Why solar households should learn to love demand tariffs

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By Mark Byrne February 15, 2018

File this one under Tough Love…

Two years ago the Total Environment Centre joined the Australian Energy Regulator in defending the its decision to reject a bid by SA Power Networks to introduce a solar tariff.

It would have resulted in solar owners paying more for their grid imports on the basis of what the network called their ‘less favourable load profile.’

We won, but the judgement left open the potential for SAPN or another network to introduce a tariff that discriminates against solar households, if it was framed differently.

No network has tried since then, but last year we witnessed the AEMC seriously consider the option of changing the rules so solar owners can be charged for the privilege of exporting energy to the grid.

The reaction the solar industry, advocates and owners was swift and strong, but they are about to have a closer look at it again this year, starting next month.

So not only is it important for solar owners and advocates not to take anything for granted (the price of energy liberty is eternal vigilance).

It is also important to take a holistic and balanced approach to the costs as well as benefits of rooftop solar for the market as a whole – wholesale, networks and retail, as well as other, non-solar consumers; and the environment too.

The benefits of solar are many.

Apart from the financial benefits to individual owners and the environmental benefits to everyone, the 'whole of system' pluses include:

reducing early afternoon peak demand in business areas;

reducing wholesale prices by lowering overall demand (the merit order effect);

and reducing the need for expensive infrastructure to bring centralised generation to our homes and business from hundreds of kilometres away.

But we still need to make sure that any negative impacts are not borne disproportionately by other households which cannot, for financial or other reasons, install solar (and batteries).

Let's focus now on the costs. Even without the premium feed-in tariffs previously offered by state governments, there are a few:

- The STCs now available for 13 years under the RET, which retailers pay for but which they then recoup through all customers' bills. (The total cost of this program is running at around $500 million, or around $50 per customer, per year.)
- The cost of rectifying technical issues for networks caused primarily when there are net upstream flows to substations historically built for downstream or one-way energy flows. (Evidence of the scale of such issues is scant, but the AEMC made much of them last year, so they need to be addressed.)
- The fact that while networks recover less revenue from solar owners, due to their lower overall grid imports, they may still have roughly similar peak demands, so cost networks a similar amount in infrastructure spending. (Modelling for the AEMC a few years ago put the cross-subsidy from non-solar to solar customers at around $200 per year. But see this excellent paper from the CEEM team at UNSW for a different view.)

If you agree that the energy system should be decarbonised not only quickly but fairly, there are solutions to each of these costs.

For instance, there is a good argument for recovering RET costs through the taxation system rather than through energy bills, so that those who can afford to contribute more do so.

And there are some relatively cheap and simple solutions available for technical issues such as voltage and frequency fluctuations; the new inverter standard is already helping here.

The third issue relates directly to network tariffs.

Under the revenue caps that operate throughout the NEM, if networks recover less revenue from solar customers, they are entitled to increase the tariffs for all consumers (solar and non-solar) to maintain their revenue.

This is a major reason why networks – and retailers – have been ramping up their fixed charges in recent years.

If they can't recover their regulated revenue through variable energy charges they'll get it by increasing your daily fixed charge.

More on this in my final article next week.

Nevertheless, instead of ramping up fixed charges, the tariff/revenue issue can be largely overcome by moving consumers onto demand tariffs.

But first, some background.

There is much debate about when and where critical peaks occur on networks.

It varies, but basically, on hot summer (and, occasionally in the southern states, cold winter) late afternoons and early evenings in residential areas; earlier in the day in predominantly commercial or industrial areas.

Peaks can also vary according the level of the system. That is, the peak on my street may be different to that of the local substation, zone substation or transmission system peaks. But increasingly, critical peaks occur in residential areas in the early evening and are driven by high aircon loads during heatwaves.

Network data shows that solar owners have lower daytime grid consumption (obviously). And that helps to delay the network-wide afternoon or evening peak. However, there is conflicting evidence about but whether solar reduces the height of the evening peak in residential areas.

Under some scenarios PV does appear to reduce critical peaks, constraining future costs for non-solar as well as solar consumers.*

This mitigates against the idea that PV owners are being cross-subsidised – an important point. On the other hand, I've seen one network claim that its solar households actually have higher evening consumption than non-solars, but this makes little sense.

On balance, let's say that the evening peak demand of solar households appears, on average, to be not much different to similar-sized non-solar households. So the revenue recovery issue remains.

Fortunately, there is a ready and equitable solution.

Assuming you accept the argument in my previous article that well designed demand tariffs –

that is, ones that encourage consumers to reduce their demand at the time of the network's critical peaks rather than your or my household peak

– can help to constrain peak demand and thus reduce the cost of future infrastructure investment, solar and non-solar owners alike can pay their fair share of future costs by all being on a demand tariff. Everyone would then pay the same amount per kilowatt for their peak demand.

So on a demand tariff, the network may still lose on daytime revenue from PV households, but at least it is recovering its 'future' costs equitably.

(Well-designed demand tariffs should also ensure that owners of inefficient and ducted aircons will no longer be cross-subsidised by others to the much worse tune of $350*-$700** per year.)

This might sound reasonable, but it will mean that solar owners who don't shift their load or have energy efficient appliances will pay more compared with the 'anytime' energy tariffs many are currently on.

But solar owners who can shift some load away from the evening peak, or who have aircons and heat pump water heaters with high coefficients of performance, will come out ahead.

Ditto battery owners – although a future with a high uptake of distributed batteries is likely to see the peak demand problem disappear (unless EV owners cause another evening spike).

The problems for networks will then be even lower cost recovery and – as SAPN is already facing – 'negative load' in the middle of the day, as the 'duck' (curve) starts to sink below the waterline of zero demand.

In the meantime, networks are increasingly likely to put all new solar customers onto time of use or demand tariffs. My advice is to take up the challenge and take advantage of these new tariffs – if and when they are better designed than most of those currently on offer or proposed for the five years from 2019 or 2020.

In return, though, we should expect more of networks:

- Consumption tariffs should recognise the benefits of PV exports in delaying and possibly reducing peak demand.
- Demand tariffs should be properly cost reflective and easy to understand and respond to.
- Make better use of solar exports, for instance by moving overnight controlled loads into the middle of the day to soak up excess solar ('solar sponge' tariffs).
- Not limit exports where local feeders and substations are not facing imminent constraints.
- Introduce lower network charges for local use of the system.
- Capital and replacement expenditure forecasts should take account of the opportunities for network down-sizing.
- Put more effort into demand management programs to reduce peak demand – most obviously, by incentivising new solar owners to face their panels west. They could also encourage the uptake of more energy efficient aircons with direct load control (as Energex has done).

Sound fair?

* According to the Productivity Commission in 2013.

** According to NERA Consulting for the AEMC in 2014.

This is the second in a series of articles. You can find the first here; The long and winding road to tariff reform

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