ISBN no. 978-1-869453-02-2
Project no. 14.20/13107

Public version

Electricity distributors' performance from 2008 to 2011

Date: 29 January 2013

On 5 February 2013 we made some corrections to the paper. The table below summarises the changes.

Distributor	Change
Buller	corrected information in Table 7.1
Electricity Invercargill	corrected information in Table 13.1; replaced $7.5m with $1m in commentary under Figure 13.3
MainPower	corrected information in Table 16.1
Orion	corrected information in Table 22.1; replaced 'Electra' with 'Orion' in notes to Figures 22.13 and 22.14
OtagoNet	corrected information in Table 23.1
Powerco	corrected information in Table 24.1
The Power Company	corrected information in Table 25.1
Vector	corrected information in Table 29.1; added note under Figure 29.1; corrected Figure 29.17
WEL Networks	corrected information in Table 31.1
Wellington	corrected wording above Figure 32.17
Westpower	corrected information in Table 33.1

Chapter 1 Introduction

Helping customers understand how their electricity distributor is performing

We have written this report primarily for customers of electricity distribution services, by which we mean people who have, and pay for, a connection to an electricity distribution network.[1] This includes both households and businesses. We hope that the information presented here will also be of interest and use to other stakeholders.

We have focused on some key areas of performance

We have not attempted to provide answers on all areas of performance in this initial report. Instead, we have provided an overview of performance across the areas we understand are of most interest to customers:[2]

- **Prices and revenue.** Revenue is the income that electricity distributors receive from customers for providing electricity distribution services. Most revenue comes from line charges. We discuss prices and revenues on pages 16 to 23.[3]

- **Reliability.** The quality experienced by customers has many aspects. Quality may relate to the reliability of the service, voltage stability, the quantity of electricity distributed, any contact with the customer, and the overall customer experience. Reliability of the service is usually considered to be one of the most important dimensions of quality for electricity, and is the one that we focus on in this report. We discuss reliability on pages 25 to 27.

- **Expenditure.** Electricity distributors incur costs from providing electricity distribution services. This expenditure consists of operating expenditure and capital expenditure. The amount of expenditure required to provide a service depends on a wide range of factors, including the age of the network, geography, the configuration of the network, the efficiency of expenditure. We discuss expenditure on pages 28 to 34.

Another important measure of a distributor's performance is its profitability. We have included information on distributors' regulatory profit in this report, but not an assessment of this. An assessment of profitability involves comparing profits earned over a period to a benchmark rate of return. A meaningful assessment is not possible based on the information currently publicly available. We will assess profitability in future reports.

---

1 The legislation that applies to electricity distributors under Part 4 of the Commerce Act 1986 (Part 4) refers to 'consumers'. In this report we refer to 'customers' instead.

2 Last year we sought feedback from our stakeholders, through a survey, about how we are perceived and what you are interested in. Respondents were most interested in price, quality, and costs and cost efficiency, with profitability ranked fourth.

3 Most distributors do not bill customers directly. Instead they bill electricity retailers, who pass the cost on in customers' electricity bills. Electricity retailers may choose to structure final prices differently from distributors. For this reason the prices on your electricity bill may differ from the average prices presented in this report.

We use public information to give an overview of distributors' performance

This report presents public information that is relevant to understanding the performance of electricity distributors—primarily information that electricity distributors are required to publicly disclose under regulations that we set. The information we have used is for the period between 2008 and 2011.[4]

As this report is based on information that was compiled and disclosed by each individual distributor, we gave each distributor an opportunity to verify its information. We have relied on the distributors to ensure that the information about their individual businesses is correct.

In summarising the available data, we have focused on major trends and comparisons. In some places we have noted possible reasons for observed differences between distributors and for a distributor over time. We cannot fully assess the reasons for observed performance based on the information that is currently available. We also need to take care in drawing conclusions as some of the information has not been adjusted for unusual events.

At the end of 2012 we determined new information requirements for electricity distributors.[5] These new requirements should provide the information we, and other interested persons, need to better understand distributors' performance in a number of areas, including profitability. We therefore expect to provide fuller assessments of distributors' performance in the future.

Structure of this report

We have structured this report as follows:

- Chapters 2 and 3 give an overview of the New Zealand electricity industry, the role of electricity distributors, and the role of the Commerce Commission.
- Chapter 4 provides a summary of performance across the electricity distribution sector as a whole from 2008 to 2011. It also discusses what we mean by revenue, prices, reliability, and expenditure.
- We then present an overview of the performance of each electricity distributor.

We would like to hear how useful you found this report

We welcome your feedback on how useful you found this report and what else we can do to help you better understand the performance of electricity distributors. Your feedback will help us to improve reports like this in the future.

Please send your feedback to **regulation.branch@comcom.govt.nz** with "Electricity distributors' performance" in the subject line.

---

4 The information disclosed is available on our website www.comcom.govt.nz and on electricity distributors' websites.

5 Refer to the Commission's website at www.comcom.govt.nz/current-electricity-information-disclosure-requirements/

Chapter 2 Overview of New Zealand's electricity industry

This chapter provides an overview of:

- the main parts of the electricity industry supply chain
- the key features of the New Zealand electricity distribution sector

The main parts of the electricity industry supply chain

Getting electricity to your home or business involves several steps. Electricity is first generated from a variety of sources, before being transmitted across the national transmission grid, distributed down the power lines, and finally delivered to your house. More than 50 businesses across New Zealand play their part in that process.

Figure 2.1: The main parts of the electricity industry supply chain and their role

Generation

Generators produce electricity from renewable sources such as hydro, geothermal and wind, as well as non-renewable sources such as fossil fuels like gas and coal.

Generators contract with Transpower to deliver electricity to retailers or large industrial companies.

Transmission

Transpower runs the national grid, transporting high voltage electricity from the generators to distribution networks. It also transports electricity directly to some large industrial companies.

We regulate Transpower under Part 4 of the Commerce Act.

Distribution

Electricity distributors transport electricity from the transmission grid to homes and businesses. Distributors may choose to bill customers directly, but most bill electricity retailers, who pass the cost on.

We regulate electricity distributors under the Part 4 of Commerce Act.

Retail

Retailers buy wholesale electricity from generators and then sell it to customers.

To get electricity to customers retailers contract with the transmission and distribution networks. Customers' bills usually include the cost of transmission and distribution.

Key features of the New Zealand electricity distribution sector

There are 29 electricity distributors

There are currently 29 electricity distributors operating in New Zealand. Each distributor covers a separate geographic area.

Table 2.1 provides some key statistics for the electricity distribution sector from 2008 to 2011.

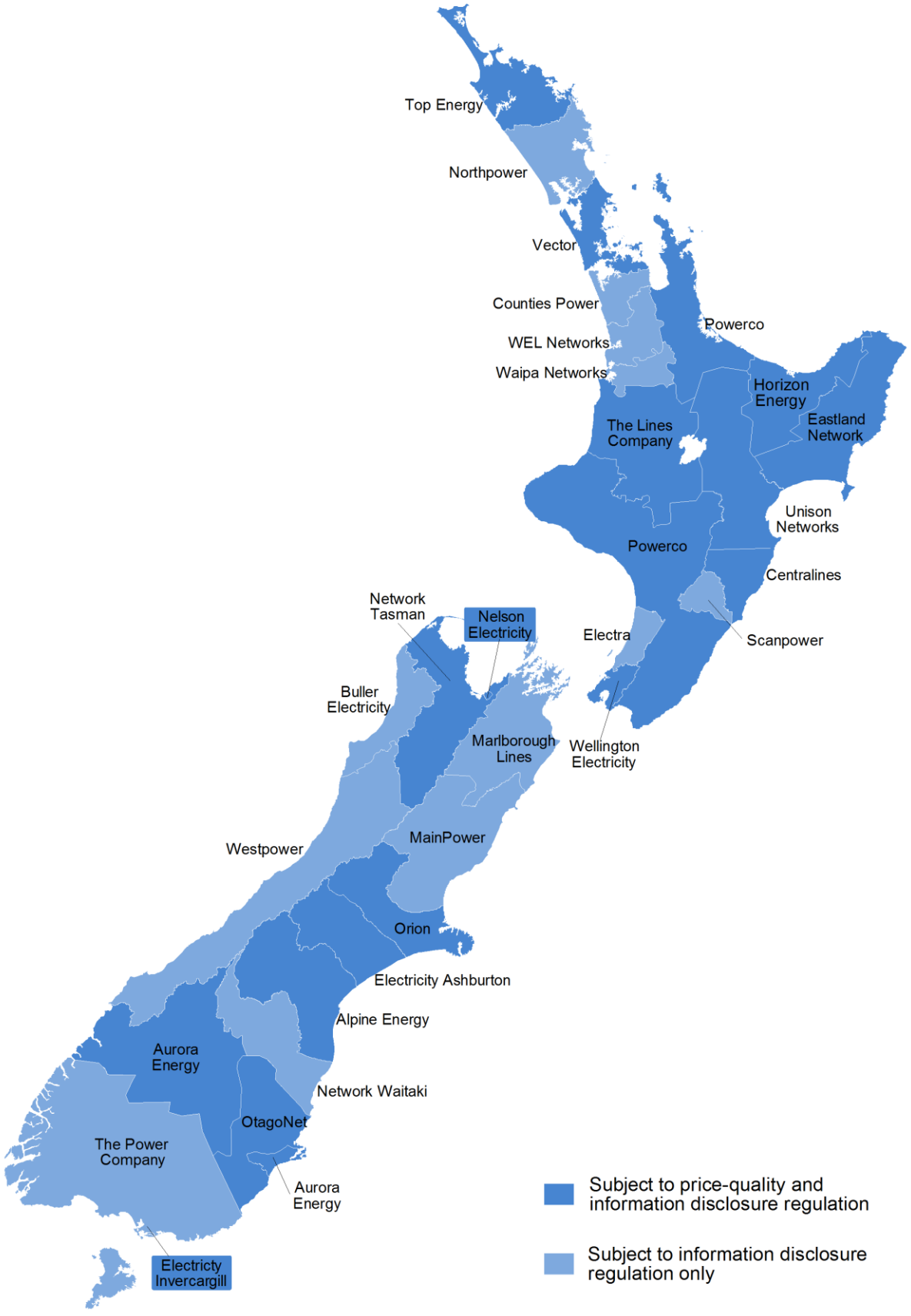
Table 2.1: Key statistics for the New Zealand electricity distribution sector

	2008	2009	2010	2011	Trend growth
Regulatory revenue ($b)	2.0	2.0	2.1	2.1	1.9%
Regulatory asset base ($b)	8.1	8.3	8.5	9.0	3.5%
Operating expenditure ($b)	0.43	0.43	0.45	0.45	2.1%
Capital expenditure ($b)	0.54	0.58	0.54	0.59	1.6%
Regulatory profit ($b)	0.93	0.91	0.82	0.99	0.9%
Electricity delivered (GWh)	30,543	29,901	31,041	30,946	0.8%
Maximum system demand (MW)	6,133	6,122	6,320	6,253	0.9%
System length (km)	145,011	147,253	148,768	149,570	1.0%
Number of customers (million)	1.95	1.98	2.00	2.01	1.0%

Note: The dollar figures in Table 2.1 have been adjusted for inflation. Trend growth is calculated as the average annual percentage growth rate from 2008 to 2011.

The map below shows the location of the 29 electricity distributors, and indicates whether a distributor is subject to both information disclosure and price-quality regulation, or whether it is subject to information disclosure regulation only.

Figure 2.2: Electricity distributors in New Zealand



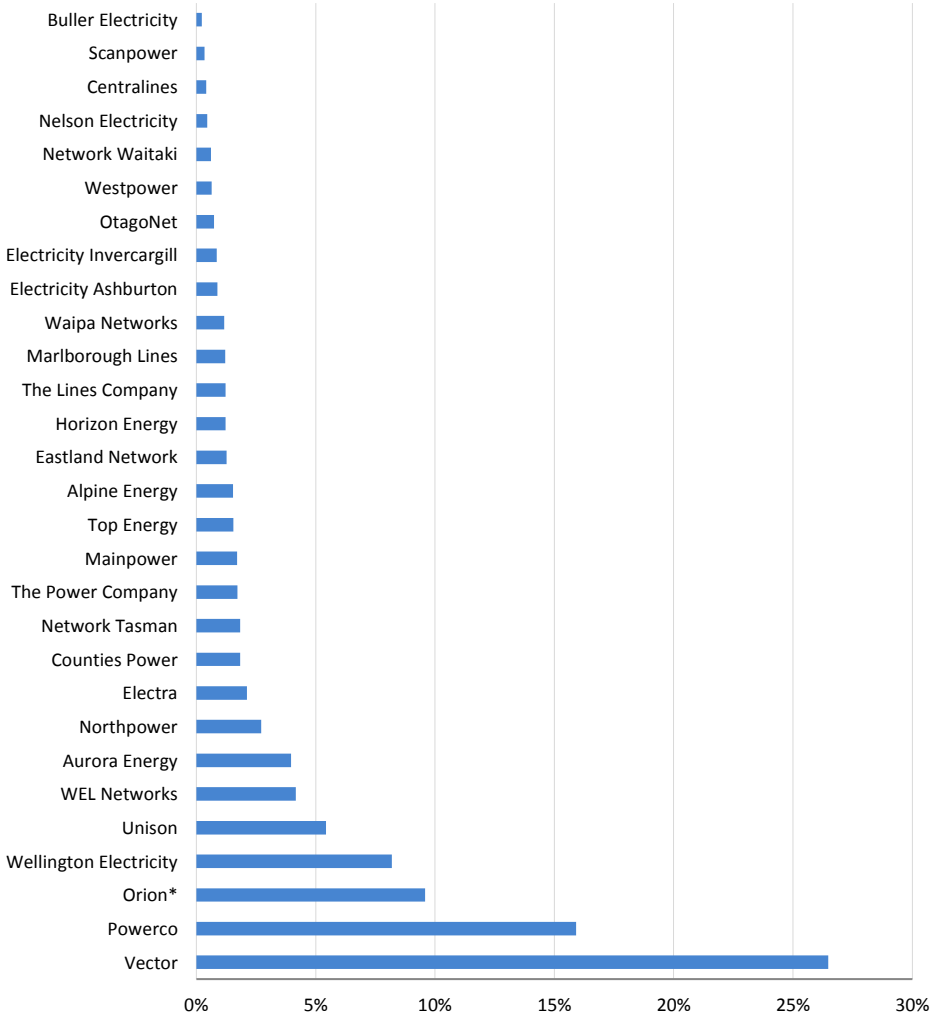
Source: This map contains Critchlow Limited copyright data.

The size of electricity distributors varies widely

The size of electricity distributors varies widely. For example, the smallest business (Buller Electricity) has fewer than 5000 customers, and the largest (Vector) serves over 500,000 customers. The three largest distributors serve over half of the 2million customers in New Zealand.

Figure 2.3 shows the share of New Zealand connection each electricity distributor serves. (One per cent on the figure represents around 20,000 connections.)

Figure 2.3: Share of connections served by each electricity distributor



Note: The figure for Orion is taken from 2010 disclosures. All other figures are taken from 2011 disclosures.

The ownership of electricity distributors is diverse

Electricity distributors use a range of ownership and governance models. Ownership matters because, among other things, it can affect the degree to which the interests of a business, its shareholders, and its customers are aligned.

Table 2.2 shows distributors' ownership models. Community electricity trusts are majority owners in most electricity distributors, though exact shareholding structures may vary. As shareholders, the trusts have rights to appoint directors to the boards of the companies they own.

Table 2.2: Ownership of electricity distributors

Fully owned by consumer trusts
Buller Electricity, Centralines, Counties Power, Eastland Networks, Electra, MainPower, Marlborough Lines, Network Tasman, Network Waitaki, Northpower, Scanpower, The Lines Company, The Power Company, Top Energy, Waipa Networks, Unison Networks, WEL Networks, Westpower
Mixed ownership
Alpine Energy, Electricity Ashburton, Vector
Fully local government-owned
Aurora Energy, Electricity Invercargill, Orion
Other (including fully privately owned)
Horizon Energy, Nelson Electricity, OtagoNet Joint Venture, Powerco, Wellington Electricity Lines

As we explain in Chapter 3, the ownership structure of an electricity distributor determines what form of regulation we must apply to that distributor.

Chapter 3 Our role in the electricity industry

This chapter gives an overview of our role as the economic regulator.[6]

We play a different role in different parts of the electricity industry

The Commerce Commission is one of several organisations with a role in the electricity industry.[7] We are responsible for enforcing the Fair Trading Act and the Commerce Act, which help promote competition. Like all other sectors in New Zealand, the electricity industry is subject to these laws. Electricity transmission and distribution businesses are also subject to economic regulation under Part 4 of the Commerce Act because they face little or no competition.

Why is there little or no competition?

The nature of the electricity industry means that Transpower (the only transmission business) and the distributors are natural monopolies. This means that a single supplier can provide services in a particular market at a lower cost than two or more suppliers. In the case of electricity transmission and distribution, because of the high cost of building a transmission or a distribution network, it is cheaper to build and maintain a single network.

Although it is cheaper to have a single network, having a single network means that any given provider of lines services does not face competition. Competition tends to result in efficient outcomes and promotes the interests of customers in the longer term.

In the absence of competition, the Government has decided that electricity distributors (and Transpower) should be subject to economic regulation.

How we regulate electricity distributors in New Zealand

In regulating electricity distributors, our aim is to promote outcomes similar to those in competitive markets so that customers benefit in the long-term. Customers will benefit if electricity distributors:

- innovate and undertake the right level of investment, at the right time
- use resources efficiently
- charge prices that reflect costs, and share efficiency gains with customers
- earn reasonable returns on their investments
- provide goods and services that customers want, at the quality they demand.

We have two types of regulation to promote these outcomes in the electricity distribution sector— information disclosure regulation and price-quality regulation.

---

6 We also briefly discuss other agencies that have regulatory roles in the electricity distribution industry.

7 Other agencies with roles in the electricity industry include the Electricity Authority, the Electricity & Gas Complaints Commissioner, the System Operator (with respect to security of supply), the Energy Efficiency and Conservation Authority, and the Ministry of Business, Innovation & Employment.

Information disclosure regulation

We require all 29 distributors to publish specified information about their businesses. The purpose of information disclosure regulation is to give transparency about how regulated businesses are performing and to help stakeholders understand whether regulation is working. This transparency should also create incentives for the distributors to improve their performance.

The distributors must publish information such as prices, measures of quality, financial information, plans for managing and investing in their assets, and forecasts of future expenditure (including investment planned in the network). We have set methodologies that the distributors must apply when preparing information, to ensure the information disclosed is consistent.

We summarise and analyse this information (through reports such as this) to help stakeholders better understand the performance of individual distributors, how they are performing compared to each other, and any changes over time. We can also use the information disclosed by distributors to set price-quality paths.

Price-quality paths

Price-quality paths are regulatory controls for distributors that are not consumer-owned, or are consumer-owned and but do not meet certain criteria. Price-quality paths cap the maximum average prices distributors can charge, and require them to deliver services that meet a minimum level of reliability. Under the current default price-quality path for distributors, we set the maximum number of power interruptions and average duration of power interruptions that distributors should not exceed.

Many distributors that are consumer-owned (currently 12) are exempt from these controls. The exemption is based on five criteria, including ownership (the distributor has to be a consumer or community trust, or a customer co-operative) and size (the distributor needs to have fewer than 150,000 customers). An exempt distributor can also lose its exempt status, eg, if customers petition the Commission to put it under price-quality regulation and the Commission and Minister agree, or it no longer meets the criteria for being consumer-owned.[8]

The map in Figure 2.2 shows which suppliers are subject to price-quality regulation and those which are subject only to information disclosure regulation.[9]

Through price-quality regulation we can set maximum average prices that distributors can charge. We do not, however, control what distributors charge individual customers or groups of customers.

---

[8] For more details refer to our website at www.comcom.govt.nz/treatment-of-consumer-owned-electricity-distribution-businesses/

[9] Price-quality paths for electricity distributors may take two forms—a default price quality path, or a customised price quality path that the distributor proposes. Where a distributor proposes a customised path, they must consult their customers on the proposal and show us how they have taken account of their feedback.

The Electricity Authority is responsible for the structure of prices charged by distributors. It encourages electricity distributors to set prices that promote economic efficiency, through a set of voluntary pricing principles.[10] While our price-quality paths constrain the total revenue distributors recover, these principles are concerned with the way prices are set for different customer groups.

[10] You can read more at www.ea.govt.nz/our-work/programmes/transmission-work/principles-or-model-approaches-to-distribution-pricing/#distribution

Chapter 4 Overview of industry performance

Summary of the electricity distribution industry's performance from 2008 to 2011

Recent trends in revenue and demand

- The electricity distribution industry's total revenue increased by around 5% over recent years. Revenue from line charges, which made up most of the industry's revenue, increased by around 8% from 2008 to 2011, or 2.6% per year, over and above inflation. Distribution line charge revenue from residential and smaller commercial customers increased by 11%, and from larger customers by 2%.
- The increase in revenue was mostly due to prices increasing, but some of it was due to increasing demand for electricity distribution services.
- The average price change from 2008 to 2011 varied across customer groups.
    - The average price for residential and smaller commercial customers increased by around 9%. When expressed per unit of electricity delivered the average price increased by around 8%.
    - Although the average price for larger customers decreased by 5%, when expressed per unit of electricity delivered the average price increased by around 2%.
- Industry-wide demand for distribution line services grew modestly from 2008 to 2011. The residential and smaller commercial user customer base grew by 2%, and used 3% more electricity in 2011 compared with 2008. The number of larger customers increased by 7% but consumed similar total amounts of electricity in 2011 and 2008.

Recent trends in reliability

- The average reliability of the distribution industry overall stayed flat but varied widely between distributors. Some distributors had a significantly larger number of outages, and a significantly longer duration of outages than others.

Recent trends in expenditure

- Overall spending in the electricity distribution industry increased from 2008 to 2011. Distributors' total expenditure increased 1.8% per year from $0.97 billion in 2008 to $1.04 billion in 2011 over and above inflation.
- Operating expenditure grew 6% to $454 million from 2008 to 2011, at an annual rate of around 2% per year over and above inflation. The industry's largest category of operating expenditure was general management, administration and overheads, on which it spent around $165 million in 2011.
- Capital expenditure grew 8% to $585 million from 2008 to 2011 over and above inflation. The largest category of capital expenditure was asset replacement and renewal, on which the industry spent around $176 million in 2011.
- Operating expenditure per length of network, per customer and per unit of electricity distributed vary widely between distributors. This may be due to differences between distributors' cost efficiency, or may reflect the characteristics of distributors, including size, geography, and condition of assets.

All dollar figures in this chapter are adjusted for inflation and expressed in 2011 dollars.

The New Zealand electricity distribution sector is very diverse. This chapter gives an overview of performance for the sector as a whole. We have grouped our analysis into:

- Prices and revenue
- Reliability
- Expenditure

We also explain the measures we use in our analysis and why they are relevant to understanding the performance of distributors. We focus on broad trends and comparisons, and possible explanations for what we observe. In future assessments we intend to provide more in depth commentary.

Prices, revenue and demand

What makes up the price of electricity?

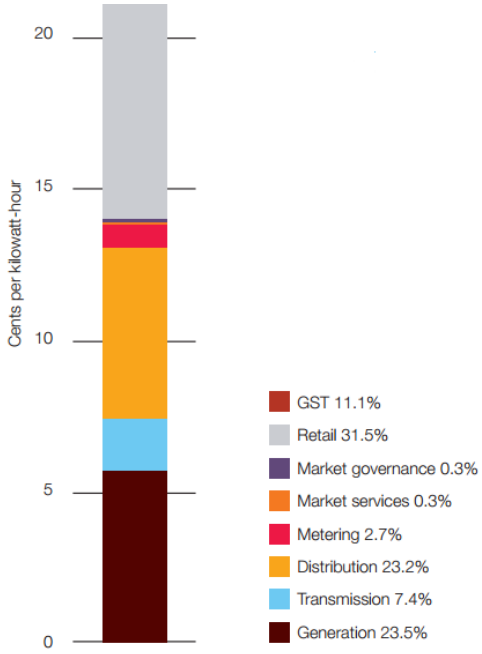
The total price that a customer pays for electricity is made up of several different parts. Through their bill, customers pay for the generation cost of electricity, electricity distribution line charges, electricity transmission line charges, retail costs, and goods and services tax (GST).

Customers pay electricity line charges for services provided by Transpower and their distributor. Transpower transports electricity via its transmission grid from the electricity generator to the distribution network (transmission line charges). The distributor delivers electricity across its distribution network to the customer's property (distribution line charges).

In most cases electricity distributors contract with the electricity retailer to distribute electricity to the customer. This means that the distributor bills retailers for electricity distribution services and the retailer decides how to pass on the costs to residential customers. In most cases the retailer, not the distributor makes the decision on how these charges are shared between different customers.[11]

The makeup of the New Zealand average residential electricity bill in 2010 is shown in the figure below.

Figure 4.1: What are the charges that make up the annual bill of a typical New Zealand residential customer?



Source: Electricity Authority, Fact Sheet 2, Breakdown of a typical bill, www.ea.govt.nz/dmsdocument/13295

[11] The Lines Company charges most of its customers directly. Other distributors sometimes charge their largest customers directly.

The New Zealand average residential customer paid around $1,950 in 2010 for electricity. Of this, 23% was for distribution line charges and 7% for transmission line charges.

The electricity bill amount and breakdown are for an average New Zealand residential customer using 8000 kWh. In practice, the make up and amount of customers' electricity bills vary widely for a range of reasons. We discuss the average bill and the line charges of each distributor in the distributor specific chapters.

How much do New Zealand residential customers pay for lines services?

The annual line charges relative to the representative New Zealand customer's electricity bill are shown below in Figure 4.2. Line charges are broken down into distribution charges and transmission charges in Figure 4.3.

The Ministry of Business, Innovation and Employment (MBIE) defines the representative customer as a residential customer using 8000kWh of electricity a year.[12]

Figure 4.2: Annual electricity bill and line charges for the representative customer ($)

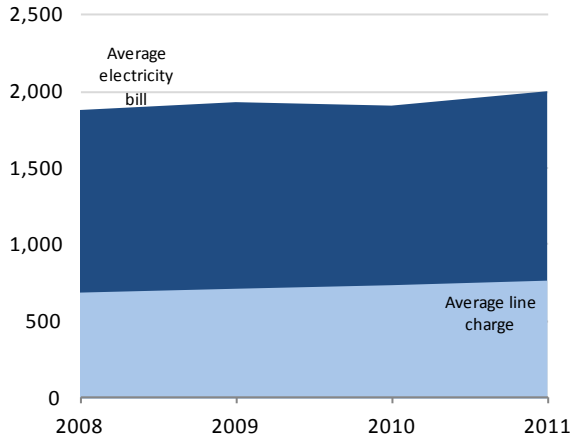
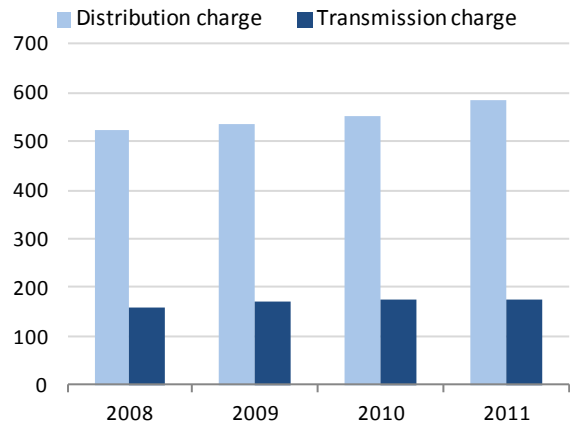


Figure 4.3: Components of the annual line charge ($)



Source: Ministry of Economic Development, Quarterly Survey of Domestic Electricity Prices to February 2011.

The average electricity bill for the representative customer increased around 7% (or around 2% per year) from 2008 to 2011 over and above inflation. The line charge increased by around 11% (or just over 3% per year) over the same period.

In 2011 line charges made up just over a third of the representative customers electricity bill. Electricity distribution charges made up the majority of lines charges. In 2011 distribution charges made up around three quarters of total lines charges for the representative customer. Overall, the industry's distribution line charges for the representative customer grew 11% from 2008 to 2011.

[12] Previously the Ministry of Economic Development published this survey. For details of the survey refer to www.med.govt.nz/sectors-industries/energy/electricity/prices/electricity-tariff-surveys/quarterly-survey

What do we mean by revenue?

Revenue is the income that electricity distributors receive from customers for providing electricity distribution services. Distributors use different 'billed quantities' and prices to bill for their services.

Distributors frequently use the amount of electricity delivered and a fixed connection charge as a basis for billing for their services. It is the electricity retailer who decides how to pass on these costs to customers. Pricing structures vary among distributors, which means that the amount of line charge revenue they get from each billed quantity varies.

A distributor's revenue changes if demand changes (eg, new houses will increase revenue from fixed per connection charges and electricity delivered), or if the distributor changes the price for different billed quantities.

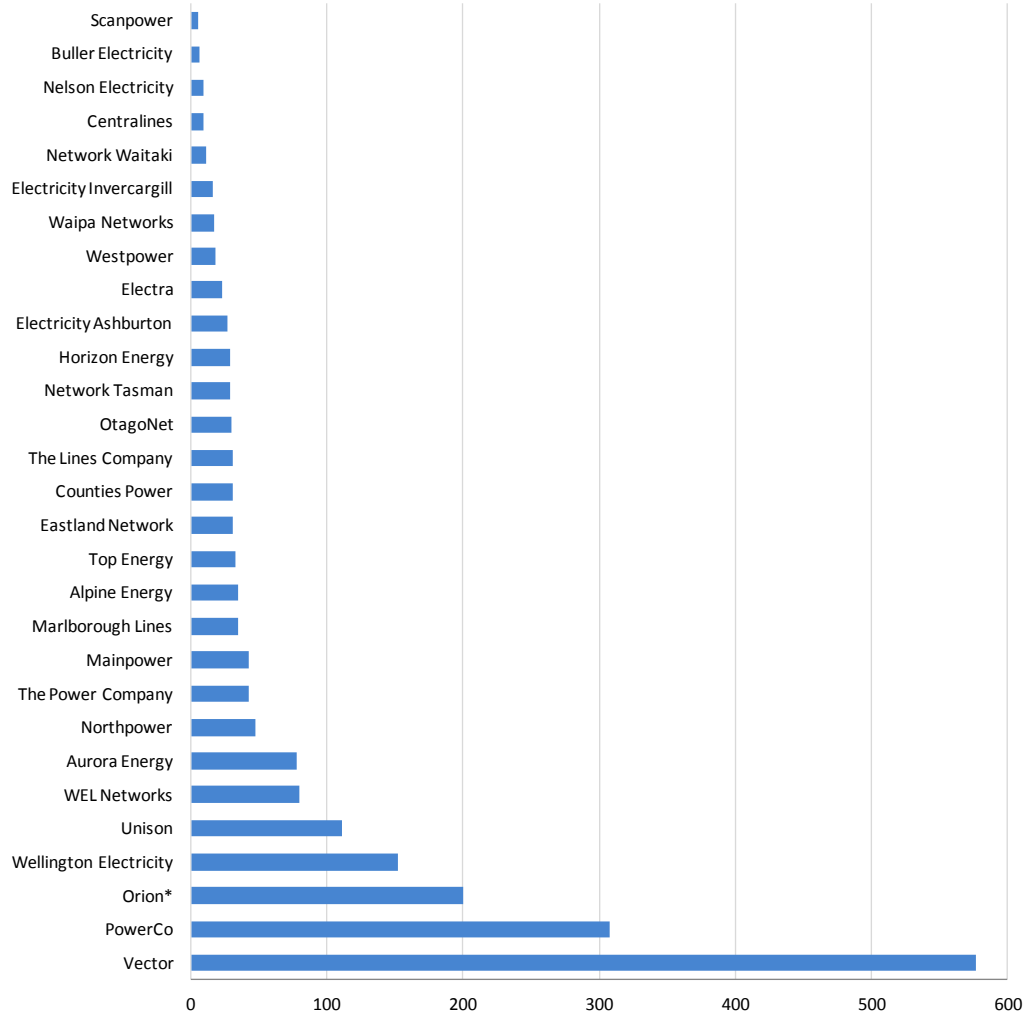
We do not regulate the actual prices that the distributors subject to price-quality regulation charge. Instead we set a maximum limit on the average price they can charge. It is up to them to choose how to set prices for different customers subject to the Electricity Authority's oversight including their voluntary pricing principles.[13]

Revenue varies across the industry

Distributors' revenue in 2011 was $2.1 billion, compared to $2.0 billion in 2008. Over half of revenue was made by the three largest distributors. The figure below shows each supplier's revenue. Revenue also includes a small amount of other income that is typically not received through line charges.

[13] For a brief discussion of the Electricity Authority's role in electricity distribution pricing refer to page 12.

Figure 4.4: Regulatory revenue by electricity distributor ($m)



Note: The figure for Orion is taken from 2010 disclosures. All other figures are taken from 2011 disclosures.

What makes up revenue?

An electricity distributor's revenue mostly comes from distribution charges.[14] Distributors also receive some revenue from other sources, most notably from capital contributions and vested assets. This revenue is typically received for connecting larger customers to the network.

The amount and makeup of the industry's revenue are shown in Figure 4.5, and the trends in the individual components of total revenue are shown in Figure 4.6.

[14] Distributors also recover transmission charges from retailers. This is simply a financial transaction where distributors pass the transmission charges from Transpower to retailers, and these in turn pass them on to customers.

Figure 4.5: What makes up revenue? ($'000)

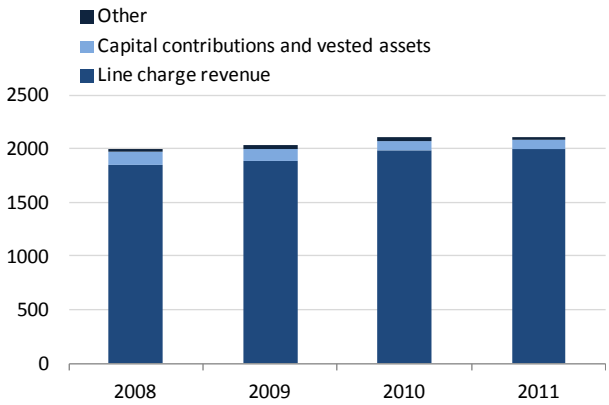
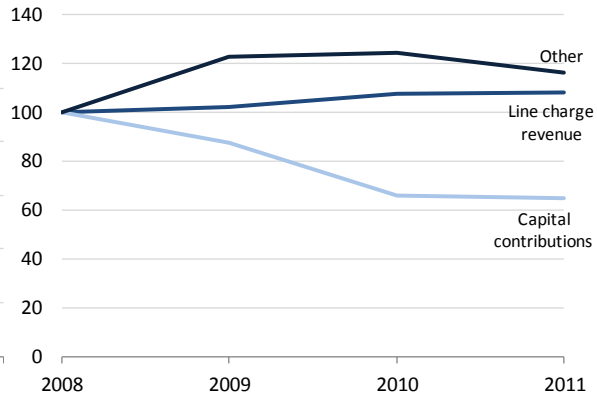


Figure 4.6: Change in revenue components (2008=100)



The contribution by different sources of revenue to overall revenue changed very little between 2008 and 2011.

From 2008 to 2011 the electricity distribution industry's total revenue increased by 5%. Revenue from line charges increased by 8%, revenue from capital contributions declined by 35%, and revenue from other sources increased by 16% over that period. Capital contributions and revenue from other sources are typically only paid by larger customers.

Below we split the revenue growth into growth in average prices, demand and different customer groups to help understand what is driving the changes.

Distributors report line charge revenue by four customer groups

To help people understand how electricity distributors are pricing, we require them to publish information on revenue by four customer groups:

- **Small connection points**, a group of customers that typically consists of residential users and small commercial users
- **Medium connection points**, a group of customers that typically consists of commercial users
- **Large connection points**, a group of customers that typically consists of industrial users
- **Largest five connection points**, the five largest customers of a distributor, where size is measured as the amount of electricity a customer uses over a year.

For the industry overview we have grouped customers into 'small' and 'larger' users to make them comparable. The group of small customers includes small connection points; the group of larger customers includes medium, large and the largest five connection points.

Distributors may choose the criteria for allocating customers into each group themselves and so there is variation in definitions. For a given distributor, the groups are usually

consistent across years and we have noted when this is not the case and aggregated groupings to achieve consistency.

The revenue measures shown in Figures 4.2 and 4.3 (and in the distributor specific chapters) and those shown for the small customer group cannot be directly compared. This is because the definition of the representative customer is different from that used for the small-sized customer group.

Total line charge revenue by customer group is shown in Figure 4.7, while the trends in revenue by customer group are shown in Figure 4.8.

Figure 4.7: Total line charge revenue from different customer groups ($m)

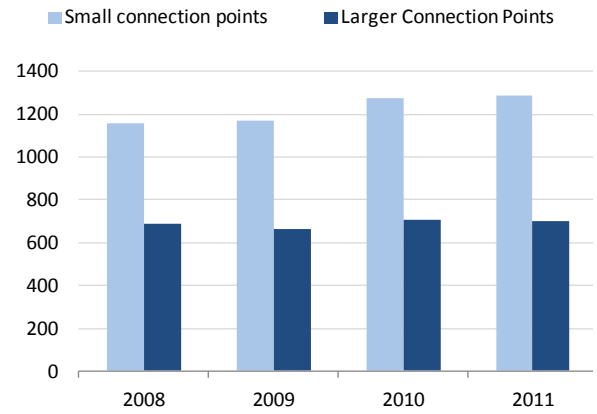
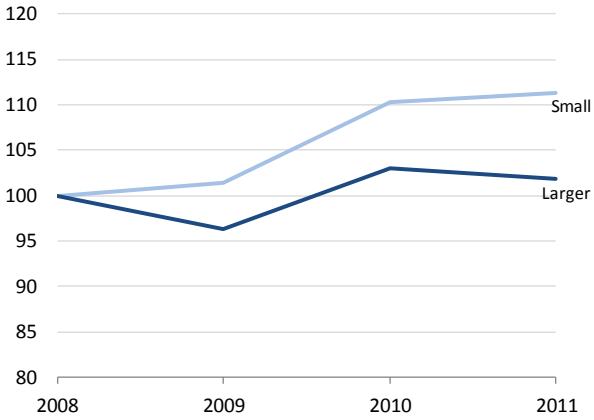


Figure 4.8: Change in line charge revenue by customer group (2008=100)



The electricity distribution sector as a whole receives around two thirds of its line charge revenue from small connection points, which are typically residential and smaller commercial users. Line charge revenue from small connection points and larger connection points has grown by 11% and 2% respectively from 2008 to 2011.

What is the average price of distribution lines services?

We use average line charge revenue as a measure for the price of distribution lines services charged to customers. There is a wide range of different prices and pricing plans across the industry. Dividing the revenue received from a given group of customers by a billed quantity gives us a comparable measure of the average price. Electricity distributors frequently use the amount of electricity delivered and a fixed connection charge as a basis for billing for their services. We have used those two measures for calculating average prices.

To better understand whether it is price or quantity that has driven the change in line charge revenue for a customer group, it is useful to look at the average line charge revenue per customer in that group, and the average line charge for each unit of electricity delivered to that group.

Average line charge revenue per connection by customer group is shown in Figure 4.9 and the trends in average line charge revenue per connection by customer group are shown in Figure 4.10.

Figure 4.9: Average distribution line charge revenue per connection ($'000s)

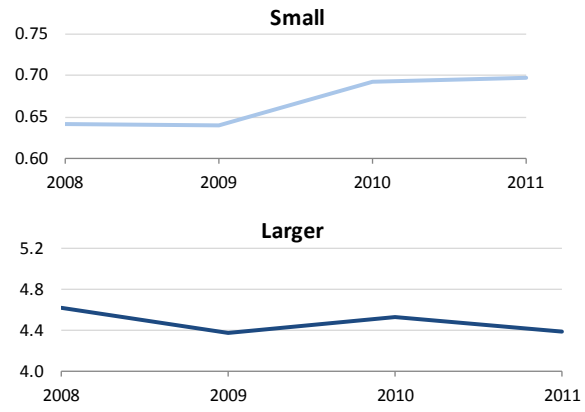
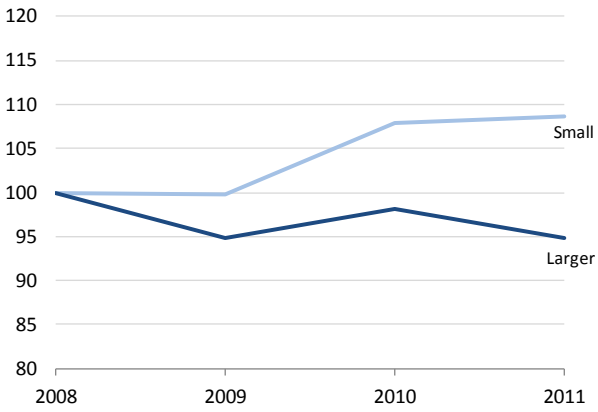


Figure 4.10: Change in average distribution line charge revenue per connection (2008=100)



Line charge revenue per larger connection is more than six times that of small connections. Average line charge revenue per small connection increased 9% from 2008 to 2011, while that for larger connections decreased by 5%.

Based on the number of connections as a measure of quantity the industry billed for it is likely that the representative customer's electricity bill (see Figure 4.2) has risen at least in part due to an increase in line charges.

The average line charge revenue per unit of electricity by each customer grouping between 2010 and 2011 is shown below in Figure 4.11. We compare trends in average line charge revenue by customer group in Figure 4.12.

Figure 4.11: Average line charge revenue per kWh of electricity delivered (cents)

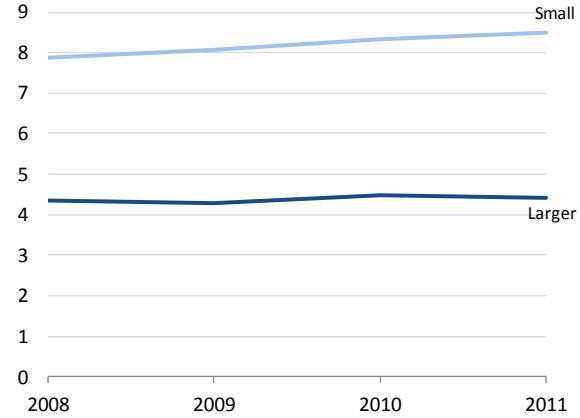
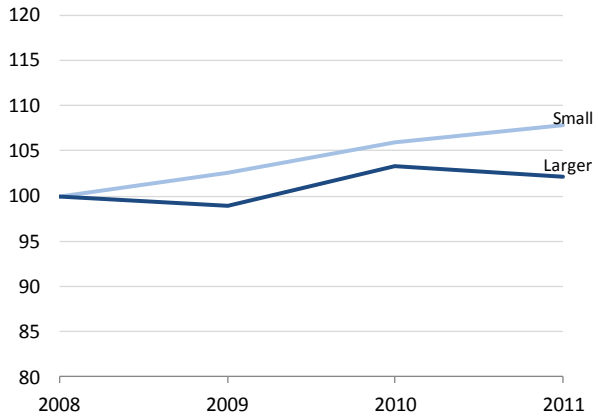


Figure 4.12: Change in average line charge revenue per kWh of electricity delivered (2008=100)



The average line charge revenue per unit of electricity was nearly twice as large for small-sized customers compared to large-sized customers. Average line charge revenue per unit of energy increased around 8% for small-sized users from 2008 to 2011 and around 2% for larger-sized users.

Based on units of electricity delivered as a measure of quantity the industry billed for it is likely that the representative customer's electricity bill (Figure 4.2) has risen at least in part because of an increase in prices.

While the trend above suggests that the average price for smaller customers has risen faster than that of larger customers, there may be other billed quantities relevant to larger customers only which could further influence the analysis. In particular, larger customers are often billed on the basis of capacity rather than per connection charges or charges based on the amount of energy delivered.

How many customers are connected to the network?

The number of connections in New Zealand and the trends in the number of connections by customer groups are shown below in Figures 4.13 and 4.14.

Figure 4.13: Number of connections by customer group ($'000)

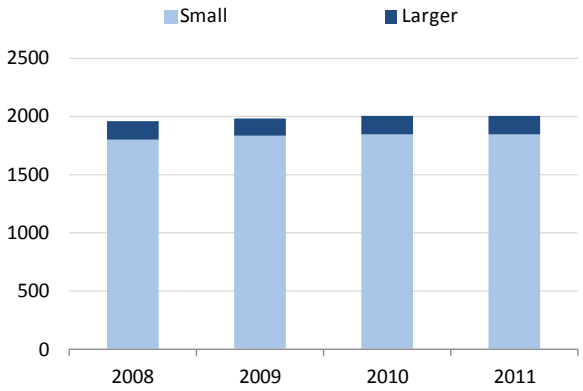
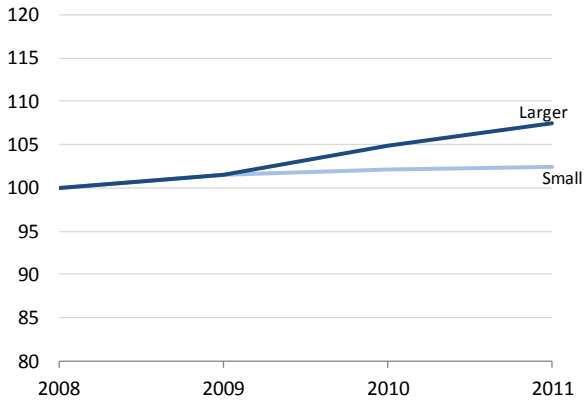


Figure 4.14: Change in number of connections by customer group (2008=100)



A large majority of the connections within the industry are with small customers, ie residential users and small commercial users. The number of small connections increased around 2%, while the number of larger connections increased around 7% from 2008 to 2011.

How much electricity do customers use?

The breakdown of electricity consumption by each customer group, and the trends in consumption are shown below.

Figure 4.15: Total electricity consumption by customer group (GWh)

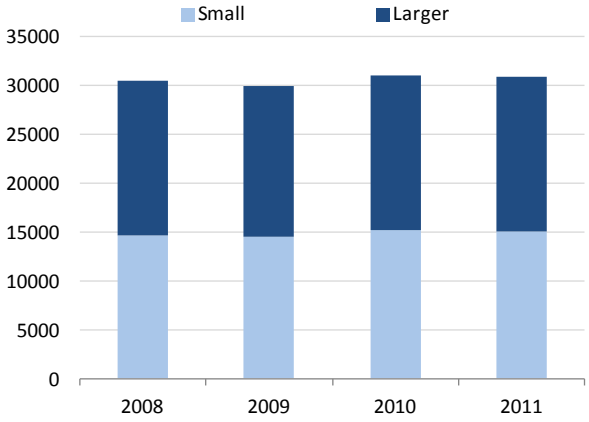
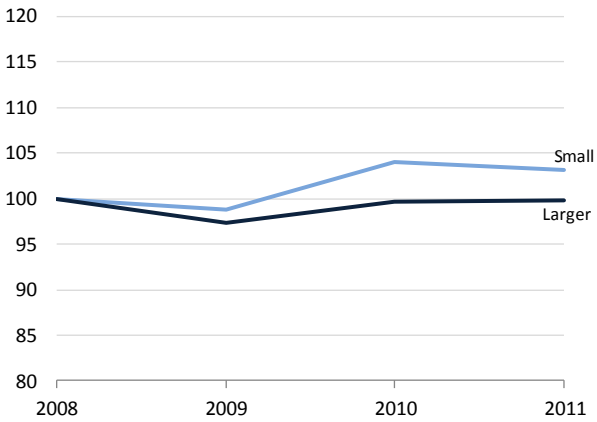


Figure 4.16: Change in electricity consumption by customer group (2008=100)



Small-sized customers consumed around half of total electricity delivered from 2008 to 2011. The small-sized customer group increased electricity consumption by 3% from 2008 to 2011. The larger-sized customer group consumed a similar amount of electricity in 2011 as in 2008.

How reliable is electricity distribution in New Zealand?

Network reliability is a key indicator of quality

The quality of service experienced by an electricity distributor's customers has many aspects. Quality may relate to the reliability of the service, voltage stability, the quantity of electricity distributed, the customer experience when dealing with distributors, and the overall customer experience.

Reliability of service is usually considered to be one of the basic dimensions of quality for electricity distribution. Customers usually expect to be able to access their electricity with the flick of a switch.

Reliability of service is usually measured by counting the number of times a customer was without power (number of outages), and the length of time a customer was without power (the duration of outages).

Industry trends in network interruptions

We currently require electricity distributors to report on the following indicators of network reliability: [15]

- **The average duration of interruption** measures the average total minutes that customers are without electricity over the year; ie, what was the average duration of any power cuts?[16] The average duration of interruption includes both planned and unplanned minutes without electricity.

- **The average frequency of interruption** measures the average number of times per year that customers are without electricity; ie, on average, how many power cuts did customers experience?[17] The average frequency of interruption includes both planned and unplanned interruptions.

The 12 electricity distributors that are only subject to information disclosure regulation are not required to maintain quality at any particular levels. They must simply report their actual performance.

The 17 electricity distributors that are subject to price-quality regulation (as well as information disclosure regulation) are required to maintain the average duration of interruption and average frequency of interruption for their network below a certain threshold. The threshold is currently based on their average historical performance.

---

15 Service quality is an area that will be explored further in consultation with the electricity distribution sector and other interested persons. This may lead to additional measures of service quality being examined in the future.

16 The technical term for the average duration of interruption is System Average Interruption Duration Index (SAIDI).

17 The technical term for the average frequency of interruption is System Average Interruption Frequency Index (SAIFI).

Below we report distributors' actual performance in the average duration of interruption and average frequency of interruption for the industry overall.

Average duration and frequency of interruption for the industry

The trends in duration and frequency of interruption for the industry are shown in the figures below.

The reliability of distributors varies across the industry. To illustrate this we provide an indication of the spread of the durations and frequency of interruptions among distributors and over time. We report the maximum, minimum and median observations for each of the reliability measures. We also report the 25th percentile (referred to as Q1) as well as the 75th percentile (referred to as Q3). These measures mean that one quarter of electricity distributors have reliability measures in between the 25th percentile and the minimum and one quarter have reliability measures between the 75th percentile and the maximum.

Figure 4.17: Average industry duration of interruption

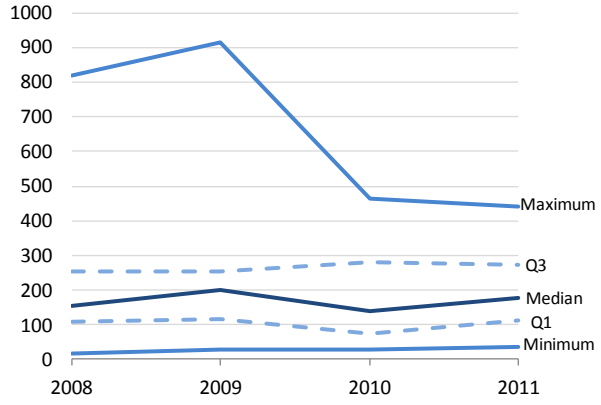
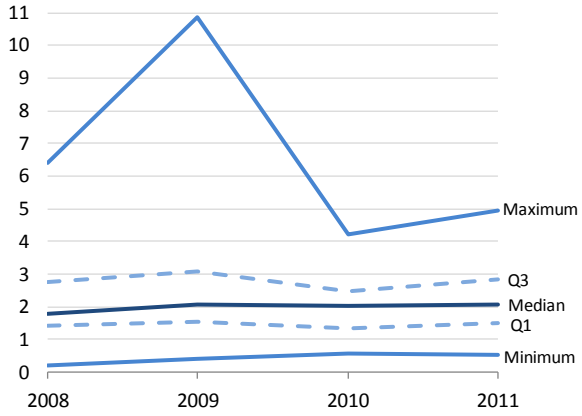


Figure 4.18: Average industry frequency of interruption



Note: Q1 represents the 25th percentile, Q3 represents the 75th percentile.
Source: Electricity distributors' compliance statements and information disclosures.

From 2008 to 2011 the median duration of interruption was flat, as were the minimum, 25th quartile and 75th quartile. The maximum duration of interruption declined from 2008 to 2011. This reflects improvements in the reliability of Top Energy (the electricity distributor with the maximum duration of interruptions in every year).

The median frequency of interruptions was flat from 2009 to 2011 as were the minimum, 25th percentile and 75th percentile. The maximum frequency of interruptions declined from 2008 to 2011 reflecting reliability improvements by Top Energy.

We found that on average the reliability of distributors only subject to information disclosure was similar to that of suppliers also subject to price-quality regulation.

For distributors that are not subject to price-quality regulation, the average number of network interruptions and the average duration of network interruptions have not been

adjusted for major event days.[18] Such events may be considered to be beyond the control of the supplier. This means that the number of outages of suppliers only subject to information disclosure regulation (and shown in this report) may be higher than that of distributors also subject to price-quality information because of a difference in the definition of outages, not because of a difference in performance.

[18] Certain extreme events on the network are classified as major event days. Information on major event days is used to adjust the average duration and frequency indices. Major event days are identified using industry standards developed by the Institute of Electrical and Electronics Engineers Power & Energy Society.

Expenditure

What do we mean by expenditure?

Electricity distributors incur costs through providing electricity distribution services. This expenditure consists of operating expenditure and capital expenditure. We are interested in total operating expenditure and capital expenditure between 2008 and 2011 as indicators of the spending by electricity distributors operating, maintaining and renewing their networks.

Operating expenditure consists of network operating expenditure (eg, maintenance) and non-network operating expenditure (eg, finance and IT). Capital expenditure consists of network capital expenditure (eg, the purchase of new network assets) and non-network capital expenditure (eg, the purchase of office buildings).

Total expenditure has increased

Overall spending in the electricity distribution industry increased from 2008 to 2011. Distributors' expenditure increased around 7% (or 1.8% per year) from $0.97 million to $1.04 billion. This increase is made up of operating expenditure which grew 6% to $454 million and capital expenditure which grew 8% to $585 million from 2008 to 2011.

The largest five distributors account for a large share of total expenditure in the industry. From 2008 to 2011 the share of expenditure of smaller distributors increased because their spending grew faster than that of larger companies. This can be shown by comparing growth in industry average expenditure and the growth in median expenditure.[19]

- The industry average operating expenditure grew 6% to $16 million, while industry average capital expenditure grew 8% to $20 million.
- The median industry operating expenditure grew 13% to $8 million while median industry capital expenditure grew 33% to $11 million from 2008 to 2011.

While we can make broad comparisons between distributors…

Expenditure should be spent efficiently. The efficiency with which distributors incur costs determines whether they get the most out of their operating and capital expenditure. We have selected indicators of scale that allow us to make broad comparisons of operating and capital expenditure between suppliers and over time:

- For operating expenditure we use the number of customers that an electricity distributor has, the amount of electricity delivered to customers and the length of the distribution network.
- For capital expenditure we use the number of customers that an electricity distributor has, the amount of electricity delivered to customers and the Regulatory Asset Base (as a broad indicator of the rate at which assets are being replaced).

[19] The industry median expenditure represents the mid-amount of expenditure among the 29 distributors in the industry. Because the largest distributors account for a large share of spending in the industry the median expenditure is below the average expenditure.

…it is not yet possible to make assessments of efficiency

Currently disclosed information on expenditure can only offer partial answers for assessing electricity distributors' performance, including distributors' efficiency.

The level of efficient operating and capital expenditure does not just depend on the scale of network (such as that measured by the number of customers or the length of network) but also on other factors such as changes in the cost of inputs, and other characteristics of distributors, including the condition of assets, the growth in new connections, and the geographic characteristics of a network.

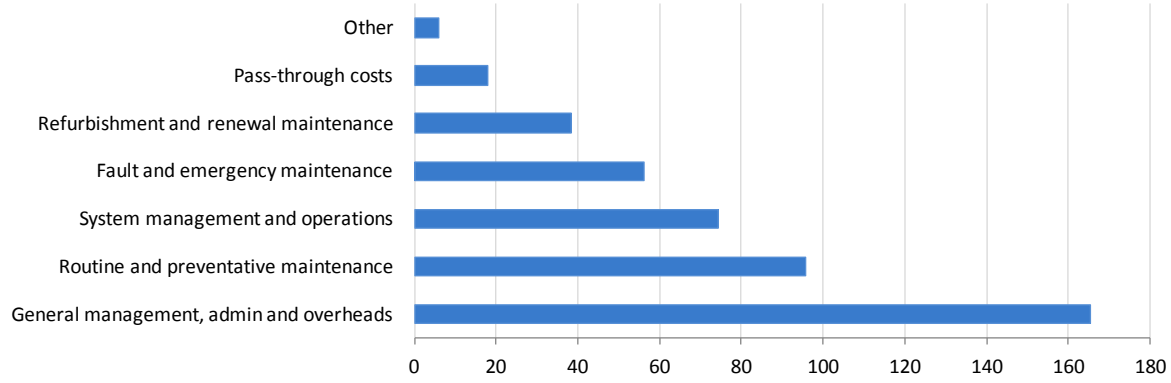
These factors need to be taken into account when assessing a distributor's efficiency relative to other distributors and a given distributor's efficiency over time. Without a closer look at these factors, it is not possible to draw any firm conclusions about whether electricity distributors are operating and investing efficiently.

How much has the industry spent on the distribution network in recent years?

What does the industry spend on each of its main operating activities?

The makeup of the industry's 2011 operating expenditure is shown in Figure 4.19, while the trends in total, network and non-network operating expenditure from 2008 to 2011 are shown in Table 4.1.

Figure 4.19: Composition of operating expenditure 2011 ($m)



The industry's largest category of operating expenditure is general management, administration and overheads, on which it spent just over $165 million. Most of the remaining categories relate to network management and maintenance.

Understanding operating expenditure over time

The table below shows operating expenditure for the industry overall between 2008 and 2011.

Table 4.1: Operating expenditure trends from 2008 to 2011 ($m)

	2008	2009	2010	2011	Trend growth 2008 to 2011
Network operating expenditure	-	-	194	190	
Non-network operating expenditure	-	-	229	240	
Pass-through and other costs	-	-	26	24	
Total operating expenditure	429	433	449	454	2%

Note: The trend growth is calculated as the average annual percentage growth rate in total operating expenditure.

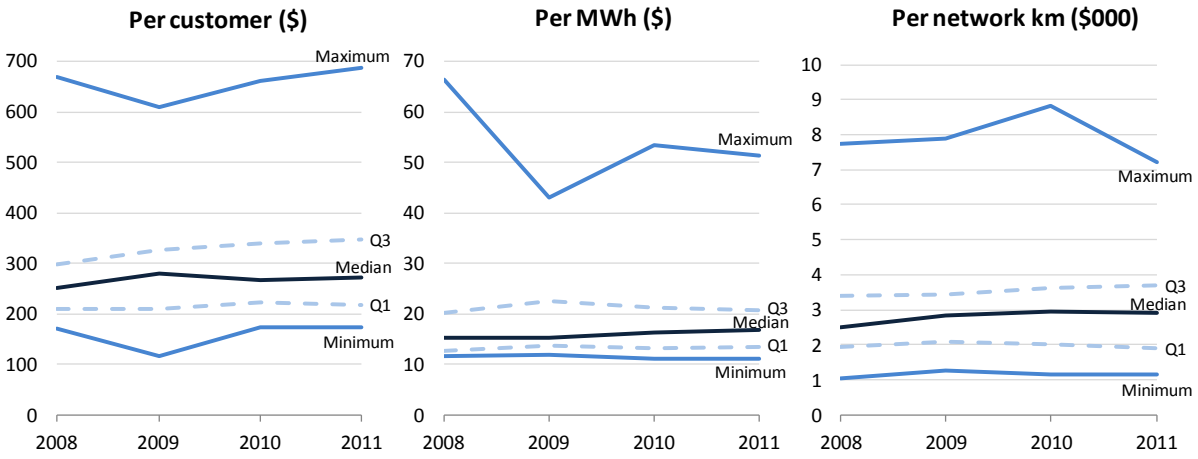
In 2010 and 2011 the industry spent more than half of its operating expenditure on non-network-related activities. The trend growth in operating expenditure was 2% per annum from 2008 to 2011.

Understanding trends in operating expenditure per unit

The level of operating expenditure required by the industry depends on the particular characteristics of the New Zealand electricity distributors and will vary between distributors. For example, the more customers a distributor serves, and the larger the total size of its network, the higher operating expenditure is likely to be.

As broad indicators of operating expenditure efficiency, we relate operating expenditure to the number of customers in New Zealand, the total distribution network length, and the units of electricity delivered to customers.

Figure 4.20: Operating expenditure per unit



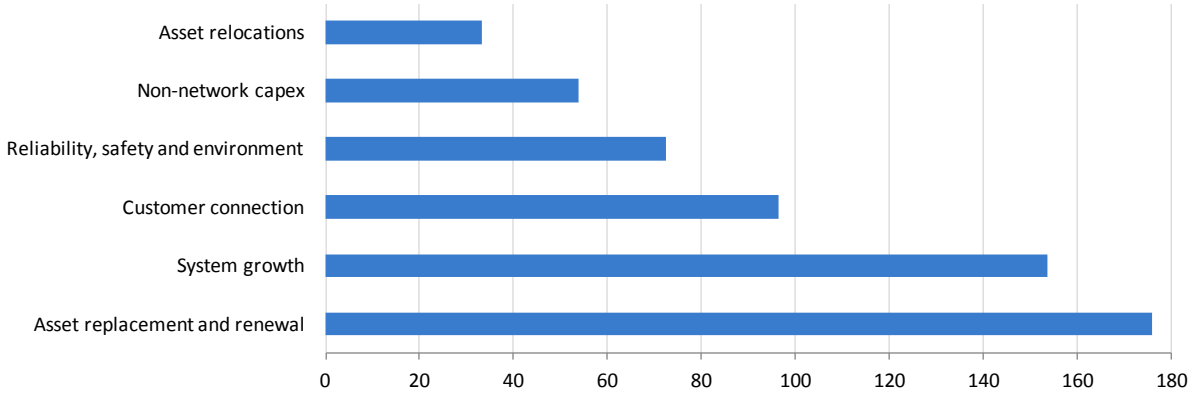
The median level of operating expenditure per customer and network length indicates a general increase in operating expenditure from 2008 to 2011. The 25th and 75th percentiles of operating expenditure per customer and per network length indicate a general increase

in diversity of operating expenditure patterns within the industry. From 2008 to 2011 the maximum operating expenditure per km of network and per unit of electricity declined.[20]

What types of investment has the industry recently made?

Capital expenditure is focused on delivering lasting services to customers over the longer term. For an individual electricity distributor it can vary significantly from year-to-year depending on the projects undertaken. The industry-wide make up of capital expenditure in 2011 is shown in Figure 4.21 below.

Figure 4.21: Composition of capital expenditure 2011 ($m)



Note: Customer connection capital expenditure includes expenditure that is recoverable in total, or in part, by capital contributions.

The largest category of capital expenditure was asset replacement and renewal, on which the industry spent just over $176 million. This was followed by expenditure on system growth and customer connections.

Understanding capital expenditure over time

The table below shows capital expenditure for the industry overall between 2008 and 2011.

Table 4.2: Capital expenditure trends 2008 to 2011 ($m)

	2008	2009	2010	2011
Network capital expenditure	514	551	502	531
Non-network capital expenditure	28	27	39	54
Total capital expenditure	543	578	541	585

Over 90% of capital expenditure from 2008 to 2011 was spent directly on the distribution network.

Understanding capital expenditure per unit over time

As with operating expenditure, the level of capital expenditure required by a distributor depends on the particular characteristics of the distributor. For example, increases in capital

[20] Without a more detailed assessment of the causes of the changes, it is not possible to conclude whether this change represents an improvement in the operating expenditure of the more inefficient distributors.

expenditure may result from the need to connect new customers or upgrade the lines, or the need to replace or refurbish ageing assets.

In the chapters for individual distributors we show unit capital expenditure for each distributor. We show capital expenditure per customer, per unit of electricity, and per unit of Regulatory Asset Base (as a broad indicator of the rate at which assets are being replaced). Such measures are useful for comparing between distributors as they provide a starting point for asking why differences between distributors exist. There is a range of possible reasons for differences, including the length of the network needed to serve customers, population growth, geography, the condition of assets, and efficiency.

We do not show these ratios for the industry overall because more detailed analysis would be needed to make such comparisons meaningful.

How much is the industry planning to spend on the network in the future?

To operate, maintain and enhance its assets to deliver the services customers want, the electricity distribution industry must continue to spend on its network. Each electricity distributor reports its planned expenditure in its Asset Management Plan.

Information disclosure requires electricity distributors to provide five year forecasts of expenditure. Expenditure forecasts are important for understanding whether electricity distributors are managing their assets for the long-term benefit of customers.

We show the five-year expenditure forecasts provided in 2009, 2010 and 2011 relative to actual expenditure in the following years and the changes in forecasts year-to-year. We do not currently have the information to analyse fully why there are changes in forecast expenditure or why there are differences between actual and forecast expenditure. Possible reasons for differences include the uncertainty associated with any forecast, a change in efficiency over time, and poor forecasting.

Forecasts of operating expenditure

Forecast network operating expenditure for the 2009, 2010 and 2011 forecast rounds and actual network operating expenditure in 2010 and 2011 are shown in Figure 4.22. To help understand the accuracy of previous forecasts, the differences between actual and forecast network operating expenditure in 2010 and 2011 are shown in Figure 4.23.

Figure 4.22: Network operating expenditure actual and forecast ($m)

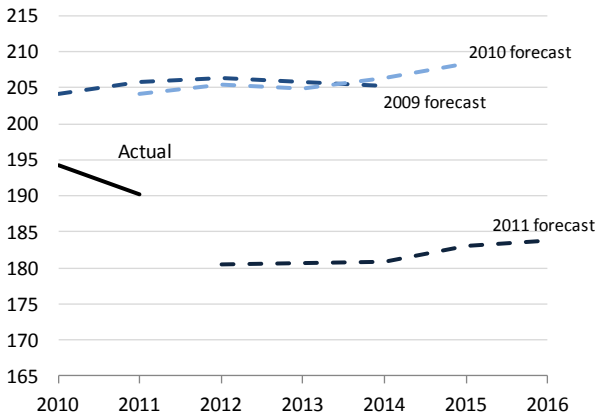
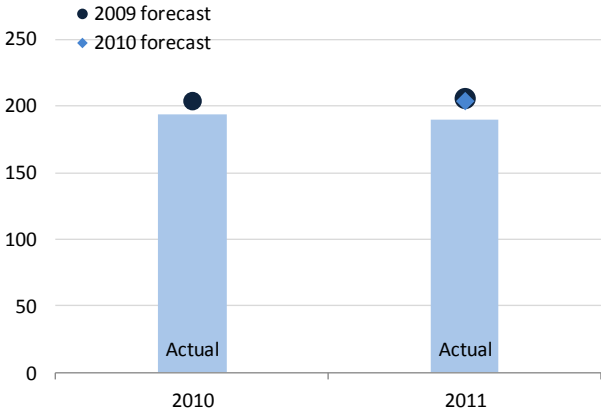


Figure 4.23: Difference between actual and forecast network operating expenditure in ($m)



Note: The scale in the figure was chosen to highlight the differences between the 2010 and 2011 forecasts.

In all the forecast rounds network operating expenditure is forecast to grow modestly in the near future. The 2011 forecast of future expenditure is significantly lower than previous forecasts. The 2009 forecast was higher than actual expenditure in 2010 and 2011 and the 2010 forecast was higher than the 2011 actual expenditure.

The differences between actual and forecast network operating expenditure for 2010 and 2011 are shown below in Table 4.3.

Table 4.3: Difference between actual and forecast operating expenditure

	Actual ($m)	2009 forecast ($m)	Difference	2010 forecast ($m)	Difference
2010	194	204	-5%	-	-
2011	190	206	-8%	204	-7%

Industry forecasts of network operating expenditure were in the order of 5% to 8% higher than actual network operating expenditure.

Forecasts of capital expenditure

Forecast network capital expenditure for the 2009, 2010 and 2011 forecast rounds and actual network capital expenditure are shown in Figure 4.24. To help understand the accuracy of previous forecasts, the differences between actual and forecast network capital expenditure in 2010 and 2011 are shown in Figure 4.25.

Figure 4.24: Network capital expenditure actual and forecast ($m)

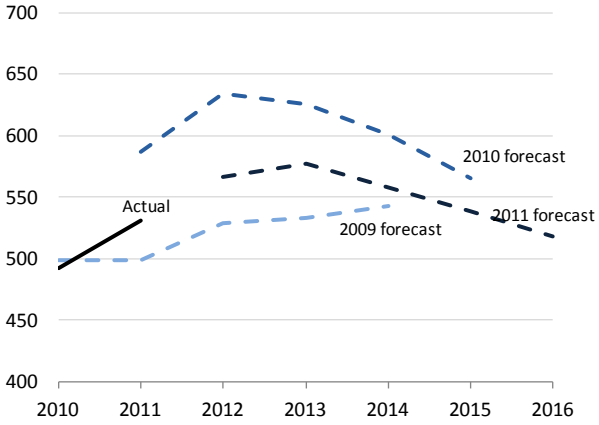
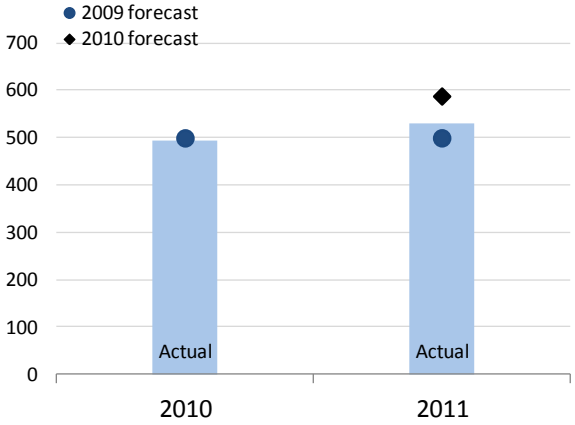


Figure 4.25: Difference between actual and forecast network capital expenditure ($m)



The 2009, 2010 and 2011 set of forecasts indicates an expectation of a rising level of network capital expenditure which peaks around 2012/13 and then tail off over time. The 2009 forecast was very close to actual expenditure in 2010 but under forecast 2011 expenditure. The 2010 forecast was higher than actual 2011 expenditure.

The differences between actual and forecast network capital expenditure are shown in Table 4.4.

Table 4.4: Difference between actual and forecast operating expenditure

	Actual ($m)	2009 forecast ($m)	Difference	2010 forecast ($m)	Difference
2010	502	499	+1%	-	-
2011	531	499	+6%	587	-10%

The 2009 forecast was around 1% higher than actual 2010 expenditure and 6% higher than actual 2011 expenditure. The 2010 forecast was 10% lower than actual 2011 expenditure.