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Ms Anna Collyer
Chair
Australian Energy Market Commission
Submitted via www.aemc.gov.au

RE: Submission to AEMC's Consultation Paper for the Pricing Review: Electricity pricing for a consumer-driven future

Dear Ms Collyer,

The Centre for Independent Studies (CIS) welcomes the opportunity to respond to the AEMC's Consultation Paper for the Pricing Review: Electricity pricing for a consumer-driven future.

The CIS is a leading independent public policy think tank in Australia. It has been a strong advocate for free markets and limited government for more than 40 years. The CIS is independent and non-partisan in both its funding and research, does no commissioned research nor takes any government money to support its public policy work.

The pricing review should ensure investors in CER are not prioritised above consumers in the electricity market. This review presents an opportunity to reform network tariffs by reducing, or ideally eliminating, cross-subsidies from rooftop-solar owners to non-rooftop-solar owners. The AEMC should re-examine whether CER does in fact reduce overall system costs compared to large-scale generation and storage, given the statement that "CER is necessary for the energy transition" does not appear to be supported, other than by its appearance in the ISP, where it is assumed into existence as an exogenous input.

Given price and reliability of electricity supply are the two most important factors for consumers, these should be considered non-negotiables when considering other relevant factors. Likewise, 'outcomes for consumers' should be the key assessment criterion, prioritised above all others in line with the AEMC's mission.

Yours sincerely,

Aidan Morrison
Director of Energy Program, Centre for Independent Studies
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Question 1: Do you consider that we should make any changes to our proposed approach to this review?

This review should interrogate whether Consumer Energy Resources (CER) are indeed "necessary for the energy transition", as stated on page i of the consultation paper. No evidence has been provided to support this claim. To the contrary, CSIRO's GenCost report states that small-scale home batteries are more than twice the cost of large-scale batteries.[1] The costs and benefits of further additions of rooftop solar generation need to be thoroughly examined, given AEMO's recent warnings of the threat posed by rooftop solar to system security and the need to curtail output.[2]

The consultation paper cites AEMO's estimates of cost savings of $4.1 billion on page i and ARENA's net benefits figure of $6.3 billion by 2040 on page ii, but both these estimates relate to coordination of CER, not CER itself. In fact, the ECMC's review of the ISP highlighted that AEMO's economic modelling "incorporates CER and distributed resources as an exogenous variable" and concluded that "this is a limitation of the current ISP".[3] This is because, as the review states:

> …modelling future CER investments in this way is unlikely to adequately consider the tradeoffs between small-scale investments in CER against investments in renewable generation and storage, the wholesale market, distribution networks, and transmission infrastructure. This is problematic from the perspective of the ISP's ongoing scope as a national transmission plan, but also presents challenges for stakeholders who rely on the ISP to assess energy market conditions.[4]

The AEMC is one of these stakeholders. The consultation paper has used AEMO's analysis of the value of CER orchestration as evidence on page i that "CER and DER are required to play a critically important and significantly larger role in Australia's energy transformation". However, AEMO's modelling does not provide any evidence for this claim, as it assumes — rather than optimises — a certain level of CER being installed.

Research indicates financial benefits are the primary driver for most consumers who purchase rooftop solar and batteries. A CSIRO study indicated 75% of rooftop solar owners gave economic reasons for installing solar panels, compared to only 53% citing environmental reasons.[5] In an Ausgrid survey, the most popular reason for installing a home battery was to store excess solar electricity from a rooftop solar system (94% rated this as very or extremely important), followed by saving money on bills (88% rated this very or extremely important).[6] Storing excess solar power would also have the effect of reducing bills by allowing solar owners to reduce grid electricity consumption during peak times. These results suggest most consumers will purchase rooftop solar and/or home batteries only if they benefit financially.

Any benefit CER owners receive will ultimately come at the expense of not only taxpayers through direct government subsidies, but also non-CER-owning consumers due to the indirect cross-subsidies inherent in the network tariff structure.[7] When questioned about the AEMC's rationale for stating CER is necessary for the energy transition during the Public Forum on November 27, Andrew Lewis responded by saying "it's happening". But CER uptake is only occurring *en masse* due to these direct and indirect subsidies. Governments rely on the advice of the energy market bodies to help determine the trade-offs of various subsidies. By not providing any evidence that CER itself reduces total system costs, and therefore consumer bills, energy market bodies are leaving policymakers in the dark about how their policies may be contributing to bill increases; particularly for low-income consumers who cannot afford CER.

CIS recommends the AEMC examines whether CER does in fact reduce overall system costs compared to large-scale generation and storage. If this is outside the scope of this review, CIS recommends the AEMC clarifies the lack of supporting data for this proposition.

Question 2: What are your views on our proposed Consumer Preference Principles? How might the CPPs help us in assessing whether our decisions will lead to good consumer outcomes?

The Consumer Preference Principles would be most relevant and useful for the review if applied in the context of their various levels of importance to most consumers. Given that "'price' will be the most important preference for almost all consumers", as stated on page 13 of the consultation paper, it is vital this remains the top priority throughout the review and is not traded off in the pursuit of other objectives. Reliability is the second most important principle for consumers, as Appendix B of the consultation paper lays out, with the remaining principles being much less important to consumers. Therefore, 'value for money' and 'availability' should be considered non-negotiable in the context of this review, with all other principles only being pursued insofar as they do not compromise the core two principles.

The existing range of principles is sufficient and does not need to be expanded.

Question 3: What are your views on our proposed Consumer Archetypes?

The 'resources' axis of the Consumer Archetypes includes resources for installing and managing CER. It is important that consumers who have been able to afford investing in CER do not continue to receive cross-subsidies, as outlined above, from those who cannot afford

these investments. This requires a distinction between a CER owner's role as a consumer and as an investor.

In the scenario in Box 6, Sandra has been able to afford to install a wide range of CER devices and wants to maximise her return on investment. However, if the current cross-subsidies in the network pricing structure remain, she will be maximising her return at the expense of consumers who are unwilling or unable to install CER. Sandra is in effect playing the role of consumer and investor in the electricity market. The role of the AEMC is to develop the right market settings for consumers, not investors. Investors should receive payment only in line with the value they provide the grid. Accordingly, electricity pricing should serve Sandra as a consumer, but not prioritise giving her an outsized return as an investor when this requires cross-subsidies from other consumers, as is currently the case.

It is important that this review does not result in consumers in the category labelled 'full of potential' being pushed towards realising that 'potential' i.e., needing to expend more resources engaging with the electricity market. As stated on page 15 of the consultation paper, "In a market where customers do not get to choose whether they participate, it is imperative that they are not punished financially or otherwise for lacking the resources or interest to engage." Given consumers can rarely opt out of this market, a well-functioning market should allow consumers to devote minimal resources to thinking about their electricity plans and daily consumption without receiving outsized financial penalties. The review should be conducted with the understanding that realising this 'potential' is not necessarily a good thing since it creates an opportunity cost for consumers, and therefore a more complex electricity system requiring more engagement from consumers has broader economic impacts.

Question 8: What should network tariffs look like in the future? What are the key choices and trade-offs we should consider when answering this question?

As outlined in response to Question 1, network tariffs currently promote cross-subsidies from non-rooftop-solar-owning consumers to rooftop solar owners. This disadvantages those who live in apartment buildings and/or rent, who tend to be younger[8] and lower income[9] than house owners, creating inequitable bill impacts. Greatly reducing these cross-subsidies will help protect those most vulnerable and reflect the true price signals of investment in rooftop solar.

When designing network tariffs, it is important to note that rooftop solar without storage cannot reduce network costs, and therefore a consumer exporting or self-consuming their solar output should not afford them any savings on the network component of their bills. It

is commonly believed that rooftop solar reduces critical peak demand.[10] Forecast critical peak demand drives costs, as DNSPs must provide enough capacity to accommodate future peaks.[11] But rooftop solar does not, in fact, lower costs for DNSPs, as any lowering of critical peak demand from rooftop solar is both negligible and unreliable. Rooftop solar cannot reduce the need for capacity upgrades to accommodate critical peak demand driven by uncertain future weather events.

DNSPs sometimes quote the estimated reduction in critical peak demand attributed to rooftop solar in their reports. In 2023, Queensland's Energex estimated the 5,221 MW peak demand would have been 292 MW higher without rooftop solar, representing a reduction of 5.3%,[12] while Ergon Energy estimated a reduction of 23 MW from residential and commercial solar generation resulting in a peak of 2,637 MW — a 0.9% reduction.[13] This would seem to indicate that rooftop solar can provide a small but material reduction in peak demand, at least for some DNSPs.

Similarly, a 2016 study of 69 representative Queensland households found rooftop solar reduced peak demand by an average of 4.4% in summer and 0% in winter.[14] The solar households had an average rooftop solar system size of 3.2 kW, small by today's standards, meaning current reductions would likely be greater, aligning with the 5.3% figure quoted by Energex above. However, this study did not calculate reductions from the actual critical peak demand but rather 'critical event days', being the 12 hottest and 12 coldest working weekdays in the year. The average reduction over the most extreme days is not what drives system costs. It is only the absolute maximum demand that matters, as this feeds into the forecast critical peak demand which determines the need for grid capacity upgrades. Also, like most analyses of peak demand, this study used half-hourly data. But DNSPs must operate a network with a current alternating at a frequency of 50Hz, or 50 times per second.[15] This means it is not half-hourly average demand that matters for system stability at peak times, but rather the absolute maximum demand at each second, or even millisecond.

Ultimately, a reduction in past critical peak demand of a few percent aggregated across the whole network cannot reduce the need for capital expenditure to accommodate forecast critical peak demand. Data from AEMO indicates a solar farm's output can be reduced by 80% in a 5-minute period by passing clouds.[16] It is no different for any given section of the distribution network with rooftop solar owners all located in the same area experiencing similar weather conditions.

DNSPs must have enough capacity built into the grid to handle a sudden increase in load from rooftop solar households when passing clouds cause a sudden drop in generation, which means no amount of rooftop solar can ensure a reduction in critical peak demand, and therefore capital expenditure. This is because DNSPs must ensure their system capacity contains a margin above recent observed peak demands to allow for infrequent extreme

weather conditions.[17] DNSPs cannot predict with certainty at which exact second a critical peak demand will occur and how much rooftop solar generation will be available at the time. Each individual subsection of the network must be built to withstand a critical peak without any reliance on rooftop solar. This reality is masked when reductions are calculated across the entire network, as critical peaks do not occur at the same time everywhere due to e.g. people switching appliances on at different times.[18] Given the negligible and unreliable reductions in critical peak demand provided by rooftop solar, it is clearly unable to contribute to a reduction in system costs for DNSPs.

Network tariffs must be reformed so that non-rooftop-solar owners are not cross-subsiding rooftop solar owners. The most straightforward way to reduce cross-subsidies is to increase the share of costs recouped from the fixed component of network tariffs and reduce the variable component. This will help prevent rooftop solar owners from receiving outsized savings on their bills. However, this will occur only if retailers are required to pass through network price signals.

Arguably, eliminating variable network charges altogether and solely recouping costs through the fixed component may be the most cost-reflective tariff structure. This is because the only truly cost-reflective way of recouping variable costs would be to charge a household according to their contribution to critical peak demand in, say, the last year, which most directly reflects network upgrade costs. But this would result in consumers who are home and using electricity on the single highest peak day of the year receiving a large variable charge compared to those who happen to not be home, and therefore using very little electricity. This more 'cost-reflective' variable structure would likely be perceived as unfair by consumers, and would be difficult to implement for those who move often. Thus, eliminating variable network charges and relying solely on fixed network charges, potentially based on the maximum a household can draw from the grid at any one time, may be the most cost-reflective tariff structure.

Shifting to only a fixed network charge would increase some consumer bills and decrease others, but the overall impact should be a reversal of the cross-subsidies from non-rooftop-solar owners to rooftop-solar owners. This will generally mean those of lower socioeconomic backgrounds who cannot afford or are unable to install CER will be better off, resulting in more equitable outcomes.

Question 11: Do you have any feedback on our proposed assessment criteria?

Outcomes for consumers, particularly with respect to price and reliability, must be prioritised above all other criteria, in line with the AEMC's mission to place "energy consumer interests at the heart of everything we do".

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[2] ABC. 2024. AEMO says emergency powers to switch off solar needed in every state amid 'system collapse' fears”. https://www.abc.net.au/news/2024-12-02/aemo-demands-emergency-backstop-to-switch-off-solar/104670332.

[3] Energy and Climate Change Ministerial Council. 2024. “Review of the Integrated System Plan – Final Report”. Commonwealth of Australia. pp 28-29.

[4] Ibid. p 29.

[5] CSIRO. 2019. “Adoption of solar power – why or why not?” https://www.csiro.au/-/media/EF/Files/Energise-insights/Insight-56-Adoption-of-solar-power.pdf

[6] Ausgrid. 2017. p 36. “Household Solar Power and Battery Survey: Project Report”. https://www.ausgrid.com.au/-/media/Documents/Demand-Mgmt/DMIA-research/Household-Solar-Power-and-Battery-Survey_-Report.pdf

[7] Simshauser, Paul. 2016. “Distribution network prices and solar PV: Resolving rate instability and wealth transfers through demand tariffs”. *Energy Economics*. https://www.sciencedirect.com/science/article/abs/pii/S0140988315003060.

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[9] Australian Bureau of Statistics. 2022. “Household Income and Wealth, Australia”. https://www.abs.gov.au/statistics/economy/finance/household-income-and-wealth-australia/2019-20.

[10] Parkinson, Giles. 2016. “How rooftop solar has dramatically shifted and reduced peak demand”. *Renew Economy*. https://reneweconomy.com.au/how-rooftop-solar-has-dramatically-shifted-and-reduced-peak-demand-66446/.

[11] Lawrence, Denis & John Kain. 2013. *Economic Benchmarking of Electricity Network Service Providers*. Economic Insights. Prepared for AER. p 12. https://www.aer.gov.au/system/files/Economic%20Insights%20report%20-%20Economic%20benchmarking%20of%20electricity%20network%20service%20providers%20-%2025%20June%202013.PDF.

[12] Energex. 2023. *Distribution Annual Planning Report 2023-24 to 2027-28.* p 2. https://www.energex.com.au/__data/assets/pdf_file/0003/1167006/Distribution-Annual-Planning-Report-2023.pdf.

[13] Ergon Energy. 2023. *Distribution Annual Planning Report 2023.* p 34. https://www.ergon.com.au/__data/assets/pdf_file/0009/1167156/Distribution-Annual-Planning-Report-2023.pdf.

[14] Simshauser, Paul. 2016. "Distribution network prices and solar PV: Resolving rate instability and wealth transfers through demand tariffs". *Energy Economics*. https://www.sciencedirect.com/science/article/abs/pii/S0140988315003060.

[15] ARENA. 2022. *What is electricity grid inertia?* https://arena.gov.au/blog/what-is-electricity-grid-inertia/.

[16] Fox, Jack. 2019. *Operational Forecasting in the NEM.* AEMO. https://www.linkedin.com/feed/update/urn:li:activity:6569528273326473216/

[17] Lawrence, Denis & John Kain. 2013. *Economic Benchmarking of Electricity Network Service Providers*. Economic Insights. Prepared for AER. p iv. https://www.aer.gov.au/system/files/Economic%20Insights%20report%20-%20Economic%20benchmarking%20of%20electricity%20network%20service%20providers%20-%2025%20June%202013.PDF.

[18] Parmar, Jignesh. 2024. *Energy Demand Factor, Diversity Factor, Utilization Factor, and Load Factor.* Electrical Engineering Portal. https://electrical-engineering-portal.com/demand-factor-diversity-factor-utilization-factor-load-factor.