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**Asia-Pacific
Economic Cooperation**

Advancing Free Trade
for Asia-Pacific **Prosperity**

New Zealand: Electricity Retail Services Market Reform

APEC Policy Support Unit
May 2017

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EXECUTIVE SUMMARY

PURPOSE OF THIS REPORT

This case study examines the reforms to the electricity retail market in New Zealand between the early 1980s and 2016, with a particular focus on two key phases of change in 1999 and 2010. The analysis is based on literature review and extensive consultation with the government, regulators, electricity industry, consumer complaints Commissioner, and other relevant stakeholders. The consultants visited Wellington in May 2016 to meet and interview relevant government and non-government stakeholders.

The case study illustrates the process, issues, problems, solutions and benefits associated with the reform of the New Zealand retail electricity sector. The lessons for APEC members from this case study are that services reform:

- Cannot occur in isolation from other elements in a supply chain and market;
- May evolve over time and result in market failures or unintended outcomes which market participants need to cooperate together to address;
- Delivers benefits for business and other consumers when governments remain committed to and consistently apply a clear set of principles that promote market based solutions and competition;
- Requires significant government commitment to ongoing structural, regulatory and policy change founded on evidence based learnings over time; and
- Involves an evolution in the behavior of all market participants and activity.

THE NEW ZEALAND ELECTRICITY SYSTEM

New Zealand consists of two main islands. The geographic spread of the population and rainfall patterns between the islands affects the demand for electricity and also its supply, particularly because New Zealand relies primarily on hydro power.

The electricity system is a network industry combining four key components.

Generation. Hydro power is the main source of electricity, contributing about 54 per cent. The generation market is contestable with deregulated pricing based on the cost of production and investment in future supply. There are five main generators, which have vertically integrated retail businesses.

Transmission. A government corporation (Transpower) owns and operates the national grid of transmission poles and wires which is a natural monopoly. The maximum average price it can charge is regulated.

Distribution. There are 29 companies owning and controlling the local lines and cables that connect transmission to residential and business end users. These companies are natural monopolies. About 50 per cent of distributors are owned directly by local communities. The maximum average price non-community owned businesses can charge is regulated.

Retail. The retail market is contestable with deregulated pricing based on the cost of providing electricity. This cost is based on network (transmission and distribution) charges and the wholesale price for electricity. There are 31 companies selling electricity to residential and

business end users. End users are free to switch between retailers and the market enjoys the world's fastest rates of switching.

The electricity system is regulated by different bodies.

Electricity Authority. The Authority is the regulator of the generation and retail markets. It applies a light touch facilitative regulatory approach to achieve its main objective which is market efficiency. It also approves the methodology for transmission prices and grid reliability standards.

Commerce Commission. The Commission is the regulator of generally applicable competition law in New Zealand. In relation to the electricity sector it sets total regulated revenue that natural monopolies (transmission and non-community owned distribution) can receive.

Ministry for Business, Innovation and Employment (MBIE). The MBIE advises the Minister for Energy on energy strategy and policy. The Minister has no power to direct the market activities and regulation of the electricity sector.

Electricity and Gas Complaints Commissioner. The Commissioner has legislated functions to independently resolve disputes between electricity providers and consumers. Electricity retailers are legislatively required to fund the activities of the Commissioner.

HISTORY AND NATURE OF REFORM

The reform process has witnessed a change in asset ownership and shift towards the separation of natural monopoly and contestable assets and services in all parts of the energy supply chain.

At the beginning of the reform process the national government owned transmission and generation services, while distribution and retail activities were under local government or community ownership operating within a statutory geographic franchise.

However, by the end of the reform process the sector was separated into two distinct parts. One was a regulated natural monopoly part (transmission and distribution) with mixed government and local community ownership. The other was a contestable part (generation and retail) with mixed government (through a shareholding rather than direct control arrangement) and private ownership.

Key motivations for the reforms included the desire by governments to:

- Introduce commercial incentives to promote efficiency (in the first phase from 1987 to 1993);
- Improve competition in the contestable parts of the energy sector to align prices with costs, encourage innovation, and improve the quality of services; and
- Improve the security of supply and its management by market participants. This is particularly because the economy relies primarily on hydro power and supply can be unreliable in years with lower than normal rainfall and snowmelt.

While strengthening consumer protection was not a specific motivation for reform, the process increased the responsibilities of market participants to protect users from potential adverse consequences of reform. These consequences included the removal of historic cross-subsidies between urban and rural consumers.

The 1999 reforms were a key phase because they included the first major structural asset and services separations to create a mix of generators and retailers and facilitate competition in those markets. It also established the frameworks for regulated pricing of the natural monopoly parts of the supply chain (transmission and distribution). These reforms permitted vertical integration between generators and retailers, but excluded distributors from the retail market.

Vertical integration of generators and retailers was not a public policy concern during the 1999 reforms because the government considered such integration to have economic benefits. The benefits of vertical integration, recognised in economic theory, include exploiting vertical economies of scale, decreasing transaction costs between firms with highly co-specialised assets, and eliminating the inefficiencies of double marginalisation that occur when the downstream market is not perfectly competitive.

The 2010 reforms were a second key stage because they included further structural and regulatory changes in the generation and retail sectors to address unintended outcomes in the electricity retail market. Specifically these were a lower than expected level of competition arising from the 1999 measures, and concerns about security of supply.

One of the main issues hindering competition was the insufficient capacity of new retailers to enter the market if they did not have a relationship with a generator. Thus when considering options to improve competition in the retail market the government considered ending vertical integration between the five main generators and retailers. However this option was rejected because the economic benefits of retaining vertical integration outweighed the costs of removing it, and other more efficient options were available to improve competition.

These options included actual and virtual asset swaps between generators and making the hedge market more liquid to reduce barriers to entry for retailers not integrated with generators. It also included defined funding for education campaigns to raise public awareness about switching between retailers, and required retailers to fund and collaborate with the independent Electricity and Gas Complaints Commissioner to improve consumer protection.

The current data shows that the 2010 reforms have had the results that they were intended to achieve. These include encouraging new entrants in the retail market, promoting increased innovation and product choice for consumers, and ensuring that residential pricing does not increase faster than the costs of producing and supplying electricity. The number of retailers in the market (31 with a further 13 investigating market entry) is at an all-time high, and customer switching rates are the fastest in the world.

KEY LESSONS OF REFORM

The key lesson from the process and approach to reforms in New Zealand is that when pursuing change successive governments have never deviated from a commitment to promoting market based responses and competition, and the clear set of principles that were established at the beginning of the reform process to underpin this commitment. This commitment has remained intact even though it was put to the test by several major reviews during the period of reform.

These principles are as follows.

Learning by doing. Successive governments have not been risk averse and have applied reforms even when there was no model or precedent to guide them. They have been willing to

accept that market failures may occur and address them as they arise. As a result the reforms have been evolutionary in nature.

Commitment to market based competition, even when addressing market failures. Successive governments have consistently ensured that their reactions to issues are based only on supporting and encouraging market based responses. The most critical test to the government's faith in market based solutions occurred as part of the 2010 reforms. Leading up to 2010 residential prices were increasing, not falling, and this was opposite to public expectations about the benefits of the 1999 reforms. To address this problem the then government considered a range of publicly popular regulatory options including capping residential prices, but nevertheless maintained a commitment to measures that encouraged market based solutions.

No price signals to distort market based responses. Successive governments have not been tempted to introduce consumer price concessions or controls, feed-in tariffs to support solar and other alternative local generation sources, subsidies to encourage renewable energy, or any other kind of financial support or exemptions. This has not dissuaded investment in renewable generation sources such as new development options for hydro power, wind farms or the use of solar panels.

Accordingly, behaviour in the retail market is driven solely by market based pricing. One advantage that New Zealand has enjoyed is that it is naturally more reliant on renewable sources of energy (hydro and geo-thermal) than thermal sources (coal) with higher emissions profiles. This has meant that its responses to electricity market issues have not needed to be driven by emissions reduction objectives as much as in some other jurisdictions.

However, consistent with its commitment to market based principles, New Zealand also phased in an emissions trading scheme (ETS) from 2008 to 2015 to reduce carbon emissions in its economy.

Regulatory intervention is only used to improve market efficiency, where competition cannot. The approach of the regulators is based on facilitating outcomes through guidelines rather than rule setting and prescriptions for behaviour. For example, there is no prescriptive licensing regime for retailers to meet as a condition of market entry.

BENEFITS

The consistent commitment to market based solutions and competition and application of these clear principles at each stage of reform has enabled New Zealand to maintain a course of continually improving reform that builds on and learns from successes and failures within a robust and defined framework.

This approach has delivered a range of economic benefits including reducing electricity costs for business; enabling business to better control their energy supply and price risks; providing investors in the energy market with certainty to the extent that has stimulated a diversity of development options for new generation; and encouraging the listing of the five major retailers on the Australian stock exchange and promoting the strength of their shares and trading in NZ electricity derivatives on the futures exchange.

The government, regulators nor industry have formally assessed the social and economic value of the reforms as they have operational evidence of their positive impact.

1. METHODOLOGY

The case study was prepared using a wide ranging desktop review of relevant literature sources and extensive consultation with key stakeholders.

The analysis considers reforms from the early 1980s to 2016, but the focus is on two key phases of change in 1999 and 2010.

The assessment considers effects of changes in the retail market arising from reforms in generation, transmission and distribution markets. This because energy markets are network industries with integrated components which don't operate in silos.

The case study is based on a literature review and extensive consultation with the government, regulators, electricity industry, consumer complaints Commissioner and other relevant stakeholders. The literature review relied on market regulator data and Ministerial review documents, Cabinet papers and regulatory impact assessment informing 2010 reforms.

There is no available government or independent assessment of the socio-economic impact of the reforms that the assessment could draw from. Specific economic data for the electricity sector is not reported by Statistics New Zealand. Performance data for the electricity sector is reported in combination with the gas, waste and water sectors and accordingly the case study cannot draw definitive links between the reforms and economic benefits for New Zealand.

However, economic uplift could potentially occur from increased investment in generation assets and the effects of improved competition and energy supply reliability on productivity.

1.1 DESKTOP REVIEW

The literature review considered primary sources of information available from and provided by the:

- Electricity Authority, the energy market regulator.
- Ministry of Business Innovation and Employment, which has responsibility for advising the government on energy policy.
- Electricity and Gas Complaints Commissioner, which is responsible for facilitating dispute resolution between participants in the energy market.
- NZ Energy Retailers Association, which represents most of New Zealand's energy retail companies.
- Commerce Commission, which regulates consumer and competition law, and administers economic regulation of natural monopolies.
- Reports and assessments by academics and research houses.

The literature considered included:

- Discussion papers released during reform processes to gain views and information to inform recommendations.
- Cabinet papers associated with the New Zealand government's decisions about the direction and nature of reforms.

- Regulatory Impact Statements supporting the consideration of reform options by the New Zealand government.
- Independent reviews and assessments of government decisions and options considered about reforms.
- Historic and current data and information about market performance and trends.

1.2 STAKEHOLDER CONSULTATION

The consultants visited New Zealand in May 2016 to meet with and interview a range of key stakeholders involved in the energy market. These were:

- The Chair of the Electricity Authority.
- Principal Policy Advisor, Energy Markets Policy, Ministry of Business Innovation and Employment.
- The Electricity and Gas Complaints Commissioner and her team.
- The CEO of the NZ Energy Retailers Association.
- A number of energy retailers including Genesis and Nova representing large formerly government owned retailers and smaller new market entrants.
- The Principal Economist, New Zealand Institute for Economic Research.

A series of questions were developed based on a preliminary literature review, and these were used to structure stakeholder interviews. Questions were provided to interviewees in advance of meetings and some participants provided written responses to these questions.

Other stakeholders who were consulted included the former Electricity and Gas Complaints Commissioner.

2. THE ELECTRICITY SYSTEM AND MARKET

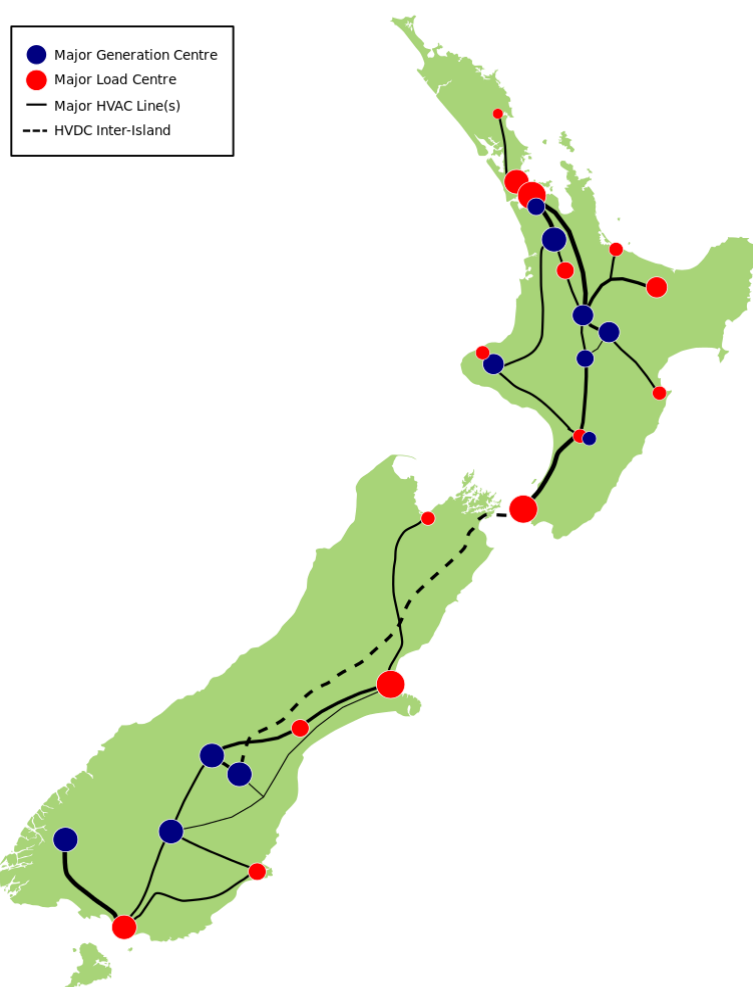
2.1 OVERVIEW

New Zealand consists of two main islands, the North and South Islands. Of the total population of about 4 million people, approximately 75 percent live in the North Island, and 25 per cent in the South Island. While there are key urban and industrial centres, creating the bulk load of energy demand the population is also spread amongst all areas of the islands.

The rainfall patterns between the islands varies, and the South Island contains alpine mountain ranges which experience snowfall. This is important for hydro power.

The geographic spread of the population and rainfall patterns affects the demand for electricity and also its supply, particularly because New Zealand relies primarily on hydro power.

Figure 1. Generation and Transmission in New Zealand¹

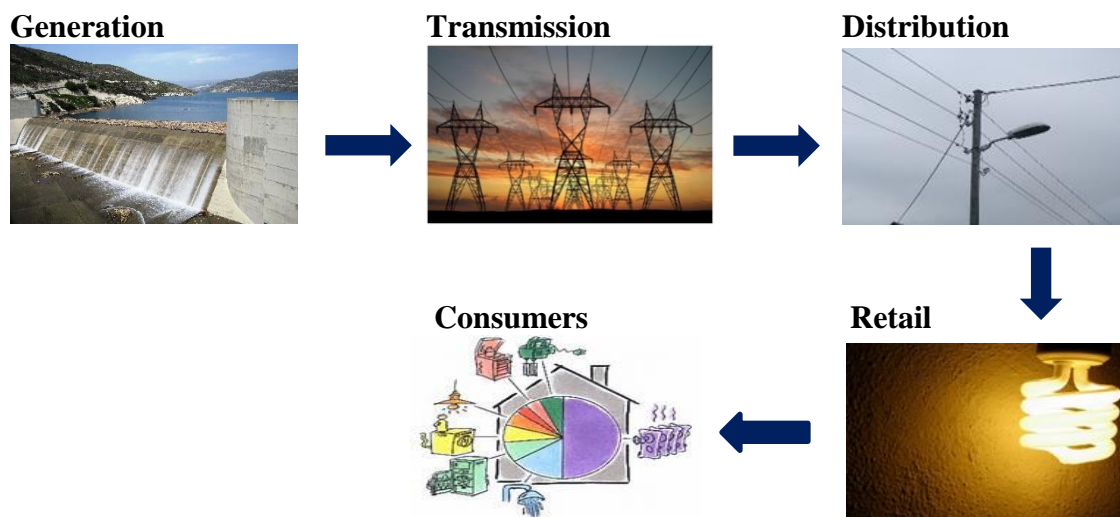


¹ Drawn from various sources including Ministry of Business, Innovation and Employment, Government of New Zealand and the New Zealand Electricity Authority, May 2016

2.2 HOW THE ELECTRICITY SYSTEM WORKS²

The electricity system in New Zealand, like all similar systems in the world, is a network industry consisting of generation, transmission, distribution and retail. Accordingly, it relies on these various separate components working in an integrated way for the whole system to operate effectively and efficiently. In network industries, reform to achieve outcomes in one component often also requires complimentary change in other parts of the system.

Figure 2. Components of the Electricity System



Source: Please see footnote

Generation

Hydro power is the main source of electricity, contributing about 54 per cent. Other sources of electricity include natural gas, geothermal, wind and coal, but 80 per cent of energy supply is derived from renewable sources.

The generation market is contestable with deregulated pricing based on the cost of production and investment in future supply.

All generators connected directly to the transmission grid are dispatched by the system operator on the basis of their price offers. A market-clearing spot price is determined every 30 minutes by the pricing manager for each point of connection on the national grid. The spot price can vary depending on supply and demand.

There are five main generators, three of which are mixed owned corporations with majority (51 percent) government ownership, and two are private companies. All of the generators have vertically integrated retail businesses and therefore are referred to as gentailers. Most of these gentailers are listed on the New Zealand Stock Exchange (NZX) and Australian Stock Exchange (ASX).

² All the information in this section is based on discussions with and information provided by the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Electricity Authority, and New Zealand Energy Retailers Association May 2016

Other smaller generators also compete. This includes businesses and households which sell their surplus electricity generally produced from thermal (industrial processes) or solar power to the central clearing manager or directly to retailers.

There are no subsidies or feed in tariffs to support renewable energy or supply by users into the grid.

The major gentailers publish performance information under their stock exchange disclosure obligations and statutory financial reporting. Lines companies must publish performance data such as pricing data, quality measures, financial information, or forecasts of future supply, expenditure and network investment.

Transmission

A government corporation (Transpower) owns and operates the national grid of transmission poles and wires which is a natural monopoly.

The Commerce Commission sets the total regulated revenue Transpower can receive. This is done via a price quality path which includes the maximum average price that Transpower can charge. This is intended to provide certainty about a key network charge that must be absorbed by contestable parts of the market.

The Electricity Authority approves the methodology Transpower uses to allocate revenue requirements among its transmission customers and sets grid reliability standards.

Transpower must publish performance data such as pricing data, quality measures, financial information, or forecasts of future expenditure and network investment.

Distribution

There are 29 companies owning and controlling the local lines and cables that connect transmission to residential and business end users. These companies are natural monopolies. They can compete in the generation and retail markets, but affiliated generation and retail businesses must operate at 'arm's length' to the monopoly distribution business when generation exceeds 50 MW and annual retail sales exceed 75 GWh.

About 50 percent of distributors are owned directly by local communities through trusts.

For non-community owned companies the Commerce Commission sets the total regulated revenue via a price quality path which includes the maximum average prices distributors can charge. This is intended to provide certainty about a key network charge that must be absorbed by contestable parts of the market.

Companies must publish performance data such as pricing data, quality measures, financial information, or forecasts of future expenditure and network investment.

Retail

The retail market is contestable with deregulated pricing based on the cost of providing electricity. This cost is based on network (transmission and distribution) charges and the wholesale price for electricity.

There are 31 companies selling electricity to residential and business end users. About 75 per cent of households have smart meters which facilitate the remote measurement of actual usage. End users are free to switch between retailers and the market enjoys the world's fastest rates of switching.

Retailers manage risk of spot price volatility via contracts to hedge against future risk. Examples of hedging contracts include fixed price and fixed volume, and fixed price and variable volume. Hedging is explained in the box below.

Box 1: Concepts Explained: The Meaning of Hedging

An active hedge or futures market with transparent and robust forward prices and easy accessibility for new entrant generators, retailers and consumers is critical to promote competition, reliability and efficiency in the wholesale and retail markets.

A hedge is a risk management contract. It is used to manage the price volatility of the spot market for both generators and electricity purchasers. The spot price which is published every 30 minutes at every connection point in the national grid guides wholesale prices. The spot price can vary with supply and demand and therefore creates risks for generators and electricity purchasers.

Hedges are either agreed upon directly between the parties (known as over-the-counter - OTC) or purchased as derivatives on the Australian stock exchange (ASX) electricity futures market.

There is also a separate specialised financial transmission rights (FTR) market to help parties manage the risk they face from large, unpredictable differences in wholesale electricity prices between the North and South Islands.

Source: Electricity Authority 2016

2.3 REGULATION OF THE ELECTRICITY SYSTEM³

The two main regulators of reliability of supply, market efficiency and competition in the electricity system are the Electricity Authority and Commerce Commission.

The Electricity Authority has an oversight role of the entire electricity system. The Commerce Commission has a role in determining acceptable pricing for natural monopoly elements of the system (transmission and distribution) to ensure competitive outcomes in the sector as a whole.

³ All the information in this section is based on discussions with and information provided by the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Electricity Authority, and New Zealand Commerce Commission May 2016

The Authority is funded by the New Zealand Government, but the cost of this is fully recovered by a levy that the government collects from electricity industry participants. The levy also funds the electricity efficiency programmes delivered by the Energy Efficiency and Conservation Authority (EECA).

The Commission is also funded by the New Zealand Government, but the costs of regulating transmission and distribution services are fully recovered by a levy on the regulated companies.

Electricity Authority⁴

The Electricity Authority is an independent Crown entity responsible for the efficient operation and regulatory oversight of the electricity sector. The Authority is responsible for achieving long term benefits for consumers by ensuring that electricity prices are reasonable, electricity supply is reliable, consumers have choice, and innovation is occurring in the market.

The Authority seeks to achieve these benefits in the various following ways.

It administers, enforces and continually improves the *Electricity Industry Participation Code* (the Code), which is a set of rules that govern almost every aspect of the electricity sector, including generation, transmission, system operation, security of supply, market arrangements, metering, distribution and retail.

The Authority performs the role of the market administrator under the Code. This includes administering the day-to-day (real-time) operation of the electricity system and markets to ensure efficiency and reliability. As the market administrator, the Authority contracts different service providers to perform the range of functions that market participants require and must comply with under the Code. These functions are as follows:⁵

- The system operator is responsible for the real-time operation of the power system, including scheduling and dispatching electricity, in a manner that avoids undue fluctuations in frequency and voltage on the transmission grid.
- The whole information trading system is used to transfer information among participants, especially the uploading of bids and offers.
- The reconciliation manager allocates volumes of electricity to generators and purchasers. It uses metering information supplied by participants and calculates unaccounted for electricity.
- The pricing manager calculates and publishes final prices, which are used by the clearing manager to calculate invoices.
- The clearing manager invoices and settles physical electricity sales and purchases identified by the reconciliation manager, ancillary service payments and any financial hedges required to be taken into account in the prudential calculation. It also maintains prudential security requirements.
- The registry manager maintains a database that identifies every customer point of electricity connection to a local or embedded network. The database enables customer switching between retailers and contains key information for the reconciliation process.
- The FTR manager is responsible for running regular auctions of financial transmission rights (FTRs), which is an instrument for hedging price risk.

⁴ The discussion in this document is based on information provided by the Electricity Authority 2016

⁵ New Zealand Electricity Authority May 2016

To support compliance with and identify required changes to the Code the Authority monitors the electricity industry for competitiveness, efficiency and supply reliability. It assesses these issues on the basis of information supplied the industry including the performance of participants as well as its own examinations.

The Code and the Authority's monitoring of the market are a substitute for the kind of strict licensing regime common in many jurisdictions. Licensing regimes are generally based on assumptions that the market must be protected from unfettered self-interest of participants. These regimes therefore create eligibility criteria for initial and ongoing market participation, and are therefore often barriers to entry.

By contrast, in New Zealand the Code and approach of the Authority create a light touch regulatory regime that encourages market participants to operate in the collective interest of the market as well as themselves.

One reason this occurs is because the Authority has the capacity to monitor market outcomes, not just inputs, in a detailed way. For example, it monitors accuracy of metering, meter reading and customer switching between retailers, including ways to minimise entry barriers to new retailers.

Much of the information relied on by the Authority to make its assessments is provided by market participants as part of regulatory obligations. For example the Code and/or the *Commerce Act 1986* requires generators, Transpower, distributors and retailers to publish information on their past, current and forecast business performance, financial health, capital expenditure, investment strategies and other information relevant to understanding market dynamics. In addition the Authority conducts its own investigations.

The other reasons the Code and monitoring can work as, if not more, effectively than a strict licensing regime is that all market information is transparent. The nature of this and reliance placed on it by market participants and investors means that the regulatory approach cannot be a 'set and forget' one.

The Authority makes information available through a website dedicated to Electricity Market Information. This website provides detailed analysis on wholesale, natural monopoly and retail pricing, market concentration, supply and generation capacities, customer switching rates and other information.

This transparency of information is critical to supporting market efficiency and competition. For example, prices play a critical role in the electricity market by providing information that forms the basis of investment decisions by generators, Transpower, distributors, and retailers and the consumption decisions by consumers.

Transparent access to information is also essential to investment decisions by existing and future shareholders of the five gentailers listed on the ASX, as well as other companies in the sector which may seek stock market listing. It also supports the investment decisions in future generation development options across any generation type, particularly as there are no non-market prices signals, such as subsidies, for renewable or other generation sources.

In addition to these activities the Authority supports the development of the industry through education, guidelines, information, and model arrangements. This is consistent with a

facilitative, rather than prescriptive approach to regulation. It can also be an integral part of promoting competition.

For example, the Authority runs a specific campaign (funded since the 2010 reforms) to educate consumers about process and benefits of comparing and switching retailers.⁶ The campaign provides consumers with transparent information that enables them to judge whether their retailer is offering them the best pricing and other deal. The capacity of consumers to switch is made easier because as part of the Code obligations the Authority contracts a registry manager to manage points of connection information in the retail market. These points of connection make it a simple process for consumers to switch power companies.

The regulatory approach is also assisted by the complementarity that is embedded in the functions of the Authority and Commerce Commission. For example, the Commission has the role of determining the regulated revenue for Transpower based on input methodologies (see discussion below). This is because the Commission, as the competition authority, has responsibility for regulating natural monopolies in industry sectors.

However the Authority approves the transmission pricing methodologies and also approves the grid reliability standards Transpower is required to meet. This is because of the intersection between transmission prices and reliability and the efficiency of the contestable parts of the electricity sector.

Commerce Commission⁷

The Commission is an independent Crown entity and is not subject to direction from the government in carrying out its enforcement and regulatory control activities.

The Commission is the regulator of generally applicable competition law in New Zealand. It also has specific roles in relation to a variety of regulated industries that have natural monopoly characteristics, including the electricity industry.

In relation to the electricity sector it sets total regulated revenue that natural monopolies (transmission and non-community owned distribution) can receive. It does this by providing Transpower and distribution companies with a price quality path which includes maximum average prices they can charge.

Transpower and distribution companies are obliged under the *Commerce Act 1986* to publish information about their performance, pricing, forecasts, expenditure, and network investments.

⁶ What's My Number? – this campaign was one of the outcomes of the Ministerial Review that led to the 2010 reforms

⁷ The discussion in this section is based on information provided by the Commerce Commission 2016

Box 2: Concepts Explained: The Meaning of Price Quality Paths for Transpower

From April 2011 Transpower was regulated under Part 4 of the *Commerce Act 1986* by way of individual price-quality regulation. The individual price-quality path governs Transpower's revenues for each pricing year, with the paths being reset either every four or five years. The current individual price-quality path was reset for the 2015-2020 regulatory period on 1 April 2015.

The price quality path is determined according to input methodologies for asset valuation, cost allocation, regulatory tax treatment, the cost of capital, capital expenditure proposals and regulatory rules and processes.

Source: Commerce Commission 2016

Box 3: Concepts Explained: The Meaning of Price Quality Paths for Non-Community Owned Distribution Companies

Price-quality regulation is designed to ensure that distributors have similar incentives and pressures to suppliers operating in competitive markets to innovate, invest and improve their efficiency. It also aims to limit their ability to earn excessive profits, while also ensuring that consumer demands on service quality are met.

The default price quality path has a number of key features.

- It sets the 'default path' that applies to all regulated distributors for a regulatory period between four and five years.
- During the regulatory period individual distributors can apply for an alternative or 'customised' price-quality path to better meet their particular circumstances.
- It sets the maximum prices/revenues that are allowed at the start of the regulatory period (the starting prices).
- It sets the annual rate at which all distributor's maximum allowed prices can increase (the rate of change). This is expressed in the form of 'CPI-X', meaning prices are restricted from increasing each year by more than the rate of inflation less a certain number of percentage points.
- It sets the minimum service quality standards that must be met.

Source: Commerce Commission and Electricity Authority 2016

There are some other bodies that also play an important role in the regulation of the electricity market.⁸

⁸ The discussion about these bodies is based on information provided by the Ministry for Business, Innovation and Employment, Government of New Zealand and the New Zealand Electricity and Gas Complaints Commissioner 2016

Ministry for Business, Innovation and Employment (MBIE)

The MBIE advises the Minister for Energy on energy strategy and policy. The Minister has no power to direct the market activities and regulation of the electricity sector.

However the MBIE obtains key retail electricity price and other performance data through a regular quarterly survey. It provides analysis and information which it makes publicly available. It also monitors the performance of the Electricity Authority and Commerce Commission.

Another government agency, the Energy Efficiency and Conservation Authority, is responsible for developing policies and programs to promote energy efficiency and sustainability.

Electricity and Gas Complaints Commissioner

The Commissioner has legislated functions to independently resolve deadlocked disputes between electricity providers and consumers. Electricity retailers are legislatively required to fund the activities of the Commissioner. The majority of disputes relate to billing and disconnection issues. The Commissioner is not a consumer advocate, but plays a critical consumer protection role in the market.

3. HISTORY OF REFORMS

3.1 OVERVIEW

The New Zealand electricity market has been subject to a range of ongoing services and structural reforms since the early 1980s. Since their commencement and throughout their progress these reforms were not based on an existing structural or service reform model. Rather the reforms evolved over time and included unintended outcomes which successive governments sought to address as they arose.

Nevertheless, the reforms were based on a clear set of principles for electricity markets including the need for a reliable power pool; financial contracts governing the sale and distribution of energy; competition; regulatory certainty to the extent required for investment; and the capacity to address market failure when required.

Tables 1 and 2 below provide an overview of reforms since the early 1980s, including the kinds of reform measures applied over this time.⁹

⁹ Tables 1 and 2 are based on discussions with and information provided by the Ministry of Business, Innovation and Employment, Government of New Zealand, May 2016

Table 1. NZ Electricity Sector Key Structural Reform from the Early 1980s to 2016

	Early 1980s	1987	1988	1993	1994	1996	1999	2003	2010	2016
Transmission	Controlled by NZ Ministry of Energy: Electricity Division, a government agency.	Controlled by Electricity Corporation of NZ (ECNZ), a government corporation.	Controlled by Transpower, a specifically created subsidiary of ECNZ.	Transpower retain control.	Controlled by Transpower, a specifically created State Owned Enterprise (SOE).	No change.				
Wholesale price setting			ECNZ retains control.	Controlled by M-Co, a market company created by a joint venture between ECNZ and energy suppliers. Trading was regulated via 1 st multilateral agreement.	M-Co retains control. Creation of energy market with trading controlled via 2 nd multilateral agreement in 1996.			Controlled by new Electricity Commission (EC), marking the end of industry 'self-governance'.	Controlled by Electricity Authority (EA) which was the reformed EC.	No change.
Generation				ECNZ retains control.	No change.	Controlled by ECNZ and a new independent generator in the form of Contact Energy, a SOE created from ECNZ.	Controlled by a mix of created independent companies: <ul style="list-style-type: none"> • Contact (privatised) • Meridian (SOE) • Genesis (SOE) • Mighty River Power (SOE) 	No change.	Physical generation assets and virtual asset swaps via long term contracts occur to promote competition in retail market.	No change.
Retail	Controlled by Electricity Supply Authorities (ESA), owned	No change.	No change.	ESAs rationalised and corporatised and control	No change.		Retail companies are created by separating them from monopoly distribution	No change.	Measures introduced to improve liquidity in the hedge	There are 31 retailers with 13 others at

	Early 1980s	1987	1988	1993	1994	1996	1999	2003	2010	2016
	by the, local government and/or local community trusts. There was one distributor (Southland Electricity Public Supply)			transferred to 40 Electric Power Companies (EPCs). Geographic retail franchises removed, and competition commenced for customers with half hourly metering.			businesses. Retail companies merged and vertically integrated with generators. Retail competition commenced for consumers without half hourly metering.		market to enable new entrants in retail market.	different stages of market entry.
Distribution	that was managed by government under statutory management after a financial failure. ECNZ managed this until it was handed back to community control in the early 90s.						EPCs are reduced to 29 Distribution companies and excluded from retail market.	No change.	Distribution companies permitted to enter retail market subject to constraints within their network areas.	No change.

Table 2. Key Structural Reform Measures Used over Reform Timeline

1987-1993 → 1993-94 → 1994-99 → 1999 → 2010				
Corporatisation	Joint Ventures	State Owned Enterprise (SOE)	Privatisation	Other Structural Mechanisms
<ul style="list-style-type: none"> 1987: creation of Electricity Corporation of NZ (ECNZ) to manage transmission, wholesale price setting and generation. 1993: corporatisation of distribution authorities to create companies. 	<ul style="list-style-type: none"> 1993 and 1994: Creation of M-Co to manage wholesale price setting. M-Co was a joint venture between ECNZ and energy suppliers. Electricity trading was regulated via a multilateral agreement between parties to M-Co. Retail competition also commenced in 1993, but was generally restricted to commercial and industrial consumers with half hourly metering. Retail competition was governed by rules developed by the incumbent retailers and wholesaler (ECNZ). 	<ul style="list-style-type: none"> 1994: Transpower created as a SOE to manage transmission in the market. 1996: creation of an independent generation company (Contact Energy) as a SOE. 1999: separation of Contact Energy assets and functions to create 4 new independent generation companies as SOEs. These were Meridian, Genesis and Mighty River Power. 	<ul style="list-style-type: none"> 1999: privatisation of Contact Energy, previously a SOE. 1999: privatisation of some local government owned distribution companies. 	<p><i>Rationalisation</i></p> <ul style="list-style-type: none"> Used in a phased way from the early 1980s to 2010 to reduce Distribution networks from 61 to 29. <p><i>Separation</i></p> <ul style="list-style-type: none"> Used in 1999 to delineate retail and distribution functions and preclude distribution companies from the retail market. <p><i>Vertical integration</i></p> <ul style="list-style-type: none"> Used in 1999 to encourage generation and retail company mergers to create economies of scale for competition. Used in 2010 to enable distributors to merge with retailers to address anti-competitive effects of generator/retailer integration. <p><i>Hedge Markets</i></p> <ul style="list-style-type: none"> Efforts made in 2010 to ensure hedge market liquidity to support new entrants in retail market. <p><i>Asset swaps</i></p> <ul style="list-style-type: none"> Forced physical and virtual asset swaps in 2010 to address anti-competitive effects of vertical integration and promote competition in retail market.

One of the key lessons to note from the history of reform is that the current market is a result of the phased introduction of structural change over about 25 years. Some of the stages of reform were intended to address problems created by earlier initiatives. This is specifically the case with the 2010 reforms implemented by the *Electricity Industry Act 2010* (EIA). Many of these reforms were introduced to address unforeseen anti-competitive effects arising from the 1999 reforms which were contained in the *Electricity Industry Reform Act 1998* (EIRA).

During the 25 years of reform, key changes were as follows.¹⁰

Natural Monopoly Transmission and Generation Infrastructure and Services

The reforms have retained government ownership of transmission but introduced limited privatisation in the generation sector. However the nature of public ownership and executive government control of assets and services has changed. This has occurred by shifting the control of transmission and generation from government departments to government corporations within Ministerial control and then eventually to State Owned Enterprises which operate independently of executive government and apply the same commercial decision making and investment decisions as private sector companies.

The last phase of reform (2010) included executive government mandated physical and virtual asset swaps between SOE generators to improve competition in the retail market.

The five major generators (including SOEs), Contact Energy, TrustPower, Genesis Energy, Meridian Energy and Mighty River Power are all listed on the stock exchange. The later three are Mixed Ownership companies with 51 percent government ownership under the *Public Finance (mixed ownership model) Amendment Act 2012*.

Natural Monopoly Distribution Infrastructure and Services

The reforms have shifted some local government owned distributors from public to private ownership. Many of those distributors which were historically owned and operated by local government or local community trusts (primarily in regional areas) have been retained in their control but have been exposed to commercialisation or corporatisation.

Over the entire period of reform the number of distributors has reduced (through voluntary mergers and acquisitions) from 61 to 29 to improve efficiencies and economies of scale. In 1999 when distribution and retail functions were separated in order to promote retail services competition, distribution companies were prohibited from competing in the retail market.

In the last phase of reforms (2010) distribution companies were permitted to re-enter the retail market without restraint outside of these areas they owned lines and subject to a number of constraints or thresholds within the area where they are the monopoly lines company. This was intended to address poorer than expected competition outcomes arising from the 1999 reforms.

¹⁰ Based on discussions with and information provided by the Ministry of Business, Innovation and Employment, Government of New Zealand and the New Zealand Electricity Authority, May 2016

Contestable Retail Services

Historically these services were provided by supply authorities which included a mix of local government and local community ownership based on geographic franchise areas. As a first tranche of reform these authorities were commercialised or corporatised to form companies, and all geographic retail franchises were removed (1993). Retail competition emerged for large commercial and industrial customers, but did not emerge for the mass market due to an industry agreement that restricted competition to customers with half hourly metering.

The second tranche of reform involved the separation of retail and distribution functions of these companies and the introduction of measures, such as provisions to support mass market retail competition without half hourly metering (known as ‘deemed profiling’), to promote competition in the retail market including new entrants (1999). This second stage of reform included the horizontal break-up of the generation sector and the capacity for generators to vertically integrate with retailers, but specifically excluded distributors from competing in the retail market.

Vertical integration was supported because of the economic benefits it can provide such as lower transaction costs between companies. It can be a logical approach where a competitive market is being created and where an economy with geographic and population dimensions like New Zealand wishes to preserve economics of scale as a priority. But it can also lead to barriers to entry because retailers which do not have a preferred relationship with generators can face hurdles, such as lesser access to supply at reasonable prices.

The third stage of reform in 2010 sought to address these kinds of barriers to competition created by the vertical integration of retailers and generators. This included measures to make market information more transparent, reduce generator monopolies in geographic areas via asset swaps, and make the hedge market more liquid.

It also included enabling distributors to enter the retail market without restraint outside of these areas they owned lines. This was subject to a number of constraints or thresholds within the area where they are the monopoly lines company. This was a sensible approach as the existing market capacity and knowledge of distributors makes them an immediate competitive threat to incumbents in the retail market.

Box 4: Concepts Explained: The Innovative Use of Generator Asset Swaps to Promote Retail Market Competition

In the 2009 Ministerial Review which led to the 2010 reforms it was identified that there was an imbalance in the geographic spread of SOE generators. Specifically, Genesis and Mighty River Power (MRP) had no generation in the South Island and Meridian had almost no generation in the North Island. This geographic based concentration in combination with transmission based constraints meant that SOEs were regionally focussed and their retail businesses did not compete with each other.

To address this the government required Meridian to transfer two of its generation assets to Genesis and Genesis to transfer one of its generation assets to Meridian. It also required all SOEs to virtually swap assets through the inter-transfer of long term supply contracts. These actions rebalanced the spread of generation between the islands and eroded the geographic franchises on which gentailers had based their retail businesses. This successfully encouraged the retail arms of generators to compete with each other more aggressively.

Source: Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009

3.2 IMPACT OF 1999 REFORMS

The reforms in 1999 represented the most significant change to the structure and operation of the electricity market compared to previous periods of reform. The reforms attempted to stimulate competitive generation and retail sectors, including by permitting vertical integration between generators and retailers (gentailers). This was pursued for clear reasons of economic benefit.

Economic theory has established that vertical integration can improve and also reduce welfare.

On the positive side vertical integration can be a natural incentive to escape regulatory restrictions or maintain the cross subsidies; take advantage of vertical economies of scale and scope; reduce transaction costs between companies; internalise network spillover effects; and eliminate double marginalisation.¹¹

For example, double marginalisation can occur when the downstream market is not perfectly competitive and the prices charged by companies (retailers) in this market do not reflect those being levied by the upstream monopolist. If aggregate profits are lower than the profit of the vertically integrated structure the upstream company will impose restraints to address this. Vertical integration of upstream (generators) and downstream (retailers) companies can eliminate this problem and therefore increase welfare.¹²

In terms of adverse effects vertical integration can encourage price discrimination in downstream markets particularly where a monopolist can charge a higher price in a market

¹¹ Treasury and Ministry for Commerce, Government of New Zealand, Regulation of access to vertically integrated natural monopolies – discussion paper, 1995

¹² Ibid

with less elastic demand. It can also discourage firms from dealing with rivals for non-profit maximising reasons particularly where downstream markets are not perfectly competitive.¹³ For example, even if downstream markets (retail) have only a limited capacity to bypass upstream markets (main generators) by accessing some the electricity supply they need from other sources this can incentivise the main generators from dealing with rivals. This can often occur in publicly owned network industries where the reticulation component (retail and distribution) are imperfectly competitive.¹⁴

As the 1999 reforms were stimulating competitive markets in the generation and retail sectors for the first time, it was logical to pursue vertical integration to maximise competition while also optimising the benefits that can flow from vertical integration.

In 2002 the Commerce Commission, commenced an investigation into whether companies in the electricity sector were using market power to an effect that lessened competition.¹⁵ The multi-year review reported in 2009. The investigation did not result in prosecution or other enforcement action being taken against any companies. However the Commission found that several gentailers had used market power to raise wholesale prices and that the nature of vertical integration enabled them to do this.¹⁶ While the government considered the findings of the Commission, it also believed that the Commission's assessment of wholesale pricing had misunderstood the nature of the risks of dry years to electricity supply, and the associated underlying impacts on wholesale pricing.

Accordingly, the Commission's findings were not considered to be a major reason to alter the preferred approach to vertical integration.

3.3 2009 REVIEW OF ELECTRICITY MARKET AND 2010 REFORMS

Around the same time as the Commerce Commission had delivered its report, a change of national government occurred. The incoming government had committed to review the electricity market as part of its election manifesto, and used the Commerce Commission report findings as one element of evidence of the need to do so.¹⁷

The Ministerial Review of the electricity market was completed in November 2009 and the New Zealand Cabinet accepted most of its recommendations which concerned three main areas:¹⁸

- Prices, costs and competition;
- Security of supply; and
- Governance;

¹³ Ibid

¹⁴ Ibid

¹⁵ Wolak F, An assessment of market power in the New Zealand wholesale electricity market, Stanford University: a report for the New Zealand Commerce Commission, 2009

¹⁶ Based on discussions with and information provided by the Ministry of Business, Innovation and Employment, Government of New Zealand and New Zealand Energy Retailers Association, May 2016

¹⁷ Based on discussions with the Ministry of Business, Innovation and Employment, Government of New Zealand, May 2016

¹⁸ Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market, 2009

The findings of the review and government responses formed the basis for the 2010 reforms.

These are discussed in more detail in section 4 – reasons for and nature of reforms.

4. REASONS FOR AND NATURE OF REFORMS

4.1 PRICES, COSTS AND COMPETITION

Improving Market Performance

In 2009 the Commerce Commission review of the wholesale electricity market found that gentailers had exercised market power in the spot market in years with limited rainfall and snowmelts (dry years) and overcharged by \$4.3 billion between 2001 and 2007.¹⁹ This was particularly relevant for New Zealand because over 50 per cent of its electricity source is hydro power, and variations in rainfall and snowmelt can have a significant effect on the price of wholesale electricity.

The 2009 Ministerial Review also concluded that gentailers could exercise short term market power in the wholesale spot market, especially when demand for power outstripped supply as could occur in dry years or if there was a constraint in transmission of electricity. However it noted that for the period from 1998 to 2008 changes in wholesale prices were largely consistent with underlying costs of generation.

Nevertheless it was the effects of gentailer activities on the retail market that the Ministerial Review was most concerned about. Its key findings were that during the 1998-2008 period:²⁰

- Retail prices, especially for residential customers had increased faster than the rate for underlying generation costs. In fact residential prices had increased since 1987 and it was considered that insufficient retail market competition was driving this trend.
- Margins being enjoyed by retailers were too high when compared to assessed costs and international comparisons. This affirmed the view that insufficient retail market competition was keeping consumer prices higher than normal.
- Competition in the retail market in regional areas was weak. This was particularly driven by the prohibitions on distributors (of which about half operated in regional areas) from competing in the retail market.
- The transparency and liquidity of the hedge contract market was below expectations because:
 - It was risky for retailers to enter markets where they did not own generation assets. This was particularly due to the risk of transmission constraints causing energy price spikes at grid off-take points, and the lack of any mechanism to hedge against this risk.

¹⁹ Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market, 2009

²⁰ Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009

- Three State Owned Enterprise (SOE) gentailers were geographically concentrated in the North or South Islands of New Zealand. When combined with transmission constraints, this led to gentailers becoming regionally focused and weakened retail competition.
- The combination of the absence of a mechanism to hedge against transmission constraints, lack of a liquid hedge market and vertical integration of generators and retailers created barriers to entry for new retailers.
- The number of distribution businesses (29), variety of tariffs and complexity of use of system business rules created cost barriers for new entrants in the retail market.
- Consumers appeared reluctant to switch between retailers despite the significant available savings they could make by moving to a cheaper retailer.
- Concentration of thermal generation assets with some generators exacerbated insufficient competitive outcomes particularly in dry years when poor rainfall increases the reliance on thermal instead of hydro power.

To address these issues and improve market outcomes the Ministerial Review considered a range of options and proposed preferred ones which were agreed to by the New Zealand Government.

The actions recommended by the Ministerial Review and agreed to by the government are described in the table below.

Table 3. Key 2010 Reforms to Improve NZ Electricity Retail Market Performance

Problem being addressed	Recommended action	Rationale and benefits	Some key alternatives considered and rejected
<p>Poor competition amongst SOE gentailers (merged generators and retailers) between regions and the North and South Island of New Zealand restricts new entrants in retail market.</p>	<ul style="list-style-type: none"> ▪ Transfer some physical assets of some SOE gentailers in the North Island to other gentailers in the South Island and vice versa. ▪ Require virtual asset swaps between SOE gentailers through long term hedge contracts for energy trading for 15 years. 	<p>The benefits of giving SOE gentailers an actual and virtual presence in generation and retail markets other than those they have been traditionally concentrated included:</p> <ul style="list-style-type: none"> ▪ Increased contestability in the wholesale market by diversifying views about the value of water storage. ▪ Increased security of supply by diversifying views about water storage and management. ▪ Reduced barriers to entry for retailers which are not vertically integrated with generators. 	<p>Various configurations of asset swaps were considered before the preferred option was selected.</p> <p>The asset swaps that were selected had the least anti-competitive and adverse security of supply risks.</p>
<p>Hedge market is not sufficiently transparent and liquid enough to support the efficiency of the wholesale market. This is partly a result of vertical integration between generators and retailers.</p>	<ul style="list-style-type: none"> ▪ Incentivise voluntary participation by generators in the hedge market to acceptable levels by mandating hedge trading requirements where voluntary behavior is insufficient. ▪ Complement this with a mechanism for retailers to hedge against the risks of transmission constraints. 	<p>The benefits included:</p> <ul style="list-style-type: none"> ▪ Helping new entrants in the retail market that did not own generation assets. ▪ Enabling generators to diversify risk by selling their products to other generators and retailers. ▪ Supporting the use of physical and virtual asset swaps. 	<p>Preventing vertical integration between generators and retailers. This was rejected because it was considered that:</p> <ul style="list-style-type: none"> ▪ Vertical integration enables firms to capture risk management efficiencies that may be difficult to obtain via contracts alone. ▪ Reversing vertical integration may increase retailing and generation risk and therefore the cost of capital. ▪ There was no evidence that disaggregation would benefit the hedge market or promote retail competition. ▪ Disaggregation would affect private property rights and disadvantage SOEs compared to private companies.
<p>Preventing distributors from providing retail services in their network areas weakens competition in the retail market.</p>	<p>Permit distributors to participate in the retail market. However to manage the risk that further vertical integration between generation, distribution and retail businesses reduces competition:</p>	<p>The benefits included increasing retail services competition especially in regional areas.</p>	<p>Not applicable.</p>

Problem being addressed	Recommended action	Rationale and benefits	Some key alternatives considered and rejected
	<ul style="list-style-type: none"> Require corporate separation and arms-length rules between each vertically integrated business. Prevent large scale vertical integration by requiring ownership separation between distributors and generators with over 100MW of grid-connected generation. Prevent distribution businesses from purchasing the customer bases of existing retailers. Prevent community owned distributors (Trusts) from offering rebates to customers that discriminates in favour of the customers of the retail businesses they own. 		
Complex business and system use rules and poor data transparency create barriers to entry for retailers and reduce regulatory efficiency.	<ul style="list-style-type: none"> Simplify line tariffs. Simplify use of system rules. Ensure that all wholesale market data is publicly released each day with no or minimal cost for access. 	The benefits included: <ul style="list-style-type: none"> Reducing market participation complexity and costs. Improving transparency to reduce the risks of exercise of market power. Increasing scrutiny of market participants. 	Not applicable.
Customer apathy reduces retail competition and increases the risks that demand management solutions will fail.	<ul style="list-style-type: none"> Provide NZ\$15M over three years for a contestable fund to support initiatives that encourage, facilitate and promote the benefits of active customer switching between retailers. Ensure that guidelines and standards for smart meters support energy efficiency, open access communications, customer switching and the development of smart networks. 	The benefits included: <ul style="list-style-type: none"> Increased pressure on retailers to offer high value, low cost products to suit varying demands by customers. Standards for smart meters will support the accelerated implementation of smart meters in 1.3 million homes by 2012. 	Not applicable.

Source: Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009 and consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association, and Electricity Authority, May 2016

Together this package of reforms was considered to be the most preferred approach to improve retail competition and reduce consumer prices. Some key alternatives that were considered to achieve lower consumer prices were as follows:²¹

- *Wholesale price caps.* This could involve a ceiling or maximum on wholesale prices. This was rejected because it was considered to be a short term solution with the risk of discouraging investment in new generation assets.
- *Retail price caps.* This could involve a ceiling or maximum on retail prices. This was rejected because it was considered to be difficult to set any cap at correct levels and included two inherent and serious risks. Firstly a cap may cause an under-recovery of costs which would discourage retailers. Secondly a cap may cause an over-recovery of costs and consumers may bear these unnecessary costs. It was also considered that both retail and wholesale prices would need to be capped to avoid exposing retailers to volatile wholesale prices.
- *Mandatory price/reliability insurance mechanism.* The 2009 Commerce Commission review had recommended that insurance for retailers should be contingent on retailers guaranteeing that the annual average wholesale price paid by a customer did not exceed a pre-specified level. This was rejected because it was considered to be too difficult to calculate the correct wholesale price and insurance premium (which is used to cover the cost of building new capacity) and also because it was a form of retail price control.

²¹ Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009 and consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association, and Electricity Authority, May 2016

Improving Competition Regulation

Box 5: Concepts explained: Common competition issues in electricity markets

In network industries, like electricity, common issues that can restrict competition include:

- Monopolistic behaviour by owners of natural monopoly infrastructure that reduces competition in downstream contestable markets such as retail and distribution. This behaviour can include inflating prices above the marginal cost of production or supply, price discrimination, and denying competitors access to infrastructure at reasonable prices.
- Use of regulatory, geographic, demographic or other issues by market participants to restrict, lessen or not pursue competition between franchise areas.
- Information asymmetry between market participants which reduces access to and transparency of information necessary for market efficiency.
- Information asymmetry between service providers and consumers which denies consumers the capacity to make the kind of informed choices necessary to switch between service providers.

Source: Aegis Consulting Group 2016

Regulation of monopoly services in the electricity industry also evolved throughout the reform period. Immediately following the 1993 reform tranche, transmission and distribution services were not subject to price control, but lines companies were required to publicly disclose information about the financial and non-financial performance. Following a ministerial review in 2000, limited price control was introduced in 2001, and subsequently revised in 2008.

The *Commerce Act 1986* is the principle instrument used to regulate anti-competitive behavior in markets in New Zealand. Prior to 2008 the *Commerce Act* included provisions that gave the Commerce Commission:²²

- An oversight role of the pricing methodology of Transpower, the natural monopoly transmission business;
- The power to review asset valuations by Transpower and distribution businesses relevant to energy pricing;
- The capacity to approve changes to control of geographic areas by distribution businesses and Transpower; and
- Other powers to seek and monitor information from energy businesses.

The *Commerce Amendment Act 2008* enhanced the role of the Commerce Commission. These changes included giving the Commission:²³

- The power to require Transpower and distribution businesses to publish information about their performance such as pricing data, quality measures, financial information, or forecasts of future expenditure and network investment. This is viewed by industry as a key incentive

²² New Zealand Commerce Commission

²³ Ibid

for regulated businesses to ensure that they are managing the energy pool, security of supply and pricing paths in a sustainable way to support current and future reliability. Transparency of information about business performance also enables the national government and regulators to plan for the future, identify and respond to any potential reliability problems, and promote consumer confidence in the energy system.

- The power to set price and quality controls for Transpower and distribution businesses which are not owned by consumers (through community Trusts). This does not include the power to set prices for services. Instead the Commerce Commission has the power to set the maximum average price that Transpower and non-consumer owned distribution businesses can charge or revenue they can earn. It also determines the input methodologies used for calculating these average maximum prices.

This is done via default price-quality paths which businesses must meet at a minimum. The Distribution businesses which are consumer owned (about 50 per cent) are not subject to price-quality paths because the Parliament has determined that their ownership by community Trusts gives consumers sufficient control over pricing and quality issues. However, they are subject to information disclosure requirements. See Box 2 and 3.

These measures complimented the actions to improve market performance, particularly those retaining vertical integration between generation, distribution and retailing and permitting distribution businesses to participate in the retail market.

4.2 SECURITY OF SUPPLY

Features of Supply and Use

The geography, population spread and energy sources which New Zealand relies on for electricity are significant features influencing the nature of reforms. As the economy consists of two islands, creating a national market for electricity can be challenging. An interconnector was built between the North and South Islands in the 1970s and has been operating effectively since then.

However the nation relies on hydro power for the majority of its electricity supply and therefore energy flows between the islands depend on the degree of rainfall and snowmelt each experiences. The importance of reliable rainfall and snowmelt is especially acute because New Zealand has limited water storage capacity, estimated to be between 6 and 12 weeks.²⁴ The population spread with two-thirds residing in the North Island and one-third in the South Island, creates transmission and supply risks particularly in dry years when energy flows from the South to North cannot meet demand.

Other sources of electricity include thermal (coal, diesel and gas), geo-thermal (heat), wind, co-generation and solar.²⁵ Co-generation occurs primarily where industrial sites produce heat and electricity for the purpose of operating plants, factories and alike, however excess cogenerated electricity can be exported into distribution networks or to the national grid.²⁶ It is

²⁴ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, and Electricity Authority, May 2016

²⁵ Electricity Authority, Electricity in New Zealand 2016

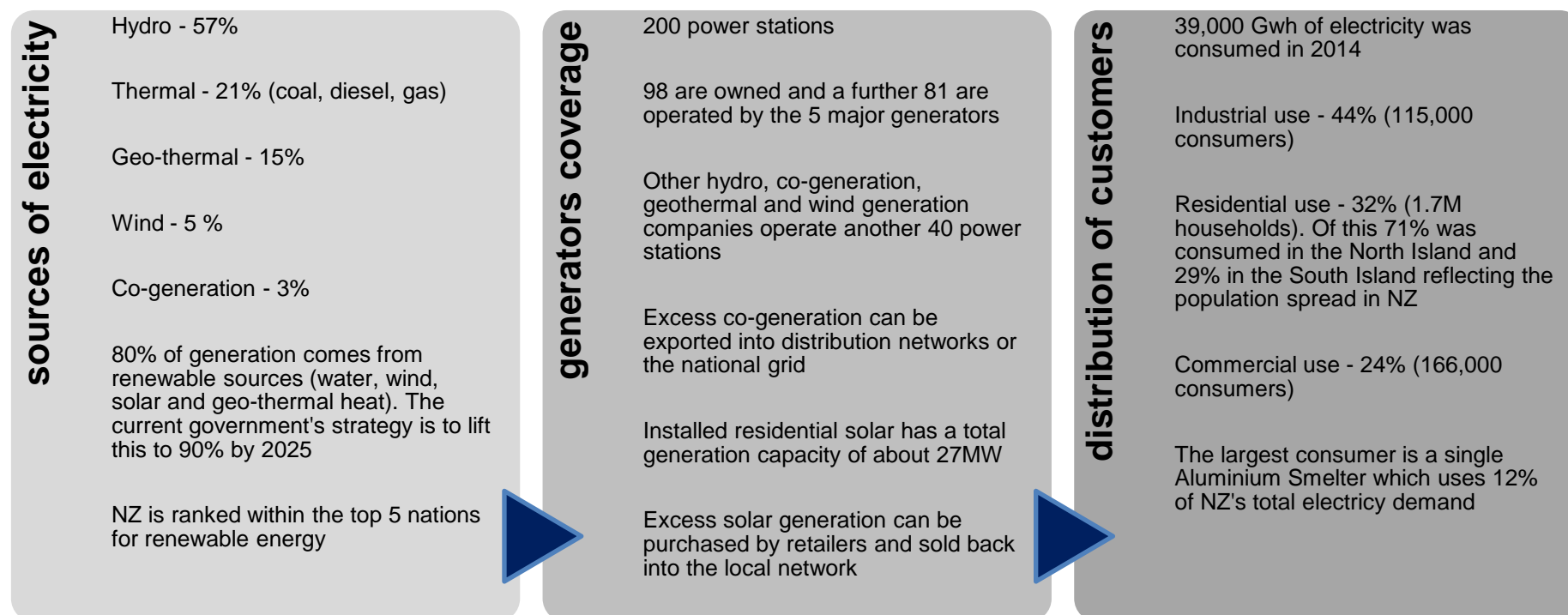
²⁶ Ibid

not uncommon for industrial users (which account for the largest share of electricity demand) to produce energy and export it to the grid. Some examples include pulp mills, dairy producers and other manufacturing processes. This occurs because of three main reasons:²⁷

- Industrial users have always enjoyed direct relationships with generators;
- Industrial users have been incentivised over a long period of time to develop their own energy production capacity in response to price spikes caused by transmission constraints. However it should be noted that this is a marginal incentive. The industrial users in most cases have added this capability as a by-product of their industrial steam and heat production. Adding generation to this was cost effective; and
- The reforms in New Zealand have never included subsidies, such as feed-in tariffs, for renewables. Thus industrial users have relied on efficient price signals from the market to develop electricity production capacity for their own use first for cost reasons, rather than being encouraged to produce energy for revenue purposes.

Residential customers represent the second highest share of electricity demand in New Zealand. They are able to install and use solar panels and sell excess energy to retailers for use in local networks. This is not supported by any subsidy schemes.

²⁷ Consultations with New Zealand Institute of Economic Research, May 2016

Figure 3. Key Features of the Supply and Use of Electricity in New Zealand²⁸

²⁸ Electricity Authority, Electricity in New Zealand 2016

Motivating Factors for Reforms

New Zealand's reliance on hydropower and limited storage capacity makes it vulnerable to supply issues in years of low rainfall and snowmelts (dry years). During dry years a traditional response of the electricity sector and governments had always been to call on the public to reduce its energy and water use (public conservation campaigns). Leading up to the 2010 reforms public conservation campaigns were initiated in 2001, 2003 and 2008 and planned in 2006.²⁹

One of the major consequences of these public conservation campaigns, particularly when they occur frequently, was an erosion of public and business confidence in the electricity sector and government's capacities to manage the sector and ensure reliability of supply. The public conservation campaign in 2008 occurred at the same time as the Commerce Commission review into the abuse of market power in the electricity sector. The convergence of these events played a major part in exacerbating public and government distrust in the capacity of the electricity sector to forecast and manage supply issues.³⁰ Accordingly, this had a strong influence on the New Zealand's government's approach to the 2010 reforms.

A key effect of public conservation campaigns was that it put downward pressure on wholesale spot prices. While this lowers costs for market participants exposed to spot prices (such as generators and retailers), it equally increases inconvenience for business and residential consumers and also passes the costs of demand reductions onto them. The 2009 Ministerial Review recognised that this outcome encourages market participants to lobby for public conservation campaigns and did not provide the appropriate price signals for the risks of supply constraints.³¹

In response to the dry years in 2001 and 2003, the then government's lack of confidence in the capacity of the electricity sector to manage supply persuaded it to build a 155MW diesel power station as part of a reserve energy scheme. The 2009 Ministerial Review found that this scheme had the unintended and perverse result of reducing the incentive for market participants to manage supply risks because:³²

- Market participants had an expectation that the Electricity Commission would manage those risks as a last resort;
- The price at which energy was offered under the reserve scheme was administered and did not recover the cost of capital involved in building the diesel plant. This could potentially undercut the price at which alternative capacity resources would be offered in the market and discouraged generators from building plants to increase their own capacity to meet peak demand; and

²⁹ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, and Electricity Authority, May 2016

³⁰ Ibid

³¹ Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009

³² Ibid and Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association and Electricity Authority, May 2016

- The fixed costs of the government built diesel plant were recovered by levy and spread across all consumers even though some may have effectively managed their supply risks via hedging contracts.

It was also concluded that the scheme was vulnerable to lobbying by parties for rule changes and to the Electricity Commission purchasing additional reserve electricity or reserve capacity.³³

Nature of Reforms

To address these issues and improve market outcomes the Ministerial Review considered a range of options and proposed preferred ones which were agreed to by the New Zealand Government. The actions recommended by the Ministerial Review and agreed to by the government are described in the table below.

³³ Ibid

Table 4. Key 2010 Reforms to Improve NZ Electricity Security of Supply

Problem being addressed	Recommended action	Rationale and benefits	Some key alternatives considered and rejected
The reserve energy scheme creates perverse incentives in the market and discourages market participants from taking responsibility to manage supply risks.	<ul style="list-style-type: none"> Abolish the reserve energy scheme. 	<p>The benefits included:</p> <ul style="list-style-type: none"> Creating the appropriate price signals for market participants to manage supply risks. Increasing certainty of the system by removing the opportunities for participants to lobby government for rule changes and for market interference by the Electricity Commission. 	<ul style="list-style-type: none"> Mandatory offering of hedges by generators. This involved generators being required to offer 100 percent of their dry year capacity, net of demand from their retail and direct customers. This was rejected because of its administrative and design complexity which would include the need to determine dry year capacity, reserve prices, hedges and penalty regimes. Mandatory contracting by load. This involved requiring all energy load to be fully contracted through hedge contracts, internal hedges or own generation. This was rejected because of the design and administrative complexity and the risk that it would drive up the price of hedge contracts.
Public conservation campaigns undermine consumer, public and government confidence in the management of supply issues by the energy sector and can be used too easily as a substitute for effective management of supply risks by market participants.	<ul style="list-style-type: none"> Require retailers to make payments to consumers in the event of a public conservation campaign or enforced power cuts with a guaranteed scale which reflects the level of nationwide savings. Savings would be determined by the System Operator. 	<p>The benefits included:</p> <ul style="list-style-type: none"> Discouraging the use of public conservation campaigns as an easy option. Encouraging market participants to take full responsibility for forecasting and pricing supply risks. Ensuring that public conservation campaigns are used as a last resort in dry years. 	Not applicable.
Limited consequences for market participants during public conservation campaigns.	<ul style="list-style-type: none"> Impose a floor on spot prices during any public conservation campaign or enforced power cuts in a dry year. 	<p>The benefits included:</p> <ul style="list-style-type: none"> Discouraging the use of public conservation 	Not applicable.

Problem being addressed	Recommended action	Rationale and benefits	Some key alternatives considered and rejected
		<p>campaigns as an easy option.</p> <ul style="list-style-type: none"> ▪ Encouraging market participants to take full responsibility for forecasting and pricing supply risks. ▪ Ensuring that public conservation campaigns are used as a last resort in dry years. 	
Limited scrutiny of market participants and their reasons for requesting public conservation campaigns.	<ul style="list-style-type: none"> ▪ Require all major generators, including those which are SOEs, listed and privately owned companies, to disclose information which will inform the market about supply risks and management of those risks. This includes hydro reserves, fuel stockpiles and availability, planned outages and net hedge positions. 	<p>The benefits included:</p> <ul style="list-style-type: none"> ▪ Increasing scrutiny of market participants and incentives for them to manage supply risks more effectively. 	Not applicable.

Source: Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009 and consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association, and Electricity Authority, May 2016

4.3 GOVERNANCE

Overview

Up until the 2010 reforms the national government participated in the market in four ways. It:

- Determined energy policy and strategy;
- Provided transmission services through Transpower, a State Owned Enterprise (SOE);
- Provided generation services through three SOEs; and
- Regulated the market through the Electricity Commission and the Commerce Commission.

In effect the Electricity Commission (electricity sector regulator) was the agent of the Minister for Energy and Resources. Its operations were funded via a levy on all energy market participants. General competition regulation which applied to the energy sector and price control of natural monopoly transmission and distribution was administered by the Commerce Commission.

The 2010 reforms were designed to create clearer separations between the role of executive government and market regulation for the benefit of competition and consumers.

Rationale for Reforms in 2010

The 2009 Ministerial Review determined that governance arrangements needed amending because:

- The Electricity Commission had too many objectives and functions which was confusing its focus on important rule making. Its objectives included promoting competition, energy efficiency, environmental sustainability and fairness.
- This confusion had contributed to slow progress on some government agreed reforms that were critical to improve competition in the market. This included improving the liquidity of the hedge market and demand side participation.
- The regulation of energy grid planning lacked clarity because of overlapping responsibilities by the Electricity Commission and Commerce Commission, and because of tension between the Electricity Commission and Transpower over the grid planning role.
- The Electricity Commission was not sufficiently independent of executive government and this was reducing investment certainty.
- Stakeholders were not sufficiently involved in rule development and this was undermining confidence in the system.

Nature of Reforms

To address these issues and improve market outcomes the Ministerial Review considered a range of options and proposed preferred ones which were agreed to by the New Zealand Government. The actions recommended by the Ministerial Review and agreed to by the government are described in the table below.

Table 5. Key 2010 Reforms to Improve Electricity Sector Governance

Problem being addressed	Recommended action	Rationale and benefits	Some key alternatives considered and rejected
The Electricity Commission is not operating effectively to promote investment certainty and competition in the market because it has too many objectives, and is an agent of executive government.	<p>Replace the Electricity Commission with an Electricity Authority (EA) which would:</p> <ul style="list-style-type: none"> Operate independently of executive government as an entity under the <i>Crown Entities Act 2004</i>. Have the single objective of promoting competition, reliable supply and efficient operation of the electricity market for the long term benefit of consumers. Have the power to make market rules via a Market Participation Code without Ministerial approval, although the Minister can ask the EA to review market issues and can make regulations relating to consumer equity and fairness. Have a narrower set of functions in addition to rule making. These would be market facilitation through education, monitoring Code compliance, enforcing the Code, monitoring market performance, undertaking reviews and inquiries related to market performance and contracting for market operations including pricing, registry, reconciliation and system operations. 	<p>The benefits included:</p> <ul style="list-style-type: none"> Removing the risks of perceptions of Ministerial interference in the operation of the market. Enabling the EA to regulate the market having regard to government policy without needing to give effect to it. Ensuring that the EA was focused on market efficiency and competition. Making the Energy Efficiency and Conservation Authority responsible for energy efficiency outcomes. Making the Commerce Commission responsible for regulation of natural monopoly transmission and distribution revenue and grid development. Making the System Operator (part of Transpower) accountable to the EA for forecasting and provision of information about security of supply. The EA would create a panel of experts (the Security and Reliability Council) to assist it assess the work of the System Operator. Legislatively requiring market participants to fund the operations of the NZ Electricity and Gas Complaints Commissioner. 	<ul style="list-style-type: none"> Electricity sector forum and an Electricity Commissioner appointed within the Commerce Commission. This involved the creation of a forum with appointed representatives from all sectors of the electricity industry. The forum would be responsible for market rule development which would be amended, approved and legalised by the Electricity Commissioner in the Commerce Commission. The Commissioner would approve transmission asset upgrades. This option was rejected because rule development may be delayed; the Commerce Commission would be required to expand its remit; and it may confuse accountabilities between two Ministers (energy and commerce commission). Making the Electricity Commission independent. This involved reconfiguring the EC under the <i>Crown Entities Act 2004</i>. Regulation of transmission would be transferred to the EC from the Commerce Commission. This option was not recommended because the EC would need to develop an expertise in economic regulation duplicating the Commerce Commission; rule making and market operations would not be separated; the EC and Transpower may have competing accountabilities. Co-regulation. The functions of the EC in relation to market regulation would be transferred to a private company, with the Minister for Energy retaining the power to

Problem being addressed	Recommended action	Rationale and benefits	Some key alternatives considered and rejected
			<p>approve rules. The Commerce Commission would be responsible for approving transmission upgrades. This option was not preferred because it would retain Ministerial control of rules, regulation of transmission would be split and there would be a risk of supply side control of rule-making.</p> <ul style="list-style-type: none"> ▪ Industry self-regulation. This is similar to the MCo arrangement that existed prior to the creation of the EC in 2002. Under this arrangement a multilateral agreement would govern the development and enforcement of rules. The Commerce Commission would be responsible for ensuring that the arrangement was consistent with general competition law. This option was not recommended because there were risks of supply side dominance and slow decision making; and no capacity to deliver public policy objectives. ▪ Independent system operator (ISO). This involved creating an ISO. Even though this option would separate the system operation from Transpower's ownership of the grid, this was not preferred because there may be loss of synergies between grid operation and system operation; and the benefits of the change did not outweigh the costs.

Source: Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009 and consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association, and Electricity Authority, May 2016

Figure 4. Key Changes to Governance from the 2010 Reforms

Pre 2010**Minister (more power)**

- Appoints Board of Regulator
- Makes electricity rules
- Makes regulations

**Post 2010****Minister (less power)**

- Recommends Board of Regulator for appointment by Governor-general
- Cannot make electricity rules
- Makes regulations

Market Regulation (centralised)**Electricity Commission (diverse role)**

- Agent of government
- Wide objectives – efficiency; reliability; fairness; environmental sustainability; and energy efficiency
- Many functions – develops and recommends rules and regulations for Minister to make; monitors and enforces rules; approves transmission upgrades, pricing methodology and quality; determines distribution pricing methodology; monitors security of supply; promotes energy efficiency; consumer protection.

**Commerce Commission**

- Independent of government
- Sets distribution revenue and quality
- Sets transmission revenue

Market Regulation (diversified)**Electricity Authority (focussed role)**

- Independent of government
- Narrow objectives – efficiency including reliability for long term benefit of consumers
- Fewer functions – develops, makes, monitors and enforces rules; approves transmission pricing methodology and reliability standards; approves distribution pricing methodology; promotes and monitors consumer switching.

Commerce Commission

- As for pre 2010 plus approval of grid upgrades

Security and Reliability Council (reports to Electricity Authority)

- Monitors Transpower's performance and security of supply

Electricity and Gas Complaints Commissioner

- Consumer protection and dispute resolution

Energy Efficiency and Conservation Authority

- Energy efficiency programs

5. LESSONS AND BENEFITS FROM REFORMS

5.1 APPROACH TO REFORM AND REGULATION

All of the reform measures adopted since the early 1990s have been progressively underpinned by a core and clear set of public policy principles. These principles have guided government decision making about preferred options and influenced the nature of regulatory intervention. The 2010 reforms can be viewed as the most critical test of the then government's commitment to these principles, particularly because rising residential electricity prices would have put the government under serious political pressure to apply other kinds of interventions. The core policy principles that have been consistently applied by governments to shape the reforms are as follows.

Learning by Doing

Governments have accepted that the reforms would be evolutionary in nature with successes and market failures informing each next stage. They have been able to adopt this approach partly because there were no existing models of successful reform for them to strictly follow, and partly due to their consistent commitment to a clear set of market based principles on which all reforms are anchored. The commitment of successive governments to the same clear set of market based principles has equipped New Zealand authorities to be willing to pursue options which may include risks of market failure, rather than being risk averse to imperfect change.

Commitment to Market Based Competition, Even When Addressing Market Failures

The fundamental purpose of all reform measures has been to facilitate, encourage and improve market based competition. To achieve this governments have pursued holistic reforms to ensure that all elements in the supply chain are operating to facilitate competition to the maximum level achievable.

This is evident in the 1999 reforms which created the structures to facilitate market competition in contestable markets (retail and generation) and regulate the input costs from natural monopoly elements (distribution and transmission) to promote competition in contestable markets. Prior to the 1999 reforms the potential for contestable new entry into generation and retail markets was considered sufficient to promote the desired outcomes. This was supported by the split of Contact Energy from ECNZ in 1996.

But by 1999, the government concluded that a more competitive generation market structure and stronger separation between retail and monopoly lines businesses was warranted. The commitment of the then government to convert generation into a competitive market by disaggregating the dominant generator into four generators and restructuring them into SOEs with a strong commercial focus and retail component was a critical step in the journey towards a highly competitive retail market. To achieve this the remainder of ECNZ was further broken into three companies in 1999.

The 2010 reforms were specifically designed to address perceived market failure in the retail sector, namely that there was insufficient competitive pressure to ensure that the prices for

electricity did not exceed the costs of supplying and producing it, and retail competition in regional areas was below expectations. The response to this issue was based on three main actions.³⁴

One action was to encourage increased market participation in both the generation and retail sector through measures to decrease the financial risk of participation (more liquid and accessible hedge markets); improving the spread of generation assets across New Zealand to remove barriers for new retail market entrants not vertically integrated with a generator (virtual and actual asset swaps between generators); and permitting distributors to compete in the retail sector.

A second action was to make market participants more accountable for managing security of supply and less reliant on government sponsored energy conservation schemes in dry years (compulsory compensation for customers if supply becomes unreliable).

A third action was to address low customer engagement and empowerment in the retail sector by funding public awareness campaigns about the benefits of switching between retailers, and requiring retailers to fund and collaborate with the independent complaints Commissioner so that the public had trust in dispute resolution mechanisms.

No Price Signals to Distort Market Based Responses

Unlike many jurisdictions, the reforms in New Zealand have never included price controls, concessions, rebates, subsidies or exemptions for consumers, market participants or technology. This is because these measures tend to distort markets by sending non-market based price signals that alters behavior. For example:³⁵

- There are no feed-in tariffs to encourage alternative generation sources, such as solar power.
- There are no subsidies to motivate renewable energy outcomes.

This is partly because New Zealand's reliance on hydro power reduces the need for it to shape its energy policy with considerations about climate change and emissions reductions. However, consistent with its commitment to market based principles, New Zealand also phased in an emissions trading scheme (ETS) from 2008 to 2015 to reduce carbon emissions in its economy.

- There is no pricing control to manage generation resource scarcity.

Despite the acute concerns about security of supply, particularly in years of low rainfall and snowmelt, the only and consistent response of successive governments has been to

³⁴ Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009

³⁵ Office of the Minister for Energy and Resources, Cabinet Paper – Ministerial Review of the Electricity Market: Regulatory Impact Statement, 2009 and consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association, and Electricity Authority, May 2016

improve the incentives for market participants to take responsibility for pricing supply risks through market based hedge contracts and investment in additional supply capacity.

- In response to residential electricity price increases prior to the 2010 reforms, the 2009 Ministerial Review and the then government considered capping retail prices. However this was rejected because it was not consistent with the overarching commitment to market based principles.
- There is minimal concessional pricing for consumers.

Unlike many jurisdictions New Zealand does not use concessions, such as rebates or tariff subsidies, to support the capacity of disadvantaged customer groups to pay for electricity. For example in many jurisdictions aged and disability pensioners and/or low income families receive this kind of support. In New Zealand on the other hand if these customers require assistance with their living costs, including their energy bills, they seek assistance from social welfare programs administered by the Ministry of Social Development.³⁶

The only subsidy embedded in the energy system is the low fixed tariff scheme which requires retailers to offer a fixed tariff of no more than 30 cents a day. This scheme was introduced after the 1999 reforms in response to public perceptions that fixed costs of energy were steadily increasing. While increased competition arising from the 2010 reforms has largely addressed this issue, it is politically difficult for governments to remove the tariff without public opposition and it remains in place as a consumer protection measure.³⁷

Regulatory Intervention is Only Used to Improve Market Efficiency, Where Competition Cannot

The reforms have also been underpinned by the clear principle that reinforcing market efficiency (technical, dynamic and allocative) should be the primary purpose of regulation and that intervention is only necessary when the competitive market cannot deliver this outcome. Some key examples of this approach are discussed below.³⁸

To reduce barriers to entry and encourage innovation in the retail market the Electricity Authority regulates market behavior through an Electricity Code, rather than a prescriptive licensing regime. Market participants have an obligation to report Code breaches by themselves or others. This approach provides scope for innovative products and entry by non-traditional retailers.

The bias in the Electricity Code and the approach of the Authority is towards facilitating competition and outcomes rather than imposing new rules. To achieve this the Authority prefers to develop guidelines to shape market behavior instead of making changes to the Code

³⁶ Consultations with the Electricity Authority, New Zealand Energy Retailers Association and New Zealand Electricity and Gas Complaints Commissioner, May 2016

³⁷ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, Electricity Authority, New Zealand Electricity and Gas Complaints Commissioner, New Zealand Institute of Economic Research, May 2016

³⁸ Consultations with the Electricity Authority, May 2016

and market rules. In its experience this encourages consultation, positive behaviour by market participants and reduces the cost of regulation by avoiding the needs for regulatory impact assessments that are required to accompany Code and rule changes. Guidelines include pricing principles for distributors and models for contracting between retailers and distributors.

The Authority does not necessarily consider the existence of 29 distribution networks to be inefficient because over half are controlled by local communities which they serve and as a result deliver affordable tariff structures demanded by those communities. In addition to this value, the networks work together to share resources and contractors to keep costs associated with network management at low levels and this supports the prices they charge their local communities for network access.

The Commerce Commission uses default price quality paths that include maximum average prices to regulate pricing by natural monopoly elements – distribution and transmission, instead of direct price and pricing methodology controls.³⁹

5.2 CUSTOMER PROTECTIONS

Under the electricity rules consumers have no right to be supplied with electricity. However there is an obligation on distributors under section 105 of the Electricity Industry Act 2010 for supply to be maintained to places supplied in 1993. Supply can be provided through power lines or by standalone generation systems.

Accordingly, consumer protection mechanisms are designed to equip and encourage customers to pay their energy bills. This compliments the market based principles underpinning reforms to the electricity sector and the preference of regulatory authorities to facilitate market outcomes rather than set rules.

A key body in the consumer protection framework is the New Zealand Electricity and Gas Complaints Commissioner. The Commissioner is focused on independent dispute resolution between electricity consumers and providers of electricity. Primary issues handled by the Commissioner include billing, service and disconnection complaints. The Commissioner is not a consumer advocate, but rather takes a neutral position in an effort to resolve disputes satisfactorily and fairly for consumers and energy companies. It deals with complaints with a value of \$50,000 and below and most of the issues it deals with concern residential customers.⁴⁰

Prior to the 2010 reforms it was voluntary for market participants to collaborate with the dispute resolution scheme and this restricted the impact the Commissioner could have as well as the extent of consumer protection. As part of the 2010 reforms the government made it a legislative requirement that market participants fund the Commissioner and compulsorily participate in the dispute resolution scheme. This enhanced the consumer protection framework to match the expected increase in competition. A key consequence of the government's legislative support for the Commissioner was that the Commissioner could legitimately be seen by the market as an independent umpire in disputes, instead of a suspected consumer advocate only.⁴¹

³⁹ New Zealand Commerce Commission

⁴⁰ Consultations with the New Zealand Electricity and Gas Complaints Commissioner, May 2016

⁴¹ Ibid

In 2013 the government strengthened the role of the Commissioner by enabling it to name retailers that have less than adequate consumer protection and complaints handling credentials. This is supported by the requirement for market participants to report annually on their complaints handling and also by the compliance measurement undertaken by the Commissioner. The Commissioner is also involved in regular dialogue with the Electricity Authority, Commerce Commission and Energy Ministry and has the power to raise systemic issues with those authorities and the Minister.⁴²

5.3 STAKEHOLDER SUPPORT FOR REFORMS

The preparation of this case study included consultation with a wide range of market participants and stakeholders. There appears to be widespread support for the reforms amongst stakeholders. There is particular support for:⁴³

- The evolutionary nature of the reforms to suit changes in market dynamics and address market failures as they arose.
- The fact that throughout the process of reform a clear set of market based principles consistently underpinned change.
- The pursuit of complimentary changes in the wholesale and retail markets. Stakeholders consider this to be vital because of the impact wholesale market dynamics can have on retail competition.
- The increasing commitment, particularly in the latter part of the reforms, to preserving a separation between policy making by executive government and the independent regulation of the market. This is recognised by stakeholders as critical to increase investment and business certainty.
- The minimal use of licensing and other interventionist regulation so that the market is not subject to unnecessary red tape.

However support for the reforms was also a matter evolution. According to the Electricity Authority the response of market participants to the 2010 changes to promote retail market competition can be categorised in three main phases:⁴⁴

- Denial – market participants did not believe the changes would happen.
- Reluctance – market participants adopted defensive strategies to maintain their customer bases and preserve market share.
- Embracing – market participants adopted strategies to actively obtain each other's customers through fierce competition on price, product choice and quality.

It should also be noted that more recently not all stakeholders have been entirely convinced that the reforms are sufficiently driving consumer prices downward. Accordingly in 2014 the Labour Party and Green Party proposed a major market intervention - the insertion of a single buyer into the wholesale level of the New Zealand electricity market, as a means of forcing a reduction in electricity prices to final consumers.

⁴² Ibid

⁴³ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association, Electricity Authority, New Zealand Electricity and Gas Complaints Commissioner, New Zealand Institute of Economic Research, and former New Zealand Electricity Ombudsman May 2016

⁴⁴ Consultations with the Electricity Authority, May 2016

Opponents of this proposal are concerned that it is informed by a perspective of price alone, which is regarded as ill-conceived given the impacts on retail sector reform from upstream movements.⁴⁵

5.4 COMMUNICATION ABOUT REFORMS

Stakeholders also commonly believe that one key problem with the 1993 and 1999 reforms was the public communication by governments that change would result in falls in residential electricity prices. In reality residential prices had been increasing steadily since 1987 and the 1999 and 2010 reforms accelerated the removal of traditional cross-subsidisation of residential prices by commercial prices. As a result residential prices increased and commercial prices fell.

This threatened public support for reforms and created community distrust of market participants.⁴⁶ Stakeholders consider that with hindsight it would have been preferable for communications about reforms to focus on the benefits of competition, such as consumer choice, rather than the opportunity for residential price reductions.

In order to set the appropriate public expectations about the benefits of reform, some stakeholders also consider that clear benchmarks should be set at the beginning of reform processes to enable the overall value of change to be consistently and continually evaluated and communicated.⁴⁷

5.5 MARKET PERFORMANCE AND COMPETITION

Market performance and competition can be assessed using a combination of data and information about:

- Performance – wholesale and retail pricing.
- Competition – market structures, share and concentration.
- Conduct – consumer empowerment and engagement.

These issues are discussed in following section.

Pricing

One of the key reasons for the 1999 and 2010 reforms was a desire by governments and business to achieve more cost reflective pricing for commercial customers.⁴⁸ The current data appears to illustrate that the 2010 reforms in particular have delivered this objective.

⁴⁵ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association, Electricity Authority,

⁴⁶ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, New Zealand Energy Retailers Association, Electricity Authority, New Zealand Electricity and Gas Complaints Commissioner, New Zealand Institute of Economic Research, and former New Zealand Electricity Ombudsman May 2016

⁴⁷ Ibid, particularly the New Zealand Institute of Economic Research, May 2016

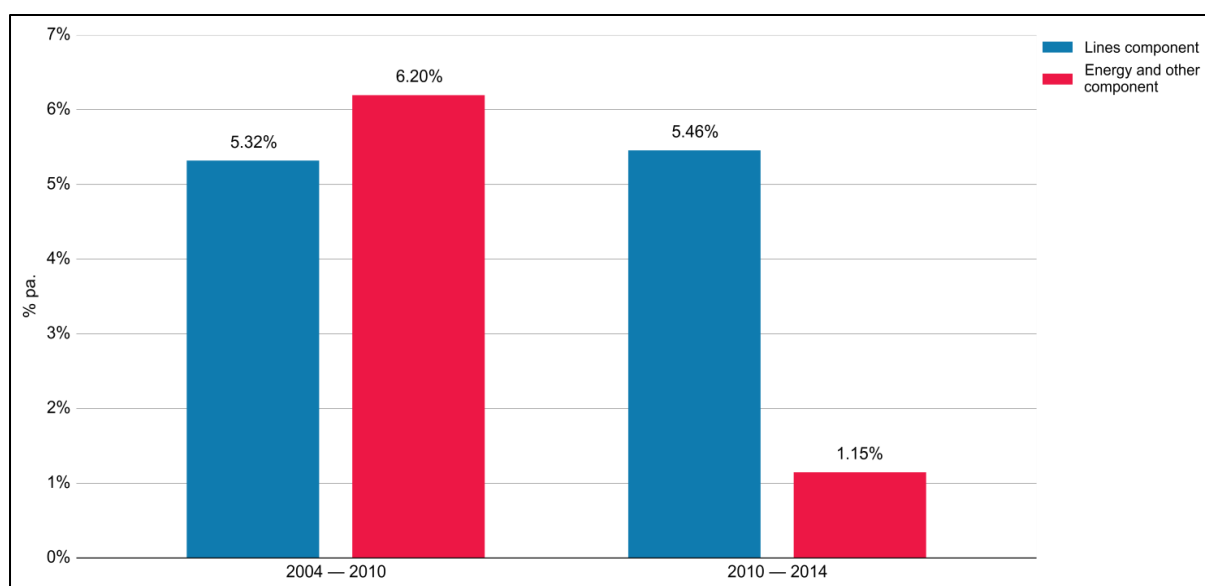
⁴⁸ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, May 2016

The figure below shows the relative compound growth rates in network (distribution) prices and the other energy pricing components (wholesale and retail) from 2004 – 2014. The data underpinning this chart is drawn from a 2014 review of residential prices and pricing information gathered by the Ministry for Business, Innovation and Employment (MBIE).

It shows that for full natural monopoly elements (distribution) prices have increased. Although the 2010 reforms were designed to enable distributors to compete in the retail and generation markets, their participation is reported to be limited.⁴⁹ The pricing in the chart for distribution component appears to support this conclusion (lines component).

However the chart also shows that competition in the wholesale and retail sectors is constraining the competitive part of the electricity prices (energy and other component).

Figure 5. Average Change in Nominal Electricity Price Components, 2004-2014



Source: Electricity Authority, 2016

Other factors which also have a bearing on wholesale and retail prices include:

- A significant increase in the market price of natural gas, which effectively doubled the marginal cost of electricity generation, between 2004 and 2009; and
- Stagnation in demand growth from about 2008, which resulted in significant surplus of generation capacity until around 2015 (because new generation capacity was commissioned on the basis of previously assumed demand growth trend)⁵⁰.

Wholesale Pricing

It is considered by some market participants that the primary influence on wholesale prices has been the significant investment in generation and transmission. Under investment previously in transmission had limited the scope for increased retail competition in some areas.

⁴⁹ Consultations with the New Zealand Energy Retailers Association, May 2016

⁵⁰ Ministry of Business, Innovation and Employment, Government of New Zealand

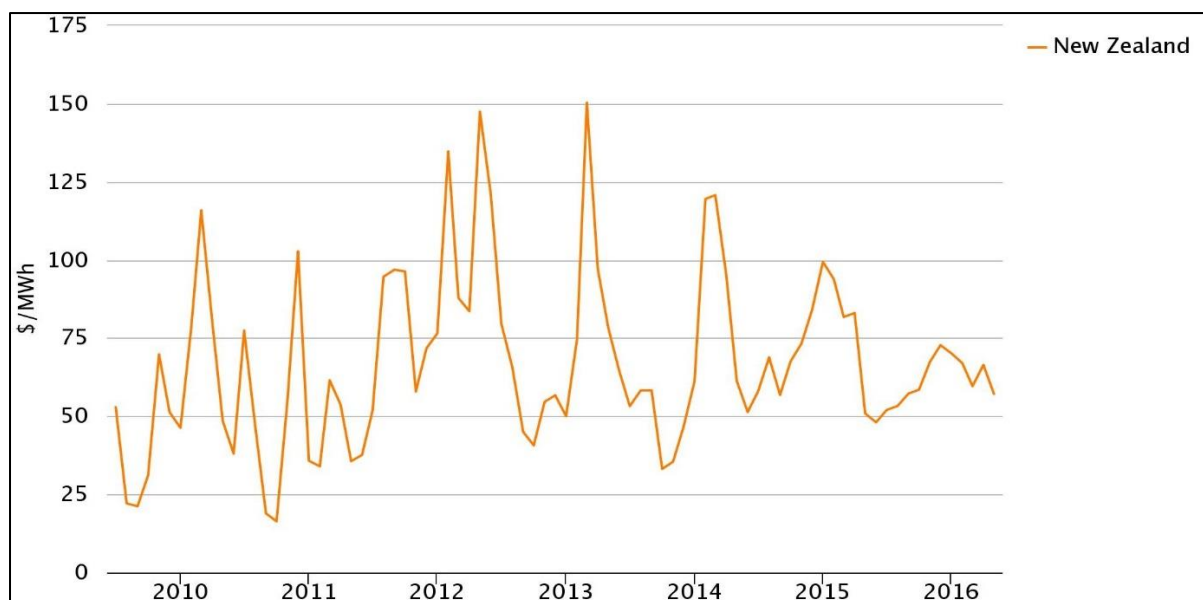
In the case of both generation and transmission the lead time for development is such that stress within the system can extend for a considerable period until resolved. For example, a geothermal power station development can take up to 10 years to develop from concept to operation. This generally consists of about 9 years of commercial negotiations for land access and environmental consents and 1 year for construction. Similar timeframes are involved in transmission.⁵¹

It is also believed that an effect of increasing competition for generation via virtual and actual asset swaps and a more liquid energy hedge market has led to a wider variety of generation types being investigated and built. For example geothermal is increasingly significant, more gas and wind generation has been built, and most large generators hold a variety of development options. This is significant achievement, as prior to the market being introduced in 1999, the ECNZ (government controlled generator) held only one development option.⁵²

The figure below shows that wholesale prices since the 2010 reforms have been subject to peaks and troughs resulting from market demand and some external factors. For example 2012 was a dry year which contributed to price spikes.

The reforms to make hedge markets more liquid and enable transmission hedges as facilitated market responsive pricing and the capacity of generators and retailers to manage risks associated with transmission and supply constraints. For example, even though 2012 was a dry year it did not create concern in the market or public as had occurred in previous years.⁵³

Figure 6. Average of Wholesale Energy Prices, 2010-2016



Source: Electricity Authority, 2016

⁵¹ Consultations with the New Zealand Energy Retailers Association, May 2016

⁵² Ibid

⁵³ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, May 2016

Retail Pricing

Prices for residential customers generally increased throughout the reform period, in contrast to prices for commercial and industrial customers.⁵⁴ This trend continued after the 2010 reforms, but appears to have levelled off and stabilised since mid-2014. Monitoring of the Consumer Price Index (CPI) by Statistics New Zealand for the year ending June 2015 showed a 0.0 per cent annual rate of change in electricity prices paid by households.⁵⁵

In a competitive market the prices for electricity would be expected to be set at or near the cost of producing and supplying electricity. To monitor the impact of competition the New Zealand authorities use three kinds of indicators as each has limitations, and alone would not suffice.

These three indicators are:⁵⁶

- The electricity component of the CPI assessed by Statistics New Zealand, the Government's office of statistics.
- A quarterly survey of domestic electricity prices (QSDEP) conducted by the Ministry of Business, Innovation and Employment (MBIE). This survey examines the contribution of the contestable part of energy (retail and generation) and the monopoly part of the sector (distribution and transmission) to the overall price of household electricity.
- An energy cost index prepared by the Electricity Authority. This index is calculated on inputs from Australian Stock Exchange (ASX) electricity futures data, demand data, annual reports from the major energy retailers, and regulated transmission and distribution charges. It is designed to represent the price at which a new entrant retailer without a generation portfolio could enter the market and sell to residential customers.

Recent data from these sources shows that:

- Between 2011 and 2016 retailer costs have increased by about 20.5 per cent, while prices for households have increased at lower rates which vary depending on the data source. The CPI shows that residential prices have increased by 17.2 per cent while the QSDEP shows that these prices have increased by 15.5 per cent.⁵⁷
- When the data from the QSDEP is separated between the competitive part (generation and retail) and monopoly part (distribution and transmission) the competitive part's contribution to the overall cost of electricity hasn't changed in real terms since March 2011.⁵⁸

The figure below shows the comparative increases in retailer costs and residential prices since 2010. It demonstrates that retailer costs have been growing faster than residential prices and

⁵⁴ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, May 2016. Pricing information can be found at <http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/publications/energy-in-new-zealand>

⁵⁵ Electricity Authority, Electricity Market Performance 2015

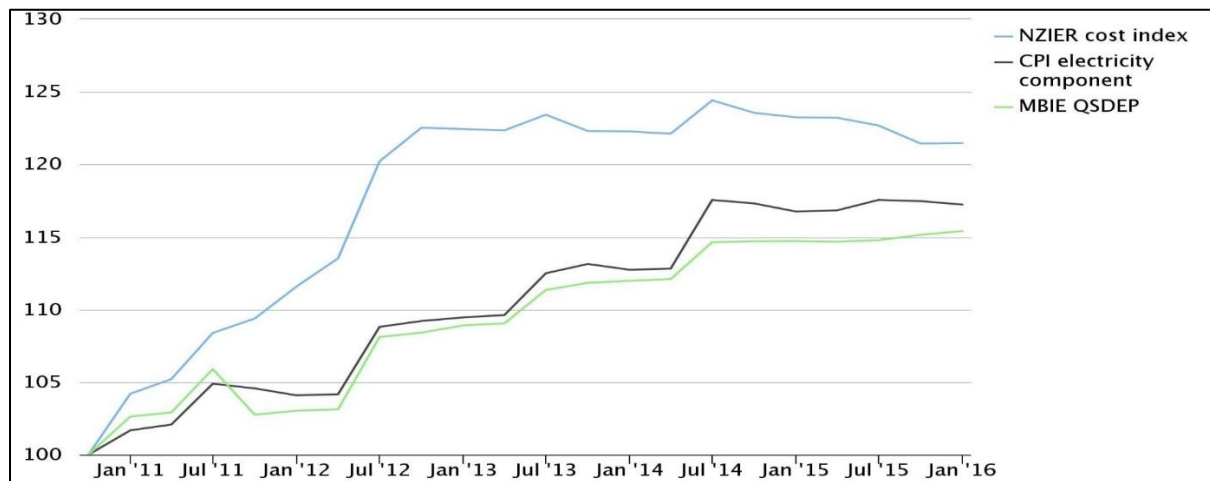
⁵⁶ Ibid

⁵⁷ Consultations with the Electricity Authority, May 2016 Electricity Market Performance 2015

⁵⁸ Ibid

that residential prices have stabilised since 2011. These are two key indicators that the reforms to improve competition in the retail market introduced in 2010 may be placing downward pressure on retail prices.

Figure 7. Retailer Costs and Residential Pricing, 2010-2016



Source: Electricity Authority, 2016

1. All series are indexed to 2010 Q3 = 100.
2. The NZIER cost index or synthetic price has been estimated for the Authority by NZIER. It is designed to represent the price at which a new entrant retailer without a generation portfolio could enter the market and sell to residential customers.
3. The MBIE QSDEP is the Quarterly Survey of Domestic Electricity Prices prepared by MBIE.
4. The CPI electricity component is the contribution of electricity to changes in the quarterly Consumer Price Index published by Statistics New Zealand.

The increase in residential prices between the introduction of the reforms and about mid 2014 was partly attributable to the unwinding of historic cross-subsidisation of household prices by business and commercial customers. This outcome is consistent with one of the key reasons for the reforms being more cost reflective pricing for business.⁵⁹

Some market participants consider that constant average increases in distribution and transmission costs (the monopoly part of the sector) have masked much of the retail competition and also limits any benefits of price competition being passed to consumers.⁶⁰

There is also view that price competition in the retail sector is practically constrained because retail margins, particularly for new entrants, are being constantly compressed. It is suggested that new entrants put limited pressure on the prices offered by incumbent retailers, especially the large five vertically integrated generator retailers (gentailers).⁶¹

This is because gentailers are better able to deal with pressure on retail margins as their effective gross margins (inclusive of generation) are larger than those of a stand-alone retailer. This means that gentailers have unparalleled financial capacity to withstand sustained competition.⁶²

⁵⁹ Consultations with the Electricity Authority, New Zealand Energy Retailers Association and New Zealand Institute of Economic Research, May 2016

⁶⁰ Consultations with the New Zealand Energy Retailers Association, May 2016

⁶¹ Ibid

⁶² Ibid

Retail Competition

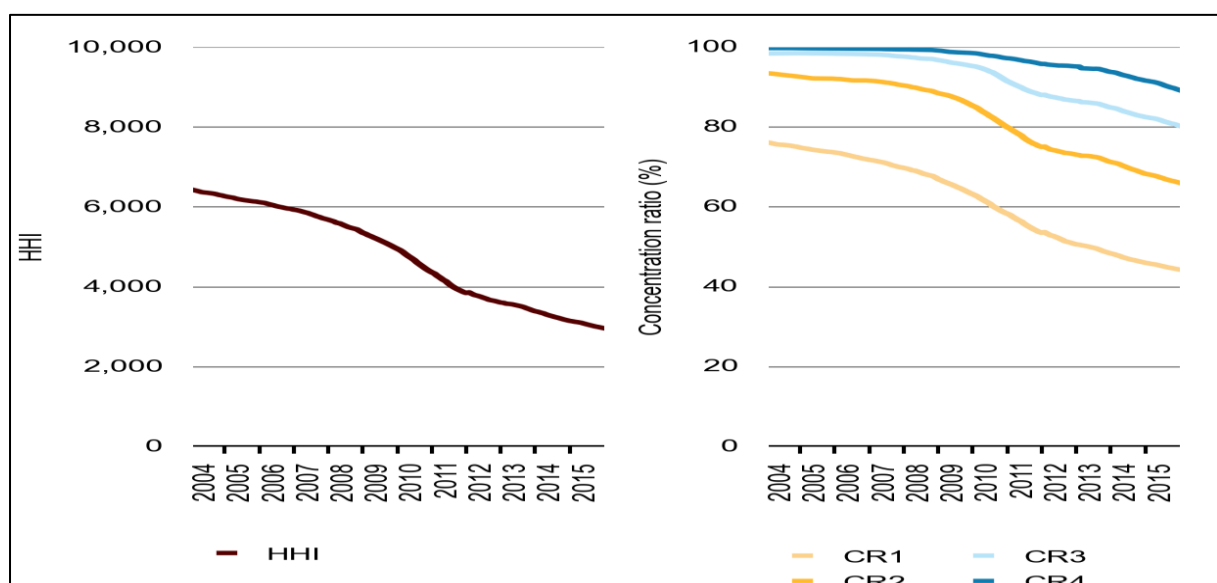
Market share and concentration are indicators of the degree of competition in the retail sector. This is because competition can be greater when market share is diversified amongst more than one or a few participants. To assess market share and concentration, the Electricity Authority (EA) uses two measures. These are:⁶³

- The Herfindahl-Hirschman Index (HHI). HHI is the sum of squares of the percentage market shares in a particular market—this calculation gives more weight to players with large market shares.
- The concentration ratio (CRX) to assess trends in market structure. CRX is the sum of the market shares for X players (for example, CR4 is the sum of market shares for 4 players). As New Zealand is split into regional markets, the EA calculates national figures using customer weighted averages of the regional HHIs and CRXs.

In the retail market there are five large retailers (gentailers), and a range of small and medium-sized retailers (not integrated with a generator). The five largest retailers have about 80 per cent market share. Small and medium retailers have over 170,000 customer connections. As the number and market share of the small and medium size retailers increases, both HH and CRX decline.⁶⁴

The chart below shows the movements in the HHI and CRXs from 2004 to 2015. The CRXs are calculated for an increasing number of retailers during this period. In the chart the CR4 shows the fall in market share of the four largest retailers since 2009 as a result of the 2010 reforms. The CR1 shows how the largest retailer in each region has experienced a decline in market share over the period.⁶⁵

Figure 8. Changes in Market Share and Concentration, 2004-2015



Source: Electricity Authority, 2016

⁶³ Electricity Authority, Electricity Market Performance 2015

⁶⁴ Ibid

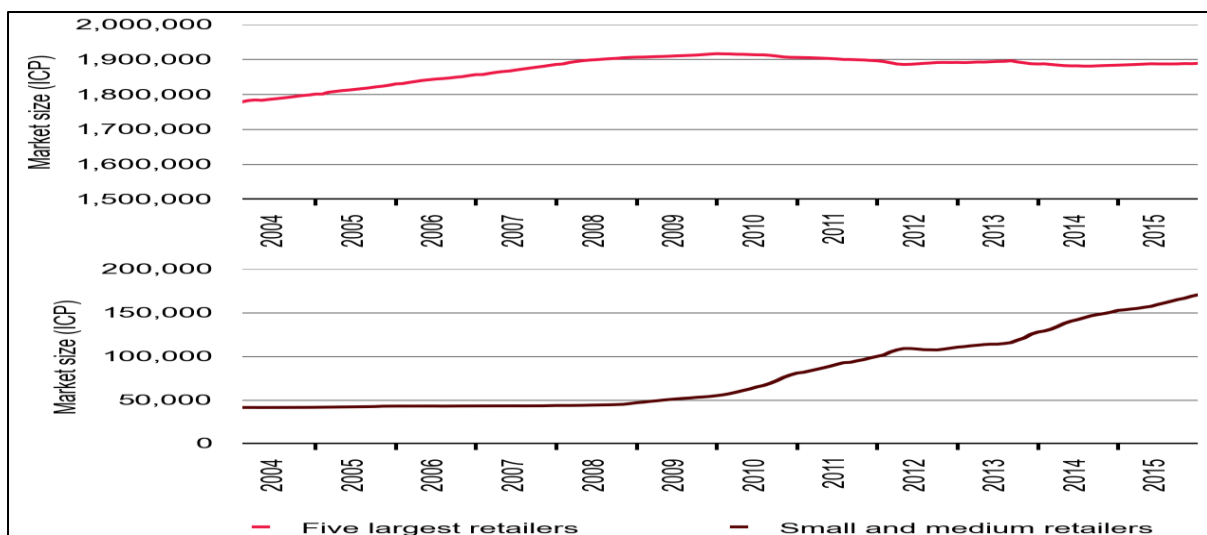
⁶⁵ Ibid

While the five large incumbent retailers have experienced declines in market share, some consider that their market share loss is as much attributable to customer switching between them as much the impact of new entrants⁶⁶.

When measured by the number and market size of retailers, competition in the retail market has increased following the reforms in 2010. Currently there are 31 retailers compared to 27 in 2014 and less than 10 in 1999. At present there are a further 13 other companies investigating or testing market entry. Since the 2010 reforms there has been an expansion of retail brands into regional areas which has been facilitated by access to a more liquid hedge market and the other risk management measures.⁶⁷

The chart below shows the relative changes in market size of the five large incumbent retailers and small and medium retailers. It shows that any decline in market size of large retailers is less acute and stable since 2010, compared to the exponential increase in market size of small and medium retailers since the 2010 reforms. This suggests that customer movements between the large retailers have as much potential impact on their market share as the impact of new entrants.

Figure 9. Changes in Market Size for Large and Small/Medium Retailers, 2004-2015



Source: Electricity Authority, 2016

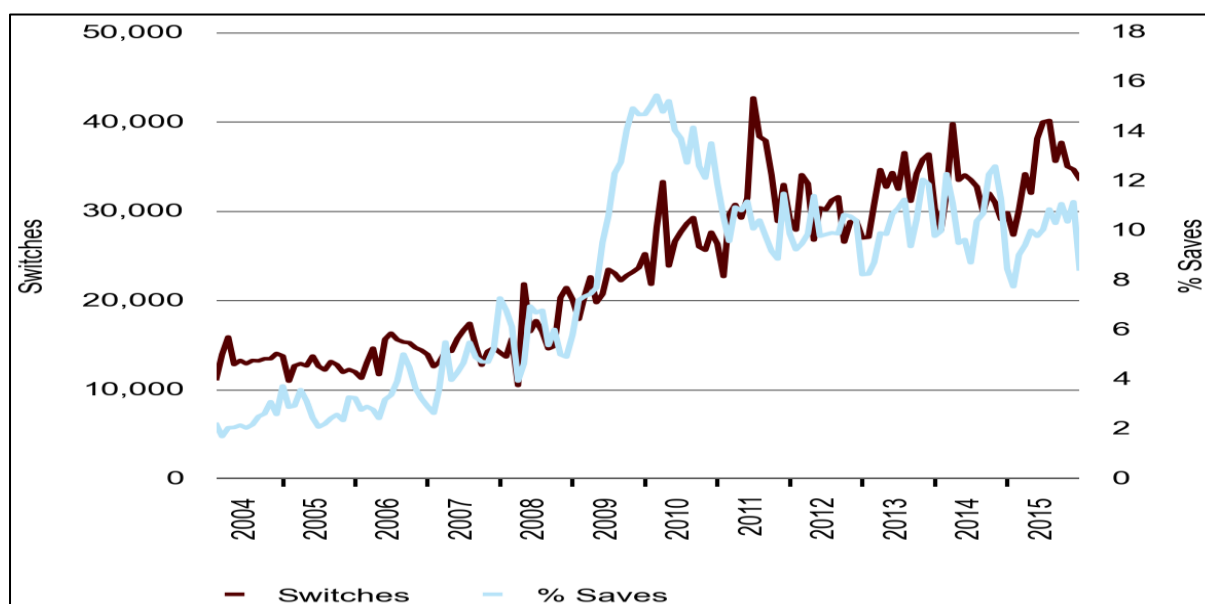
Customer Empowerment and Engagement

Customer switching between retailers is an indicator of the competitive conduct occurring in the retail market. The 2010 reforms included \$15M fund for the promotion of customer switching. The use of the fund to support public education campaigns about switching and its benefits (what's my number campaign) did result in an increase in switching rates.⁶⁸ The chart below shows the switching and save rates leading up to and following the 2010 reforms. A switch is where a customer selects another retailer, and a save is where a customer changes their mind about the switch and returns to their original retailer.

⁶⁶ Consultations with the New Zealand Energy Retailers Association, May 2016

⁶⁷ Consultations with the Electricity Authority, May 2016

⁶⁸ Consultations with the New Zealand Energy Retailers Association, May 2016

Figure 10. Residential Customer Switching and Save Rates, 2004-2015

Source: Electricity Authority, May 2016

In 2015 the Electricity Authority implemented the save protection scheme to reduce barriers for retailers to acquire new customers. The rationale for the scheme is that it is unfair for a retailer to use the offer of a competitor to prevent competition. Retailers can opt into the scheme. For those who participate it means that they are able to win a customer and complete the switching process before the customer's previous retailer can attempt to win them back. Similarly if a participating retailer loses a customer, it cannot attempt to win that customer back until the switch is completed. The impact of this scheme on switching levels has not been assessed to date.⁶⁹

Currently New Zealand has the fastest switching rates in the world. This is a result of a number of factors including consumer demand for switching, public awareness campaigns promoting switching, retailer systems that support efficient switching in response to customer expectations, and an effective independent customer complaints management system.⁷⁰

However this has evolved over time. At the beginning of the retail market reforms in 1999 retailers had poor customer database systems which did not support customer switching. This was a barrier to market competition as it created distrust amongst customers. This had to be addressed by retailers first as part of their defensive strategies and then as a component of their customer acquisition strategies as they more fully embraced a competitive mindset.⁷¹

Another lesson from the evolution of customer switching is that at the beginning of the reform process there was a need for a retailer default scheme to maintain customer participation and engagement. This scheme is considered to have been especially important because community expectations that competition would lower residential prices were not met, and retailer systems

⁶⁹ Electricity Authority, Electricity Market Performance 2015 and consultations with the Electricity Authority, May 2016

⁷⁰ Consultations with the Electricity Authority, New Zealand Energy Retailers Association and New Zealand Electricity and Gas Complaints Commissioner, May 2016

⁷¹ Ibid

did not support customer switching in line with consumer demand. Accordingly, in the absence of a default scheme customer engagement and interest was adversely affected, which partly motivated the public awareness campaigns in 2011.⁷²

5.6 BUSINESS CONFIDENCE AND INVESTMENT CERTAINTY

Key economic benefits of reform include its impact on innovation, and business and investment activity to support market growth.

Innovation – Smart Metering

The review recommended that any standards developed for smart meters provide for open access and customer switching functionality.

The New Zealand government did not mandate a smart meter roll out, leaving it to the market to apply consistent with its commitment to market based principles.⁷³ The most recent figures show smart meters now represent about 70 per cent of all meters.⁷⁴

In 2015, the Electricity Authority examined whether the varying prices charged by metering service providers to retailers were an inefficient barrier to entry to the retail market. It found that variations in metering prices were not a barrier to entry and that pricing variations occur because retailers purchase different services from metering providers.⁷⁵

The deployment of smart meters is creating one issue of business uncertainty for retailers. This relates to their concerns that distributors want free access to smart meters to manage network issues. Retailers wish to be paid to provide access to smart meters which they deploy because smart meter access enables distributors to use meter data to deploy new technology via distributor assets. Retailers are concerned that current regulatory arrangements administered by the Commerce Commission govern distributor assets, but not new services they provide via their assets.⁷⁶

Innovation – New Products

The market based approach to reforms and regulation has stimulated innovative approaches by retailers in relation to customers who have difficulty paying their energy costs. For example, Globug (a Mighty River Power retail brand) announced in early 2015 that it would discount Globug's pre-pay rates by 15 per cent to Community Services Card holders. This contributed to its rapid growth from 18,000 to nearly 32,000 customers.⁷⁷

⁷² Ibid

⁷³ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, May 2016

⁷⁴ Electricity Authority, Electricity Market Performance 2015

⁷⁵ Ibid

⁷⁶ Consultations with the New Zealand Energy Retailers Association, May 2016

⁷⁷ Electricity Authority, Electricity Market Performance 2015

The regulatory approach to promote trust in the market through campaigns for switching has enabled other retailers to offer products built on trust. For example, a new company called Saveawatt is entering the market with a product that enables consumers to delegate authority to Saveawatt which will then make sure the consumer is on the best tariff at all times, switching them as required.⁷⁸

The deployment of smart meters has enabled another company called Fick to offer residential customers tariffs based on wholesale prices, which can reduce the costs for households.⁷⁹ However, these customers are not protected under Fick's contracts from high volatility that could arise from prolonged grid constraints, plant failures or dry years which result in sustained high prices. In such circumstances consumers would either face these prices or switch to a new retailer (assuming one was available).

Ongoing failure by a retailer to pay for electricity or distribution services can lead to increasing financial losses by generators and distributors and could lead to customers becoming stranded without a retailer. The Authority has made arrangements to facilitate the orderly resolution of a default situation when an electricity retailer becomes insolvent or otherwise exits the market and is unable to supply its customers.

These innovations offer residential and business customers opportunities to reduce their electricity costs thereby increasing their disposable incomes. This can support consumption in other parts of the New Zealand economy and improve the allocative efficiency of household and business resources.

Investment and Trading Activity

The reforms have restructured the former government owned generators into companies with 51 percent government shareholding or fully private companies. All these entities are vertically integrated generators and retailers (gentailers). The five largest gentailers are listed on the share markets in NZ and in Australia. Companies such as Mighty River Power and Meridian Energy raised more than \$2 billion through their listing.⁸⁰

The four largest gentailers have market-making agreements with the ASX to promote trading in NZ electricity spot price futures contracts. The companies lodge bids and offers each day on the ASX Futures Exchange for prices to transact future supply. The actual forward price is determined by market responses to these bids. Parties make investment decisions about energy supply, infrastructure and services based on settled futures market prices. In 2015, 18,468 GWh of futures contracts were traded, which was a 36 percent increase on 2014's trading volume.⁸¹

The 2010 reforms aimed at enabling greater access to hedge markets to manage supply risks have enhanced the certainty that investors need to participate in the energy market. One indicator of this is recent analysis by financial houses studying the ASX which recommend the stock of the gentailers for their strong yield performance and ongoing value, particularly on the basis of their investments in renewable energy and development options for increased supply.⁸²

⁷⁸ Ibid

⁷⁹ Observations by Aegis consultations while visiting the NZ market

⁸⁰ Australian Financial Review, 11-12 June 2016

⁸¹ Electricity Authority, Electricity Market Performance 2015

⁸² Australian Financial Review, 11-12 June 2016

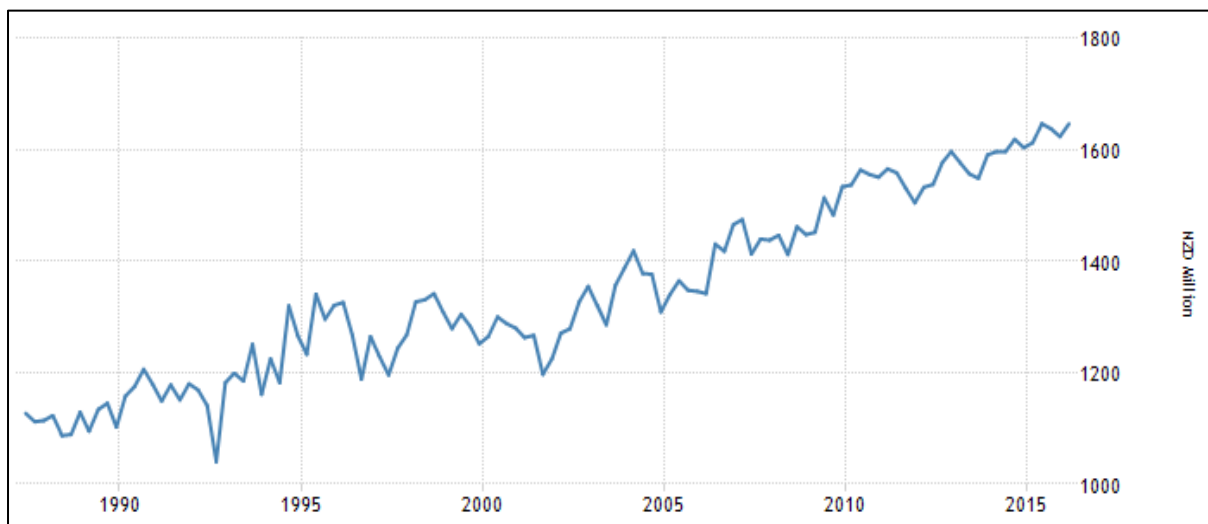
5.7 ECONOMIC IMPACTS

There is no available assessment of the economic or social value of the series of reforms undertaken to improve the performance and competition in the retail market. None have been undertaken by the New Zealand Government, the Electricity Authority or the retail sector.⁸³

At present the MBIE recognises that promoting competition is a work in progress, but is generally comfortable with the direction of reforms. There is a strong reliance on the Electricity Authority and Commerce Commission to collect data and analyse market performance and regulate behaviour where required. While this is not considered a substitute for an economic and social evaluation, the evolutionary nature of the reforms is considered to warrant the prioritisation of ongoing market scrutiny above point in time economic assessments.⁸⁴

GDP from utilities (electricity, gas, water, and waste services) rose by about 30 percent between 2000 and 2016, but it's difficult to attribute this to reforms per se.

Figure 11. GDP from Utilities, 1990-2016



Source: Statistics New Zealand

The New Zealand GDP grew by about 49 percent between 2000 and 2016 to NZD 240 billion. Of this the contribution of utilities (electricity, gas, water and waste services) to total GDP declined from 2.87 percent in 2000 to 1.4 percent in 2016.⁸⁵ This may be due to factors including technological and energy efficiency improvements reducing demand.

During this period the average GDP growth of all goods producing industries (utilities, manufacturing and construction) was about 24 percent. The growth of utilities (30 percent) was above average but below construction.⁸⁶ The reforms in the electricity sector may have had an impact on the growth of utilities. A series of natural disasters, particularly in the latter part of

⁸³ Consultations with the Ministry of Business, Innovation and Employment, Government of New Zealand, Electricity Authority, New Zealand Energy Retailers Association and New Zealand Institute of Economic Research, and Commerce Commission May 2016

⁸⁴ Ibid

⁸⁵ Ibid

⁸⁶ Ibid

this period are likely to have contributed to the comparatively high growth in the construction sector reflecting recovery and rebuilding operations.

Between 1999 and 2014 labour productivity increased and capital productivity reached a peak of 5.3 percent in 2006. Data sources make it difficult to attribute changes to reforms per se. However reforms in the electricity sector may have had a contributory impact on the improvement in labour productivity over this period.

Table 6. Productivity Growth in Utilities Sector, 1999-2014

Year	Capital (%)	Labour (%)
1999	2.5	-2.5
2006	5.3	1.8
2010	3.4	0.6
2014	2.5	0.8

Source: Ministry of Business, Innovation and Employment, Government of New Zealand, Electricity Authority, New Zealand Energy Retailers Association and New Zealand Institute of Economic Research, and Commerce Commission May 2016