ELECTRICITY AUTHORITY
TE MANA HIKO

Strategic directions for market development

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Addressing the challenges of the next decade

The Electricity Authority is responsible for overseeing and developing the electricity market, with the objective to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers.

The electricity market primarily relies on competition to establish the price of the electricity used by consumers. Prices vary depending on where electricity is produced, when electricity is used and how much electricity is used. Prices play a critical role in the electricity market by providing information underpinning investment decisions by generators and retailers and the consumption decisions by consumers (including not consuming).

The Authority's focus or strategic directions for market development are to develop a workably competitive electricity market by **reducing barriers** to entry, expansion and exit of parties in electricity markets, **facilitating consumer participation**, **providing efficient price signals** and **promoting flexibility and resilience** into the market and market systems. These strategic directions mean that the Authority will prefer initiatives that provide price and non-price information to assist efficient investment decisions by the electricity industry and consumers, confirm that consumers have a greater role in the electricity market than being passive recipients of electricity services and help industry participants and consumers to respond efficiently to changing market circumstances.

The strategic directions reflect the Authority's view of the key challenges and characteristics that are likely to influence the electricity sector in the next 10 years: uncertainty, rapidly developing technology and changing consumer expectations. The Authority's strategic directions for market development are described in this document and summarised in Table 1.

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CHAIR

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TABLE 1 » Strategic directions for market development

STRATEGIC DIRECTION	DESCRIPTION
Reducing barriers	Reducing barriers involves facilitating the entry, expansion and exit of parties in electricity markets. The Authority will focus on developing regulatory frameworks to support market entry, exit and innovation; the uptake of technology; investment; and making data and information available to assist informed investment and consumption decisions.
Facilitating consumer participation	Facilitating consumer participation involves providing consumers with the ability to exercise choice of supplier and product. Consumers are likely to have an increasing ability and desire to seek the price and service bundle that meets their requirements. The Authority will focus on initiatives providing consumers with access to information and the opportunity to exercise control over their electricity supply, assisting consumers to decide on their best price and service offering, and facilitating demand-side participation in electricity markets.
Providing efficient price signals	Efficient price signals help inform the investment and consumption decisions of participants and consumers. The Authority will focus on encouraging efficient prices for electricity services by establishing markets, where efficient and practicable and on disseminating price data and information.
Promoting flexibility and resilience	Flexibility and resilience means being able to respond efficiently to changing market circumstances and to efficiently respond to unexpected events affecting the market. The Authority will focus on promoting an efficient market and market systems, such as by promoting systems that establish and disseminate price and non-price data and information, enable broad participation in electricity markets and facilitate efficient responses to changing market circumstances. The Authority will engage with service providers and the system operator to obtain efficient services and service delivery systems that are flexible and resilient.

Source: Electricity Authority

Managing a changing environment

The electricity sector experiences constant change to the supply-demand balance, to the number and nature of services available to consumers, to the market participants and to the regulatory environment. The sector today is different to that of 10 years ago and will be different 10 years in the future.

The Authority considers that identifying strategic directions for market development will provide greater certainty about the future regulatory environment, which in turn will support innovation and investment in the sector for the long-term benefit of consumers.

This strategic directions document:

- describes the key challenges and characteristics that are expected to influence the industry over the next 10 years or so
- identifies the strategic directions that emerge from these challenges
- describes the Authority's strategic approach to market development.

This document does not set out a future blueprint for the electricity sector or regulation. There is too much uncertainty about the future to make a central plan or grand design a feasible or practical goal. Instead, this document identifies strategic directions that will underpin the Authority's approach to market development and will inform the development of the Authority's work programme over the coming three to 10 years.

The Authority expects to review this document every three years to update the challenges and characteristics influencing the sector and the associated strategic directions.

Strategic directions and the Authority's strategic framework

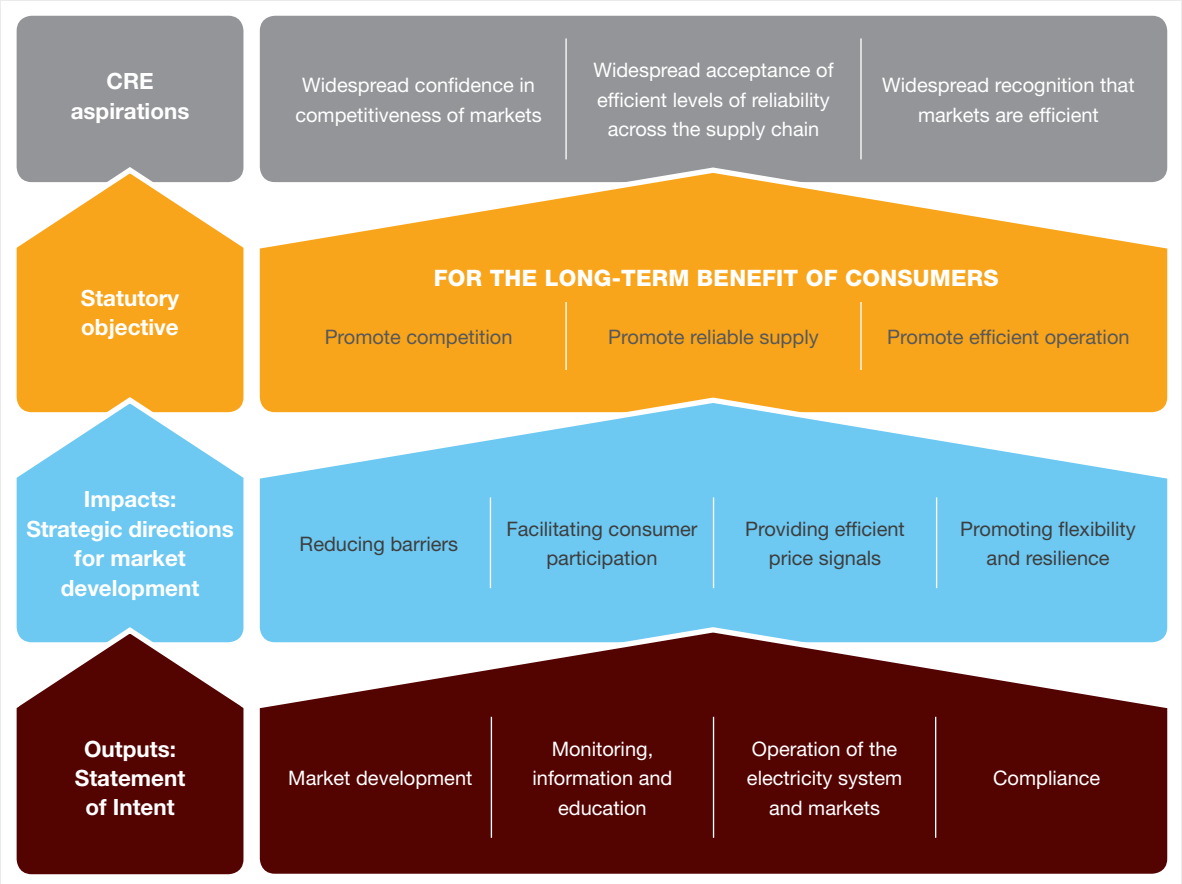
The Authority's Statement of Intent (SOI) outlines a strategic framework and a high-level work plan for the coming three years that reflects market and organisational development priorities, focus areas and projects.

The strategic directions are intended to complement the Authority's strategic framework by further explaining how the statutory objective and the CRE (competition, reliability, efficiency) aspirations will influence the development of the market and the work programme in the future. In particular, the strategic directions are intended to:

- assist the coordination of work programme initiatives and planning processes by identifying medium-term priorities and directions
- identify initiatives that should be given priority consideration based on the potential benefits available relative to the effort required
- improve parties' understanding of how the work programme contributes to meeting the CRE aspirations.

The place of the strategic directions within the Authority's strategic framework is illustrated in Figure 1.

FIGURE 1 » How the strategic directions fit into the Authority's strategic framework



Source: Electricity Authority

The key elements of the strategic framework are as follows:

- **Statutory objective and the interpretation of the statutory objective** – the interpretation of the Authority's statutory objective is to ensure that the decisions made by the Authority Board and proposals put forward by industry participants, consumers, advisory groups and staff are predicated on a consistent understanding of the statutory objective.[1] The objective defines the outcomes required of the Authority and of the electricity sector.[2]
- **Authority's vision and mission** – the Authority's vision is to be recognised as a world-class regulator, delivering long-term benefits for consumers and contributing to the New Zealand economy. The Authority's mission is for the electricity market to be widely regarded as one of the world's most efficient and innovative. The vision and mission reflect the Authority's aspirations to achieve outcomes that promote competition, reliability and efficiency (CRE).
- **Strategic directions** – the Authority has identified four strategic directions to focus and guide market development in the medium to long term. The strategic directions will inform the identification of the Authority's market development outputs.[3]
- **Statement of Intent** – the Statement of Intent (SOI) is the formal public planning document for the Authority, providing a detailed outline of priorities, outputs, performance measures and resource requirements.
- **Work programme** – the Authority publishes an annual work programme listing the projects to be completed or progressed in the next financial year.[4]

The strategic directions are used in the SOI to describe the key impacts or changes that the Authority wants to bring about through market development. The strategic directions, with the CRE aspirations, will guide the development of the Authority's work programme by informing the assessment of what projects are included in the work programme and their priority. The Authority's intention is to clearly show the link between the Authority's projects and expected outcomes. The Authority will measure the impact of its work using the strategic directions and will report the results in its Annual Report.

[1] The interpretation of the Authority's statutory objective is available at www.ea.govt.nz/about-us/documents-publications/foundation-documents.
[2] An outcome means a state or condition of society, the economy or the environment and includes a change in that state or condition.
[3] An output means goods or services that are supplied by the Authority.
[4] The Authority's 2013/14 work programme is available at www.ea.govt.nz/about-us/documents-publications/work-programme.

Challenges and characteristics influencing the electricity sector

The Authority considers that the challenges and characteristics influencing the electricity sector over the next 10 years reflect three broad themes – **uncertainty**, **rapid development of technology** and **changing consumer expectations**. These factors will influence the direction of the sector, and need to be taken into account when considering further development of the market.

The following discussion illustrates the Authority's thinking about the challenges facing the electricity sector.

The electricity sector faces uncertainty

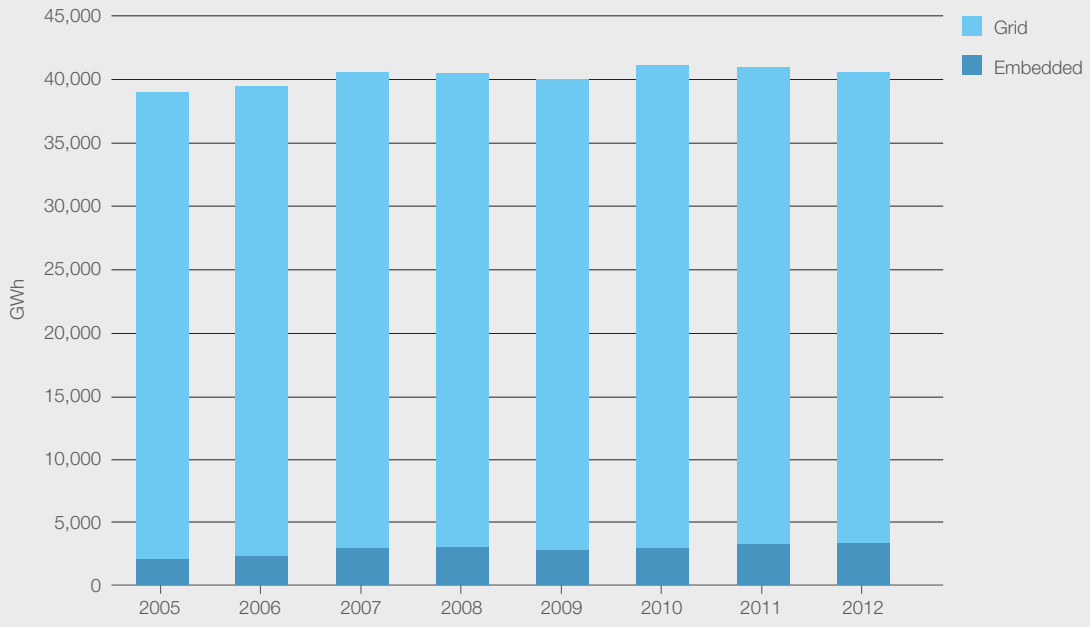
The electricity sector is constantly managing uncertainty about where electricity is required, about when electricity is required and about the optimal way of producing and delivering electricity. Supplying electricity generally requires large investments in long-lived assets (for example, up to 50–60 years) to be ready to meet consumers' electricity requirements, whether in the next five minutes or in the next five years.

Decisions to invest in new electricity infrastructure (generation, transmission, distribution or demand-side) or to retire existing infrastructure rely on assumptions about future peak demand and load levels. The risks of a wrong decision range from supply shortages due to too little investment to stranded or underused assets from too much investment. Either scenario imposes higher costs on consumers than the optimum level of investment.

There was significant generation and network investment committed during the 2000s, underpinned by assumptions of steady rates of increase in peak demand and load. However, the global financial crisis in 2007/08 and a dry year conservation campaign in 2008 led to a change in the rate of increase in peak demand and load from 2008/09.

Figure 2 shows supplied energy (to meet consumption) from 2005 to 2012. It is clear that the level in 2012 is approximately equivalent to that in 2008.

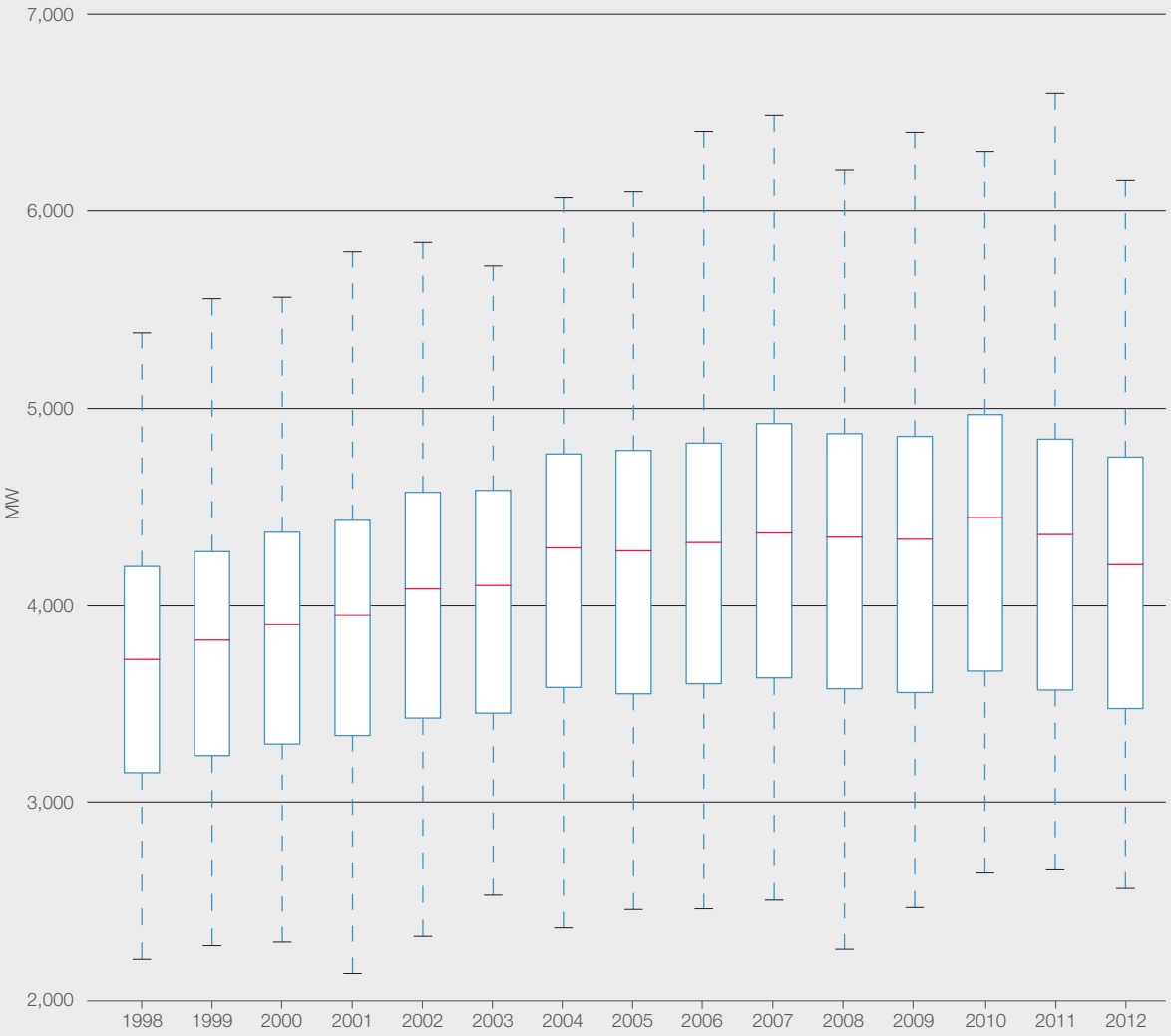
FIGURE 2 » Total supplied energy, 2005–2012



Source: Electricity Authority

Figure 3 shows electricity peak demand for the period 1998 to 2012. Maximum peak demand (the upper vertical line or whisker) has continued to increase over this period, primarily due to residential consumption patterns and weather events.

FIGURE 3 » Median, maximum and minimum electricity peak demand, 1998–2012



Source: Electricity Authority

Note: Net of embedded generation.

Note: The red line through the middle of each rectangle shows the median peak demand in each trading period for the year. The rectangles run from the lower to the upper quartile. The vertical lines or whiskers are more complicated. The upper horizontal line is the lesser of either the maximum value in the data or 1.5 times the size of the rectangle added to the top of the rectangle. This is about 2.7 standard deviations. Conversely, the lower horizontal line is the greater of either the minimum value in the data or 1.5 times the size of the rectangle subtracted from the bottom of the rectangle.

FACTORS INFLUENCING THE RATE OF CHANGE

Electricity consumption has tended to increase in line with population growth and economic growth. Peak demand is also linked to population growth and economic growth but is also significantly affected by household usage and weather events.

Other factors influence the peak demand and consumption volumes in any one year and the rate of change between years, such as the shift in economic activity from energy-intensive industry to services, the intensity of electricity use (for example, increasing penetration of heat pumps, increasing use of irrigation for agriculture), natural events (for example, the Canterbury earthquakes or the 2011 countrywide cold snap) and energy efficiency and demand-side management.

Specific examples of things that could influence future peak demand and load growth that might be considered in the decision-making processes of generators, retailers and (large) consumers are as follows:

- The possibility of the closure of the Pacific Aluminium smelter at Tiwai Point. This possibility is an ongoing uncertainty for the sector but gained more attention in 2012 as the owner considered a strategic response to soft global aluminium prices. Closure of the smelter would free up supply equivalent to about 13% of 2012 consumption, with implications for wholesale prices, transmission capacity and investment/retirement of generation plant.
- The rate of the ongoing shift in economic activity from energy-intensive industry to commercial and agricultural enterprise. The rate of load growth due to commercial and agricultural activities is increasing at a faster rate than for energy-intensive industry. Farm conversions to dairying have created a step change in electricity peak demand in some regions. Electric vehicles may account for a noticeable and rising proportion of peak demand, particularly in metropolitan areas. A further example of this trend is seen in Australia where consumption growth rates are slowing due to reducing economic growth and reducing electricity requirements from energy-intensive manufacturing but also increasing numbers of household solar photovoltaic installations.[5]
- Changing consumption patterns, particularly in households. The rate of consumption growth and peak demand growth will be affected by energy efficiency, fuel switching and the uptake of distributed generation (although these are related to economic growth rates). Household electricity consumption is the key factor determining peak demand.
- Development of distributed generation and battery technology means there is a possibility of more electricity being generated close to demand with an associated decline in reliance on electricity transported from distant large-scale power stations. Lower-cost options for generating electricity using current technology have mostly been exploited, for example, there are limited dam sites for major new hydro power stations. Options for thermal power stations (coal and natural gas) are contingent on expectations for the cost of carbon emissions and whether exploration will identify viable reserves of natural gas, including from deep-sea and non-traditional (fracking) sources.

In summary, a number of observations can be made about the recent past and outlook for the next five to 10 years as illustrated in Table 2.

[5] Australian Energy Market Operator, *2012 National Electricity Forecasting Report*, available at www.aemo.com.au/Electricity/Planning/Forecasting/National-Electricity-Forecasting-Report-2012.

TABLE 2 » Summary of recent trends in the electricity sector versus the short-term outlook

FEATURE	RECENT PAST	SHORT-TERM OUTLOOK
Consumption growth	Steady rate of increase to 2008/09.	Rate of change has been variable since 2008 and may remain static in the short term.
Peak demand growth	Volatile, reflecting household consumption patterns and weather.	Peak demand growth is likely to continue to be volatile.
Electricity generation investment	Significant investment in geothermal and natural gas power stations and wind farms.	Investment being scaled back. Unlikely to be significant new developments in the short term. Potential for improved utilisation of existing assets or use of flexible plant.
Electricity transmission investment	Major investment in grid backbone to meet expected peak demand growth.	Much reduced investment once major projects are completed. Some investments may be deferred. Potential for improved utilisation of existing assets.
Supply margin	Gradually increasing supply margin as new power stations added.	A period when a comfortable supply margin is possible. Some facilities may be retired or mothballed.
Electricity prices	Rising prices for residential and commercial consumers to reflect costs.	Forward price curve indicates slowing rate of wholesale price increases, which should be reflected in retail prices.

Source: Electricity Authority

IMPLICATIONS OF UNCERTAINTY

Perceptions of uncertainty and how to manage it differ across the sector, but the electricity industry generally deals well with uncertainty about future peak demand and consumption growth. For example, some generators are now scaling back their investment plans in response to the current slower rates of peak demand and load growth, and others are considering options to retire existing older assets. During 2012, for example, Mighty River Power decommissioned its 236 MW Marsden B thermal plant, which had been mothballed since construction in 1967, and at the end of December 2012, Genesis Energy placed its 250 MW Huntly Unit 4 thermal plant in long-term storage.

The sector cannot regularly and accurately determine the timing and rate of a future economic downturn or upswing or the subsequent future rate of peak demand and load growth. The change in the rate of peak demand and consumption growth from 2008/09 after a period of relatively consistent growth is an example of the uncertainty faced by the electricity industry.

In addition, the sector cannot predict if there will be another event leading to a similar change in the operating environment for the electricity sector. For example, wind generation was not seen as a feasible or practicable source of electricity in the 1990s but now represents about 4% of supply. Similarly, solar photovoltaic technology has rapidly developed to become a cost-effective source of electricity in specific circumstances.

The electricity market provides a framework for the sector to manage uncertainty. The market **provides information** enabling parties to decide how to best achieve their needs and adapt in response to events as they unfold:

- **Efficient price signals.** The forward price curve established through the hedge markets indicates the near-term outlook for wholesale prices (on average). This price information should incorporate all factors that might affect pricing, such as individual expectations of parties' supply (for example, investment intentions or timing of plant maintenance) and demand (for example, production requirements).
- **Diversity of supply/consumption options.** Future prices might indicate to some parties that there is value in flexibility in supply or consumption. For example, parties may decide that there is value in putting some plant into storage or in investing in quick-start gas turbines. Consumers may decide to reduce or increase consumption. Robust ancillary services markets facilitate greater utilisation of flexible assets.
- **Asset investment/retirement decisions.** Uncertainty about where and how much electricity is needed makes investment/retirement decisions difficult. Individually, wrong decisions can affect a party's financial situation. Collectively, wrong decisions could lead to too much or too little investment and a reducing supply-demand balance.

The Authority needs to make sure that the regulatory framework and the Electricity Industry Participation Code 2010 do not stop parties from managing uncertainty by preventing a range of responses to technology change, changing consumer behaviour and expectations, and predicting events. The Authority should provide a regulatory environment that is resilient and open to innovation and that provides tools and capability to achieve outcomes that are for the long-term benefit of consumers. An example of an initiative designed to foster resilience is the arrangements to manage retailer default.

More generally, all participants have a stake in developing processes for determining electricity prices that are seen to be robust, even though short-term movements can have different impacts for each party.

Technology is developing rapidly

It was little over 120 years ago that Reefton became the first town in the southern hemisphere to have a public electricity supply. Nowadays, electricity reaches into virtually every home across the country. Electricity has become an essential part of modern life – lighting, heating and powering our factories, farms, hospitals, towns, cities and homes. Electric-powered devices now proliferate in our homes and our workplaces. Increasingly, we are able to manage and control our environments using electrical and electronic appliances.

The rapid development of technology has implications at each point of the electricity supply chain – from generators to consumers.

Consumers, and particularly households, are often seen as relatively passive recipients, without much interest in how or when they receive electricity. However, the rapid development of new smart technologies has the potential to transform the way consumers control and interact with electricity and how retailers market their product. In particular:

- **smart technologies**, such as smart meters, are increasingly enabling the control of appliances, managing individual electricity demand in response to prices and integrating small-scale distributed electricity generation
- **the internet** is increasingly a part of our lives, interfacing readily with mobile communication technologies and offering the prospect of remote monitoring and control of appliances in the home or workplace
- **data and information storage capacity** is making available masses of detail about our lifestyles and consumption patterns that can be mined to show how we might do things better and more efficiently.

As well as revolutionising how consumers see electricity, technology is changing the dynamics for industry participants too. The electricity sector in New Zealand has traditionally focused on dealing with engineering problems associated with generating electricity from large-scale hydro-electric and thermal power stations and transmitting bulk electricity over large distances. However, looking forward, technology presents new opportunities and challenges:

- **Climate change** has increased government and public concerns about the impacts of technology on our environment. There has been a strong shift from fossil fuels towards renewable energy. In particular, the government has set an objective for 90% of the country's electricity to be generated by renewable resources by 2025.
- **New electricity generation technologies** have emerged, with costs progressively reducing to become competitive with traditional generation options. Geothermal and wind projects are now among the least-cost generation options, and large-scale solar generation is being developed internationally. Tidal and wave generation is still in its infancy, but adoption of those technologies is attracting more attention. These technology options may make operation of the grid more challenging by increasing intermittency and inflexibility. These challenges would need to be addressed.
- **Distributed generation** and other technologies have the potential to make consumption in the home and workplace less reliant on grid-supplied electricity. Photovoltaic panels and solar water heating are becoming more common and they reduce demand for grid electricity. Other micro-generation technologies suited to homes and workplaces are being explored. For example, the development of a relatively inexpensive artificial leaf that can mimic photosynthesis by turning sunlight directly into chemical fuel is being investigated.[6] Similarly, battery technology could allow storage and flexible use of electricity from intermittent generation. Increased distributed generation has the potential to affect how distributors recover their costs.

Solar energy – the artificial leaf American Chemical Society

[6] Massachusetts Institute of Technology http://science.time.com/2011/09/29/how-an-artificial-leaf-could-boost-solar-power/#ixzz2D0F46N48.

- **Electric vehicle** development is increasingly offering a viable alternative to the petrol engine. After several decades of research and development exploring advanced electric motors, control systems and high-energy automotive batteries, new and highly efficient drive trains for electric vehicles are in sight. Some utilities and grid companies are looking seriously at network management where there is high uptake of electric vehicles.[7]
- **Automatic response technology** and demand-side load control may change the way the industry traditionally maintains system balance and security.
- **Fracking and horizontal drilling technology** is having a significant impact on the gas industry and could influence New Zealand's relationship with gas, including where it is used and what it costs.

IMPLICATIONS OF NEW TECHNOLOGY

Markets will typically adapt quickly to new technology. Electricity retailers or some new consumer-focused service providers are likely to seek to profit from technology by offering consumers new products or ways of using electricity. New technology has the potential to engage consumers more meaningfully with electricity and improve perceptions about competition, reliability and efficient operations in the electricity sector.

Market arrangements should not impede innovation. This means the Authority should develop market arrangements that are robust, particularly so that:

- regulatory arrangements (for example, Code and service provider agreements and systems) should not pose undue compliance barriers to adoption of new technology – regulatory frameworks should facilitate the emergence of new participants or service providers
- new technologies are not hindered by electricity market pricing arrangements, for example, the potential to use technology to harness demand-side provision of ancillary services should be facilitated relative to grid-based generation or ancillary service options
- the implications of new technology for reliability are properly considered, for example, what effect might widespread use of electric vehicles have on the shape of the demand curve, network issues and security of supply?

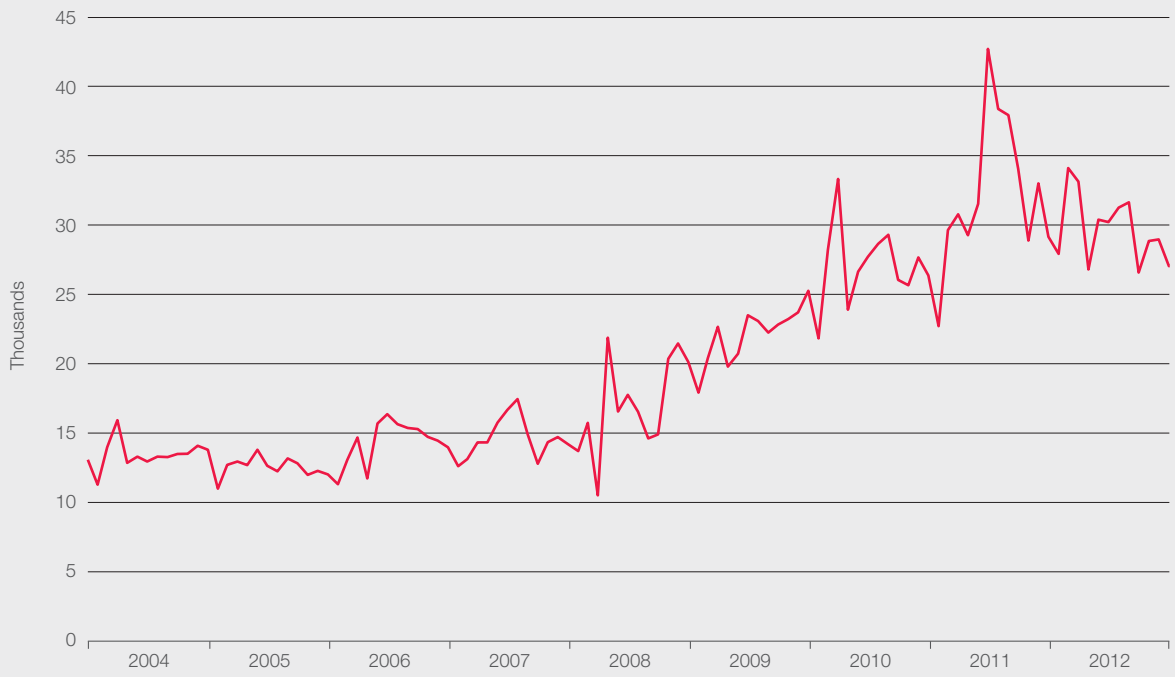
[7] In New Zealand, electric vehicles have the potential to significantly reduce greenhouse gas emissions, effectively replacing some fossil-based transport fuels with renewable electric energy sources.

Changing consumer expectations

Consumers' dependence on electricity is increasing as technology evolves. Commercial and residential users now rely on a growing number of smart devices powered by electricity. This dependence is most evident when an outage occurs – residents resort to using camp stoves and torches, factories are disabled and, with no EFTPOS or internet available, the commercial sector can grind to a halt.

Consumers generally expect electricity to be available at the flick of a switch, affordable and from a retailer that is flexible, responsive and understands their needs. The Authority has survey results indicating that consumers have increasing awareness about the ability to shop around and, as shown in Figure 4, are increasingly switching between retailers.

FIGURE 4 » Consumer switching rate, 2004–2012



Source: Electricity Authority

Note: Consumer switching is based on the active ICP switches per month and excludes bulk transfers of ICPs between retailers.

The digital revolution has brought about significant change to New Zealand society. Around 83% of households had an internet connection in 2010, up from 60% just eight years earlier,[8] and there are now more cell phones in New Zealand than there are people. New Zealanders have embraced technology – consuming and producing ever faster and smarter products.

Technology advances in the electricity sector, particularly in metering and communications, have the potential to allow electricity to be transformed from a simple utility into a product where customers can more easily interact with their suppliers (retailers or some new participant or service provider) and search for deals that best meet their needs.

[8] From the World Bank databank.

IMPLICATIONS OF CHANGING EXPECTATIONS

Electricity markets should be able to adapt to meet changing consumer expectations, and electricity retailers seeking competitive advantages are again likely to lead the way – particularly if new technology makes it easier for consumers to exercise choice and manage their electricity consumption. Meeting changing consumer expectations about how electricity contributes to their lives will be important to improving consumer perceptions about competition, reliability and efficiency in the electricity sector. This suggests the Authority should develop market arrangements that will facilitate:

- **different levels of reliability** – determining the value of reliability to different consumer groups is likely to become more important, and ways will be required to meet differing reliability needs (that is, a 'one size fits all' approach is less feasible as technology improves)
- **different types and levels of service** – determining the different types and levels of service that consumers seek from their retailer (or other party) and enabling consumers to find the service that meets their requirements
- **active demand-side response** – technology can allow consumers to actively engage by shifting demand, voluntarily curtailing demand or using back-up generation.

As consumer expectations for the electricity sector change, the Authority will seek to further empower consumers so that they are able to contribute to and influence outcomes in a complex industry and can see the benefits of competition in a changing industry landscape. Further, the Authority will need to facilitate industry capability to integrate and exploit the full potential of technologies that cater to consumer expectations, such as the internet, smart meters and distributed generation options.

Summary of challenges and characteristics facing the electricity sector

The challenges facing the electricity sector provide a strong pointer towards where the Authority should focus when it considers developing market arrangements. Table 3 provides a summary of the challenges and the Authority's possible approach.

TABLE 3 » Summary of challenges and characteristics facing the electricity sector

CHALLENGE	DESCRIPTION	AUTHORITY'S APPROACH
Uncertainty	The electricity sector faces uncertainty about the prospects for the supply-demand balance. Trends point to slower or static load growth in the shorter term relative to recent trends. The sector has responded by revising investment plans and considering retirement of assets. Peak demand will continue to increase, while still being variable. Peak demand growth may be affected in some areas by changing consumer behaviour.	■ Provide efficient price signals (prices reflect costs, value of reliability is signalled and prices reflect supply margin). ■ Provide efficient forward price discovery and efficient markets for trading electricity products. ■ Enable flexible market and operating systems to facilitate efficient responses by demand and generation. ■ Make quality information available about supply and demand trends on a timely basis. ■ Consider innovative regulatory approaches.
Rapidly developing technology	The combination of smart metering, the internet and new technologies is changing the way consumers engage with markets. The way consumers buy and interact with participants (and other service providers) will change.	■ Enable efficient pricing arrangements for new technologies. ■ Avoid undue compliance barriers to new technology or new participants. ■ Enable participation of demand-side and supply-side technologies in electricity markets.
Changing consumer expectations	Consumers may engage with the electricity sector and express individual expectations about reliability, service and price.	■ Recognise differing consumer reliability requirements. ■ Recognise differing consumer service requirements. ■ Facilitate more active demand-side participation in electricity markets. ■ Provide consumer access to industry information and models.

Source: Electricity Authority

Strategic directions

The Authority considers that the challenges facing the electricity sector in the medium to long term highlight the following strategic directions for market development – **reducing barriers**, **facilitating consumer participation**, **providing efficient price signals** and **promoting flexibility and resilience**.

Reducing barriers to entry, exit and expansion

The retail electricity market was opened to competition in 1999, and since then, market shares of incumbent retailers have dropped, smaller retailers have entered the market and there has been considerable investment in new generation and transmission. The development of competitive electricity markets has, overall, delivered long-term benefits to consumers – a reliable electricity supply, access to an increasing range of products and services, and prices reflecting costs of supply.

However, some consumers continue to have reservations about the benefits of competitive electricity markets. In particular, consumers have faced a generally rising trend in prices, which has fostered a feeling that they have not benefited from competition. Many consumers remain sceptical that the commercial disciplines of the market will work in their favour.

Ultimately, competitive electricity markets are only sustainable in the long term if supported by consumers. The Authority and the electricity sector need to create an environment that allows consumers to see and understand the benefits of competition.

A well designed competitive market will facilitate innovation and efficiency by improving operating performance and enabling entry and exit of suppliers and deployment of new technologies.

Initiatives to reduce barriers implemented in recent years are expected to lead to changes in consumers' and participants' views of the competitiveness of the electricity market, especially of the retail market. These initiatives include transferring the Tekapo A and B power stations from Meridian Energy to Genesis Energy; virtual asset swaps between Meridian Energy, Genesis Energy and Mighty River Power; development of a more active hedge market; and the Authority's What's My Number customer switching campaign for households and businesses.

Initiatives being developed or implemented include the introduction of financial transmission rights and more standardised distribution tariffs and use of system agreements.

To further reduce barriers to entry, exit and expansion, the Authority will focus on projects that:

- enable the entry of businesses into electricity markets – the Authority needs to prepare for the emergence of new retailers or the emergence of new 'non-traditional' businesses wanting to supply an electricity-related product or service
- facilitate the exit of businesses from electricity markets – the sector needs to accommodate the exit or failure of suppliers. The failure of a business is common in competitive markets and should be expected and managed.

A key focus of reducing barriers will be to develop regulatory frameworks that are resilient to an uncertain future and can support the new ideas, new technologies and new participants that are likely to arise in a more competitive and changing sector. For example, the Code should not stand in the way of parties wanting to supply innovative services that would deliver a long-term benefit to consumers and should not unnecessarily prescribe particular outcomes.

Initiatives to make industry information and analysis available can also assist entry, exit and expansion by providing parties with an overview of the sector, including potential market opportunities.

Facilitating consumer participation

As the world becomes smarter, there are opportunities to give consumers more control over their electricity use and enable innovation in how they interact with their electricity supply. There are a number of benefits that should arise from a higher level of consumer participation:

- Consumers who actively assess what electricity products are available can benefit as suppliers respond to competitive pressure to offer them a desired price and service bundle.
- Providing consumers with information about their consumption and the ability to manage their consumption and electricity costs will enable them to make decisions that reduce individual electricity bills and help manage periods of supply constraints. Improved demand-side participation will lead to improved reliability, avoid the need for investment in reserve generation or network assets to meet demand and deliver overall efficiency benefits.

Increased consumer participation in electricity markets should boost competitive pressure and deliver them the price and service bundle that they desire. Consumers should become more comfortable and confident that electricity markets are delivering them a long-term benefit if they can engage with electricity in a way that allows them to more readily meet their price and service expectations. There is no reason why electricity should not be seen in the same way as similar retail products such as banking or insurance.

The Authority will focus on projects that facilitate consumers exercising choice of suppliers and products, allow them to more readily influence their own prices and service and enable more active interaction from the demand side. For example, the Authority considers that there is potential for consumers to engage in electricity markets by providing instantaneous reserves (as interruptible load), transmission and distribution alternatives (or load management) and automatic under-frequency load shedding (AUFLS).

Providing efficient price signals

The electricity sector faces uncertainty about electricity demand and supply and about future consumer behaviour and expectations. Knowing the future is impossible, but markets are effective for managing uncertainty, particularly if they provide efficient price signals and incentives to respond to changing market dynamics in both the short term and the long term.

Several initiatives have been implemented to improve price signals and improve the trade-off between price and reliability. These include the implementation of the customer compensation scheme, which requires retailers to pay $10.50 per week to their customers on fixed-price variable-volume tariffs when public conservation campaigns occur. The implementation of an administered scarcity price band in cases of emergency load shedding should provide stronger incentives on parties to provide last-resort plant. The stress-testing regime should also encourage participants to effectively manage their wholesale risks.

Other initiatives include developing a more active market in electricity hedges and the introduction of financial transmission rights.

Prices enable parties to make decisions about use or non-use. Ensuring that prices are efficient (that is, they are a true indication of scarcity or marginal cost) provides the basis for efficient decisions. Making price signal information widely available enables the greatest possible number of parties to make efficient decisions.

The Authority will focus on projects that establish markets where practicable and that allow price information to be available to any party that might use it. One approach the Authority can take is to establish and support markets for electricity services, such as ancillary services. The Authority will also focus on projects that make information available, for example, by improving interfaces between market and operating systems and potential information users.

Flexibility and resilience of the market and of market systems

Flexibility involves being able to respond to circumstances that change over time. Resilience is being able to respond to sudden non-routine events.

Uncertainty about electricity supply and demand combined with changing consumer expectations and rapidly developing technology on both the demand side and the supply side require a flexible electricity sector. Although markets are generally good at adapting to uncertainty as events evolve, the regulatory frameworks should not preclude efficient responses to changing market circumstances. Further, the market and operating systems (such as those used by service providers) should efficiently accommodate evolving electricity markets.

The changing generation mix, especially more wind generation, and the prospect of changes to the nature and extent of demand-side and supply-side participation in electricity markets are likely to require a more resilient market and market systems, for example, to respond to sudden changes in generation or to manage more volatile wholesale and ancillary prices. A key requirement is that the market systems establish and disseminate efficient price signals.

Several initiatives are under way that should enhance the flexibility and resilience of the market. These include the wholesale market information project, which provides for greater disclosure of information relevant to the forward price curve, and the hedge market project, which seeks more active participation and liquidity in the trading of electricity hedge products.

The Authority is engaging with market service providers and the system operator to obtain efficient services, and service delivery systems that have the flexibility to respond to market circumstances. The market systems should not represent a barrier to the market delivering a long-term benefit to consumers.

The Authority will focus on projects that facilitate a flexible and resilient market and market systems. A key focus will be to ensure that the platforms for operating the market efficiently support competitive electricity markets, including by establishing and disseminating efficient price signals (and other relevant non-price information), enabling broad participation in electricity markets and efficiently responding to changing market circumstances.

Strategic approach to market development

The strategic directions will guide the road that the Authority takes towards achieving the CRE aspirations. The intention of the regulatory strategy principles is to describe the vehicle the Authority will use to get there.

The Authority's Consultation Charter, incorporating the Code Amendment Principles, sets out how it will consider possible changes to the Code. The charter is intended to assist the Authority Board, staff, advisory groups and stakeholders to identify proposals that further the statutory objective by only allowing amendments to the Code when a proposal provides a clearly identified efficiency gain or addresses a market or regulatory failure.

The Authority's approach to regulation goes beyond the Consultation Charter and the application of the principles to Code amendment proposals. In many situations, encouraging participants and stakeholders to implement certain arrangements and/or facilitating particular market arrangements can provide a better outcome than mandating a particular outcome or approach by amending the Code.

The core issue for the Authority, as for all regulators, is to strike an effective and credible balance between too much or too little regulation of an activity. Regulating an activity too lightly means the Authority could fail to correct the problem identified and therefore fail to serve the long-term interests of consumers. This could potentially undermine the credibility of electricity markets. On the other hand, regulating an activity too heavily could cause a number of adverse consequences, including encouraging the regulated party to exit the regulated activity, discouraging other parties from entering a regulated activity or encouraging lobbying directed at undermining the durability of arrangements.

The Authority aims to strike the right balance by avoiding 'one size fits all' regulatory solutions. Offering a menu of regulatory options, when possible, allows regulated parties to choose the option that best suits their circumstances.

The Authority has adopted the following **regulatory strategy principles** to guide its approach to regulation through a combination of Code amendments and market facilitation measures:[9]

- As far as possible, adopt regulatory arrangements that move the problem over time to a situation where the first-best solution can be adopted.
- Where possible, avoid 'one size fits all' approaches to regulation when regulating parties that may exit the regulated activity.
- Adopt regulatory approaches that, over time, reveal more about the true nature of the problem and the true constraints on regulatory intervention so that more effective regulation can be designed as the regulatory problem and regulatory constraints are better understood over time. The aim is to address the cause, not the symptom.
- As much as possible, avoid the slippery slope of ever more intrusive interventions arising from poorly designed regulatory interventions.
- Avoid regulatory interventions that are not likely to be credible when adverse events occur.
- Strive to achieve regulatory predictability because this is particularly important when regulating high capital investment industries such as electricity.

These regulatory strategy principles are designed to complement the Authority's overall approach to its role, which places an emphasis on a coherent holistic market design and competition and consumer choice to deliver efficient outcomes, supplemented by effective monitoring of market outcomes and wide dissemination of information.

[9] Electricity Authority, *Path to CRE – Developing the Authority's work programme for 2012 and beyond*, available at www.ea.govt.nz/dmsdocument/11932.

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