Summary of report on historical analysis of electricity costs

28 January 2014

Background

The Electricity Authority has prepared a breakdown of electricity industry costs since 1974 to look at what has driven changes in electricity prices over the last 40 years and to investigate Geoff Bertram's claim that consumers have been over-charged for electricity for more than 30 years. The analysis includes results of new modelling work that estimates the generation costs associated with supplying different types of load. This has been combined with historical cost data to indicate the costs incurred to supply electricity to different consumer groups, and to compare these costs with the electricity charges paid by those groups.

Key findings

The analysis shows:

- electricity charges were far below the cost of supply for many decades, and that current electricity charges are actually below the costs incurred to supply electricity. This finding is contrary to Geoff Bertram's claim that consumers have been over-charged for 30 years and that consumers have already paid off past investments
- setting current electricity charges on the basis of historical cost could increase prices for consumers, rather than reduce them
- historically, commercial consumers have paid a high proportion of the costs to supply them, whereas households paid a very low proportion until the 1990s
- charges to households prior to the 1980s failed to cover the historical cost of generation and often made no contribution to covering other costs such as distribution, transmission, retailing, metering and GST
- rises in household electricity prices since 1985 reflect efforts to gradually lift prices to the levels needed to cover the full cost of supplying electricity
- although average costs reduced in the 1990s, they increased quite sharply from the early 2000s as a result of increasing fuel costs, the increase to GST in 2010 and more recently increases in transmission and distribution charges
- currently, residential consumers appear to be paying charges commensurate with the historical cost to supply them whereas some commercial and industrial consumers are

paying considerably less than full historical cost (but more than short run marginal cost) to supply them

- new entry generation costs are likely to be lower than historical generation costs. In a competitive environment, the most efficient response by participants is to charge consumers at a rate consistent with new entry costs.

The Authority is continuing to promote this efficient response by reducing barriers to entry, developing the hedge markets, and promoting and enabling retail competition and switching.

The analysis was not intended to examine the efficient level of costs for each year or whether current prices reflect efficient costs:

- the report examines the actual costs incurred to build generation plants in New Zealand, whereas the value of the assets transferred to generators when they were corporatised in the 1990s were adjusted to reflect expected future earnings
- the report compares prices against the actual costs to supply electricity to test Geoff Bertram's claims (stated above) – quite a different approach would be required to examine whether costs are efficient, how prices adjust to changes in efficient costs and whether the current approach to setting prices (relying on competition) produces the best outcomes for consumers.

About the analysis

Historical construction, operating and fuel costs for electricity generation plant from 1907 to the present day were collated and analysed. This data was then used to determine the total historical cost of generating electricity in each year (from 1974 to 2013), under various assumptions as to weighted average cost of capital, taxation, and asset re-valuations on the transfer from Government to SOE and private ownership.

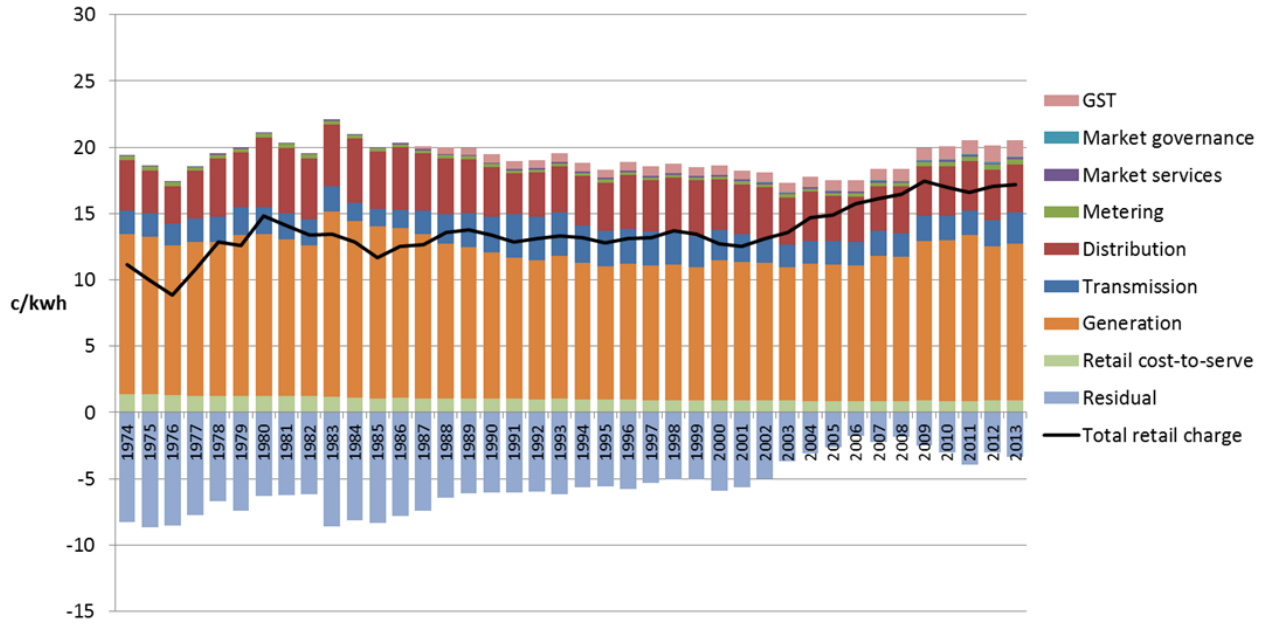
The analysis has also gathered information on transmission and distribution costs, metering costs, retail cost to serve, and market governance costs.

This information has been used to construct a stack graph of the components of cost contributing to the estimated retail price paid, shown in Figure 1 below. The parts where the graph is negative indicate under-recovery of historical costs.

The figure shows retail cost components averaged over all classes of consumer (residential, commercial and industrial), in real 2013 dollars. The average retail price has not increased significantly over the period due to the weighting of the industrial and commercial sectors which

declined or stayed at similar level in real terms even as real prices to residential consumers increased.

Figure 1 Average consumer cost breakdown based on estimated average generation costs



Background notes

- The analysis is based on Ministry of Business, Innovation and Employment (MBIE) data, as well as data from a range of sources including New Zealand Electricity Department and other company annual reports and documents.

- The review has been on the Authority's work plan since 2010, but was commenced in February last year partly in response to Geoff Bertram's claim that consumers have been over-charged for 30 years, which was prior to the announcement of the NZ Power central buyer proposal in April 2013.

- We estimated system costs of generation and calculated average costs per year. We also looked at the lumpiness of residential consumption compared to industry consumption profiles which tend to be very flat. Residential consumers' consumption is much more variable and so it is more expensive to service for generators (as they have to build peaking plant).

- The analysis has involved collation of substantial quantities of historical data going back to 1907, and all data, models and assumptions will be available to interested parties.

- The analysis and material have been peer reviewed by New Zealand Institute Economic Research (NZIER) and are available at www.ea.govt.nz.