WHOLESALE ELECTRICITY

WHAT ARE HIGH PRICES IN THE MARKET TELLING US?

THE EVENTS OF SPRING 2018 PUT A SPOTLIGHT ON THE WHOLESALE ELECTRICITY MARKET.
JAMES STEVENSON-WALLACE, CHIEF EXECUTIVE OF THE ELECTRICITY AUTHORITY, GIVES HIS VIEW...

The wholesale market has been around since 1996, and helped achieve a lot of good things in that time. For example, the number of independent retailers has increased to 38, which is providing more choice for consumers. The share of renewables in the energy mix has grown too, reaching 80%. New Zealand is one of the more successful countries in tackling the energy trilemma—balancing security of supply, cost and sustainability.

The wholesale market is regarded as having reached a relatively mature stage of development. While the fundamentals are sound, it operates in an ever-evolving space—there are always more challenges. The Authority has a key role in helping the market address those challenges—for example the growth of electric transport, the installation of more batteries on to the system, or ensuring prices are sending the right signals.

KEY POINTS

- The purpose of the wholesale electricity market is to balance supply and demand, allow the right price to emerge and enable people to manage risk.
- High prices at times of genuine scarcity are an effective and necessary signal to the market for short-term usage and generation decisions, and long-term investment.
- Availability of good information, understanding the risks and using the forward contracts market enable participants to manage volatility.
- We continually monitor the market and identify areas for development, including emerging industry challenges.
- For example, we are considering new work to address insider trading rules and support liquidity in the forward contracts market.
- We look out for and will clamp down on unacceptable behaviour.

Last Spring constrained gas supplies and low lake levels caused higher prices in the wholesale market, and some participants came under pressure. This led to some interesting discussions about aspects of the market design and operation.

1 Ranked eighth in the 2019 World Energy Council Energy Trilemma Index trilemma.worldenergy.org
Getting the balance of electricity supply and demand right is a complex task. Lots of decisions go into managing it every minute of every day—as households and businesses make choices about when, where and how much to consume, generate or invest. The wholesale electricity market is the engine coordinating this decision-making. It captures available information about costs, risks and opportunities, and processes it to create clear price signals.

The wholesale market has three main components. Price signals from the spot market help consumers and generators to make short-term decisions, such as when to run power stations and large industrial equipment. Longer-term price signals are generated by the forward contracts (hedge) market, which helps with planning and investment decisions. The ancillary services market generates prices for technical services that help ensure reliable and quality supply.

NEW ZEALAND CONTEXT
Electricity supply and demand change all the time, mostly very predictably. For example, demand is generally higher in winter than in summer, and during the day than at night. However, some features of our system are less predictable (see box).

THE SPOT MARKET COORDINATES SHORT-TERM DECISIONS
The operation of the spot market is carefully prescribed. The market selects the lowest-cost mix of available resources, in the form of generation or load reduction, to meet demand for each half-hour—plus some reserve supply in case something goes wrong.

It provides forecast prices for up to a week ahead through schedules, which help parties tailor their decisions. In taking information from across the country, the spot market provides clear signals for local decisions. It is important spot prices reflect the full value of power in times of scarcity, because that provides the incentive for consumers to reduce use and for generators to maintain reliable supplies, both in the short and long term.

Growth in retailers has accelerated in the past three years, to reach 36 at the end of January 2019. Some players have exited—a normal occurrence in a competitive and resilient market. The information presented is for retail parent companies (that is, not brands as a customer might know them) and excludes direct purchasers.

SOURCES OF UNCERTAINTY
- Around 65 percent of New Zealand’s electricity generation is weather-dependent, with a large proportion of hydro generation and increasing amounts of wind generation. For example, the timing of rainfall and snow melt is variable from year to year, presenting challenges for managing hydro storage.
- Another 20 percent of generation depends on supplies of coal and gas, and the prices for these are influenced by international markets.
- As an island nation, we rely entirely on domestic electricity generation.
- The New Zealand electricity system is relatively small, which means individual plant outages can have a relatively large impact.
- The New Zealand transmission system moves electricity long distances and is stringy rather than heavily interconnected, which is costly and its operation can be technically challenging.
- Demand is also affected by weather—for example during winter storms household consumers use more electricity for heating—and longer term changes such as economic growth and energy efficiency.
THE FORWARD MARKET HELPS MANAGE RISK

We view the forward contracts market as an essential companion to the spot market. The forward contracts market allows participants to lock in a price well in advance. All kinds of people with different information and views of future spot prices participate. There are some requirements for transparency around forward contracts—particularly around publication of the agreed prices. This gives a collective view of what prices will be in the current month through to the next three years or more. It also provides a way for participants to manage costs associated with potential spot price volatility, according to their risk appetite. This is driven by their own business strategy.

The forward contracts market operates in a fairly open and free manner—with available products ranging from bespoke contracts between individual participants to standardised exchange-traded products. This facilitates innovation and flexibility in how the industry manages risks in the long-term, while maintaining incentives for participants to manage them.

With our encouragement, four participants support trading of contracts on the Australian Securities Exchange (ASX) by regularly making contracts available to both buy and sell (market making), which is generally helping maintain market liquidity.

There is room to improve performance of the market and there are no doubt future enhancement opportunities. We could address questions such as whether we have sufficient market makers and liquidity.

THE ANCILLARY SERVICES MARKET MANAGES QUALITY

The ancillary services market rewards some participants for providing technical services that help ensure the reliability and quality of electricity supply, for example frequency keeping—provided by plant that compensates for changes in grid frequency. Though these services are a relatively modest cost, they are extremely important to the stable and effective operation of the system.

The wholesale market design helps the industry operate efficiently through change—by clearly signalling what response is valued and facilitating competition to explore opportunities. In guiding the development path, we seek to maintain and build confidence in the market, and support investment in the electricity sector.

Supplying electricity has traditionally required large investments in long-lived assets (for example, up to 50–60 years) that need to be ready to meet consumers’ electricity requirements—whether in the next five minutes or in the next five years.

Increasingly, electricity might be supplied by smaller investments in technologies such as solar PV, batteries and wind generation. Consumers will have more choice and greater control over their electricity use in the future than they have previously. These kinds of technologies may be more variable in output, as well as being owned and controlled by a multitude of investors rather than a few centralised ones. These factors potentially create new risks and opportunities that will require different management approaches and expectations of the wholesale market.

Furthermore, climate change concerns and policies, and major technology changes such as uptake of electric vehicles and solar PV, may mean change happens at a much faster pace than the electricity industry is used to.

To be effective, the prices produced by the wholesale market need to be a certain and accurate reflection of the costs, risks and opportunities—as these evolve. For this to be the case, the information feeding into it needs to be as comprehensive as possible, for example about future demand and supply.

This chart shows wholesale electricity prices since 1998 (as a 30-day moving average of settled prices for all nodes). While prices in Spring 2018 were high, they also reached this level during a dry season in 2008.

Source: Electricity Authority
At the same time, we want regulations to be dynamic and capable of adapting to constant changes in the market. In our development work, we prefer to give space for the market to develop a variety of solutions and avoid picking winners.

**PARTICIPANTS NEED THE RIGHT INCENTIVES TO ACT**

Participants will make decisions for the long-term benefit of consumers if they face the right incentives—which for commercial participants are price signals. We want to see spot prices that reflect the full value of electricity, combined with an effective forward contracts market that signals longer-term value.

Sometimes spot prices will rise to reflect supply scarcity—this is appropriate. When this happens, it must reflect genuine scarcity rather than the exercise of market power or weak competition.

**PARTICIPANTS NEED INFORMATION AND TOOLS TO MAKE GOOD DECISIONS**

Participants need robust information about risks and opportunities in the market and appropriate tools to respond.

Participants understand the factors influencing spot and contract prices, based on comprehensive, transparent and easy-to-access information. Over the past decade, we've improved the disclosure of

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**WE TAKE A PRINCIPLED APPROACH TO MARKET DESIGN**

We consider the best way to tackle uncertainty is for the wholesale market to be competitive, well-informed and flexible with efficient price signals. **Three key principles** guide us when considering the design and operation of the wholesale market.

**GOOD DECISIONS SHOULD WIN OUT**

Competition exposes participants to the full impact of their choices. They risk losing money or market share if they are not sufficiently efficient and innovative—and those that outperform their competitors are rewarded for their efforts. This is particularly important in an industry that faces rapid change and disruption from new technologies.

To facilitate this, we focus on development that reduces barriers—to new entry, new technologies, investment in new assets or implementing new ideas. We have brought in default rules to ensure if retailers do fail, they can exit the market in an orderly fashion and consumers are shielded from potential disruption.
market information through our Wholesale Market Information project. This is an area of continued focus for us and we seek further improvements in this area.

We have focused on developing the forward contracts market over the past decade. This has lifted participation by independent retailers and competition in different regions, as well as helping generators make fuel management and investment decisions.

We also support continued education of participants about the market, the risks involved in participating in it and ways to manage those risks, within their own risk tolerance. We require that participants undertake stress tests, which ensure participants understand their potential spot price exposure, and actively manage it. For example, if a participant chooses to participate in the wholesale market without forward coverage, they will pay high prices at some points as well as low prices at other times.

3 WE’RE CONTINUING TO REFINE THE MARKET DESIGN

We’re always interested in improving the wholesale market. Our current and future work programme is shaped by our principled approach to market design, the market context and the problems and enhancement opportunities we identify.

We recognise there are always opportunities for us to improve the market design and operation, and we encourage feedback about where we should act.

We monitor market performance to make sure it is operating in a way that is consistent with a well-functioning and disciplined market. Sometimes a specific event will cause us to review aspects of the design. For example, following a period of low hydro storage in winter 2017 we undertook a market performance review. It found the market generally worked well and identified potential enhancements to the forward contracts market.

We also actively monitor market behaviour and will enforce compliance with the rules to ensure parties are discouraged from abusing market power. We apply a risk-based framework, which is well practised across government and gives us the ability to calibrate our approach to the prevailing industry environment. To underpin ongoing confidence in the market, our reading is we need to take a deliberate and hardline approach to compliance and enforcement.

Occasionally, it’s necessary for us to change the rules. For example, we’re taking a second look at the trading conduct rules, to improve clarity.

CASE STUDY: WE HAVE DEVELOPED A NEW PRODUCT FOR MANAGING RISK

Successful development of financial risk management tools is helping the wholesale market mature.

The chart shows the amount of transmission price risk covered by Financial Transmission Rights (FTRs) each year since this market was launched in 2013. The Authority introduced FTRs to help generators and retailers manage the future price risk from transmitting electricity across different geographical points in the country. This price difference is caused by the losses and constraints that exist on the transmission network. (The risk is very much like the exchange rate risk for importers and exporters.)

The FTR manager has been able to increase the volume of FTRs available, measured in terms of GWh. This has mainly been because initial success of this market has meant the Authority approved the number of FTR hubs from two in 2013 to eight now. Another measure of success is the participants have broadened from generators, large industrial users and retailers, to increasingly also proprietary traders who use this product to be more active and support liquidity in the ASX options market. Also, as a result of this increasing competition, the auction prices for FTRs have moved closer to a more cost-efficient level, that is, better reflecting the network costs involved.

Source: fnr.co.nz
ENSURING GOOD DECISIONS WIN OUT
We’re currently implementing rule changes for how wind generators offer into the market, to better reflect how their technology works and remove a barrier to their participation, as a source of renewable energy. We are also removing barriers to participation of new technologies like batteries or automated demand response.

GIVING PARTICIPANTS THE RIGHT INCENTIVES TO ACT
One of our top-priority projects is refining the pricing process so spot prices are finalised in real-time, rather than being uncertain for two or three days. This will provide better information for short-term decision making, as participants will have certainty about the prices they are exposed to.

We are also improving the triggers for starting a campaign asking the public to use less electricity when lake levels are low. This will help participants make decisions about using fuel or investing in assets to avoid supply shortages.

We are also working to ensure the price anyone pays reflects the actual costs of distribution and transmission services that are used to get electricity to them, which is particularly important as a signal for future investment.

GIVE PARTICIPANTS INFORMATION AND TOOLS TO MAKE GOOD DECISIONS
We’re supporting the development of cap products on the ASX exchange. These forward contracts would enable parties to cap their exposure to spot prices and support investment in assets that enhance security of supply. We expect these would support the integration of more renewable generation.

We’re also working to ensure market making arrangements support effective risk management.

Given the experience during recent gas outages, we’re particularly considering issues around disclosure of information about thermal generation capability and access to fuel, in collaboration with the Gas Industry Company.

WE’RE WORKING WITH AND LEARNING FROM OTHERS
Overall, we think the design of the wholesale electricity market is generally right and working for the particular contexts we face.

However, there are many other ways to design and regulate wholesale electricity markets. Some international electricity markets cap spot prices, for example, and seek to guarantee the amount of generation on the system—design aspects we have considered and don’t favour as they create new issues that need to be managed. Our observation is those interventions appear to try to address a fundamental discomfort with uncertainty (which we find is a positive for incentives and innovation).

Other jurisdictions face many of the same challenges from technology disruption and climate change policies, and some issues are cross-sectoral. Therefore we collaborate with and learn from overseas electricity regulators and other New Zealand regulators.

The wholesale electricity market is working well and is also a work in progress. It has proven it can help New Zealand achieve its aspirations for the reliable supply of renewable electricity and positions us well to tackle the challenges of the next decade.