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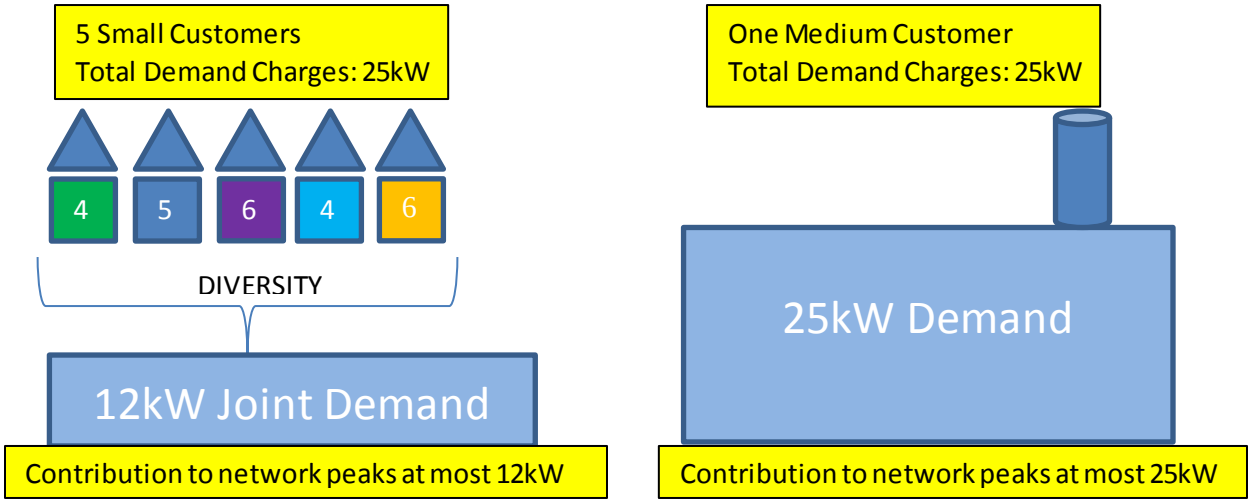
More Hidden Bias in Demand Tariffs: Preface to a Submission on Ausgrid's TSS.

By John Herbst
Many thanks to members of SA Renewable Energy Policy Group for feedback.
This work does not express the official opinion of any group or organisation.

If all customers pay the same price for maximum Demand ($/kW per billing period), then small customers pay many times their cost-reflective impact on network peaks.

Figure 1: Bias in Demand Tariffs against the smallest customers.



Joint Demand of 12kW is a representative case, based on anecdotal estimates of average joint demand for residential customers with 5kW usage each: "2 customers average 7.5kW joint demand, 3 customers average 9kW, 4 customers average 10.5kW, and 5 customers average 12kw". Actual coincident demand for the 5 small customers in Figure 1 can range from 6 to 25kW, with results highly dependent on the window of measurement (15 minutes or 4 hours) and the number of days in a billing period (30 or 365).

By contrast, we *know* that the larger customer's Demand actually reached 25kW, and may have been sustained over long intervals.

The bias in Demand charging is even more apparent when we examine larger groups and larger customers. 1000 small customers might need only 1MW of joint peak capacity but could be charged for 5MW, 5x their estimated peak impact, when a single large customer using the same 1MW of peak Demand pays 1/5th the price.

Incredibly, some networks have set Demand charges on a DECLINING BLOCK, offering even lower prices to already subsidised large businesses within a tariff class. For those correctly thinking "but it costs more to serve the 1000 small customers", my reply is, first, "not 5x as much", and second that the additional cost is completely recouped through the 1000x supply charges and/or capacity charges. Local network costs are not meant to be recovered through peak surcharges.

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Submission on Ausgrid's Tariff Structure Statement, 2019-2024

All references are to pages of the Draft Tariff Structure Statement as submitted by Ausgrid with its regulatory proposal. Thanks to members of SA Renewable Energy Policy Group for help to clarify the graphics and case that Demand charges are unfair to the smallest and most efficient customers

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The Good: I'd like to see more on these quotes. This section is to acknowledge that Ausgrid is often correct in its economic analysis, and we do agree on many points regarding cost-reflectivity and tariffs.

> *The effects of the large-scale implementation of demand pricing on network diversity are also uncertain. A demand charge that encourages customers to smooth their peak consumption may be intuitively appealing but, given diversity in the timing of customers' demand, it may be ineffective at reducing peak demand and so avoiding future costs. (36)*
>
> *However, if our prices are above cost reflective levels then we signal to customers that the future network costs that could be avoided by an investment in DER are much higher than they really are. This means that a customer investing in DER may realise a network bill reduction that exceeds the resulting reduction in our future network costs. This is an inefficient investment in DER since our network could have provided the services our customers want at a lower cost. (47)*
>
> *In this context [NB: listening to stakeholders' opinions], we acknowledge the potential merits of demand price structures but consider there is a degree of uncertainty and a divergence of opinions regarding the impact of alternative pricing structures on our customer's future network use and investment decisions. For these reasons, the implementation of demand pricing is not in the best interests of our customers at this point in time (8)*
>
> *By way of example, the additional network costs imposed by customers running their air conditioners on hot summer nights after 8pm (when there is excess capacity on our network) is low. If this is something customers value, we do not want to unnecessarily discourage them from using our network by sending them above-cost reflective price signals. (47)*
>
> *In summary, transitioning towards cost reflective charges will assist in transitioning to a decarbonised economy, encouraging the efficient use of our network and promoting efficient investments in DER while avoiding potential inequities between adopters and non-adopters of new technologies. In other words, our pricing will be technology agnostic. (10)*
>
> *We propose to replace the existing flat block structure or non-time of use pricing with an inclining block structure in 2019/20. (13)*
>
> *Peak demand is the principal driver of our network costs. (21)*
>
> *This is expected to result in an upturn in peak demand in summer which will to a degree be offset by the energy efficiency measures and the uptake of solar PV and batteries. We expect that over the 2019-24 period maximum (peak) demand will increase by 1.5% per year.(21)*
>
> *Broadly, the framework established by the Rules necessitates the development of a theoretically efficient tariff, and then, an assessment of whether there exists a need to transition to those 'efficient' tariffs over a period of one or more regulatory control periods. (34)*
>
> *Again, we emphasise that this is a hypothetical, theoretically efficient reference tariff that would likely be infeasible to implement in the short term, given the importance of a pricing strategy that reflects customer preferences and avoids unacceptable customer bill impacts, while also reflecting practical constraints such as metering technology. (34)*
>
> *In summary, reducing non-peak variable charges will encourage efficient investments in DER and avoid potential inequities between adopters and non-adopters of new technologies. Therefore, our pricing will be technology agnostic. (47)*
>
> *We consider that fixed daily charges best reflect the nature of the connection service we provide to customers and will also assist in facilitating peer-to-peer trading. (48)*
>
> *Consistent with the requirements of the Rules and economic literature, fixed daily charges also recover our historical costs in a manner that least distorts customer's decisions because they are least likely to*

have an impact on our customer's behaviour. (48)

While it is clear that our approach will need to rely to a large extent on the exercise of professional judgment in relation to the allocation of costs, Ausgrid believes that our approach is acceptable at this stage given that the prohibitive cost of obtaining more robust engineering estimation of the costs is likely to outweigh the benefits of doing so. (70)

Setting network tariffs by reference to LRMC encourages customers to use our services where the benefit they derive exceeds the cost of providing the relevant services.

The Bad:

Ausgrid believes that the efficient reference tariff should be based on the recovery of residual costs through the fixed daily charge to the extent that this approach does not lead to inefficient grid defection or by-pass. (104)

This results in unfair charges to the customers who can't quite leave the grid, but impose little cost from remaining on-grid. High fixed costs distort the decision to leave the grid, as recognised by the AER.

It is demand that drives our network costs, rather than the level of energy that flows through our network. It is for this reason that we are proposing to rebalance our prices away from less cost reflective energy charges (22)

This means that, at a very high level, the cost of operating our network will be relatively similar regardless of whether customers use our network more or less outside of the peak periods, i.e., before 2pm or after 8pm on summer working weekdays and before 5pm or after 9pm on winter working weekdays. This means that we can enhance our customers welfare by encouraging them to use our network more outside of the peak period for little or no additional network costs. (46)

"Anytime" energy charges do better than fixed or off-peak usage charges in allocating residual charges in a user-pays manner, without distorting the price signal for efficient use of the network.

A customer will invest in DER if the cost of that investment is less than the expected total bill savings through time (47)

Efficient investment in DER occurs only under certainty and perfect conditions. DER investment is being stifled at the moment by uncertainty, some of which stems from DNSP tariff proposals which would distort the value of DER severely from cost-reflective levels.

we propose:

• to launch a research program, to be developed collaboratively with stakeholders, of which a key focus will be whether demand pricing will lead to more affordable, reliable and sustainable outcomes for our customers; and

• to include in our TSS a demand pricing structure to give us the potential to fast-track a mid-period implementation if our research program indicates it is appropriate. (42)

The AER should scrap this and any other funding for research into Demand Tariffs, particularly by DNSPs themselves, which would profit in the long run from sending the weakest possible price signals, stimulating demand for grid services, particularly costly network peak demand.

Our view at present is that the first-best approach to recovering residual costs is by means of the fixed daily charges, which are least likely to affect a customer's behaviour. That said, we acknowledge the potential merits of recovering residual costs through capacity charges. A pure capacity charge would be based on the size of a customer's connection and is substantially equivalent to a fixed daily charge. Alternatively, a charge could be designed such that it has characteristics similar to a capacity charge, but
is more variable, in other words, similar to our existing capacity charges for large customers. (37)

From a purely theoretical perspective, minimising distortions to the efficient customer decisions elicited by the above mentioned efficient price signals would involve recovering residual costs from fixed daily charges or capacity charges based on the size of a customer's connection. The efficiency properties of these charges draw from their lack of variability and the consequent minimal effect on customer behaviour. (34)

we propose to gradually recover a smaller proportion of historical costs from variable energy charges. (37)

Non-peak shared infrastructure costs should be collected from Anytime Energy Charges.

> *Since this charge would apply only at those times when the network approaches a constraint, it could be either a demand charge or an energy charge. This is because the distinction between the price signal arising from a demand charge versus a time of use energy charge diminishes as the period over which it is signalled shortens. (34)*

Are you arguing that Demand minimises distortions as well as ToU because it would do so as peak interval size approaches zero? Isn't ToU a superior signal for all Demand Windows in the realm of feasible choices?

> ***Time of use Capacity pricing*** *are mandatory for all medium to large business customers (23)*
>
> *Peak kW Capacity Charge– This tariff component is a network use of system charge applied to the maximum kW demand in any half hour interval between 2pm and 8pm on a working weekday in the previous 12 months; (85)*
> [NB:Tariff EA023, EA211 EA302 and EA370 all have this definition, not the same as the peak demand period!?]

Capacity pricing is Ausgrid's term for Demand Tariff with a different window than the peak period, charges lagged by 1-2 years to make it more difficult to escape, making it more like a fixed cost. Shameless!

> *Our extensive engagement with customers illustrated a significant divergence of opinion on whether potentially avoidable future network costs should be signalled to customers using demand or TOU energy charges. (35)*

Economic theory must not be derived from popular opinion, but I acknowledge the value of consultation in the tariff process.

Thank you to the AER for protecting electricity consumers, as well as purveyors and adopters of efficiency products and services, by ensuring that prices accurately reflect the costs of different patterns of behaviour and consumer decisions.

More quotes which I question without comment are below, mainly for Ausgrid's consideration.

> *Focusing our pricing approach on connection to the grid, as opposed to electricity consumption, reflects the fact that the majority of our costs are stable in nature and are based on investments completed to meet the peak demand reliability needs of our customers. (p5)*
>
> *measures to significantly improve our approach to recovering the cost of the existing network by rebalancing prices away from non-peak variable energy charges and towards fixed daily charges (p8)*
>
> *For example, we will be well placed to offer lower fixed daily charges to those customers willing to accept a lower maximum capacity draw from the network. (10)*
>
> *Consistent with the requirements of the Rules and economic literature, fixed daily charges also recover our historical costs in a manner that least distorts customers' decisions. (10)*
>
> *Therefore, we propose to offset the reduction in non-peak variable energy charges by increasing fixed daily charges in a way that leaves a typical customer's network bill unchanged.(10)*
>
> *Importantly, fixed daily charges reflect the nature of this connection service we provide to customers (10)*
>
> *by encouraging large energy users to switch to time of use pricing (by increasing the discount that a typical large customer receives from time of use pricing); (15)*
>
> *We understand from retailers that the transaction costs of establishing, marketing and implementing additional retail tariffs would be prohibitive, and so some retailers, such as EnergyAustralia, indicated strong support for the use of rebates to avoid unacceptable customer bill impacts from price rebalancing. (16)*
>
> *The load control of air conditioners in particular offers significant opportunities for reducing network costs since air conditioning load is a significant driver of peak demand. Ausgrid's (23)*