THE CUSTOMER ADVOCATE

10 November 2015

Queensland Productivity Commission
PO Box 12112
George Street QLD 4003

By email: Qld Productivity Commission website

Re: Electricity Pricing in Queensland Issues Paper
Submission from *The Customer Advocate*

Thank you for the opportunity to provide a submission regarding the QPC's issues paper 'Electricity Pricing in Queensland' of October 2015.

I wish to present a view of the opportunities raised in the issues paper from the point of view of residential and small-to-medium enterprise consumers in the somewhat unique Australian energy market. This response does not consider in detail the impact of wholesale energy costs or retailer margins, instead focusing on the core network distribution component of the electricity bill.

Many of the questions raised in the issues paper extend into the very nature of the National Energy Market, and to adequately address these issues in any detail would require a very significant response indeed. My comments in this response are therefore focused on those issues that have a direct influence on customer's electricity costs.

I base this submission on my thirty years' experience as a professional engineer in the electricity distribution industry, practicing in three states in the fields of network planning and investment, network operations and most recently in customer advocacy and energy strategy.

I would be happy to meet with the QPC to discuss this submission.

Thank you once again for the opportunity to respond.

Regards,

Mike Swanston
The Customer Advocate

THE CUSTOMER ADVOCATE
PO Box 3089
Norman Park QLD 4170
+61 400 986 987
mike@thecustomeradvocate.com.au

Introduction

The electricity industry, in particular the distribution and transmission sectors, is not in a happy place.

Fueled by triple-digit price increases, a senate enquiry, the shadow of accusations of 'over-capitalising' and falling productivity, there is no doubt that a new approach to electricity prices is necessary. Even the very requirement of a QPC enquiry into electricity prices suggests a failure of the market initiatives first touted by Hilmer in 1993. Similarly, the fact that eight pages (ten percent) of the QPC issues paper is a bibliography of recent works in itself indicates the level of contemporary discussion on energy pricing.

The nature of National Energy Regulation carries a major burden for this situation. A revenue - capped regulatory framework provides a situation where the fundamental productivity of a transport network – that is, the efficient utilisation of the assets – is all but absent from the economic drivers of shareholder value. Networks have little incentive to make best use of the existing assets to deliver their basic intent of energy transport.

It is useful to consider recent events in consumer attitudes to energy as an indicator of the opportunities that may lie ahead. Off-peak tariffs for water heating have been a powerful demand management (storage) device for many years, whereas the uptake of off-peak tariffs in Queensland today is well below the historical average. Incentives for greater use of 'spare' network and generation capacity remains off the radar. Solar PV uptake remains steady as an energy management options for customers, and will become more so. Customers (as well as retailers and distributors) continue to shy away from simple time-of-use tariff options, largely because distributors offer tariffs that are clearly uneconomic for most consumers. The barbeque discussion is often about "how I am going to get off the grid."

High levels of customer churn in Victoria is often regarded as sign of a healthy market, whereas it is more indicative of a broader level of customer dissatisfaction and high retail margins. Permitting discounts of up to 28% on standing offers.

When all the layers of customer engagement, retail marketing and regulatory oversight are stripped away, there remains four key points of interaction between the energy industry and the consumer community:

1. The price of the service to provide energy to meet an individual customer's needs
2. The quality, in particularly reliability, of the energy supply
3. The respect shown by utilities to consumers through fair and honest service
4. The respect shown by utilities to the community through the responsible application of their assets

This response proposes a number of actions for the QPC to consider, and provides comment on a number of the questions. The values that underpin this response are:

1. Empowerment – a customer's ability to make decisions on energy use that has a clear impact on the price they pay;
2. Commercial focus - incorporate the appropriate returns for actions taken; for both customers and the utility
3. Simplicity and Consistency – simple messages that can be understood and responded to.

I trust this response is useful to the Commission in its deliberations.

1. A CUSTOMER'S RESPONSE TO PRICING

Much has been made of the moderating of the growth in energy costs in the recent price decisions.

Unfortunately, much of the benefit of this price levelling has been lost due to the simultaneous introduction of a new metering cost, new connection charges and a significantly higher daily fixed charge. Whilst lower volumetric charges are useful in lowering a customer's energy bill, the poorly communicated tradeoff in these charges against the rise in other line items on the bill means the overall message has been lost. Similarly, some retailers have chosen to include the alternative service cost of metering within a single fixed charge line, reducing the AEMC's intent of making customers aware of metering choice.

The message of the reduction of the energy transport component of the electricity bill has been overshadowed by the concerns of the significantly increased fixed charge and new charges, such as the metering charge.

It's seen as giving in one hand, and taking in the other.

Many complaints I have received from energy customers relate to the 'fixed charge rip-off' and 'I have less control on my bill' brought by these changed charges. Any message to customers inherent in the reduction in the volumetric charge is lost. Given that the cornerstone of improved industry productivity is how customers react to pricing 'signals', customer perception of the change is as important as the change itself. Whatever the outcome of this pricing enquiry, a clear and powerful communication process is critical for any initiatives to have a real impact on customer involvement in new ideas and changes to the way energy is priced and used.

Another opportunity relates to the communication of network pricing to customers. It is curious how the infrastructure costs are made so transparent to the customer, when it's the final bill that matters. Telephony companies don't engage customers on their infrastructure costs despite it being a major component of the overall bill, nor does Linfox discuss transport costs with Coles' grocery customers.

There is a school of thought that suggests that network transport services should recognise energy retailers as their primary commercial customer, and permit innovative and contemporary relationships between network operators and energy retailers. After all, retailers have the direct communication paths, the marketing expertise and the incentive to provide new and differentiated products to energy customers. The hard part is to give retailers a negotiation position to encourage networks to focus on a retailer's commercial needs, rather than maintain a simple N+R relationship on the bill.

Customers not only find new energy products and pricing confusing, there is a high level of distrust in the industry. As highlighted in a number of studies, including recent work by the CSIRO, when customers are faced with a range of complex decisions in an environment of a lack of trust and questionable empowerment, they stay put. The very poor take-up of flexible pricing in Victoria is an example, despite the plethora of regulation-driven meter data services and comparison websites.

This situation will prevail across the NEM due to the simple inability for a customer to answer the question 'am I likely to be better off ?'. And then to trust the answer …

The nature of discussions today about the most effective recovery of costs and addressing cross-subsidies is fueling distrust in the energy industry. This approach is viewed poorly by customers.

For instance, the 2014 Queensland Household Energy indicated more than 3 in every 4 homes in Queensland have air conditioning installed. Statements such as *'… (customers with) high disposable income who may install air conditioning …. It estimated the latter groups subsidise the former by around $700 per year*' [1] … is doing a great disservice to tariff reform, as it suggests that (a) affording air conditioning indicates a high disposable income, and (b) 75% of energy customers subsidise the remaining 25 percent.

Suggesting that the three-quarters of Queenslanders who have air conditioning have a high disposable income and are not paying their fair share to the tune of $700 pa will not sit well when asking for their support for tariff restructuring.

Similarly, the 300,000 customers who invested on average $5000 each to install solar PV are not particularly receptive to the suggestion that they are now 'ripping off the system'.

A better avenue to gain customer support is to highlight reform as an opportunity to 'make the best use of an existing publically-owned asset.' Expanding opportunities to access 'spare' capacity during the daytime to support solar communities, or offering opportunities to use off-peak energy for energy storage or discretionary loads will resonate far more effectively in the community than the suggestion of equitable cost recovery.

2. PRODUCTIVITY

Networks should be given a commercial incentive to use their networks efficiently, not just run them efficiently

As discussed in the issues paper, the economic view of productivity in terms of the efficient delivery of the distribution service is now well-managed by the AER and others. The key issue for customers, however, is that the fundamental efficient use of the assets - as defined as drawing maximum value from the assets employed - is falling. Declining load factors, stranded assets and overhead recovery is being hidden by increased fixed charges, and the 'overs-and-unders' cost recovery scheme and regulatory funding framework that does not reflect the actual performance of the assets themselves.

Is not possible to significantly reduce or scale the costs of owning, operating and maintaining a distribution network as the throughput or utilisation of the asset changes. This is particularly true in the case of falling energy throughput and relatively low peak demand growth. New assets are built as new customers connect, however one would reasonably expect that new customers should not drive everyone's costs up, as the larger customer base would absorb the costs of those new assets, particularly under a capital contribution regime.

The utilisation of the network assets have fallen by a factor of 12% in Ergon, and 19% in Energex in the past five years [2]. This declining load factor must be addressed. Regardless of a tariff

[1] QPC Issues Paper, p20

[2] AER Consumer Challenge Panel research by B Hughson, reported by H Grant, AER Determination 2015

framework that is based on energy throughput (volumetric based) or service capability (demand based), the poor utilisation of largely non-scalable assets must be rectified. Whilst the ability to meet peak demand defines the 'design quality' and amenity to a customer, a network is essentially a volume-delivery tool. It's there 24 hours per day, with a largely constant capacity, waiting to be used.

Tariffs based on time-varying customer value (demand capacity) may be a useful way of recovering the cost, but the key to lower costs to customers lies in addressing the effective use of the network's inherent capacity. Customers need to be encouraged to use the network when the capacity exists through a range of off-peak and time-varying tariffs. Networks need to embrace the use of a network's capacity over the full 24 hours to support changing customer requirements such as encouraging participation in demand management and the use of short-haul Use-of-System charges for energy communities.

Question 2.1: Structure of the supply chain and regulation

This is a significant and wide-ranging question. In essence, the key impact for customers from the disaggregation of the energy supply industry has been that each step in the chain has a different view of 'success', and the customer is left with an aggregated (some may say, residual) outcome. Take an approach to tariffs, for example. The latest public information from distributors about network tariffs indicate state-by-state preferences of inclining block, declining block, demand-based, time-of-use and increased fixed charge pricing; all in the interest of 'signaling' customer behaviours.

Retailers, however, wish to minimize customer churn and servicing costs through, in part, reductions in bill shock, minimal customer servicing costs and high customer satisfaction.

Customers want to have trust that they pay a fair share for the energy they use, and have relatively low-involvement control over the energy bill.

Somehow, all these disparate needs have to come together.

Another cost issue is the lack of commonality and coordination across states and utilities. With sixteen active retailers and two distributors in Queensland, or 13 distributors in the NEM, all have their own variants of IT through billing and market systems. Even a simple innovation or clarification of customer operations that require change to thirty IT systems makes the cost-benefit of any innovation in the market questionable,

For retailers, having to support different connection processes, safety requirements, tariff arrangements and field responses across every state and jurisdiction is also costly to customers.

Note the position by the UK regulator's 'ban on complex tariffs' in January 2014.

It will be useful to examine more mature utilities, such as residential telecommunications, in their provision of:

- Simple, banded access and capacity pricing
- Integrated volumetric and demand pricing options
- Retailers manage the commercial infrastructure arrangements 'behind the bill'
- Incentives to use 'spare' capacity for both customers and utilities
- Market segmentation through innovation and niche capability
- Low-cost 'essential service' options
- Encouragement of third-party support services for customers, such as aggregation

Question 2.2: Energy Productivity

The cost to own, operate and maintain an electricity network and generation capability is relatively independent of how efficiently those assets are used. AER benchmarking on the Partial Productivity factors of costs per number of connections or peak demand are in some ways misleading. The number of connections does not reflect how efficiently that connection is used. Peak Demand in itself is a 'proxy' indicator, as not one asset in the supply chain carries that peak demand. Both of these costs reflect long-term design assumptions such as After Diversity Maximum Demand (ADMD), and trending these indicators will not give an indication of more efficient use of the asset itself.

So long as the lion's share of a distribution network owner's cost recovery is a regulated return on the value of the asset plus operating costs, there is little incentive for the utility to seek innovative ways to improve the use of its asset base to transport energy.

Retailers, generators and networks should be given a commercial incentive to use their networks efficiently. Current regulatory incentives such as DMIS are not strong.

Technological change, in particular local embedded generation and the participation in peak-demand management provides an opportunity for networks and retailers to seek benefits that can be shared between customers and utilities. For instance, encouraging customers to engage in solar communities, facilitating the ability for customers with excess solar generation to sell that energy to nearby local businesses will provide a new opportunity to recover network costs in times of low utilisation, thereby reducing the amount of costs to be recovered from the broader customer base.

To generate such incentives, regulatory roadblocks will need to be removed. These include the requirement for low-level energy trading to be carried out under the prudential arrangements of an energy retailer, questions of metering ownership and the lack of network use-of-system charging that reflects use of fewer assets than the 'pool' of asset between the transmission point of connection (TNI) and the customer.

Perhaps an opportunity for unregulated revenue through a distributor's ability to 'sell spare network capacity' could be investigated.

Granted, this is a commercial view of what is essentially an engineering and physical operation. Network capacity, security and the deferment of upstream capital costs are all considerations, but this all starts with an incentive to think differently.

Government Policy and Energy Mix

There is no doubt that the Queensland Government Solar Bonus Scheme drove an artificially high passion for rooftop solar. It can be viewed as a positive in so far as Queensland utilities and retailers now have a good line-of-sight to the new technologies as they fall in price and approach the position as a real alternative to many services provided by grid connection.

The advantages of renewable energy and energy storage at grid-fringe and in isolated power networks in Queensland is clear. These solutions are approaching prices and a practicality that is genuinely competitive with traditional grid solutions without specific regulatory intervention.

In respect of the current Government plans for renewable energy, it is clear that targets will only be achieved with the use of renewable energy not only in the current role of self-generation of energy, but also in commercial and community environments where innovative energy pricing and distribution network operation is required.

Under the broad banner of a low-carbon future, energy pricing is needed to support the following:

a) Encouragement of self-generation and energy feed-in at times of (local) network peak demands
b) The use of networks to support short-haul energy transfer between local generators and nearby customers
c) The ability for aggregators to bring together smaller segments of customer participation in demand management or local generation
d) The use of renewable energy to support low-income consumer segments
e) The use of renewable energy outside the traditional single-premise rooftops, such as in multiple-occupancy buildings and rented premises.

Question 2.3 – 2.5 : Government policy objectives, risks and benefits

The Queensland Government, like other state governments, have objectives that include the support of a low carbon economy and the provision of low cost, quality energy to Queenslanders.

Almost by definition, the use of renewable energy generation is in that mix.

The greater use of renewable energy, most likely solar power in Queensland, will exacerbate the concerns of the traditional utilities in the areas of network voltage management and economic returns from customers on volumetric tariffs.

Luckily, Queensland has significant experience in these matters already, and therefore has a head-start in understanding these technical, commercial and social solutions to these challenges.

As the shareholders of the distributors, it should be possible to support the investigation into more efficient use of network assets as part of the renewable energy policy.

Similarly, the falling price of renewable energy and new technology provides the opportunity for governments to seek alternatives to direct financial compensation for customers in hardship. Load-limiting capability of new-technology meters provides an alternative to disconnection. Investment in energy efficiency and self-generation is an alternative to financial support for customers in Government housing.

Regarding wholesale prices, the impact on the wholesale price of the gas trains in Central Queensland will have more influence that direct customer behaviour; so price signaling or passing any price risk of wholesale energy price to small customers is not effective.

Peak Demand

Customer attitudes to the use of off-peak energy and storage in the form of water heating provides an insight into the future engagement of customers in peak-demand management

The issues paper (s2.4.2) suggests the potential to store electricity economically has been limited to date. This is incorrect, as Queensland enjoys a very powerful method of energy storage and peak demand management in the form of over 600 Megawatts of controlled load in storage hot water and swimming pool pumps. Thermal energy storage may not able to be easily converted

back to electrical energy as batteries, but as a demand-shifting facility that is attractive to customers, controlled-load hot water has provided significant benefits in the form of the deferment of capital investment to meat peak winter demand and cheaper off-peak energy tariffs for over a million customers with minimal impact on amenity.

There is evidence that customers are moving away from hot water storage, particularly in recent years. The convenience of instantaneous gas heating is one reason, however the rising fixed cost and reduced tariff advantage for off-peak energy acts as a detractor. Differential pricing for peak and off peak energy is a basic signal for customers to use the network and generation efficiently, yet networks continue to reduce the incentive.

Curiously, despite the consideration by Energex that it is necessary to reduce a cross-subsidy to customers using a controlled load tariff (see inset below), a 'peaksmart' campaign continues, where, in part, cash subsidies are offered to customers who install or convert equipment onto a controlled load tariff.

Typical customers on the 'off-peak' or 'controlled load' tariffs (tariffs 31 and 33) will face increases in the controlled load portion of their bills of 11% ($26) and 5.6% ($20) respectively (compared to increases of 7.9% and 3.8% in the draft determination). These increases are due to higher network prices and the introduction of metering charges.

We understand from Energex that network prices for tariff 31 and 33 are increasing, despite a decrease in total network revenue, as a result of Energex ***reducing cross-subsidies from tariff 11 customers to controlled load customers***. Typical residential customers on tariff 11 and the most widely used controlled load tariff (tariff 33) will face an increase in their annual bill of 3.2% ($46).

QCA Final Determination, Regulated retail electricity prices for 2015-16, June 2015

The action of continuing to subsidise the adoption of controlled load seems inconsistent with the decrease the incentive to use the tariff.

It could be argued that the cash incentive scheme has permitted the tariff to increase without a loss of net value to the customer, but there is no evidence of this thinking as neither the Energex nor Ergon annual regulatory pricing proposals address this issue, other than to broadly refer to the tariff change under the DCOS (Distribution Cost of Supply) model.

It could be argued that distributors are 'purchasing' behind-the-meter load control through capital rebates for air conditioners connecting to Demand Reduction (DRED) capability. How such a capability would work under a peak-demand charge tariff framework will need some thinking.

Similarly, retailers have been reluctant or unsuccessful in marketing demand control, such as stored water heating, to small customers.

The distributor and the retailer need to embrace the clear benefits of encouraging customer participation in peak demand management, either passively though controlled load tariffs or actively through the connection of energy storage and embedded generation.

This approach by utilities that controlled load (off-peak) tariffs are 'too low' is confusing in the light of falling network load factor, particularly in residential sectors where the 'duck curve' is significant.

Since 2010, the retail cost of off-peak energy (intended to provide the customer with signals of low-cost generation and unused network capacity) has increased by over 62 %, compared to a change of 15% in 'peak' or 'anytime' energy. Figures 1 and 2 below show that the incentive for customers to adopt controlled load off-peak tariffs as a method of reducing the bill is falling.

It may be prudent to approach Energex and Ergon for the rates of take-up of controlled load in new connections to determine how peak demand management is embraced by customers.

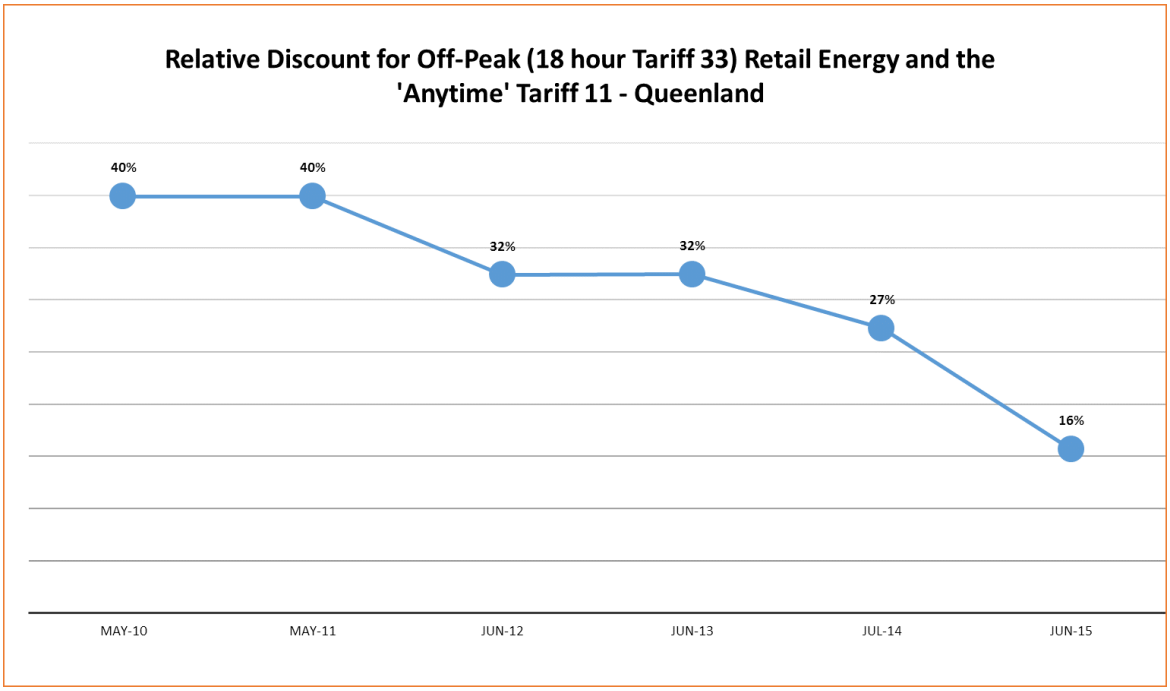


Figure 1- The relative retail price of Tariff 33 to Tariff 11 in Queensland

Source: Queensland Tariff Gazettes, 2010 - 2015

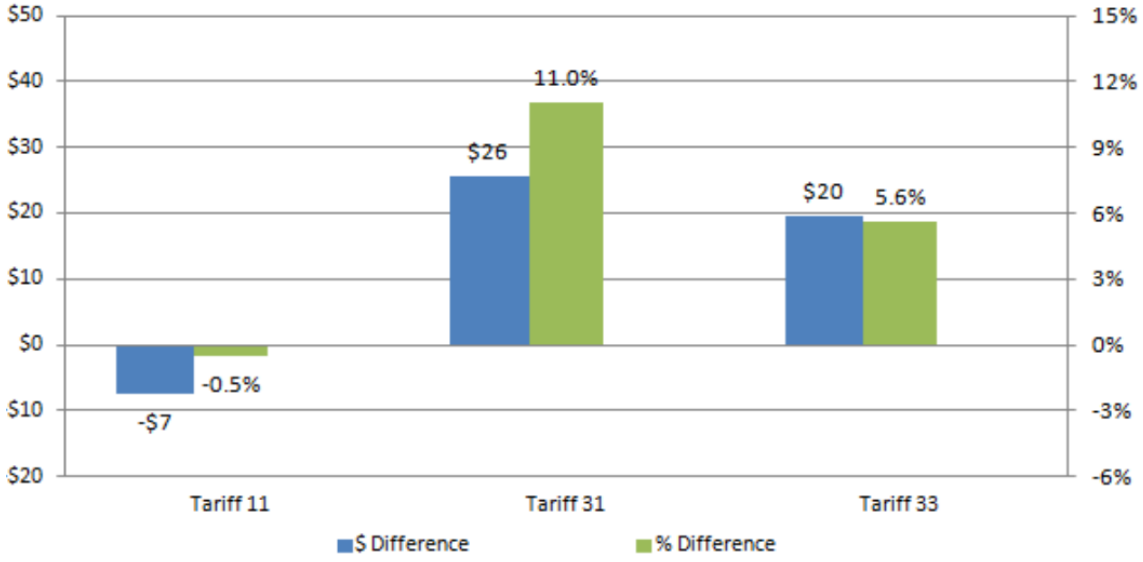


Figure 2 – Changes in the components of the annual residential bills for typical customers 2014-15 to 2015-16

Source: Queensland Competition Authority determination 2015-16

Finally, the issue of peak demand tariff uptake has been clouded by the role of solar PV and feed in tariffs. For the 200,000 customers still on the premium feed-in tariff, there is an incentive to maximize the load connected to a controlled-load tariff, as this energy is exempted from the net feed-in balance.

Conversely, customers with embedded generation without the premium feed-in tariff are now encouraged to largely avoid controlled load tariffs, as it is now more economic to use as much self-generated energy as possible during the day through the use of time clocks, photo-controls and smart inverter controls.

Tariff Structures

Tariffs need to be simple, and fairly reflect the value of a customer's energy use choices and investment into demand shifting capabilities from peak times to those of low network utilisation and low wholesale energy prices.

In practice, the following features of a tariff are required:

1. Simple to understand, and easy to respond to (control)
2. Tariffs need to fairly reflect the value of the investment demand–shifting capability by customers from times of peak to times of low network utilization or low energy cost (empowerment)
3. Tariffs do not unfairly penalize customers for unintentional or rare digressions from the statistical norms for energy demand (non-penalty)

Each state seems to have a different approach to managing falling network utilisation and rising distribution costs. Even across Energex and Ergon Energy, despite a common heritage, significant differences in tariff structure appear (see inset).

There are … key differences between the flat rate tariff structures of Energex and Ergon Distribution:

- Ergon tariffs are more heavily weighted toward the recovery of costs through fixed charges than Energex tariffs
- Energex has flat consumption charges, while Ergon Distribution has three-part inclining block tariffs (IBTs)
- Energex does not have a fixed charge for its controlled load tariffs, but Ergon Distribution does.
- The Ergon Distribution residential time-of-use tariff structure is the same as the Energex structure but different time periods apply to each consumption charge.
- there is a mismatch between the structure of the Energex and Ergon Distribution small business time-of-use tariffs.

QCA Final Determination, Regulated retail electricity prices for 2015-16, June 2015 s3.2.1

Both approaches are valid in the eyes of each distributor and have received AER approval.

However, for customers, retailers and contractors working across Queensland, are network conditions that different between Gatton and Kingaroy, or Nambour and Rockhampton to justify a fundamental cost recovery mechanisms and diverse commercial signals to customers ?

There is a common theme, however, towards increasing fixed

charges and a maximum demand-based usage component. This is a trend across many utilities in Australia and overseas.

Fixed Charges

Until the last six or seven years, the energy distribution industry viewed the connection assets at the customers' premises as the fixed cost of supply. The low daily charge of a few cents per day covered the cost of the meter(s), fuse and service cable. The energy itself and its transport were considered a variable cost.

These few cents per day became a dollar per day in Victoria as costs of the smart meter rollout were recovered. Whilst a significantly higher cost, it still reflected the fixed charge as being 'for the assets at the customer's premises'.

Nowadays, as the operation of an energy retailer and energy transport are considered independent of the volume of energy consumed, there is unfortunately a worldwide trend towards increasing the fixed component of a customer's electricity bill. For over 300,000 Queenslanders, the fixed component of the residential electricity bill has increased from 27 cents per day to over $1.17 per day in just five years, - an increase of 433% [3] This calculation does not include the fact that many customers now pay over 21 cents per day ($78 pa) for the use of an energy meter. [4]

Whilst understandable from a utility point of view as the volume risk shifts from the utility to the customer, this practice has three major concerns.

1. *Rising fixed charges disempower customers.*

As the fixed component of energy starts to dominate, either explicitly or in the customer's impression of energy pricing, the component of the charge that is under the customer's control through intelligent and efficient use of energy is reduced. In the 2015-16 tariff rates, customers have a reduced ability to control their energy costs. This leads to frustration and anger towards utilities, with community resistance to any reform.

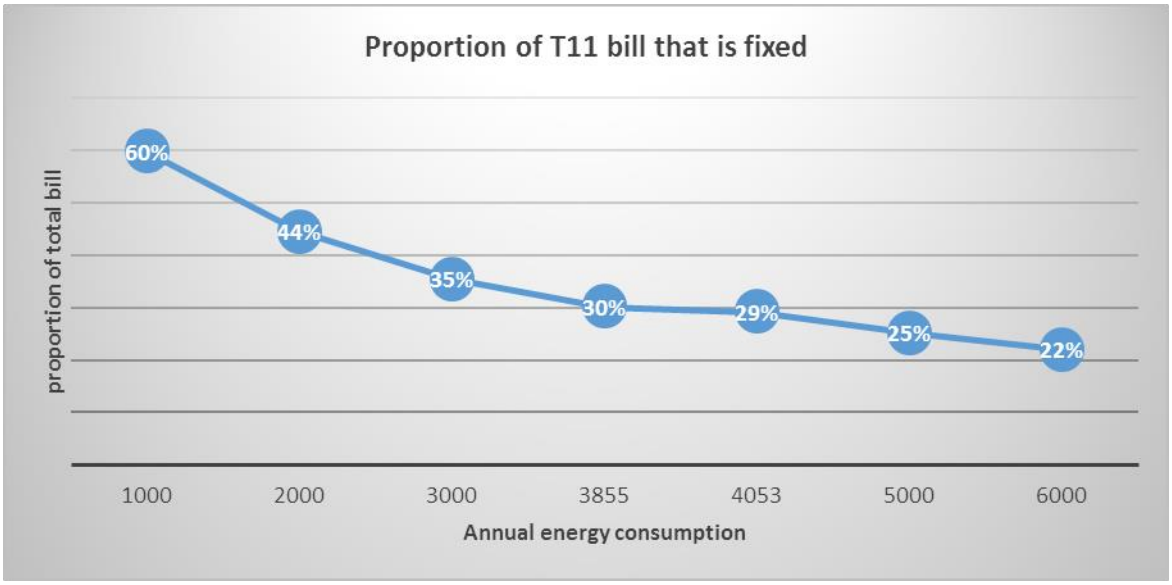


Figure 3 - Proportion of fixed charges for typical residential energy bills (T11 only)
Source – analysis from QCA determination 2015

[3] Queensland Electricity Tariff Gazettes 2009 – 2015, inclusive of GST
[4] Energex public pricing proposal 2015, table 13.8, including GST, installation with T11, T33 & solar PV

As the costs of alternative energy supplies fall, disempowered low-usage customers are likely to leave the grid as a means of managing costs. Low energy users include intermittent consumers such as rural halls and community infrastructure, small irrigation sites and customers with a level of self-generation capacity.

As a customer leaves the grid, fixed costs for the networks remain in the form of the requirement to continue to maintain and keep safe the 'stranded' assets, or disconnect and remove them. Either option presents costs with no economic return to the utility.

Another option may be to perhaps sell them to a community energy entity, however this concept will require further consideration that is outside the scope of this response.

2. *The smaller variable charge proportion of the bill weakens the demand management incentive, and could fuel future capital investment to meet new peak demand*

As more costs are classed as 'fixed', the variable component that signals to customers to avoid inefficient use of energy is reduced. Extrapolating this idea leads to customers who, once connected, have very little regard as to how much energy they use, and when they use it.The imperative for peak demand management is reduced, as is the likely economic returns of new and beneficial technology such as energy storage.

Over time, customer disregard for time-time of use or other signals is likely to result in further degradation of load factor, and a claim for new capital investment to meet new peak demand is likely.

3. *The incentive for better network utilisation is reduced*

As the cost-risk of variable network utilisation is transferred to the customer, the utilities have less incentive to enhance the functionality and amenity of the energy network.

based usage component. This is a trend across many utilities in Australia and overseas.

Variable Charges

Customers understand the paradigm of 'the more you use, the more you pay.' Volumetric tariffs are accepted. There is no doubt, though, that volumetric tariffs for all but wholesale energy do not appropriately convey the right messages for efficient use of the energy system.

Time of use-tariffs have been around for some time for commercial use, and served customer and industry needs well. The knowledge that 'it's cheaper after 8pm' resonates well with customers, whether the product be energy, telecommunications or public transport.

Maximum Demand as a basis for charging customers is gaining favour, and the concept is certainly useful. Its acceptance and success hangs on how complicated it is, and how engaged customers need to be to maintain some control of their bill.

There is a complexity / success tradeoff for demand-based tariffs.

The poor take-up of flexible pricing is a powerful example of complex pricing, poor communication and a mistrust of the utilities. Despite the many information websites and regulation to provide customers with their smart meter data, customers still are unwilling to embrace tariff reform with less than 2% of customers on flexible (time of use) tariffs.

This reaction must not be ignored as new tariffs of half-hourly demand, top four demands, and the like are developed.

Interestingly, a maximum demand tariff is really just another time-of-use calculation; it's just that the energy use is integrated over a shorter time period, such as 30 minutes as proposed by most distributors.

There is no real hard and fast rule why the period is 30 minutes. Some may say it's to take diversity out of the equation.

In reality, a maximum demand tariff calculated over one or two hours would still permit demand-type pricing, however it would allow for the natural lumps and bumps in a customer's demand over the period of interest.

For a customer, it can still be interpreted as a 'power is expensive between Xpm and Ypm', yet the same measurement can be considered as a demand factor by the network provider.

Even if a 'market rollout' of smart (advanced) meters is undertaken, the capability to embrace demand-based pricing is going to take a long, long time. Not that the metering is the issue, as there are already hundreds of thousands of electronic (type 5 capable) meters in service, and reprogramming in situ would permit the measurement of demand or time-of-use energy.

However, demand pricing will only realise the purpose of demand management and equitable allocation of costs by 'value to the customer' if the customer is empowered to respond. As reasonable tools for customers to be reasonably engaged in energy demand are few and far between, the industry may be ready, but customers wont be.

More innovative and practical solutions need to be found.

Perhaps a hybrid Time of Use / demand model that serves both utility and customer needs may be a suitable compromise. Time of day is a parameter already available to the customer, so managing appliance use without complex tools or displays is easy. When the time basis moves into half-hour periods, customers are much more in the dark about their 30-minute energy usage and how that compared to last hour, or yesterday, or last week.

A demand or time of use energy tariff model can provide incentive for customers to use the 'spare capacity' of a network by providing cheap access to the network and generation outside peak hours.

Pricing demand is tricky, however. For instance, in unconstrained parts of the network, demand is cheap. Some parts of the network however are heavily loaded, and demand capacity is very valuable. Similarly, demand on network segments showing a commercial (weekday) demand pattern may have plenty of capacity on a weekend so Monday to Friday peak allocation is warranted. In contrast, many residential local network segments are heavily loaded on Sunday afternoons, so peak demand charging should be considered on weekends.

This highlights the complexity in using 'customer value' (i.e network capacity) as a means of recovering what is essentially a non-time varying cost.

Compromise and practicality must prevail, and any new tariffs must pass the public reasonableness test in order to gain acceptance.

Question 2.9 : Recovering costs associated with demand

The 'Thin Pipe Model' (Swanston, 2013) contemplates the ability for a customer to choose the capacity of the connection to the network. A higher capacity, a higher price. A customer knows in advance what their choice is and how that relates to appliance use.

Exceeding the contracted demand over a period results in a price penalty.

The analogy is the mobile phone or internet connection. A customer purchases a 'package' of calls and data that may include peak and off peak use. Off peak use is cheap. Small energy users purchase a cheap package with limited capacity before excess charges apply, large users can choose a 'fat pipe' with lots of data (volume) and speed (capacity), but at a higher price.

The customer is messaged as they approach their contracted limit, or exceed the prescribed capacity limit for the first time (without penalty). Excess use results in allocation the next 'package' for a period of time.

Similar for energy - Customers can purchase a 'bronze' (thin), 'silver' (standard) or 'gold' (fat) connection package. Each package contains an on and off-peak energy component, perhaps even prepaid. Each package also contains a 'demand' level matched to the customer's energy use pattern and preparedness to invest in demand management and self-generation.

Small stand-alone consumption monitors can be available at no more than two or three hundred dollars to signal customers when contracted energy or capacity is likely to be exceeded.

Advantages:

- The customer is empowered to choose the type of connection
- The customer can take whatever level of demand management actions they wish and receive commercial benefit from a lower cost of connection
- The connection package includes incentives to manage demand and peak energy use
- The connection package permits incentives for new technologies and better asset utilisation
- The cost decision is made up-front, not a 'surprise' when the bill comes
- Exceeding the contracted demand or energy prompts an upgrade to the next level, similar to today's mobile phone contracts
- Demand management is inherent in the agreement with the retailer, not the distributor.
- Capacity includes 'download' (consumption) and 'upload' (feed-in) components and incentives
- Limit alerts can be provided locally, independent of retailer, distributor, or meter provider
- Connection contracts can be given 'high demand, low throughput' (i.e poor load factor) or 'flat demand, high throughput' characteristics to meet different customer types

Question 2.10 : Sharing volume risk

Customers and utilities alike should be given the incentive to use the energy service efficiently. 'Use' reflects two aspects – matching generation and network transfer capacity to consumption, and avoid creating peak congestion and the use of low-merit generation.

Utilities must maintain some level of risk in order to generate a desire to seek the best use of their assets.

Question 2.11 : Reliability Standards

There has been a significant of customer survey work carried out by the utilities in regard to network reliability. A response to this issue should be guided by that information.

Question 2.12 – 2.14 : New Technologies

The issue of new technologies, in particular solar PV and battery storage, is the subject of a current AEMC study. The response from The Customer Advocate can be found at:

http://www.aemc.gov.au/Major-Pages/Technology-impacts/Documents/The-Customer-Advocate.aspx

In summary:

1) The framework for peak-demand shifting and energy storage already exists through stored hot water and other responses by customers to off-peak tariffs. The trend in network tariffs, however, tend to discourage more efficient use of the power network.
2) The mechanism for the connection of embedded micro-generators is already in place, albeit poorly executed. These connection rules are independent of the energy source, whether it be solar PV or stored energy from batteries.
3) To a customer, networks already provide energy storage services with 'the biggest battery on the world' – the grid. The complexity is how that service is charged to customers. New and innovative Use of System charges are required to adapt not only to energy storage, but also short-haul DUoS (virtual net metering) and energy communities. Existing regulation largely already supports the emerging energy storage and its potential application to energy customers. It's how distributors & retailers approach the application of energy storage through tariffs and connection rules that really matters.
4) The application of network storage at grid level is no more than an alternative to other more traditional solutions to network augmentation for peak demand; power quality and voltage control; or frequency control / ramp rate services. Existing 'most efficient solution' decisions can corporate storage as an option where appropriate within existing regulation.
5) The ownership and control of demand-management and demand-shifting capability behind-the-meter apply to many technologies, of which energy storage is only one. Provided it is done at arms-length to networks in a fair and commercial environment, any regulatory environment should empower customers to make reasonable investment and control decisions as to their energy choices and bill management.

There are three fundamental concepts that should underpin the adoption of energy storage:

1. Energy storage is adopted by choice by the customer in response to fair, cost reflective tariffs;
2. Those tariffs reflect the true benefit to the network and retailer of the demand management or energy feed-in actions of the customer; and
3. Network owners require an incentive to allow customers to fairly adopt energy storage

Question 2.16 : Consumer Interest

"When you bet on a horse in a race, son, bet on the one called Self-Interest"

There has been much research into consumer engagement and generating interest in energy market issues and pricing. A lot of work has been done by advocacy groups in behalf of hardship and disadvantaged customers, with the National Energy Customer Framework attempting to address many customer protection requirements.

A number of initiatives under the Power of Choice banner are proving of limited use. Moving metering charges into the ACS charging regime has been seen by customers as just 'another charge'. The value of a customer's choice of meter is questionable. The push-back of opt-out time of use charges in Victoria and New South Wales highlight the power of the 'active disinterest' in energy matters by the larger community.

Trust in the energy industry is low.

Essentially, the only things that are effectively engaging energy customers are either bill shock or commercial empowerment, such as the Queensland Solar Bonus Scheme.

The ability of utilities and the government to make a case for change is limited (aka barriers), because:

a) There is not a lot in it for utilities, who get their money anyway

b) Shareholders and owners are seen as 'just after returns'

c) There is a lack of trust in the industry

Engaging customers to embrace tariff reform needs to take the form of:

a) Clearly articulating the problem of failing cost recovery from a public asset that remains critical to the communities' wellbeing and amenity;

b) Explaining the future role of the network and grid generation, from backup and local energy communities to expanding the application of renewable energy and new technologies

c) Identify new community benefits from the assets, such as community renewable energy, cheap off-peak energy and 'low cost storage'

d) Ensuring the discussion focuses on 'what's in it for the consumer', not 'cost-recovery and the reduction in cross subsidies'

This issue is similar to managing the drift of customers from the copper telecommunication network.

The hallmarks of the low-key engagement required are:

1. Simple signals that are understandable and easy to respond to
2. Transparent and honest intent that resonates with the customer
3. An achievable benefit to the customer that is not based on 'trust me'

Finally, any engagement to assist a customer make better use of utility assets and generation must support the question 'will I be better off ?' Pushing customers into opt-out schemes, or even those with a 'price guarantee' will not alleviate the concerns or mistrust from the energy customer community.

"Will I be better off ?"

There are around 400,000 electronic meters in service in residential and small business applications in Queensland. Whilst being programmed and read as 'type 6 – accumulation' mode, most of these meters hold up to 90 days of energy consumption data at 30 minute intervals.

This data is invaluable as a way to help customers understand "will I be better off if I change my tariff ?"

We need an environment where the customer value of that information is extracted and used to help guide customers onto new tariffs. Self-service (similar to Victoria) is not the best mechanism, however a framework that encourages third parties to assist may help.

An obstacle to this approach is the requirement that these third parties, whether they be retailers or others, cannot function as financial advisors or brokers.

Solar Bonus Scheme

Other states and countries chose to fund the decision to subsidise solar PV schemes from sources other than the revenue from state-owned distributors. In so doing, the conversation of the direct cost of funding the schemes centered around the broader cost-benefit to the community. In Queensland, however, the choice to fund the scheme from distributor revenues has compounded concerns of the cost of the scheme by including a cross-subsidy argument that sits beside the second issue of loss of network utilisation.

As the cost of new technologies fall, and as new and innovative tariffs and uses for renewable energy emerge, there may be new schemes that provide a greater commercial incentive for customers. Time-of-day feed-in or strong demand management signals may emerge.

Question 2.20 – Better funding for the solar bonus scheme

Essentially, the funding commitment is likely to remain depending on Government planning. The key, however, is establish an environment of innovative demand control incentives that target wholesale energy, network and ancillary costs. In such an environment, the financial commitment for the SBS is funded from benefits and efficiencies in the energy supply chain, rather than being little more than an excessive payment for 'kilowatt-hours'

New technologies to benefit utilities and customers

A useful mechanism will be the ability for customers of many shapes and sizes to negotiate connection and energy purchase (or sale) agreements with distributors and retailers. At the moment, the establishment of negotiated connection contracts is complex and practically available to only the largest customers.

It could be said that the capacity to negotiate connection of energy purchase agreements already exist in the regulatory frameworks, however in reality they are complex, expensive and the commercial benefits are often unclear due to split or missing incentives. The tough road for the establishment of a demand management aggregation industry illustrates this difficulty.

In an environment of new technology and customer energy management incentives, customers could seek to negotiate specific network access arrangements or energy purchase contracts that reflect mutual advantages in an innovative fashion, such as:

- Demand reduction on request
- Energy feed-in on request
- Power factor (voltage) support
- Flat load factors, or load factors that complement those of other customers on the same network segment to aid efficient utilisation
- Community energy schemes
- 'take-or-pay' funding of capital contribution requirements through ongoing charges

Admittedly, administration of such schemes can introduce overheads, however some flexibility in the negotiation would yield benefits.

An energy 'reverse' auction was carried out to identify new sources of energy in an emerging constrained network. Amongst the successful bidders was a battery provider, who not only installed the energy storage, they negotiated on behalf of the customer for a reduced retailer charge, through a contract that included energy curtailment and a greater component of off-peak energy. The bidder then negotiated a lower-cost network connection agreement that reflected a much improved load factor and a greater level of demand management available to the network operator.

Question 2.21 – 2.22 : New technology benefits

Refer to the response to question 2.12

Question 2.23 – 2.25 : Harmonisation

In terms of direct costs to customers, most opportunities for harmonization will be identified by overheads inherent in the operating costs of the national energy retailers, who have to deal with 13 distributors, each with their own tariffs, new connection processes, re-energization and disconnection processes, product codes and safety requirements.

A recent opportunity has arisen regarding a national approach to the connection of embedded generators and batteries.

Question 2.26 – 2.28 : Legislation

Electrical safety legislation has been identified in the issues paper as requiring attention, in two areas:

1. The self-inspection regime for connection and meter installation will need to be considered in the light of distributor 'ownership' of the Service and Installation Rules (the QECMM), with the introduction of third-party meter provision.

2. Queensland safety legislation is relatively silent on the introduction and implementation of embedded generation. Many if the EG concerns exist 'behind the meter', yet distributors have come in to fill the legislative and safety gaps. The role of the Electrical Safety Office should be reviewed regarding electrical safety in circumstances of energy storage and embedded generation as it becomes more mainstream.

   Currently, many of the 'behind the meter' issues for embedded generation and storage are considered in varying mechanisms across the NEM states, including the Victorian and new South Wales Service and Installation Rules (SIRs). The opportunity for harmonization of matters pertaining to embedded generation and energy storage exist.

In addition, it is time 'schedule 8' of the *Queensland Electricity Regulations* was reconsidered.

3. DEREGULATION

This response has no comment on the operation of energy supply policy discussed in section three of the issues paper.

Question 3.7 – 3.8 : Consumer Protections

The provisions of the National Energy Customer Framework should provide the required level of customer protection.

If anything, the use of technical 'demand limiting' devices, more elegant metering capability and prepaid metering should be encouraged in lieu of disconnection. Such facilities would reduce the level of disconnections for non-payment through mechanisms such as prepayment (with appropriate non-disconnection at night, etc), monthly or weekly billing and debt-self management. Technology can assist in customers not reaching the point of energy hardship.

There is no doubt that the consumer advocacy organisations will raise the opportunity for better funding of financial support and support services for vulnerable customers.

See also the response to Q2.9 for vulnerable customers.

Question 3.9 – 3.10 : Consumer engagement

This matter has been largely dealt with under Q2.16.

4. REGIONAL QUEENSLAND

This response has no comment on the operation of energy supply policy discussed in section four of the issues paper.

5. CONSUMER PARTICIPATION AND SUPPORT

Customers respond to clear and verifiable messages in the energy industry.

"Sign up with retailer X, and get 10% discount of you pay by direct debit"

"Install solar PV, and your energy bill will halve. It's a 5-year payback"

Put the words '*should*' and '*if you can change your behaviour and it is likely that* …', and it's a very different situation.

At a recent energy conference, three speakers discussed energy pricing. The first, a distributor, outlined a seasonal time-of-use tariff with embedded critical peak pricing. The second, a retailer, put the case for smoothed billing, reduced bill shock and minimal customer interaction. The third, a social scientist, discussed how customers will shy away from decisions when the consideration is complex and benefits unclear.

Until these discontinuities are addressed, it will be very difficult to engage the customer in the electricity market.

For many years, customers made use of controlled load tariffs for water heating almost without thinking. There was trust that off-peak hot water was cheaper, yet did not impact amenity. Hot water systems were connected to off-peak tariffs by plumbers and builders as a matter of course. Almost unintentionally, customers engaged in the market.

Nowadays, burdened by high fixed charges, embedded generation, staged connection processes, separate metering charges and regulatory complexity (note the treatment of the load control relay as a standard control service, yet the meter (which may be in the same unit) is an ACS, the uptake of controlled load (read: engagement in the nmarket) is much lower than the historical average.

How do we remove this red-tape, and make it simple for customers and almost automatic for customers to engage in the market again ?

The 'standard' installation of variable speed swimming pool pumps on a controlled load tariff is a more recent example of 'automatic' engagement in the market.

What is the next off-peak hot water or variable speed pool pump ?

Question 5.1 - 5.4 : Barriers & developments

The issue is that customers essentially don't want to participate in the energy market. Its uninteresting, complicated and untrustworthy. What I do want as a customer is to be reassured that:

- I am paying a reasonable price
- I have a level of control of the overall bill, where my energy use actions can influence the cost
- There is a low cost of entry to products and services

There are many obstacles to engaging a customer or a customer's agent in these matters.

Firstly, we have to re-establish a level of trust in those delivering the message – that means the current industry nor government are the best to convey that information.

Secondly, the need for change and articulation of the benefits need to be in customer language. Terms such as network tariffs, metering charges and fixed cost components will not engage customers. It has to be simple, as in 'how much will my bill go down ?'

Thirdly, actual customer data needs to be accessed. Discussing 'standard consumption' and deemed demand will not resonate. See the previous inset on existing meter data availability.

Next, products and services that permit the customer to simply access the market, such as automatic energy controls, intelligent demand management and suppliers / contractors / aggregators exist to supply and install these devices

Finally, the tariff and energy price regime must be conducive to the use of these 'smart' facilities.

The features of an empowered market are:

1. A reasonable mechanism to set ***the fixed connection charge for customers that fairly reflects the actual connection assets employed***, with use of the shared network charged through a variable tariff structure that reflects the actual use the customer makes on the network;

2. A ***variable network charge that empowers customers to have control of the cost of supply*** through choice in the level of energy use, appliance type, daily routine and degree of participation in demand management;

3. The ***ability for aggregators*** to identify and draw out the maximum value from the use of energy storage across the energy value chain on behalf of customers; and

4. An ***incentive for network operators to negotiate effective connection contracts*** with customers that reflect the benefit of a customer's investment in demand management, energy storage and embedded generation where such a connection provides benefit to the network itself.

Question 5.2 : Benefits

The issue is that customers essentially don't want to participate in the energy market. Its uninteresting, complicated and untrustworthy. What I do want as a customer is:

- A belief that I am paying a reasonable price
- A level of control of the overall bill, where my actions can influence the cost

The value of networks consulting on tariffs should be questioned. Ultimately, it is the energy retailer that has the commercial relationship with the customer. It is confusing for many customers to understand and appreciate the commercial role of the network business, especially when the objectives and tariff tools considered by networks are so specialized.

This excludes in tradeoff discussions in the area of network investment, network reliability and asset design (eg undergrounding), where it is totally appropriate for networks to seek customers' views on the available alternatives.

The role of engagement directly between retailers as customers and distributors should have significantly more focus and latitude for network owners to meet the needs of retailers.

Questions 5.3 – 5.6 : engagement and education

This question is discussed in previous responses in this document.

Cost (availability) reflective pricing

The wide use and correlation between 'demand as a driver of network investment' and 'demand-based tariffs as the strongest term of cost-reflectivity' is not particularly intuitive.

This correlation has been widely embraced and uses freely in the QPC discussion paper and many other documents.

There is no doubt that increasing demand drives additional network investment. However, capital expenditure on network investment is only a small component of the cost to operate a network, particularly in an environment of low demand growth.

Why does a customer who may draw significant energy from the network for a very short period of time be considered a greater 'user' of the network and attract a greater share of the owner's costs to own and operate the network, than another customer who draws smaller, but significant energy through the network 24 hours per day ?

My point is that it is not an immediate correlation that a large demand on the network is a driver of the cost of owning, operating and maintaining a largely existing network.

Demand pricing is not that it is a cost driver, yet it is one reasonable accurate way of determining the availability of the network when needed by the customer. Demand pricing should be called 'availability-reflective', not 'cost-reflective'. When availability is short (congestion), then price is high. When network capacity is freely available, then cost is low.

Questions 5.7 – 5.8 : Transition to demand-based tariffs

Taking a conversation to the community on 'cost-reflective, demand-based' pricing will be difficult. The implicit correlation that the cost of owning, operating and maintain existing networks is dependent on a customer's demand will be challenged. In addition, the term generates impressions of 'it's all about the money' when presented as 'cost reflective'.

Presenting a 'congestion charge' or 'low availability charge' can be related to traffic, or water pressure, or many other examples of congestion in the real world. This will take much of the 'technical mystery' out of the public communication requirements as part of the transition.

This concept also supports the 'size of the pipe into your home or business' and the time when energy is consumed in relation to other customers on the network.

Question 5.9 - Metering

The main issue with the uptake of advanced metering is that very few customers, if any, will actually be interested in the meter.

The facility of the meter, whether it be a time-varying tariff, or market demand management participation, or an innovative solar tariff will be the product, not the meter.

The cost of a type-6 meter in small customer installations remains of concern. An efficient, low cost meter provision, reading (communications and back-office) and management process is needed. The Victorians got around it by vesting the smart meters in the distributors' asset base for a few years. Whether a market-led rollout can work without that type of arrangement will be of interest.

Questions 5.10 – 5.11 : new tariffs

No comment, in respect of the volumes of research on this subject that are in the public domain.

Question 5.12 : the role of retailers

Maturity in the role of retailers in new tariff structures will be demonstrated by a voluntary departure from the current tariffs that are essentially discounts off the N+R framework.

When retailers have confidence in the operation, stability and risk management of network tariffs to confidently offer new retail products and innovative tariffs, a level of market maturity will have been reached.

Demand Management

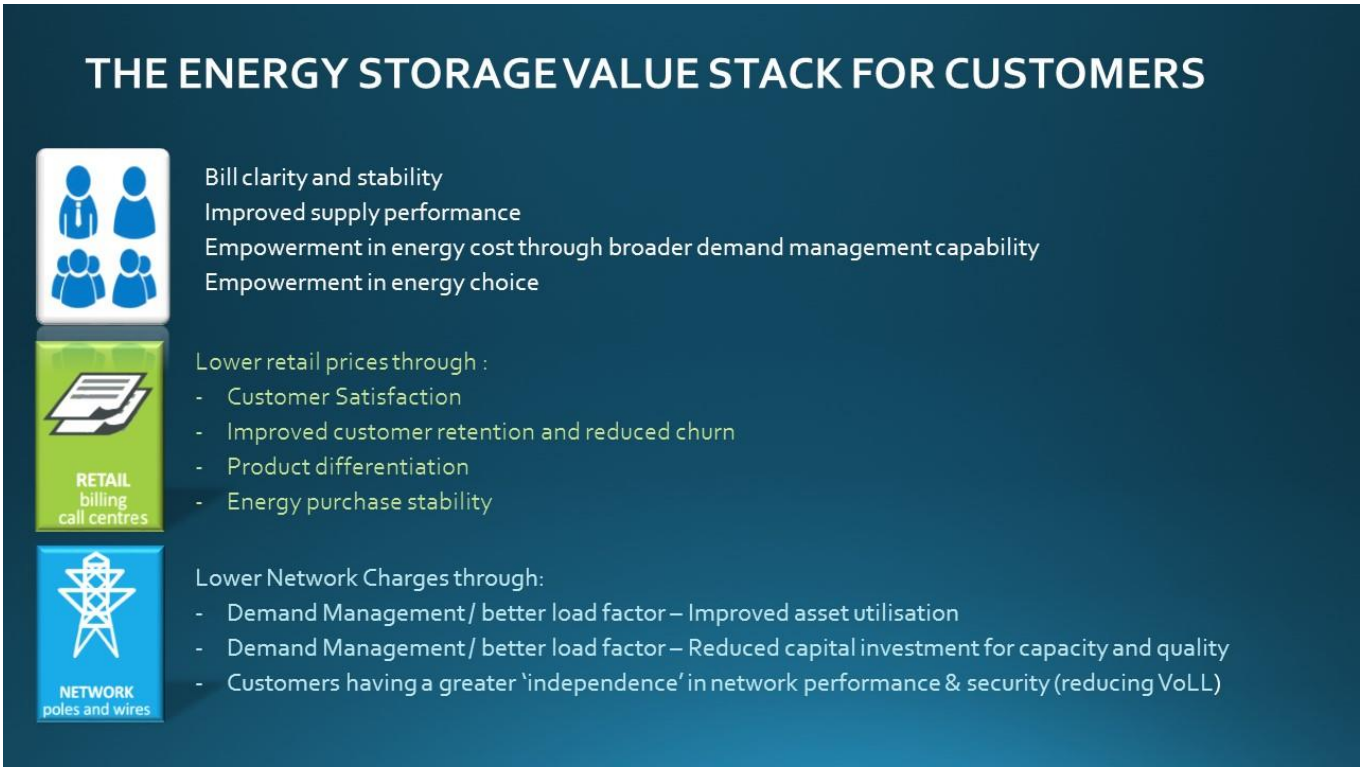
Any regulatory framework needs to support the ability for the amalgamation of the 'value stack' and pass much of that value back to the energy customer.

Question 5.13 : customer benefits of demand management

The strongest case for customer engagement in demand management will be when the customer receives benefits from the largest 'value stack' – that is; an aggregation of the benefits that efficient asset utilisation offers the customer through:

- the ability to make best use of the 'cheapest' energy where a price differential through the day exists;
- a component of the retail benefits through their contract with the energy retailer; and
- a component of the network benefits from better utilisation of the local power network

See the graphic below.



Questions 5.14 – 5.16 : Incentives

Incentives for customers to engage in demand management should be directly in line with the customer objectives, that is:

- To access appliances and equipment that can participate in demand management (eg delayed start)
- To purchase energy efficient devices
- To remove inefficient devices (cash for clunkers)
- Support for hardship and low-income customers (and renters) access demand-management capability

Attachment 1 – About The Customer Advocate

Mike Swanston is the Managing Consultant for **The Customer Advocate,** an advisory body for energy consumers, grid operators, governments and regulators, with a passion to encourage and support the changing needs of energy consumers.

Our mission is the development of simple and engaging strategy and policies to effectively adopt new technology, provide intelligent and empowering tariffs and energy prices, with a focus on just plain old sensible, simple and efficient customer service.

Skills & Experience:

Mike is a professional engineer with over thirty years of experience in the electricity industry, crossing the boundaries of technical design, field operations and, for the past ten years, into the realm of renewable energy and Advocacy for energy customers.

The most recent experience in the electricity industry was as Customer Advocate within the Customer Services Team at Energex in South-east Queensland. Taking engineering skills - which include the role as Network Operations Manager and Network Development Engineer - into the world of government policy and customer advocacy, Mike led the strategic integration of renewable energy policies into Energex.

Earlier this year Mike recently returned from Germany and California following discussions with manufacturers, utilities and regulators regarding the connection of behind-the-meter renewable energy generators and energy storage. This was followed by some time working with the International Energy Agency in Bangkok regarding the issues associated with the high penetration of generation and storage in advanced electricity grids.

Mike is conversant with the current and proposed versions of Australian Standard AS4777, as well as related standards and industry practices on the installation of PV systems and inverters, stand-alone systems and battery installations. Mike presents at workshops and professional development days on the impact and requirements for inverters to consider PV impacts at both a grid level (frequency load rejection) and local distribution (voltage, quality of supply, safety).

Until his recent departure from Energex, Mike was a member of the Queensland Energy Ombudsman Advisory Council since the inception of the scheme, and has presented a number of discussion papers on consumer-oriented subjects such as the empowerment of the energy consumer and the effective commercial, technical and social integration of renewable energy.