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Electricity Authority
Wellington

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2021 WHOLESALE MARKET REVIEW

1. Introductory remarks

Thank you for the opportunity to provide our views on the Electricity Authority's (**the Authority's**) review of competition in the wholesale electricity market (**the review**) for the period between January 2019 through to June 2021.

The review comprises of two parts:

- An information paper¹ which describes the Authority's analysis and observations around the current state of the wholesale market; and
- A discussion paper² which explores the Authority's specific concerns around inefficient price discrimination.

Within this submission we provide feedback on the key themes explored by the Authority as part of the review, including the analytical work that has been undertaken to date. These themes are captured within the following questions:

- Did spot prices reflect underlying market conditions?
- Did a competitive environment exist?
- Is there inefficient price discrimination occurring?
- Why has required investment in new generation been delayed?

Our submission comprises of:

- this cover letter; and
- an expert report from The Lantau Group (Appendix 1) titled Competitiveness in the New Zealand Wholesale Electricity Market.

2. Trustpower's past and future

Since 1994, Trustpower has evolved from a regional vertically integrated electricity business operating in the Tauranga district to a leading nationwide multi-product retailer with a strong history of making significant investments in renewable generation in both New Zealand and Australia.

¹ Market Monitoring Review of Structure, Conduct and Performance (SCP) in the Wholesale Electricity Market since the Pohokura outage in 2018

² Inefficient price discrimination in the wholesale electricity market – Issues an Options – An initial response to the wholesale market review

Trustpower's current generation business comprises 486MW of installed capacity from 38 power stations throughout the country. More than 98% of this capacity is from hydro generation. Trustpower is New Zealand's fifth largest electricity generator and fourth largest electricity retailer.

Trustpower has conditionally sold its retail mass-market business (for electricity, gas and telecommunications) to Mercury, subject to a restructure of TECT being completed³

On the successful completion of this process our generation business will be renamed Manawa Energy Ltd. This new business would retain Trustpower's existing Commercial and Industrial (C&I) electricity customers.

Manawa Energy will be a new business on a development path that will assist in responding to increased demand for renewable energy as New Zealand pursues greater electrification. Manawa Energy's focus will be on new generation growth, operational excellence for existing assets, along with attracting and retaining C&I customers.

3. The transition to a low emissions economy

An unprecedented level of investment across the electricity supply chain will be required to meet New Zealand's decarbonisation objectives, particularly in renewable generation.

Trustpower's Whakamana I Te Mauri Hiko report estimates that electricity demand (under its accelerated electrification base case) is likely to increase by 68% over the next 30 years.⁴ The scale of the renewable generation investment required to meet this increased demand and offset thermal station retirements will be challenging. Ensuring a competitive, thriving wholesale electricity market will be a cornerstone for supporting the necessary investment to occur.

The New Zealand electricity market is starting from a good foundation with our existing wholesale market design, but the journey will be challenging, and we need to be prepared. The Authority's review provides a useful opportunity to explore whether the current wholesale market is delivering for the long-term interests of consumers before we cast our minds towards the journey ahead.

As an overarching consideration for the transition, certainty around the regulatory/policy settings will be an important prerequisite for capital to be made available for further investments in renewable generation and note TLG's advise that:

"The energy transition is challenging that traditional perspective, by increasing the complexity and range of choices available. Yet, the road to carbon free energy is not at all clearly marked. With many risks and uncertainties yet to be navigated, the most important aspect of the Review, in our view, has been to acknowledge the importance of attracting new investment to support the complex transition to a low carbon emission economy. Interventions risk increasing uncertainty in an investment environment that is already changing rapidly with increased focus on renewable sources of generation and smaller distributed options, including behind the meter technologies (all of which are quicker to market compared to traditional hydro and thermal resources).

4. Did spot prices reflect underlying market conditions and did a competitive environment exist?

Trustpower doesn't consider that the analytical work undertaken for the review provides a sufficient basis for drawing any concrete conclusions that a competitive environment did not exist or that spot prices didn't reflect underlying market conditions during the time period examined. More definitive results would be required to support any further actions being taken. This view is shared by TLG.

TLG advise that:

³ The other conditions were Trustpower shareholder approval and Commerce Commission approval which have both now been completed.

⁴ <https://www.transpower.co.nz/sites/default/files/publications/resources/TP%20Whakamana%20i%20Te%20Mauri%20Hiko.pdf> , page 22.

“The BCG (Boston Consulting Group) framework is one of many that highlights the logical importance of applying increasing caution as a function of decreasing certitude of a given concern. It is not a case of being wrong or right, it is a case of exercising the appropriate level of prudence when no clear wrong or clear right exists. Stability, benefit of the doubt, or a shift in focus to elements that are more certain but also more surgical in nature are all the more important when an overarching path is less clear....”

We would think it prudent not only to allow time to test the efficacy of the recent amendment to the trading conduct rules but to establish a clearer need for further regulatory intervention. Necessary interventions are those the need for which is clearly supported by evidence, address a widely observed and material market failure, and are unlikely to cause even greater harm. It takes time to establish the basis and specificity of prudent intervention. The Authority have fallen well short of meeting this test in our view....”

TLG also expresses concern that:

“... insufficiently supported claims or even mere suggestions of possible issues have the potential to confuse commentators, provide ammunition for both agreeing and opposing stakeholders to leverage further views without having the burden of proof - which the Authority recognises has not strictly been met in its own evaluation - or to distract policy makers away from other more important points being made (such as the need to attract and reward new investment to support the low carbon transition).”

More broadly, we consider that the Authority shouldn't be concerned with questions such as “how to turn all the indicator's green” or “account perfectly for all underlying conditions”. Its particularly notable that TLG questions whether this is even the correct aspirational standard, suggesting it would be inconsistent with the premise of workable competition on which the market has been designed:

“... we understand the desire for perfect markets or to explain every market outcome decisively, that is not the standard to which any electricity market is designed. Grey areas such as ‘workable’ competition and other qualitative constructs implicitly recognize this (or they would not be necessary or have ever arisen in the first place). The energy transition throws additional uncertainty and risk into the market mix. All else equal, it is likely to be better to give the ‘market’ more ‘space’ to work through these things and focus on reducing the uncertainty around potential interventions that could chill investment or distort the on-going response and adaptation that the energy transition requires.”

There are however three potential matters identified by the review which we consider warrant further attention at this time:

- The level of concentration in the market suggests it would be appropriate for the Authority to enhance its focus on monitoring the trading conduct of net pivotal parties to ensure that competitive outcomes are arising;
- The concerns around the countervailing market power of Tiwai suggests it would be timely to consider extending the trading conduct provisions to cover both supply and demand side of the market; and
- The issues with contractual arrangements containing provisions which act as a restraint on resale (as identified during the Authority's review of the Tiwai) should be further explored as part of a more comprehensive market study. Refer to section 5 of this submission.

Our more detailed comments on the three elements of the assessment framework are as follows:

Market Structure

The observation that Meridian is gross pivotal 90% of the time also does not on its own suggest that the market structure is resulting in distortions to competitive outcomes occurring.

Simply having market power doesn't mean a party is using it to the detriment of the long-term interests of consumers. Understanding the underlying behavioural incentives (financial, social licence, reputation etc) for a party that is pivotal is also key. It is notable that the Authority's indicator has focussed on the frequency of a party being gross rather than net pivotal, which is where a supplier may actually have incentives to raise prices and any targeted regulatory action would be more reasonably focussed.

As TLG notes:

*“in New Zealand’s case, we would expect to see that where market power exists, it is more likely to be localised and temporary. This expectation is supported by the overall more moderate SCP observations (the prevalence of amber traffic lights observed in the SCP analysis – refer **Error! Reference source not found.**).*

We would thus expect to see the SCP framework being used to help identify where such structural imperfections may exist, and under what circumstance they are likely to manifest, so that appropriate regulatory tools can be necessarily and appropriately targeted. In this regard it is critical to differentiate between a market being generally competitive and how that market responds when demand/supply conditions temporarily tighten....

Net pivotal supplier is an area where targeted regulatory action is appropriate e.g. where the application of the new trading conduct amendment rule may be efficacious and should be monitored closely by the Authority (as we see has been taking place with the new market monitoring weekly report on trading conduct). However, we repeat our earlier point that the existence of market power is not proof in and of itself that market power is being exercised. However, in our view, more broadly and untargeted regulatory actions are not warranted in this area - please do not keep the whole class in because you suspect one child is acting out.”

In our view the identified concentration in the market reinforces the importance of the Authority maintaining vigilance in ensuring competitive outcomes are arising and fully utilising its existing suite of regulatory tools, including the new trading conduct provisions, in a targeted manner.

We note the recent increases in resources available within the Authority to support its enhanced monitoring function and continue to strongly support the Authority’s efforts in this area.

Market Conduct

Given the unprecedented need for investment to occur across the supply chain during a time of significant change and uncertainty for the industry, we consider it is vital that the Authority vigorously prioritise its efforts and ensures it does not focus on short run allocative efficiencies at the expense of long run dynamic efficiencies.

As TLG note:

“the prudent focus necessarily shifts towards ensuring that the market is able to respond via a combination of price signals and commercially driven entry and exit. These are the more important issues in any transitional period. The risk of applying a relatively microscopically focused lens on shorter-term idiosyncrasies at a time when the more concerning problems and challenges are at a macroscopic perspective is that market stakeholders are processing not just medium and longer-term energy transition risks but must also consider short-term regulatory risk and associated uncertainty.

Our view is that the best long-term outcomes for consumers will arise from the Authority focussing its efforts on addressing any barriers to entry so new entrant generation can enter the market and provide further competitive pressure to discipline pricing outcomes.

This should occur in conjunction with the Authority continuously monitoring trading conduct, with a particular focus on net pivotal suppliers, in order to identify if non-competitive outcomes have occurred.

Market Performance

It is notable that Concept Consulting’s profitability analysis does not provide clear financial evidence to support concerns around profitability of the four large generator retailers. Instead, the analysis demonstrated fairly stable aggregate EBITDAF for the financial years 2016 - 2020, with the exception of Meridian.

However, we note that profitability needs to be considered over an appropriate timeframe given the nature of the underlying investments – this is particularly relevant when considering investments in high-cost, long-lived generation assets. In our view Meridian’s increase in EBITDAF over the short period considered by the review is not sufficient to draw any conclusive views.

5. Is there inefficient price discrimination occurring?

Trustpower agrees with the Authority that there may be some issues associated with “use it or lose it” provisions in longer term contracts with large users (as identified from reviewing the Tiwai contract) which require further consideration.

As written in the Tiwai contracts such a clause is effectively a restraint on re-sale. These types of arrangements are more commonly seen in gas markets where their enforceability is now in question. In fact, within Europe and Japan similar resale restrictive provisions in LNG contracts have been found to be anticompetitive in recent years. This is further explored in section 5.3.4 of TLG's paper.

However, as TLG notes:

"Given the unique nature of Tiwai, in both terms of scale and historical physical link to Manapouri generation, we wouldn't necessarily expect to see the same issue arising with other large users. We are also not aware of any broader studies undertaken by the Authority to support this being the case."

We suggest that a comprehensive study would be required to fully understand the potential problems in this area (including the potential magnitude and likely frequency of occurrence) before any further action is taken. Consideration of whether these types of provisions are anti-competitive does not however sit within the realm of traditional "market regulation" and we suggest the Commerce Commission should lead any further work in this area.

Finally, we note that this is a relatively narrow issue that, depending on the outcomes of the study, would be most appropriately addressed via a surgical intervention to prohibit these types of provisions in contracts. Some of the Authority's other identified potential solutions are highly interventionist (i.e. pre-approval of large contracts) and much broader in scope. They could be described as trying to crack a nut with a sledgehammer, particularly when it's not clear that there is much to be gained from cracking the nut in the first place.

6. Why has required investment in new generation been delayed?

We agree with the Authority's findings that a number of matters have led to delays in new generation in recent years (including the impacts of uncertainty around Tiwai and government policy) but that there is evidence this is now changing as demonstrated by a number of recent public announcements around new generation projects.

As a broader observation, we note the concerns of others that the largely vertically integrated nature of the market makes it challenging for independent generators and retailers. However, we consider these concerns are misgiven, as evidenced by our recent decision to sell Mercury our mass market customers.

In our view the current market arrangements provide adequate arrangements for managing risks and we don't consider there are any major impairments which will impact on our ability to operate as an independent generator under the current market design. There may however be further evolutionary improvements which can be made to the market design to address any barriers to entry impacting on new entrants (both load and generation).

We support the Authority further exploring this as part of its recently announced work programme⁵ to identify barriers to the connection and operation of renewable generators and suggest the scope should be widened to also consider barriers to entry impacting on large load.

We offer the following suggested initial areas of focus:

- **Further development of hedging arrangements** – Ensuring that the hedge market arrangements will be fit for purpose during the transition will be important for supporting entry of new generation and/or load. We support the Authority's intended exploration of these opportunities (as signalled in the released energy transition roadmap) and note that the outcomes of the MDAG's work to explore 100% renewables should also provide valuable insights around this matter.

⁵ Refer to <https://www.ea.govt.nz/assets/dms-assets/29/Roadmap-Transition-to-Low-Emissions-Energy-System-v1.0.pdf>

For example, the costs of trading on the ASX potentially acts as a potential barrier for participation at the moment and we would encourage the Authority to explore enabling prudential offsetting between the ASX and clearing manager.

- **Further development of the PPA market to support longer term contracts** - The current PPA market⁶ is relatively informal and worked reasonably effectively over many years at low cost. The market however remains largely in its infancy, particularly when compared with the PPA market for renewables which is emerging in Australia⁷.

There has been some broader development in the PPA market more recently, with Meridian Energy signalling that it will be tailoring more of its commercial contract to five-year terms (or longer) and Contact Energy recently announcing a 10 year contract with Pan Pac Forest Products and Oji Fibre Solutions, off the back of the MEUG initiated New Zealand Renewable Energy Generation Project.

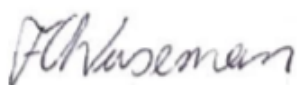
We anticipate this development of the PPA market will continue to evolve naturally, however we recognise the ICCC's view that it might be challenging for owners or would-be investors in small to medium size distributed generation to access suitable buyers in the electricity market and that this problem may grow overtime as electrification occurs. This suggests there may be some scope for further facilitation of PPAs in this segment of the electricity market⁸ and we support the Authority working with officials to explore the opportunities to further develop the PPA market⁹.

There are also broader challenges for the entry of new generation under the existing environmental statutory framework and we are not satisfied that the resource management system reforms, as currently proposed, will enable the pace of renewable generation development required for the transition.

While this is a matter outside the remit of the Authority, we encourage all regulatory institutions which are involved in the electricity sector (MBIE, Commerce Commission, CCC, ECCA and Ministry for the Environment) to continue to work together on these interrelated workstreams which have implications for the energy transition to ensure an aligned policy response can be achieved in practice. This will remain particularly important for ongoing work looking at addressing any barriers to entry for new generation.

For any questions relating to the material in this submission, please contact me on 027 549 9330

Regards,



Fiona Wiseman
Senior Advisor, Strategy and Regulation

⁶ A well-designed PPA potentially can deliver multiple benefits including electricity cost reductions, the ability to hedge against energy market volatility, greater budget certainty and ensure emissions reductions to meet a business's decarbonisation commitments. It also can help support the progression of new renewable generation projects, particularly at a smaller scale.

⁷ Refer to the Corporate renewable PPA tracker developed by energetics: <https://www.energetics.com.au/insights/knowledge-centres/corporate-renewable-ppa-deal-tracker>

⁸ Enhanced facilitation arrangement should be focussed on projects similar to the previously proposed, but now cancelled, Blueskin Bay turbine (~1x3MW turbine). Or the often muted Paekakariki project (3x900kW).

⁹ Further details of our suggestions for the development of the PPA market were outlined in our submission to MBIE on its Accelerating Renewable Energy consultation paper.

Final Report

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1. EXECUTIVE SUMMARY

The Electricity Authority (Authority) has conducted a review into competition in the wholesale electricity market (the Review) following a period of **sustained elevated electricity prices** since an unplanned outage at the Pohokura gas facility in Spring 2018. The period of the review extends from 1 January 2019 until 30 June 2021.

The conclusion from the review is that:

1. Higher wholesale prices cannot be fully explained by the underlying demand and supply conditions,
2. There is some evidence that wholesale prices have not been formed in a competitive environment,
3. Inefficient price discrimination may have taken place with the Tiwai Contracts, and
4. New investment to support a low emission economy may be unnecessarily delayed.

However, much of these findings have been drawn from inconclusive statistical analysis, overly simple extrapolation of future prices, ambiguity between the factual and the counter-factual, and a focus on short run outcomes despite these being insufficient to form a robust long-term perspective on the quality and nature of an investment environment required to both support timely investment and provide broadly reasonable signals to guide a prudent transition to a low carbon environment.¹

Ironically, the higher prices giving rise to the review have largely resolved since the period of the review concluded.

¹ Whilst we understand the desire for perfect markets or to explain every market outcome decisively, that is not the standard to which any electricity market is designed. Grey areas such as 'workable' competition and other qualitative constructs implicitly recognize this (or they would not be necessary or have ever arisen in the first place). The energy transition throws additional uncertainty and risk into the market mix. All else equal, it is likely to be better to give the 'market' more 'space' to work through these things and focus on reducing the uncertainty around potential interventions that could chill investment or distort the on-going response and adaptation that the energy transition requires.

1.1. INCONCLUSIVITY SHOULD BE SUFFICIENT

The Authority recognises that the analysis to date is largely inconclusive. The BCG framework (refer Figure 5) is one of many that highlights the logical importance of applying increasing caution as a function of decreasing certitude of a given concern. It is not a case of being wrong or right, it is a case of exercising the appropriate level of prudence when no clear wrong or clear right exists. Stability, benefit of the doubt, or a shift in focus to elements that are more certain but also more surgical in nature are all the more important when an overarching path is less clear.

We have also noted that, following the end of the review period (since 30 June 2021), a number of the conditions giving rise to the review have since altered materially. These are a decline in wholesale prices since the middle of this year and an increase in investment activity being signalled through a higher level of engagement with Transpower over new potential connections. We also note that much of the concern over the review period is concentrated in one or two brief periods, making it even more difficult to extract broader inferences or form views on appropriately defined solutions. When a *preponderance* of evidence does not exist, the urge to assign cause or guilt becomes more problematic.

A key focus in markets is whether there is reasonably unfettered scope for responsive entry. Trustpower restructuring itself into a largely independent generator with a clear focus on renewable options is a positive indicator.

The effect of 'competition' in high fixed cost sectors with supply and demand that can be relatively inelastic in the short-term is to resolve imbalances using relatively volatile price signals. New Zealand's hydro-dominated system offers some offset to this effect as short term supply may be more responsive than medium term supply in an energy limited system. Yet the energy transition will tend to increase volatility all else equal as dependence on intermittent renewables increases. Arguably a less volatile market in the midst of so many changing factors would be more concerning as it may indicate an inability for the market itself to transmit valuable signals about risk or opportunity to the supply and demand side to drive efficient (or in some cases simply mitigating) responses. The pathway to the energy transition is not going to be smooth no matter how much we might prefer it to be.

We also note that there have been a number of new regulatory and industry initiatives that would appear to be well aligned with addressing some of the concerns raised by the Authority but have not yet had the opportunity to be observed in practice (such as the new trading conduct rules, the Genesis-Methanex gas swap and the announced closure of the Marden Point Oil Refinery).

We would think it prudent not only to allow time to test the efficacy of the recent amendment to the trading conduct rules but to establish a clearer need for further regulatory intervention. Necessary interventions are those the need for which is clearly supported by evidence, address a widely observed and material market failure, and are unlikely to cause even greater harm. It takes time to establish the basis and specificity of prudent intervention. The Authority have fallen well short of meeting this test in our view.

We are concerned by a number of the headline claims that the review has generated about the impact of the Tiwai Contracts on the price of electricity paid by other consumers. It is easy for headlines to escalate perspectives that were not specifically supported in the first instance.

We are also concerned that insufficiently supported claims or even mere suggestions of possible issues have the potential to confuse commentators, provide ammunition for both agreeing and opposing stakeholders to leverage further views without having the burden of proof - which the Authority recognises has not strictly been met in its own evaluation - or to distract policy makers away from other more important points being made (such as the need to attract and reward new investment to support the low carbon transition).

1.2. NEW INVESTMENT REQUIRED

Traditionally, generation investment has been seen as a large-scale, capital-intensive activity where the larger the balance sheet to support the investment the more efficient the investment would be.

The energy transition is challenging that traditional perspective, by increasing the complexity and range of choices available. Yet, the road to carbon free energy is not at all clearly marked. With many risks and uncertainties yet to be navigated, the most important aspect of the Review, in our view, has been to acknowledge the importance of attracting new investment to support the complex transition to a low carbon emission economy. Interventions risk increasing uncertainty in an investment environment that is already changing rapidly with increased focus on renewable sources of generation and smaller distributed options, including behind the meter technologies (all of which are quicker to market compared to traditional hydro and thermal resources).

We have also noticed in our experience internationally that there is a much greater willingness for parties to enter into Corporate Power Purchasing Agreements (PPAs), especially for Green Corporate PPAs, to support new investment in renewable generation. Such options offer a further pathway for speeding up the response of demand and supply to changing conditions.

During the period of the Review we note that there has also been examples of long term PPAs being struck off market between willing sophisticated counterparties in New Zealand. A case in point being the financial hedge agreements between Trustpower and Mercury associated with the sale of Trustpower's retail portfolio.

Amidst this transition the electricity sector is gaining complexity with more technology and fuel choices, more stakeholders, and a growing need for better and more information to guide, measure, coordinate, and generally 'signal' optimal investments and behavioural choices. Regulation and regulatory bodies have a significant impact on the effectiveness of the electricity sector in meeting broader policies in an efficient and responsible way. The least of which is to ensure that markets are dynamically efficient in order to attract and reward the new investment required.

1.3. TARGETED REGULATORY TOOLS

As we note, well-functioning markets will have to achieve both short run and long run efficiencies. Much of the review focuses on short-run efficiencies (predominately allocative) at the expense of long-run efficiencies (dynamic).

In any electricity market, we would expect that it is possible for some market participants to have some market power at some time or in some locations. The practical standard for electricity market structure in New Zealand or anywhere to date has not been perfect competition. However, it is not the existence of market power that should give concern, but whether such market power is being exercised to a degree that necessitates consideration of corrective, mitigating, or other forms of *targeted action*.

Some of the regulatory solutions proposed to address inefficient price discrimination (when such a concern has not been demonstrated to exist within or outside of the Tiwai Contracts) are blunt and intrusive. The concern here is that in trying to address a problem perceived with short run allocative efficiency the regulatory tool will potentially dampen long-run dynamic efficiency. And as we note, in an environment where a key policy objective is to attract new investment to support a low emissions economy, such regulatory direction is counterproductive.

The area where we do see a potential concern with the Tiwai Contracts is the use-it-or-lose-it clause which may translate to a restriction on re-sale. If such a clause could be considered anti-competitive, then it would benefit from the broader perspective on such clauses across industries as the Commerce Commission could normally bring. In any event, these would, more naturally, be concerns that should take precedence over the short-run allocative efficiency concerns arising from the Authority's review.

1.4. FREEDOM TO CONTRACT

Freedom to contract between well informed and willing buyers and sellers in the absence of market power being a unduly material factor, is a cornerstone of workable markets. The only concern we can see arising from such contracting is the potential loss of information transparency to the wider market. However, we note that disclosure of risk management contracts is already provided for under part 13, subpart 5 of the Code.

In the interests of maximising transparency, and to ensure consumers make informed decisions, we would also advise, to the extent that this is not already taking place, that hedging information be disclosed by retailers to customers, similar to how insurance providers disclose their credit ratings in respect of claims paying ability².

² Insurance (Prudential Supervision) Act 2010, paragraph 64

1.5. THE WAY FORWARD

While New Zealand already has a high level of renewable generation available to it (albeit reducing in recent years as a proportion of the overall market output) the magnitude of the transition required to further lower carbon emissions while maintaining high levels of system availability and reliability is significant.

The market needs to be given time to develop and adapt with an increased focus on long run rather than short run outcomes. The greater use of green corporate PPA agreements to support new renewable investment is part of a global trend that should be further encouraged in New Zealand.

However, managing this energy transition will not be easy. There will need to be a greater acceptance that high prices are sometimes required to allow a market to be both allocatively and dynamically efficient.

The Authority can support this energy transition by ensuring that its regulatory tools do not distort pricing signals through blunt un-targeted measures. The recent weekly trading conduct reports are an excellent example of a prudent regulator lifting confidence in market outcomes through increased transparency.

2. INTRODUCTION

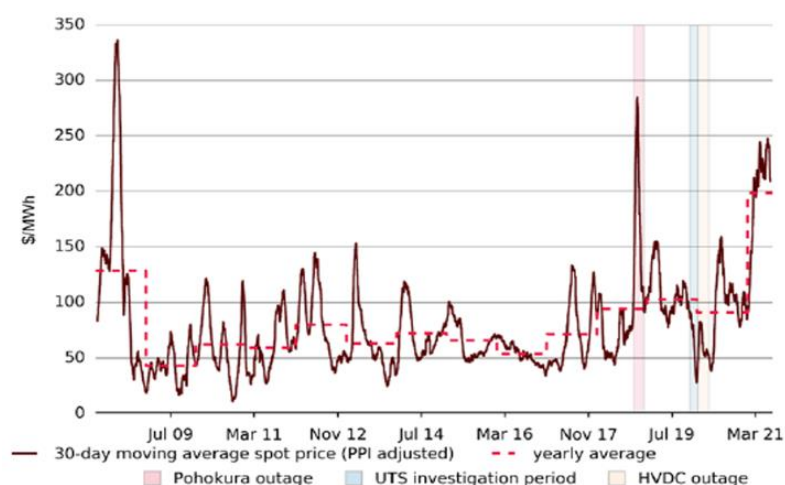
2.1. ELECTRICITY AUTHORITY MANDATE

The Electricity Authority (Authority) is an independent crown entity with the objective to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers³. The Electricity Industry Act 2010 provides for the Authority to undertake industry and market monitoring, including reviews, studies, and inquiries into any matter relating to the electricity industry⁴.

2.2. ELECTRICITY AUTHORITY REVIEW INTO WHOLESALE MARKET COMPETITIVENESS

Within its mandate, the Authority has conducted a review into competition in the wholesale electricity market following a period of **sustained elevated electricity prices** since an unplanned outage at the Pohokura gas facility in Spring 2018 (refer Figure 1). The period of the review extends from 1 January 2019 until 30 June 2021.

Figure 1: Prices have been elevated since late 2018



Source: Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market, Information Paper, October 2021

The Authority has produced a report titled **Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market** (the Review) which outlines the methodology it has followed for the review, as well as its observations about the competitiveness of the wholesale market. The main observations from the Review are⁵:

- 3 Paragraph 15, Objective of Authority, Electricity Industry Act 2010.
- 4 Paragraph 16(1)g, Functions of Authority, Electricity Industry Act 2010.
- 5 EA website

- (i) Some prices offered by electricity generators do not reflect underlying supply and demand conditions;
- (ii) There is some evidence of an increased incentive and ability for electricity generators to structure their offers into the market in a way that keeps prices high (economic withholding);
- (iii) Interviews with investors indicated investment has been impacted by the uncertainty surrounding the Tiwai smelter and other factors such as the need to update resource consents for new technology; and
- (iv) The New Zealand Aluminium Smelter (NZAS) was offered a low electricity price to encourage it to stay and this may have resulted in other consumers having to pay more.

A second report produced by the Authority titled ***Inefficient price discrimination in the wholesale electricity market*** addresses in greater detail point (iv) above – the belief that the Tiwai smelter staying in New Zealand results in higher prices for other consumers. The Authority claims that generators are subsidising the smelter by up to \$500m over its 4 year contract renewal term (expiring 31 December 2024), resulting in higher prices for other consumers. The Authority estimates that this could add up to \$200 to household electricity bills each year. In this second paper, the Authority proposes possible options to ensure that “similar, future contracts between electricity generators and large consumers are efficient”.

In this paper we look at four areas of concern raised by the Authority:

1. Do wholesale prices react to the underlying demand and supply conditions?
2. Are wholesale prices being formed in a competitive environment?
3. Is inefficient price discrimination taking place with the Tiwai Contracts and is this indicative of allocative inefficiency elsewhere?
4. Is new investment to support a low emission economy being unnecessarily delayed?

3. DO PRICES REFLECT UNDERLYING DEMAND AND SUPPLY CONDITIONS?

The Authority has concluded that “prices over the review period have, at least to some extent, reflected underlying supply and demand conditions, which is a sign of a competitive market”⁶. However, prices have been high by historical standards, which the Authority suggest is only partly explained by:

- higher demand,
- lower hydro inflows and storage,
- a number of gas production outages,
- all fuel costs rising, including the value of stored water, and
- costs associated with carbon dioxide emissions having risen.

The Authority go on to say that:

*“It is not possible to definitively conclude whether all of the increase in prices is due to underlying conditions, including uncertainty about future gas supply from existing fields, or if some of the increase is due to prices not being determined in a competitive environment. This is because, given the data available to the Authority, it is **difficult to account perfectly for all underlying conditions**”⁷.*

We would be surprised if it were possible to account perfectly for all underlying conditions. We are not sure that is even the correct aspirational standard. It seems wasteful to need to determine if prices are always perfectly reflecting underlying conditions. In the absence of a clear problem, markets are supposed to be trusted as the manifestation of complex interactive processes. If all outcomes were so easily predicted, it is less clear what value a market might even provide.

In simply looking at wholesale prices over the last 10 years (refer Figure 2), while it is observable that there has been a period of higher prices and higher price volatility in the last 3 years (the area circled in Figure 2) this has **fallen steadily since peaking in May 2021**.

⁶ Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market (executive summary page ii), October 2021.

⁷ Emphasis added.

Such price behaviour should not be a complete surprise to the informed observer given that the New Zealand electricity system has experienced significant pressure over the period of review, including demand swings due to Covid-19, is still highly dependent on thermal generation for hydro firming and ‘insurance’ for dry year risk, and such insurance being a) called upon more frequently with more frequent hydrological events, and b) becoming more expensive with reduced thermal supply, gas outages becoming more common, greater reliance on coal at times and the incorporation of carbon cost into the equation.

And, we would expect to see higher levels of wholesale price volatile continuing in the short to medium term due to both continuing climate change affecting hydrology and an increased drive towards higher levels of intermittent renewable generation. This will likely continue to be the case until new fast response technologies (e.g. grid level battery storage) replace thermal generation in the role of renewable firming to maintain system security and reliability.

It is also possible that the pricing changes we have seen over recent years are more systemic and may represent an industry in transition (to a low emission economy).

Figure 2: Wholesale Prices (monthly averages)



Source: Electricity Authority EMI (12 November 2021)

What this means is that the prudent focus necessarily shifts towards ensuring that the market is able to respond via a combination of price signals and commercially driven entry and exit. These are the more important issues in any transitional period. The risk of applying a relatively microscopically focused lens on shorter-term idiosyncrasies at a time when the more concerning problems and challenges are at a macroscopic perspective is that market stakeholders are processing not just medium and longer-term energy transition risks but must also consider short-term regulatory risk and associated uncertainty.

3.1. SUPPLY AND DEMAND CONDITIONS

In looking at the market conditions (as provided by the Authority) over the period of the review, it would be fair to say that one of the few common themes has been a high degree of both variability and unpredictability (see Table 1).

Table 1: Summary of market conditions by month

Period	Summary
January–February 2019	Ongoing gas supply disruption following the 2018 Pohokura outage, another Pohokura outage in February, hydro storage below mean in January and declining in February, high summer demand
March 2019	Low wind and low hydro storage — hitting the 1 percent Electricity Risk Curve, high thermal generation
April–June 2019	High hydro storage with spilling occurring in the South Island
July 2019	Continuing high SI hydro storage and improving North Island hydro storage
August–October 2019	Decreasing hydro storage, high thermal generation, Kupe unplanned outage late September–early October, high demand
November–December 2019	Undesirable trading situation period. Spilling in the SI, NI hydro generators were trying to increase and conserve storage for the upcoming high-voltage, direct current (HVDC) outage
January–March 2020	HVDC outage. Storage levels reverted to mean, demand was higher than average, and the HVDC outage caused price separation
April 2020	COVID-19 level 4 lockdown, demand very low
May 2020	Historically low NI inflows, delayed scheduled maintenance outages, start of declining output from Pohokura
June 2020	NI hydro storage low (fifth lowest on record), thermal generation high
July 2020	Cold weather, low wind generation, low lake levels, thermal generation high, NZAS terminates electricity contract, Kupe outage
August 2020	Auckland COVID-19 level 3 lockdown, warmer temperatures, low wind generation, low lake levels
September 2020–December 2020	Improving — but fluctuating — lake levels, Pohokura outage finished, decreasing Pohokura output, constrained output from the lower SI due to transmission outage
January–March 2021	NZAS contract announced, decreasing hydro storage, high gas spot prices, high carbon prices, decreasing Pohokura output, low wind generation, Rankine outages
April–June 2021	Very low hydro storage, constrained gas supply, weak wind conditions, Kawerau outage in June

Source: Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market, Information Paper, October 2021

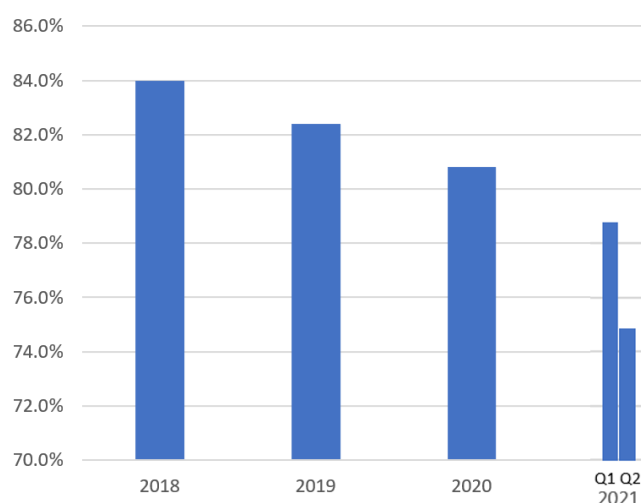
Stepping back, it is not clear why the Authority chose this particular time to undertake a review of pricing activity – given the backdrop of contemporaneous events, it would be prima facie more difficult to resolve to an actionable finding conclusively. One problem is that it becomes easy to lose sight of the counterfactual against which to draw inferences and comparisons. None of the myriad counterfactuals are perfect, either. It would seem better to and more productive to suggest that any industry that can manage its way through such a plethora of variability and uncertainty warrants some level of positive acknowledgement. The market may not be perfect for any number of reasons but risking a loss of confidence in what the market regularly achieves is problematic.

3.2. COMPOUNDING EVENTS IMPACTING PRICE - A PERFECT STORM

A number of concurrent events appear to have compounded in recent years which has led to the pricing outcomes seen in the wholesale market (creating a '*perfect storm*'). These are:

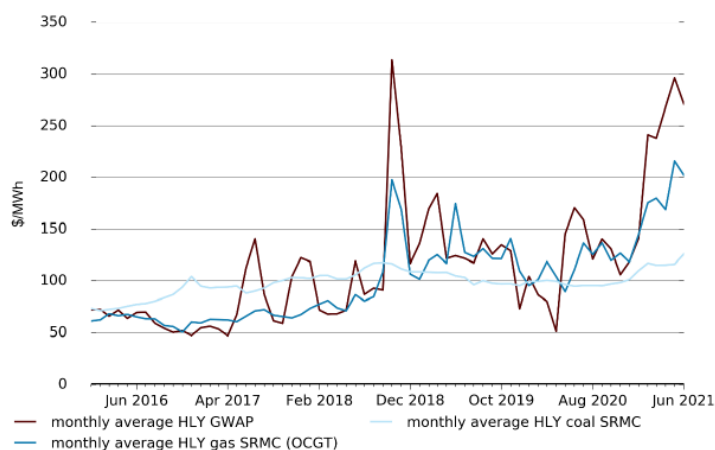
- Reduction in hydro generation availability causing the level of renewable generation to decline year on year- see Figure 3.
- Increased gas outages meaning that when gas is needed to cover for the declining levels of renewables it will be more expensive (due to reduced supply), and at times when gas is insufficient, the greater need to use coal. According to the Authority electricity generation from coal increased in 2019 by 43 percent and in 2020 by 47 percent, compared with 2018. The first quarter of 2021 saw the highest quarterly coal usage for electricity since 2012.
- Increased thermal fuel prices (gas and coal) and increased carbon costs – see Figure 4.
- Managing demand recovery uncertainty due to Covid-19.

Figure 3: Decline in Renewable Generation Output over the Review period



Source: Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market, Information Paper, October 2021

Figure 4: Huntly Generation Weighted Average Price (GWAP) and coal and gas SRMC (inclusive of carbon price)



Source: Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market, Information Paper, October 2021

3.3. STATISTICAL ASSESSMENT

We note that the Authority has undertaken a regression analysis of the wholesale price (dependent variable) against a number of factors (independent variables). It establishes correlation across a number of these factors (indicating, subject to 'causation vs correlation' that prices are responding to market fundamentals). However, the Authority concluded that:

While spot price movements appear to have reflected underlying conditions, there has been an overall increase in the level of spot prices above the level explained by the market fundamentals in the regression.

The key point to note here is "**in the regression**". The Authority is not saying that price outcomes cannot be fully explained by the underlying conditions, only that they cannot be explained by the regression model it has applied. This may simply be that the linear regression model being used is too simplistic for the multiple number of causal factors (variables) that are at play. Regression analysis works best when attempting to examine a few independent 'causal' variables. The Authority has not made this task easy for itself in tackling a very complex interplay of conditions (as highlighted in Table 1).

Linear regression tests make a number of assumptions about the independence of variables and the relationships between them. They are prone to error and explicitly allow for this with a 'error term'. The **perfect storm scenario** we present in Section 3.2 would suggest to us that the underlying factors are not truly independent, and their relationship is likely to require a further degree of complexity than that assumed in a linear regression test.

Common errors in the application of multiple linear regression arise when:

- The relationship between the dependent variable and the independent variables do not follow a linear model.
- Two or more independent variables are highly correlated with one another (multicollinearity). That is, that the factors influencing price are not independent of each other.
- Successive observed values of the dependent variables are correlated rather than uncorrelated (autocorrelation). That is, that prices in successive time periods are not independent.
- General assumption of variables being normally distributed does not hold. Electricity price distribution is known to be long tailed (kurtosis).

We suspect that all of the above errors may have arisen in the Authority's application of linear regression model.

The Authority attempts to introduce a further independent variable "uncertainty in gas availability following the Spring 2018 Pohokura outage" by using a 'dummy variable' to see if the Pohokura outage event can account for increased prices over and above what has already been correlated to other underlying factors. It concludes that **prices are higher for other reasons**. In this case 'other reasons' relates solely to other than the single gas outage event and/or increased gas outage uncertainty following this event). The failure to correlate more strongly with this dummy variable may have been exacerbated by the 2018 Pohokura outage not being a simple Boolean event (as is assumed when using a dummy variable) – i.e. it wasn't 'out of service' and then 'in service'. When the Pohokura came back from outage, it was at circa 50% of previous flows, and falling.

The end conclusion reached by the Authority, which we would agree with is that:

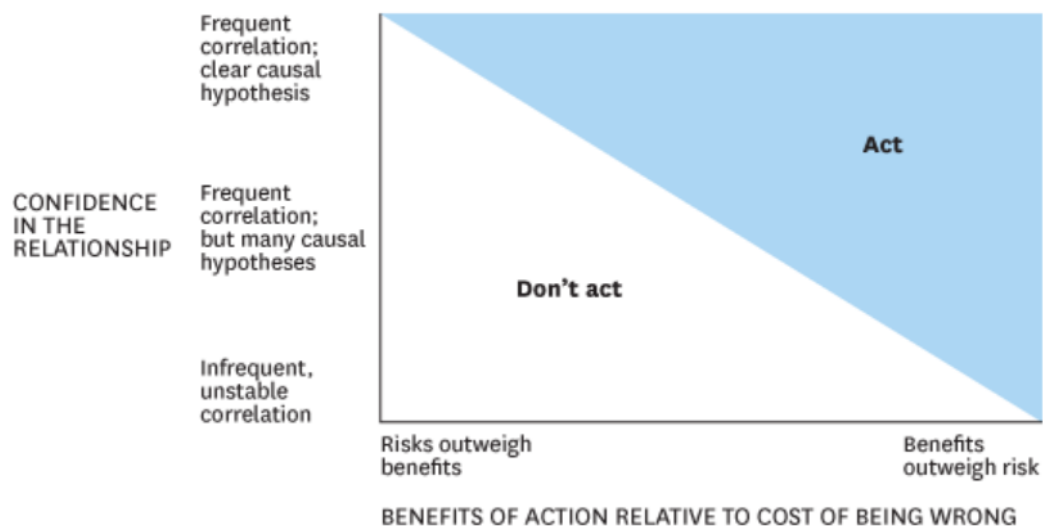
*However, we still cannot conclude definitively that gas supply risk (or indeed, some other underlying condition that we have missed from the regression analysis) is not contributing to the sustained upwards shift in prices indicated by the significant dummy variable. **Linear regression analysis is an imperfect approximation of the interactions that occur between supply and demand in the electricity market.***

Effectively, the Authority has not been able to reach any conclusive view.

A further statistical test is also used by the Authority, being a structural break test. These all show that there has been a statistically significant change (increase) in pricing behaviour since late 2018 but go no further to indicate what this 'change' may be. We don't dispute this finding but note that the Authority again has been unable to reach a conclusive view.

We believe that given the inconclusiveness of the statistical analysis undertaken by the Authority that a high degree of caution be adopted in any further action taken based on these results. The BCG action model shown below is a useful illustration of how caution needs to be applied. We would assess that based on the statistical evidence provided (or not provided) we are well within the “**Don’t Act**” zone as shown in Figure 5.

Figure 5: When to act on a correlation in your data



Source: Boston Consulting Group

3.4. HIGHER ELECTRICITY PRICES ARE SOMETIMES NECESSARY

In its broadest sense, an electricity market will attempt to achieve two objectives:

1. **Short-run efficiency:** making the best use of resources available. Provided participants' offers are generally reflective of their Short Run Marginal Cost (SRMC) then the market clearing algorithm (SPD⁸ in the case of New Zealand) will seek to optimise dispatch and reserves to achieve the lowest cost to consumers while maintaining system security requirements (often referred to as security constrained economic dispatch). The objective function is to achieve an efficient welfare maximising outcome. However, when resources are scarce, prices will rise to signal that greater, and more expensive, levels of resources need to be committed. And due to the relatively inelasticity of demand, very high prices will be tolerated by consumers if the only alternative is a curtailment of supply.

⁸ Scheduling, Pricing and Dispatch software.

2. **Long-run efficiency:** providing incentives for efficient long-run investment. In the absence of scarcity payments or a capacity market the only way that a market can achieve this objective is to allow prices to rise to high levels for a sustained period of time when new investment is required. And due to the long lead times for new construction to take place, such sustained periods of high prices can be extensive. In liberalised markets it is useful to remember that it is the investor who bears the financial consequence of new capacity decisions, not the consumer. This risk needs to be adequately rewarded for efficient and timely investment to take place.

Despite the necessity of higher prices at times - whether arising due to short run scarcity or long run signalling of new investment being required – they are often politically unpalatable. However, without higher prices at times, you end up with a market that will achieve neither short-run or long-run efficiency. The responsibility sits clearly with ministerial advisers and regulators to ensure that policy makers are well informed on why high prices are sometimes necessary, and what such prices are signalling about the supply/demand balance of an industry. Where specific concerns arise with the competitiveness of an industry, then these need to be addressed in ways which minimise distorting valid price signals (we discuss this more in Section 4.3).

We note from the MBIE report⁹ on the events of 9 August 2021 that a general concern has also been raised on the need to make the electricity system more resilient in response to increasing availability expectations by consumers.

Society has an increasing intolerance of electricity cuts. As the demand side mechanisms develop there will be less and less buffer for the SO to draw on in times of generation shortage. That means ripple control will not be available to save the day as it did, or could have, on 9 August. Additionally, climate change will increasingly test system resilience.

That begs the question as to whether the SO should adopt a more conservative posture. A simple way to frame the question would be 'should we have a redundancy setting of, say, $n-2$ not $n-1$?' Such a move might encourage additional investment but may also raise prices marginally¹⁰.

Again, without allowing high prices to signal underlying market conditions there will be no efficiency signals to incentivise (and compensate for) the types of changes required to increase system reliability.

An obvious corollary to the above is the importance of price hedging in a market where higher prices can arise. Although outside of the scope of this paper, much of the criticism thrown at markets experiencing high prices are from those who are inadequately hedged (or those reliant on the moral hazard risk for their hedging).

⁹ MBIE, Investigation into electricity supply interruptions of 9 August







¹⁰ We note from our own experience in considering $n-2$ contingencies in other electricity markets that the impact on prices can be very material.











4. DOES A COMPETITIVE ENVIRONMENT EXIST?





The Authority says that despite looking at many different indicators “*none in isolation provide concrete evidence* to establish whether spot prices are being determined in a competitive environment”.

The general methodology followed by the Authority in their Review is the Structure, Conduct and Performance (SCP) approach. The Authority provided the following ‘traffic light’ summary of observations made using this approach (generally, the greater the number of red traffic lights the higher the likelihood that market power is present).

Table 2: Summary of structure, conduct and performance observations.

	Measure	Indicators Used	What the Authority would expect to see in a competitive market	What the Authority observed
Market structure	Seller concentration	Generation HHI	Low concentration reduces risk of any one firm unilaterally affecting prices, or of lasting collusion between groups of firms. A lower HHI means lower seller concentration.	
		Gross pivotal	While the structure of generation in New Zealand means a generator may be gross pivotal a large percentage of the time, this won't change quickly over time in a competitive market. We would also expect a generally decreasing trend for each generator as new-entrant generation enters the market.	
	Barriers to entry	Vertical integration	Low barriers to entry place pressure on incumbents to display competitive pricing behaviour. Vertical integration may increase costs for new entrants by reducing liquidity in the forward market and reducing the demand for PPAs supporting new-entrant generation.	
Market conduct	Price–cost relationship	Offers over time	These should reflect underlying supply and demand conditions.	
		Percent of offers above cost	To stay the same over time. Offer prices should reflect costs (including opportunity costs) but there are some legitimate reasons for having a tranche with a higher offer price – ie, a “non-clearing” tranche	
		Relationship of storage to cost	Expect a negative correlation, because the value of stored water for hydro generators increases when storage is low relative to what is expected.	

	Measure	Indicators Used	What the Authority would expect to see in a competitive market	What the Authority observed
		Relationship of offers to cost	Should be a positive correlation, because we expect generators to increase their offers if their costs increase.	
		Lerner Index	To be closer to zero and remain about the same over time.	
	Output	2 percent decrease in demand in the SI	A modelled decrease in demand in the SI is equivalent to SI generators shifting supply from higher priced tranches to lower priced tranches. If the average price decrease from a decrease in demand has increased, this suggests an increased incentive to economically withhold.	
		Inter-island price separation	Should change with underlying conditions or changes in market structure, but not have any trend unrelated to these factors.	
		Trading periods with price separation in pre-dispatch but not in final	Offers consistent with underlying conditions, revisions in pre-dispatch consistent with underlying conditions.	
		Trading periods with high prices	Offers consistent with underlying conditions, revisions in pre-dispatch consistent with underlying conditions (no obvious manipulation). Prices reflect the marginal generator as determined by underlying conditions.	
		Tiwai contracts event analysis	Any contract made in a competitive market should not be below cost.	
Market performance	Pricing trends	2 percent increase in demand	When the market is competitive, any trend towards increases in demand resulting in large price increases should attract entry. A large price increase would indicate supply is limited at the current price level and a higher incentive to economically withhold	
		Spot market supply curve	A steeper supply curve indicates greater incentive and ability for generators to exercise market power.	
		Marginal analysis	No big changes in the percent of time any one generator is marginal (before 2018 and after), especially in higher priced trading periods. Any changes are consistent with underlying conditions.	

	Measure	Indicators Used	What the Authority would expect to see in a competitive market	What the Authority observed
		Actual versus predicted prices	Any deviations should be explainable by underlying conditions that are not captured by the regression explanatory variables.	
		Forward prices	Forward prices should reflect expectations of future supply and demand conditions, that is, future spot prices determined in a competitive market.	
	Profitability	Cost to income ratio	No firm should be able to make supernormal profits on an ongoing basis unless it is linked to innovation and a pushing out of the production efficiency frontier.	
	Dynamic efficiency	Investment	Has there been investment in least-cost generation technology? (As supply tightens, expect an increase in investment.)	

Source: Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market, Information Paper, October 2021

Of the 20 indicators used it is noteworthy that only 4 strongly indicated market power (red light), 2 provided the opposite indication (green light) while most (70%) provided a less conclusive view.

However, in considering the “complete picture” the Authority conclude that “there appears to be **some evidence** that spot prices **may** not have been determined in a competitive environment,” noting the following observations:

- The market is dominated by a few large firms, with Meridian needed to meet demand over 90 percent of the time.
- Offer prices have increased since the Pohokura outage, and there is often a large proportion of offers above cost (regardless of the cost estimate used) for some generators. However, these observations could be consistent with gas supply uncertainty.
- Some offers do not reflect underlying conditions.
- Steeper supply curves in recent years suggest an increased incentive and ability to economically withhold.

- Differences in price between the North and South Island have been subdued over the review period when storage has been high. This suggests some generators may have been economically withholding so the price they pay to cover their retail books in one island is not much higher than the price they receive for their generation in the other.
- The Lerner Index (the mark-up of price over cost) is sometimes high, so these offers above cost appear to be resulting in prices above costs, although this result is sensitive to the cost estimate used.
- Previous instances have occurred where the Authority was concerned about economic withholding.
- The contracts made between Meridian and Contact and NZAS in January 2021 (the Tiwai contracts) caused a sharp increase in the forward price. Based on that increase, spot market purchasers could be expected to pay between \$1.6 billion and \$2.6 billion more over the 3 years 2021-2023.
- The price in the Tiwai contracts (which is between \$30/MWh and \$40/MWh) does not provide assurance that the electricity is going to the highest value use.
- The estimate of the scale of the potential inefficiency of the Tiwai contracts is significant and raises concerns that the institutional arrangements are creating incentives for this.

4.1. THE STRUCTURE, CONDUCT AND PERFORMANCE (SCP) FRAMEWORK

As we noted earlier, the Authority says that despite looking at many different indicators “**none in isolation provide concrete evidence** to establish whether spot prices are being determined in a competitive environment”. From the traffic light indicators provided by the Authority (see Table 2) it would be equally valid to say of the indicators that “none in isolation provide concrete evidence to establish whether spot prices are **not** being determined in a competitive environment” i.e. to give the benefit of the doubt until proven otherwise.

We also note that the concern of economic withholding has been raised by the Authority:

Our analysis of conduct in the spot market does not currently show any definitive evidence that generators are operating outside the rules of the Electricity Industry Participation Code 2010 (the Code).¹³ There is some suggestion that economic withholding has occurred, on occasion. By way of example, the [Undesirable Trading Situation] UTS in 2019 found some evidence of this.

The SCP framework is often used through a range of industries and jurisdictions when considering antitrust (competition) matters. It is akin to a Hollywood crime drama trying to establish means, motive and opportunity.

One of the extraordinary statements made by the Authority in their Review, which we find difficult to reconcile, is that:

While the spot price may appear to reflect underlying supply and demand conditions, this analysis alone does not determine definitively whether spot prices have been determined in a competitive environment.

Provided wholesale prices are competitive (responding to underlying supply and demand conditions) it would largely appear moot to us the circumstances of the competitive environment they were determined within. Reverting back to the Hollywood drama analogy, this is akin to saying that just because she didn't shoot the victim doesn't mean to say she didn't have means, motive and opportunity.

Further, the existence of market power does not of itself indicate that market power is being exercised. Structural deficiencies, which give rise to the presence of market power, are likely to be present in any electricity industry. This is due to a range of factors including:

- economies of scale, high levels of capital investment, and historic ownership structures lending themselves to a more concentrated market environment,
- the need to coordinate interconnected parties,
- a highly transparent environment (increasing the possibilities for tacit collusion), and
- adopting a locational marginal pricing system with a long stringy grid system, is likely to limit the transfer of electricity required to create competition in all parts of the system all of the time.

However, in New Zealand's case, we would expect to see that where market power exists, it is more likely to be localised and temporary. This expectation is supported by the overall more moderate SCP observations (the prevalence of amber traffic lights observed in the SCP analysis – refer Table 2).

We would thus expect to see the SCP framework being used to help identify where such structural imperfections may exist, and under what circumstance they are likely to manifest, so that appropriate regulatory tools can be necessarily and appropriately targeted. In this regard it is critical to differentiate between a market being generally competitive and how that market responds when demand/supply conditions temporarily tighten.

4.2. RECENT ACTIONS TAKEN

A number of actions have recently been taken or are about to be implemented that should start correcting some of the issues raised. These include:

- Trading conduct rules recently amended (but were after the period of review), including the 9 August brown out investigation which will provide the first test of new trading conduct rules
- New Genesis Methanex summer/winter gas swaps (announced May 2021) which will help ensure greater gas supply to the electricity industry when the need for hydro firming is more prevalent
- Announced closure of the Marsden Point Oil Refinery – freeing up about 5% of New Zealand’s gas production for other uses

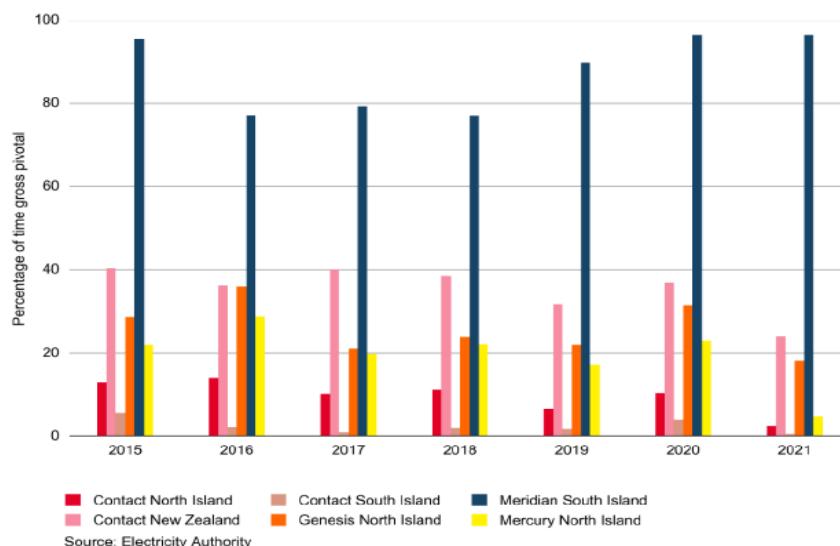
4.3. TARGETED REGULATORY ACTION

One observation from the review that immediately draws attention is the fact that Meridian is pivotal 90% of the time (refer Figure 6). However, we note that there is a difference between gross and net pivotal. These terms were defined by the Market Development Advisory Group (MDAG)¹¹ as:

Gross Pivotal - total demand in a trading period at any 1 or more nodes would not have been met if the generator had not submitted offers for all or any of its generating plant.

Net Pivotal - required to generate to avoid unserved load and whose generation is greater than its own retail and hedge sales in the relevant area.

Figure 6: Gross pivotal (generator must operate to meet system demand)



Source: Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market, Information Paper, October 2021

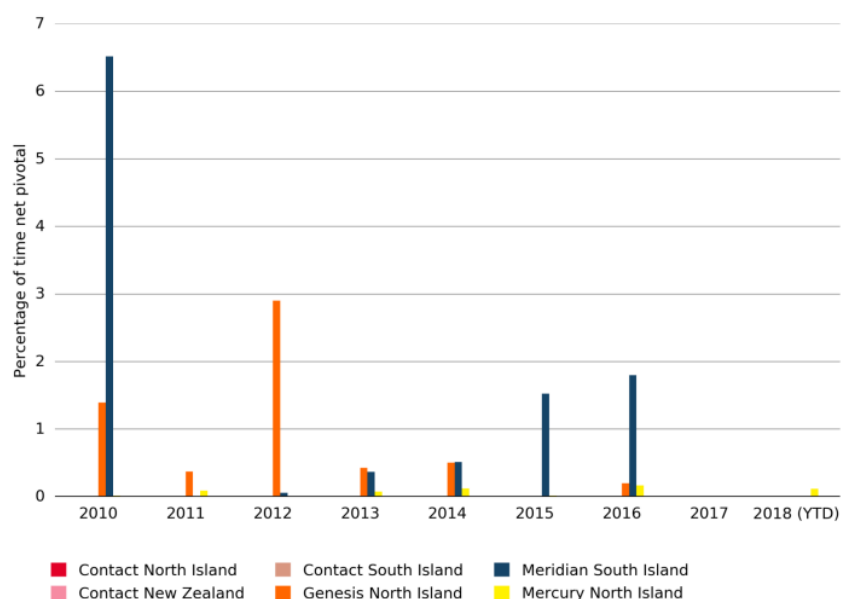
¹¹ Trading conduct review: Pivotal vs Net Pivotal, Market Development Advisory Group, 5 September 2018

MDAG go on to note that when a supplier is net pivotal they have incentives to raise prices because:

- their hedge position, including retail, provides no financial constraint
- they lack competitive pressure, i.e. they have market power

However, net pivotal occurs much less than gross pivotal (refer Figure 7).

Figure 7: Net Pivotal Supplier



Source: Trading conduct review: Pivotal vs Net Pivotal, Market Development Advisory Group, 5 September 2018

Net pivotal supplier is an area where targeted regulatory action is appropriate e.g. where the application of the new trading conduct amendment rule may be efficacious and should be monitored closely by the Authority (as we see has been taking place with the new market monitoring weekly report on trading conduct). However, we repeat our earlier point that the existence of market power is not proof in and of itself that market power is being exercised. However, in our view, more broadly and untargeted regulatory actions are not warranted in this area - please do not keep the whole class in because you suspect one child is acting out.

Following the conclusion of the review period the Authority began to actively monitor trading conduct as part of the new trading conduct provision which came into effect on 30 June 2021. Since this active monitoring and reporting has taken place month-on-month average wholesale prices have consistently fallen (refer Figure 2) with no significant deviations of prices from underlying supply and demand conditions noted (see Table 4). This may well be a case of *post hoc ergo propter hoc* or simply because it started to rain.

Table 3: Weekly Trading Conduct Reports

Week	Overview
7 to 13 November	Prices this week appear to be consistent with underlying supply and demand conditions. Higher prices appear to be due to low wind generation and an increase in planned outages.
31 October to 6 November	Prices this week appear to be consistent with underlying supply and demand conditions
24 to 30 October	Prices this week appear to be consistent with underlying supply and demand conditions. However, further analysis will be done on reserve offers in some trading periods.
17 to 23 October	Prices this week appear to be consistent with underlying supply and demand conditions.
3 to 9 October	Prices this week appeared to be consistent with underlying supply and demand conditions.
26 September to 2 October	Prices this week appeared to be consistent with underlying supply and demand conditions. High prices were due to a combination of high demand, transmission and generation outages and low wind.
19 to 25 September	Prices this week appeared to be consistent with underlying supply and demand conditions. Overall, prices have decreased due to increased hydro storage. There was some price separation on 22 September when the increase in North Island demand was unable to be met by South Island generation.
12 to 18 September	Prices this week appeared to be consistent with underlying supply and demand conditions. There was an increase in outages which caused tight supply during some peak periods resulting in high prices.
5 to 11 September	Prices this week appeared to be consistent with underlying supply and demand conditions. High prices on 8 September were due to high demand.
29 August to 4 September	Prices this week appeared to be consistent with underlying supply and demand conditions.
22 to 28 August 2021	Prices this week appeared to be consistent with underlying supply and demand conditions, with price separation due to the HVDC outages, and high reserve prices due to reduced supply.
15 to 21 August 2021	The HVDC outage this week caused price separation, an outcome that reflected the underlying supply and demand conditions in each island. A few trading periods without price separation will be further analysed.
8 to 14 August 2021	The events of 9 August are already subject to a trading conduct breach allegation and a pricing error claim. Prices for the rest of the week reflected demand and supply conditions.
1 to 7 August 2021	High prices this week may be due to high demand and tight supply conditions, but some trading periods warrant further analysis. The trading periods we will investigate further are listed at the end of this report
25 to 31 July 2021	Energy prices this week appear to be consistent with underlying supply and demand conditions. There was one trading period (TP) with high FIR prices that will be investigated further listed at the end of this report.

Week	Overview
18 to 24 July 2021	Energy prices this week appear to be consistent with underlying supply and demand conditions. There was one trading period with high FIR prices that will be investigated further listed at the end of this report.
11 to 17 July 2021	High prices this week appear to be due to tight supply condition coinciding with high demand, but some trading periods will be further analysed. The trading periods we will investigate further are listed at the end of this report.
4 July to 10 July 2021	High prices this week may be due to high demand and tight supply conditions but some trading periods warrant further analysis. The trading periods we will investigate further are listed at the end of this report.
27 June to 3 July 2021	High prices this week may be due to high demand and tight supply conditions but some trading periods warrant further analysis. The trading periods we will investigate further are listed at the end of this report.

Source: Electricity Authority, Trading Conduct Report

5. THE TIWAI SMELTER - INEFFICIENT PRICE DISCRIMINATION?

The Authority has paid special attention to the supply arrangements between Meridian, Contact and the Tiwai Smelter operated by New Zealand Aluminium Smelters (NZAS) because it believes that the smelter is evidence that **inefficient price discrimination** may be taking place in the market. In respect of the smelter, the Authority estimates:

- potential efficiency costs to be around \$57 million to \$117 million per year,
- the subsidisation of NZAS to be over \$500 million over the contract's 4-year term, and
- Generators may be willing to subsidise NZAS because its demand increases national prices and spot market revenues by as much as \$850 million per year, more than offsetting the cost of the subsidy.

The Authority goes on to say that **all parties to the agreement appear to have acted rationally** given their respective commercial incentives. The Commerce Commission separately opened a preliminary enquiry of the Tiwai contracts (both between Meridian and NZAS and between Meridian and Contact) and decided to make no further enquiry under the Commerce Act 1986.

The Authority states that it wants to ensure that contracts involving price discrimination, particularly major contracts, are efficient and in the long-term interests of consumers.

5.1. THE TIWAI CONTRACTS

As noted, the Authority appears to place an extreme amount of import on whether the Tiwai Contracts were negotiated at a 'market' price. In fact, if taken at their word, this single contract is pivotal to the entire state of competition in the marketplace.

If NZAS were, in principle, prepared to pay 'market' prices, then the prices the rest of New Zealand pays for electricity would reflect underlying fundamentals of supply and demand and the public policy concerns would be mitigated.

In this paper we only examine the Tiwai contracts because of how critical they appear to be to the Authority's report on wholesale competition. Normally we would not presume to provide comment on commercial contracts willingly undertaken by other parties that we were not party to, nor where we have any advisory relationship with the parties concerned. It is only largely through the actions taken by the Authority in their review that these contracts have now entered the public domain.

The Tiwai contracts sit outside of the wholesale market. This is understandable and necessary given that New Zealand has adopted a mandatory pool model for wholesale trading. Under this mandatory model, all wholesale electricity (over a de minimis amount) is traded through the market at ½ hourly spot prices such that, if parties wish to hedge prices, or fix other terms, they need to contract outside of the market. In this case, New Zealand Aluminium Smelters (NZAS) has entered into a bilateral arrangement with Meridian Energy (Meridian) to fix a price for electricity (amongst other terms). Meridian has subsequently entered into a bilateral arrangement with Contact Energy (Contact) to offset (share) some of the risk arising from this fixed price arrangement. The parties still transact electricity through the wholesale market at spot prices but use a financial Contract for Differences (CfD) to additionally transact the difference between their strike price (fixed price) and the spot price each ½ hour, such that the net result of the physical spot and financial CfD transactions will equal the fixed price agreed.

The Authority has raised the concern that the fixed price arrangements willingly entered into between these parties is below the true market price for electricity and as such there is the possibility that **price discrimination** implicit in the 'Tiwai contracts' between Meridian, Contact and NZAS may not have been **allocated efficiently**.

5.2. PRICE DISCRIMINATION

Price discrimination is a sales strategy that charges different prices for the same product or service to different consumers based upon their willingness to pay. Willingness to pay will vary based on the relative elasticities of demand of the consumers. Relatively inelastic consumers will generally be willing to pay more than elastic consumers.

There are three degrees of price discrimination:

- **First-Degree Price Discrimination** or perfect price discrimination, occurs when a business charges the maximum possible price for each unit consumed. In this case the producer captures all available consumer surplus for itself.
- **Second-Degree Price Discrimination** occurs when a company charges a different price for different quantities consumed. Unlike first-degree price discrimination not all consumer surplus is extracted as the higher demand consumers will retain some.
- **Third-Degree Price Discrimination** occurs when a company charges a different price to different consumer groups.

For price discrimination to work the producer must be able to:

- set the price (i.e. have some degree of market power)
- segment consumers into groups based upon their willingness to pay (or their different elasticities of demand)

- prevent resale of the item from one market segment to another (otherwise a higher demand segment can re-sell to a lower demand segment thus capturing additional consumer surplus that would otherwise have been available to the producer through selling directly to the lower demand segment).

The Tiwai Contracts would prima facia appear to be an example of second-degree price discrimination (as the smelter is not only a higher demand customer but the highest demand customer in the country). Or, as laconically expressed by Meridian's chief executive, "***the price per apple for a million apples is a lot less than the price per apple for a bag of apples. That's how markets work***".

However, price discrimination is about providing the same product or service at different prices. In looking closer at the Tiwai contracts we can see that there are some characteristics that make Tiwai's demand more valuable to Meridian than other potential demand points around the country - 24x7 baseload (well matched to hydro generation characteristics), close proximity (making full use of stranded water at Manapouri and avoiding potential transmission constraints) and demand response (additional supply management flexibility during extreme system events).

The rebate in section 6 of this agreement reflects the core commercial terms of this agreement, in particular the base load 24 hour, 7 days a week demand at TWI located close to Meridian's generation assets, for significant quantities of electricity, over the Term, as well as Meridian's ability to call a Smelter Demand Response¹².

The Authority also appears to acknowledge this difference when it says that¹³:

It is also expected that consumers will pay different average prices for the electricity they consume if their consumption profiles differ (eg, peak-weighted versus baseload), and additionally if they agree to forego consumption in situations requiring demand response.

5.3. AUTHORITY'S CONCERN

The Authority is addressing ***inefficient price discrimination*** in the wholesale market as a priority because it believes there is evidence to indicate that inefficiencies are potentially significant, with material implications for consumers and generators. The Authority does not appear to be concerned with the use of price discrimination as a sales strategy but rather that in the case of the Tiwai contracts the price discrimination may have been ***allocated inefficiently***.

¹² Meridian Energy Limited and New Zealand Aluminium Smelters Limited Electricity Agreement, Conformed and Redacted as at 1 January 2021

¹³ Inefficient Price Discrimination in the Wholesale Electricity Market – Issues and Options (executive summary page ii), Discussion Paper, October 2021

The Authority notes that an electricity market segmented through **inefficient price discrimination** may fail to deliver efficient outcomes in at least three ways¹⁴:

1. consumers with relatively low valued uses of electricity may potentially consume too much electricity and other consumers with higher valued uses may consume too little
2. the benefits of consuming electricity may be less than the costs of producing it. This is a waste of finite resources
3. resultant market prices may distort signals for investment in generation and electrification, thereby compromising the efficient transition to a low emissions economy.

However, these three arguments appear to be slightly disjointed from the reality of the situation. Looking at each in turn:

1. this argument assumes a reasonable degree of fungibility for electricity consumed in the system. It is useful to remind ourselves that we are talking about moving 13% of New Zealand's demand; transporting through a transmission network with limited capacity (known constraints around Clutha-Upper Waitaki and the HVDC connector); and based on a 24x7 baseload consumption profile.
2. the cost of producing from hydro generation is the opportunity cost of the stored water. And, for that component of water that is stranded due to transmission constraints the opportunity cost will be zero until such time that the Clutha-Upper Waitaki transmission constraints are relieved.
3. the Authority has argued that keeping Tiwai's demand on the system has increased the wholesale price of electricity above what it should be otherwise. If this was the case and given that higher prices that are required to signal new investment, then this aligns well with the efficient transition to a low emissions economy. Interestingly, if we look at the Tiwai contracts there is a clear statement of intent that "as a result of entering into this agreement, Meridian intends to further pursue projects to build new renewable generation capacity in the South Island"¹⁵.

¹⁴ Inefficient Price Discrimination in the Wholesale Electricity Market – Issues and Options (executive summary page iii), Electricity Authority, October 2021

¹⁵ Meridian Energy Limited and New Zealand Aluminium Smelters Limited Electricity Agreement, Conformed and Redacted as at 1 January 2021

We would also caution against too much focus on short run outcomes as this may lead to incorrect conclusions. For example, let's consider a strategy to optimise value over a longer time period. Holding onto your largest customer until the next contract negotiation point may be a valid approach if there is an expectation that the relative negotiating power shifts more in your favour at that future time, e.g. a rise in global aluminium prices (refer Figure 8), a relieving of transmission constraints (making Manapouri's water more fungible) and additional time to develop new demand to compete for supply (e.g. data centres and hydrogen production).

Figure 8: Aluminium Prices (\$US)



Source: Markets Insider

5.3.1. Hypothetical 'Headline' Numbers

The Authority states that¹⁶:

Generators are incentivised to subsidise the cost to NZAS of electricity through the Tiwai contracts when the cost of this support is more than offset by the higher prices paid by other consumers, arising because of the increase in total demand for electricity.

¹⁶ Inefficient Price Discrimination in the Wholesale Electricity Market – Issues and Options, Discussion Paper, October 2021

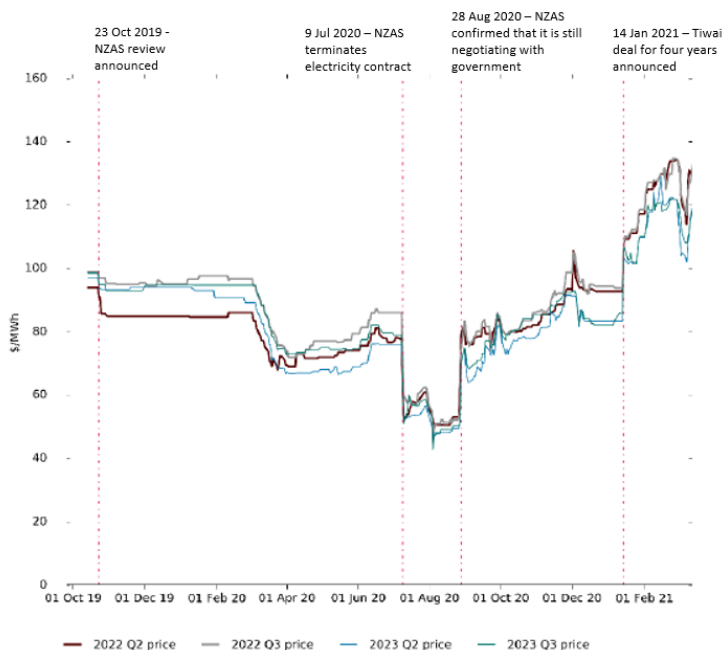
In the case of the Tiwai contracts, it appears that generators have effectively subsidised the price of electricity to the NZAS and, as a consequence, prices have remained higher for other consumers. The *potential efficiency costs are estimated to be around \$57 million to \$117 million per year*. The *subsidisation of NZAS is estimated to be over \$500 million over the contract's 4-year term*. Generators may be willing to subsidise NZAS *because its demand increases national prices and spot market revenues by as much as \$850 million per year*, more than offsetting the cost of the subsidy.

It would appear to us that there is a transposition in the above statements between the factual and the counterfactual. Correcting for this would suggest that the Authority's argument is that generators would prefer not to see 13% of demand suddenly removed from a market in equilibrium as this would cause prices to collapse towards Short Run Marginal Prices (SRMC). It would be in the interest of generators to reduce their revenues below that required to meet return on capital requirements in order to avoid this situation from occurring, with the knowledge that in the medium to longer term this problem would self-correct as the market reached a new point of equilibrium (with less efficient generators being forced to exit the market).

Consequently, we would advise a high level of caution with how these *hypothetical 'headline' numbers* are interpreted and used (if at all), and over what timeframe they are expected to hold. They are not so much a consequence of the price being paid by NZAS but rather the demand that NZAS consumes (or rather wouldn't consume if it exited). Further, added assumptions for these numbers to hold are that no new demand was developed, no generation exited the market as wholesale prices collapsed, all transmission constraints were relieved, and a new market equilibrium wasn't reached.

We would also caution extrapolating prices off the forward electricity curve to value any wealth transfer from residential, commercial and non-NZAS industrial customers as has been done by the Authority (see Figure 9). We would expect that the forward curve has been strongly influenced by the uncertainty of Tiwai contract renewal rather than just the act of renewal itself. Further, as correctly noted by the Authority, any wealth transfer will be dependent on the level that wholesale prices are passed through to consumers (i.e. to the level that they are currently unhedged and to the extent that they subsequently hedge against the future curve before it comes into convergence with spot prices).

Figure 9: Tiwai contracts timeline and Benmore futures



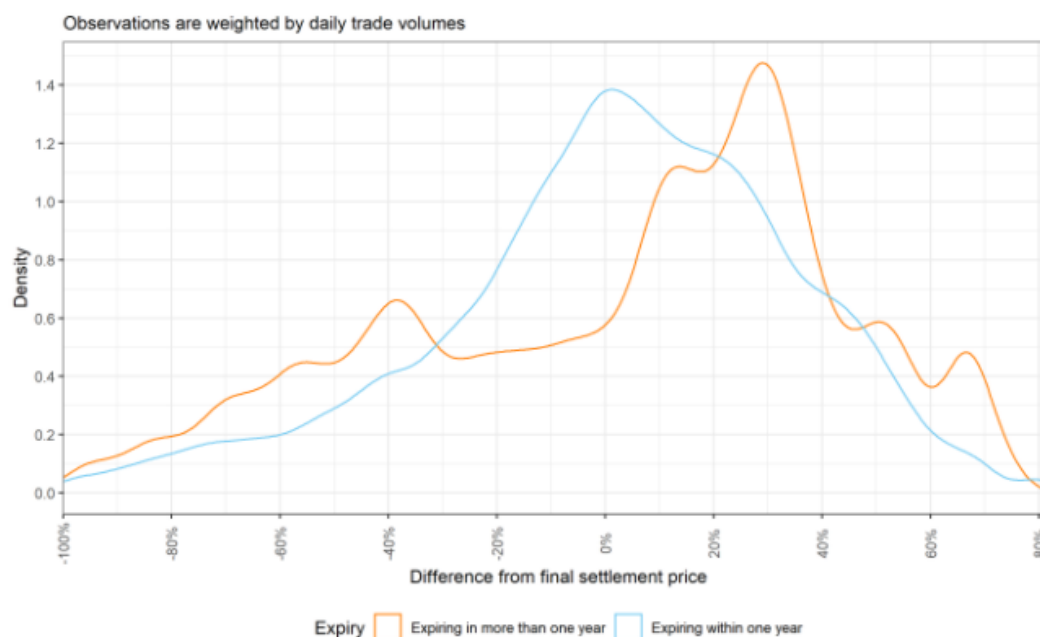
Source: Inefficient Price Discrimination in the Wholesale Electricity Market – Issues and Options, Discussion Paper, October 2021

The Authority actually allude to the magnitude of the level of uncertainty created by the Tiwai contracts elsewhere in their report¹⁷:

“The periodic review of the Tiwai contracts creates significant and ongoing uncertainty for the industry because there is no alternative electricity load that could immediately replace NZAS if it should decide to exit New Zealand”.

We would expect to see considerable divergence between future prices currently priced in the out-years to those that are financially settled against spot prices once these out years come into ‘delivery’ (i.e. the price for electricity three years from today in the futures market is likely to deviate substantially from the spot price of electricity in 3 years’ time) – refer Figure 10.

¹⁷ Inefficient Price Discrimination in the Wholesale Electricity Market – Issues and Options (Section 4.13), Discussion Paper, October 2021

Figure 10: Distribution of daily forward price differences from final settlement price

Source: ASX Energy

5.3.2. Impact on Wholesale Market Prices

As the Tiwai Contracts are financial CfDs (refer Section 5.1) they take place outside of the mandatory wholesale market and thus do not directly affect wholesale prices. We would assume that generation offers into the market from Meridian to support NZAS consumption would be priced at or close to zero to ensure dispatch. This would be typical of how such contracts are managed. Provided Manapouri SRMC (opportunity cost) sits below the marginal price setting unit in the market, and NZAS continues to consume electricity, there would be no effect on the overall market clearing price. Admittedly, if NZAS were not consuming electricity the entire demand curve would shift (but this is independent of the strike price of the CfD).

However, we can see two areas where wholesale prices could be impacted (indirectly):

- If the Tiwai Contract strike price was set above the level considered to be commercially necessary by NZAS to maintain operations in New Zealand, then this would see a dramatic shift in the overall demand curve. This decision to exit would be dependent on several factors including global aluminium prices, exit costs and alternative supply arrangements available elsewhere).

- The strike price being below that necessary to meet hurdle-rate returns for Meridian and Contact. This would create incentives¹⁸ for these Generators to find ways to increase margins elsewhere in their portfolio to compensate, subject to market competition dynamics (we discuss this further in Section 5.3.5).

5.3.3. Transmission Pricing

We also note that in negotiating the Tiwai contracts that NZAS have claimed that they were seeking to correct for what they see as an overpayment in transmission costs of \$10 million per year. This will also potentially be inflating the hypothetical headline numbers that the Authority has claimed as the Authority assumes that the Tiwai Contract strike price is for the wholesale energy component (and demand response) only and not an offset for the perceived overpayment of transmission charges.

As it stands, the cost of upgrading the national grid is distributed evenly across power users. Since Tiwai Point uses about 12 percent of the country's electricity, the smelter pays about 12 percent of the cost of any grid upgrades. That occurs even for recent costly upgrades to the grid in Auckland and Northland, which have no impact on the smelter whatsoever.

The Electricity Authority, which regulates the electricity market, has finally wound up a 10-year process to redesign these charges so those who benefit most from grid upgrades pay for them. These changes would save Tiwai Point \$10 million a year but aren't scheduled to come into effect until April 2023 - far too late to benefit the smelter or incentivise it to delay its exit.

To compensate, Rio Tinto had previously pushed Meridian for a 33 percent reduction in the price of power, which the energy company rejected at the time¹⁹.

It is also useful to remember that in the event that the Tiwai smelter ceases operation then the transmission costs it has been paying will be reallocated across all other consumers.

5.3.4. Use-it-or-Lose-it

The Authority has raised concerns that the Tiwai Contracts have a clause that gives Meridian the option to terminate if NZAS drops their consumption below a prescribed minimum amount:

¹⁸ However, if one assumes that commercial enterprises in general will pursue a profit maximization strategy then such incentives are ever present.

¹⁹ Transmission pricing still on the table, Marc Daalder, Newsroom, 14 January 2021

Crucially, the Meridian–NZAS CFD has a ‘use-it-or-lose-it’ clause requiring NZAS to use the electricity, or else Meridian could exercise an option to terminate the contract. This clause effectively precludes NZAS from significantly scaling back operations and re-contracting the surplus electricity with other consumers who may value the electricity more highly. This clause is a central feature of the agreement to protect Meridian and Contact from price reductions on the rest of their portfolios, but it adversely affects the allocation of electricity to the consumers with the highest willingness to pay for that electricity, reinforcing the efficiency concerns.

The concern from the Authority is that the nature of this clause effectively translates to a **re-sale restriction clause**. While such clauses are necessary to prevent ‘leakage’ between price discrimination market segments (refer Section 5.2) they are generally seen as being anti-competitive. Such re-sale restriction (or destination/usage specific) clauses are not typically seen with electricity supply contracts but have been an historic feature of Gas Supply Agreements (GSA).

However, such restrictive clauses are becoming **less common** and their **enforceability in some jurisdictions are no longer possible**. According to the Guide to Energy Arbitrations²⁰, the European Commission has said that such provisions are not permitted in contracts for the sale of LNG to European buyers²¹. More recently, the Japan Fair Trade Commission has indicated that it is ‘highly likely’ that destination restriction clauses are anti-competitive, and that such clauses should not be included in new LNG contracts²².

We note that the Commerce Commission opened enquiries into the 2021 Tiwai contract but concluded that there was insufficient evidence of a breach of section 27 (contracts, arrangements, or understandings substantially lessening competition prohibited) and section 30 (prohibition on entering into or giving effect to cartel provision) of the Commerce Act 1986 and decided to make no further enquiries. For the Authority to reopen a case based on these clauses being allocatively inefficient rather than anti-competitive would appear to us as being somewhat circumventive of the Commerce Commission’s primacy in potential anti-competitive matters.

²⁰ The Guide to Energy Arbitrations, Third Edition, Bishop & Kaiser, January 2019

²¹ In 2018, the EU Commission opened an investigation into restrictions to the free flow of gas sold by Qatar Petroleum in Europe

²² The JFTC stated that companies should not include competition-restraining clauses when negotiating new contracts and should review existing contracts for ‘competition-restraining business practices which lead to restrictions of resale

Ultimately the use-it-or-lose-it provisions may be largely moot in any case as they only come into effect should NZAS elect to downsize their operations before the end of the contract term (before the end of 2024). If NZAS considered this event likely they may have been less willing to have accepted this term in the agreement unless there was a significant price discount negotiated in return (which runs counter to the value of not having this term from NZAS's perspective i.e. the lower the strike price of the contract the higher the value of being able to re-sell the electricity²³).

5.3.5. Incentive to Extract Profits Elsewhere

We would generally assume that from an average portfolio perspective, the Tiwai Contracts would sit at the lower margin end of Meridian's portfolio (not uncommon when price discrimination is based on size).

As noted in Section 5.3.2 this may create incentives on the business to extract higher margins elsewhere in the portfolio. In a competitive market this should generally not be possible.

However, when markets tighten, and temporal or locational market power arises, opportunities to extract monopoly rents may arise (especially in cases where price separation arises due to New Zealand's locational marginal pricing methodology). This is an area where we would advise that targeted regulatory tools be used to detect and address such potential exercise of market power rather than broader regulatory measures which inevitably tend to be less effective, likely to raise the overall market cost of regulatory compliance and increase perceptions of regulatory risk (which will serve to dampen dynamic efficiency and consequential sectorial investment at a time when it is most needed).

²³ In this case it is not actually a re-sell of the electricity per se but rather a re-sell of the CfD.

5.4. ARE THE TIWAI CONTRACTS A SPECIAL CASE OR REPRESENTATIVE OF A BIGGER PROBLEM

Even if we assume for the moment that the Authority's concerns over the Tiwai Contracts are largely valid, then the next step should be to consider if Tiwai is a one-off case due to its unique history (Manapouri and the Tiwai Smelter were built in tandem, matching hydro potential with attracting foreign investment in large industry).

The issue of the smelter receiving 'subsidised' electricity has been discussed since before it was completed. Consolidated Zinc raised the concern that it didn't want to be accused of receiving subsidised electricity from other power stations as part of its justification for insisting that Lake Manapouri levels be raised to those agreed in its contract with the New Zealand Government to ensure 99% planned availability²⁴.

As well as the inherently bi-lateral nature of the relationship between the Tiwai Smelter and Meridian's Manapouri hydro generation (with outage support from Contact's Clyde and Roxburgh hydro power stations) the Tiwai contracts stand out due to their size and consequential impact on the rest of New Zealand's electricity sector if they are withdrawn.

Keeping the smelter operational in New Zealand has been debated over recent decades with NZAS claiming its operations are unprofitable during many years (due to low aluminium commodity prices and unfavourable exchange rates). This has placed pressure on NZAS to seek lower electricity prices during contract negotiations and, due to the economic contribution of the smelter to Southland's economy (see Section 5.4.1), has placed pressure on consecutive governments to make explicit direct subsidies or to 'support' electricity supply re-contracting.

Recalling History

Completed in 1971, Manapouri was built primarily to supply electricity for the Tiwai Point aluminium smelter some 160 km to the southeast. The transmission system was also specially augmented to allow for the significant electricity flow between Manapouri and the Smelter.

On 19 January 1960, the Labour Government of the day and Consolidated Zinc (later to be Comalco) signed a formal agreement for Consolidated Zinc to build both an aluminium smelter at Tiwai Point and a power station in Manapouri.

Consolidated Zinc/Comalco received exclusive rights to the waters of both Lakes Manapouri and Te Anau for 99 years.

However, in 1963 Consolidated Zinc decided it could not afford to build the power station. The National Government of the day then took over the power station project and the company proceeded to build their smelter. Comalco thus exchanged its 99 year water rights for 99 year power rights.

²⁴ A Question of Power – the Manapouri Debate

The Authority has stated that its concern is not only with the Tiwai Contracts, but also with “any longer-term contracts with other large users”²⁵. Given the unique nature of Tiwai, in both terms of scale and historical physical link to Manapouri generation, we wouldn’t necessarily expect to see the same issue arising with other large users. We are also not aware of any broader studies undertaken by the Authority to support this being the case.

5.4.1. Broader Considerations

We note that the Tiwai smelter contributes \$406 million to the Southland economy (6.5 per cent of Southland's GDP) with export revenue of around \$1 billion each year²⁶ but has not been in a tax paying situation in recent years due to losses²⁷.

The Authority has acceded that these broader issues are at play with the Tiwai Contracts but then asserted that these other considerations should be for other areas of government to consider²⁸:

The Authority recognises the parties agreed to these contracts given the commercial incentives they faced to deliver value to shareholders. These arrangements both supported their commercial goals and contributed to a wider set of national goals, including regional job creation and supporting cleaner aluminium production, when compared with other Rio Tinto smelters. Issues such as regional development, employment, foreign direct investment and taxation lie outside of the Authority’s remit and are better addressed by other arms of government.

While we accept the Authority wishing to restrain itself to its remit, it would seem an extraordinary omission not to allow these broader issues to be considered which impact the same New Zealanders who are also electricity consumers. A potential way forward may be for the Authority to only progress these issues as part of a broader government approach.

We note that such a broader government approach was adopted during the negotiation of these contracts (refer media extract below) which begs the question why the Authority didn’t raise its concerns with allocative efficiency as the contracts were being renewed.

²⁵ Inefficient Price Discrimination in the Wholesale Electricity Market – Issues and Options (executive summary), Discussion Paper, October 2021

²⁶ NZAS website

²⁷ New Zealand Aluminium Smelters Limited, Annual Financial Report for the year ended 31 December 2020

²⁸ Inefficient Price Discrimination in the Wholesale Electricity Market – Issues and Options (Section 5.41 and 5.42), Discussion Paper, October 2021

Deputy Prime Minister Grant Robertson and Energy Minister Megan Woods, who have been negotiating with Rio Tinto to keep the smelter open, said the deal provided welcome certainty to the Southland community by protecting jobs and incomes as the region planned for the future.

“The Government is committed to working on a managed transition with the local community,” Robertson said.

“The Government has been focussed on helping to ensure a deal is reached which kept the smelter open for longer than the year initially proposed by Rio.”²⁹

5.5. POSSIBLE OPTIONS IDENTIFIED BY THE AUTHORITY

While the Authority acknowledges that the horse may already have bolted (if, indeed, a horse was ever present) with respect to the Tiwai Contracts³⁰

“It does not appear that the Authority would be able to unwind the Tiwai contracts even if they were definitively found to be inefficient”

it still wants to consider and resolve whether policy interventions are required to address inefficient price discrimination before any renegotiation of the Tiwai contracts in 2024, or the negotiation of any longer-term contracts with other large users (eg, data centres or hydrogen plants).

The Authority has identified possible options to address potential problems with discriminatory pricing:

1. Status quo
2. Prohibit ‘use-it-or-lose-it’ clauses
3. Electricity Authority pre-approval of large contracts
4. Require public offering of all (or some percentage of) hedge contracts
5. Require public offering of large hedge contracts
6. Extend trading conduct provisions beyond the spot market to hedge markets
7. Non-discriminatory pricing rules
8. Hybrid of non-discriminatory pricing and pre-approval of contracts

²⁹ Stuff News, Evan Harding, January 2021

³⁰ Inefficient Price Discrimination in the Wholesale Electricity Market – Issues and Options, Discussion Paper, October 2021

While providing solutions for a problem that may or may not exist seems premature, we offer a few general observations on each of the Authority's proposals.

Table 4: Authority proposed solutions for addressing inefficient price discrimination

Proposed Solution	TLG Comments
1. Status quo	<p>We would recommend this option is the most prudent as it gives the opportunity to test the efficacy of the recent amendment to the trading conduct rules before more interventionist actions are considered. This will also provide the Authority with additional time to reach a more definitive conclusion on the existence of inefficient price discrimination with the Tiwai Contracts and to assess if such a concern is more widespread.</p>
2. Prohibit 'use-it-or-lose-it' clauses	<p>For clarity we believe this should be more broadly seen as prohibiting re-sale clauses. However, as these are likely to be within anti-competitive legislation, the Commerce Commission should probably take primacy on enforcement.</p>
3. Electricity Authority pre-approval of large contracts	<p>We believe this is a highly interventionist move that is likely to curb the free trading of contracts between willing buyer and willing seller. It is also likely to introduce delays that will mean that contracts are not struck in a timely way to meet prevailing conditions. The current review is a case in point – despite the considerable time and effort placed on reviewing the Tiwai Contracts, there has not been any clear conclusion by the Authority that these contracts are in fact allocatively inefficient.</p> <p>Overall, such interventionist measures introduce significant regulatory risk. Also, we query whether such an intervention was intended by the Electricity Industry Act which provides for a framework for the regulation of the industry rather than the regulation of individual industry participants. We would have thought the Commerce Commission had primacy in relation to the regulation of anti-competitive contracts between market participants.</p>
4. Require public offering of all (or some percentage of) hedge contracts	<p>Should obligation fall with buyer or seller or both? We have concerns that transparency may expose participants' short or long exposures that may make them more vulnerable to competitors. However, requiring greater disclosure on retailers to reveal hedge positions would be useful mitigation for the moral hazard risk.</p> <p>Contracts may not be that fungible once specified for size, proximity, reference node, load profile and other terms (eg. demand response) – there are good reasons why some contracts are OTC (non-standardised products) vs on market.</p>

Proposed Solution	TLG Comments
5. Require public offering of large hedge contracts	Be careful what you mean by a 'public offering'. You may not want to create a regulated offering as defined by the Financial Markets Conduct Act (2013) unless the "small offers" or "wholesale investor" exemptions apply. Otherwise, this will create added compliance requirements and costs such as preparation of a product disclosure statement.
6. Extend trading conduct provisions beyond the spot market to hedge markets	Physical market trading provisions are quite different from financial and future market trading positions where the view of future price can be much more difficult to support objectively (e.g. valuing uncertainty). Further, current trading provisions are just one-sided. Both buy and sell sides should be reflected in further considerations.
7. Non-discriminatory pricing rules	<p>We note that the Authority hasn't raised any specific concerns relating to price discrimination except where such discrimination is allocatively inefficient so this would appear to be straying from the scope and problem definition of the Review.</p> <p>As noted in point (4) there will always be a trade-off between pricing and non-price terms. This will make it difficult to provide any meaningful price comparisons between contracts.</p>
8. Hybrid of non-discriminatory pricing and pre-approval of contracts	The worst of all worlds.

6. INVESTMENT TO SUPPORT A LOW EMISSIONS ECONOMY

The Authority states that:

Investment in efficient and low carbon technology needs to displace legacy technology, but the rate of new investment in generation has been slow in recent years. Significant investment will be required to effect the transition to renewables.

While the Authority acknowledges a wide range of factors that could be impeding investment (based on interviews with market participants), such as:

- the need to update consents for newer technology,
- time taken to obtain consents,
- the need for transmission connections,
- uncertainty around government policy, and
- uncertainty around demand growth
- uncertainty over the Tiwai Smelter (although believed to have lessened following the January 2021 contract extension for 4 years).

it also makes a number of suppositions:

- If a high percentage of new generation built or committed has been from the incumbent vertically integrated firms, this could suggest that there are barriers to entry for smaller, independent players (refer Table 5).

Table 5: Built and committed generation investment

Project name	Developer	MW	Generator-retailer?
<i>Built during the review period (January 2019 to June 2021)</i>			
Waipipi wind farm	Tilt Renewables	133	N (but now owned by Mercury)
Ngawha S4	Top Energy	32	N (distribution company)
Rakaia	Barrhill Chertsey Irrigation Ltd	3	N
<i>Definitely committed</i>			
Tauhara 1	Contact	152	Y
Harapaki	Meridian	176	Y
Turitea North	Mercury	119	Y
Turitea South	Mercury	103	Y

Pukenui	Far North Solar Farm	16	N
Possibly committed			
Kaitaia	Lodestone Energy	39	N
Naumai	LightYears Solar	3.4	N

Source: Market Monitoring Review of Structure, Conduct and Performance in the Wholesale Electricity Market, Information Paper, October 2021

- forward prices have been above the cost of new electricity supply by about 50 percent, and this has been the case for longer than we would expect to see in a workably competitive market (refer Figure 11). This gap would suggest, to a casual observer, that more generation investment is signalled, at least over the term of the forward curve.

Figure 11: Prevailing contract prices and estimated cost of new supply



Source: Review of generation investment environment, Concept Consulting, August 2021

- Incumbents may be making investment decisions with regard to their existing portfolio, and they may be less inclined to invest if a delay will increase returns on existing plant, unless spurred by competition (ie, the prospect that others will invest in newer more efficient generation).
- The existing large generator–retailers in New Zealand have access to hydro generation to firm any intermittent wind or solar generation build, an advantage that new entrant generators of wind or solar (the cheaper and easier generation options available) do not have.

In referencing a report³¹ it commissioned from Concept Consulting, the Authority notes that the tide may be positively turning with respect to new investment:

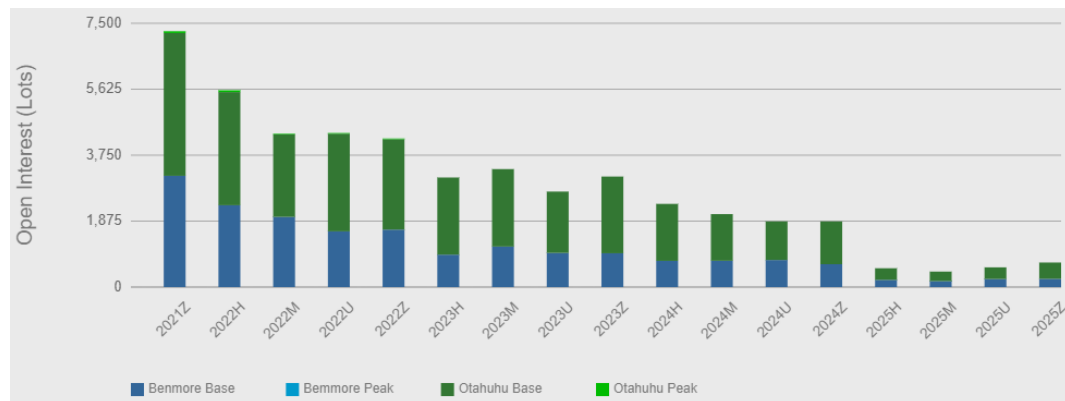
*However, Concept concludes that there are some signs that **the investment environment is improving**. Development interest (especially in solar farms) is increasing, concern about the Tiwai Point smelter exit may have reduced, and the demand outlook is strengthening with decarbonisation. Further, Transpower has indicated increased enquiries over the past year or so about grid connections. These signs of improvement may be the start of a response to recent high prices.*

The Authority also claims that:

The price signals that are provided in each trading period and expectations of future price signals also provide incentives for timely investment. If the Tiwai contracts with NZAS result in inefficient prices, then the signals provided for all forms of investment - both generation and electrification - may be distorted, threatening the efficient transition to a carbon-neutral economy.

In our view, this overplays the role of spot and future markets in providing dynamic efficiency signals for generation investment. In looking at the ASX futures open interest, this gets very thin in the out years (refer Figure 12).

Figure 12: Open Interest (quarterly products) as at October 2021



Source: ASX Market Wrap

³¹ Review of generation investment environment, Concept Consulting, August 2021

We would be surprised if many generators are making investment decisions based on a price curve that realistically only extends out 3 years. Rather, most prudent investors would be seeking a physical hedge through a retail book or power supply agreements with large anchor customers and/or retailers. For example, we note that off the back of the Tiwai Contracts that Meridian have said that³²:

As a result of entering into this agreement, Meridian intends to further pursue projects to build new renewable generation capacity in the South Island.

6.1. TRADE-OFF BETWEEN ALLOCATIVE EFFICIENCY AND DYNAMIC EFFICIENCY

As we have noted in Section 5.5 we believe that the Authority needs to take caution that, in introducing potentially intrusive and interventionist regulatory policy to manage perceived problems with allocative efficiency, it doesn't do this at the expense of reducing dynamic efficiency through heightened investor perceptions of regulatory and political risk. This is especially relevant in the current environment of wishing to move further towards a low emissions economy that requires considerable new investment.

6.2. TIWAI SMELTER STILL CREATES SIGNIFICANT UNCERTAINTY

While extending the Tiwai Contracts out to the end of 2024 has provided some shorter-term certainty for the industry, it has really only pushed the problem out by a few years. Potential investors will still be mindful of the risk of losing 13% of New Zealand's demand and how this will affect future electricity prices. The longer-term continuance of the Tiwai Smelter is not a simple dynamic to predict and there has been much industry speculation on this. The global prices of aluminium have risen significantly since the current renewal was negotiated and the global environment continues to develop towards more environmentally sustainable options and in this regard the aluminium from Tiwai is well placed³³. Meridian have announced that they are looking for alternative industrial demand to develop in the South Island to replace Tiwai in the future and Transpower are working on strengthening the transmission grid to increase potential flows northwards from Manapouri.

6.3. IS THE MARKET GETTING RISKIER FOR INVESTORS?

In looking at market prices over the period of the Review there is a distinct possibility that underlying market dynamics are becoming more extreme and volatile and that these conditions will continue for some time (refer Section 3.2). This potentially increased risk will serve to increase the cost of new entry for investors.

³² Meridian Energy Limited and New Zealand Aluminium Smelters Limited Electricity Agreement, Conformed and Redacted as at 1 January 2021

³³ NZAS aluminium is marketed under the Rio Tinto "RenewAl" brand which has been certified to have smelting emissions of less than 4 tonnes of CO₂ per tonne of aluminium

This will be especially true when you have a volatility amplifier such as hydrology to complement and augment any impacts of demand variations and more predictable and short-run stochastic outages (refer Section 3.2).

6.4. CHANGING GENERATION AND MARKET DYNAMICS

Electricity industries globally are undertaking a substantive transition towards lower carbon emissions. The magnitude of the energy transition is difficult to overstate. Bloomberg New Energy Finance pegged the investment cost of the energy transition at \$173 trillion through 2050. Even fractions of such an estimate would still be material and worth paying attention to:

London and New York, July 21, 2021 – Achieving net-zero carbon emissions by 2050 will require as much as \$173 trillion in investments in the energy transition, according to BloombergNEF's (BNEF) New Energy Outlook 2021 (NEO), the latest edition of its annual long-term scenario analysis on the future of the energy economy. The route to net zero remains yet uncertain. BNEF's NEO outlines three distinct scenarios (labelled Green, Red and Gray) that each achieve net-zero while relying on a different mix of technologies³⁴.

Amidst this transition the electricity sector is gaining complexity with more technology and fuel choices, more stakeholders, and a growing need for better and more information to guide, measure, coordinate, and generally 'signal' optimal investments and behavioural choices. Regulation and regulatory bodies have a significant impact on the effectiveness of the electricity sector in meeting broader policies in an efficient and responsible way.

As noted earlier, the Authority has expressed concern that if a high percentage of new generation built or committed has been from the incumbent vertically integrated firms (refer Table 5), this could suggest that there are barriers to entry for smaller, independent players. Traditionally, generation investment has been seen as a large-scale, capital-intensive activity where the larger the balance sheet to support the investment the more efficient the investment would be.

However, this dynamic is changing with the increased focus on renewable sources of generation and smaller distributed options, including behind the meter technologies (all of which tend to require less capital investment and are quicker to market). Concept Consulting have noted in their report³⁵ for the Authority that capital concerns from the industry appeared to be improving with:

- Genesis (an integrated party) has signed PPAs with an independent supplier (Tilt was independent at the time) and a competitor (Contact). Genesis is also reported to be negotiating with other potential suppliers for further PPAs.

³⁴ <https://about.bnef.com/blog/getting-on-track-for-net-zero-by-2050-will-require-rapid-scaling-of-investment-in-the-energy-transition-over-the-next-ten-years/>

³⁵ Concept Consulting, Review of generation investment environment, August 2021

- Similarly, Trustpower's planned demerger suggests it considers that vertical integration is not value enhancing for its business and that new generation developments can be underpinned by PPAs or other contractual options (including sales to large industrial and commercial customers).
- a group of larger industrial users has been seeking to negotiate a PPA (or multiple PPAs) with potential suppliers, and if concluded this may underpin new investment.

We have also noticed in our experience internationally that there is a much greater willingness for parties to enter into corporate PPAs, especially for Green Corporate PPAs, to support new investment in renewable generation. This appears to be especially the case with larger multinational consumers (e.g. global technology companies seeking to build data storage sites).

During the period of the Review we note that there has also been examples of long term PPAs being struck off market between willing sophisticated counterparties in New Zealand. A case in point being the financial hedge agreements between Trustpower and Mercury associated with the sale of Trustpower's retail portfolio.

Elsewhere, we have seen the importance of capacity mechanisms and capacity markets being reviewed to better support the need for new supply investment. This avoids the problem with energy only markets being reliant on higher prices to signal new investment and to allow capital recovery for investors. However, we are not necessarily suggesting that a change of this magnitude is required for New Zealand at this time.

6.5. ACHIEVING 100% RENEWABLE TARGET

While we are not expressing a view on how realistic New Zealand's target of 100% renewables may be, the continued movement towards a low emission economy will require a number of key challenges to be overcome. These include:

- Ensuring system availability and reliability, especially during more frequently seen hydrological events,
- Reduced dependency on thermal generation for managing dry year risk,
- Providing firming for increased renewable intermittency, and
- Transmission investment to reduce transport constraints.

Policy and regulatory setting plays a key part in creating the pro-investment environment needed to make this energy transition. This includes³⁶:

³⁶ Trustpower, 100% renewables and price formation, presentation to Market Development Advisory Group (MDAG), 30 August 2021

-
- Regulatory settings that encourage investment and divestment – need revenue adequacy at the end/over life of project.
 - Robust, well-understood and stable policy objectives.
 - Transparency, consistency, and stability of the regulatory decision-making processes.
 - Primacy of policy over politics, particularly when making 20-year+ investments.

As noted in Section 6.1, this is not the time to be contemplating untargeted and potentially interventionist regulatory policy or to be re-raising vertically integrated arguments that were previously closed off in the 2019 Electricity Price Review recommendations:

The Electricity Price Review concluded in 2018 that the structural separation of Gentailers was “unnecessary” because lower-cost and less risky options were available to “counter the drawbacks of vertical integration” while retaining the benefits of integration.

7. ABOUT THE AUTHORS

7.1. DAVE CARLSON

Dave Carlson is an experienced energy market operator, designer and change manager with a track record spanning Asia, Africa, Australia and New Zealand.

Before returning to New Zealand in 2016 he was a Senior Vice President at SGX (Singapore Securities Exchange), responsible for new initiatives in the gas and power sectors. Prior to that he spent 10 years as the CEO of the Energy Market Company, EMC, the national electricity market operator for Singapore.

Dave has served on and chaired many industry and governance panels in Singapore to further liberalise energy markets including market rule evolution, the implementation of retail contestability, developing gas trading and introducing electricity derivative products.

Dave continues to work with a number of national utilities, regulators, market operators, private generator-retailers, and government clients in Southeast Asia, Australasia and the Middle East. He has a BSc in Mathematics from Victoria University in Wellington and passed the Associate Examinations of the Institute of Actuaries, London.

Dave is a senior advisor to, and board member of, The Lantau Group.

7.2. MIKE THOMAS

Mike Thomas, is a founding partner at The Lantau Group with 30 years of consulting experience, focussing mainly on the energy sector. He advises clients on market design and development; regulatory matters; commercial transactions and disputes; and business and regulatory strategies.

Within the Asia Pacific region, he has led seminal projects on energy-only and capacity market design issues; advised on cost-benefit analysis of transmission expansion; provided crucial expert testimony in a number of commercial contract disputes; served as market advisor on around 50 GW of transacted or commissioned capacity across Mainland China, Hong Kong, Taiwan, Malaysia, Philippines, Singapore, Vietnam, Australia, and New Zealand; advised on regulatory and policy developments concerning cost of capital, cost of service, tariff design, and market power mitigation; and worked extensively with numerous stakeholders to identify opportunities or mitigate risks arising from technology and fuel market shifts, policy developments, and regulatory uncertainty. He has worked extensively with commercial stakeholders, financing entities, regulatory bodies, policy ministries, and end users, maintaining a balanced and coherent perspective on the challenges and requirements of the regions complex and dynamic energy sector.

He started his career in 1988 as an Associate at Putnam, Hayes & Bartlett, in the United States. In 1997, he transferred to the Asia Pacific region. Prior to co-founding The Lantau Group in 2010, he headed the Asia Pacific Energy & Environment practice of a global consulting firm. Mike has an MPP from Harvard Kennedy School and a BA in economics from Carleton College.