Demand Side Management

concerns related to

Regulation of Electricity Lines Businesses

A submission to the

Commerce Commission

by

Enermet Ltd

Abstract: A unique feature of the fully deregulated electricity market in New Zealand is that nearly half of the domestic electricity is used for water heating and is controlled by the Lines Business. The effectiveness of this control has a substantial effect on the capital cost of the network and the efficiency of the business.

There are economic drivers that discourage monopoly Lines Businesses from maintaining load control systems. This submission focuses on aspects of regulation that may restore the correct incentives for load control.

1 Background

Over the long term regulated lines companies are essentially in the business of selling network capacity and can be expected to strive to grow the business by encouraging demand. In New Zealand, where there is a lot of controllable water heating load (approximately 800MW, when not in disrepair), it is easy to stimulate demand by allowing the load management system to deteriorate or by setting tariffs that do not provide adequate incentives for Demand Side Management (DSM). Enermet originally voiced concerns about this opportunity for gaming in a letter to the MED on 5 May 2000 which is attached. This letter was sent prior to the publishing of the fourth edition of the ODV Handbook, and, at a subsequent meeting with MED officials in July 2000, Enermet were advised that it was too late to make any changes or additions to the Handbook. It was finally published in October 2000.

In NSW the role of the regulator to monitor the performance of load control systems is clearly recognised. A director of IPART[1] has publicly noted that inadequate surveillance of DSM activities in the USA seems to have resulted in network companies maximising their Optimised Depreciated Replacement Cost (ODRC) by investing in high priced load control systems that do not function efficiently.

In responding to the relevant questions in the Commerce Commission's Discussion Paper we wish to re-submit a proposal which we believe will be effective whilst keeping within the light handed style favoured by the industry in New Zealand.

The questions that this submission specifically responds to are:-

48. If the prescribed ODV method were to be used as an input into the regulatory functions under Part 4A, what, if any, changes would be required to the fourth edition of the ODV Handbook? What effect would any necessary changes have on the values of system fixed assets?

71. If the ODV method were adopted for regulatory purposes, is the handbook for the prescribed ODV method adequate, or are changes required?

[1] Eric Groom, Director, Analysis and Policy Development of the Independent Pricing and Regulatory Tribunal (IPART) speaking at the Load Forecasting and Demand Side Management Conference, Sydney 19 July 200

2 Responses to Questions

If profits are to be judged in relation to WACC then this begs the question, what is an efficient level of capital investment for a Lines Business to provide the service that the consumers require?

The usual estimate of the efficient capital is the ODV which in most cases is equal to the Optimised Depreciated Replacement Cost (ODRC) which in turn is related to the Maximum Demand (MD). A Lines Business can increase its ODV and hence its permissible profit by increasing its MD. In New Zealand this is literally as easy as clicking a mouse because the Lines Business has control of the ripple control load management system.

More subtly the Lines Business can stimulate demand by allowing its ripple control system to deteriorate. This has two effects. Firstly, if the system fails to shed load, the MD reduction is not as great as it should be and secondly, if the system is erratic in restoring load, customers will be inconvenienced and may opt for a more expensive uncontrolled tariff. Also, by setting tariffs that do not accurately reflect the congestion cost of using the lines at peak time, a network company can effectively subsidise congestion time consumers and this may artificially stimulate demand for network capacity.

In Enermet's view, the problem with the current fourth edition of the ODV Handbook is that it doesn't begin to regulate controllable variables early enough in the auditing process. This problem was also overlooked by the Commission's own consultants during the recent national audit of Lines Companies.

The Handbook rigorously defines how to determine Replacement Cost (RC), how to Optimise, how to Depreciate and how to determine EV in the final calculation of ODV.

However, nowhere in the Handbook is there a definition of how to calculate Maximum Demand (MD), which is eminently controllable through the use, or non-use, of the ripple control system, and which is fundamental in determining the size and hence ***value*** of all downstream assets. In the absence of any defined method, the Handbook simply assumes the historic MD figures measured at the output terminals of transformers or the Grid Exit Point should be used, irrespective of the state of disrepair of the downstream ripple control system.

Enermet submits that the ODV Handbook should include in the preamble or introduction a simple statement saying " In calculating the Maximum Demand (MD) on any network or sub-network for the purposes of optimisation, the Electric Lines Business must assume the use of *best industry practice* with respect to efficient load control on its network". A further option would be to include a prescriptive definition of MD within the Handbook and expand the Optimisation process to include a first stage of calculating the minimum MD allowable for subsequent asset sizing. The MD could be simply defined as the total load at peak time less controllable hot water load.

The effect of this change would be a significant reduction of ODV values in many Lines Companies, a lowering of tariffs and subsequent restoration of the ripple asset.

5 May 2000

Russell Vogtherr
Ministry of Commerce
PO Box 1473
WELLINGTON

Dear Mr Vogtherr

REFINEMENT OF ODV FOR ELECTRICITY DISTRIBUTION BUSINESS REPORTING

Enermet's experience in control of electrical heating loads goes back 53 years and covers 28 countries around the world. We have seen load control reducing the costs of delivering electricity under a diverse range of economic regimes. At the same time, in spite of government prodding, load control has failed to flourish in the UK and North America. We are concerned that as our economy moves towards the free market model our electricity industry could lose the benefit of load control unless care is taken to ensure that the efficient systems that have been built in New Zealand are given the framework to thrive.

Nearly one half of all domestic electricity is consumed by water heaters and is delivered through a load control switch operated by the distribution company. If this control was discontinued the increased load on the New Zealand electricity network would be some 800 MW which would cost $M138 per year[2] to deliver in terms of increased generation, transmission and distribution capacity.

What is not widely understood is that less than 10% of the benefit of load control is related to generation and subject to market forces. The main benefit of load control falls in the monopoly section of the industry which at present is disciplined by neither commercial nor democratic processes.

The present "light handed regulation" of Electricity Line Business (ELB's) is based on reporting profits in terms of a percentage of the ODV with a voluntary limit set on the Return On Investment (ROI). The ELB profit can be expressed by:

Profit = ROI x ODV

In all but a few exceptional circumstances the EV is much greater than the ODRC so the equation becomes:

Profit = ROI x ODRC

For a given network geography and standard of reliability the Optimised Depreciated Replacement Cost (ODRC) is a function of the Maximum Demand (MD).

[2] See Enermet Ltd submission to the Ministerial Inquiry into the Electricity Industry.

The Profit can be written:

Profit = ROI x $\text{Function}_{\text{ODRC}}$ (MD)

A feature of the New Zealand electricity industry that is not found in the UK or North America is that the NZ ELB has direct control of the MD. The NZ ELB can increase its maximum demand and therefore its profit by allowing its load control system to run down. Enermet has evidence that this is happening:

- Investment in replacement ripple control equipment is running at about half the level necessary to sustain the existing systems.
- Some ELB's will only invest in ripple control transmitters if they are paid to do so by the retailers. Retailers are not in a good position to organise an effective load control system so this effectively blocks renewal of the load control system. The outcome, increased peak demand, increases the lines company profits.
- Some ELB's line charges do not encourage the retailers to invest in ripple control receivers or to set retail tariffs that will promote consumer demand side management initiatives.
- Some ELB's executives have actually mentioned to us the opportunities for gaming the ODRC by deliberately retarding load control activities.

There has been a trend for the regulator to put pressure on the ELB to improve network utilisation statistics. In fact one of the best tools to improve network utilisation is load control. Pressure to improve utilisation in terms of MD/Capacity appears to be having the perverse effect of discouraging some ELB's from maintaining load control systems.

We submit that the valuation and/or regulatory system needs to be refined to restore the incentive for the network company to maintain load control systems and develop new initiatives. We have identified four possible approaches. None is without difficulties but any one of them would be an improvement on the present situation:

1. The effectiveness of the load control system could be audited and any controllable load that in fact was not being controlled at the time of measured maximum demand could be deducted from the optimum network capacity.
2. The load factor of the network could be audited and the network company rewarded for improvement in load factor.
3. The network business could be split in two parts: delivery of essential electricity with an uninterrupted supply and delivery of non-essential electricity where the network is entitled to interrupt supply at peak load times or during network component outages. Profits derived from the delivery of non-essential electricity would not be regulated.
4. Directly rewarding reductions in MD by a corresponding reduction in the 'x' factor of CPI-x (if adopted).

Thank you for the opportunity to present our views. We hope our contribution is useful.

Yours faithfully

David Waugh
MANAGER NEW ZEALAND