

Submission – EA consultation on more efficient distribution prices

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Summary

We agree with the Electricity Authority that lines charges send important signals to consumers and that getting lines charges wrong can result in significant costs in the electricity sector. The deployment of technology in the electricity sector is moving at pace and is opening up options for both consumers and lines companies. Pricing needs to recognise both these opportunities and the reality that lines companies are no longer the sole investors in network supporting assets. It is our contention that an important aspect of lines charge regimes should be to maximise the value of existing lines investments through maximising utilisation efficiency of the extant infrastructure. Lines charges should drive consumer behaviour towards maximum efficient utilisation of network infrastructure while maintaining quality of service.

The consultation document draws heavily on an NZIER report dated 2015. Assuming the data for that report was compiled in 2014, or earlier, that report is now seriously out of date in terms of technology that is now cost effective in the New Zealand power sector or will shortly be so.

Electricity demand is set to increase significantly as transport and the wider economy is electrified. At the same time distributed storage technology means time shifting demand is increasingly possible. A goal for lines pricing should be to maximise the ability of the existing infrastructure to service the projected increase in demand, thereby facilitating speed of electrification of the economy and minimising the cost to do so.

Investment in distribution infrastructure tends to be lumpy and needs to be made years or even decades ahead of when the forecast increase in capacity is actually reached. Therefore, there is always a significant amount of inefficiency in investment in lines company infrastructure – this is the nature of lumpy infrastructure investment. In this respect distributed storage technologies¹ are a game changer because they can enable demand increases to be managed as the demand increases. In effect enabling principles of “just in time” management to be applied to the electricity industry – a change in the electricity distribution paradigm.

Charging regimes need to be forward looking, recognise that a lot of the investment in storage technologies will be by third parties, and encourage the adoption of new, more efficient technology that enhances network performance as it comes to market. Similarly, they also need to promote the network enhancing behaviours the technologies enable. The thinking in the consultation document is predominantly backward looking; it needs to be forward looking and focus on ensuring that lines charges result in behaviour that minimises future network investment by maximising efficiency.

Lines companies should have a stronger incentives to optimise Asset Utilisation Efficiency, to ensure that the benefits of past investment in the network are maximised, while maintaining appropriate reliability/service. Working from this objective the pricing principles and measures would have some important differences from those proposed.

For example, a key measure should be the difference between minimum and maximum demand in an electricity network. This measure should not be just about the reduction in morning or evening

¹ Static and mobile batteries (EVs)

peaks, but should look at the whole day. Lines companies should set pricing signals that encourage a flat demand profile 24/7 and the results of their pricing signals should be measured and reported. In addition, lines charging regimes should be designed to encourage energy efficiency.

In terms of judging the efficacy of lines charges, fixed charges should be minimised and lines companies should recover revenue via time-varying kWh prices. The Regulatory Assistance Programme summarises the fixed charge debate²:

“Fixed charges take the power of choice out of consumers’ hands and are contrary to the EU vision of broad deployment of energy efficiency, demand response, and distributed generation. They promote consumption at times of stress on the grid and overconsumption generally, resulting in increased costs for all by driving excessive investment in underutilised grid infrastructure. Given the need to decarbonise the transport and heat sectors in large part through electrification, fixed charges will exacerbate the problem of underutilised grid infrastructure and higher costs for the energy transition. The incentives created by further shifts to fixed charges will lead to the need to overbuild distribution infrastructure and in so doing will create a significant hurdle for the deployment of beneficial electrification of the heat and transport sector.”

Q1. Do you agree that distributors need to reform their prices? What is the reason for your answer?

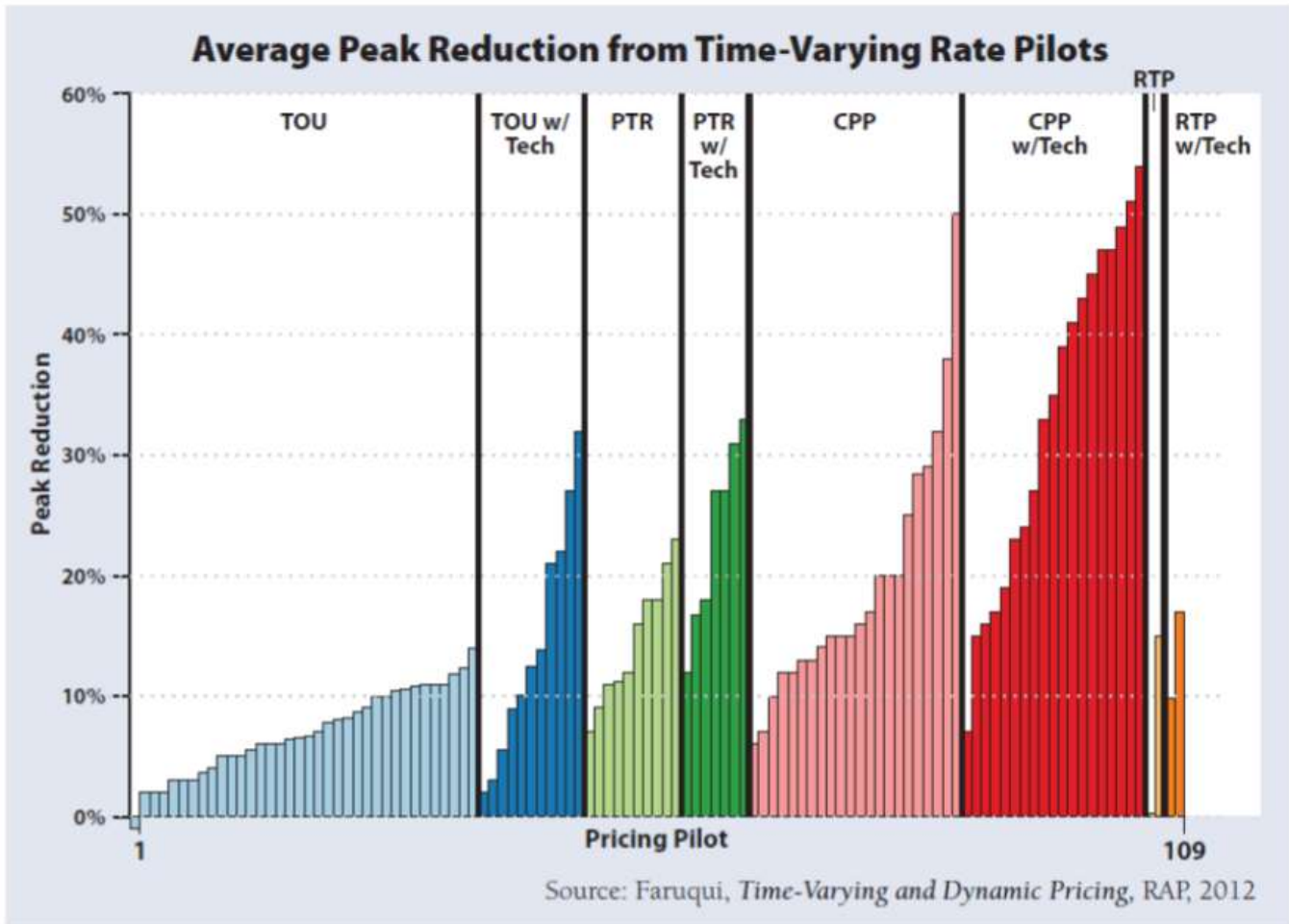
One of the long standing premises of the electricity system has been that the demand profile (load) is, to a very great extent, unmanageable. Some limited control via techniques such as ripple control has been possible but anything else required behavioural shift by individuals. This premise is no longer true; behind the meter storage technologies mean that demand profiles can be actively managed without requiring behavioural change. Technology can be used to manage the load, on site storage and contribution to the network in a controllable fashion.

Given load is now mutable and with electricity use set to increase due to the electrification of the economy there is a need to ensure that consumers receive the right price signals. If peak demand increases significantly a large amount of investment will be needed in transmission and distribution, which won't be efficient. Smart pricing can encourage consumers to proactively manage load and reduce peak demand.

A driver for distribution pricing should be to maximise existing asset utilisation efficiency and therefore minimising future investment. In time this approach will lead to lower prices for all consumers.

Work by the Regulatory Assistance Programme identifies that time of use charging coupled with technology is the most effective way to reduce peak demand and maximise existing asset utilisation. Lines companies in New Zealand need to be encouraged to put in place time of use charging which some already have.

² https://www.raponline.org/wp-content/uploads/2018/01/rap-ck-mh-aj-network-tariff-design-for-smart-future_2018-jan-19.pdf

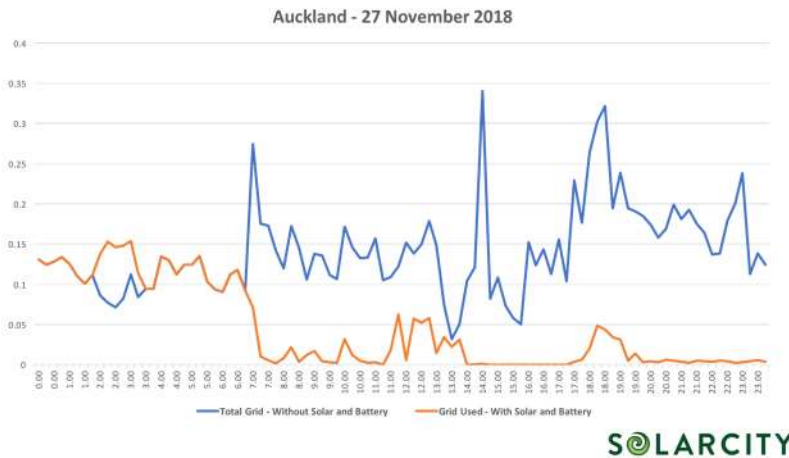


Note: "Tech" refers to the availability of smart technology

Time of use charging will:

- Encourage consumers/third parties on behalf of consumers to shift demand, for example, charge EV at off peak times.
- Encourage the deployment of behind the meter batteries together with solar. Batteries will result in a significant shift in load and result in a flattening of the demand curve (see figure below).

Operation of Solar and Battery



This graph shows the impact of solar and batteries on household electricity demand. During the night the battery charges up. During the day the battery discharges and household use of the distribution network is low.

Q2. How important and urgent are the issues identified by the Authority?

The consultation report states that the NZIER report (2015) suggests a high level of urgency for this work. The NZIER report is now well out of date in that it is based on data that is probably more than 5 years old. In particular the report needs to be updated to reflect cost reductions and technology developments in the battery/home electricity management area. Further, the work needs to be updated to reflect projected demand increases related to EV and the electrification of the economy in general.

Having said that, we agree that there is a need to look at lines charges in relation to new technologies. But the EA and Commerce Commission needs to go broader – it needs to look at how lines company asset planning and pricing reflect new technology and likely increases in electricity demand.

In terms of the mandated pass through (or not) of lines charges by retailers, it does seem odd that a lines company can develop a sophisticated pricing regime for the use of its assets only for the retailer to potentially send a contrary set of signals. Lines pricing signals are either part of the management tool kit or they are not.

Q3. Do you agree with the proposed Distribution Pricing Principles? And Q4. What, if any, changes would you recommend are made to the proposed Distribution Pricing Principles, and why?

Our proposed changes to the pricing principles are set out below

Proposed Distribution Pricing Principles

(a) Prices are to signal the economic costs, maximise existing asset utilisation and hence minimise future costs of service provision by:

- (i) being subsidy free (equal to or greater than incremental costs, and less than or equal to standalone costs), except where subsidies arise from compliance with legislation;*
 - (ii) signalling the effect that network use has on asset utilisation rates, current and future costs including losses, opportunity costs of capacity constraints and other avoidable costs;*
 - (iii) being time and location-specific;*
 - (iv) charging costs to a specific user or group of users where those costs can be attributed to that specific user or group of users.*
- (b) If prices satisfy (a) above, they should be responsive to the requirements and circumstances of users and potential users, including by reflecting current and future services provided by users and to users:*
- (i) where prices based on efficient incremental costs would under-recover allowed revenues, the shortfall should be made up by prices that **maximise existing asset utilisation** and reflect the value that users derive from the network;*
 - (ii) allowing for negotiation to better reflect the economic value of services and enable stakeholders to make price/quality trade-offs or non-standard arrangements for services; and*
 - (iii) encourage investment in transmission and distribution alternatives (eg, distributed generation or demand response) and technology innovation that support **maximising existing asset utilisation** to help meet the goal of minimising future inefficient investment in the network.*
- (c) The application of these principles should be transparent and predictable.*
- (d) Prices should not place unreasonable costs and requirements, including transaction costs, on retailers or other consumer agents and should be economically equivalent across retailers and other consumer agents.*
- (e) Consumers should be able to know or predict prices they will face when making decisions to connect to or use the network.*

The pricing principles should start from a clear premise. That premise should be to maximise the value of existing lines investments through maximising utilisation efficiency of the extant infrastructure and minimise future investment in the network. The current premise seems to focus on recovering the cost of past investment with little regard to efficiency or costs of future investment. That premise needs turning on its head; start with maximising existing asset utilisation as a design principle.

Q5. What if any changes would you propose to the star-ratings to better reflect the relative efficiency of distribution prices?

An overall assessment of the success of the distribution pricing regime is needed. Part of that success should be measured by the difference in electricity demand on the network in a 24 hour period between 3am and 5pm. The closer this difference is to zero the higher the stars for the lines company, because a small difference will indicate that the pricing regime is driving efficient use of the network.

The star system as proposed may well drive lines companies down the route of developing overly complicated and poorly communicated charging regimes that others have tried and failed. . The work by the Regulatory Assistance Programme clearly indicates that time of use pricing with technology is almost as effective as Peak Time Rebates (demand response). While TOU is not as effective at reducing peak as Coincident Peak Pricing (CPP) it is much easier to understand and therefore is likely to get much stronger consumer buy in, i.e. be more effective overall.

ToU should become the industry standard in New Zealand for residential consumers and should be given a star rating accordingly. It represents a trade off between impact and ability to be easily understood. The assessment of other systems, such as demand response and CPP for residential consumers, must include an assessment of how easy the system is to understand and respond to. To date these approaches have been difficult for residential customers to understand and therefore respond to. Technology may provide a way of enabling households to respond with the householder actively engaging in the pricing regime, for example, via automated approaches and this should be thoroughly investigated.

Q6. How long do you think distributors would reasonably need to introduce the different price structures discussed above?

Lines companies can introduce time of use pricing reasonably quickly, e.g. within a year or two. For example, Wellington Electric Lines introduced ToU pricing (for households with a battery or EV) within a year or two.

Q7. Can you illustrate how and to what extent the LFC regulation hinders price reform?

The standard user charge hinders price reform by enabling lines companies to set a fixed charge for residential consumers. It should be abolished and replaced with the low user charge across the board. As the Regulatory Assistance Programme states in relation to fixed charges³:

...increasing the share of those costs levied through fixed charges should not be treated as necessary or advisable. Indeed, doing so would represent a serious threat to consumers' ability to actively participate in a smart energy future.

*Fixed charges are inefficient, do not promote equity across users of the grid infrastructure, **and are contrary to economic theory and practice.** [emphasis added]*

Q8. How accurately has the Authority categorised distributor revenues and costs? How could this be done more accurately?

The underlying philosophy appears to be backward looking (i.e. takes a historical perspective) and does not appear to focus on how consumers can best be influenced to proactively manage load. Costs need to be forward looking, i.e. lines pricing regimes should aim to minimise future inefficient investment. Maximising existing asset utilisation (while maintaining service levels) should be a key objective of lines charging regimes.

³ https://www.raponline.org/wp-content/uploads/2018/01/rap-ck-mh-aj-network-tariff-design-for-smart-future_2018-jan-19.pdf

Q9. What, if any, would be better indicators of the efficiency of distribution prices, or the ambition of and progress being made by distributors on their price reforms?

A metric based on the difference between electricity use at 3am and 5pm should be developed. A small difference should be rewarded (given many stars) and a large difference should be penalised with only a few stars.

A key question must be; how can distribution pricing influence proactive load management so that future investment in the distribution network and grid is minimised? Such a pricing regime will result in productivity in the distribution and transmission part of the power system being maximised.

Q10. What assistance could the Authority (or other stakeholders) offer distributors in order to speed up the reform process, or help to remove or reduce barriers to distribution price reform?

Firstly, the EA should promote abolishing the standard user charge, i.e. the low user charge should apply across the board.

Secondly, lines companies should be provided with assistance and advice on setting pricing regimes. For example, the EA should consider inviting members of the Regulatory Assistance Programme to New Zealand to help with the development of distribution pricing regimes.