

14 September 2023

Dear Ben,

Submission on Integrating Price-Responsive Resources into the NEM

Evergen Pty Limited (Evergen) welcomes the opportunity to give feedback on the Consultation Paper on the “Integrating Price-Responsive Resources into the NEM” rule change.

Evergen is an Australian company founded in 2016. We are a software and infrastructure platform for enabling Consumer Energy Resources (CER) monitoring, control, optimisation and orchestration. Rather than being a Virtual Power Plant (VPP) owner, we enable VPP owners and CER owners to readily integrate and participate in energy markets.

From early beginnings with residential photovoltaic (PV) and battery systems, Evergen now has more than 12,000 such systems on our platform, making us one of the most significant VPP enablement platforms operating in Australia today. We deliver VPP capability for a large range of clients, including retailers, network service providers and CER system suppliers. We also provide similar capabilities for larger scale renewable energy and storage facilities, and flexible loads such as air-conditioning, hot water and EV chargers. While based in Australia, Evergen is active internationally, with initiatives under way in Europe, Latin America, New Zealand and Japan.

We acknowledge and appreciate AEMO’s initiative in preparing for the energy market’s evolution. Our focus has always been to optimise the benefits of CER for both consumers and the wider market, and in light of this mission, we would like to communicate our insights on this proposal.

As a leading provider of services to facilitate CER coordination and aggregation, Evergen is strongly of the view that Australia can meet the technical task of coordinating CER to deliver dispatchable capacity. However, Evergen can not emphasise enough that in order to participate VPP operators will require incentives that support a business case to enter the market and enable them to offer customers a sufficiently compelling product..

Evergen is unconvinced that anticipated revenue from market participation will provide VPP operators the impetus to participate in AEMO’s proposed Schedule Lite solution given the inherent uncertainty of market revenues. This uncertainty will potentially hamper both the appetite for investment in the necessary capabilities to manage a much higher level of complexity and may also temper the attractiveness of offers that a VPP operator can make to customers. This uncertainty, for utility scale investors, is for example being addressed through the Capacity Investment Scheme.

A similar de-risking of investment needs to be considered for VPPs. To achieve the required level dispatchable CER in the National Electricity Market, the proposed Schedule Lite proposal will need to be underpinned by unlocking further value streams for small-scale storage and VPPs and policy support that provides investment certainty. Evergen suggests market bodies and governments work closely together to unlock revenue streams and provide investment support that could incentivise retailers and aggregators to establish VPPs that can provide visibility and dispatchability to AEMO.

We also emphasise that incentives rather than mandates should be used to encourage participation in Schedule Lite. The AEMC should be mindful not to dis-incentivise investment in CER and the

development of VPPs through imposing mandatory requirements to participate or by linking eligibility to participate in contingency FCAS to Schedule Lite participation.

It will also be important for AEMO to continue working with industry on initiatives such as SCADA Lite and ensuring there are no barriers to the participation of CER in ancillary services including regulation FCAS.

The attached submission explores these issues in more detail and includes feedback on the:

- costs participants (retailers and aggregators) will incur to build capability and participate in the Schedule Lite visibility and dispatch modes
- the incentives for participating in the Scheduled Lite visibility and dispatch modes as outlined by AEMO
- other options that could complement AEMO's proposal including improving forecasting arrangements and implementing a simpler visibility model.

Evergen is committed to a collaborative approach and is eager to work closely with the AEMC, AEMO and other stakeholders to refine this proposal. I would welcome the opportunity to discuss any part of it with you.

Yours sincerely

Ben Hutt

CEO

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Introduction

Under the step-change scenario, the ISP projects a massive role for coordinated Consumer Energy Resources (CER) storage in providing dispatchable capacity in the National Electricity Market even in the short-term. AEMO sees CER storage playing “a significant role in managing intra-day variability, particularly in the Step Change scenario.” The required growth in CER investment underpinning this is significant.

Evergen appreciates that in proposing Scheduled Lite, AEMO is attempting to take steps to be prepared for the future, and seeks increased visibility and dispatchability of price-responsive CER.

However, as it stands, Evergen is concerned the proposal doesn't fully take into account the different stakeholders in the CER marketplace, the different value they derive from CER and the incentives they have for investment and market participation.

While the Consultation Paper speaks of customers, consumers, energy retailers, aggregators and Traders - it ultimately specifies that the focus of the document is on “...energy service providers (retailers and aggregators) that operate the resources on consumers' behalf. Residential and small consumers using their resources for their own use are not the focus of this rule change request.”

Furthermore, in the proposed solution section it restricts it further to Trader - “a general term to describe energy service providers participating in scheduled lite (for example, retailers and aggregators)”. We would argue that this term pertains to a subset of Retailers and Aggregators, specifically the Getailers.

For any program like this to be effective, all stakeholders need to share in the value. If the program does not offer value to any given stakeholder segment it will not be successful. In light of this Evergen suggests any approach should take the following simple principles into consideration:

- the implications of the program for all stakeholders must be thought through
- if funding or revenue is insufficient or unpredictable, adoption may be limited
- system complexity reduces available funds and can inadvertently increase consumer costs
- mandating unattractive solutions will likely deter uptake of both CER and the program and raise consumer costs
- hindering other innovative and effective approaches, such as value-chain optimisation, should be avoided.

Consumers and CER

The typical consumer is not an energy market expert, and has no interest in becoming an energy market expert. Typical consumers want reliable products, value for money, and ideally not to spend any more time than absolutely necessary thinking about energy.

When investing in a solar and battery system, a primary motivator for consumers is energy independence and bill savings. As a result, consumers will usually size the system to meet their current self-consumption needs most of the time. Playing the spot market is not usually front of mind and assets are not being sized to provide significant additional capacity for market participation.



Investment in CER is not just driven by economics but by other intangible values such as energy independence, individual agency, and care of expensive consumer durables (for example battery degradation due to over cycling and warranty considerations). CER also provides essential services to the consumer that take precedence over participation in the energy market - such as hot water, a comfortably cooled or heated home and transport.

Some consumers are willing to offer “flexible” generation/load into a Virtual Power Plant (VPP), where “flexible” denotes surplus or transitory capability (if prices are particularly high) for an additional benefit rather than the CER’s entire output. As such a VPP participates in the market very differently to a dedicated asset. A battery may, for example, spend much of its time locally maximising solar self-consumption, and only dispatch to the grid based on a simple high-price trigger. As the consultation paper points out, this is generally done “off-market”.

Consumers are typically looking for some level of certainty around outcomes when making significant purchases, and often make decisions based on advice from trusted sources. This includes deciding on whether they join a VPP or not. VPPs are typically offered and run by energy retailers and aggregators.

Retailers, Aggregators and CER

As the Consultation Paper notes, energy service providers (retailers and aggregators) act on behalf of consumers. They operate in a commercially competitive environment and must attract and retain customers to their offers.

Before they can use customers' resources to help manage network infrastructure, manage energy fluctuations, and assist them to reduce their wholesale costs they need to have some sort of offer to incentivise the customer to give them such control.

For VPPs to be appealing to consumers, they must be:

- trusted;
- clear and simple; and
- provide some tangible consumer benefits.

It falls on the energy retailers and aggregators to make products that are clear, simple and deliver customer benefits. To do this they look at the available tariffs and network programs along with myriad other considerations to ultimately deliver a product to market.

Where the retailers or aggregators need to bear costs for participation, such as those from participating in Scheduled Lite, these costs need to be covered by someone in the value chain.

A notable distinction between large dedicated assets and CER is the flexibility consumers have. Consumers often prioritise energy independence alongside economic motivations. This poses a challenge for retailers and aggregators: not only must they sign up customers for a VPP, but they must also retain them. Consumers can opt out of a VPP at any time, while still enjoying the perks of self-consumption and tariff optimization.



An important driver for retailers and aggregators in developing VPP programs is customer acquisition. Retailers and aggregators are becoming increasingly aware that providing retail offers that allow consumers to maximise the benefits of their CER is a key service they must provide in the future energy market. As the consultation paper outlines, retailers can, and are, also coordinating CER to reduce their costs in the wholesale market and to lower their hedging costs.

Given the scale of investment required in the transition, the role of emerging business models which involves retailers financing behind-the-meter assets, such as solar and battery systems, will also be critical to consider. These business models may include for example, fully financed or discounted batteries. In return the customer permits the retailer or aggregator to use that battery to manage wholesale market costs, provide FCAS, or generate value in other ways (e.g. wholesale exposure or hedge reduction) etc. These business models help address the upfront barrier of cost for the customer and support the growth to scale that we need from behind the meter assets in Australia. Regulatory risk and revenue uncertainty will undermine this model and put an unnecessary handbrake on investment. On the other hand, supportive investment policies and access to markets will promote these business models.

In considering the design of the Schedule Lite mechanism and incentives for participation, Evergen stresses the importance of providing VPP operators with incentives that not only make a solid business case for market entry but also allow them to present customers with offers that surpass the combined tangible and intangible benefits of self-consumption.

Trust in outcomes is the other key requirement for energy retailers and aggregators. Given the inherent unpredictability of market revenue, energy retailers and aggregators will need to find a way to trust in the projected earnings from participation in a program like Scheduled Lite, and understand the opportunity cost of participation. Unpredictability is sure to dampen investment enthusiasm towards managing increased complexities, or if enforced, drive up costs to consumers and diminish the appeal of what VPPs can offer.

The design and implementation of the Wholesale Demand Response Mechanism provides a cautionary example of how complexity and insufficient incentives hamper uptake. The scheme has had undeniably poor uptake with a single DRSP registered with a total capacity of 65.3MW as of 13 June 2023. This uptake is a tiny fraction of the peak demand in the NEM and is most likely due to the complex accounting and restrictive baselining methodologies which are only suitable for particularly flat loads with very little variability.

COSTS AND INCENTIVES TO PARTICIPATE

Costs

While the design of the visibility mode, based on the information shared, seems technically viable, we must not underestimate the accompanying costs. These costs arise from the need to:

- Supply both standing data and real-time data, specifically data readings at 5-minute intervals
- Provide forecasts detailing expected capacity in the near-term
- Submit indicative bids, which entail forecasting volumes at various price points over the short-term horizon.



The costs of participating in dispatch mode will be higher again given:

- operational requirements including submission of PASA availability, formation and submission of bids and compliance with dispatch instructions and directions
- the telemetry/SCADA requirements and data exchange standards (notwithstanding that AEMO is currently working on a SCADA lite solution)

It is difficult to understand what the costs of participating in dispatch mode, in particular, will be given the high level of the design. However some of the costs are likely to include:

- **Data collection and storage:** Data centres or cloud storage solutions to store large volumes of collected data.
- **Forecasting Tools:** Advanced software tools that can predict future energy generation or consumption based on historical and real-time data.
- **Bidding Platforms and market interface:** Software platforms that allow energy providers to submit their bids in compliance with AEMO requirements and the NER, accounting for the necessary speed of response to dispatch instructions where applicable. This may also entail regulatory and compliance costs including maintaining the necessary information and providing reports to AER if requested.
- **Data Security and Encryption:** Ensuring the data is secure requires investment in encryption tools and cybersecurity measures.

Incentives to participate in visibility mode

It is unclear to Evergen how the majority of options outlined in Table 3.1 will act as an incentive for participation, other than the direct payment mechanism. Evergen has provided specific feedback on each of the options:

- **Predispatch schedule provided to participants:** Evergen does not see how this would provide an incentive for the trader's participation in visibility mode given it would only be useful on the basis that a trader is participating and wishes to meet a dispatch schedule. Following a dispatch schedule may be less attractive to VPPs that may want to retain flexibility. Nor will it assist the trader in attracting price-responsive resources that aren't currently aggregated into VPPs.
- **Reduce costs for market ancillary services, NCAS and system restart interventions:** this is a whole-of-system benefit that will be difficult for traders to quantify and make a business case on the basis of.
- **Direct payment:** Even direct payments may only provide a weak incentive if they are designed only to "help offset costs incurred in participating". To incentivise participation, payments would need to at least meet costs given the other incentive mechanisms identified don't contribute to building revenue streams for VPPs. However, we acknowledge that the primary reason for a trader to participate in Visibility Mode may be to "test and learn" before moving into the Dispatch Mode.
- **Link contingency FCAS to participation in Schedule Lite:** Evergen is strongly of the view that participation in contingency FCAS should not be linked to participation in Schedule Lite for the following reasons:
 - a. **Deterrence to New Entrants and Reduced Competition:** A new requirement for participation in the wholesale energy market as a prerequisite for the Frequency Control Ancillary Services (FCAS) market, could see existing participants exit the market and deter new entrants. This may limit competition, potentially driving up the

costs of FCAS and reducing market efficiency. This is contrary to the aim of promoting robust competition in marketplaces.

- b. **Barriers to Entry and FCAS Cost:** Best regulatory practices generally advocate for reducing barriers to entry in markets to ensure competitive pricing and innovation. Higher barriers to entry usually result in higher costs for consumers, which in the case of FCAS could impact grid stability and the efficiency of the entire energy system.
 - c. **Compromising Efficiency for External Issues:** Addressing issues in one market (e.g., visibility of Virtual Power Plants in the wholesale market) should not come at the expense of efficiency in another critical market like FCAS. Regulatory measures should aim to enhance the overall performance, stability, and reliability of each market individually and should not compromise one for the sake of another.
- **Mandatory participation for all traders with specified characteristics:** Evergen is not supportive of mandating participation. Using mandates to force VPPs to participate, rather than incentives, could discourage smaller traders and new entrants from participating in VPPs altogether, thereby limiting market competition. There will also be enforcement challenges given the mandate would likely require VPPs to self-declare. Most significantly, if participation is not attractive to consumers, they will simply churn out of VPPs and be uncontrolled and invisible to AEMO.

Incentives to participate in Dispatch Mode

Having the right incentives in place to attract VPPs into Dispatch Mode will be critical to the success of the Schedule Lite mechanism and thus reaching the level of dispatchable capacity from these resources that AEMO has indicated will be required.

AEMO has proposed several measures, termed as "incentives", to encourage participation in the Dispatch Mode. These include:

- The capability to schedule resources
- The ability to co-optimize energy and FCAS
- The eligibility to contribute regulation FCAS
- Access to various services like operating reserves, capacity certificates, and primary frequency response (PFR).

Evergen anticipates that access to the market revenues **currently available** may not be sufficient to attract VPPs into Schedule Lite's Dispatch Mode, noting that there is no revenue stream available to recognise capacity from small-scale assets.

Market revenue is inherently uncertain and furthermore participants that don't currently operate utility scale assets will not have a good understanding of market revenue available. As discussed above, there must be an investment case for retailers and aggregators to establish a VPP which requires financing behind-the-meter assets or compelling customers to bring their own assets.

Nor do the current value streams fully recognise the value that small-scale storage, for example, can provide in terms of firm capacity.

Evergen suggests that AEMO and the AEMC work with the Department of Climate Change, Energy, the Environment and Water on policies that will provide some level of investment support and



certainty while the market develops. There is currently a stark policy gap in providing VPPs and small-scale storage the type of investment support that is being implemented for utility scale storage through the Capacity Investment Scheme.

Evergen also notes the proposal that VPPs could provide regulation FCAS and access to additional services carry an element of uncertainty. Evergen would like to highlight there may be other potential barriers that DER might face in participating in regulation and primary FCAS. For example, would the existing AGC approach and control system requirements for providing regulation FCAS be applicable? It will be important to not just provide market access through Schedule Lite, but also to ensure the requirements are fit-for-purpose and do not exclude VPPs on the basis of technical requirements.

SEPARATION OF CER AT THE CONNECTION POINT

The AEMC's consultation paper has queried whether participation in the Schedule Lite mechanism is dependent on whether price-responsive resources can be separated at or behind the connection point.

Participation of retailers (i.e. the customer's FRMP) in this mechanism would not rely on separation of CER behind the connection point providing they could be confident of complying with dispatch targets. Separating CER behind the connection point would make it possible for traders, other than a customer's retailer, to participate in the wholesale energy market. However, Evergen does not consider the benefits of introducing flexible trading to enable this to outweigh the benefits.

As we put forward in our submission on the "Unlocking CER benefits through flexible trading" rule change, Evergen believes there is currently a disconnect between the value of PV/batteries for the consumer, versus the value that can be garnered from wholesale energy market participation via a VPP.

Fully committing all PV/battery behaviour to the wholesale market via a VPP is unlikely to generate better value for the consumer versus using CER for self sufficiency and solar self-consumption. These latter uses require that CER are **not** separated from each other or from uncontrolled load. As discussed above, consumers may be willing to offer "flexible" generation/load into their VPP, where "flexible" denotes surplus or transitory capability (if prices are particularly high), rather than CER's entire output. Secondary metering / multiple FRMPs does not facilitate this hybrid behaviour of mostly using PV/battery locally and then sometimes contributing to wholesale market participation.

Achieving maximum behind the meter self-sufficiency and solar self-consumption requires a single settlement point at the same place as the connection point. Allowing market participation of CER around these local goals puts the onus on companies like Evergen to effectively forecast local loads and generation and deliver co-optimisation between customer uses and VPP uses, a capability Evergen has already developed. Rather, a single settlement point at the same place as the connection point is required, putting the onus on companies like Evergen to effectively forecast local loads and generation and deliver co-optimisation between customer uses and VPP uses, a capability Evergen has already developed. Consumers will maximise return on investment for their PV/battery when they can co-optimize across a value stack including self-consumption, flexible loads and market participation.



OTHER POTENTIAL OPTIONS

Improving forecasting arrangements

The Commission identifies a number of potential inefficiencies that will arise if price-responsive resources are not integrated into market systems including:

1. higher dispatch costs due to inaccurate demand forecasts in dispatch, pre-dispatch and ST PASA
2. prices will not be set at efficient levels
3. meeting system security requirements is likely to become more expensive
4. additional resources will need to be obtained to ensure reliability including an increased need for regulation FCAS, contingency FCAS and RERT in the short term and
5. networks may become less efficient due to more conservative operating limits, and potentially misguided capital investments in energy infrastructure.

Evergen accepts the concerns outlined by AEMO and that the Visibility and Dispatch solutions proposed by AEMO would assist in mitigating these concerns. However, it is unclear as to how much price-responsive resources would ultimately be captured through this approach if VPPs are not sufficiently incentivised to participate. The demand from such resources already responds to price stimulus, and both individual demand data and price signals (e.g. dispatch and pre-dispatch data) are available for AEMO to create cause-effect models.

As such, Evergen suggests that AEMO consider options for improving its demand forecasting using the data already available to it including historical demand data and data collected for the Distributed Energy Resources Register, with potentially some adjustments for more dynamic data and some additional forecasting information from aggregators and retailers. These resources are behind-the-meter consumer devices, and for that reason, their operation should be predictable and forecastable, even when made price-responsive. Using the currently available data, AEMO could segment the demand forecast by how much each group of resources respond to price signals. The response to prices may vary depending on the capacity of the resources and market exposure, going from no response to highly correlated responses. Hence, the new forecast system could use price signals as an input to estimate the demand for each segment.

Simple Visibility Model

If AEMO did desire additional data Evergen suggests implementing a mechanism more aligned to the Simple Visibility Model outlined by AEMO,¹ with some differences with respect to how forecasts over short-term horizons may be provided. A simpler model may encourage a greater uptake than the more complex Visibility Model which may primarily attract participants interested in graduating to the Dispatch model and could be implemented as a standalone initiative or to complement the Schedule Lite solutions.

One of the issues with the design of the visibility model, which is based on providing forecasts based on different price points, is that it does not reflect how assets are increasingly being optimised using modern AI. That includes a variety of technologies readily available nowadays, such as machine

¹ AEMO, *Electricity Rule Change Request: Scheduled Lite*, January 2023, p. 40.

learning, evolutionary algorithms, fuzzy logic, game theory, model predictive control and reinforcement learning.

By way of example we outline the Evergen optimisation process below and suggest the type of information that could be provided more simply than the indicative bids under the Visibility mode proposed by AEMO.

Our approach does not simply bifurcate decisions based on prices within a discrete interval. Instead, we have developed an optimisation process that runs every five minutes and creates (or updates) a plan to control each individual resource aiming at minimising the consumer's electricity costs. This method allows us to efficiently adapt to changing conditions and make the most accurate and strategic decisions based on evolving data.

Given this approach, while we understand the industry norm of providing forecasts for a range of prices, we believe it would be more beneficial and accurate for both parties if we were to provide you with a forecast based solely on the pre-dispatch price forecast available at any given time and which could be updated on a regular basis e.g., every six hours. This would not only represent our operations more genuinely but also reduce the potential noise from unnecessary data points. This approach would also have the benefit of being suitable for simple optimisation as well as VPPs that are being dispatched at particular price points.

In summary, under a Simple Visibility Model, the data provided could include:

- Actual data: provided as part of a regular energy metering and settlement process.
- Forecast information: monthly profile of availability for all the resources in the portfolio (in aggregate)
- Indicative information: indicative forecasts for the portfolio of aggregated consumption or generation to be updated on a regular basis (e.g. every 6 hours) rather than submitting an artificial bid stack.

To incentivise the provision of this data a service payment would be recommended, particularly given this should be a voluntary program. This service payment should reflect the cost of the service being provided so as to incentivise participation.

However, Evergen would recommend that if this model was pursued that this be implemented through a data exchange using APIs rather than requiring data to be provided through a web portal as suggested by AEMO. APIs allow for, amongst other things: real-time or near-real-time data sharing; automated data submission; scalability to accommodate increasing amounts of DER data; and are more easily integrated into existing software systems.

CONCLUSION AND KEY RECOMMENDATIONS

Evergen, with its experience and platform of well over 12,000 systems, understands the pivotal role that CER storage plays in the ongoing stability and efficiency of Australia's energy markets. Without timely support for CER storage investment, there is a genuine risk of being ill-equipped to meet the demands of the future energy landscape, potentially compromising grid reliability and increasing costs for all consumers.



To achieve the required level dispatchable CER in the National Electricity Market, the proposed Schedule Lite proposal will need to be underpinned by unlocking further value streams for small-scale storage and VPPs and policy support that provides investment certainty. Evergen suggests market bodies and governments work closely together to unlock revenue streams and provide investment support that could incentivise retailers and aggregators to establish VPPs that can provide visibility and dispatchability to AEMO.

Evergen also recommends that care be taken in the design of the Schedule Lite not to dis-incentivise the uptake of CER and participation in VPPs through imposing mandatory requirements to participate or by linking eligibility to participate in contingency FCAS to Schedule Lite participation. In addition, we recommend other options be considered such as improved forecasting arrangements and a simpler visibility model, which could meet AEMO's objectives with less complexity and cost.

