A review of literature on electricity network pricing against recent findings in New Zealand.

Paul Christie, Senior Regulatory and Pricing Analyst at Alpine Energy, New Zealand, +6436874300,
paul.christie@alpineenergy.co.nz

Overview

New Zealand electricity network companies (ENCs) are under pressure to design and adopt cost reflective prices, in the face of disruptive technology that can enable consumers to use network services at below cost.

As a response to both external and internal pressures the Electricity Networks Association (ENA) has tasked a working group to develop guidance for its members to assist them through the process of designing and implementing cost reflective pricing. One of the initial tasks of the working group was to conduct a literature review of international peer reviewed papers centred around cost reflective network pricing.

At the same time the industry market regulator the Electricity Authority (EA) has reviewed the pricing methodology of a New Zealand network company that was facing consumer backlash for direct billing cost reflective network peak demand based pricing.

The aim of this paper is to assess the literature reviewed against the findings of the ENA working group, and the EA review, in order to suggest avenues for further research.

Methods

The conclusions made in 26 peer reviewed papers on electricity network rate design have been assessed against the findings of the ENA working group and EA review. In order to areas for further research.

Results

There is general agreement in the literature reviewed, the ENA working groups findings, and the EA review, for the following.

- The need for cost reflective network pricing based on long run marginal costs (LRMC).
- Network peak demand based pricing best reflects an electricity network's cost structure.
- Network companies must work closely with electricity retailers and other stakeholders throughout the process of designing and implementing new prices.
- When implementing cost reflective pricing, choice should be offered; opt in/out etc., or phase in new prices carefully and over time.

Gaps identified in the literature include the:

- need for simplistic price signals that consumers can understand and act on
- strength of the price signal and impact on long terms benefits to the consumer
- impact of different forms of technology to communicate potential peak pricing periods
- impact of unpredictable peak pricing periods on consumer wellbeing
- trade-offs between predictable and unpredictable peak pricing periods
- regulatory response to the dilution of ENC price signals by electricity retailers

- type of pricing appropriate when the price signal is diluted by electricity retailers
- importance of efficient cost structures against other types of pricing that offer consumer choice.

Conclusions

There is general agreement in the literature, that ENC costs should be recovered through a charge that reflects the nature of fixed short run costs which vary in the long run with investment in capacity. A charge that reflects the nature of ENC costs should signal to consumers how consumer actions will change their level of welfare over time. Where network companies are not vertically integrated with retailers, as in New Zealand, a network peak demand charge, based on long run marginal costs is considered to be the most cost reflective.

The literature also agrees that consumers must be engaged throughout the process for them to except and make best use of cost reflective pricing.

The experiences of the ENA working group and the results from the EA review show that an 'ideal' demand based charge may not be practical in some circumstances, particularly when price signals are diluted by electricity retailers. Where price signals are diluted a compromise of using time of use styled pricing may have a better impact, particularly when regulation is silent on the issue.

Regardless of whether integration occurs, the EA review shows that for cost reflective pricing to be effective further work on understanding how consumers interpret and act on price signals, and how consumers are impacted by pricing signals is required. This requires a cross disciplinary approach including behavioural psychology, policy and marketing. One area of research that could be useful for ENCs who traditionally do not engage with end consumers is how the level of consumer trust in the ENC impacts on consumer behaviour and acceptance of new pricing.

References

Not included.