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20 December 2024

Anna Collyer
Chair
Australian Energy Market Commission
GPO Box 2603
SYDNEY NSW 2001

Dear Ms Collyer

Re: Consultation paper - The pricing review: Electricity Pricing for a consumer-driven future

The Australian Energy Regulator (AER) welcomes the opportunity to provide this submission to the Australian Energy Market Commission's (AEMC) consultation paper and final terms of reference for the pricing review: Electricity pricing for a consumer driven future (the Pricing Review).

The AER reaffirms its support of the AEMC's forward-looking review to re-examine electricity pricing arrangements to capitalise on future opportunities and deliver beneficial outcomes for all consumers. In the context of a transition away from thermal generation to reliance on renewable energy generation there will be challenges and opportunities for greater flexibility in demand. For households and small business consumers, new technologies are yielding a range of new energy services that are changing the way consumers can generate, store and use energy. As we navigate through the energy transition, it is crucial that the pricing arrangements for residential and small business customers reflect these changes and can support all consumers.

The AER's purpose is to ensure that energy consumers are better off, now and in the future. This submission is guided by our strategic objectives, and will address the following key topics:

- the AER's role in the current and future network tariff reform program
- key lessons from our involvement in the network tariff reform program to date which we consider should inform the AEMC's approach to the Pricing Review, namely:

- throughout the energy transition and beyond, we want a least cost energy system that provides value for consumers. A high level of system utilisation is a critical component to a least cost system because it makes efficient use of infrastructure assets.
- the expected growth of Consumer Energy Resources (CER) and Distributed Energy Resources (DER) presents a potential need for network augmentation. However, it also presents a large source of flexible capacity to help avoid this by shifting load away from periods of network congestion and to help maintain system stability.
- trust, consumer choice and acceptance are critical to the success of the energy transition. Consumer's must feel their expectations of energy services are being met, including the option for a flat retail tariff.
- the network distributor-retailer relationship is important in managing the pricing exposure of end-use consumers, given retailers' role to manage risk on behalf of customers.
- network price signals will continue to remain important in helping deliver CER orchestration to ensure the price signals retailers receive remain useful and effective. However, these alone will not be enough to deliver the level of CER orchestration¹ required to deliver a least cost energy transition for consumers.
- as such, complementary measures to network tariff reform are required to support consumers. This will enable the potential benefits of greater CER orchestration.

The AER acknowledges there are necessary trade-offs that must be considered when balancing the principles above. For example, the degree and manner of which CER orchestration is delivered for a least cost energy transition may need to be tempered by the need to gain and maintain the necessary degree of consumer choice and acceptance.

Brief history of network tariffs

The network tariff reform program was intended as a long-term micro-economic reform program with provisions to manage potential impacts of variable charge network tariffs to customers, initially with a focus on managing peak demand as smart meters were rolled out in the National Electricity Market.² Subsequently, with the growth in distributed resources, including rooftop solar and on-site generation, the focus has shifted to also managing inter day fluctuations in demand and generation.

Before the tariff reform program was introduced, network tariffs were largely flat. Since then, network tariffs have evolved through simple variable charge network tariffs with extended low or 'off-peak' (and sometimes shoulder) price periods and shorter higher-priced 'peak' periods. The timing of peak periods was chosen to align with when there was the most demand on the network from consumers using electricity – often in the late afternoon and early evening. These types of tariffs disincentivised electricity consumption during the peak periods (periods of scarcity on the network) and encouraged consumption during periods of relative abundance.

¹ The orchestration of CER refers to the management and coordination of energy assets owned by consumers to optimise energy usage, enhance efficiency, and contribute to the overall stability of the energy grid.

² *National Electricity Rules* cl 6.18.5(h).

In recent years, these have been followed progressively by network tariffs which now include very-low to zero prices in the middle of the day where there is typically an abundance of solar generation, low prices overnight and high prices during evening periods of scarcity. These have been called ‘solar soak’ or ‘sun soaker’ network tariffs. These network tariffs have increased price differences between the periods which provides clearer signals to retailers on the periods of abundance and scarcity. In addition to disincentivising electricity consumption during the peak periods as before, it also offers significant cost savings to consumers able to shift some of their electricity consumption to the very low cost periods in the middle of the day.³ Some distribution network businesses have also been implementing network tariffs for residential customers that contain a component based on the peak demand drawn during peak periods.

Another feature of the suite of current network tariffs is that there are few alternatives to the default network tariff for residential and small business customers and network tariffs are “network” wide (i.e. they are not locational).

The AER’s involvement with network tariff design

The need for pricing signals to address capacity constraints and conditions on electricity distribution networks was first considered in the Power of Choice Review. In its Final Report in November 2012, the AEMC stated that:

The overall objective is to provide that the community’s demand for energy services is met by the lowest cost combination of demand and supply side options. This objective is best met when consumers are using electricity at the times when the value to them is greater than the cost of supplying that electricity.”⁴

Subsequently, the network tariff reform program was introduced in 2014 following the AEMC’s *Distribution Network Pricing Arrangements*⁵ rule change. This rule change:

- required distribution businesses to progressively develop cost-reflective network prices; and
- send more efficient pricing signals to consumers based on long-run costs.

Following this rule change, distributors have been required to develop and consult on the structure of their proposed network tariffs in their 5-year revenue determination processes. After submission of a draft tariff structure statement as part of the network reset program, the AER undertakes a review and approval process that typically runs for 18 months.⁶ This process includes two formal periods of public consultation and rigorous assessment of the distributor’s entire proposal, including the tariff structure statement.⁷

³ Electricity consumers are assigned to network tariffs based on the distributor’s assignment policies. However, a retailer is billed for the network charges and it is at the retailer’s discretion on how to package these costs with other costs into the retail offers available to consumers.

⁴ See [AEMC, Power of Choice - Stage 3 DSP Review](#), November 2012.

⁵ AEMC, [Distribution Network Pricing Arrangements](#), November 2014.

⁶ The Tariff Structure Statement is a mechanism to progress network tariff reform, showing how the distribution business has applied the pricing principles to develop its price structures and indicative price levels for the regulatory period.

⁷ The Tariff Structure Statement is a mechanism to progress network tariff reform, showing how the distribution business has applied the pricing principles to develop its price structures and indicative price levels for the regulatory period.

In parallel, the AER has been an advocate for the network tariff reform program encouraging more efficient use of the existing network infrastructure. In turn, this is intended to result in lower network costs for consumers by reducing the need for future additional investment in distribution infrastructure. The AER's experience is that the network tariff reform program has facilitated distributors innovating their network tariff offerings over time.

However, the adoption of CER and the pace of the broader energy system transition have been significantly greater than was anticipated when the network tariff reform program commenced. By far, the fastest development has been in rooftop solar installations, but interest is also growing in battery systems, electric vehicles, and demand response initiatives. The objectives of the original network tariff reform program established in 2014 did not envisage the full scale or scope of the opportunities and challenges that CER and DER pose to the energy system. The AER agrees that a range of well-designed network tariffs can facilitate efficient and effective integration of CER and DER and support all consumers to share the benefits of an efficient energy system.

The AER agrees it is timely to now re-examine electricity pricing arrangements to ensure they enable diverse types of offerings consumers may want and need in the future. This includes retaining the option of a flat retail tariff, for consumers that prioritises simplicity and predictability of energy costs.

Achieving optimal policy and regulatory settings for network tariff designs and/or alternative tools for maximising network utilisation can reduce overall system costs to the benefit of all consumers, maintain public trust in the energy system and institutions, and improve the value which consumers are able to extract from their CER.

Network price signals will remain important in a consumer driven future

The AER considers network pricing signals are a key measure to support a least cost energy transition, particularly in a future state of a high uptake of CER, and an energy system that empowers consumers. In this context, for distributors to perform their role of transporting electricity through the poles and wires at the lowest cost for all consumers, it is important they can communicate the actual costs of the customer's use of the service at that point in time.

In this context, the AER notes network pricing signals will continue to play a role in a future consumer-driven electricity system. These network pricing signals can enable intermediaries to develop new business models and retail products that manage electricity pricing risks on behalf of customers and derive value from a consumer's behaviour shift. The AER notes that the type of options available to consumers can and should change as the energy system transitions and consumer preferences change alongside it. For this future state, the AER notes the critical importance of ensuring consumers are afforded the appropriate levels of protection and choice.

The AER considers a principles-based approach to the network tariff reform program continues to be appropriate. This approach allows for variability within and between networks based on aspects including geographical, urbanisation, industrialisation, climate, jurisdictional policy and localised consumer preferences. It also increases flexibility, enabling the AER and distributors to respond to sector changes along with emergent localised network pressures.

The proposed accelerated deployment of smart metering technology will also enable the introduction of different types of network tariffs.

The AEMC's recent finalisation of the *Accelerating Smart Meter Deployment* rule change⁸ will accelerate the rollout of smart meters to achieve a universal penetration level by 2030⁹ that could, in turn, potentially result in more customers who are willing and able to be exposed to "network pricing risk" in their retail offer. In the same way, retailers today are already responding with choices of retail offer that expose consumers who choose those products to be exposed to wholesale price risk.

The network distributor-retailer relationship will remain important

Network distributors provide price signals to retailers, or similar intermediaries,¹⁰ for a given consumer. Retailers may then manage this network price exposure on behalf of their customers, as they already do with wholesale price exposure, or pass through the price signals, in part or in whole. In a future state, some consumers may prefer retailers do more to absorb and manage network pricing risk on their behalf. The AER acknowledges managing this risk exposure has a cost for retailers, however they may be better placed to do so due to their resources, skills, direct relationship with their customers and ability to manage the risk across its customer portfolio. The AER encourages retailers to innovate within their retail service offerings, as well as working with customers willing and able to manage or shift some of their energy usage for flexible devices, to manage retailer risks associated with network prices.

The AER notes one example of the benefit to both consumers and the energy grid derived from the successful alignment of distribution network signals and the retail product offered to customers is the solar/sun soaker/sponge tariff structures. These network tariff structures have emerged over the past five years. Network distributors signal to customers very low network charges during the middle of the day, which retailers can then package this as a benefit in retail offers to consumers. The network benefit is derived from those consumers who are able to shift their usage to take advantage of the period of abundance on the network during peak solar production hours. This supports managing minimum system load challenges for the distributor, reducing network costs and providing value for all consumers with and without CER. There are also benefits in "peak shaving" when some customers are able to move some of their load into earlier in the day.

Trust, consumer choice and acceptance are crucial

The AER considers reforms, including to encourage CER orchestration, will achieve limited practical effect for the energy grid if diverse consumers' expectations of their energy services are not being met.

A key enabler of the energy transition is the establishment and maintenance of social licence from consumers. If the majority of consumers are not able to benefit from the energy transition, there is a risk of inequity, which could put support for the transition at risk.

The energy landscape is increasingly changing at a fast pace. Some consumers are willing to take on a more active role in the energy market, with new technologies allowing them to interact with the energy market in more dynamic ways. For other consumers, simplicity and predictability of energy costs are of greater priority.

⁸ AEMC, [Accelerating smart meter deployment](#), March 2024.

⁹ This excludes jurisdictions such as Victoria and Tasmania who are working towards a near 100% penetration of smart meters due to jurisdictional programs.

¹⁰ This could include, for example, an aggregator or storage provider.

The AER notes the increasingly two-way interaction in the energy market, with many households feeding electricity into the grid via CER assets and purchasing energy from the market. These changes mean that consumers will need to make multiple decisions when provided with complex choices in the energy market. The ability and willingness of consumers to embrace the new array of energy services, along with further innovations, will be pivotal to the continued evolution of the market and the realisation of potentially significant benefits that arise from the transformation of the energy landscape.

In the Power of Choice Final Report, it was observed that a strategic and coordinated approach was required to build consumer energy literacy, enable consumers to make informed choices and quantify impacts of consumption decisions. The AEMC further noted that consumer awareness and an education strategy should be undertaken before implementing reforms.

In the future, the focus needs to be on enabling informed choice, and considering consumers' motivation, opportunity and capability for behaviour change. Further, consumer protection frameworks need to be fit-for purpose to ensure consumers are not exposed to contract terms and risks that result in poor outcomes. These matters are worthy of further consideration as part of the Pricing Review.

There is a need for mechanisms that drive a more efficient use of the energy grid

Australian energy consumers are increasingly and rapidly embracing CER, from solar panels, electric vehicles and home batteries to home and business energy management systems. CER currently provides over 20 gigawatts of generation capacity in the National Electricity Market (NEM). The 2024 Integrated System Plan (ISP) suggests this could rise to 130 gigawatts by 2050, making it the largest source of capacity for the NEM.

Considering this, the AER notes there are significant cost savings for energy consumers and the energy grid from the efficient integration and orchestration of CER. These cost savings are drawn from areas including a reduced need for increased distribution network capital investment to support the integration of CER, as well as investment at the transmission level and upstream large-scale generation and storage level. Due to a variety of reasons, it is difficult to quantify the exact reduction in costs and benefit value. However, various reports and modelling suggest it is in the order of magnitude of tens of billions of dollars for consumers. For instance:

- \$4.1 billion in additional costs¹¹ would be incurred (compared to the step change scenario) if CER orchestration does not increase beyond current levels;¹²
- over \$19 billion would be required in additional central system costs if the step-change scenario forecast of CER take up and orchestration was to materialise;¹³
- the costs of not meeting the draft 2024 ISP step-change scenario CER forecasts were estimated to risk losing over \$22 billion in savings and \$35-\$71 in savings off the average annual energy bill until 2050.¹⁴

¹¹ These costs are due to the higher levels of medium and deep duration utility storage required to compensate for the lack of coordinated embedded storage devices.

¹² Australian Energy Market Operator, 2024 ISP Overview, pg. 1.

¹³ Oakley Greenwood, commissioned by the Clean Energy Council in [Modelling the value of CER to Energy Consumers](#), 29 May 2024, pg. 8.

¹⁴ Clean Energy Council, [Powering homes, empowering people: A national Consumer Energy Resources roadmap](#), June 2024, pg. 2.

- \$18 billion (net present value at the time) in consumer cost savings for a state of the world with high CER uptake, electrification and high electric vehicle uptake.¹⁵
- \$14.3 billion in avoided grid storage costs with a mix of efficient heat pumps and flexible resistive water heaters.¹⁶

In addition, the AER has previously commissioned reports by consultants Baringa, and Argyle Consulting and Endgame Economics which complement the above evidence. The topics include:

- a quantitative ‘size of the prize’ view of the potential value of optimising flexibility for a household with DER;¹⁷ and
- a strategic piece on the challenges and opportunities posed by electric storage (batteries) for the design of network tariffs and network regulation more broadly.¹⁸

To capture the majority of these benefits and cost savings for energy consumers, the optimal policy and regulatory settings should be in place before the impact of CER on the energy grid significantly increases which is anticipated to be around 2030. The AER notes modelling¹⁹ shows the time period prior to this is a critical window for maximising the benefits of avoiding network augmentation costs. The AER is encouraged by the AEMC’s proposed timeline for the Pricing Review as this would support the development and deployment of the necessary policy and regulatory frameworks to capture these modelled benefits and cost savings for energy consumers.

In considering the modelling, the AER notes the main driver for peak demand growth is electrical loads from electric vehicle charging. However, we also note the electric vehicle charging and domestic water heater systems also offer two of the largest potential sources of flexible capacity. A recently commissioned ARENA report found electric vehicles could provide one-third of storage requirements for the NEM.²⁰ The AER notes there are projects underway to explore optimal ways to control and orchestrate operations of domestic electric water heating systems.²¹

To achieve these levels of CER orchestration, complementary measures are required

The AER considered that network pricing signals will be a necessary component of mechanisms to drive efficient use of the grid. However, we also consider that the network tariff reform program in isolation will not be enough to deliver the level of CER orchestration required to realise the forecast significant cost savings for energy consumers and the energy grid. A broader range of mechanisms will be needed to meet consumer needs and deliver a least cost system.

¹⁵ NERA Economic Consulting, commissioned by the Australian Renewable Energy Agency (ARENA), [Valuing Load Flexibility in the NEM](#), published February 2022.

¹⁶ UTS Institute for Sustainable Futures commissioned by ARENA, [Domestic Hot Water and Flexibility](#), 5 June 2023.

¹⁷ Baringa, [Value of optimised flexible DER](#), July 2020.

¹⁸ Argyle Consulting and Endgame Economics, [Network tariffs for the distributed energy future – final paper for the Australian Energy Regulator](#), June 2022.

¹⁹ Modelling undertaken by Baringa for the Energy Security Board in 2021 showed substantial benefits of CER orchestration start to accrue from 2026-2027, based on the 2020 Electricity Statement of Opportunities (ESOO) Step Change scenarios and from around 2031-2032 under the 2020 ESOO central scenario. Modelling undertaken by NERA Economic Consulting, commissioned by ARENA, found the majority of reduced capital and operating costs occur after 2028.

²⁰ V2X.au Summary Report, [Opportunities and Challenges for Bidirectional Charging in Australia](#), June 2023.

²¹ SolarShift, a project led by the University of New South Wales is exploring the optimal ways to control and orchestrate the operations of 2,850 domestic electric water heating systems at Endeavour Energy’s Off-Peak + Trial in Albion Park, NSW, using smart meters to soak up excess solar generation in the middle of the day. More information about the project is available [here](#).

Complementary measures to sit alongside network tariff reform and assist with CER orchestration are those primarily and predominately based on automated control of devices, and enablers such as visibility of conditions on the network and innovative approaches to metering. There are also different models through which this range of signals and enablers can be utilised which could build upon existing market roles and responsibilities or fundamentally change them. For example, network-led coordination of CER/DER, retailer-led innovation, third-party virtual power plant models or community-based utility models may all provide powerful but different outcomes.

The AER's regulatory sandbox function provides an opportunity for the concepts to be tested through live trials with customers. The AER is already exploring how this framework could be used to accelerate our understanding of a range of models to overcome barriers to access, deploy and orchestrate DER/CER, or create incentives for it to occur in a way that is both effective and protective of consumer interests. We consider this provides a safe and expediated real-world environment to innovate in, enabling for example the effectiveness and acceptability of these different signals and models to be trialled, accelerating our understanding of what works, for whom and in what combination.

AEMC's proposed approach and methodology for the Pricing Review

Clarification of the future timeframe

The AER encourages the AEMC to clarify its thinking on the timeframes it regards as the "future" for the Pricing Review's purposes. This clarification is helpful to understand the extent to which the Pricing Review will project into the future for stakeholders generally when evaluating potential electricity offerings and the diverse consumer archetypes that may emerge. For example, electricity services offered to consumers in the near term (i.e., five to 10 years) are likely to be vastly different to that offered in the long term (i.e., 25 to 50 years). This could result from, for example, technological advancements, consumer behaviour and preferences, and environmental factors.

Principles underpinning network tariff design

Network tariff design informed and influenced by consumer preferences may enhance the effectiveness of the responses to network price signals of retailers and those consumers who are willing to be exposed to network price risk. However, network tariff design must also signal to consumers the costs of using the network, if they are to be effective in reducing future network costs through avoided investment.

The AER notes the timeliness of the Pricing Review's scope touching on the pricing principles. We consider this may help with accommodating industry developments. For example, increasing amounts of large and flexible loads/devices as well as technologies enabling automated control of load and supply may warrant exploring alternative network tariff structures, such as short-run marginal cost-based tariffs, including to accommodate dynamic operating envelopes. The AER considers sending short-run signals, alongside appropriate consumer protections, could provide new opportunities for those owning or aggregating flexible devices. The AER also notes, for instance, the recent report published by Energy Consumers Australia, *Cost-reflective network tariffs aren't very cost-reflective*,²² which explored the concept of network pricing signals for peak demand on peak days (i.e. a short-run marginal cost signals).

²² The report is available [here](#), published 27 August 2024.

We are open to exploring alternative approaches to more dynamic and locational network tariff structures for some customers and/or CER devices. There will also remain a role for network tariffs that may be more static or set in advance and do not signal more dynamic responses to changing network conditions over a day, or over the year. In this context, we anticipate that there will be further work in developing a range of network tariff designs, to underpin new retail and intermediary offers, that reward consumers for behaviour change.

Consumer archetypes

In considering consumer archetypes, the AEMC needs to also consider small businesses, as well as households, in the Pricing Review, as together they make up the group of “small customers”.

The AER welcomes the AEMC’s approach to developing the consumer archetypes, particularly the expressed intent to capture the diversity of future residential and small business customers. Households may move in and out of these archetypes, depending on changes in the drivers of their energy use and in the convenience or flexibility, such as shifting hot water or electric vehicle charging. The AER agrees it is important to reflect that different consumers will elevate some priorities over others and make trade-offs amongst the preferences that are most important to them when choosing a retail energy offering.

The AER encourages the AEMC to use the consumer archetypes as a lens to help reflect how a consumers’ interest in engaging or the resources necessary to engage may differ depending on aspect of pricing or energy use being considered. For instance, the same consumer may be ‘full of potential’ in terms of responding to retail price signals but ‘behind barriers’ in terms of CER adoption. This approach may be more useful in more holistically identifying additional supports/considerations for different consumers. By contrast, taking an approach where the same consumer is considered in the same archetype for all aspects of future energy use risks overlooking the diverse opportunities and challenges faced by residential and small business consumers.

Consumer preference principles

The AER encourages the AEMC to consider extending the current Consumer Preference Principles to include an equity principle. This could be covered in the framing of “appropriate protections”. As the AEMC notes, it is important that all energy consumers benefit from the energy transition and the full potential of CER through the resulting improvements to the operation of the overall system. Including equity within the scope of the Consumer Preference Principles can help ensure that customers who prefer simplicity and predictability over pricing risk and those who are vulnerable and/or resource poor will not be left behind in reforms emerging from this review.

The AER notes the AEMC’s recent work in the *Residential Electricity Price Trends*²³ report, particularly the concept of a consumer’s ‘energy wallet’ to understand their total energy costs.²⁴ The AER recommends the AEMC consider utilising this concept, where practical, as part of its approach to the Pricing Review. The AER also notes the opportunity for the Pricing Review’s scope to consider impacts from: any transition away from the end-use of natural gas, future climate change and extreme weather events on pricing. Similar to the Monash University report, *Digital Energy Futures - Scenarios for Future Living 2030/2050*,²⁵ the

²³ AEMC, [Residential electricity price trends 2024](#), November 2024.

²⁴ The ‘energy wallet’ describes the total amount a household spends directly on energy, including electricity bills, petrol for cars and gas for heating.

²⁵ Available [here](#), published February 2023.

AEMC should consider embedding impacts from climate change and extreme weather events on electricity pricing into their future thinking. For example, extreme weather events may result in more frequent or longer duration peak periods and outages, which may affect the network costs to provide electricity to consumers. Further, as Australia is trying to reach net zero by 2050, lower levels of gas will be required through to 2050 and beyond. This will have an effect on current gas uses for heating and cooking for residential and small business customers.

Continued engagement

The AER values the opportunity to provide this submission and welcomes continued²⁶ and collaborative engagement with the AEMC throughout the Pricing Review. We are available to discuss our submission further if needed.

Yours sincerely



Lynne Gallagher
Board Member
Australian Energy Regulator

Sent by email on: 20.12.2024

²⁶ The AER made a submission to the Pricing Review's draft terms of reference in August 2024, which can be accessed on the AEMC's website [here](#).