

26 October 2022

Dear AEMO,

**RE: Proposed Design for a Visibility Framework Consultation Paper September 2022**

Evergen Pty Limited (Evergen) welcomes the opportunity to provide feedback on the Proposed Design for a Visibility Framework Consultation Paper, September 2022.

Evergen exists to accelerate decarbonisation of the energy system. Evergen provides a platform for monitoring, optimisation and orchestration of DER. We have an Australian origin but an international scope. Our operations in Australia cover both the NEM and the WEM. Among other things, Evergen has visibility of 2,000 residential battery+PV DER sites across the SWIS, totalling 13MWh of nameplate storage capacity, approximately 7MW of maximum battery discharge power, and 10MW of rated PV capacity.

However, we do not typically consider these DER to constitute a VPP (or a VPP component) solely through virtue of being on our platform. Evergen provides: free optimisation to end-users, features and visibility to our supplier/installer partners, and we provide operational capability for VPP operators. The latter now includes Synergy, with whom we have partnered to provide services under Project Symphony, and it is only the latter that we would consider part of a VPP. Not all DER on our platform are in the same VPP, nor necessarily in any VPP.

Evergen understands the rationale for a visibility framework and appreciates the opportunity to provide feedback on this consultation paper. We are well-placed to provide visibility of DER to the market operator (AEMO) and DSO (Western Power) in the WEM, but are mindful that arrangements in the WEM create challenges for us. In this submission, we seek to highlight issues that could impact on the framework delivering its intended objectives while also hindering innovative business models that will deliver benefits to end-use customers and across the system.

This submission is offered in the spirit of collaboration and achieving the best possible outcome for all. I would welcome the opportunity to discuss any part of it with you.

Yours sincerely



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CEO

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## 1. Evergen's role

Evergen is a software and cloud platform that enables the monitoring, control, optimisation and orchestration of DER. Our capability spans the full gamut from individual site monitoring, up to fleet (VPP) orchestration.

Evergen does not control small-scale DER via the installation of proprietary Evergen hardware. Rather, we integrate on a cloud-to-cloud basis with manufacturers, and via this integration we obtain a channel to monitor and control individual DER via the relevant manufacturer. To date Evergen has integrations with over 10 battery/inverter manufacturers.

Many battery/inverter manufacturers have already developed significant computing infrastructure to remotely monitor and control DER sites. They do this to provide monitoring to end-users via apps/portals, to aid in maintenance, and increasingly to facilitate the possibility of grid services. Evergen piggybacks off these existing capabilities and avoids the installation of additional hardware.

We also partner with suppliers and installers and have contact with end-users, such that we only gain and retain visibility/control with the explicit consent of each end-user.

Evergen provides optimisation and app/portal-based visibility to end-users at zero cost. We derive income from providing a platform for monitoring and control of DER to VPP owners or consumers of VPP services, such as retailers, network operators and some system suppliers. However, for Evergen, to commit end-users on our platform to such VPPs requires separate consent from the end-user.

At present, Evergen generates no market-based income for sites on our platform in WA. We are deploying to get scale in advance of market reforms that will facilitate and reward active participation.

Evergen's role is pertinent to discussion of the proposed visibility framework. By presenting our role, we can provide insight on:

- how ambiguity in the proposed definitions of "VPP" and "central control" could inadvertently capture site specific optimisation services
- the interactions of the proposed framework with Synergy's role as sole aggregator for non-contestable DER and the obligations that could arise for end-user optimisation services and third party aggregators
- the risks of introducing requirements for "real-time" data from individual DER when other options may provide sufficient visibility
- implications of using the DER register as a proxy in terms of the DER that should be considered in size estimation of VPPs
- the perverse outcomes that may arise if the Visibility framework disincentivises the provision of end-user optimisation services or the growth of VPPs.

## 2. Definition of a VPP

**“Virtual Power Plant (VPP):** An aggregation of DER comprising at least 5 MW of DER of the type represented on the DER Register, located behind one or more Transmission Nodes and centrally controlled by a person via an orchestration system.”

“...the term **‘centrally controlled’** within the definition of VPP refers to the actions of a Rule Participant (who is the VPP operator) to actively coordinate the Injection or Withdrawal of DER that are electrically connected to a distribution system. “

“The term **‘orchestration system’** refers to the mechanism (for example, the technology platform) or group of mechanisms that a person uses to centrally control a VPP.”

The above are working definitions included in the Consultation Paper. Given Evergen’s role, we will highlight ambiguities arising from these definitions:

- The VPP definition includes “... controlled by a person...”, and the definition of orchestration system also mentions “... a person...”. Evergen’s platform includes the ability to manually (i.e. by a person) control sites and fleets. However, we predominantly undertake automated (by an algorithm) control for optimisation, or for VPP operations such as bidding and dispatch to comply with a bid.
- There is ambiguity in the definition of “centrally controlled” as to what “actively coordinate” means. Evergen actively optimises systems (though our optimisation is dormant for end-users on flat tariffs: >95% of our DER sites in the SWIS are on flat tariffs). This optimization is site-specific, and any appearance of coordination would reflect similar circumstances between sites rather than active coordination. Our optimisation may result in many sites all having similar controls (e.g., pre-charging a battery on an off-peak tariff). Optimisation behaviour is governed by factors including weather and tariff structure which can be broadly common across many sites. However, we are of the strong view that this service to end users should not qualify as a VPP, given assets are not being actively coordinated to inject or withdraw energy with respect to the grid. If the DMO or DSO wanted visibility of systems on our platform despite them not being in a VPP, Evergen would request alternative visibility arrangements to those presented in the proposed framework.
- An inverter or battery manufacturer may well have many thousands of DER in the SWIS. They may also technically have the capacity to remotely control these DER, including applying export limits, curtailing solar, discharging/charging batteries and so on. However, for most manufacturers, there is no intention of orchestrating a fleet. These capabilities are to provide the end-user some remote control capability, or to perform optimisation functions similar to Evergen (e.g., pre-charging in advance of a forecast storm with associated blackout risk), or to simply provide a channel into VPP participation. Evergen’s firm view is that manufacturers who make such functions available to their customer should also **not** be considered a VPP since they are not “actively coordinating” all of these systems towards participation in the broader market. However, like Evergen there remains the possibility of incidental coordination that may result in aggregate behaviour.

## 3. Synergy’s role as sole aggregator for non-contestable DER

Synergy is the sole aggregator for small-scale non-contestable DER, as described in the *DER Roadmap: DER Orchestration Roles and Responsibilities Information Paper*. If a battery manufacturer

or a 3rd party such as Evergen provides end-user services (e.g. optimization) and is regarded as a VPP under the proposed visibility framework as a result, it seems there may arise a **requirement** to partner with Synergy. There should be no requirement for a company such as Evergen or a battery/inverter manufacturer to partner with Synergy just because they happen to provide services to end-users. Neither Synergy nor the 3rd party may wish to or be able to agree on terms for such a partnership. This may lead to a perverse outcome as described in Section 6.

If Synergy is the Rule Participant and sole aggregator, then they will quickly qualify as a large VPP, with resulting standing, operational and dynamic data requirements. Synergy may also be required to register VPP components as facilities, and their scale may push these facilities towards particular facility classes (e.g., semi-scheduled or scheduled). Any 3rd party aggregator/platform such as Evergen that partners with Synergy (as we are already doing within Project Symphony) would then also have the perhaps significant barrier to entry of needing to provide visibility commensurate with Synergy's requirements as an existing rule participant and large VPP. This conflicts with the intention of a staged implementation approach.

#### 4. Dynamic data

The proposed visibility framework currently provides no certainty on what is meant by "real time" data. Requirements for the latency of providing real time data, and the granularity of such data will have a significant impact on the possibility, capability and cost of a VPP meeting requirements, as will the required method of integrating with AEMO to deliver this data.

If "real time" is defined too onerously the framework risks placing a cap on the size of VPPs to avoid needing to provide dynamic data. OEMs may not be inclined to improve their hardware to meet dynamic data requirements specifically for the WEM, thereby limiting the value that VPPs can provide to the network, retailers and end-use customers unless additional 3rd party hardware is installed.

Handling large volumes of data at scale and with low latency is Evergen's core business. However, given we rely on hardware partners, our capacity to deliver visibility is limited by what our hardware integration partners can deliver to us, and on any API rate limits that Evergen must comply with as part of an integration.

Local memory and communications equipment may be a bottleneck and limit what granularity of data can be buffered and streamed to the cloud. Manufacturers' cloud infrastructure is also oriented towards the use case of providing visibility for very large numbers of end users, not necessarily for delivering high granularity real-time dynamic data. As a result, Evergen's hardware partners may not store or make available high granularity data to Evergen.

Should high sample rate requirements apply even at the individual DER level, then as the definition of "real-time" potentially becomes tighter over time, there will come a point for each battery/inverter manufacturer where they will no longer be compliant via their existing server infrastructure and/or local hardware. Since manufacturers of such hardware typically have international coverage, they will not necessarily improve their hardware to meet requirements specifically for the WEM. Large VPPs may therefore be capped unless they consist solely of DER sites with additional 3rd party hardware capable of delivering dynamic data at the granularity and latency that may be required.

The lack of clarity of requirements and the potential for these to change over time also provides a lack of certainty for investors in small-scale DER and may also eventuate in some investors needing to withdraw their DER from a VPP if they are unable to meet new requirements. “Real time”, high sample rate data might be required for a big VPP, but it will still be the case, whether a VPP consists of only a handful of DER or many thousands, that the individual small-scale DER comprising the VPP are individually of little consequence to network stability or the broader market. The usefulness of requiring individual DER to provide high-sample-rate telemetry is therefore dubious.

One potential option here is that the overall VPP or VPP component facility may provide partial high resolution telemetry, even if individual DER telemetry is much coarser. For example, consider a notional VPP of 2,000 DER, where each DER provides a refreshed telemetry sample once every 5 minutes (300 seconds). The delivery of telemetry across DER is either unsynchronised or else deliberately staggered. The overall facility could present refreshed aggregate telemetry every 4 seconds, where the change from one sample to the next record 4 seconds later reflects the new information from any DER that deliver refreshed telemetry over that 4-second interval (i.e., approx.  $4/300 \times 2000 = 27$  DER), and the entire VPP delivers telemetry refreshed across all DER over 5 minutes.

By working with the DMO and DSO and providing information on permitted maximum power ramp rate (at the aggregated VPP level), Evergen suggests that a sufficiently accurate VPP-scale high-resolution visibility may be delivered to the DMO/DSO without resorting to requiring very high resolution telemetry from every single DER.

## 5. DER are not all equal - thoughts on VPP sizing

The proposed visibility framework suggests that the DER register could be used to guide VPP sizing. In so doing, it treats all DER the same, whether PV, battery or EV charger, or something else such as controlled load. Yet there are substantial differences in operation and impact between these devices, and in their control. To consider these devices as homogenous will likely lead to over-rating the size of VPPs and inconsistent treatment of VPPs under the framework.

By way of example, consider Evergen’s 2,000 sites in the SWIS, where our integrations currently mean that these consist of controllable batteries and uncontrolled solar (i.e. monitoring only for solar). Should we be in a position to form a VPP (e.g., as a 3rd party aggregator for Synergy), we would view our VPP as focused on batteries, and approximately 7MW in size - a small VPP. But the proposed sizing rules would regard these 2,000 sites as 17MW (7MW of battery + 10MW of uncontrolled PV), meaning it would be a large VPP.

Also, consider a battery-based VPP, comprising DC-coupled systems, where each system consists of 5kW of PV, 5kW battery and a 5kW hybrid inverter. Maximum possible export to the grid (assuming zero load) will be 5kW. Yet the proposed sizing rules would treat this as 10kW size.

And in a final example, consider an AC-coupled system may have 2x 5kW inverters (one for solar, one for battery) that has a theoretical max export to grid of 10kW. In almost all cases where the solar is generating, the battery will either be charging or else idle because it is full. Western Power’s battery rules which actively seek to mandate time-based battery behaviour (e.g. prohibiting battery discharge between 10am-3pm), and which Evergen considers ill-conceived and counterproductive, also need to be considered. In this scenario:

- It is unlikely that a VPP would discharge the battery at full power at the same time the solar is generating at full power since the market price is very likely to be low under such conditions. It is possible to conceive of some rare scenarios where this may occur (e.g., maybe the battery is being emptied so that it can be used to help comply with a DOE constraint later in the day). However, being an edge case, such scenarios shouldn't be used in designing the sizing methodology for visibility requirements.
- A 5kW PV system would only output at 5kW for short periods of the day, only when the weather is good and only for perhaps the 6 months in and around summer. Whereas a battery may output 5kW every day.
- A VPP aggregator may be controlling batteries, with PV being uncontrolled and at some more complex sites, the aggregator may not have visibility of all PV at the site.

## 6. Perverse outcomes

This submission highlights a number of aspects of the proposed Visibility Framework that could impact on delivering its intended objectives while also potentially hindering innovative business models that will deliver benefits to end-use customers and across the system.

Ambiguity in the definition of a VPP proposed in the Consultation Paper could inadvertently capture site specific optimisation services for end-use customers.

A requirement to provide near "real-time" data will have a significant impact on the possibility, capability and cost of a VPP meeting requirements as will the method of integration with AEMO's systems.

Also, as discussed in section 3, it seems there are interactions between the requirements under roles and responsibilities for Synergy to be the sole aggregator and the proposed visibility framework.

How different forms of DER are considered for the purpose of sizing VPPs, combined with Western Power's rules prohibiting discharging batteries during certain times of the day, may also lead to over estimating the size of VPPs and placing overly onerous visibility requirements on these VPPs.

The above points may lead to a perverse outcome where DER are ejected from cloud platforms such as Evergen's since the compliance costs may outweigh the benefits to the platform, a negative outcome at all levels:

- The end-user loses access to services such as optimisation, or pre-emptive battery charging which will decrease the return on investment on their devices and may inhibit uptake of batteries
- Innovative cloud-based platforms lose visibility of DER and a route to market for the provision of energy, network support and ancillary services to the detriment of the system as a whole.
- The DSO and DMO lose a significant opportunity to convert passive/invisible DER to active/visible DER by making the requirements too onerous on smaller VPPs, by virtue of their being a third party aggregator to Synergy, and deterring their participation.

Although not the subject of this consultation Evergen also suggests AEMO encourage a review of Western Power's rules regarding time of operation of battery energy storage systems. Batteries are inherently good for grid stability, and automatically mitigate against minimum load conditions

resulting from high levels of PV. Mandating time of operation will not help at all with minimum load, but will prevent batteries from mitigating the impact of a thunderstorm moving quickly over Perth with the resulting big swing in aggregate solar generation injected onto their network.

## 7. Recommendations

In summary, Evergen recommends:

- Improving the visibility of VPPs by implementing a market design that encourages their participation in the WEM
- Definitions be amended to avoid providers of services to end-users via centralised remote control such as Evergen or inverter manufacturers from being considered as a VPP or VPP component.
- The requirements for third-party aggregators in Stage 2 be based on the size of the aggregation under their control rather than the size of the VPP registered by Synergy as the sole aggregator of non-contestable DER.
- Alternative options to the provision of near “real-time” data from individual DER, which can still provide sufficient visibility, be considered where dynamic data is required.
- The methodology for calculating a VPP’s estimated size recognise that not all DER will have an equal impact on the operation of the VPP.