



Government of Western Australia  
Energy Policy WA

# DER Roadmap: DER Orchestration Roles & Responsibilities Information Paper - Summary

May 2022

Working together for a **brighter** energy future.

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# 1. Background

The Distributed Energy Resources (DER) Roadmap was released in April 2020 as a key part of the Western Australian Government's over-arching Energy Transformation Strategy. The Roadmap outlines a set of specific, time-bound actions to reach a future where DER owned by households and businesses, such as rooftop solar, energy storage, and controllable devices (such as water heaters, pool pumps, air-conditioners, and Electric Vehicles [EVs]) participate in the power system, for the benefit of all users.

The Roadmap contains the following actions to develop the initial capability for DER participation:

<b>Action 24</b>	By December 2020, develop a plan for the establishment of a DSO [Distribution System Operator] and DMO [Distribution Market Operator] in the SWIS [South West Interconnected System], including the identification of roles, functions, costs, and practical operations. This plan should include an assessment of the costs and benefits to the system for the establishment of these functions.
<b>Action 25</b>	By December 2020, identify legislation and regulatory framework requirements including timeframes for development and implementation to establish DSO and DMO functions.

The roles of the Distributed System Operator (DSO) and Distribution Market Operator (DMO) are critical to enabling the secure and efficient orchestration and participation of aggregated DER in the power system. The functions of the DSO – as an extension of Western Power's current role – will require improved visibility and alternative methods for ensuring the secure management of a lower-voltage distribution system hosting increasing amounts of DER. The DMO – as an extension of the Australian Energy Market Operator's (AEMO) current role – will facilitate the formal participation of DER in the provision of system-wide services in the Wholesale Electricity Market (WEM).

The Energy Transformation Taskforce released an Issues Paper in August 2020 outlining provisional policy positions and key matters to be considered in progressing DER orchestration and participation, including Actions 24 and 25. However, the deferral of the new WEM commencement date (from 1 October 2022 to 1 October 2023) and delays in the commencement of Project Symphony (the State Government's flagship Virtual Power Plant [VPP] pilot), prompted a review of timelines for multiple DER Roadmap actions focused on DER participation in the WEM, including Actions 24 and 25.

In the meantime, accelerated uptake of rooftop solar has necessitated the introduction of Emergency Solar Management (ESM) and export limits for larger rooftop solar systems to manage emerging risks to power system security. ESM and export limits will manage risks while the development of policy settings and frameworks for DER participation, and implementation of facilitating WEM Rules and regulation changes in a phased approach continues. This phased approach will reflect the costs and benefits of different modes of aggregated DER participation in the power system.

This summary sets-out the key requirements and implementation pathways for the DSO and DMO functions in the South West Interconnected System (SWIS), completing Actions 24 and 25 of the DER Roadmap. Further, this Information Paper also specifies many of the key policy positions required to support the future aggregation and participation of DER, thereby also progressing related Roadmap Actions 26-30.

More information regarding each of the policy positions is contained in the detailed Information Paper, available on Energy Policy WA's website.

## 2. The value of aggregated DER participation

Fundamental to the vision outlined in the DER Roadmap is that VPPs, comprised of household, commercial and other small customer DER devices, can provide value to both customers and the power system. The DER Roadmap noted that enhanced DER participation in the power system was essential to: enable households to continue to invest in rooftop solar; avoid or reduce expenditure on networks and other infrastructure; and maintain power system security and reliability.

Three scenarios are presented below that illustrate the potential for DER participation to help address emerging power system issues:

### Scenario 1: Low operational load

ESM was introduced in the SWIS on 14 February 2022 in response to accelerated uptake of rooftop solar and increasing risks to the power system from extreme low operating load events. The introduction of ESM provides AEMO with the ability to maintain the security of the power system by directing rooftop solar to be turned down or switched-off (via a direction to Western Power and action by Synergy as an aggregator) at times when load is forecast to breach a minimum demand threshold and the power system is likely to enter an Emergency Operating State. This threshold represents a level of demand that is required to support the continued operation of dispatchable energy resources that provide critical Essential System Services (ESS).

In the absence of actions to integrate DER within the power system, continued uptake of distributed rooftop solar would result in households being more frequently subject to emergency curtailment. However, the ability to coordinate DER and activate demand response to consume excess rooftop solar generation via a VPP will result in ESM being required less. A prerequisite to such coordination will be investment in improved visibility in the lower-voltage distribution network by the DSO. Greater visibility will enable optimised allocation of network capacity to DER (including via the use of Dynamic Operating Envelopes [DOEs]), facilitate participation of VPPs, and enable aggregators to dispatch energy and demand in response to price signals to flatten the operational load curve.

### Scenario 2: Electric Vehicle charging

The lower-voltage distribution network has been built based on assumptions about historical load profiles and patterns of usage. The uptake and charging requirements of EVs will upend these assumptions and could require expensive upgrades to the distribution network if not appropriately managed (preliminary modelling has indicated that under an EV uptake scenario of 15% customer base with 1 EV per household charging during peak period, more than \$1 billion worth of network investment would be required in the SWIS to facilitate unmanaged charging<sup>1</sup>).

In a future where DER can be managed and coordinated, DER participation can be used to shift charging to periods of low demand or utilise local resources to prevent overloading of lower-voltage feeders. Western Power as the DSO could implement DOEs in conjunction with smart charging capability, to support the integration of EVs at lower cost by managing charging rates during periods of peak network use. Placing limits on imports may prove contentious and significant community engagement would be required prior to introduction to gain social licence and guide implementation.

The key requirement for achieving this is adequate visibility (including access to usage and other data) in the distribution network. Without appropriate investment in visibility, Western Power will not

<sup>1</sup> Source: Western Power modelling.

have access to the data it needs to manage the distribution network, accurately identify system constraints, and inform NSS procurement.

### **Scenario 3: Improved grid resilience**

In extreme weather scenarios, power can be lost to distribution networks because of equipment damage resulting from fires, physical damage to network infrastructure (such as by high winds), or protection mechanisms tripping due to excessive demand as a result of extreme heat. These events are forecast to become more frequent in future, increasing the risk of damage to networks and resultant power supply interruptions.

The increasing importance of electricity for day-to-day household and business activities, including transport as EVs become more prevalent, makes a resilient power supply and distribution system more critical now than it has ever been.

A resilient and smart distribution network will be characterised by two main factors:

1. *Operational visibility* (availability of usage and power quality data) in the lower-voltage network so that potential failures can be forecast in advance and acted on. Improved visibility also facilitates faster repair and recovery after extreme weather events have occurred by enabling network operators to detect where faults have occurred.
2. *Control and coordination capability* of local DER to provide supply while networks are repaired and restored. To facilitate this, the DSO would need planning visibility of the distribution network to identify the potential for network restoration services.

### 3. Policy settings for DER orchestration roles and responsibilities

This Information Paper summary identifies a range of policy positions and questions relevant to DER orchestration roles and responsibilities and categorises them as being either ‘settled’ or ‘deferred’. ‘Settled’ positions and questions are those where the Minister for Energy has adopted a policy position. Those that have been ‘deferred’ have not yet been endorsed and are likely to require further information (such as through the Government flagship VPP pilot Project Symphony) or the evolution of the market prior to becoming ‘settled’.

Most of the policy matters contained in this Information Paper are those that were raised in the August 2020 Issues Paper. Even where positions or questions are categorised as being settled, the relative immaturity of DER orchestration technology and the progressive transition to a new WEM design will require that a phased approach is adopted in implementation.

The policy settings outlined in this Information Paper summary are a function of current and anticipated technological maturity; visibility required within the DSO and DMO to facilitate orchestration; the legislative and market frameworks present and anticipated in the SWIS; and a pragmatic approach to seeking the best value for customers and the power system from DER aggregation.

Providing clarity regarding settled positions will enable the network and market operators, as well as energy market participants, potential new entrants, and prosumers to plan investment decisions. Policy positions will be reflected in the progressive implementation of changes to regulation and other instruments, such as the WEM Rules, and are expected to remain unchanged following the commencement of new WEM arrangements on 1 October 2023. However, there may be opportunities to revisit policy positions in the medium- to longer-term as technology and the market evolve.

#### 3.1 Key themes and principles

Noting the key elements identified in the August 2020 Issues Paper and related stakeholder consultation, policy positions in this Information Paper summary have been categorised into four key themes:

1. **Optimise distribution network access:** This theme includes discussion of how DER participation can be facilitated through improved network visibility and DOEs;
2. **Build required technology and market infrastructure:** This theme includes policy positions and discussion of the new technology, market infrastructure, and WEM Rules development required to facilitate improved DER participation. This includes infrastructure for facility and device visibility, Network Support Services, DER aggregation, value stacking, WEM participation, ESS, the Reserve Capacity Mechanism (RCM), meter data for settlement and standardisation protocols;
3. **Align customer incentives and protect rights:** This theme includes policy positions and discussion of the end-consumer incentives and regulatory protections required for improved DER participation in the power system; and
4. **Integrate and phase implementation:** This theme includes policy positions and discussion around the coordination of aggregated DER and how it can be dispatched in various markets.

Consistent with the August 2020 Issues Paper, key matters considered in determining the status and detail of policy positions included consideration of three guiding principles, namely that policy positions should:

1. improve visibility;
2. 'start off simple'; and
3. recognise opportunities for ongoing evolution.

**Improving visibility** – Visibility is essential to enabling DER participation, and significant improvement to visibility and enabling technologies are required:

- Western Power as DSO requires visibility of the distribution network.
- AEMO as the DMO will require visibility of VPPs providing WEM services.
- Aggregators require visibility of their fleet to ensure services are delivered appropriately.
- Prosumers will require visibility of how their equipment is managed to ensure trust and social licence is maintained.

Facility visibility is a critical precursor to the provision of NSS and WEM services by aggregated DER.

**Starting-off simple** – Existing technology, systems, and regulatory frameworks should be progressively amended to facilitate increased DER participation in-line with anticipated value. In the short- to medium-term, this may mean that main existing frameworks are retained. For instance, maintaining the 'linear' contractual relationship between customers, retailers, and the DSO for the purposes of DER aggregation will work within existing metering arrangements and will ensure customers have adequate protections while DER participation matures. More complex arrangements, such as 'multiple-trading relationships' where an end-use customer contracts separately with Aggregators, retailers, and the DSO, may be costly to implement while producing limited benefits in the early stages of DER aggregation.

**Recognising opportunities for ongoing evolution** – As technology evolves and knowledge regarding DER participation and new market arrangements deepens, some settled policy positions may require re-assessment regarding whether more sophisticated arrangements can be cost-effectively implemented to further optimise the use of DER and improve overall customer welfare.

## 3.2 Key policy settings - Overview

The settled and deferred policy positions described in the Information Paper are briefly outlined below, with each issue, policy position, or question being provided an identifier for ease of stakeholder reference. Where appropriate, policy positions have been related to actions and allocated to a specific entity. Policy issues are grouped by theme, as described above.

### 3.2.1 Optimise distribution network access

#### Network visibility

Western Power requires a 'digitalised' distribution network in which low- and medium-voltage data is readily available to:

- provide it with a more accurate understanding of hosting capacity and network capacity; and
- inform network planning and operational responses.

Without digitalisation and the resulting improvements in network visibility, Western Power will be unable to identify distribution constraints at a granular level, and hence be unable to clearly specify network support requirements. Additionally, Western Power will need to make conservative



assumptions about hosting and network capacity, which will result in DOEs that may not optimise DER access to the network (including for the purposes of WEM participation and reducing emissions in the electricity sector).

The immediate requirement is a forward-looking strategy and plan for investment in monitoring and communication capability to enable further digitalisation of the electricity network, focusing on the low voltage network. This was outlined under Action 14 in the DER Roadmap and is still being progressed by Western Power.

#### **Network visibility**

**(VIS1)** Western Power to undertake, as a matter of priority, a forward-looking strategy and plan for investment in monitoring and communication capability to enable further digitalisation of the electricity network, focusing on the low voltage network.

### **Dynamic Operating Envelopes (DOEs)**

DOEs are a method of allocating access to network capacity; they define the limits for imports and exports from and to the electricity grid at the customer's connection point, with these limits varying dynamically by time and location.

Dynamic limits are preferred to static limits because they enable optimised use of hosting capacity and enable increased access to the network. This is important, because as DER uptake increases, relying on static limits would have the effect of inefficiently reducing the total amount of solar energy exported to the grid. This is because static limits prevent exports at times when the network can't accommodate them, but also at times when they could be easily accommodated.

Similarly, dynamic limits support optimisation of power imported from the grid through placing limits on household load. DOEs have the potential, in conjunction with smart charging capability, to support the integration of EVs in the power system at materially lower cost by helping to manage charging rates during periods of peak network use.

DOEs are being trialled through Project Symphony and lessons learned through the pilot will support their future development. However, consistent with Project Symphony, DOEs will only be able to be available to 'active' DER that is under the control of an Aggregator.

#### **Dynamic Operating Envelopes**

**(DOE1)** Western Power to develop a framework for the use of DOEs including development and implementation, trade-offs, reporting, incentives, and regulatory requirements by December 2023.

**(DOE2)** DOEs will only be available to active DER.

**(DOE3)** DOE parameters adopted within Project Symphony will inform future deployment.

**(DOE4)** The Aggregator will apply the DOE at the customer connection point (NMI). The DSO will be responsible for monitoring and enforcing the Aggregator's compliance with the DOE.

### **3.2.2 Build required technology and market infrastructure**

#### **Facility and device visibility**

Facility visibility is a fundamental requirement for the participation of DER in WEM services and NSS; however, visibility comes at a cost. As such, requirements for visibility of individual Facilities and devices should be determined based on the needs of particular WEM services or NSS, which have yet to be specified.

### Facility and device visibility

**(VIS2)** Decisions on real-time or near real-time visibility requirements for DER market participation will be deferred pending further investigation and learning. Project Symphony will test how real-time visibility of facilities (via a gateway device) providing WEM services and NSS can best be facilitated.

## Network Support Services

NSS are services provided by non-traditional assets (such as controllable generation and storage) to operate the distribution network. These services are an alternative to standard operational responses used by Western Power to operate its network to applicable safety, security, and reliability standards. NSS can be used by Western Power to defer and potentially avoid costly network augmentation, which is ultimately paid for by customers.

Western Power procurement of location-specific NSS is incorporated into the new Non-Co-optimised Essential System Services (NCESS) framework in the WEM Rules, effectively harmonizing NSS procurement with the intent of the Alternative Investment Options process contained in the Electricity Networks Access Code 2004 (ENAC). Adjustments will be made to the ENAC to reflect the focus of procurement and NSS dispatch through the NCESS framework. To ensure the integrity of the procurement process for NSS, Western Power will continue to assess the cost-effectiveness and technical suitability of third party offers to provide a service prior to directly investing in network solutions, including energy storage, and will not compete with aggregators for Small Use Customers (customers consuming less than 160 megawatt hours (MWh) per year). However, Western Power will be able to engage directly with larger customers at a single site (>160MWh per year).

More sophisticated frameworks for NSS procurement and dispatch may be considered in future if required to unlock additional benefits.

### Network Support Services

**(NSS1)** Procurement of NSS will be incorporated into the NCESS framework.

**(NSS2)** The current regulatory framework adequately enables Western Power to procure of alternative options (including making the necessary investment to facilitate the ability to procure).

**(NSS3)** To ensure the integrity of the procurement process for NSS, Western Power will continue to assess the cost-effectiveness and technical suitability of third party offers to provide a service prior to directly investing in network solutions, including energy storage.

**(NSS4)** Western Power must only procure NSS through aggregators for DER associated with Small Use Customers (<160MWh per year).

**(NSS5)** Western Power may procure NSS directly from larger customers (greater than 160MWh per year at a single site).

## Aggregation

The policy settings for aggregation reflect the State Government's current electricity retail contestability policy, existing metering arrangements, and practical cost and technical limits to implementing multiple trading relationships (as described above). They also reflect technical barriers to offering multiple services with existing infrastructure; for example, if an aggregator is offering energy into the WEM, then an additional participant would not be able to control the flexibility at the relevant NMIs to provide ESS or a Demand Side Programme (DSP) while energy is being controlled by the primary aggregator.

The cost benefits of maintaining existing metering arrangements and real technical and cost barriers to multiple trading relationships are the key determinants to the optimal approach to DER aggregation in the short-term.

Synergy's (the state-owned retailer) role as the sole aggregator for non-contestable customers (customers consuming less than 50MWh per year) is consistent with electricity retail contestability policy and obligations on Synergy to provide ESM. Synergy may engage with third parties in a variety of ways to deliver services, and Project Symphony will assist in the development of Synergy's approach to procuring services. This position will be reviewed in the longer-term as technical capability matures and bespoke customer protection frameworks are developed for aggregation services, such as through the State Government's planned Alternative Energy Services framework.

Further consideration is needed around minimum VPP size associated with WEM registration requirements.

Consideration of **AGG5** (below) is deferred until DER's capability to provide Frequency Co-optimised ESS (FCESS) is better understood, and any changes to FCESS technical specifications are implemented following the commencement of new WEM arrangements on 1 October 2023.

The framework for providing access to customer data (**AGG7** below) is deferred pending the reassessment of the implementation of the Customer Data Right in Western Australia later in 2022.

## Value stacking

Further work is required regarding assessment of value stacking to assess the risk of inefficient double payments being provided to aggregations (**AGG8**). The main area in which this has the potential to occur is the provision of multiple NSS services; however, the concept of stacking value from different services (e.g. Energy and NSS) is supported.

### Aggregation

**(AGG1)** Only the Financially Responsible Market Participant (FRMP) (the retailer for most customers) at a connection point (NMI) can aggregate that NMI into a VPP for the purpose of offering energy into the WEM.

**(AGG2)** Non-Contestable Customers can only be aggregated by Synergy (or an intermediary acting through Synergy) for all services (WEM and NSS).

**(AGG3)** Contestable Customers can be aggregated by anyone – subject to the above.

**(AGG4)** For aggregations registered as Demand Side Programme or Interruptible Load services in the WEM:

- Any Market Participant can associate Contestable Customer NMIs (no change).
- Only Synergy (or an intermediary acting through Synergy) can associate Non-Contestable Customers NMIs.

**(AGG5)** *[Deferred]* Can aggregators aggregate connection points (NMIs) to provide FCESS where those NMIs are associated with a different FRMP but are otherwise a non-dispatchable load?

**(AGG6)** Aggregators or service providers providing NSS may need to register in the WEM in accordance with the WEM registration and NCESS rules.

**(AGG7)** *[Deferred]* How will the efficient exchange of historical meter and other energy data be facilitated to enable third parties (aggregators) to access data for business development purposes?

**(AGG8)** *[Deferred]* What approach will be used where an aggregation provides similar services across the value stack to prevent "double-dipping" related to NSS? (Consideration deferred pending clearer service specifications for NSS).

## WEM participation

The technical standards and testing requirements specified in the WEM Rules and WEM Procedures regarding DER aggregation capability mean that, in practice, DER is not currently able to participate in the WEM, despite there currently being no explicit barrier, except as:

- a DSP in the RCM;
- Interruptible Loads providing Contingency Reserve Raise under FCESS; and
- unregistered Facilities, providing services procured through the NCESS framework (e.g. to provide a minimum load product to address the low load issue).

The policy positions settled for WEM participation described below reflect this current reality.

Project Symphony will provide information on the ability of aggregated DER to provide Contingency Reserve services in the WEM. As such, it is prudent to defer any changes to FCESS technical standards and accreditation until the capability of DER is established via the pilot.

Further work is also needed to determine contribution of VPPs to Contingency Reserve Raise requirements. Consideration of the **WEM\_REG2** is deferred pending further progress towards WEM participation of VPPs.

### WEM Participation

**(WEM\_REG1)** The high-level principles around grouping conventional Facilities in the WEM will also apply to Small Aggregations (or VPPs).

**(WEM\_REG2)** *[Deferred]* What approach will be taken to determining the contribution of Small Aggregations to the Contingency Reserve Raise requirements?

**(WEM\_REG3)** DER aggregation process for Small Aggregations should follow a similar model to the Non-Dispatchable Load to DSPs association process in the WEM.

**(WEM\_REG4)** AEMO can transition Facilities to different WEM Facility Classes if configurational changes require it, or where Power System Security and Reliability (PSSR) concerns require the Small Aggregation to appear in network constraint equations.

**(WEM\_REG5)** System Size for Small Aggregations will follow similar model to DSPs, reflecting the dynamic nature of VPPs.

## Essential System Services

No changes are proposed to be made to the WEM Rules in the immediate term to enable DER provision of FCESS. However, technical specifications, including required speed of response, may be revisited once findings from Project Symphony and other VPP pilots being undertaken nationally are available.

VPPs may form an Interruptible Load (to provide Contingency Reserve Raise under FCESS), and all connection points that are part of the aggregation must be at the same Electrical Location.

AEMO may procure services from VPPs through the NCESS framework, including (but not limited to) services to maintain minimum load, address intermittency and DER volatility, and provide ramping.

Further work is needed in technical areas around dispatch and accreditation of FCESS and capabilities of DER. Both **WEM\_ESS4** and **WEM\_ESS5** are deferred pending resolution of technical issues relating to FCESS provision (potentially via future review of ESS arrangements) and learnings from Project Symphony and other pilots and trials.

### Essential System Services

**(WEM\_ESS1)** Existing technical specifications will be retained for FCESS provision in the post-amended WEM Rules and the short-term.

**(WEM\_ESS2)** DER can be aggregated into Interruptible Loads; all connection points that are part of the aggregation must be at the same Electrical Location.

**(WEM\_ESS3)** AEMO may use the NCESS framework to procure NCESS from DER as required, via a market participant where a power system security and reliability need is identified.

**(WEM\_ESS4)** *[Deferred]* Will the requirement to meet a Dispatch Target (clause 7.6.11 of the WEM Rules) be amended to enable energy and FCESS provision from hybrids and DER if such facilities cannot control their energy output to meet a Dispatch Target?

**(WEM\_ESS5)** *[Deferred]* Will FCESS accreditation thresholds be reduced to facilitate DER participation?

### Reserve Capacity Mechanism

VPPs can currently seek certification as DSPs to participate in the RCM. A review of the RCM by the Coordinator for Energy is currently underway that may result in changes to the Planning Criterion as well as how Certified Reserve Capacity is allocated to different technologies. As such, decisions about DER participation in the RCM (other than as a DSP) will be deferred pending the results of the review.

Specific questions to be considered following the completion of the RCM review and Project Symphony include those regarding the approach to be taken to facilitate RCM participation for larger DER aggregations intending to register in the Scheduled Facility or Semi-Scheduled Facility classes.

### Reserve Capacity Mechanism

**(WEM\_RCM1)** Small Aggregations can seek certification as DSPs.

**(WEM\_RCM2)** *[Deferred]* How to certify as non-scheduled facilities – facility visibility is an issue that needs to be resolved first.

**(WEM\_RCM3)** *[Deferred]* The approach to VPPs as scheduled or semi-scheduled facilities – visibility, metering, Network Access Quantities (NAQ).

### Meter data access for market settlement

For market settlement, Western Power's AMI program will mean all meters at non-contestable customer connection points will be 30 minutes or five-minutes configurable. While Western Power can facilitate the provision of such data at 30-minute granularity, Western Power's and AEMO's communications infrastructure and back-office systems have not been designed to accommodate five-minute settlement of Non-Contestable Customer connection points that are part of registered Small Aggregations.

- For 30-min settlement AEMO will have access via Western Power AMI.
- Further work is needed to understand the costs associated with 5-min settlement for all non-contestable NMIs.

### **Meter data access for settlement**

**(WEM\_METER1)** For the purposes of 30-minute settlement:

- AEMO will have access to 30-minute meter data through Western Power's Advanced Metering Infrastructure (AMI) program.
- AEMO will require a head of power to profile 30-minute meter data into five-minute quantities for the purposes of the Energy Uplift Payment calculation.

**(WEM\_METER2)** *[Deferred]* Once five-minute settlement is implemented, will Small Aggregations comprising Non-Contestable Customer connection points be required to submit five-minute meter data or will profiling be used? (Consideration deferred pending further work on visibility and Project Symphony outcomes).

## Standardised protocols

Decisions regarding standards and protocols governing communications between the Aggregator and the devices in a VPP, as well as redundancy requirements to cover the loss of communications, will be deferred pending completion of work underway under the Distributed Energy Integration Program (DEIP)<sup>2</sup> and Project Symphony.

### **Standardised protocols**

**(COMMS1)** *[Deferred]* What standard and protocol will be adopted to govern communications between the aggregator and the devices in a VPP? (To be resolved through on-going work in relation to DER Roadmap action 3, 2030.5 and CSIP-AUS by DEIP and others at a national level).

**(COMMS3)** *[Deferred]* What standards and protocols will apply to communications between Western Power and customers that it directly procures from? (Issue deferred until framework for direct NSS procurement from customers by Western Power is developed).

**(COMMS4)** *[Deferred]* What standards and rules will be placed on VPPs to mitigate against loss of communications by way of standardised default behaviour and redundancy requirements (Issue is deferred pending lessons from Project Symphony and NEM pilots, which will inform default behaviour and redundancy requirements).

**(COMMS5)** *[Deferred]* Which regulatory instrument should common standards and protocols be enforced through? (Deferred pending completion of work on DER Roadmap action 3, 2030.5 and CSIP-AUS).

<sup>2</sup> DEIP is a collaboration project involving government agencies (at both a state and Commonwealth level), market authorities, industry, and consumer associations aimed at maximising the value of customers' DER for all energy users. More information regarding DEIP can be found at: <https://arena.gov.au/knowledge-innovation/distributed-energy-integration-program/>



### 3.2.3 Align customer incentives and protect rights

#### Tariffs

Consideration of the design of network tariffs, retail tariffs, and retail VPP and aggregation products (by which customers may be paid for the participation of their DER) is outside scope of the Information Paper and this summary. Energy Policy WA is separately progressing work on tariffs (network and retail) appropriate for a future with high levels of DER and DER aggregation. Lessons learnt from Synergy's 'Midday Saver' time-of-use tariff pilot (which offers a low daytime rate coinciding with periods of high rooftop solar output), undertaken as part of DER Roadmap Actions 17 – 19, will inform new opt-in products for consumers.

### 3.2.4 Customer protections

The Alternative Electricity Services (AES) framework is currently under development by Energy Policy WA, with protections to be provided through industry- and service-specific codes of conduct, including for Aggregators, and enable access to the Energy Ombudsman.

#### Customer incentives

**(CUST1)** Postage stamp network tariff pricing retained for customers below 1MVA.

**(CUST2)** [Deferred] Once the legislative heads of power for the AES is established, what changes required to the retailer and network operator licensing framework to ensure customers are protected from risks associated with entering contracts with aggregators using devices at customer sites (e.g. residences) for orchestration purposes? (To be resolved pending the establishment of the AES Framework).

### 3.2.5 Integrate and phase implementation

#### Coordination of WEM and NSS dispatch

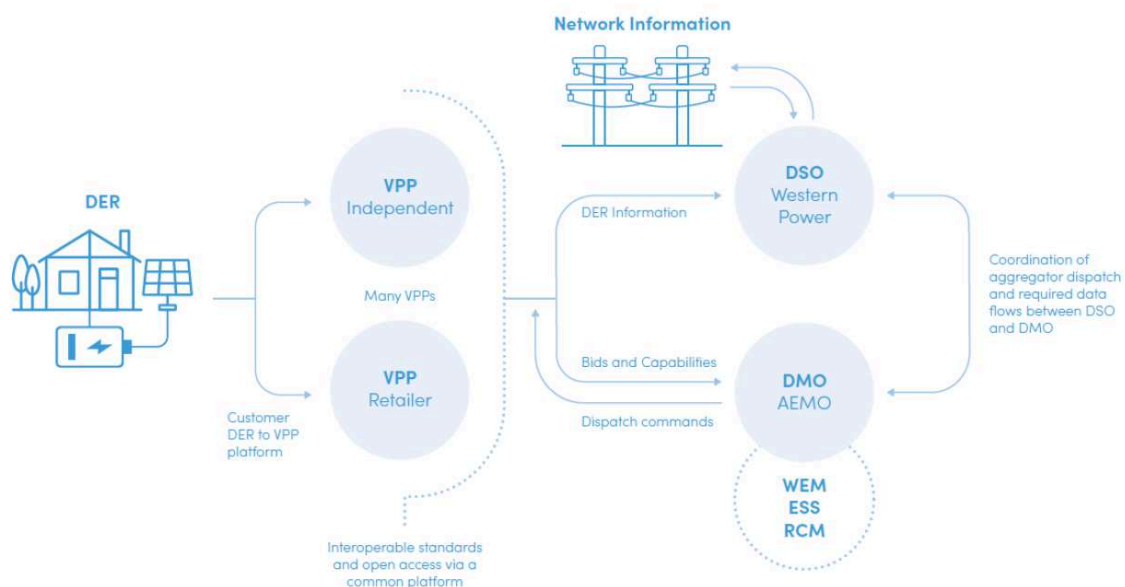
There is currently no framework or processes in place for the coordinated dispatch of NSS and WEM services where those services are provided by aggregated DER. While Western Power does procure some NSS, it is from conventional, larger-scale generators, and the extent to which NSS is currently used does not require the day-to-day coordination between Western Power and AEMO for the purposes of maintaining power system security and reliability.

Orchestration of DER will see aggregators coordinating distribution connected devices to value stack services such as energy, capacity, ESS and NSS (procured via the NCESS framework). Service provision across WEM and network services requires co-ordination between Western Power and AEMO to ensure all services are delivered while maintaining security and reliability requirements across the power system and the distribution network.

The 'Hybrid Model' for DSO and DMO functions and their roles in aggregated DER dispatch was identified in the DER Roadmap as the most appropriate for the SWIS and is outlined in the Figure below. This model remains appropriate, with its primary features including a single energy market with dispatch coordinated between the DSO and DMO.

Under the Hybrid Model, Western Power's role is extended to become the DSO, extending network management capability and visibility within the distribution network. AEMO is the DMO, which extends markets to include VPPs.

Figure 1: Hybrid (DSO/DMO) model for the SWIS



Source: Issues Paper – DER Roadmap, April 2019

### Integrate and phase implementation

**(IMP1)** The hybrid model will be adopted with Western Power and AEMO performing the DSO and DMO functions respectively.

**(IMP2)** [Deferred] Who will be responsible for dispatching NSS? (Deferred pending insights from Project Symphony).

**(IMP3)** The following dispatch hierarchy will be adopted (for a facility):

- NSS will be dispatched first; and then
- WEM services will be dispatched second.

**(IMP4)** [Deferred] How will NSS dispatch be coordinated when Western Power procures NSS from larger customers directly? What information would Western Power need to provide AEMO? (Deferred pending resolution of NSS dispatch responsibility.)

**(IMP5)** [Deferred] How can NSS be provided by a subset of connection points within a registered aggregation also providing WEM services? If so, how will it be dispatched? (Deferred pending the decision on NSS dispatch responsibility and lessons from Project Symphony on whether a dynamic approach to managing the composition of aggregations is scalable.)

**(IMP6)** Distribution network outages and network switching affecting an aggregation's availability to provide market services will be managed by:

- increased visibility and communication between the DSO, aggregators and the DMO for switching; and
- application of DOE constraints for outages.

**(IMP7)** [Deferred] More complex arrangements for NSS procurement and dispatch may be contemplated in the future. The increase in complexity could vary significantly depending on the evolution of technology, investment in network visibility, knowledge, and aggregator entry.



## 4. Where next? The future evolution of DER participation

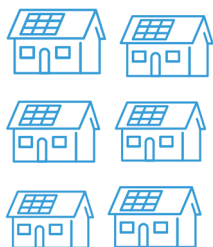
Since the development of the DER Roadmap in 2019, there is now greater clarity about the likely evolution of DER participation with national and international pilots and trials providing useful information that was not previously available. Based on lessons learned from these pilots and trials, it is not considered likely or desirable that DER orchestration and participation immediately commences with full integration with the WEM at new market start on 1 October 2023. Rather, there will be a glidepath over time commencing with highest value forms of participation, leveraging lower-risk technologies which can be implemented at lower costs.

Given rapid changes to technology and the broader energy sector, some uncertainty remains regarding the optimal pathway for the cost-effective transition to full integration of DER orchestration in the WEM; however, there are some likely scenarios:

- Aggregated DER will provide the highest net value services first, which includes high value services with less sophisticated (and expensive) orchestration requirements (which can be provided at a lower cost).
- Services are expected to expand and evolve over time as control and measurement costs reduce and the WEM grows in depth and sophistication.
- Services are likely to be 'stacked' as they develop, delivering value to customers, aggregators, and the power system as latent value in DER is realised.

Given the timing of the new market start, the review of the RCM and Project Symphony, as well as current value/aggregation cost trade-offs is likely that there be a phased commencement of DER aggregation. This is uncertain but could follow the trajectory outlined in figure 2 below.

Figure 2: Potential phases in the evolution of opportunities for DER participation

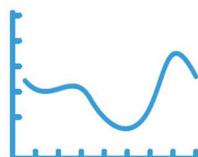
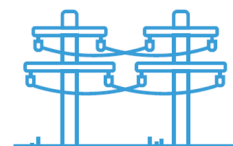


### 1: Retailer/Aggregator services

- 'Off market' services coordinated by retailer / aggregator to provide value to retailer, aggregator, or customer.
- e.g. managing DER to limit exposure to wholesale pricing extremes, allow commercial portfolio management, or customer energy optimisation.
- Does not require market registration.
- Some visibility needed by the system and network operators.

### 2: Network support & System support

- Non-Cooptimised Essential System Services (NCESS) provided to the:
  - network operator (Western Power/DSO); or
  - system operator (AEMO/DMO).
- Procurement under NCESS framework. e.g.:
- assist DSO manage local network peaks allowing network investment to be deferred or avoided; or
- provide specific services related to power system security and reliability not current defined in the market.



### 3: WEM services

- Co-optimised WEM services (Wholesale energy, FCESS, Reserve Capacity).
- Will require DER have higher levels of metering and telemetry capability to meet compliance and settlement obligations, dependent on the specific service provided.
- e.g. manage DER to offer demand response services or frequency support services alongside other market participants.

## Timeframes

The timetable for implementing the DER participation actions within the DER Roadmap has been amended to reflect the dependencies for completing actions and status of work that will inform approaches to several issues. As discussed, above, two major dependencies include the implementation of new WEM arrangements on 1 October 2023 and the completion of relevant analysis from the outcomes of Project Symphony.

**Table 1: Timeframes for DER Aggregation**

DER Roadmap Action	Date
<b>26.</b> By December 2023, finalise communications protocols, data, and technology requirements to accurately predict and publish operating constraints on the distribution network under a DSO, and requirements for coordination with the system operator.	December 2023
<b>27a</b> By October 2023, implement initial changes to WEM Rules to enable development of DMO functionality and DER Aggregator participation in the WEM.	Oct 2023 – changes to basic participation model
<b>27b</b> By July 2025, commence implementation of changes to wholesale market arrangements necessary to enable the participation of DER in the wholesale market via a DER aggregator.	Jul 2025 – changes to wider participation model
<b>29</b> By July 2024, deliver a DSO / DMO legislative and regulatory framework, for transition to commencement by October 2025.	Jul 2024 – Oct 2025
<b>30.</b> On 1 October 2025, DSO and DMO commencement with DER coordinated to provide services to the network and wholesale market and compensated appropriately.	Dec 2023 - Basic participation Oct 2025 - Wider participation

Updates on more detailed actions to develop and implement the settled policy positions, and progress on developing positions on deferred policy positions will be provided to external stakeholders via Energy Policy WA's DER Participation Stakeholder Forums.

Further work will be undertaken in consultation with stakeholders on the timeframes for developing these policy positions, with a detailed implementation plan to be released in mid-2022.



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