Export tariff guidelines for distribution networks

Consultation Paper

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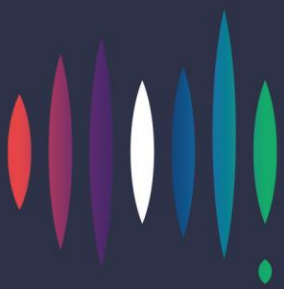

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Energy Consumers Australia supports the AER creating strong guidelines for determining basic export levels and when and how networks propose export tariffs. Strong collaboration and guidance are necessary as we enter the second major energy transition, from large scale generation and low consumer investment to lower scale generation and high consumer investment.

Energy Consumers Australia welcomes the opportunity to comment on the AER's export tariff guidelines for distribution networks Consultation Paper.

Energy Consumers Australia is the independent, national voice for residential and small business energy consumers. Established by the Council of Australian Governments (COAG) Energy Council in 2015, our objective is to promote the long-term interests of energy consumers with respect to price, quality, reliability, safety, and security of supply.

The introduction of basic export levels and export tariffs recognise that distribution networks no longer exist just to serve consumption, but also to serve exports. Basic export levels should be set to enable most consumers to install sufficient solar to meet their basic needs. If set correctly, export tariffs can send strong signals to consumers to change their behaviour in ways that will allow for more solar to be added to the grid, benefiting everyone. If network investment is required to allow for more solar to connect to the grid, effective export tariffs allow the cost of these upgrades to be more effectively recovered by those with solar, as opposed to those without it.

While there may be circumstances that require the use of export tariffs, the network application of export tariffs should in principle be **rare, observable,** and **effective**.

Rare, because relatively few consumers will pay export tariffs due to networks setting export limits that reflect the right of consumers to host sufficient solar to meet their needs. **Observable**, because export tariffs are seen by consumers as they are incorporated into retail prices by retailers. **Effective**, because export tariffs achieve the desired behaviour change when seen by consumers.

The export tariff guidelines must:

- make it clear the instances where and when a network can propose such pricing structures, noting the basic export levels should be set taking into account network obligations for export, consumer rights to install solar, and the low-cost ways to maximise the inherent hosting capacity of networks
- require networks to transparently communicate their hosting capacity in line with the Energy Security Board (ESB) Data Strategy recommendations
- state that export tariffs must be likely to be incorporated by retailers into retail prices, in ways that charge solar customers (and not non-solar customers)
- state that networks must ensure consumers know how to benefit from retail two-way pricing

- ensure that networks include the costs of responding to the tariff change in consumer impact analysis.
- state that tariffs should also create incentives for exports at the evening peak.

We explain the reasons for our views in further detail below.

Rare

Energy Consumers Australia considers that export tariffs should be relatively rare, because the capacity of rooftop solar that typical residential consumers need to meet a reasonable majority of their energy needs likely fall within the intrinsic hosting capacity of most networks.

Demonstration of Need for an Export Tariff and the Provision of Basic Export Level

As the AER notes, all distribution networks have an intrinsic ability to enable export from consumers' export capable devices, notably rooftop solar and battery energy storage. The AEMC's rule change requires all distribution networks to provide a 'basic export level,' and consumers are only required to pay to export solar energy if they export above the basic export level.

The ability of most (not all) network types to enable consumers to host a reasonable amount of solar to meet their needs is particularly true if networks employ the variety of no-cost and low-cost solutions available to them to maximise the intrinsic hosting capacity of their networks as built.

Accordingly, the AER should require networks to consult with consumers in setting basic export levels, and when they do, they should take into account:

- the amount of rooftop solar energy that is sufficient for a typical network consumer to meet a reasonable amount of their typical energy needs; and
- the network's application of no-cost and low-cost operational techniques to manage solar exports and maximise the network's ability to host solar.

The AEMC's Access and Pricing Rule Change recognised that distribution networks no longer exist just to serve consumption, but also to serve exports. Establishing the basic export level should reflect this fundamental change in network obligation and provide most, if not all consumers with a basic export level that enables them to cost-effectively install sufficient rooftop solar to meet their daily needs.

Notwithstanding any local ordinances to the contrary, consumers have a right to install solar on their premises. Networks have an obligation to export some "basic level" of that solar energy without requiring the consumer to pay an export tariff. The basic export level – whenever practicable – should be set such that consumers can cost-effectively install sufficient solar to meet their basic energy needs without paying an export tariff.

For setting the basic export level, the most material considerations are the consumer's basic needs and their ability to cost-effectively install sufficient solar to meet them. The AER should require networks to consult with consumers in the development of the basic export level. Determining a consumer's basic needs should vary (perhaps slightly) by network, should be set with consumers, and might begin from the bottom up by defining basic consumer needs, including typical appliances for a home or business and their load shapes, including electric space heating and cooling, water heating, miscellaneous plug loads. In the future, when their uptake is more common, an electric car might be considered a basic need.

When the network is determining the cost-effective installation of solar for setting the basic export level, they should consider typical present and projected future costs for panels, wiring, inverters, and associated works required to install a solar system. Energy storage and other devices that can help a consumer manage their solar use should also be considered, but only used in determining the export level if storage and other solar management devices are cost-effective. Cost-effectiveness should be determined as the total solar installation investment paying for itself within a 5-7 year timeframe. Given current costs of energy storage, presently the basic export level should assume that consumers require the grid to be able to export some excess solar during times when consumers are not using all their devices.

One might worry that setting the basic solar export level based on consumer energy needs and their right to install solar could balloon network costs to integrate this potential "excess" solar. On the contrary, however, if networks avail themselves to the variety of no and low-cost ways to integrate solar and other exporting DER, there will be relatively minimal costs required for networks to meet their basic export obligation.

Earlier this year, on behalf of RACE for 2030, several research organisations developed "Opportunity Assessment: Network Visibility and Optimising Hosting Capacity," which lists a number of DER integration techniques available to networks and consumers, as adapted in Table 1.

Table 1-- DER Integration Techniques[1]

Category	Type	Description
Network-side DER Integration Techniques	Augmentation	Installing bigger transformers or circuits
	Tap-changing	Adjustment of LV off-load tap transformers, the addition of more taps for LV transformers, adjustment of the on-load tap changer (OLTC) in zone substation transformers
	Advanced tap-changing	LV OLTC transformers with adaptive Control, Low Voltage Regulator
Customer-side DER Integration Techniques	Inverter-settings	PV inverter Volt-Watt/Aar response set/required from inverters
	Flexible export limits	Flexible export limits/dynamic operating envelopes vary the export limit from consumers based on daily network conditions.
	Maximise solar consumption/demand-side management	Incentivising or controlling flexible consumer devices (electric water heaters, pool pumps, storage, EV chargers) to consume energy during peak solar production times

[1] "Opportunity Assessment: Network Visibility and Optimising Hosting Capacity, RACE for 2030 N2, June 2021"

	Coordinated DER response	Services from community or residential batteries or other devices to control voltage and/or export from a particular network segment.

If establishing a basic export service level requires network investment to meet basic consumer needs, distribution networks should demonstrate that they have exhausted most of these integration approaches aside from augmentation. Indeed, distribution networks should identify their own lists of technically potential DER integration options and then assess the cost of each of them if they require the use of DER integration techniques to maximise the intrinsic hosting capacity of their existing network to meet a basic export level.

Many of these approaches are limited cost and mostly require modest ICT investment and digital skills uplift. In general, we believe that while a straightforward cost-benefit analysis might not always show it, the engineering time required to develop and implement such digital solutions provide a net benefit to consumers because they simultaneously increase the level of digital capability at a network, which has flow on benefits in broader network planning and operation.

Network Data, Transparency, and Stakeholder Engagement

A principal challenge in setting a basic export level is that while the limits on export, also known as network PV hosting capacity, are knowable, they are for the most part unknown within the low-voltage distribution network. This lack of knowledge predisposes distribution network businesses to act more conservatively than they might with greater awareness of the true limits. The result is lower overall utilisation of existing network infrastructure, greater costs, and reduced control by consumers over their energy usage.

Indeed, a key component of setting export limits is network visibility and data. The same data that is analysed statically to determine long-term export limits can be used operationally to improve network performance and utilisation through dynamic export limits. Importantly, network visibility is not an issue that is reserved to setting or addressing export limits – though it may be more pronounced in this setting. Improved network visibility when applied intelligently by network businesses will serve to lower total costs, as it can help identify the need for proactive maintenance and inform the best allocation of resources to replace assets. Accordingly, we encourage the AER and networks to invest in improving digital capability and data collection, cleaning, and sharing techniques.

Such sharing, however, is not simply a matter of consumers sharing information or data about their devices – or their consumption – with networks. Networks need to reciprocally share data with consumers, particularly as they identify export limits.

Indeed, the network's basic export level should not only be a matter for consideration with the AER. Networks must transparently share the current and projected future hosting capacity of their networks – including information on the data and methods used for calculating hosting capacity – with consumers. Such information should be a mandated from all networks as they determine their basic export levels. Indeed, the ESB Data Strategy states,

> *"The ESB propose that monopoly network providers should be required to support greater transparency in local network performance and hosting capacity, emerging constraints, and voltage issues with the market. The form of this obligation needs to be considered carefully, particularly vulnerable consumers. The ESB propose that the AER lead a*

process, reviewing existing network data and network visibility requirement to develop pathway to network transparency."[2]

Such transparency is not only important for consumers as they consider their own energy and real estate investments, but it also serves to increase trust with the networks, which is vital for providing the social license required to enact particular network interventions, like flexible export limits, which can help maximise use of a network's intrinsic hosting capacity.

While in the US hosting capacity maps are increasingly commonplace and found in nearly a dozen states, from California and Hawaii to Minnesota, Australian consumers lack information on what exports are permitted in which locations. As noted above, one pernicious challenge in providing consumers with this amount of insight is that the networks themselves may lack it.

Indeed, Australian networks today are stuck in a vicious cycle: Even adding a modest amount of visibility has proven challenging. One reason for this challenge is that network business' proposals to improve visibility typically rely on estimating the benefits from greater DER integration (which the visibility will enable). Estimating those benefits effectively, however, itself requires improved visibility. Networks struggle to credibly claim the benefits of increasing PV hosting capacity when they are unable to accurately identify the existing hosting capacity of a network. In other words, networks find themselves in a circular argument in which they lack the visibility to justify investments in additional visibility.

On the other hand, better data and digital capability likely creates a virtuous cycle. Networks that go looking for data to help integrate DER soon recognise that it can help them plan and operate their networks more efficiently in multiple ways. The challenge often is that such data "use cases" are not obvious or even discovered until a given network engineer has the data to see precisely how the network is or has been operating.

Examination of locational pricing and export levels

Solar congestion is localised to certain areas of the network due to variation in solar uptake rates, demand profiles, network topology and other factors. The AER should provide guidance requiring networks to apply basic export levels and export tariffs by location.

To ensure that prices remain cost reflective, export charges should only apply to the specific location(s) with congestion. This will ensure fairness from a cost recovery perspective, as only those who are causing the congestion are paying for the cost. Setting the basic export level by location ensures that consumers fortunate to live in unconstrained areas are able to cost-effectively install sufficient solar to meet their needs.

This raises the question of how, and to what specific locations of the network the export pricing will apply to. In theory, the impacts of solar vary by connection point, at the low-voltage transformer (aggregating roughly 60 connection points); and at the zone substation. Pricing and the basic export service could therefore vary at each of these locations on the network. Networks will need to balance the potential efficiency and utilisation gains from setting limits more locationally with the increased consumer engagement requirements and perceived equity issues resulting from varying export terms by location.

Our working assumption is that setting the basic export level and export tariffs at the zone substation is the most workable approach – it is achievable, at least in the near-term, for most networks given their current visibility challenges and also lowers the equity challenges of changing

[2] Data Strategy Final Recommendations, Energy Security Board, July 2021, page 25.

export terms more locationally. No network should be setting basic export levels and export tariffs uniformly across their service area unless they set a high basic export level uniformly.

Given that network visibility and capability – along with consumer awareness – are both likely to increase substantially in coming years, the AER should review the guidelines in the future to ensure they remain fit for purpose.

Observable

For export tariffs to work as designed, they must be observable by consumers. That is, they must be included in retail prices so they are seen by consumers.

Need for coordination between networks and retailers

Network tariffs are charges on the retailer for the consumer's use of the consumption or export service. We emphasise that consumers do not see network tariffs, and instead only view their retail bill structure. It is therefore ultimately up to retailers to decide how any export charges are passed on to their customers via their various products.

We are pleased that the guidelines state that distribution networks need to demonstrate that any tariff must be reasonably capable of being incorporated by retailers. However, there is a difference between a tariff structure being *capable of being incorporated* and it ultimately being *likely to be incorporated* by the retailer.

There needs to be a mechanism to ensure that export tariffs are observed by consumers. One solution is for there to be an obligation for retailers to offer any proposed export tariff in their products. In the absence of any obligation, Energy Consumers Australia suggests that the guidelines ensure that there is collaboration between networks and retailers so that it is likely that any proposed network tariff changes will ultimately be passed on to consumers by retailers.

Key discussions will be how export tariffs interact with the feed-in tariffs that retailers provide, and then the resulting signal that these two factors combined give to consumers through their retail price. These interrelationships may distort the signals the distribution network is trying to send to consumers and therefore have significant impacts on a consumer's behaviour change.

It is likely that retailers would want to have their bill structures as simple as possible for many customers, reflecting consumer preferences for simple bills. Therefore, they may not be inclined to pass on the export tariff structures as set by networks due to the added complexity it creates. This would limit the overall behavioural change that would be achieved by the tariff due to consumers not receiving the full signal and works against the policy intent of solar customers paying for their service level.

We also suggest further guidance on how networks and retailers coordinate the communication of these changes to wider parts of the community. These changes are to be driven by the distribution network, which likely means they are best placed to explain the changes. However, consumers engage with the energy market through their retailer, meaning there may be benefits to retailers undertaking the communication instead. The pros and cons of each approach to communication need to be considered.

Consumer awareness of tariffs is likely to be low

The observability of export tariffs is also dependent on the underlying level of consumer engagement with the energy industry and of pricing structures generally. We suggest that the guidelines note that there is a need for networks to increase wider knowledge of tariffs and (aligned with the ESB's recommendation) network hosting capacity before proposing any changes.

Increased awareness of tariffs and hosting capacity will lead to increased benefit from the tariff changes.

Consumer engagement with bills can be quite low for a large majority of consumers due to:

- bills being relatively infrequently, where variation between bills is largely driven by seasonality, rather than behavioural changes and is the aggregate of household decisions
- some consumer preferences for simpler bills which may not include information regarding the previous bill period which can be used to compare differences
- the rise of direct debit bill payment plans and bills moving online, leading to lower engagement with bills.

This suggests that as currently designed, bills should not be the source of information on which consumers can respond. Given the intention of export tariffs is to signal to consumers when exports are valuable and when they are less valuable, we recommend that retailers must provide such real time information.

Showing the lack of knowledge of bill structures, in our October Energy Consumer Behaviour Survey[3] nearly 1 in 3 respondents stated they did not know the underlying tariff structure of their bill when asked to name it. This proportion of consumers would likely be greater than our survey suggests as we expect some would have likely named their tariff structure incorrectly. This is suggested by a 2017 study[4] which found that over half of households were uncertain or incorrect about the type of tariff they were on. This lack of knowledge was present across all income and education demographic groups and included participants who were interested in energy efficiency and technology. This shows that this is a wide scoping issue, which will take significant work to address.

For some consumers, engagement might be low because they are not getting the information they need and when they need it. While for a portion of others, they will likely never be engaged with or respond to price signals (whether that is due to a lack of interest or the lack of ability to respond). This will have to be an important factor to consider when proposing any export tariffs, especially when forecasting benefits, as it cannot be assumed that all consumers will respond to the changes, nor will their behaviour changes be long standing (i.e., behaviour changes may only be short term changes before reverting to old habits).

Effective

When export tariffs are passed to consumers through their retail bill, the tariffs must be designed so that they are effective. An effective tariff is a tariff that achieves the desired outcomes when seen by consumers. Distribution networks must demonstrate that their tariffs are likely to be effective.

Networks must ensure consumers know how to benefit from two-way pricing

We agree with the AER that networks should demonstrate that tariffs are understood by consumers. However, *consumers understanding the tariffs* is different to *consumers understanding how to benefit from the tariffs*. The latter is ultimately more important for ensuring that tariff

3 Energy Consumers Australia, Consumer Behaviour Survey, October 2021

4 Nicholls L., Strengers Y. & Tirado S., 2017, Smart home control: exploring the potential for enabling technologies in vulnerable, disengaged and regular households, Centre for Urban Research, RMIT University, Melbourne.

changes lead to desired outcomes. We recommend that the guidelines state that networks go beyond explaining the tariff structures and the reasons for the changes, but also provide consumers with the necessary information for them to make the correct choices to benefit from two-way pricing.

Export tariffs should incentivise two broad behaviour changes:

1. shifting consumption to periods of high solar generation, and therefore using solar generation for consumption rather than export
    - the consumer benefits through a lower consumption charge
2. purchasing a household battery or obtaining access to a community battery, to either/or:
    - use excess solar for consumption during peak period and benefit through a lower consumption charge
    - export excess solar at 'peak' time and benefit through regaining the lost solar export revenue.

Networks must transparently explain these options and give consumers the information necessary to make the decision that is best for their circumstance. Analysis showing how consumers can benefit by adopting these various behaviour changes will be important for obtaining broad acceptance of the changes.

For example, a consumer may think they can shift consumption to periods of high solar generation. However, they may have misconceptions as to which loads are material and would look to shift loads that have an immaterial impact on demand. Providing this consumer with information as to what loads can be reasonably shifted, and the bill impact of shifting this load helps them make an informed decision in response to the pricing change. Conversely, a consumer may not be able to shift any material consumption and would therefore be interested in a battery. However, they may not be able to afford a battery and would therefore be interested in a community battery scheme. In this case, they would require information as to who to contact to access such a scheme, and how much it would likely cost.

Consumers face material costs to respond to tariff changes

Distribution networks will need to consider the costs a consumer will face to respond to the tariff changes. Networks through research (for example through willingness to pay studies), must estimate these costs and compare them with the benefits from changing behaviour. These costs are likely to be material and must be transparently communicated to consumers in any engagement.

If a consumer is to change consumption, the costs they face are:

- real costs, such as the costs or replacing devices with more efficient ones, or smart devices, or
- perceived costs, such as the loss of autonomy over consumption.

If a consumer is to access a battery, they face either the upfront capital costs to purchase and install a battery or the costs of joining any battery scheme.

Overall, a consumer is going to be faced with two choices when they observe the pricing change (noting above that some consumers likely will not observe the change due to lack of engagement or preference for simpler bills). Either the consumer will respond to the tariff, or they will decide not to. They will change their behaviour if and only if their perceived value of changing behaviour (the

benefit of changing behaviour minus the cost of changing behaviour) is greater than the value of not changing behaviour (the costs of not changing behaviour).

For some consumers, the cost of changing their behaviour will be greater than the benefit and therefore they may decide it is in their best interest not to change the behaviour. It will be important to estimate how many consumers this will likely be, and the corresponding bill burden they will face. If an analysis finds that this would be the case for a large majority of consumers, then there are questions as to if the tariff should be proposed, as it will likely not lead to any material shifting of load, and therefore likely not be effective.

Factors to consider when undertaking consumer impact analysis

Distribution networks should demonstrate that their tariffs are effective through cost-benefit analysis of the impacts of their tariffs. This analysis should be undertaken at the retail level, as that is where consumers receive signals.

Some have been mentioned above, but below are the factors that need to be considered when undertaking consumer impact analysis:

- the real or perceived costs a consumer faces responding to the tariff.
    - the higher the perceived costs, the less likely it is that consumers will respond to the tariff change
- the likely response rate to the tariff change (as perceived at the retail level)
    - it cannot be assumed that every consumer will respond to the tariff, as for some, the costs of responding to the tariff will outweigh the benefits
    - it cannot also be assumed that the immediate response rate will be maintained over time
- the amount of load that the consumer would be reasonably expected to be able to shift
    - we consider there is limited ability for consumption to change materially (while the recent trend towards working from home may have changed this)
- direct and indirect bill impacts
    - direct bill impacts are the immediate impacts a consumer faces through the change in tariff structure only
        - these can be negative for those who can respond to the scheme while positive for those who do not respond to the scheme
    - indirect bill impacts are the longer-term bill changes resulting from avoided or deferred investment to accommodate DER
- the number of consumers with, or intending to purchase solar in an area and the average size of the installed solar
- the number of consumers with solar who would be able to purchase a battery
    - It cannot be assumed that all consumers will be able to afford a battery.

Pricing should also create incentives for exports during the evening peak

The guidance note is framed around networks charging for exports during periods of high solar generation. However, overall community benefit is maximised if there are also incentives for exporting during the evening peak (i.e., to reduce peak demand). We recommend that the guidelines explicitly state that networks should offer rebates to consumers for times when solar exports would be of benefit, in addition to assigning costs for exports in times of high congestion.

Failure to balance incentives in this way will potentially lead to undesired consequences. If the signal is to only avoid exporting during periods of high solar generation, the consumer may be incentivised to disconnect from the grid (and avoid consumption charges) rather than remain connected to the grid (and benefit from exporting solar to the grid at the times when it has high value).

Consideration of the transition away from export pricing

It is important to recognise that congestion in a network segment can be temporary. It can be alleviated through both behavioural changes by consumers (e.g., by purchasing electric cars), but also through network augmentation and other schemes (such as community batteries). Therefore, in addition to considering the transition to export pricing, it is important to consider what will happen with export pricing after congestion is alleviated.

Export pricing may only be a short-term solution because:

- there is forecast network investment that will increase the hosting capacity of the location
- the export pricing elicits the desired behaviour change, removing the need for the pricing structure.

TSS proposals must therefore be aligned with expenditure proposals to ensure that costs are not double recovered (i.e., consumers pay for export pricing as well as for augmentation that will alleviate the congestion). This will require a centralised view of the entire network and transparency from networks as to their planning, which underscores the appropriateness of carrying forward the ESB's recommendations on network transparency within this proceeding.

Final recommendations

Many of the issues above suggest the need for the AER to drive broader capability building and collaboration between the consumers who are engaging with the distribution network on their export tariff proposals and retailers. This will ensure that networks and retailers are not all working individually on these issues.

While networks face their own specific circumstances leading to the need for specific tariff structures, different approaches between networks comes at a cost of further complexity for consumers. Having significantly different approaches to the establishment of basic export levels and tariffs can lead to confusion and the inability for consumers to share knowledge with relatives or friends (especially in states with multiple distribution networks and retailers). For that reason, we support collaboration and knowledge sharing across the industry, and across the network-retail businesses on how to set and communicate basic export levels and tariffs wherever possible.

If you would like to discuss this submission further, please do not hesitate to contact Ashley Bradshaw by email, [redacted].

Yours sincerely,

[redacted]

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ENERGY CONSUMERS AUSTRALIA