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**Total Environment Centre**  
**AEMC Distribution Market Model (DMM)**  
**Submission to Draft Report**  
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## Total Environment Centre's National Electricity Market advocacy

Established in 1972 by pioneers of the Australian environmental movement, Total Environment Centre (TEC) is a veteran of more than 100 successful campaigns. For nearly 40 years, we have been working to protect this country's natural and urban environments: flagging the issues, driving debate, supporting community activism and pushing for better environmental policy and practice.

TEC has been involved in National Electricity Market (NEM) advocacy for ten years, arguing above all for greater utilisation of demand side participation — energy conservation and efficiency, demand management and decentralised generation — to meet Australia's electricity needs. By reforming the NEM we are working to contribute to climate change mitigation and improve other environmental outcomes of Australia's energy sector, while also constraining retail prices and improving the economic efficiency of the NEM — all in the long term interest of consumers, pursuant to the National Electricity Objective (NEO).

### Introduction

TEC congratulates the AEMC for initiating this “exploration of the key characteristics of a potential evolution to a future where investment in and operation of distribution energy resources is optimised to the greatest extent possible.” In particular, we concur with the DMM Draft Report's recognition of the *optimal investment* in and *coordinated operation* of distributed energy resources (DER) as the most important dimensions of the emergence of a higher DER grid.

In future we would hope that a third dimension may be added, namely *effective decarbonisation*. We recognise that this is not within the AEMC's purview for this process, given its current interpretation of the NEO. Nevertheless, in this submission we take it for granted that the AEMC, like other market bodies, market participants and consumers, has a responsibility to advance solutions to what the Finkel Panel termed the energy trilemma, including lower electricity sector carbon emissions.

We are also very pleased that, despite our frustrating and ultimately disappointing involvement in the Local generation network credit (LGNC) rule change process, the AEMC now appears to accept that there may be circumstances under which local use of the system (that is, the wheeling of energy between small to medium generators connected to the distribution network and consumers on the same part of the network, instead of the centralised model of energy being transported for hundreds of kilometres via expensive grid infrastructure) may be of financial value to networks themselves—even if this value cannot be recognised by long run marginal cost methodologies involving a not very long run (5-10 year) time horizon for future investment costs. If nothing else, the LGNC rule change process showed how difficult it can be to calculate, signal and pay the benefits of DER to consumers, let alone to the whole system.

TEC has come late to this review, so we apologise for adopting a rather narrow approach in our response. Without diminishing the value of the other questions raised, consistent with our past work on contestability of DER and our involvement with solar owners and advocates we have chosen to concentrate on the proposal to delete clause 6.1.4 from the NER. This clause protects consumers by preventing networks from potentially ‘double dipping’ by charging generators as well as consumers for network use of the system (NUOS). This proposal by the AEMC is more specific than most of the others in the DMM draft report, and does not gel well with the avowed strategic nature of the report, which “is not intended to be a prediction of, or pathway, for future regulatory reform”. A related rule change could be implemented within a year if an interested stakeholder interprets the AEMC's attitude as sympathetic to short term reform. In the current regulatory and market context, and in the absence of other regulatory reforms, pursuing this rule change would send a clear message to consumers with, or intending to invest in, DER that market bodies

and participants do not support their use of the grid. This is exactly the wrong message to send in the context of rising retail prices and the need to rapidly decarbonise grid electricity.

The conundrum now facing distribution networks is that total volumes are likely to continue decline on a per capita or per customer basis with the burgeoning demand for behind the meter generation and storage, threatening their current business model and tariff structures. Networks are therefore seeking to reinvent themselves as trading platforms for energy services. This is perfectly legitimate. The challenge for regulators and consumer advocates is that these are regulated monopolies with guaranteed revenues which may try to skew the rollout and management of DER to maximise the return they earn from them, potentially to the detriment of consumer choice and bills as well as decarbonisation results.

We wholeheartedly agree with the AEMC's overall response to this issue, which is effectively to recommend the introduction of one or more "market optimisers"—a role it says should not be performed by networks, given their monopoly status and ability to stifle competition. However, we find it somewhat confusing that, on the one hand, the report states that

...the optimising function is best carried out by a party that does not have a financial or regulatory interest that would result in them favouring the provision of one service over another, other than in response to efficient price signals...

while it then goes on to state that "The Commission also considers that such a party should be exposed to financial incentives." We are not convinced that this role should be taken by a body exposed to financial risks rather than being independent and objective, such as AEMO or a body with powers that are related to AEMO's though specific to DER markets. Its role would be not to direct investments or technologies but to ensure competitive neutrality in the context of maximising consumer choice.

To illustrate the complexities involved in relying on the market to provide this function in a holistic and independent manner, here are some examples of overlapping or competing DER value streams:

- Consumer-side batteries controlled by networks or retailers for their benefit.
- 'Solar gardens' or other small to medium DER designed to facilitate the sharing of energy in the local area.
- Software designed to turn home appliances or business equipment on or off in response to signals about the current emissions intensity of generation in the wholesale market.
- Microgrids established in order not just to share renewable energy and storage but also to reduce exposure to network consumption tariffs.
- A new wave of advanced inverters designed not only to minimise network impacts but to provide services (such as voltage and frequency control) to networks.
- High and/or variable feed-in tariffs paid by retailers for solar and battery energy exported to the grid during high wholesale price periods and by networks to respond to peak demand events

Given the complexity of this issue and the lack of clear analogies in other jurisdictions or markets, we would encourage the AEMC to revisit this process on a regular basis in order to keep track of developments and to steer the inevitable regulatory reforms towards the aims identified in the draft report. This is important given the uncertainty around how DER markets will evolve and who should take on the role of market optimiser. In our view the AEMC should create a stakeholder working group that would anticipate and guide the optimal investment and operation of those DER which provide wholesale and network as well as consumer services.

(In this respect we note that the range of DER value streams identified in the very useful Figure 2.2 omits another one relevant to consumers, namely *local energy trading*—the sharing of the financial value of energy flows between individual consumers or groups in the same substation area, not necessarily for profit but potentially also, say, to assist consumers unable to directly invest in DER.)

Finally, despite its understandable aversion to predicting future outcomes, in its future work on this issue we would also encourage the AEMC to consider (a) what a high-DER future might look like (as the ENA/CSIRO Network Transformation Roadmap [NTR]), and then (b) what the optimal regulatory framework might be to facilitate that outcome. This process need not constrain how the AEMC acts in the short term, but it might encourage it to think in more ‘blue sky’ terms about regulatory reform than did the NTR itself. We accept that the idea of a market optimising function may be a significant step in that direction, although it will obviously require a lot more work to bring to fruition.

#### **Question 4 Is there support for the Commission's proposal that the deletion of clause 6.1.4 of the NER be explored?**

Not at this time.

Given the tenor of the draft report’s discussion and our conversations with consumer advocates who favour this reform, it appears likely that the abolition of this rule would result in networks charging for solar and battery exports on the rationale that these have a net cost greater than the net benefit to networks.

To be clear, there are several costs associated with rooftop solar exports to the grid in particular:

- Mandated feed-in tariffs where these are recovered from retailers.
- Renewable Energy Target contributions from all consumers via bills.
- Cross-subsidies from non-solar to solar consumers caused by lower revenue recovery via energy charges from solar consumers.
- Engineering costs caused by high bidirectional energy flows on the grid.

On the other hand, there is a range of benefits from solar and storage DER to all consumers. The draft report recognises many of these in Figure 2.2. They include:

- Low marginal costs, reflected in the merit order effect and potentially passed through to consumers in the form of lower bills.
- Reducing carbon emissions and other negative health impacts from fossil generation.
- Lowering and pushing out network peak demand, reducing the need for future investment.
- Allowing greater consumer-side self-consumption and thus increasing consumer autonomy and control.
- Reducing the need for expensive infrastructure investment to support centralised generation.
- Supporting ancillary services such as voltage and frequency control—and potentially synthetic inertia.
- Allowing fringe-of-grid consumers to be more cheaply and efficiently supplied than by long lines serving relatively few consumers.
- Allowing individuals and communities to share energy generated locally for environmental, economic or social reasons.

- Replacing the outmoded concept of baseload energy with reliable, dispatchable energy—ie, energy on tap for when it is needed, not for when coal power stations need to supply it.

We are concerned that the proposal to delete 6.1.4 would address only the last of the costs, while addressing few if any of the benefits—even those within the ambit of networks. Conversely, any thorough discussion of the fairness of DER costs should extend beyond this narrow framework to include alternative means of cost recovery for the RET, FiTs and energy efficiency schemes, such as through Consolidated Revenue rather than energy bills.

Likewise, the problem of cross-subsidies between DER and other consumers caused by lower cost recovery from solar owners through consumption charges is eminently fixable through the introduction of more cost reflective network tariffs which recognise and charge or reward consumers equally on the basis of their contribution to future costs via peak demand events and the need to equitably recover sunk costs.

The discussion that follows proceeds on the assumption that this reform proposal is concerned with one issue only—the ability for networks to charge or reward for the engineering costs of high bidirectional flows only—while other costs and benefits are extraneous for current purposes.

Certainly the value of solar energy exported to the grid varies by location and time. (This has been best recognised by the Victorian Essential Services Commission work on mandated FiTs.) In theory it may seem attractive to allow networks to charge or pay solar owners on this disaggregated level accordingly. However, in practice there are several critical impediments to instituting such a system:

- . It would favour centralised generation if a similar system was not also implemented for generators connecting to the transmission network.
- . The value to networks of rooftop solar could potentially vary from street to street and every five minutes of the day. With current metering and billing technologies the cost of monitoring and signalling these values could significantly undermine the economic benefit of moving to granular pricing for DER.
- . The value streams for DER exported to the grid are much greater than those relevant to networks alone, and include to the wholesale market and to local consumers. We are concerned that networks could seek to recover related costs without there being efficient and effective ways for DER providers to amortise other, positive value streams.
- . To the extent that there are costs to networks associated with high bidirectional flows, these appear to be mostly predictable at the time of connection and can be recovered through a combination of connection charges and export limiting from inverters (as some networks currently practice).
- . If it were implemented, the message many DER owners would get is that their generation is unwanted, leading to a greater level of behind the meter consumption and potentially disconnections, with the unintended consequence that instead of increasing the equity of network cost recovery it would leave legacy non-DER consumers to pay higher network tariffs.

The AEMC's discussion of this proposal in the draft report is focused almost entirely on the alleged costs rather than the benefits of DER to networks. Having read the summary of these potential costs in the approach paper for this project, we note that (a) it, too, was one-sided; (b) it makes no attempt to quantify the penetration or export level at which such costs become material for networks, and (c) even then, the indicative costs involved, or (d) the opportunities available through Australian Standards on inverters and batteries to reduce or eliminate these costs and even to allow DER to provide benefits to networks in relation to issues such as voltage and frequency control. Given this apparent bias in the AEMC's work to date on this project, we do not have much faith that, if this proposal were to result in a related rule change, the result would be fair to DER owners.

Nevertheless, we accept that there is a valid case for continuing to monitor, research, engage and strategise on this issue, for two reasons:

1. The current system whereby, in relation to network impacts, DER owners are regulated only through connection charges and export limiting is relatively crude and favours “first movers” (the opposite to large new generators connecting to the transmission network); while there is no mechanism requiring networks to pay for DER exports where there is a net benefit.
2. In an efficient market, there may be places where the market may want to signal that some DER exports have more impacts than benefits in some places at some times, and failing to signal these through export tariffs means that non-DER consumers are effectively paying for inefficient investment - noting that, as above, the materiality of the infrastructure cross-subsidy issue is not clear, and that there are much greater cross-subsidies in the system, such as from small to large consumers and from non-aircon to aircon owners.

Another equity-related issue concerns capex spending as a part of network revenue determinations. There is substantial evidence of network gold-plating over the past decade, which all consumers will pay for over 30 years on average. Capex investment to facilitate high DER penetrations would appear to be prudent and efficient, and is inherently logical and efficient: who would now argue that two-way flows on a relatively small network is less efficient than one-way flows on an extended network? Yet the so far minor (if any) costs related to high DER exports are being singled out as costly and unfair to other consumers. Augex and repex spending are major components of revenue determinations. We are not convinced that even where they are necessary to facilitate high bidirectional DER flows, this would not constitute efficient investments for the grid of the future.

Should the AEMC decide to support this reform, here are the elements TEC considers should be fundamental to any new rule that is proposed to replace the current 6.1.4:

#### **Process**

1. Clause 6.1.4 should not be deleted without another rule taking its place.
2. The AEMC should assess the positive and/or negative impacts on the achievement of Australia’s decarbonisation policies and targets of implementing this reform.

#### **Content**

1. The new rule should apply to transmission as well as distribution networks.
2. The introduction of a new rule allowing networks to charge or reward generators for their costs or benefits must not result in any net change to network revenues.
3. The new rule should not be implemented by particular networks unless they can show that it will not impose administrative and compliance costs that would be onerous for any party.
4. It also should only be implemented where networks can show that the impacts of DER to be recovered (a) are marginal rather than predictable according to inverter size and type, and (b) are therefore not recoverable via connection charges.
5. It should require networks to assess (at their own expense—ie, not recoverable through revenue determinations) *all* relevant cross-subsidies, and wherever possible to address through cost reflective consumption tariffs the most material first.
6. Networks should only be able to charge export tariffs to some generators if they are also willing to pay feed-in tariffs to others of the same kind. That is, networks must accept that by opening this can of worms, they may end up paying more than they recover from DER owners.

7. (As per clause 6.18.4(a)(3)), networks must not be able to treat a particular class of generators as a group, irrespective of the load or export profile. That is, given the aim is to disaggregate classes of generators according to their impacts and benefits, generators are entitled to have their exports treated individually.
8. Given that this rule would likely still result in some level of smeared pricing and therefore cross-subsidies, DER owners should have a right of appeal to the AER where they consider that they have been unfairly assigned to a particular tariff class.

## **Recommendations**

1. The AEMC should abandon the proposal to delete clause 6.1.4 as inappropriate to the current state of evolution of DER markets in the NEM.
2. Instead, it should work on developing one or more methodologies for assessing the costs and benefits of DER.
3. It should also commission a properly independent assessment of the materiality of, and engineering or regulatory solutions to, the alleged costs or impacts of high bidirectional flows to local substations from rooftop solar systems.
4. The AEMC should create a stakeholder working group to monitor the evolution of the full range of DER value streams and markets, to advise on the introduction of a market optimiser, and where required to propose regulatory reforms consistent with the NEO.
5. TEC hereby formally requests early notification of any request to delete 6.1.4 so that we may lodge a related rule change request to replace it with a new rule with the characteristics outlined above.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Jeff Angel', written in a cursive style.

**Jeff Angel**  
Executive Director