

## My Overall Theme

Don't underestimate the rate of consumer uptake of new applications of existing technologies as well as the uptake of new technologies and don't under estimate equipment manufacturers willingness to anticipate future opportunities to enable better consumer energy efficiency and cost savings.

Submitted by [REDACTED] on 12/2/2026

### Scope of this submission

My comments in this submission are intended to cover issues raised with Theme 3 of the AEMC draft paper and not Theme 1 & 2 which involve retailer misbehavior. I have been driven out of the retail circus as I view current and past practices are both inefficient and predatory. I am more interested in innovation than retail reform.

### Time line of my solar PV, inverter and battery installations

- 2012- first quote for a PV system. It was ridiculously expensive and small. I did not accept that quote.
- 2015 - [REDACTED] installed without battery.
- 2017 - [REDACTED] battery installed
- 2025 – old system removed and [REDACTED] PV, [REDACTED] 3 phase battery and [REDACTED] 3 phase AC/DC coupled inverter installed with VPP/API and load constraint enabled

### Economics of installations

- From 2005 to 2025 the cost of my grid purchased electricity went from [REDACTED] to [REDACTED]
- 2014 annual electricity bill was plus [REDACTED]
- 2025 – annual electricity cost minus [REDACTED] with Amber as retailer
- New installation cost 50% more than old installations including PV and battery subsidies (RECs) though PV capacity increased 250% and battery increased 1260%
- Old PV alone produced 100% of household load but reduced household electricity consumption by 40%
- Old PV + old battery reduced household electricity consumption by 60%
- New PV/inverter/battery covered 100% household load + exported 150% of household load
- Number of days per annum with new system where grid was required to cover household load = [REDACTED]

- Old PV installation paid off in savings via reduced electricity bills in 3 and a half years with FIT of [REDACTED]
- New installation estimated over 10 years to reduce electricity household costs to \$ zero per annum plus run my PHEV for \$ zero and pay off the entire installation via positive earnings through export earnings rather than by reduced electricity bills all thing remaining essentially unchanged.
- New installation overall network charges (transmission and distribution) both volume and daily charges are negative. With Ausgrid's high demand export incentive the network pays me rather than I pay the network.

#### Affect on grid stability of new installation

- With load constraint I do not contribute to the duck curve phenomena
- Mostly during winter months, at times, I reduce duck curve stress by charging my battery during the middle of the day
- I export excess solar only when the spot market is positive. That is when demand exceeds generation therefore reducing network stress
- I export via my battery during high demand periods thus relieving network stress on the grid during peak demand periods
- As I only require grid support for my household load on [REDACTED] days per year and for the rest of the time I support network stability it is reasonable to say the network needs me more than I need the network

#### Implications of PV and battery uptake

- According to AER the total NEM energy generation for the last 5 years have been flat at around 190 TWh annually. This lack of growth is due, I presume, to increasing PV and battery uptake and behind the meter generation and consumption. This lack of growth in electricity consumption is, by my reading, lower than AEMO projections.
- This lack of growth, essentially a good thing, also implies that income from transmission and distribution providers is flat except for CPI increases. Network customers, by means of PV/battery installations, should by first principals, be contributing less to volumetric fees. However, the flat growth could be explained by either increased customer consumption (possible by electrification) or new connections or both that counteract increased behind the meter consumption.
- As transmission and distribution providers income is based on a regulated asset base (RAB) those not having PV± battery installations will be increasingly be paying, unless the rules are changed, proportionally more for transmission costs as new builds (for example Hume Link) begin to contribute to transmission RAB. As most of these new builds have had cost blow

outs the rise in transmission tariffs will become problematic. Hence one of the motivations, I presume, for this draft report.

- If network costs are raised this could act as an incentive to install PV± battery systems or place an extra burden for those who cannot or choose not to install such a system. The price signal of rising transmission costs could form a negative loop where fewer and fewer customers are left paying for transmission costs. Any increase in network access charges across the board will disproportionately affect efficient users. An interesting conundrum. Who will be the losers efficient or inefficient users?
- Residential consumers, like myself, are becoming increasingly aware that rooftop PV + adequate battery storage can affordably supply 100% of household annual electricity load if roof space is adequate. This is evidenced by the increasingly larger PV arrays being installed and the uptake of larger than expected choice of battery capacity in the subsidies instigated after 1/7/2025. This is in spite of current negligible feed in tariffs. In the background is the public perception that electricity bills have risen way faster than CPI for decades leading to a drive to opt out of the standard retail offerings. The electricity retailers “loyalty tax” is a egregious example of public disquiet.
- Distributors and transmission service providers are caught in a double bind. The first bind is that larger regulated asset bases leads to larger income so encouraging network builds leads to greater income and therefore greater income for shareholders but greater cost for consumers. However, regulators will not allow this until other and or cheaper options have been exhausted. The second bind is that one such option is the increasing uptake of PV and batteries. This in turn leads to less volumetric traffic and therefore less volumetric fees and the need to derive income by other means.

Ideally customers who use excess battery capacity to export electricity locally during high demand periods would be volumetric and revenue neutral to a DNSP as the buyer of the electricity would be paying a volumetric tariff within the DNSP network. If the buyer is outside the DNSP network currently the DNSP revenue could be negative (paying the exporter an incentive but getting no tariff revenue). The first scenario, in a dynamic system, would enable the DNSP to not impose a high demand period tariff as the transfer would occur locally and be less likely to place stress on the grid and more so likely to relieve grid stress. The DNSP network tariff could also be managed dynamically. However, (high voltage) HV (high voltage) transmission tariffs would be adversely affected and would lead to increased cost to those relying on transmission for their electricity supply by the current RAB method.

- National electricity production has fallen from 2017 to 2020 and has been stagnant from 2020 to 2025. This output will most likely fall again after the battery subsidy takes effect. Current best retail cost of residential batteries is around \$250/kWh with the rebate (Amber web site). The federal government has allotted \$7.2 billion to this subsidy. Assuming 100%

utilisation of daily battery capacity and best price purchase of batteries equates, by my calculations, to around at most 10 TWh of loss of network volume annually or a 6% drop in national “in front of the meter” electricity generation. However, from anecdotal stories, residential battery prices currently range from \$500-\$1200/kWh. The impact on annual NEM volume I suspect will be less than 2% and have a significantly lower impact on customer bills than new builds.

- The publishing of AS 4.777 last year enabling V2G and V2H onto the grid adds another residential asset to reduce reliance on the grid. Batteries on wheels and generators on wheels make an already existing asset (EV/Hybrid EV) being utilised for grid independence or support. Particularly the generator on wheels concept may tempt some customers to go off grid even in suburban locations or form local micro grids sharing a common backup generator for the odd days when additional electricity is needed. This would be a disaster for NEM design and operation. Customers who are most likely to support grid stability by way of large PV and battery installations and who also have received government subsidies for these installations should not be tempted to opt out. Such a scenario would then place an increased burden on those left on the grid without any existing capability of clawing back costs from the most efficient users.
- Other technological innovations, for instance 1) some PV manufacturers are now offering a 30 year warranty for residential highly efficient and cheap PVs 2) new battery types most notably sodium/salt are entering the market. The manufacturers claim a 30 year life, no fire risk and half the price of LiFePO4 batteries. If performance matches manufacturers’ claims this may have the capacity to disrupt the Integrated System Plan (ISP). PV + battery installations would become so standard that there would be a penalty for a premise for rent or sale for not having such an installation.
- Considering the above and other unforeseen innovations there is the possibility that the ISP may lead to stranded assets or very cheap electricity for those willing to acquire those NEM stranded assets at a discount.

As the draft paper appears to be solely consumer oriented and I assume that recommendations will be based on the overall benefits to the consumer and not profits of generators, transmission service providers, retailers and distribution network service providers. The latter being most likely to be affected, in effect, by a loss of paying customers by the fact that 1) falling or zero volume use by customers with batteries 2) an increasing number of those on the grid will be predominantly exporters of electricity and more importantly exporters during high demand periods where distribution network charges are currently negative (an incentive to export). This incentive is to relieve stress on DNSP networks and obviate the necessity for future builds. However, the incentive will have to be recouped from non high demand exporters (duck curve exporters) and all the time importers of electricity. Which customers will pay for this incentive is an interesting paradigm.

A new model of electricity retailers is emerging which are more transparent in their pricing, more efficient and non-predatory. Amber is a good example. You know more precisely what you are paying or being paid for.

#### Response to Questions on recommendations 5&6

Draft recommendation 5: Amend the rules to focus network tariff design on efficiency, supporting a lowest cost grid and a fairer sharing of costs among consumers

#### *Response*

The key words are efficiency and fairness. The former (efficiency) is more straight forward. Price signals are a time proven effective way of ensuring efficient use of resources. To remove time of use (TOU) signals would eventually lead increases peak consumption and therefore to distribution network builds to relieve strain and congestion on the grid and is therefore inefficient. However, to move towards a dynamic less rigid system of demand price signals would improve efficiency.

To increase the daily charge for all consumers would penalize low volume consumers and renters and people who have insufficient roof space, roof structure, orientation or overshadowing to make solar PV practical or affordable. This would also disincentivize new solar and solar battery installations and or possibly encourage larger systems to enable selective exporting electricity to compensate for disproportionately increased cost for simply being on the grid. The latter is an interesting paradigm.

The tying of network tariffs to RAB is inefficient. As a consumer moves towards more efficient generation and usage of electricity and therefore less NEM volumetric electricity consumed higher network tariffs will be charged which, in effect, punishes productivity and is therefore inefficient. Paying more for using less. The draft report does not document graphically or otherwise how network charges have changed over time by state and DSNP and transmission provider. It would be useful for consumers to see how much transmission and distribution charges contribute to their electricity bill.

Fairness, on the other hand is a more opaque concept and as yet undefined concept. I agree with the draft paper's observation that network charges could increasingly fall on consumers without PV ± batteries and who are efficient low volume users of electricity as well as inefficient users of electricity. There is no way for regulators to accurately determine which consumer is efficient or inefficient. The only available data is volume and time of use. To charge all customers the same increase in daily network access charges could be viewed as a tax on efficient consumers of electricity. If daily network access charges are increased equally to all users such a practice would be inefficient and send the wrong price signal to both efficient and inefficient consumers of electricity. I view that it is the role of the government to assist low income people who are efficient consumers of electricity who may be disproportionately affected by an increase in daily access charges.

The sweet spot would be to increase daily access charges on a stepwise basis based on volume. This would eliminate the inefficient and unfair current situation where low volume consumers contribute disproportionately to access to the grid. This would send the appropriate price signal to either invest in PV + battery or use electricity more efficiently for higher volume users. With the marked reduction in feed in tariffs, installation of PV alone is only marginally efficient and in current circumstances would add the duck curve problem.

I do not view the NEM should play a socio economic role in redistributing network costs to low income consumers with low income as the sole criteria as this would be inefficient and politically problematic and send the wrong price signals. AGL in their web site stated that consumers who were claiming financial assistance were also the largest consumers of electricity.

The discussion in the draft regarding Recommendation 5 uses the words flexible, dynamic and poor signals. My experience with Amber would support the proposed concept with reservations. I could envision not only AEMO demand forecasts and spot market prices influencing Amber's or my decision to discharge my battery but also Ausgrid's congestion forecasts and real time data. Ausgrid could detect a particular sub-network coming under stress and asking/ordering Amber or its equivalents to discharge (for under supply) or charge (for over supply) batteries supplied by that sub network for an incentive. Over supply would be less common if PV inverter load constraint were in place if the majority of consumers with PV ± batteries with inverters with API linked to a retailer or DNSP or other third party that could initiate load constraint.

On the other hand a dynamic flexible system is more complex and this in itself could be problematic. My experience with Amber is that about once a month there is a problem somewhere in "the system". Market spot price feed to Amber, communication issues with a particular brand and or model of inverter, firmware updates needed for my inverter, home energy management system software and communication problems with other devices and systems, Amber's own software glitches and internet failure either on Amber's telco or my telco all occur on a semi regular basis. To integrate all of these systems to operate harmoniously is a big ask. On top of this is cyber security issues either into my home internet set up, my inverter, Sungrow's cloud system and Amber's system. There is also the geopolitical issue. Many of Australia's most popular and affordable inverter and battery systems are manufactured in China. It is conceivable during cyber warfare the Chinese government orders these manufacturers to destabilize the Australian grid. There are an increased number of points of failure which could lead to network instability.

Currently I know if the sun is shining I have adequate electricity and can make decisions to, for instance, charge my car. I know that for 8 months of the year if the time is between 3:00 PM and 9:00 PM I am in the high demand period and must not import electricity or pay a heavy penalty. In a dynamic flexible system I would never know what the state of play is without the reliance on being connected to many devices and everything is working

properly. I would be tempted to check my iPhone or home management system or get alerts every time I wanted to charge my car, turn on the oven or HVAC even if the sun is shining. The current system is simpler and more predictable. It is imperfect but a dynamic flexible system is heading into uncharted waters with the potential for unintended consequences.

Other 'fairness' considerations include 1) Should person who invests in solar panels and preferably a battery who currently receives a 30% subsidy not share equally the network costs on a per customer basis? 2) On the other hand that person has invested 70% of the cost of the installation so why should they carry equal network charges when they are in effect not using the network as often and have contributed to reducing new distribution builds that all would have to pay for. Other "moral" considerations for instance include 3) pensioner who has raised and supported children and therefore have honored the 'intergenerational social contract' but then cannot afford a PV/battery system versus double income no kids who can afford and install a solar battery system 4) a person who goes on overseas trips rather than invest in a solar/battery system paying the same network fees as someone who has invested in such a system and forgone such luxuries. The examples are endless and beyond the scope the NEM rule maker.

Draft recommendation 6: Amend the rules to ensure networks design tariffs for energy service providers, rather than directly for customers, to promote more flexible and innovative retail offers.

#### Response

Recommendation 6 involves the distribution network service provider to provide the retailer both a dynamic and a basic fixed rate. Thus removing the energy service providers passing on risk to the customer for the basic rate. By offering a basic network rate may translate to more honest energy plan to potential customers.

The dynamic rate would move towards what I have alluded to in Recommendation 5. The intent to remove the requirement to have tariffs not vary significantly between periods implies a more volatile system if a customer is not on the basic plan. Such dynamic pricing would require energy service providers to control inverters, batteries and possibly appliances either directly or through home energy management systems. Such widespread integration is to me attractive as I have ample battery capacity and enjoy the automation that Amber usually provides. The NEM spot market is more profitable to me than the distribution network incentives via Amber. I would welcome more volatile and dynamic pricing from my DNSP which offers very modest incentives to export and very severe penalties to import during high demand periods.

Network tariff charges designed for energy service providers requires more detail. Would there be a single network charge? Would there be a volume charge? Would there be a TOU charge? Would there be a feed in charge or incentive? Would there be the feed in TOU charge or incentive? Would these charges be dynamic or rigid? How would my retailer,

Amber, for instance be impacted? Would Amber be discouraged playing the spot market and distribution TOU network charges?

Considering my response to Recommendation 5 supporting the concept of dynamic flexible systems with good signals, I ask the question, how would a retailer offer a plan in a dynamic flexible system? The retailer would have to factor in local network conditions, spot market conditions, weather conditions and generator reliability and possibly accompanying power purchase agreements (PPA) as well as customer battery availability and PV output availability. If AEMC is not happy with the behaviour of retailers now such a dynamic system provides even more means to obfuscate costly energy plans.

At best distributors would be forced to offer retailers a default simple tariff on which they could offer a default plan so as to be comparable to other retailers. Would this default tariff include TOU and volume charges? If not, how would distributors in particular reduce the movement towards distribution grid overload and the necessary expensive build required to enable grid stability.

There is no mention of the cost of revised network tariffs or any modelling. Smart Energy Council proposes a \$400-\$680 increase in electricity bills annually for those with existing PV± battery system though I cannot find any mention of that in the draft report.