of the means in the STEM + (accepted unit normal probability standard deviation* (historical standard deviation in the STEM))*100.

Subsequently, in its reviews of the EGRC regulatory schemes for the 2016 and 2017 calendar years, the ERA employed the Deloitte method and recommended imposing greater discipline on Synergy's pricing of standard products by reducing the standard product maximum spread to 10 per cent. Consideration of outcomes in standard product trades in each year resulting from changes in standard product pricing and reviews of spreads in other competitive markets also supported this recommendation.

Following the ERA's review, the Public Utilities Office (PUO) discussed the prospect of a reduced buy-sell spread with Synergy.[113] According to the PUO, Synergy was opposed to any reduction to the maximum buy-sell spread, contending that it could lead to perverse market outcomes and that Synergy would likely incur a financial loss. Synergy stated that it has a long position on energy, and a reduction in the buy-sell spread would increase the risk that Synergy would be obligated to purchase additional energy and exacerbate Synergy's risk position.

Synergy further considered that there was no evidence that the current maximum buy-sell spread was inappropriate, and that given the historic volatility in the balancing market, it would be unreasonable to expect the business to forecast future market prices within tight boundaries. Synergy stated that a lower buy-sell spread would transfer risk from other market participants to Synergy, increasing the likelihood of speculation and risk-taking amongst other WEM participants.

In 2019, in responding to the ERA's recommendation, the PUO considered Deloitte's method of calculating the implied buy-sell spread for quarterly products to be prudent. The PUO recalculated the implied spread based on Deloitte's method and directed the maximum spread to be set at 15 per cent from 1 January 2020 until the 31 December, after which the spread would revert back to 20 per cent (see Appendix 4 and the section in Appendix 5 titled 'Margins and standard products' for a review of outcomes in 2020).

A new method for setting the maximum spread: forecasting accuracy

The ERA has considered ways to improve the method it uses to recommend a suitable value for the maximum buy-sell spread in the standard product regime that allows Synergy to recover efficient costs, including a margin for risk. To do this, the ERA has considered Synergy's Wholesale Business Unit's (WBU's) risk of making a profit or loss on a standard product trade, whilst having regard for Synergy's ability to forecast future average spot prices.

Like Deloitte, the ERA's approach in this review also considered the illiquidity of the standard products market. The ERA assumed that the WBU cannot close its trading position with a counterbalancing trade, and therefore, it must settle its buy or sell contract by selling or buying at the balancing market price to meet its obligations under the futures contracts it has traded.

Using this approach, the WBU's risk of making a profit or loss on a future trade therefore depends on how accurately Synergy can forecast the average market price during a contract period. The ERA's calculation of Synergy's historical forecasting error can thus be used to determine a maximum spread that would provide Synergy with a reasonable opportunity of profiting on a transaction.

As set out in Table 2, the new method for calculating the maximum spread has increased validity because of improvements in two main areas. The method accounts for spot price forecasting uncertainty (the driver of the margins) and the relationship between forecasting uncertainty and the maximum spread across time and contract term.

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[113] Public Utilities Office, 2019. Electricity Generation and Retail Corporation Regulatory Scheme - Response to 2016 Report to the Minister for Energy on the effectiveness of the Scheme, p. 14. (online).

Table 2. Shows the advantages of the improved method to that developed by Deloitte.

Area of Improvement	Improved calculation method	Deloitte method
Driver of risk premiums included in contract prices.	Considers the relationship between accuracy in forecasting average spot prices in a single quarter (or year) in the future and the margins included in contract prices. The ERA developed a measure of Synergy's forecasting accuracy for determining the probability of Synergy making a profit.	Given data limitations at the time, assumed historical volatility of the spot markets is a good predictor of future volatility. Used a measure of historical average STEM price volatility across quarters in several years to determine the probability of Synergy making a profit and to set the risk premium included in contract prices.
Relationship between forecasting uncertainty and maximum spread.	Accounts for the possible effects of several factors on Synergy's forecasting accuracy, including forecast lead time, forecast period and possible improvements in forecasts across time.	Given data limitations at the time, did not consider the effect of forecast lead time, forecast period and possible improvements in forecasts over time.

The ERA's approach to determining the maximum spread for quarterly products using forecast errors is set out below. The maximum spread for yearly products can be estimated using the same steps below, with yearly average prices.

- Determine the historical average balancing price for flat and peak products for each quarter since 2014. For flat products the average is taken over all trading intervals. For peak products, the average is taken over peak trading intervals only. The historical average balancing price over the contract period is represented as variable p.

- Calculate Synergy's forecast average spot prices for each quarter since 2014. Repeat this for all forecasts periodically produced by Synergy for determining the standard product prices. Adjust the forecast quarterly average spot prices for the effect of inflation by applying the Consumer Price Index (CPI).[114] The forecast quarterly average spot price is the price that the WBU could buy or sell a quarterly standard product for and have an equal chance of making a profit or loss. The forecast quarterly average spot price is represented as variable $\hat{p}$.[115]

- Calculate forecasting error, e, for forecasting quarterly average spot prices. This is the difference between the forecast quarterly average spot price and the historical quarterly average balancing price for each quarter since 2014, as calculated in the first two steps above:

$$e = \hat{p} - p$$

- Select the desired number of standard deviations away from the mean price in the unit normal distribution. Selecting one standard deviation (±0.5 deviations around the mean) would provide the WBU with a 69 per cent chance of not losing money on a trade. This is represented by variable z.

- Calculate the implied maximum spread, s_z, using the equation below (Equation 1):

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[114] The CPI adjustment method is specified in Synergy, Standard Products – CPI Adjustment Mechanism, (online).

[115] The calculation in this section only included forecasts with up to 800 days lead time.

$$s_z = \frac{2z\sigma_e}{\mu_{\hat{p}} + z\sigma_e}$$

where,

- σ_e is the standard deviation of forecast error, e, for forecast average balancing price.

- $\mu_{\hat{p}}$ is the expected value of forecast average spot price, $\hat{p}$.

- z is the z-score in the standard normal distribution related to the target probability level.

The mathematical proof of Equation 1 is provided below.

Mathematical proof of Equation 1

Using the same approach as that used by Deloitte, this analysis assumes that the standard products market is perfectly illiquid and determines the maximum spread as the spread required to give Synergy a certain probability of making a profit in each standard product transaction.

Synergy makes a positive payoff on a sell quarterly standard product trade when its sell price p_{sell} is greater than the observed average balancing price, p, during trading intervals covered by the product, or:

$$p_{sell} > p$$

At the time of trading a quarterly product, the average balancing price during the term of the product is uncertain, and therefore, is a random variable. The figure below presents a stylised standardised distribution for the quarterly average balancing price, as expected at the time of advertising a standard product. This figure shows the possibilities of the average balancing price occurring during the contract.
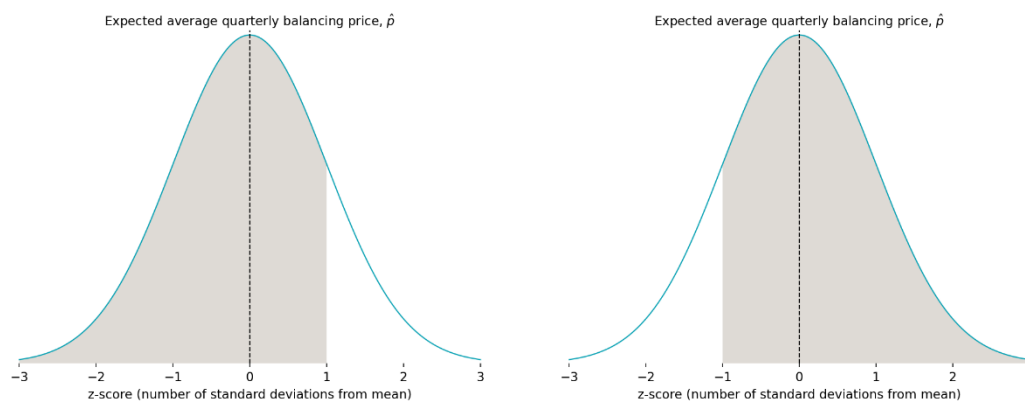
If Synergy sets the sell price, p_{sell}, at its expected average quarterly balancing price, Synergy would expect a 50 per cent chance of making a positive payoff from the trade.

A trader in a competitive market would expect to profit from offering electricity futures. To account for the risk of forecasting error and incurring losses on a product trade, Synergy would price the sell quarterly product above the expected average balancing price.

The figure below shows that, in principle, Synergy sets its sell price, p_{sell}, at its target z-score level above the mean of the distribution, or its expected average price $\hat{p}$, to provide it with a target probability of making a profit commensurate with its propensity for risk:

$$p_{sell} = \hat{p} + z.\sigma_e \qquad\qquad\text{(I)}$$

where σ_e is the standard deviation of expected forecasting error distribution, and z is the target z-score to specify the target level of probability of making a profit.

Panel (a): Synergy sets the sell price, p_{sell}, for example, at one standard deviation ($z = 1$) above its expected forecast average quarterly balancing price. This provides Synergy with a probability of making a profit on a sell trade equal to 84 per cent.	Panel (b): Synergy sets the buy price, for example, at one standard deviation ($z = 1$) below its expected forecast average quarterly balancing price. This provides Synergy with a probability of making a profit on a buy trade equal to 84 per cent.

When Synergy's view of the possible average quarterly balancing price is symmetrical around its expected average quarterly balancing price, Synergy sets the buy price, p_{buy}, at

this same z-score level but below the average of the distribution. The distribution of Synergy's forecast average quarterly spot prices between 2014 and 2020, for peak and flat averages, was normal and therefore was symmetrical around its expected value.[116] Accordingly, for a buy product, the required buy price would be:

$$p_{buy} = \hat{p} - z.\sigma_e \qquad \text{(II)}$$

Under the scheme the buy-sell spread, s, is defined as:

$$s = \frac{p_{sell} - p_{buy}}{p_{sell}}$$

From equations (I) and (II) and the definition of the spread, a target level of spread, s_z, can be calculated to yield a target probability of profiting on standard product trades:

$$s_z = \frac{2z.\sigma_e}{\hat{p} + z.\sigma_e} \qquad \text{(III)}$$
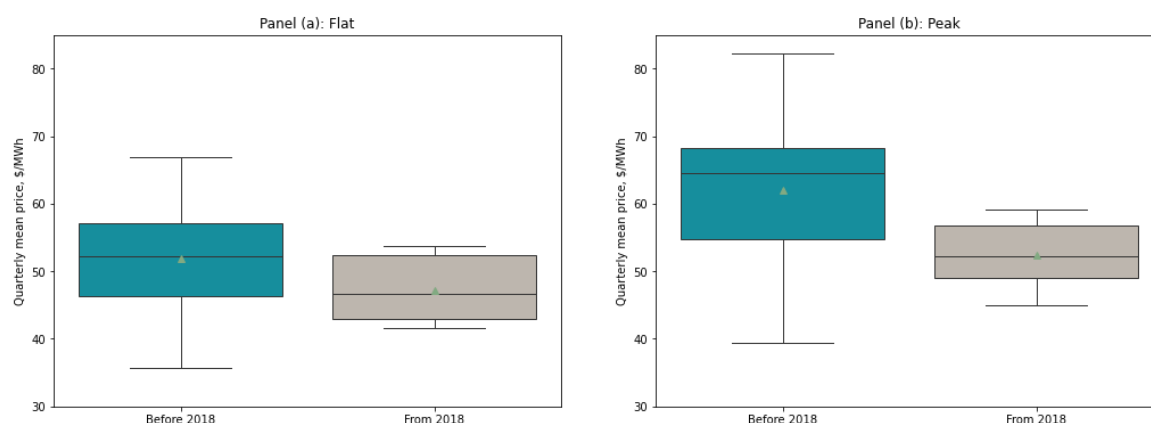
Review of forecasting error

The ERA compared Synergy's spot price forecasts with observed balancing prices to determine Synergy's forecast error. The ERA's analysis found that since 2017 the range of forecast errors has decreased. The forecast error range for flat average spot prices was generally smaller than that for peak average spot prices. This is expected because flat average spot prices include spot prices from a larger set of trading intervals than just peak trading intervals. The larger the forecast period, the less the magnitude of variation in average prices, when compared to the average of the sample, because of the law of large numbers.[117]

The variation in spot prices during peak periods might also be inherently larger than that for off-peak periods due to the larger set of factors that can influence peak period prices. The decreased range of forecast error since about 2017 or 2018 may also be explained by the decreased variation in quarterly average balancing prices in the WEM over time, as presented in Figure . So, it is not clear whether forecast error after 2017 decreased because of any improvement Synergy has made to its forecasts or because of decreased variation in the observed quarterly average balancing price in the WEM.

This decrease in variation of periodic average balancing prices might be partly due to an increased penetration of renewable generators in the SWIS. For example, behind-the-meter solar generation has generally reduced balancing prices during the daytime, also reducing the variation in the periodic average prices. Although some extremely low prices have occurred in the SWIS recently, balancing prices during very short extreme events were not sufficient to raise the variation in periodic average prices.

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[116] Normality test results indicated that the assumption that Synergy's distribution of forecast error for quarterly average spot price between 2014 and 2020 (and between 2017 and 2020 and between 2018 and 2020) was normal could not be rejected. This was tested based on the null hypothesis that the sample of forecast errors for quarterly average spot price (for peak and flat averages separately) come from normal distributions. The chosen alpha level was 1 per cent. The test was based on D'Agostino and Pearson's omnibus test of normality. Refer to D'Agostino, R. B., 1971, An omnibus test of normality for moderate and large sample size, Biometrika, 58, 341-348. and D'Agostino, R. and Pearson, E. S., 1973, Tests for departure from normality, Biometrika, 60, 613-622.

[117] The law of large numbers, or central limit theorem, is that, with large sample sizes, sampling distributions of means are normally distributed, regardless of the shape of the distribution of the variable. When the sample size is large, the mean of the sample is less affected by extremely large or small observations.

Tabachnick, B.G. & Fidell, L.S. (1996). Using Multivariate Statistics, Third Edition. HarperCollins College Publishers.

Figure 22.   Distribution of observed quarterly average balancing price between 2018 and 2020

Note: the small green triangles in the boxplots show the distribution means.

This analysis also considered whether forecasting error changes with forecast lead time. The results showed that there was not a substantial decrease in forecasting error range with a decrease in forecast lead time.

The ERA also found that when compared to quarterly average spot price forecasts, the forecast error range for annual products was smaller. This might be explained by the law of large numbers. Although more factors might influence spot prices over the period of a calendar year when compared to a quarter, extremely low or high prices are less likely to influence the average price over a longer period of time. This observation indicates that Synergy would require a lower spread (and risk premium) for the pricing of calendar and financial year products, when compared to that for quarterly products.

A suitable maximum buy-sell spread

Based on the method presented at the start of this section, the ERA calculated the level of the maximum spread required to provide Synergy with a 69 per cent chance of making a profit on quarterly and annual standard product trades. The required maximum spreads calculated are implied by Synergy's ability to forecast future spot prices, as observed between 2014 and 2020, presented in the previous section.

These results are presented in Table 3 and Table 4, for two separate expectations of forecast error range: one based on the forecast error distribution observed between 2014 and 2020, and another based on the forecast error distribution observed between 2018 and 2020. The most recent estimation period better reflects expected forecasting accuracy because it is based on the most recent forecasts produced by Synergy. Synergy's annual report indicates that since about 2018, Synergy has used Plexos as its market simulation tool for forecasting "providing the business with an improved level of forecasting accuracy".[118]

Table 3.   ERA implied maximum spread for quarterly standard products based on Synergy's observed forecasting error (per cent)

Forecast error distribution date range	2014 to 2020		2018 to 2020	
Quarter of year	Flat	Peak	Flat	Peak

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[118] Synergy, 2019, *Annual Report,* p. 17. ([online](#)).

Forecast error distribution date range	2014 to 2020		2018 to 2020	
Q1	16.8	18.6	11.5	10.3
Q2	12.1	13.3	7.9	8.8
Q3	16.3	18.5	9.4	11.0
Q4	12.3	13.5	13.7	14.6
Average	14.4	16.0	10.6	11.2

Table 4.   ERA implied maximum spread for calendar and financial standard products based on Synergy's observed forecasting error (per cent)

Forecast error distribution date range	2014 to 2020		2018 to 2020	
Product type	Flat	Peak	Flat	Peak
Calendar	9.5	11.3	3.9	4.3
Financial year	9.2	11.1	5.2	4.7
Average	9.4	11.2	4.6	4.5

Given observed forecasting accuracy since 2018, the results suggest that:

- For advertised quarterly products since 2018, a maximum spread of 11 per cent would have been sufficient to provide Synergy with a reasonable chance of making a profit on possible trades.

- For advertised calendar and financial year products since 2018, a maximum spread of approximately 5 per cent would have been sufficient to provide Synergy with a reasonable chance of making a profit on possible trades.