



economics

Report to:

Office of Leader of Opposition, NZ Labour Party

RESULTS OF MODELLING ECONOMIC IMPACT OF ELECTRICITY PRICE CHANGES

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Economic Impact of Electricity Price Changes

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1 Overview

The BERL computable general equilibrium (CGE) model was used to estimate the economic impact of a one-off reduction in the user cost of electricity.

This reduction is postulated to arise from the actions of a regulator/single buyer basing decisions on the historic capital costs of generator assets. Calculations of the consequential reduction in electricity costs were provided to BERL by the Office of the Leader of the Opposition. These changes were input by BERL into the CGE model with the results being observed.

The results of two model simulations are presented in this note. These were, as follows

- a \$500m reduction in electricity costs, with 67% of the cost reduction targeted on the residential sector, and the remainder pro-rata (based on existing use shares) across the industrial and commercial sector – labelled 5H
- a \$700m reduction in electricity costs, with 67% of the cost reduction targeted on the residential sector, and the remainder pro-rata (based on existing use shares) across the industrial and commercial sector – labelled 7H.

The percentage changes in per-unit electricity costs to the user in each of these simulations, as provided by the client, were as follows.

Electricity user cost % change	simulation	
	5H	7H
for residential sector	-10.3	-14.43
for industrial and commercial sector	-4.85	-6.75

2 Headline results

Compared to the business as usual (BAU) outcome these simulations result in

- higher real household consumption by between 0.3% and 0.5%
- higher real export volumes by between 0.1% and 0.2%
- higher real GDP by 0.2%
- lower consumer prices by between 0.2% and 0.3%
- higher employment by between 5,000 and 7,500 full-time equivalent (FTE) positions
- an improvement in the government's crown balance by between \$200m and \$270m (excluding the direct loss of revenue from lower generator dividends and lower tax receipts from their reduced profits).

Table 1 Model results of impact of electricity cost changes

	% Δ on BAU	
	5H	7H
Real GDP		
Household consumption	0.33	0.47
Investment	0.00	0.00
Government consumption	0.00	0.00
Stock change	na	na
Exports	0.14	0.19
Imports	0.23	0.33
GDP	0.17	0.24
Capital stock	0.00	0.00
Employment FTEs	0.27	0.38
Mean wage rate	0.01	0.01
Mean profit rate	0.42	0.59
Price indices		
GDP deflator	0.18	0.25
Output prices	-0.08	-0.11
Consumer prices	-0.21	-0.29
Real wage rates	0.21	0.30
	absolute Δ on BAU	
	5H	7H
Employment FTEs	5.4	7.5
Govt accounts balance \$m	198.7	276.8

3 Discussion

The channels through which these results accrue vary across the sectors

3.1 Household sector

For the household, the reduction in the cost of electricity flows through as an effective increase in the real purchasing power of its disposable income. Nominal wage rates are (by model assumption) unchanged and thus real wage rates increase as consumer prices decline. This additional income is divided between additional spending and saving, consistent with the model's standard default assumptions as to expenditure and savings ratios.

3.2 Industrial and commercial sector

For producers, the reduction in the cost of electricity improves their cost competitiveness (vis-à-vis overseas producers). Producers increase output in response to the increased demand from the domestic household sector, as well as to take advantage of their improved competitiveness status in the external sector.

Output is increased through expanding employment, as the availability of physical capital resources are fixed (by model assumption). Consequently, profitability is improved (compared to the BAU) as extra output and sales are achieved with the given amount of capital resources.

The impact of the electricity cost changes would be larger should the change in competitiveness and profitability encourage and attract increased investment in the industrial and commercial sector. Such investment, leading to the greater availability of physical capital resources, would enable a larger economy-wide impact. However, such an outcome is not (by model assumption) captured in these results.

For completeness, note that if the economy-wide availability of labour resources was constrained, then the impacts of the electricity cost changes would be noticeably smaller. However, we are comfortable that the assumption of unemployed resources being available to the industrial and commercial sector is an appropriate setting for these model simulations.

3.3 Government accounts

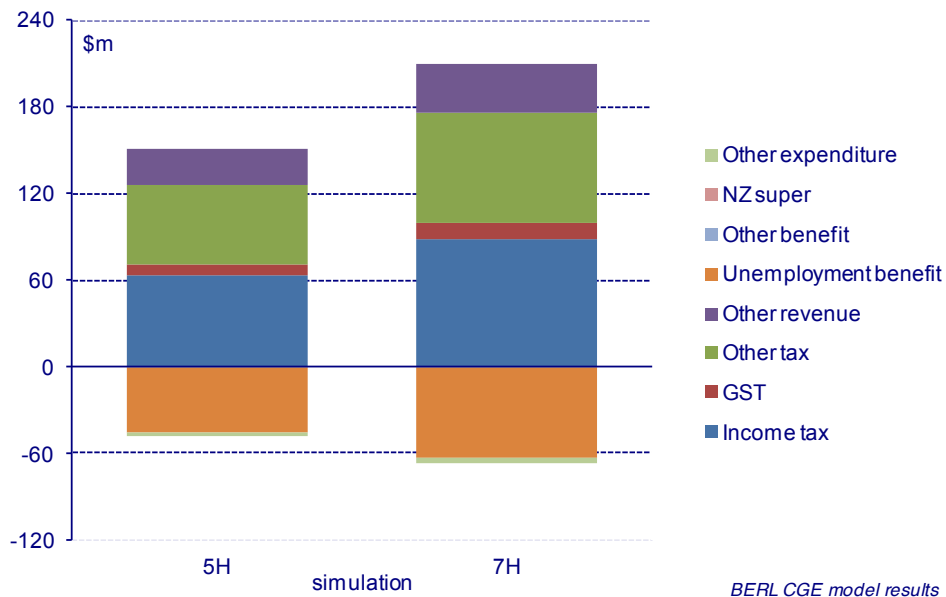
For the government accounts, increased employment and profitability result in increased tax revenue. GST revenue also rises in line with the higher consumption spending. Other

revenue increases in line with the change in nominal GDP, consistent with the standard default model routines.

Increased employment results in reduced expenditure on unemployment benefits. Although benefits are usually adjusted for changes in consumer prices, the client advises that in this case benefit rates would not be adjusted for the one-off impact of electricity price changes¹. That is, benefit rates would remain the same as assumed in the BAU. NZ superannuation benefit payments are tied to changes in nominal wage rates, and so remain unchanged in the model simulations.

Additionally, as a consequence of the lower level of prices across the economy, government consumption and investment nominal expenditure (which is held unchanged in real volume terms by model assumption) is lower than in the BAU.

Figure 1 Impact on government accounts²



Note that the model's calculation of the impacts on the government accounts exclude the direct loss of revenue from lower generator dividends and lower tax receipts from the generator's reduced profits. These calculations were outside the scope of our brief – however, we understand that the client has calculated these direct impacts themselves.

¹ We understand that discretion as to the indexation of benefits to consumer prices has been exercised in the past; for example, to exclude adjustments in tobacco excises from the annual adjustment to benefit rates.

² Excluding the direct loss of revenue from lower generator dividends and lower tax receipts from their reduced profits.

Table 2 Impact on government accounts³

	absolute Δ on BAU	
	5H	7H
Govt accounts \$m		
Balance	198.7	276.8
Income	150.3	209.9
Expenditure	-48.4	-67.0
Income tax	63.2	88.1
GST	8.1	11.0
Other tax	54.5	76.4
Other revenue	24.5	34.3
Unemployment benefit	-45.4	-63.5
Other benefit	0.0	0.0
NZ super	0.0	0.0
Other expenditure	-2.9	-3.4

3.4 Sector impacts

The BERL CGE model comprises 53 separate industries, with Table 3 listing the impacts of gross sector output for the aggregated primary, manufacturing and services sectors.

Table 3 Impact on gross output of sectors

	% Δ on BAU	
	5H	7H
Sector output		
Primary sector	0.15	0.21
Manufacturing	0.26	0.36
Services	0.16	0.23

These results confirm that the largest impacts of the electricity cost changes are for the manufacturing sector. Within the manufacturing sector, the detailed results indicate relatively larger impacts on the pulp, paper, and paper products, and the basic metal manufacturing industries.

³ As noted in the text, these impacts exclude the direct impact on the government accounts arising from the reduction in the level of generator profits.

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