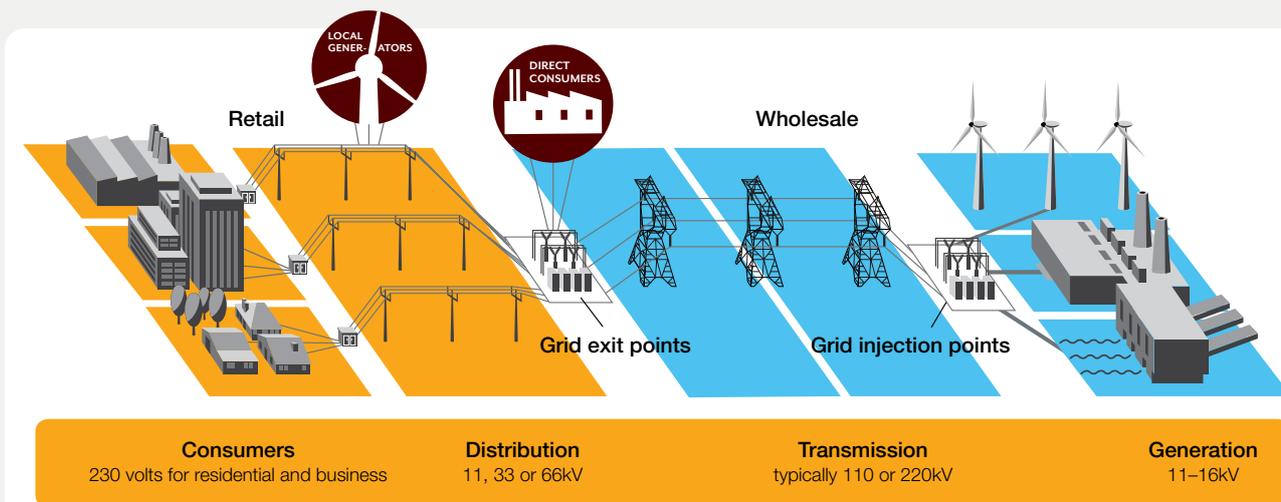


## The supply chain

The exact amount charged by retailers to supply electricity to a household varies depending on the retailer and type of consumer account, but electricity bills generally reflect the costs incurred by participants across the electricity industry. This fact sheet describes the industry structure and is the first in a series outlining how the costs<sup>1</sup> are made up and how they compare to prices paid by other consumers such as business customers.

### The electricity supply chain in New Zealand



Source: 2011 Electricity Authority *Electricity in New Zealand*.

Most electricity is produced by generators located well away from where it is eventually used. This is often because of the geographical location of energy sources, for example, rivers used for hydro-generation, geothermal fields, or the location of good wind generation sites. There are also other factors to consider when placing large generation close to consumers and communities.

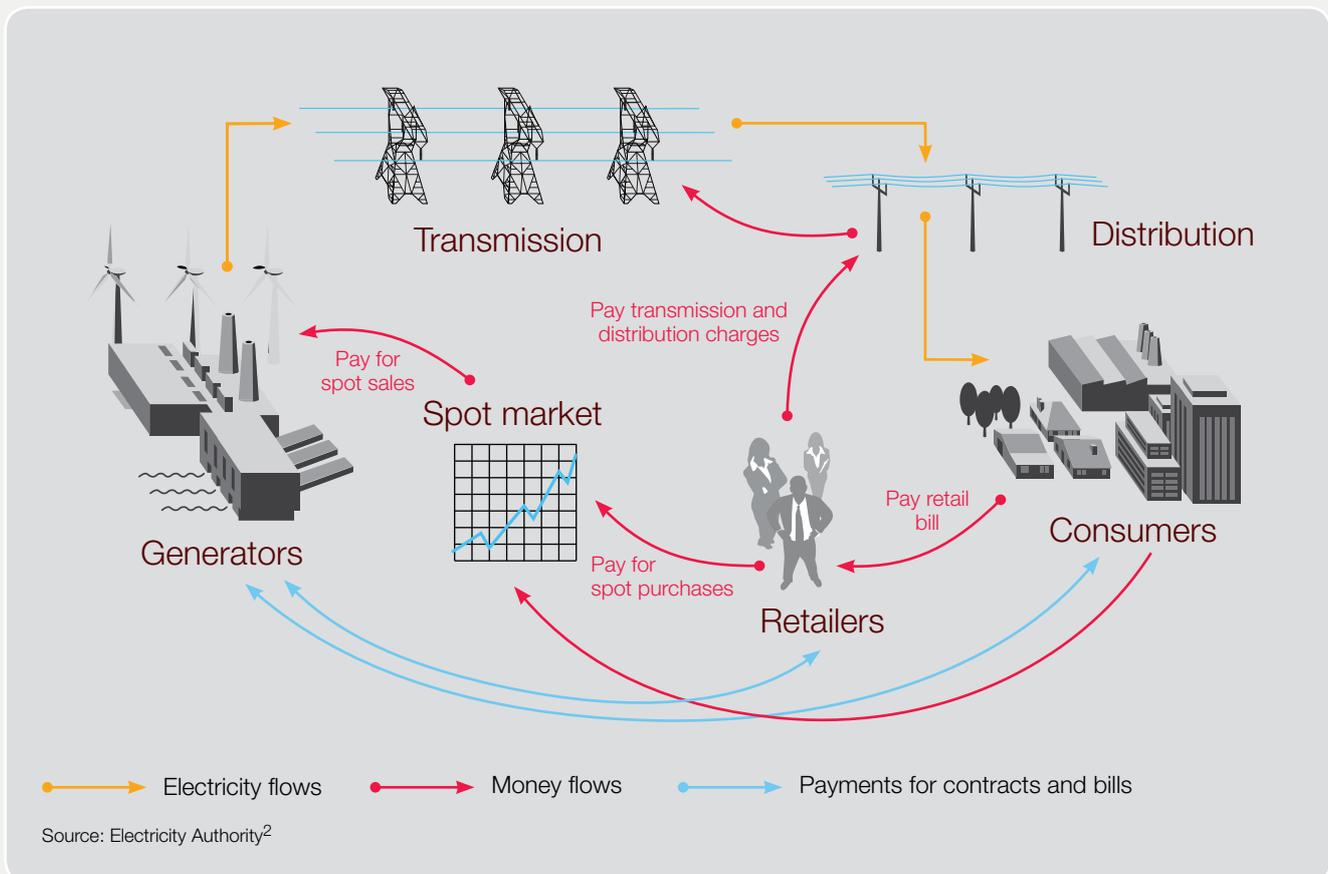
Around 90 percent of the total electricity New Zealanders use passes through the high voltage transmission system that spans the country and is known as the national grid. The transmission system delivers electricity at high voltage to substations in each area. Large cities may have several substations serving them and in a few cases electricity is supplied directly to large industrial consumers such as the Tiwai Point aluminium smelter. Local distribution systems take the power delivered to each substation and deliver it at lower voltages to homes and businesses. The remaining 10 percent of electricity that doesn't pass through the transmission system is generated by plant that is directly connected to the local distribution system or, in the case of some large industrial consumers, by their own on-site generation.

90 percent of the total electricity New Zealanders use passes through the high voltage transmission system

1. The term 'cost' in this paper includes the costs associated with producing electricity, including any profits.



## Participants and money flows in the electricity industry



Retailers purchase electricity from generators and charge consumers for its use. The sale and purchase of electricity between generators and retailers is carried out in the wholesale electricity spot market. Many retailers operate their own generation, but because of the way that both consumption and generation change over time, all retailers need to buy electricity through the wholesale market at times. In most areas, retailers also manage recovering local distribution system costs from consumers, and the cost of metering.

Other costs that make up consumers' electricity bills include the costs associated with running the electricity system and the markets, and systems that support it.

The organisations that carry out these functions are referred to as market operation service providers and include:

- **Operating the system**

The system operator coordinates the operation of the various generators and the transmission system. The amount of generation always needs to be matched to the amount of demand at any time to maintain a stable transmission system. The system operator does this in a way that minimises the total cost of generation, while ensuring that enough generation and transmission capacity is held in reserve so that unexpected events can be managed without interrupting supply to consumers.

The amount of generation always needs to be matched to the amount of demand

- **Pricing, reconciliation and clearing**

These activities relate to the operation of the wholesale electricity market, and determine how much revenue each generator receives through the market, and how much each retailer must pay the market for the electricity that they sell to consumers.

2. Excluding money flows associated with financial instruments such as hedge contracts. A hedge contract is an agreement between two parties used to manage price risk in the wholesale electricity market.

- **Wholesale market information system**

This is the information system that manages data provided by industry participants that is needed for both system and electricity market operation.

- **Registry**

The registry is used to manage residential and business consumers' connections, and for when consumers switch from one retailer to another. The registry is a common system for all retailers to use to avoid unintended power disconnections when consumers switch retailers.

- **Electricity Authority**

The Electricity Authority oversees the rules that the industry must operate under, known as the Electricity Industry Participation Code 2010 or the Code. The Authority provides information to, and monitors the industry, and maintains the contracts with the various market operation service providers. Energy efficiency programmes are run by the Energy Efficiency and Conservation Authority (EECA). The consumer switching fund, used to encourage consumers to find the best power deal for themselves, is run by the Electricity Authority and the Ministry of Consumer Affairs.

The costs of the market operation service providers, the Electricity Authority, and the energy efficiency and consumer switching activities are funded through the Electricity Industry Levy which is set out in Government regulations. The levy is paid by companies generating, retailing or distributing electricity. The costs of the levy are passed to consumers through the prices charged by retailers.



Power in the community: the Breakers basketball team in action at the North Shore Events Centre.



**Fact sheets in this series** cover topics including the electricity supply chain, breakdown of a typical bill, price comparisons between different consumer groups and internationally, and projecting future costs. The full set can be found at [ea.govt.nz/consumer/factsheets](http://ea.govt.nz/consumer/factsheets)

