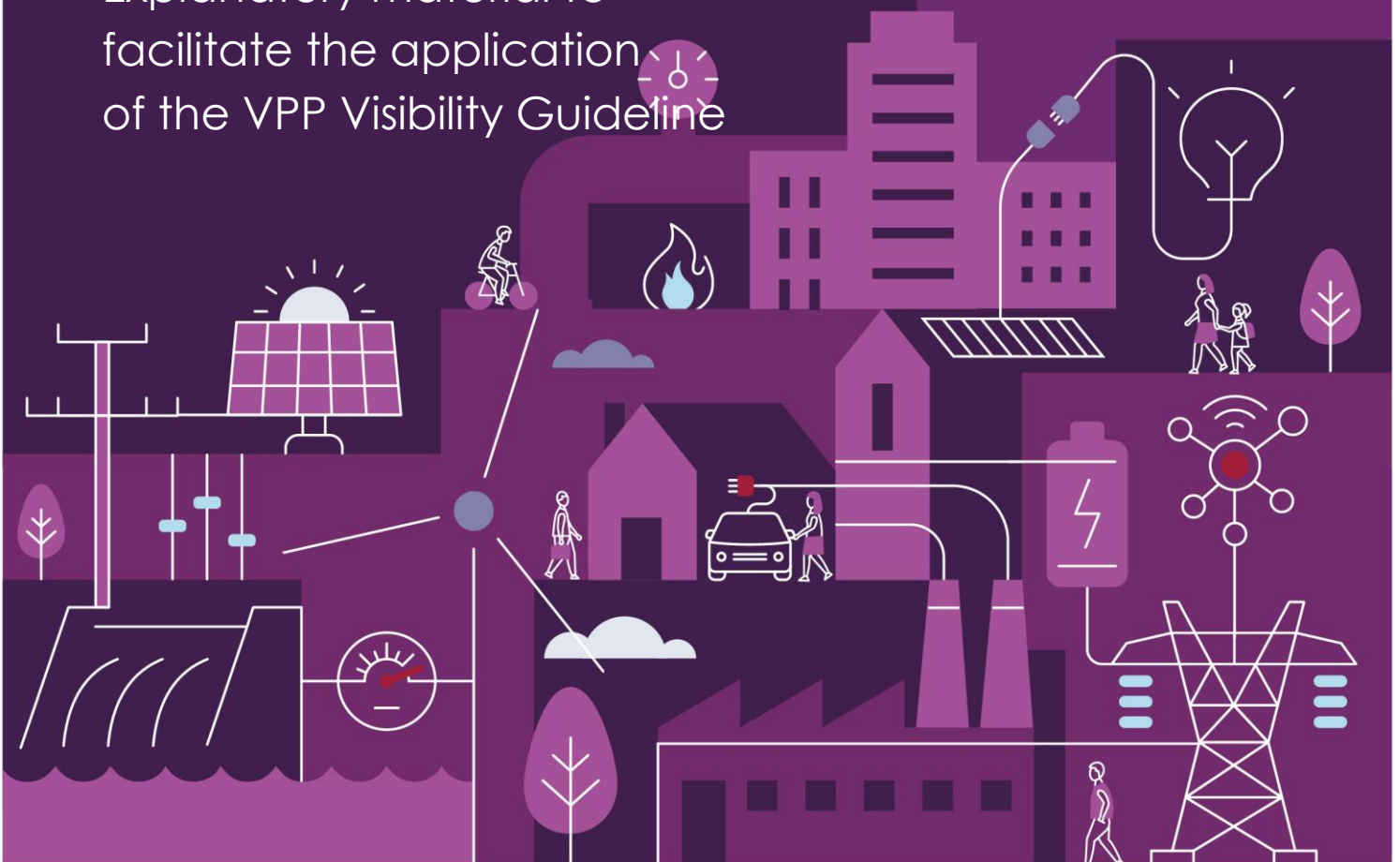


# Visibility Framework

## VPP Visibility Guideline Explanatory Paper and Explanatory Note

January 2023

Explanatory material to  
facilitate the application  
of the VPP Visibility Guideline





# Important notice

## Purpose

The function of ensuring that the South West Integrated System operates in a secure and reliable manner for the purposes of the Electricity Industry (Wholesale Electricity Market) Regulations 2004 is conferred on AEMO under clause 2.1A.1A of the Wholesale Electricity Market Rules. The purpose of this document is to provide explanatory material to facilitate the application of the VPP Visibility Guideline, which partially implements the Visibility Framework.

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## Version control

Version	Release date	Changes
1.0	04/01/2023	Final version for stakeholder advice

# Introduction

## **Purpose of the proposed Visibility Framework**

*The purpose of the Visibility Framework is to enable AEMO to collect data on the existence and operation of aggregations of Distributed Energy Resources (DER) acting as Virtual Power Plants (VPPs) that have the capability of moving material amounts of energy via 'off-market' activities. This information will inform AEMO's decision-making when fulfilling its functions under the Wholesale Electricity Market Rules (WEM Rules).*

As part of its implementation of the DER Roadmap, AEMO is working with Energy Policy WA to develop arrangements for the integration and orchestration of aggregations of DER into the South West Interconnected System (SWIS). This includes the identification and implementation of DER Orchestration Roles and Responsibilities to enable the future integration and orchestration of aggregated DER into market arrangements, as enabled by the Wholesale Electricity Market (WEM) Rules.

In the short term, AEMO has developed a Visibility Framework intended to better inform decisions when performing its function of keeping the power system secure as the SWIS transitions to a highly distributed energy future.

The aim of the Visibility Framework is to enable aggregations of DER to commence service provision for any service and to achieve scale, while also ensuring that the operation of the SWIS remains secure and reliable. The framework will provide AEMO with better information as commercial arrangements develop outside of the WEM Rules. The framework coordinates with the WEM Rules to support future participation in the WEM once the market arrangements are in place, so that early investments in visibility can contribute towards enabling access to future revenue opportunities from the WEM.

In September 2022, AEMO published its consultation paper on the *Proposed Design for a Visibility Framework*<sup>1</sup> to enable stakeholders to consider and respond to the framework's proposed high-level design and staged approach to implementation. The focus of Stage 1 is to build experience in operating the framework through the voluntary participation of existing Rule Participants who are VPP Operators while incorporating learnings from Project Symphony to determine what, and how, visibility data may be collected. See Figure 1 below for an overview of the proposed stages and timings for the implementation of the Visibility Framework.

Submissions to the consultation paper closed on 26 October 2022. Feedback to the consultation paper informed the development of the VPP Visibility Guideline (previously referred to as the VPP Aggregation Guideline) and the Minimum Visibility Data Model, as the principal mechanisms for implementing Stage 1 of the Visibility Framework.

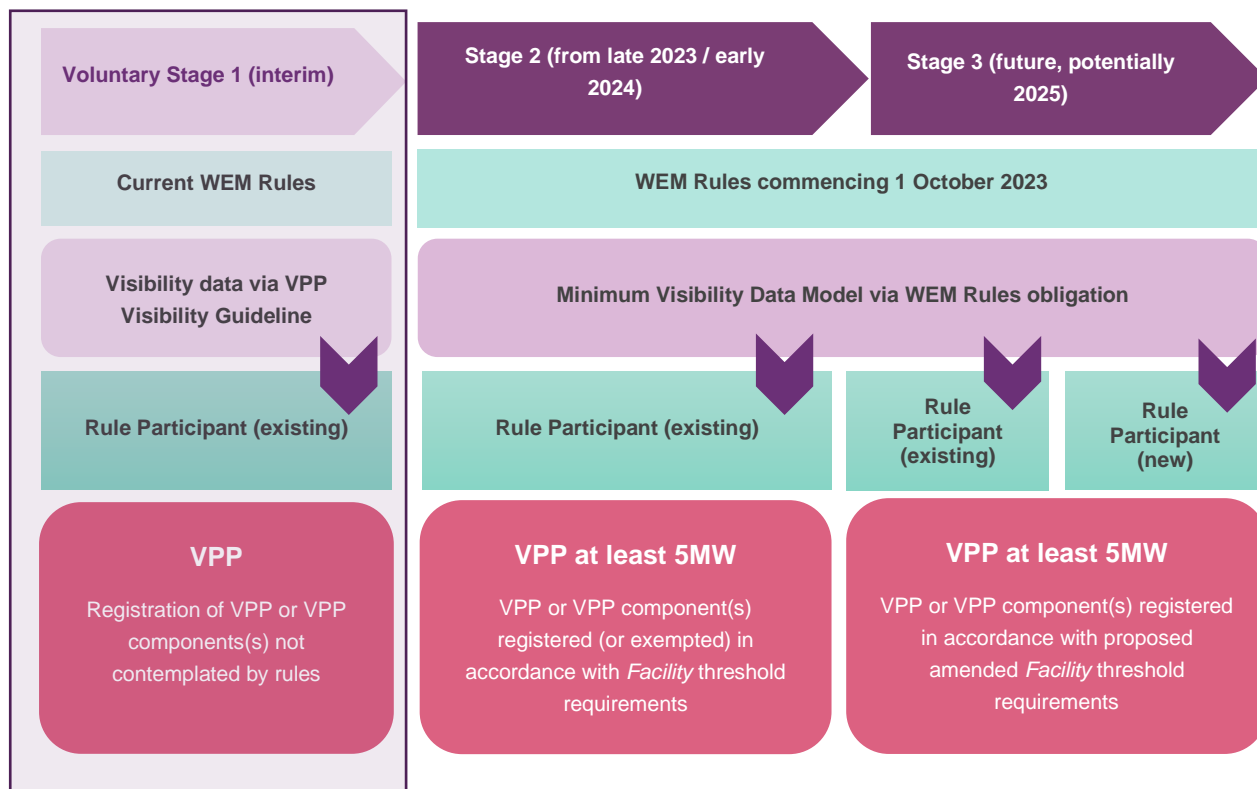
The VPP Visibility Guideline (guideline) is the subject of this explanatory paper which is structured as follows:

- Appendix 1 provides a high-level overview of the aspects of the Visibility Framework design that attracted the most feedback, some clarifications on the framework design and how AEMO has reflected feedback in the drafting of the guideline.
- Appendix 2 contains the guideline explanatory note, which summarises the purpose of each section and provides detail on the operation of each subsequent sub-section.

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<sup>1</sup> See <https://aemo.com.au/consultations/current-and-closed-consultations/proposed-design-for-a-visibility-framework#:~:text=The%20purpose%20of%20this%20Framework,a%20highly%20distributed%20energy%20future.>

Figure 1 Overview of the proposed stages and timings for Visibility Framework implementation



AEMO thanks all respondents for their comments on the proposed Visibility Framework, including suggestions for design improvements and insights into data availability and potential implementation issues.

AEMO will be engaging Rule Participants throughout Stage 1, which commences with the publication of the guideline, to develop the detailed design of visibility data management processes. In this stage AEMO will investigate the extent to which DER Register arrangements can be leveraged to facilitate visibility data collection and/or validation and will test the suitability of the Minimum Visibility Data Model. The work will enable AEMO to gather insights into potential amendments to the WEM Rules that may be needed for Stage 2 implementation (where Stage 2 is required); noting the Visibility Framework must work alongside the new market arrangements, the design outcomes from Energy Policy WA’s DER Orchestration Roles and Responsibilities work, as well as the Technical Rules.

When considering implementation activities to deliver Stage 2, AEMO will take into account stakeholder views received to date, insights gained from Stage 1 and further stakeholder engagement at the appropriate time.

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# A1. Stakeholder response overview, design clarifications and incorporation of feedback

## 1.1 Overview of responses

Responses to AEMO's consultation paper on the *Proposed Design for a Visibility Framework* demonstrated an interest in the proposed Visibility Framework, support for a staged implementation approach that leverages learnings in a prior stage, and an understanding of the purpose of the framework.

Feedback was considerate of the (voluntary) Stage 1 design and the operation of subsequent stages, potentially under WEM Rules at some time following the commencement of new market arrangements on 1 October 2023.

The aspects of the Visibility Framework design that attracted the most comment from respondents include:

- Proposed definitions for 'VPP', 'centrally controlled' and 'orchestration system' – respondents sought clarity on these terms and on what constituted an 'off-market' service. Respondents wanted to ensure visibility arrangements did not unintentionally apply to third-parties, and specifically, third-parties facilitating the coordination of site optimisation services solely for the benefit of end-use customers.
- Estimated size calculation – respondents suggested the calculation should reflect the different capabilities of DER in terms of their controllability and flexibility to prevent an overestimation in VPP size leading to unnecessary imposition of requirements.
- Minimum Visibility Data Model – there was broad agreement that the data model was not onerous; however, respondents requested clarity on the services that might be subject to Operational and Dynamic Data requirements and on the meaning of 'real-time' data.
- Proposed interaction of visibility arrangements with the WEM Rules registration regime – respondents requested clarity on how visibility arrangements would apply to third-parties facilitating the coordination of aggregations of DER.

Section 1.3 goes into further detail on how these matters were addressed in the drafting of the guideline. Other matters raised by stakeholders may be best addressed through further clarification on the relevant design aspects of the Visibility Framework (see section 1.2 below).

## 1.2 Visibility Framework design clarifications

AEMO recognises that stakeholders raised a range of matters in relation to the Visibility Framework, in addition to those mentioned above, and offers the following clarifications to further guide stakeholder understanding of the framework.

- The focus of the Visibility Framework is off-market services that involve the movement of material amounts of energy that are also 'grid-facing'. In other words, the aggregation of DER is providing a service other than, or in addition to, behind the meter optimisation on behalf of the DER equipment owner.
- Stage 1 arrangements for the provision of visibility data are voluntary, are targeted at current Rule Participants and aimed at trialling the collection of data as per the proposed Minimum Visibility Data Model. This early stage is effectively a 'trial' to determine the suitability of the specified data items and their update frequency, and the most efficient method of data collection.
  - The provision of Operational Data and Dynamic Data and data updates is not 'automatic' – its provision is subject to a negotiation process that takes into consideration (among other things) the availability and cost of providing the data.

- The Minimum Visibility Data Model does not require telemetered data in fulfilment of the Operational Data or the Dynamic Data requirements in Stage 1. The reference to ‘close to real-time’ in regard to Dynamic Data updates means:
  - A close to real-time notification to AEMO, potentially in the form of email from the VPP operator, to confirm a service will be activated (for a period of time) and then to confirm the service has been deactivated.
  - For each Market Interval, a close to real-time forecast of the expected change in energy in MW that is available to the VPP from its joined on NMI for control to provide the service.
- Stage 1 findings will inform the design detail of any subsequent stages to the Visibility Framework, which will also be aligned with Energy Policy WA’s design for the market participation of DER.
- The estimated size calculation applied in the Visibility Framework is not the same as the system size calculation used for market registration and fulfils a different purpose – it is only relevant to the application to the Visibility Framework.
  - The purpose of the estimated size calculation is to help the Operator of an Aggregation of DER and AEMO to determine whether, based on a standardised methodology, the aggregation fulfils the size criterion for a VPP.
  - For an Aggregation of DER to be considered a VPP, it should be at least 5 MW in estimated size *and* fulfil another criterion specified in the guideline (see sub-section 1.3.1 below).
- Even where an Aggregation of DER meets all the criteria of a VPP, AEMO may determine not to seek visibility data in respect of that VPP; the obligation to provide Static Data does not apply ‘automatically’.
  - AEMO must notify the Rule Participant where it determines Static Data is to be provided.
  - Once AEMO receives the Static Data, DER Register information can be used to identify the VPP’s location. This and other information will inform AEMO’s determination on whether to collect (subject to negotiation) any further visibility data from the Rule Participant in respect of the VPP.
- The interaction of visibility arrangements with the WEM Rules registration regime, as proposed by the consultation paper, is consistent with the WEM Rules as they apply from 1 October 2023 to commence the reformed market arrangements.
- Further reforms to market arrangements to support DER participation are currently being designed by Energy Policy WA as part of the DER Orchestration Roles and Responsibilities program of work. Energy Policy WA’s timings for the broader participation of aggregations of DER is expected to be October 2025.
  - It is expected this work will determine the market registration requirements for aggregations of DER, including a methodology to calculate the system size, and for DER Aggregator (and treatment of third parties).

## 1.3 Incorporating feedback into the VPP Visibility Guideline

In the context of the design clarifications made in section 1.2 above, AEMO has addressed feedback to the consultation paper as outlined below.

### 1.3.1 Clarification of definitions and application of visibility requirements

The guideline’s drafting makes clear that the visibility data requirements for VPPs will not automatically apply to aggregations of DER, including those used for the primary purpose of providing customer-facing aggregation services to end users, such as site optimisation services. In addition, AEMO may not seek Operational or

Dynamic Data in respect of an aggregation of DER that provides site optimisation services. The guideline does this by –

- Inserting definitions that differentiate between an ‘Aggregation of DER’ and a ‘VPP’ to allow differential treatment under the Visibility Framework. For the purpose of the guideline –
  - Aggregation of DER means a grouping of DER that is ‘Centrally Controlled’ and coordinated via an ‘Orchestration System’, where:
    - Centrally Controlled means the active control of the activities of an Aggregation of DER by its Operator; and
    - Orchestration System means, without limitation, the technologies, technology platform(s), algorithms, process and systems used to coordinate the Injection and Withdrawal of DER within an Aggregation of DER.
  - The definition of ‘VPP’ has been revised to reflect two further criteria that an Aggregation of DER must meet to be considered a VPP:
    - it provides a grid-facing service; and
    - it has been calculated to be at least 5 MW in estimated size.

It should be noted that the guideline will allow AEMO to request (under prescribed circumstances) that a Rule Participant who operates an Aggregation of DER, including those that offer site optimisation services, provide the same or ‘similar information’ to the Static Data items specified in the Minimum Visibility Data Model. The information to be provided (if any) must be agreed through negotiation between AEMO and the Rule Participant.

### 1.3.2 Estimated size calculation

Feedback included suggestions for alternative methods for the estimated size calculation, including methods that reflect controllable load, controllable DER portions and a broader range of DER equipment, to facilitate a more accurate measurement of the size of an Aggregation of DER.

AEMO considers such accuracy will better serve the calculation of the ‘system size’ of an Aggregation of DER, to determine whether (in future) the aggregation triggers a registration requirement under the WEM Rules. AEMO anticipates that the calculation method will be reconsidered as part of the ongoing DER Orchestration Roles and Responsibilities work to help inform, along with the findings from Project Symphony, the design of market participation arrangements for DER.

For the purposes of achieving visibility, a simpler calculation based on the nameplate capacity of the DER most likely to contribute to the capability of an Aggregation of DER in Stage 1 is warranted – Solar PV systems, Battery Storage and Electric Vehicles. To achieve alignment with the WEM Rules, Solar PV systems are treated as Small Generating Units and considered as Injection capacity, while Batteries and Electric Vehicles are treated as Storage Works with the former considered as both Injection and Withdrawal capacity and the latter as Withdrawal capacity.

The estimated size calculation included in the guideline is a slightly amended version of the one detailed in the consultation paper and is as follows:

2.3.2 The estimated size calculation is the summation of the total Injection capacity and total Withdrawal capacity of DER within the Aggregation of DER that are Solar PV, Battery Storage and Electric Vehicle Storage Equipment (including charging equipment), rounded to three decimal places:

$$\text{Estimated size (MW)} = \text{total DER Equipment Injection capacity (MW)} + \text{total DER Equipment Withdrawal capacity (MW)}$$

It should be noted that:



- The terms 'Injection', 'Withdrawal' and 'DER Register' are capitalised within the definition to indicate that the terms have the same meaning as they currently have, or will have, in the WEM Rules.
- The calculation now refers to the Injection and Withdrawal 'capacity' of each DER within the Aggregation of DER to clarify that the calculation is concerned with the 'nameplate capacity' of the DER rather than the controllable 'capability'.

To facilitate an estimated size calculation, Rule Participants will be provided with a template that is consistent with Table 3 of the guideline. In Stage 1, the utility of the estimated size methodology and the template will be tested, and if necessary, amended for application in Stage 2.

### 1.3.3 Provision of 'close to real time' Dynamic Data

The Minimum Visibility Data Model, as presented in the consultation paper, proposes that the 'default' update frequency of the two Dynamic Data items is to be 'close to real-time'. Feedback indicated that hardware limitations, and local memory and communications equipment bottlenecks, can affect the ability (and costs) of a VPP in meeting real time data requirements (and its integration with AEMO systems). For this reason, the Minimum Visibility Data Model, as presented in the guideline, will specify that the update frequency of the two Dynamic Data items is to be 'as negotiated'.

It should be noted that AEMO must first determine that Dynamic Data will be required before negotiating with the Rule Participant on the Dynamic Data items or similar information to be provided, and the update frequency. The negotiation framework also allows AEMO and the Rule Participant to agree that this information would not be provided on the basis of technical limitations, information confidentiality, or unreasonable cost or effort.

### 1.3.4 Treatment of third parties providing aggregation services

Respondents requested that AEMO clarify how visibility arrangements would apply to OEMs or third parties who are providing aggregation services to a Rule Participant. The main concerns were the 'cascading down' of the visibility data obligation that applied to the Rule Participant and whether the third-party operators of aggregation services would be required to undertake market registration.

Consistent with the design clarifications made in section 1.2 above, the Visibility Framework:

- Will not automatically apply to aggregation services that are directed at end-use customers.
- Is voluntary in Stage 1 and only applies to Rule Participants (i.e. parties who are registered under the WEM Rules to facilitate their participation in the WEM) and who choose to comply with visibility arrangements.
  - OEMs and third-party providers who are not providing market services will not be required to undertake market registration for the purposes of the Visibility Framework.
- Is not a market participation framework; any obligation to provide visibility data that a Rule Participant chooses to comply with would need to be managed by the Rule Participant and need not impose upon OEMs or third-party providers. Furthermore, the Rule Participant is only required to supply the data that it can practically make available to AEMO using best endeavours.

In view of stakeholder responses, AEMO is satisfied that there should not be any barriers to Rule Participants from receiving data from third-party providers that is consistent with the data proposed in the Minimum Visibility Data Model, especially in relation to the Static Data items and most Operational Data items, as this data would be required to facilitate the delivery of services. However, it should also be noted that in Stage 1:

- The only obligation on a Rule Participant who is a VPP Operator that may be considered 'mandatory' is in relation to the provision of Static Data. The provision of Operational Data and Dynamic Data is subject to negotiation and agreement between AEMO and the Rule Participant.

- Where a Rule Participant cannot provide Static Data, Operational Data or Dynamic Data items in accordance with the Minimum Visibility Data Model, the Rule Participant and AEMO can negotiate and agree the provision of 'similar information' to fulfil the data requirement.
- Additionally, there is scope under the framework for a Rule Participant to negotiate and agree on Operational Data and / or Dynamic Data that would not be provided. The grounds for non-provision are technical limitations or information confidentiality, or an unreasonable cost or effort associated with providing the Operational Data or Dynamic Data.

## A2. Explanatory Note

Subject		Section overview and sub-section summary
<b>Section 1</b>	<b>Introduction</b>	<i>Covers the purpose and scope of the guideline document with guidance on how, and in what context, the document is to be interpreted.</i>
<b>1.1</b>	<i>Purpose and scope</i>	The purpose of the guideline (the document) is given as providing an overview of the Visibility Framework and facilitating a process for the voluntary and negotiated (as relevant) provision of visibility data to AEMO. While the main focus of the guideline is on facilitating the provision of visibility data to AEMO by a Rule Participant who operates a VPP, the process contains scope for a Rule Participant who operates an Aggregation of DER that is not a VPP to voluntarily provide visibility data to AEMO.  Figure 1 provides a high-level overview of the process for the collection of Minimum Visibility Data from a Rule Participant.
<b>1.2</b>	<i>Definitions</i>	Table 1 clarifies which terms are defined for the purposes of the guideline and which have the meaning given to them by the WEM Rules or another legal instrument.
<b>1.3</b>	<i>Interpretation</i>	Lists the principles that apply to the interpretation of the guideline, including how to apply guideline prescription in the context of the WEM Rules and WEM Procedures.
<b>1.4</b>	<i>Related documents</i>	Table 2 lists the WEM Procedures that are relevant to the arrangements enabled by the guideline.
<b>Section 2</b>	<b>Visibility Framework</b>	<i>Provides detail on the fundamental aspects of the Visibility Framework, including its objectives and key operational elements.</i>
<b>2.1</b>	<i>Overview</i>	Lists the objectives of the Visibility Framework and provides a high-level overview of the visibility arrangements. The guideline has application to a Rule Participant who is a 'VPP Operator' (i.e. who owns operates or controls a VPP) and chooses to participate in the Visibility arrangements. Noting there is nothing preventing a Rule Participant who operates an Aggregation of DER (less than 5 MW in estimated size) from choosing to participate.
<b>2.2</b>	<i>VPP definition</i>	'VPP' is defined in paragraph 2.2.1. Paragraph 2.2.2 provides additional detail on the defined terms used within the definition of VPP. Figure 2 is a visual illustration of the definition of VPP.
<b>2.3</b>	<i>Calculation of estimated size</i>	Sets out a method for estimating the size of an Aggregation of DER for the purpose of determining whether the Aggregation of DER is a VPP (for the purposes of the guideline). The method standardises the inputs to be used in the calculation, which is made to three decimal places (in alignment with the WEM Rules for registration). Note that an 'estimated size' of at least 5 MW is one criterion that must be fulfilled for an Aggregation of DER to be considered a VPP; the other specified in paragraph 2.2.1 is that the service being provided is a 'grid-facing' service.  A Rule Participant who operates a VPP is a VPP Operator may notify AEMO of the result of its calculation of estimated size and of the service(s) being provided. However, a Rule Participant may elect to notify AEMO where its Aggregation of DER is less than 5 MW in estimated size. Table 3 provides an example of an estimated size calculation.
<b>2.4</b>	<i>AEMO may request calculation</i>	Allows AEMO to make a written request to a Rule Participant to make an estimated size calculation and provide details of the service(s) being provided by the Aggregation of DER. The Rule Participant may notify AEMO of the result of the calculation and of the service(s).
<b>Section 3</b>	<b>Minimum Visibility Data</b>	<i>Details the voluntary arrangements for the collection and provision of Minimum Visibility Data under Stage 1 of the Visibility Framework. It is expected that a (rules-based) obligation and requirements on the provision of Minimum Visibility Data to AEMO will apply to a Rule Participant who is a VPP Operator under WEM Rules commencing 1 October 2023.</i>

Subject		Section overview and sub-section summary
3.1	<i>AEMO determination to collect Static Data</i>	Requires AEMO to determine whether it will collect Static Data, or similar information, following a Rule Participant notifying AEMO of the result of its calculation of estimated size. AEMO must consider the (off-market) service(s) being provided and the suitability and availability of alternative data source(s) and its associated cost(s). Where AEMO determines that it will not collect visibility data, the Rule Participant is to be notified in writing.
3.2	<i>AEMO may request and collect Minimum Visibility Data</i>	<p>Allows AEMO to collect Minimum Visibility Data and updates from a Rule Participant. For a Rule Participant who is a VPP Operator this includes Static Data items (and updates) as specified in the Minimum Visibility Data Model, subject to a written request from AEMO after AEMO has made a determination under sub-section 3.1, and Operational or Dynamic Data (and updates) as specified in the Minimum Visibility Data Model, subject to a written request from AEMO following a determination made in accordance with the negotiation framework (under sub-section 4.1).</p> <p>For a Rule Participant who operates an Aggregation of DER, this includes the same or similar information to the Minimum Visibility Data items specified in the Minimum Visibility Data Model following a determination made in accordance with the negotiation framework (under sub-section 4.1).</p> <p>AEMO will develop standard forms for the request and collection of Minimum Visibility Data items and updates.</p>
3.3	<i>Application of Minimum Visibility Data requirements</i>	There is a general statement in paragraph 3.3.1 that a Rule Participant is requested to provide Minimum Visibility Data to AEMO on a voluntary basis.
3.4	<i>Provision of Minimum Visibility Data</i>	<p>There is no penalty on a Rule Participant for not providing Minimum Visibility Data (and updates) to AEMO, where AEMO has requested it following a determination. Paragraph 3.4.2 clarifies that the visibility data provided voluntarily to AEMO is the Rule Participant's Minimum Visibility Data, and is to reflect the VPP or Aggregation of DER as a whole i.e. inclusive of all components, even where the VPP or Aggregation of DER (in whole or in part) is registered as a Facility under the WEM Rules.</p> <p>To support the application of sub-section 3.3, paragraph 3.4.1 identifies the circumstances under which the Rule Participant may elect to provide Minimum Visibility Data (and updates) to AEMO following AEMO's written request. These circumstances include, as relevant, when Static Data is provided at AEMO's written request (following a determination), when Minimum Visibility Data is updated following AEMO's written request (ad hoc basis), and where visibility data is provided (and updated) as negotiated and agreed with AEMO.</p>
3.5	<i>Updates to Minimum Visibility Data</i>	<p>Where a Rule Participant's Minimum Visibility Data comprises Static or Operational Data items as specified by the Minimum Data Model, the update frequency of that data is as specified by the model, unless different update frequencies are negotiated and agreed between AEMO and the Rule Participant under sub-section 4.3. (Note that the 'automatic' update frequency for Static and Operational Data is once a month for large VPPs and every three months for smaller VPPs – see explanatory notes on Appendix A below). If the Rule Participant is providing similar information, then the information is to be updated as negotiated and agreed under sub-section 4.3.</p> <p>AEMO at any time to make a written request to a Rule Participant who is a VPP Operator or who operates an Aggregation of DER to update some or all of their Minimum Visibility Data.</p>
<b>Section 4</b>	<b>Minimum Visibility Data negotiation</b>	<i>The focus of Section 4 is to provide scope for AEMO to negotiate the collection of visibility data that is as close as practicable to the data items (and the update frequency of those data items) specified in the Minimum Visibility Data Model. The process is prompted by AEMO's review of a Rule Participant's Minimum Visibility Data, or its receipt of an estimated size notice, and AEMO's subsequent determination (under sub-section 4.1 and/or sub-section 4.2, as relevant) that the Rule Participant's Minimum Visibility Data should contain more (or less) visibility data than AEMO is already collecting.</i>

Subject		Section overview and sub-section summary
4.1	<i>Ongoing AEMO review of Minimum Visibility Data determination on data collection</i>	Allows AEMO to review a Rule Participant’s Minimum Visibility Data and determine to collect some further visibility data and updates, or to stop collecting visibility data or updates that the Rule Participant is already providing. AEMO must make a written request to the Rule Participant in accordance with the paragraph 4.3.2.
4.2	<i>Criteria for review or determination</i>	To support the application of sub-section 4.1, paragraph 4.2.1 sets-out the criteria for AEMO’s review and determination. The criteria include, the service(s) provided, the prevailing power system conditions, the suitability and availability of alternative data and the associated cost, AEMO’s readiness to use the data, and other matters that AEMO deems necessary. The criteria aim to ensure that AEMO collects only the data that is necessary for visibility and be efficiently collected and purposely used.
4.3	<i>Negotiation process for Minimum Visibility Data collection</i>	<p>Sub-section 4.3 contains the process that AEMO and the Rule Participant is to use to negotiate and agree on what visibility data a Rule Participant who operates a VPP or an Aggregation of DER is to provide AEMO. Specifically, the negotiation process is used to:</p> <ul style="list-style-type: none"> <li>• agree the Operational and/or Dynamic Data items to be provided to AEMO as part of a Rule Participant’s Minimum Visibility Data (normally in respect of a VPP);</li> <li>• identify and agree what similar information can be provided to AEMO where a Rule Participant is unable to provide visibility data in accordance with the Minimum Visibility Data Model;</li> <li>• identify and agree what visibility data is to be provided to AEMO as part of a Rule Participant’s Minimum Visibility Data in the case of an Aggregation of DER (if relevant and necessary);</li> <li>• agree the update frequency of a Rule Participant’s Minimum Visibility Data (where the update frequency specified by the Minimum Visibility Data Model is impracticable or not applicable); and</li> <li>• identify the visibility data AEMO will no longer collect from a Rule Participant.</li> </ul> <p>Once AEMO has determined (under paragraph 3.1.1 or paragraph 4.1.1) to collect visibility data, or to stop collecting visibility data, AEMO must provide the Rule Participant with a written request that specifies (as applicable) the Minimum Visibility Data Model data items or similar information to be provided and their update frequency, or the data items that AEMO will cease to collect along with the cessation date. AEMO may expect that a Rule Participant will use best endeavours to comply with AEMO’s written request for visibility data.</p> <p>If the Rule Participant cannot comply with AEMO’s written request for reasons identified in paragraph 4.3.3, there is scope within the negotiation process for AEMO or the Rule Participant to propose similar information and/or an alternative update frequency. AEMO and the Rule Participant may communicate until AEMO obtains the Rule Participant’s agreement on the visibility data to be provided and the update frequency. AEMO is then required to make a written request to the Rule Participant for the visibility data or similar information, and the update frequency, that was agreed by the Rule Participant through negotiation. There is scope for AEMO and the Rule Participant to agree that data is not provided.</p>
Appendix A	<b>Minimum Visibility Data Model</b>	<p>There is a general statement in paragraph A.1.1 that the Minimum Visibility Data Model is the specification of the full set of data items that AEMO may request from a Rule Participant who is a VPP Operator. Paragraphs A.1.2 to A.1.4 require the Minimum Visibility Data Model to include data of the Static, Operational and Dynamic data type, and to specify the information that is to accompany each data item contained within the model.</p> <p>Table 4 identifies the Minimum Visibility Data items of the Static Data type that may be considered ‘mandatory’.</p>

Subject	Section overview and sub-section summary
	<p>Tables 5 and 6 identify the Minimum Visibility Data items of the Operational Data type and Dynamic Data type (respectively) that may AEMO request from a Rule Participant who is a VPP Operator following a negotiation between AEMO and the Rule Participant.</p> <p>The default or 'automatic' update frequency for Minimum Visibility Data items is every three months for a Small VPP (of at least 5 MW and less than 10 MW in estimated size) and every month for a Large VPP (of at least 10 MW in estimated size) for Static and Operational Data items. Dynamic Data items are to be updated as close as practicably possible in real-time for Small and Large VPPs.</p> <p>AEMO may also use the negotiation process under section 4 to seek visibility data (and updates) that is the same or similar to the Minimum Visibility Data items specified in the Minimum Visibility Data Model from a Rule Participant who operates an Aggregation of DER.</p>