

5 February 2016

Submission on evolving technologies

On 3 November 2015 the Electricity Authority (EA) released a Consultation Paper: *Implications of evolving technologies for pricing of distribution services*, with submissions due by 5 pm on 2 February 2016. We were granted an extension until today 5 February 2016.

What's the problem?

The concern is that current distribution pricing may cut consumers off from potential benefits of new, 'disruptive technologies'. The EA says such "evolving technologies will be transformational for consumers," in two ways:

- Consumers control how and when they use electricity, via new technologies smart meters and controls [demand side].
- New competition to electricity distributors from solar/-batteries – consumers can even disconnect from the grid [supply side].

These changes in technology (including reduced costs) potentially bring competition to both *generation/ retailing* [solar is the consumer's own power plant], as well as *transmission and distribution* [solar/-battery units feed the consumer directly.]

The EA looks to its mission of improving efficiency for New Zealand consumers, by focusing on electricity distributors. It wants consumers to enjoy both components. Consumers need to act: they must invest in solar panels, batteries, smart meters and consumer appliances; plus, use them appropriately. Consumers who buy the kit and follow sensible policies will use less energy, but distributors' earnings from such consumers then falls; distributor pricing is mainly on energy use.

As investments happen there is a risk that the present distribution pricing will mean higher charges for consumers who don't invest in solar panels now, to make up distributor's revenue losses on consumers who have invested and pay less.

The EA conclude that distribution companies should change the structure of their pricing, away from a "usage basis" [energy] and towards a "service basis" [below].

The EA assessment is that:

- Prices paid are not aligned with services bought. They should: *signal the price of marginal investments in capacity and recover common costs while*

changing “consumers’ decisions about investing in technology and using electricity as little as possible.”

- There is no single ‘right’ distributor pricing scheme as they have different: spare capacity, demand growth, variability of demand and services.

Previously the usage basis did not matter as consumers had no options. There were few chances to invest in alternative use/ supply methods and little information on which to base decisions.

Today, typical distributor pricing is a mix of 4 components:

- Energy charging – reflecting kwh consumption (a);
- Connection charging including:
 - a daily rate (b);
 - maximum demand in the period (c); and
 - capacity – maximum potential power supply (d).

Distributors have to set their charging parameters (a), (b), (c), and (d) so their allowed total revenue is the total income. Retailers bundle these into final tariffs.

The EA proposal

The EA wants distributor pricing to change in an effort to reduce network costs; and to shape consumer investments where these shift costs onto other consumers. It calls this “service-based pricing.” Without it the situation is unstable.

Individual consumers are over-compensated now for reducing their energy use from the grid¹; shifting costs onto those who continue grid-based supply. ‘Losers’ are likely to lobby for regime changes, creating uncertainty, which undermines investment.

For the EA a fundamental issue is the distortion in distribution prices. As long as it continues investment in solar panels is inefficient; they are a costly energy source. But in future lower costs of solar/-batteries will create incentives to reduce demand further. More consumers are likely to reduce their energy draw, or quit the grid.

The EA see this as forcing distributors to change pricing; even in the short term, adjustments toward service-based pricing could help distributors respond.

The EA has no solutions; it will consider what to do after responses to the paper.

But it suggests consumers should, as part of a revised distribution pricing structure, have choices over service levels – such as the capacity available to each consumer [like broadband.] A consumer would be in a charge group with a maximum power demand of say, 5 kw.

Of course, it is unclear how any new incentive will be reflected to the consumer in retail prices – the EA sees high levels of retail competition adjusting bundled prices.

¹ They save the variable retail energy charges, which include a contribution to cover both transmission and distribution costs, as well as retailer overheads, none of which decrease linearly with energy consumption.

When differences in usage-based distribution charges become noticeable to users, this could hurt lower income consumers. The assumption is that they are least likely to be early adopters of solar panels and batteries, and so they would be paying proportionally more for distribution.

AECT View

There is no doubt there is a potential issue here. While economic incentives do not necessarily change behaviour, and there seem to be groups of users who are not interested, others may look closely at the costs and benefits of choices they have. These consumers are more likely to make the right decisions if they have clear information available in the form of the right signals. As a consumer cooperative we thank the EA for bringing this matter firmly into public debate.

This submission takes the following form: a general comment on a series of issues leads into responses to relevant questions posed in the consultation paper.

General comment

Evolving technologies are potentially affecting all sectors of the electricity industry. They are still changing extremely dynamically as are the associated costs. It is difficult to see how to tailor a tariff change so it will remain fit for purpose in say, five years, given the prospect of not yet foreseen innovations. This means any changes should be made carefully to avoid confusing consumers and other industry participants.

The industry today has a structure that reflects its established economics; and moreover its design and operation reflects existing costs and technologies.

Thus the high level of fixed costs in generation, transmission and distribution are rebundled in the retail market so most consumers are charged on the basis of components (a) and (b) [above] only.

More general issue than was posed

A serious omission from this consultation is that the issues raised in the consultation paper are not confined to the distribution sector. Most of the points made in the consultation paper about the pricing structure of distributors are also true, to a greater or lesser degree, of the other sectors of the electricity industry. Transmission costs are effectively all fixed; and a substantial portion of generators' costs are non-variable, as are part of retailers'. Their contribution to this issue via 'misleading signalling' is not discussed but seems of a scale that would suggest they have to be part of any changes being urged on distributors. To neglect such action would have the risk of undermining work by distributors to adjust tariffs.

Effects on and from other parts of the system

The EA discussion of the issues is too narrow. For instance a significant omission is what might happen to the wholesale market. If a generous share of consumers invest in solar or exit the grid, the effect on peak demand may be large. This will impact on

the supply mix; in particular, market prices² are likely to fall. And if demand drops sufficiently to make thermal supply irregular, pricing renewables at variable cost is unsustainable. This may cause market instability, or even collapse, if consumers and generators contract directly. This serious threat is not imminent, but shows the wider analysis needed to ensure a sound base to organise the electricity industry in future.

Communication with the audience

Moreover, consumers can only react to what they see: distributors do not set the shape, nor the content of consumer's bills. RAG has spent a great deal of time discussing just what information consumers should be entitled to. One function retailers³ have is to rebundle their costs to make their products/-prices saleable to their consumers.

And the discussion in the paper about the forces that might act on retailers in the highly competitive market if distributors changed their pricing seems unrealistic. The competitive side of that market is reflected in the way retailers strive to attract and retain consumers. If, as seems likely from the structure of retail pricing in the current market, consumers want an emphasis on energy use, retailers are likely to retain that emphasis. So there is little point in distributors working to shift their tariffs without ensuring that any changes they make are passed through to consumers at the retail level. Indeed, this is a basic point: if it is consumers who are to be given the choices, they must have the correct signals provided.

Ensuring that such retail pass-through is successful is a fundamental role for the EA; if it is not put in place other efforts to change signals are going to be largely wasted.

Practical tariff design – no simple matter

Beyond the questions of pass-through by retailers and actual consumer responses is providing them with clear information that they can use if minded to.

So if consumers are looking for information about costs and benefits on which to base investment decisions they need to know the marginal costs of such choices. When *capacity* is involved as a cost driver, it is complicated because it is essentially about *congestion*. In other words, it depends on the correlation with the behaviour [individual decisions] of other consumers on the circuit in question; typical consumer distribution systems have excess capacity most of the time. Thus to be an effective cost reducing signal there must be an ability for the consumer to prevent loads on the system exceeding a limit. This means a charging regime that includes information about the [real-time] behaviour of other users.

This moves beyond tariffs to require detailed decentralised system monitoring and signalling, plus the ability for the consumer to respond aptly to such signals. This might entail the consumer selection of a tariff with a maximum 'power take,' plus some way of signalling the situation to the consumer. But unless this is actually coincident with other users peaking it would not be economically efficient.

It is also a *one-sided effect* as there is no direct cost saving when consumers reduce their [peak] capacity usage significantly. One way of thinking about it may be via the

² This brief discussion omits any consideration of the strategic response by generators.

³ This is a general statement about retailing – not just electricity.

way it affects future system development – say by delaying capacity enlargement investments. This requires a more nuanced signal than a simple price component. It might be addressed through a sophisticated charging regime like shifts in capacity banding, but would require a new degree of flexibility from consumers.

Off grid

An important threat to system health is significant consumer departure⁴. Every person who departs loads extra [share of fixed] charges onto those who stay, irrespective of their consumption and changes in capacity. Any new tariffs need to be wary of the risk that shifting to a full version of service charging might perversely accelerate consumers off the grid.

The only tariff change that would deflect this would include a substantial exit tax to compensate the remaining users for the externality they created – the extra share of costs others will bear in future. But it is hard to see how such a tariff could be implemented in practice.

Otherwise, it is hard to see how such costs can be avoided merely by changing the tariffs unless new charges reduce turnover. It also means there are advantages in adjusting the signals and incentives to avoid departures.

Coordination and balance – avoiding wrong incentives

The “quit the grid” decision is another consumer “investment” decision. It sits alongside the right choice of system investments and individual investments. It is also important and can be triggered falsely by misleading signals. Thus it is possible a shift to full service pricing [covering fixed costs] may have the perverse effect of accelerating consumers away from the grid.

In addition, there are actions that the consumer “should” be empowered to make – such as the timing of a wash cycle – to minimise social costs by time-shifting load. The discussion in the paper suggests that this will all be possible through simple use of ‘apps’ and time controls. But in practice widespread adoption may involve significant organisation and learning by consumers.

Together, all this means there are five complicated sets of signals and incentives bearing on consumer decisions that have to be lined up to ensure consumers are positioned to make the right choices:

- *Apt selection of appliances* – signals showing accurately when heat pumps and low use lighting are worthwhile.
- *Appropriate actions as a user* – being sufficiently informed and incentivised to be able to react to the information available about system loads.
- *Capacity increments by the system* [distributor] – and this of course flows over into similar capacity increments on the transmission side.
- *Supply investment decisions by the consumer* – signals to allow the right timing and degree of solar and battery purchasing/ leasing.
- *Stay/-quit decision by the consumer* – data to support exit decisions so they are sensible for the whole of the consumer population.

⁴ Of course there are plenty of situations where evolving technology and grid exit will allow a better solution to the individual circumstances of the consumer – such as isolated rural users.

If these factors are confused or even unclear consumers will be given the wrong signals, and thus likely react wrongly.

Political and social impact – more than just changed messages

Finally any serious change in distribution charging, even if done with the aim of “no change in total revenue⁵”, will inevitably shift the way costs fall on individual consumers; different attributes of their behaviour will now be charged for and at new rates. The result will be a significant number of ‘winners’ and ‘losers’ even if only on a relatively small scale.

This raises serious problems that tie back to the lobbying based instability discussed by the EA. Losers will naturally be unlikely to just accept that the new bills are a better signalling device – what will they see as benefits to offset the new costs? They will seek to preserve the option of their previous tariff.

Such a significant upheaval – with its associated round of unanticipated consequences – demands someone to take responsibility. There needs to be “ownership” of the change. This would include justifying the need change and showing it is all worthwhile. This will attract substantial marketing costs which cannot be left to fall where they may.

And it matters: previous serious changes in the electricity industry have not been well handled in the market and were poorly understood by the consumers⁶. The upshot is reflected in consumers’ views about electricity pricing to this day.

A serious campaign is needed to ensure that the consumers are carried along with any changes. It will raise numerous practical issues of communication that will need resolution. Previous EA moves in this area under the RAG have been extremely protracted.

Many issues will arise: How will people understand what is driving their new bills? Will there be a new standard structure for accounts? For instance, will retailers provide bills on both bases for some overlap period?

And to close with the fundamentals: How is it all going to be organised? Who is going to do it? Who is going to pay for it? And who is going to take overall accountability?

What would the Auckland Energy Consumer Trust like to see?

The AECT would like to see a better informed public discussion of the possible future developments and risks. It would also like the regulators to focus on information and their role in providing a degree of coordination along perhaps with some broad industry guidance about future tariffs and their signal content – as they reach consumers.

As the consultation paper recognised, each of the electricity industry participants is in a particular situation. They know best how to balance the risks inside their own businesses. So in particular, each lines company should be given freedom to develop

⁵ Given this is mostly fixed by the Commerce Commission and will therefore have to remain.

⁶ The reference is to the passage of the Electricity Reform Act of 1998.

its own tariff structure within the guidelines and free from detailed restraints on tariffs.

Answers to selected EA questions

Question No	Question	AECT Response
Q1	What are your views on the scope of the Authority's review? Please give reasons for your answer	<p>The scope needs to be wider. It must include all the aspects of the industry as they are all affected and all need to act to address the issue. Changes to the industry have impacts well beyond those considered in the consultation document.</p> <p>The consumer/ retail interface needs to be carefully examined and better attention paid to the way it is likely to pan out.</p> <p>If the approach is not wide-ranging the whole endeavour is likely to be a wasted effort.</p>
Q3	What do you think about the Authority's concerns that existing distribution pricing structures do not reflect the costs of the different distribution services provided and may not be durable?	<p>There are issues in assisting consumers make sound decisions – including their interest in the topic. But major changes in the way distributors charge consumers will not address these matters. Other issues are addressed in our general comments.</p> <p>Moreover, making positive and practical changes will be difficult. There is a risk of unintended consequences from any material change to tariff structures.</p>
Q6	What is your view of the potential for battery technology to defer or avoid investment to augment distribution networks?	There is a role for such investment as low cost substitutes for conventional distribution methods. If battery investment is embedded soundly it can reduce expansion and strengthening costs of distribution.
Q8	What is your view of distributors' options for structuring their pricing?	It is possible to move tariffs but care is needed to ensure that the right signals reach consumers to avoid false actions. And there are a number of practical issues to be solved in tariff design.
Q9	What needs to occur for distributors to amend their distribution pricing structures to introduce more service-based pricing?	<p>A number of practical design issues need to be considered to ensure that clear accurate signals are available.</p> <p>There also needs to be action to make sure any changes reach the consumers at retail levels.</p>

A handwritten signature in black ink, appearing to read 'William AA Cairns', with a horizontal line underneath.

William AA Cairns

Chairman, AECT