GOVERNMENT OF WESTERN AUSTRALIA

Department of **Energy, Mines, Industry Regulation and Safety**
Energy Policy WA

Distributed Energy Resources Roadmap

Third Progress Report

July 2024

Contents

Minister for Energy foreword

In April 2020, the Western Australian Government released the Distributed Energy Resources (DER) Roadmap as part of its broader Energy Transformation Strategy. The Roadmap responded to the challenge posed by the energy transformation, the unique characteristics of DER, and the opportunity for consumers to benefit from DER orchestration. With 36 core actions and a vision for 2025, the Roadmap marked an ambitious first for Australia, aiming to leverage DER to make an active contribution to the clean energy transition.

The Roadmap is now in its penultimate year of delivery, with most major actions having been completed. Most notable is the conclusion of Project Symphony, WA's flagship virtual power plant (VPP) pilot. Project Symphony coordinated rooftop solar, batteries, and other smart devices in the Southern River region of Perth and rewarded consumers for their participation. I thank the organisations involved in the success of this foundational project, the households and businesses that took part, and the Australian Renewable Energy Agency (ARENA) for its financial support.

The final Project Symphony report includes 18 recommendations to maximise the role of households and businesses in meeting our energy needs. These recommendations are informing the business strategies of Western Power (which led Project Symphony), Synergy, and the Australian Energy Market Operator. The recommendations have been reflected in the updated Roadmap actions.

The second major achievement noted in this Progress Report is the passage of the *Electricity Industry Amendment (Distributed Energy Resources) Act 2024*. The amendments made through this legislation provide for changes to the rules and regulations to better manage the future power system — particularly relating to the regulation of lower voltage networks and DER. It also enables, for the first time, for environmental matters such as emissions reduction to be considered by regulatory decision-makers. Complementary legislation to provide for better electricity customer protections for users of Alternative Electricity Services has also been recently passed by the WA Parliament.

The amended legislation, combined with further development of the detailed roles and responsibilities of those who operate the electricity system and market, have contributed to this Third DER Roadmap Progress Report. The journey outlined in the original DER Roadmap is nearing completion, delivering the framework required to support continued growth in rooftop solar, distributed batteries, electric vehicles, and smart devices.

WA is leading the nation when it comes to optimising the benefits of DER. With collaboration, innovation, and a commitment to sustainability, our endeavours hold promise not only for the energy landscape but for the communities they serve.

This 2024 Progress Report marks a major milestone. I look forward to the next stages of that journey as we move towards a future where DER empowers individuals and businesses, strengthens networks, and paves the way for a more resilient and sustainable future for WA.

Hon. Reece Whitby MLA
Minister for Energy; Environment;
Climate Action

Key Achievements

Significant progress has been made since the last DER Roadmap Progress Report was released in 2022. In this time, WA's flagship VPP pilot has concluded, analysis of future actions to integrate DER in electricity markets has been undertaken, and new DER-enabling legislation has passed WA Parliament. Further, major initiatives to support power system security in the near- to medium-term have been implemented through the roll out of Emergency Solar Management (ESM), DER installation compliance has improved, and the first commercial VPP products in the South West Interconnected System (SWIS) have commenced. Key DER Roadmap achievements are summarised below.

- **Project Symphony**, WA's flagship VPP pilot, has now concluded. Delivered over a two-and-a-half-year period in collaboration between project partners Western Power (Project Lead), the Australian Energy Market Operator (AEMO), Synergy, and Energy Policy WA (EPWA – Project Steering Committee Chair), it tested the end-to-end process of DER orchestration. It included aggregation of assets such as rooftop solar, batteries and appliances, demonstrating how they can deliver value to the power system, market, and consumers.

  The Project Symphony Final Report is one of over 18 public reports delivered as part of this initiative, and was released by ARENA early in June 2024. The report features 18 recommendations focused on enabling and supporting the development of VPPs SWIS and span four themes:

  - ***Technical capability*** – technology, devices and systems that meet the required standards (including reliability) to facilitate DER orchestration via a VPP.
  - ***Positive customer experience*** – considered engagement, access to support, and educational assistance for how DER devices can be used for greatest financial and/or environmental benefit.
  - ***Value*** – ensuring electricity markets are set up to allow customer DER to participate and receive payment for service provision.
  - ***Supportive policy and regulation*** – frameworks that facilitate DER participation in energy markets and for value to flow through to customers.

All recommendations are outlined on the following page and are reflected in the actions within this Progress Report.

Project Symphony recruitment and testing achievements

- 514 customers in the Southern River area of Perth
- 911 DER assets
- 2 third-party aggregators
- 2 large-scale batteries
- 4 core capabilities/market scenarios

Project Symphony final recommendations

The recommendations outlined in the Project Symphony Final Report cover four major areas and are listed below. They are categorised as tier one – critical requirements, or tier two – an enabling opportunity.

Table 1.

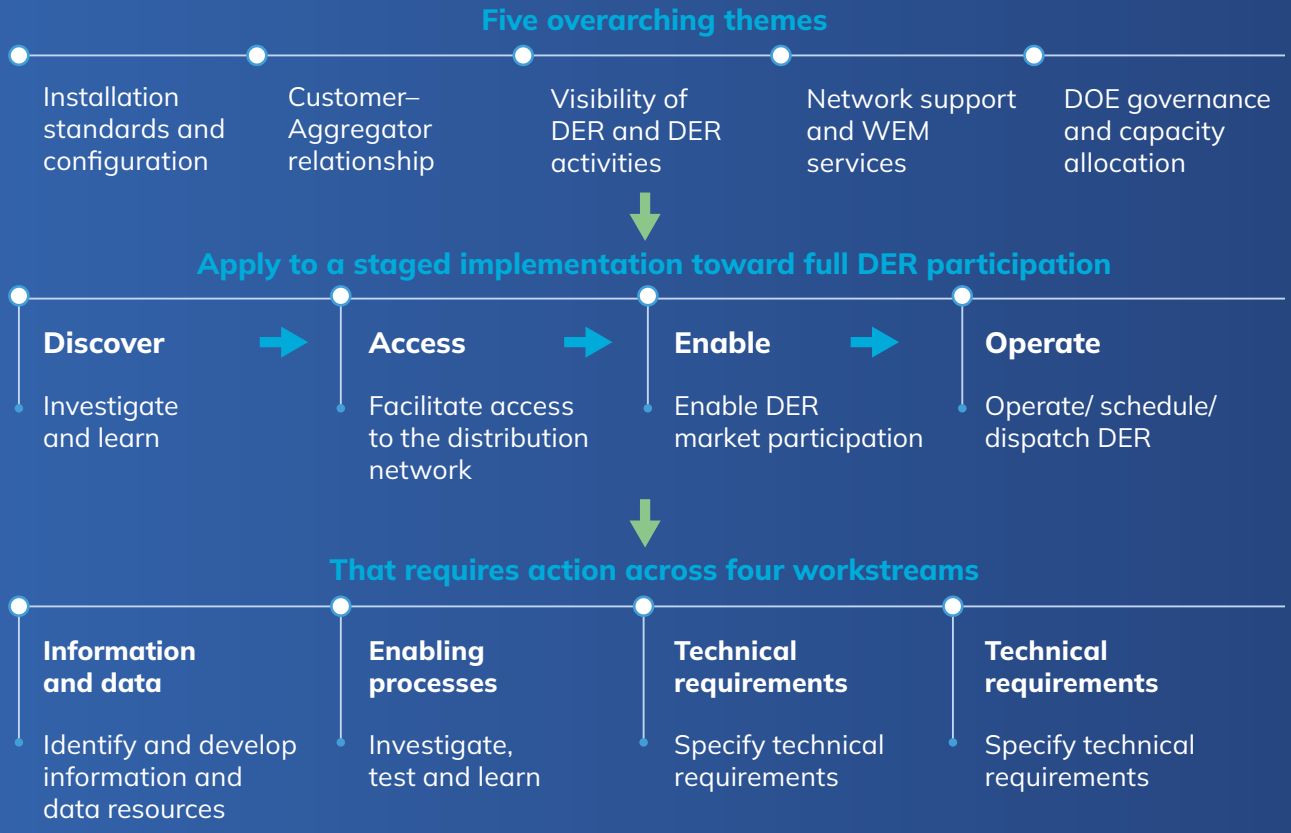
Development area	Tier one	Tier two
Technical	1.1 Adopt a single communications protocol for all inverter-based DER (CSIP-AUS) to maximise asset interoperability. 1.2 Develop the busness case for a 'DER Data Hub' to facilitate effective and efficient DER data exchange between the Distribution Market Operator (DMO), Distribution System Operator (DSO) and aggregators. 1.3 Develop specifications around Parent Aggregator service delivery standards to accelerate compliance with service delivery standards in the Wholesale Electricity Market (WEM).	1.4 Explore opportunities to establish platform and communication solutions, such as AMI, to lower risk and achieve greater efficiencies. 1.5 Establish a 'DER Test Lab' accessible by DSO, aggregators and DMO to prototype and test DER integration products and solutions prior to roll out.
Customer	2.1 Create simple, transparent, accurate and timely customer facing information on VPP participation for communication throughout the customer journey to improve customer experience, buy-in and retention. 2.2 Develop end-to-end customer engagement tools to manage and improve the customer experience of VPP participation.	2.3 Establish a SWIS-wide customer engagement strategy and plan to achieve a consistent and cohesive approach to improve general customer awareness of VPPs.
Value	3.1 Commence work on policy solutions to establish market frameworks that support the participation of DER aggregations in the WEM. 3.2 Deliver a Network Support Service that achieves deferral of network augmentation, to confirm existing funding, recovery, incentivisation and coordination mechanisms are adequate at scale.	3.3 Quantify the actual value of DER asset participation for non-contestable customers (>12 months data and without pilot costs) to better inform value streams and the distribution of value between DER owners and the aggregator(s). 3.4 Establish clear frameworks to enable third party aggregators to engage with the Parent Aggregator for non-contestable customers, to reduce barriers to entry and ensure consistent customer experience.
Policy and regulation	4.1 Support VPP visibility for the DMO and DSO, through implementing amendments to the WEM rules. 4.2 Establish policy positions that appropriately incentivise aggregators to participate, and ensure value is passed through to the customer. 4.3 Review and reform end-to-end DER installation, connection, commissioning, and compliance.	4.4 Develop incentives to accelerate the take-up of energy storage, bringing forward power system and decarbonisation benefits. 4.5 Mandate adoption of AS4755 Demand Response Standards by OEMs to enable greater interoperability of air conditioners for load management by aggregators. 4.6 Introduce dynamic network connections to enable the flexible connection of DER onto Western Power's network to improve customer choice whilst contributing to decarbonisation.

Key Achievements (cont.)

- The second phase of the **DER Orchestration Roles and Responsibilities program** has been substantively completed, with an Information Paper to be published in 2024. With an initial focus on the non-contestable market and through collaboration with AEMO, Western Power, and Synergy, EPWA has further defined:
  - Functional requirements and obligations of AEMO as Distribution Market Operator (DMO), Western Power as Distribution System Operator (DSO), and Synergy as aggregator of all non-contestable customers.
  - Policy positions related to the step-by-step process of DER orchestration. Matters covered include visibility requirements for the DMO and DSO, data coordination, business-to-business information exchange, technical requirements and regulatory settings.
  - Priority recommendations for policy and regulation change that will enable and support VPPs to realise value in market and for provision of network support.

DER Orchestration Roles and Responsibilities themes and workstreams

The DER Orchestration Roles and Responsibilities Phase 2 Information Paper (to be released in 2024) confirms DER orchestration policy positions and outlines the required steps to implement and give them effect. It covers a range of activity across five themes and four workstreams that collectively facilitate network and power system service provision by aggregated DER at scale.



- There has been significant achievement in **legislative and regulatory reform** supporting the implementation of the DER Roadmap. Two Acts were introduced to WA Parliament in late-2023, subsequently passing in 2024. The first major update to WA's central electricity industry legislation (the *Electricity Industry Act 2004* – EI Act) in two decades, both Acts serve to establish DER as a fundamental part of the electricity system and will enable implementation of the next stages of the State Government's Energy Transformation Strategy. Highlights of the two Acts are outlined below:

  - The ***Electricity Industry Amendment (Distributed Energy Resources) Act 2024*** amends the EI Act to enable most aspects of electricity regulation, including the Wholesale Electricity Market (WEM) Rules, to be centralised within a single instrument – the **Electricity System and Market Rules (ESMR)** (p8). The amended EI Act also now includes a new 'State Electricity Objective' that ensures that decision-makers consider the environment (including greenhouse gas emissions) when making decisions alongside matters relating to the quality, safety, reliability, cost-efficiency, and price of electricity services. Importantly the amended EI Act enables the new ESMR to regulate all aspects of electricity distribution networks, including DER connection processes, standards, and obligations for entities such as Western Power, AEMO, and DER aggregators.

  - The ***Alternative Electricity Services (AES) Act 2024*** will improve customer protections through enabling the introduction of a mandatory code of practice for new and emerging electricity services. Currently, two services are being considered for regulation under the new AES framework. The first is the supply of electricity in embedded networks (such as in apartment buildings, shopping centres, residential parks and retirement villages); the second is on-site power supply arrangements where a third party manages electricity equipment on a customer's property, such as solar as a service. The amendments to the EI Act will also enable the future development of specific code provisions relating to the provision of services through VPPs.

- In the two years since its launch, **Emergency Solar Management (ESM)** has grown to reliably offer over 120 megawatts (MW) (as of April 2024) of generation reduction from residential customers' rooftop solar systems under emergency operating conditions. ESM is yet to be called upon in an emergency, however it is a valuable tool to help maintain system security should it be required. New system low records continue to be set, with the most recent WEM record being 595 MW in September 2023.

- In addition to developing new ways of providing ESM-enabled customers with information online on whether their system has been affected in an ESM event or test, Synergy has leveraged its ESM platform to develop the **Solar Rewards** orchestration product, Synergy's first 'on-market' VPP using residential rooftop solar systems. Solar Rewards offers customers financial incentives in exchange for having their rooftop solar remotely turned off ahead of system load becoming critically low. Launched in response to AEMO's request for a 2023–24 Minimum Demand Service, Solar Rewards is a 15-month initiative that has 2,700 recruited customers, with strongly positive feedback.

Electricity System and Market Rules

The EI Act establishes the regulatory framework for the electricity sector in WA. Now two decades old, the Act required amending to reflect major changes to the sector as part of the energy transformation and to promote a secure and reliable power system as it transitions to more diverse sources of energy production and storage.

The Wholesale Electricity Market (WEM) Rules govern the operation of the SWIS, including the wholesale sale and purchase of electricity, Reserve Capacity, and Essential System Services. The WA Government's Coordinator of Energy, head of EPWA, is responsible for maintaining and developing the WEM Rules and the AEMO is responsible for operating the WEM. Currently, the WEM Rules are not able to accommodate obligations for most distributed connected facilities, including DER.

Amendments to the EI Act through the introduction of the ***DER Act 2024***, will see the WEM Rules renamed the **Electricity System and Market Rules (ESMR)** as part of expanding its range to address matters currently contained in:

- the Electricity Networks Access Code 2004;
- Western Power's Technical Rules;
- the Electricity Industry (Metering) Code 2012; and
- the Electricity Industry (Network Quality and Reliability of Supply) Code 2005.

Additionally, the scope of the ESMR builds upon the matters dealt with under the above instruments, providing enabling heads of power for the regulation of all aspects of the lower-voltage distribution network in the SWIS. This includes DER-related matters such as standards and connection processes, as well as the ability to apply obligations on new roles critical to the future integration of DER, such as the DSO (Western Power), DMO (AEMO), DER aggregators, and embedded network operators.

Change will enable state-wide consistency of governance and application while ensuring flexibility for Horizon Power's service requirements, and the participation of DER in the provision of network and market services.

Key Achievements (cont.)

- Horizon Power launched the **Smart Connect Solar** program in early 2024. The program provides customers the opportunity to install solar where they were previously unable to do so. This has been enabled through installation of a gateway device that connects to Horizon Power's DER Management System (DERMS). Through this, Horizon Power can increase or decrease the amount of energy exported into the grid by a customer's solar system, keeping the grid stable when there is more solar generation than it can handle. Enabling flexible exports in this way means Horizon Power will be able to remove rooftop solar connection limits on all its microgrids so more customers can access solar, reduce their energy bills and help decarbonise the power system.

  To help customers understand what is happening to their assets, Horizon Power developed an associated online portal. It provides customers access to user-friendly information about the management of their DER.

- Sharing the benefits of solar and encouraging efficient use of the power system continues with the introduction of several **new time-of-use tariffs** launched by Synergy and Horizon Power as part of their approach to DER integration:

  - **Midday Saver** and **EV Add On** – both Synergy tariffs offer a reduced cost for electricity consumed during the day to reflect the lower price of wholesale energy and to promote customer demand shifting. The EV Add-On has an additional reduced rate that can be accessed overnight to encourage EV owners to use the flexibility of their EVs and schedule charging times that efficiently utilise the power system.

  - **Community Energy** – a Synergy product that offers zero cost electricity in the middle of the day (10 units) to incentivise customers to shift or increase their energy use outside of the peak. The product has initially been made available to customers in financial hardship, with over 700 customers currently receiving the benefits of lower bills.

  - **Sunshine Saver** – a time-of-use tariff launched by Horizon Power in Esperance and being rolled out further in the Goldfields as well as the Mid-West. For a daily subscription fee, it provides customers unable to install their own rooftop solar access to zero cost, carbon-neutral energy during the day. Eligible customers will receive five units of energy credited to their account, with 10 per cent off any additional energy used between 6am and 6pm. The objective is to share the benefits of DER while encouraging energy use prior to the evening peak.

- Investment in **community batteries** to address network and system constraints and support the power system. Western Power has been successful in receiving support through the Australian Government's 'Community Batteries for Household Solar' program for the installation of six community batteries across the SWIS. Much like the DER Roadmap's PowerBank pilots, the program will feature a corresponding customer product for eligible Synergy customers. The product will support equitable access to DER by being available to both those with and without rooftop solar.

Battery locations were determined based on Western Power's **Network of Opportunity Map (NOM)** which identifies areas of the network that are constrained and require additional capacity. The most recent edition was released in November 2023 and includes an additional level of detail to better support prospective providers of network services and those seeking to connect to the network.

- Work is ongoing under the **Electric Vehicle Action Plan (EVAP)**. The EVAP was launched in August 2021 and provides a detailed program of work to optimise the accelerated uptake of electric vehicles (EV) and their integration in WA's power systems.
    - Synergy launched its EV Add On tariff in October 2022, offerings a lower rate for electricity during the middle of the day and overnight to incentivise moving charging away from the evening peak. As of November 2023, there were approximately 1,671 EV owners on this tariff — around 10 per cent of residential EV owners in the SWIS.
    - EPWA worked with Western Power to develop more sophisticated EV charging scenarios to better understand the future impact on the network.
    - EPWA commissioned a study into EV charging behaviour to better understand how it can be influenced for improved customer and power system outcomes (further detail on following page).
- In addition to the EVAP, the WA Government launched the $15 million workplace charging grant scheme 'Charge Up' in early 2023. The scheme aims to help Local Governments, small businesses and not for-profits to make the shift to electrified transport while supporting grid-friendly EV behaviour. The grant design aims to maximise daytime charging and promote off-peak charging, and has recently expanded scope to offer high-capacity 'Level 3' DC chargers in addition to Level 2 Destination chargers.

WA Residential EV Charging Behaviour Study

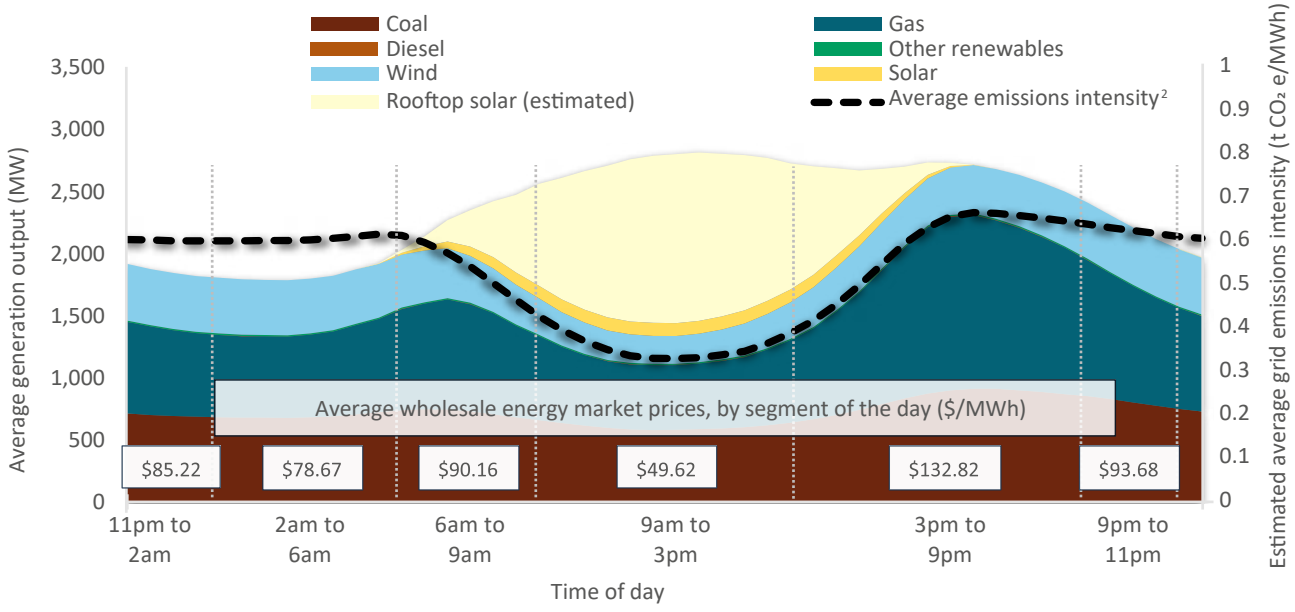
Under the *EV Action Plan*, EPWA commissioned independent research from Evenergi and the University of Sydney, published in November 2023, to provide insights into how Western Australian residential owners charge their EVs and to make policy recommendations about managing the impact associated with EV charging on the power system.

A survey undertaken as part of the study showed current WA EV owners fit an 'early adopter' profile and mostly charge their EV during the day or overnight — times when it is optimal for the power system. That is, this customer segment is likely to have rooftop solar, be on time-of-use (TOU) electricity tariffs, and use a dedicated EV charger that enables charge times to be pre-programmed. While this is encouraging, additional measures are likely to be required to produce similar outcomes as EV ownership becomes more mainstream with mass market uptake. A review of international evidence confirmed that, in the absence of incentives or remote management measures, EV owners are likely to charge each evening when they get home using a regular power point. In WA, this is when grid power usage is highest.

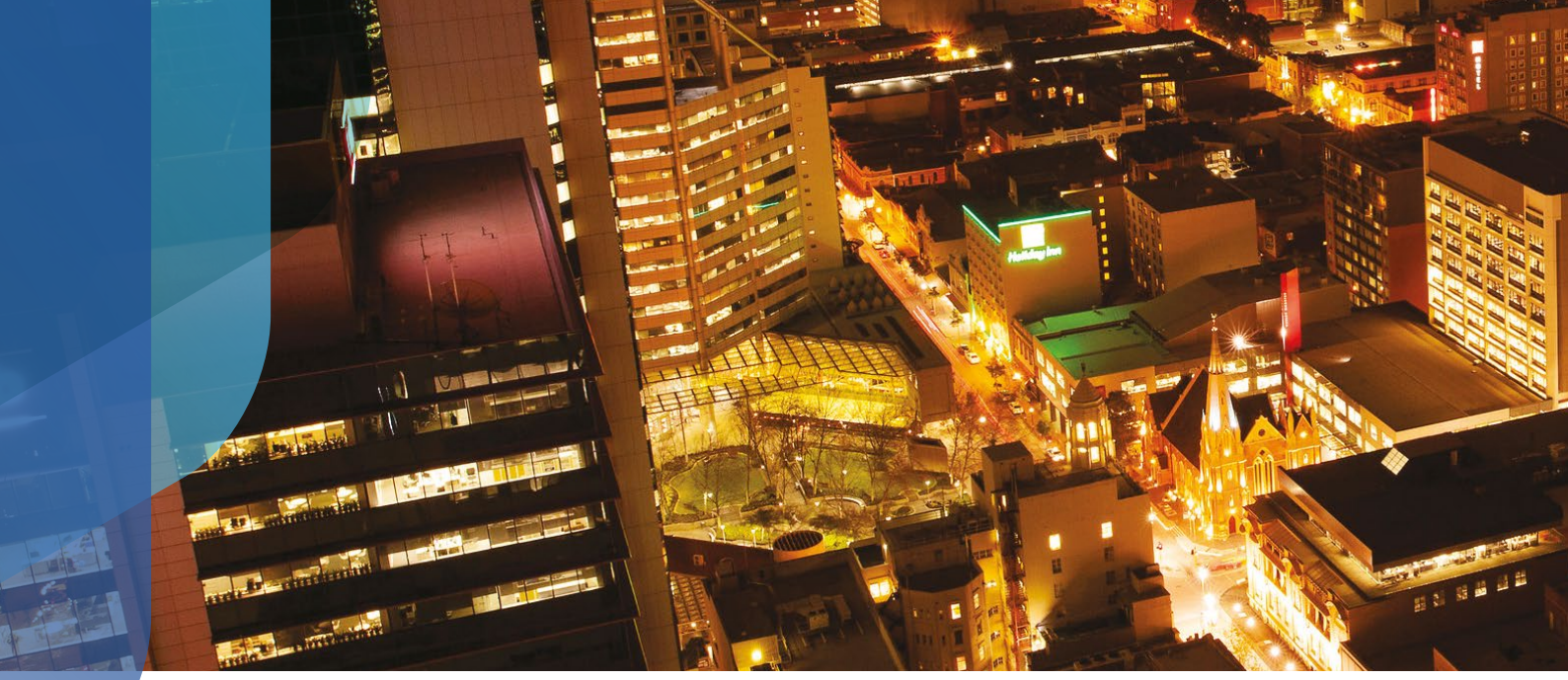
The study informed updated Government advice for EV owners, which confirms that charging during the day is good for households, the grid, and the environment. Figure 1 highlights that when there is abundant rooftop solar generation, power demand from the grid, wholesale energy prices and average greenhouse gas emissions all tend to be lowest. Power prices and average emissions spike during the evening peak, when the grid relies most on non-renewable generation sources.

The researchers recommend education about and promotion of TOU tariffs, the benefits of daytime charging and the use of smart chargers. They also noted the need for data collection and trials to test consumer responses to measures to optimise EV charging. This analysis is now informing the development of pilots under the EV Action Plan, which will also look at how to integrate EVs into VPPs and explore the opportunities and potential of vehicle-to-grid (V2G) technology.

Figure 1: Average daily SWIS generation, emissions intensity and wholesale energy market prices (2023)



Source: AEMO daily market data, calculated over 2023. 1 Reference Trading Prices in the wholesale market are averaged over *Synergy's Midday Saver EV Add On* tariff intervals. (Transmission, reserve capacity and other costs are not included.) 2 Emissions estimates incorporate self-consumption of rooftop solar.



The Clean Energy Transition and the DER Roadmap

Transformation of the energy sector to accommodate renewable energy continues to progress at pace. The WA Government announced the planned retirement of state-owned coal power stations by 2030 and Synergy is investing in utility-scale battery storage projects and wind farms. Energy storage is essential for energy security, as well as unlocking the value of solar and wind generation. WA is committed to playing its part in the clean energy transition and is leading the way on the role of DER in that journey.

- In November 2023, the WA Government introduced the **Climate Change Bill 2023** to Parliament. Its objective is to contribute to national and global goals for decarbonisation, formalising the State's long-standing commitment to achieve net zero greenhouse gas emissions by 2050. This is in addition to the WA Government's existing 2030 interim target for all Government agencies, including Synergy and Western Power, to reach an 80 per cent reduction in emissions below 2020 levels.

  The Bill includes a statutory requirement to report on progress annually, set interim targets for emissions reduction, and to develop policies that encourage reduced emissions.

Supporting bodies of work are the WA Government's **Sectoral Emissions Reduction Strategy (SERS),** and the **Whole of System Plan (WOSP):**

- The SERS work program explored diverse pathways for emissions reduction opportunities. This work culminated in a 2023 report outlining 40 actions to be undertaken by 14 government agencies. Electricity industry support will take place through increased energy storage, transmission investment and the SWISDA. Rooftop solar and batteries are also key options for household and businesses to reduce emissions.

- The WOSP considers the generation and storage infrastructure required in the high voltage transmission network to meet energy demand over the next 20 years. The first WOSP was undertaken in 2020 and is due for an update in 2025. It is a detailed study of how the power system may evolve over the next 20 years, including consideration of the impact emission reduction targets and new technology types will have. The next WOSP will consider the opportunities of DER orchestration in lower-voltage networks in recognition of the increasing importance of this capability to the electricity system and decarbonisation.

- On 1 October 2023, **new WEM arrangements** commenced. This included major revision of the Essential System Services (ESS) framework to enable co-optimised service provision; and the introduction of facility bidding and five-minute dispatch. These reforms modernise the WEM in preparation for a largely renewable generation fleet and to ensure a level of flexibility to accommodate future technologies. Corresponding policy development has also taken place to enable the future participation of DER in the WEM. This has largely been undertaken through the **DER Orchestration Roles and Responsibilities** project (p6) which described the need for a DMO, a DSO and aggregators.

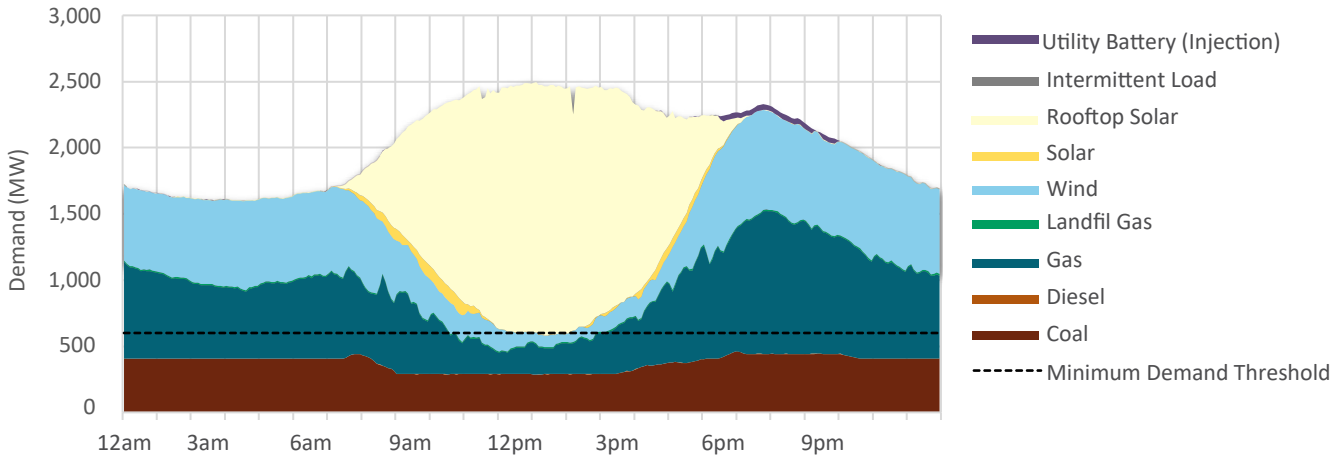
- In November 2023, the Energy and Climate Change Ministerial Council, comprising all Ministers for Energy and Climate across jurisdictions, agreed to develop a National Consumer Energy Resources (CER) Roadmap. It will be available for the council's consideration in July 2024. Thanks to the DER Roadmap as part of the Energy Transformation Strategy, WA is leading the country in many aspects of DER integration and is able to share its expertise in support of this work program.

Rooftop solar and batteries in the grid

The clean energy transition relies on solar, wind and energy storage. In 2023, renewable generation met over a third of demand for electricity in the SWIS. Rooftop solar provided half, meeting 16.4 per cent of all SWIS customer power needs. More than half of WA dwellings are yet to install solar and system sizes have increased by 40 per cent in the past five years.

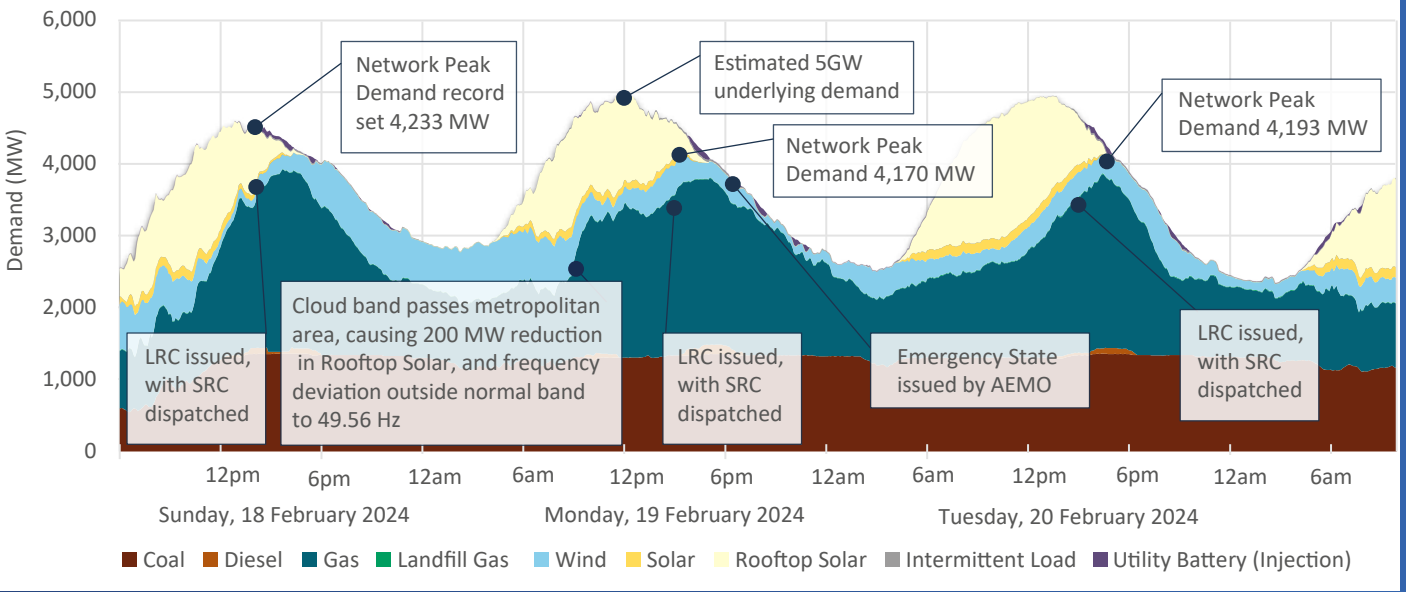
Low demand for power from the grid during periods of high solar output and moderate temperatures, most likely in Spring and Autumn, continue to be a challenge for grid operation. A new minimum demand level of 595 MW was set on 25 September 2023 (Figure 2). Currently AEMO considers 500 to 600 MW the level at which the grid and market can operate safely without emergency intervention such as though ESM. This level is referred to as the system's Minimum. Demand Threshold.

Figure 2: Record low grid demand day – 25 September 2023



In 2023, AEMO contracted battery VPPs to help maintain grid reliability, alongside utility-scale batteries and other generation and load management options through the WEM's Non-Co-optimised Essential System Service framework. AEMO utilised these facilities in a period of record high power demand in February 2024 as well as to manage solar volatility (Figure 3).

Figure 3: Wholesale Electricity Market events – 18 February 2024 to 20 February 2024



At around 11am on 19 February, a band of cloud caused a rapid drop in rooftop solar. This led to a spike in demand from the grid of 200 MW, which battery VPPs helped to cover. The day was also part of a run of hot days, with record levels of power demand from the grid after the sun had gone down. AEMO issued three Low Reserve Conditions (LRC) which required all Supplementary Reserve Capacity (SRC) parties to contribute to meeting demand, including two DER VPPs (this contribution is small and not visible in Figure 3).

DER Roadmap Evolution

The early years of the DER Roadmap were focused on managing the risk to the operation of the grid presented by uncontrolled rooftop solar and on conducting the exploratory work needed to determine how to integrate DER into the power system and the market.

In 2024, WA now has low load support mechanisms in place, and a clear understanding of the potential benefits of VPPs and what may be required so they can operate in the market on a commercial basis. Further, through the roll out of ESM, new ways to engage with customers have been established and gaps in the DER connection process to enable compliance with critical standards and VPP participation have been identified. Armed with this knowledge and the experience acquired through Project Symphony, this Progress Report marks the next stage of WA's DER journey.

The past two years has seen delivery of several DER Roadmap achievements and milestones. Significant among them was the completion of the roll out of ESM, the end-to-end VPP pilot, Project Symphony, and the completion of the DER Orchestration Roles and Responsibilities analysis.

The insight gained through these initiatives has been incorporated into Roadmap actions in its remaining two years. There is now clarity on the technical and regulatory infrastructure needed to enable DER integration and full market participation. Completing the DER Roadmap actions will enable VPPs to operate at scale to the benefit of electricity consumers, the broader market, and WA's emissions reduction goals.

Synergy's non-contestable residential, not-for-profit, and small business customers remain a priority under the DER Roadmap, as they comprise the overwhelming majority of DER present in WA.

However, new market structures will be developed that will work and apply in the contestable electricity market too. Synergy will clarify how third-party aggregators can deliver value to non-contestable customers and the grid, and Western Power will develop its capability to contract directly with contestable customer to provide Network Support Services (NSS).

Roadmap scope and timeframes

Pre-existing and new actions focus on the period to the end of 2025, consistent with the DER Roadmap vision in 2020. Action 30 of the Roadmap reflects its end goal, and has been clarified in light of the ongoing work to achieve full DER market participation. It focuses on enabling aggregation of priority technologies—rooftop solar and household batteries—by realising value through foundational energy, capacity, and network services by 2025. The Project Symphony findings (see p5) highlights these technologies as priorities in the clean energy transition and that VPPs are commercial especially if value may be 'stacked' across these key services.

Realising value for VPPs by 2025

Energy services: flexible exports will maximise the contribution of solar, and VPPs must be able to realise energy value through Synergy's (or other retailers') positioning in the market.

Capacity services: the contribution of VPPs must be recognised in AEMO's Reserve Capacity Mechanism, as well as through supplementary procurement processes.

Network support services: Western Power's network procurement must accommodate and facilitate the contribution VPPs can make to avoid network upgrades.

Value stacking: Markets for all three services need to operate so VPPs can optimise and maximise their contribution across all of them.

Other actions initiate workstreams that will continue beyond 2025. For example, scoping a VPP project to enable operation at scale, and assesing market rule changes now enabled through the *DER Act 2024*.

Refreshed DER Roadmap actions

The actions in this progress update address the next steps needed to enable foundation VPP service provision by 2025 and set up market infrastructure that will enable more complex service provision in future.

Project Symphony recommendations (p5) and the work within the DER Orchestration Roles and Responsibilities program (p6) are reflected. Focus areas include:

- an overhaul of the DER connection process (DER Roadmap Action 4b), incentives and education to ensure customer equipment and installation compliance with standards, such as remote communications capability (3, 3b, 4c);
- investment in the technical infrastructure Western Power and AEMO need to operate the distribution system (14, 24b);
- enabling dynamic operating envelopes (DOEs) to support rooftop solar export when the grid can accommodate it (26, 26b, 40);
- new reserve capacity (38) and network support contracting (24c) frameworks to encourage household storage and VPPs; and
- finalisation of Project Symphony technical testing through 'Project Encore' (23b), including testing of air conditioners, and technical delivery of more sophisticated energy market services.

Looking beyond 2025, a new DER Roadmap action (23c) requires a new project to be scoped that will establish commercial-scale operation of VPPs in the SWIS in the next few years. With enabling legislation now in place, a program to transfer the various regulatory instruments into the ESMR (p8) is in development (37).

In the near term, new rules will support improvements to equipment connection and compliance (39), the network Access Regime (41), NCESS procurement (41b) and network tariff structures (41c). Rules and regulations will continue to be developed and refined after 2025 to support delivery of more complex VPP services.

These actions will ensure electricity consumers and VPPs are well-placed to contribute clean energy and storage needed to achieve WA's decarbonisation objectives as we approach the end of the decade (Figure 4).

DER Roadmap governance

With the completion of Project Symphony and the work of its Steering Committee, new coordination and oversight arrangements to oversee the DER Roadmap to its conclusion have been established.

Implementation of the Roadmap will be overseen by the DER Roadmap Coordination Committee (DERRCC). Chaired by EPWA, the DERRCC is comprised of executives from Roadmap project partners AEMO, Western Power, Horizon Power, and Synergy (as it relates to its non-contestable customers). It is supported by three working groups that will coordinate the delivery of DER Roadmap actions across three work streams: Standards, Compliance and Customer Experience; Network Planning and Services; and Pilots and Market Integration.

Most aspects of delivery, including those resulting in new rules under the ESMR, will be subject to extensive stakeholder consultation.

EV Action Plan activities will be incorporated into DERRCC's agenda as appropriate.

The Roadmap will be reviewed in its final year.

Status of Roadmap actions

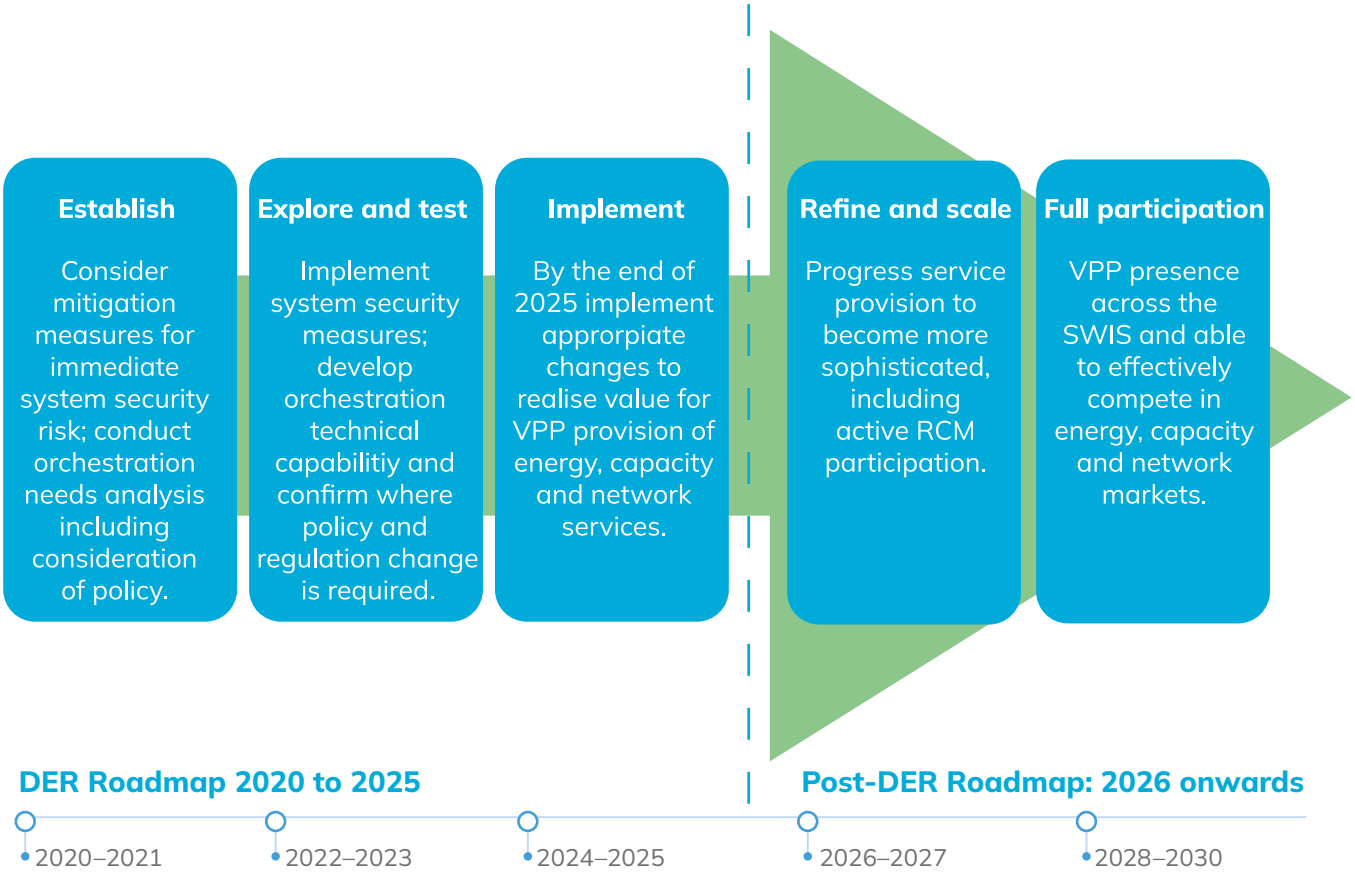
Roadmap actions are reviewed in detail in the next section. Each action's status is listed in Table 1 and explanation provided in subsequent text. Considering regulatory review and reform work commencing, rule and regulation change initiatives have been grouped under the heading 'ESMR and Regulation'.

The year ahead

Roadmap priorities for delivery in 2024 include:

- closing-out the Project Symphony VPP pilot including publishing any outstanding reports, finalising testing through Project Encore, and determining how to demonstrate and test market settings for VPPs at scale;
- embarking on rule changes to allow VPPs to participate in the 2025 reserve capacity cycle, releasing the DER Orchestration Roles and Responsibilities Information Paper, and establishing the program of work to transfer existing market and regulatory instruments into the ESMR with consideration of DER-related matters;
- releasing a statement on interoperability standards to guide DER remote communication requirements, reviewing the DER connection process and determining how to ensure equipment compliance, and maximising solar exports through DOEs; and
- scoping EV pilots to gather data for network planning, exploring vehicle-to-grid opportunities, and testing ways to encourage and enable efficient use of the network.

Figure 4: DER market development



Status of Actions

All DER Roadmap actions are listed in Table 2. Those completed since the release of the 2022 DER Roadmap Progress Report are marked with an asterisk, and new actions are indicated as such.

Explanatory detail on actions, added, amended or completed since the second progress update is provided in the text below.

Table 2. Updated list of all DER Roadmap actions

No	DER Roadmap Action	Status
Technology integration		
Inverter standards		
1	By October 2020, deliver improved inverter functions through the Standards Australia national review process for AS/NZS 4777.	Complete
1b	By December 2022, AEMO to undertake an assessment of the roll out of AS/NZS 4777.2:2020 compliant inverters on Distributed Photovoltaics (DPV) tripping incidence and identify additional updates required to improve inverter performance.	Superseded by new Technology integration actions
2	By December 2022, assess the opportunity to deliver a program to incentivise the updating of latent capabilities in the existing inverter fleet.	Superseded by new Technology integration actions
3	**Updated:** By mid-year 2025, Western Power and Synergy to evaluate appropriate mandatory standards, communications functionality, and protocols for remote management of DER, including electric vehicle equipment, and establish a plan to implement.	Underway
3b	**New action:** By September 2024, EPWA, supported by Western Power and Synergy, to publish a statement outlining the interoperability requirements for DER equipment, following industry engagement.	Underway
3c	**New action:** By the end of 2024, Synergy to commence development of a certification process for DER devices that align with national requirements and aggregation needs.	Underway

No	DER Roadmap Action	Status
Technology integration		
Inverter standards		
4	**Updated:** By December 2024, EPWA, supported by Synergy and Western Power, to develop a compliance framework to ensure DER is commissioned correctly and remains compliant with standards and VPP requirements over time.	Underway
4b	**New action:** By December 2024, Western Power and Synergy to complete an assessment of, and produce recommendations to improve, the current DER connections process. Assessment should consider data capture for network planning.	Underway
4c	**New action:** By mid-year 2025, Western Power and Synergy to commence implementation of compliance framework including an installer education program.	Underway
Distribution storage		
5a	By December 2020, deploy community PowerBanks to address network constraints in Canning Vale, Dunsborough, Ellenbrook, Kalgoorlie, Leda, Parmelia, Port Kennedy, Singleton, Two Rocks, and Wanneroo.	Complete
5b	By October 2020, develop a plan covering 2021–24 for Western Power to obtain additional distribution storage services (and installations where services do not emerge) across the SWIS to meet emerging network needs.	Complete
5c	**New action:** Western Power and Synergy to roll out community batteries under the Australian Government's 'Community Batteries for Household Solar' scheme.	Underway
6	By December 2020, implement appropriate metering and settlement arrangements for distribution storage.	Complete
6b	**New action:** By June 2025, Western Power to ensure community batteries are metered appropriately to enable progressive access by an aggregator for service provision.	Underway
7	By December 2020, ensure the Electricity Networks Access Code 2004 allows Western Power to recover appropriate costs associated with efficient use of distribution storage under its regulated revenue.	Complete
8	By June 2023, update the Technical Rules as necessary to clarify the requirements for distribution storage beyond the current treatment as both a generator and a load.	Superseded by new ESMR and Regulation actions

No	DER Roadmap Action	Status
Grid response		
9	By April 2020, install 25 MVAr (five x 5 MVAr units) of reactive power compensation, and continue the assessment and delivery of network technology solutions to provide grid support and maintain system stability on low-demand days.	Complete
10	By June 2020, complete a review Under Frequency Load Shedding arrangements, and assess implications for AA5 investment program.	Complete
10b	**Updated:** From June 2024, AEMO with support from Western Power, to commence incorporating enhanced DER and Load Model information into Under Frequency Load Shedding (UFLS).	Underway
11	By December 2022, draft updates to the *Electricity Act 1945* to reflect a voltage standard that is more suitable for a high-DER environment.	Complete*
Power system operations		
12	Beginning in June 2020, revise system restart arrangements to consider DER.	Complete
12b	From September 2021, to incorporate enhanced DER and Load Model information (achieved under Action 13) into System Restart arrangements.	Complete*
13	By March 2021, ensure the system operator's dynamic system modelling adequately incorporates DER, and arrangements adequately address power flows during system events.	Complete
Distribution network visibility		
14	**Updated:** By mid-year 2025, Western Power to develop an investment plan to enable network visibility as required by its responsibilities as the DSO for the SWIS.	Underway
15	By September 2020, deliver a register of static DER data for the SWIS, with processes to support data collection and future DSO functionality.	Complete
15b	**New action:** By mid-year 2025, EPWA in collaboration with Western Power, Synergy, AEMO and industry, to assess the evolution of the DER Register into a dynamic Data Hub, with consideration of its engagement with the DER connections process.	Underway
15c	**New action:** By mid-year 2025, EPWA in collaboration with Western Power, Synergy and AEMO, to scope a 'DER Data Coordinator' role as an evolution of the DER Register, and assess its viability.	Planning commenced
Planning for electric vehicle integration		
16	By June 2020, commence work on planning to integrate EVs into the grid, including deployment of charge ports and trials.	Ongoing

No	DER Roadmap Action	Status
Tariff and investment signals		
New customer products		
17	By March 2020, develop tariff pilot programs to explore tariff structures that encourage system-efficient use of and investment in DER and help to share the benefits of DER with all customers. The scope of the pilots should include measures to assist and protect vulnerable customers.	Complete
18	Beginning in July 2020, commence implementation of the tariff pilots.	Complete
19	By June 2022, complete reviewing the progress of and insights from tariff pilots.	Complete*
19b	**New action:** By June 2025, Synergy to develop and release new VPP products that consider customer incentives.	Underway
19c	**New action:** By mid-year 2025, Synergy to develop and recruit customers for a newly created product associated with the community batteries under the Australian Government's 'Community Batteries for Household Solar' scheme.	Underway
19d	**New action:** Synergy and Horizon Power to promote and monitor uptake of time-of-use tariffs with appropriate price signals, including as part of any VPP recruitment incentive schemes.	Planning commenced
DER for tenants		
20	**Updated:** By June 2025, finish delivery of a program that reduces barriers to the installation of rooftop solar at residential rental properties.	Underway
DER participation		
VPP pilots		
21	By July 2020, deliver a range of updates to the Electricity Networks Access Code 2004 to facilitate better procurement of non-network solutions (using DER where appropriate) to address network issues by Western Power.	Complete
22	By July 2020, commence a comprehensive VPP technology pilot to demonstrate the end-to-end technical capabilities of DER in the SWIS, and its ability to respond in a coordinated manner under central dispatch instruction. The pilot would commence with a focus on technical performance of DER and transition to market participation testing (see action 23).	Complete
23	By July 2023, complete a comprehensive VPP market participation pilot that tests the incorporation of aggregated DER into energy markets, including market dispatch and settlement arrangement from the market operator to individual customer.	Complete*
23b	**New action:** By September 2024, Roadmap project partners to complete Project Encore as a follow-up VPP pilot to Project Symphony. Leverage existing investment including customer recruitment to demonstrate the technical capabilities of DER to respond in a coordinated manner, and provide network, energy and capacity benefits.	Underway

No	DER Roadmap Action	Status
23c	**New action:** By mid-year 2025, Roadmap project partners to scope a commercial, scalable VPP project inclusive of third-party aggregator participation and based on learnings from Project Symphony and Project Encore.	Underway
Function and capability development		
24	By May 2022, develop a plan for the establishment of a DSO and DMO in the SWIS, including the identification of roles, functions, costs, and practical operations. This plan should include an assessment of to the system for the establish of these functions.	Complete
24b	**New action:** By December 2024, Roadmap project partners to develop their respective business cases for the build and scaling of DSO, DMO and Parent Aggregator platforms.	Underway
24c	**New action:** By the end of 2025, Western Power to develop its internal Non-Co-optimised Essential System Service (NCESS) process for the procurement of NSS delivered by aggregated DER, with consideration of criteria to procure and standardise services.	Planning commenced
24d	**New action:** By mid-year 2025, Synergy to develop an engagement framework for third-party aggregators to access commercial arrangements to provide market services.	Planning commenced
25	By May 2022, identify legislation and regulatory framework requirements including timeframes for development and implementation to establish DSO and DMO functions.	Complete
26	**Updated:** By mid-year 2025, Western Power to finalise communications protocols, data, and technology requirements to predict and publish dynamic operating envelopes (DOE), in accordance with the DMO's coordination requirements.	Planning commenced
26b	**New action:** By mid-year 2025, Western Power to develop a framework and the internal business processes to publish and validate a DOE.	Planning commenced
27a	By October 2023, implement the initial changes to wholesale market arrangements necessary to enable the participation of DER in the wholesale market via a DER aggregator.	Refer to new ESMR and Regulation actions
27b	By July 2025, commence implementation of changes to wholesale market arrangements necessary to enable participation of DER in the wholesale market via a DER aggregator.	Refer to new ESMR and Regulation actions

No	DER Roadmap Action	Status
28	By June 2022, introduce adapted network connection agreements that enable the DSO, once established, to interact with devices on the distribution network.	Complete
29	By July 2024, deliver a DSO / DMO legislative and regulatory framework, for transition to commencement by October 2025.	Legislation complete* Refer to new ESMR and Regulation actions
30	**Updated:** By the end of 2025, priority VPP technologies, such as rooftop solar and batteries, to be able to realise value from basic service provision via an aggregator.	Planning commenced
31	By July 2023, develop the initial design of the framework for a distribution services market with fit for purpose arrangements for dispatch and settlement. Include an assessment of the cost and benefits of market creation.	Suspended, per previous report
32	By July 2024, commence the development of trials for a distribution services market for network support.	Suspended, per previous report
Customer protection and engagement		
New business models		
33	By September 2020, assess the applicability of the Consumer Data Right to Western Australian energy customers and commence assessment of an applicable customer data regulatory framework.	Complete
34	By June 2020, commence a process to ensure that new business models in the electricity sector, at a minimum, provide appropriate protections for consumers.	Complete
35	By October 2023, establish a regulatory framework in the SWIS for new energy service business models to ensure access to the Energy Ombudsman, and that hardship schemes and exemptions are appropriately applied.	Complete*
36	By July 2020, engage with energy customers and commence an education program to ensure that industry, government, and the public are sufficiently informed about the need for changes being undertaken as a result of the Roadmap recommendations.	Ongoing
36b	**New action:** By mid-year 2025, Synergy to undertake a campaign to support understanding of VPP capability and recruitment opportunities.	Planning commenced

No	DER Roadmap Action	Status
ESMR and regulations		
DER Bill enabled rule changes		
37	**New action:** By mid-2024, EPWA to complete an initial WEM Rule and regulation review as part of the ESMR process to confirm priority changes and sequencing of reform.	Underway
38	*(formerly Actions 27a and 27b)* **Updated:** From January 2025, EPWA, in collaboration with AEMO, introduce changes to WEM Rules and service definitions to enable DER participation, including in the Reserve Capacity Mechanism and to implement visibility requirements.	Planning commenced
39	**New action:** By mid-year 2025, EPWA to commence development of new regulations that support an improved compliance framework and renewed connections process.	Planning commenced
40	**New action:** By the end of 2025, EPWA to introduce rules or regulation for the independent economic regulation of the framework for DOEs in the SWIS.	Planning commenced
41	*(formerly Action 29)* **Updated:** By December 2025, EPWA, in collaboration with Western Power and the ERA, to introduce changes to the Access Regime to facilitate VPP activities and NSS.	Planning commenced
41b	**New action:** By the end of 2025, EPWA to facilitate ongoing procurement of NSS through amendments to the NCESS process, as required.	Planning commenced
41c	**New action:** By mid-year 2025, EPWA, in collaboration with Synergy and Western Power, to identify potential changes to network tariff structures to remove any potential barriers to VPPs and DER participation.	Planning commenced

Status of Actions (cont.)

Technology integration

Inverter standards

Inverter standards govern how photovoltaic (PV) systems, batteries and electric vehicles need to interact with the network and how they must perform under different power system conditions.

Evaluation of appropriate standards and protocols to enable remote management of DER, per **Action 3**, is significantly progressed. The Common Smart Inverter Profile – Australia (CSIP-AUS) is the most likely solution for primary DER management in the SWIS and has already been committed to in other Australian jurisdictions. A single communications protocol and minimum device standards, such as those covered by CSIP-AUS, will maximise asset interoperability for market participation, network support and dynamic DOE deployment. Western Power and Synergy will complete work to confirm this approach in 2024.

Under new **Action 3b**, EPWA in collaboration with Western Power and Synergy, will publish a statement to guide remote communications requirements for new installations of rooftop solar and batteries, and by when. It will also foreshadow similar requirements for other DER assets, such as EV Supply Equipment and air conditioners. Timeframes for customer and industry engagement will be indicated. Under new **Action 3c**, Synergy, in its role as aggregator for non-contestable customers, will commence development of a process to certify customer DER devices as meeting the standard.

Action 4 is a continuing action to develop a compliance framework for customer devices which supports adherence to the Standards and orchestration requirements established through **Action 3**. The timing has been updated to occur concurrently with a review of the DER connections process (new **Action 4b**), which will inform compliance needs and draw on challenges experienced through implementation of ESM and the DER Register (**Action 15**). The review will be comprehensive, covering the end-to-end process of DER installation, connection, and commissioning. Through engagement with industry including Original Equipment Manufacturers (OEMs) and technology providers, insight will be gained on data availability that can be leveraged. Some improvements in the process will be implementable within the current regulatory framework, while others may require new regulations to ensure all DER are captured appropriately. **Action 4c** is implementation of the review outcomes and highlights the essential role of equipment installers.

Actions 4, 4b and **4c** supersede **Actions 1b** and **2**.

Distribution storage

Storage in the low voltage network can alleviate local constraints as well as provide system-wide benefits. As reflected in the new action, **5c**, uptake of community batteries has continued over 2022 and 2023 with funding from the Australian Government.

Through the *Community Batteries for Household Solar program* six, 400kWh batteries will be installed by March 2025 in Bayswater, Coogee, Dianella, Kinross, Port Kennedy, and Stratton. These areas were selected using Western Power's NOM, which indicates where location of storage or generation capacity can help avoid or defer network augmentation. To lower household

bills, customers near the batteries will be eligible for a virtual storage tariff. It will be available to those with and without rooftop solar.

Action 6b has been added to ensure community batteries meet metering requirements that enable delivery of services in market. Western Power will install the meters on new community batteries funded through the Australian Government's program as well as those previously installed as part of its PowerBank pilot.

Action 8 required amendments to Western Power's Technical Rules to clarify the requirements for distribution storage. It has been superseded by **Action 37**, which speaks to the transition of the Technical Rules into the ESMR.

Grid response and power system operations

Action 10b ensures behind-the-meter generation and storage is accounted for when managing extreme system-wide faults. Delivery has been delayed (hence the 'updated' status) but is imminent.

Action 11 is complete, with new voltage standards regulations drafted in preparation for removal of voltage and frequency limits from the EI Act by the DER legislation, to instead be more directly addressed under regulatory instruments in the ESMR. With the passage of the Bill earlier this year, the regulations will be enacted in the near-term. **Action 12b** is also complete, with DER information incorporated into system restart arrangements.

Distribution network visibility

As part of building its DSO capability and as an interim solution, Western Power has enhanced the NOM to provide additional visibility of network needs. **Action 14** requires Western Power to establish what investment is required to enable accurate forecasting and network planning for seamless NSS provision. The objective is for NSS to be provided through the NCESS process as part of everyday planning and operation. Execution of this action will require consideration of communication standards (**Action 3**), DOE implementation, information provision to aggregators, and potential changes to regulation such as the Metering Code and Electricity Networks Access Code (which will be addressed through ESMR-related actions).

Access to real-time, accurate DER device data is increasingly important to almost all actors in the SWIS. **Actions 15b** and **15c** have been added to consider and recommend how the DER Register could be leveraged to develop a dynamic 'Data Hub', inclusive of a DER Data Coordinator to manage it. Key factors for this assessment include the varying levels of confidentiality required by different proponents wishing to access the data, cyber security, and the significant interaction between the Data Hub and the revised DER connections process.

Planning for electric vehicle integration

The EVAP is the response to the DER Roadmap's **Action 16**. Released in August 2021, it kickstarted a work program to better understand the challenges and opportunities that EVs present for the network and system.

EVAP highlights are noted earlier in this Progress Report. Upcoming activities include:

Release of *Smart Connect* for EVs by Horizon Power. Smart Connect is an online EV tool that will enable customers to undertake EV supply equipment (EVSE) connection applications, and contractors to provide installation details to Horizon Power including the location, charger model and power capacity. This will provide Horizon Power with visibility of EVSE to appropriately support network demand forecasting and infrastructure planning;

- Horizon Power will also commence a 12-month EV orchestration trial. From April 2024, it aims to demonstrate that Horizon Power's DER Management System (DERMS) can provide effective automated orchestration of Smart EV chargers (including vehicle-to-grid capable chargers), thereby providing protection against power system constraints; and
- in the SWIS, EPWA in collaboration with EVAP Working Group members, is scoping pilots to orchestrate EVs as part of VPPs, collect data on charging behaviours and ways to best influence them for the benefit of customers and the grid, and explore vehicle-to-grid technology requirements. Pilots will build findings from the WA EV Charging Behaviour Study (p11) and Project Symphony (p5).

Tariffs and investment signals

New customer products

The regulated A1 tariff (for Synergy residential customers) provides no incentive to time electricity consumption and generation in a way that maximises value to the broader power system. For instance, wholesale power prices are often very low during the day due to abundant rooftop solar generation, but the tariff remains static throughout the day. New tariffs have been introduced on an opt-in basis that better enable customers to benefit from these low daytime wholesale prices, whether they have rooftop solar or not.

Following the outcomes of tariff pilots in 2022, implemented under **Action 19**, Synergy released two new time-of-use tariffs – the 'Midday Saver' and 'EV Add-On'. Referred to earlier in this Report, these products offer an 8 cent per kilowatt-hour (c/kWh) rate for electricity consumed 9am-3pm, 22 c/kWh for 9pm-9am, and a rate of 51 c/kWh for the peak energy consumption period of 3pm-9pm. The 'EV Add-On' tariff has an additional time band priced at 18 c/kWh 9pm-11pm and 6am-9am to reflect the ability for EV owners to schedule charging. The Midday Saver has over 9,000 customers and the EV Add-On has approximately 1,600.

Synergy's 'Community Energy' tariff and Horizon Power's 'Sunshine Saver' tariff are other newly introduced time-of-use tariffs. Both products have specific eligibility requirements aimed to support those that are either experiencing financial hardship or who are unable to install solar.

The Sunshine Saver product has received additional funding to expand its reach through the Community **Solar Banks initiative**. The $19.9 million partnership between the WA and Australian Governments will extend access to Sunshine Saver across regional WA, and will also deliver the **Kimberley Communities Solar Saver** program. This program will see shared rooftop solar systems installed across five remote communities in the Kimberley region assisting more than 400 First Nations households to save on energy costs and to reduce reliance on diesel generation.

New **Actions 19c** and **19d** ensure time-of-use products continue to be developed and promoted. Government incentive schemes and VPP benefits can be leveraged to drive uptake. **Action 19c** specifically refers to the development of a new tariff product based on customers accessing storage in community batteries funded through the *Australian Government's Community Batteries for Household Solar* program. A key criterion for this program is to help reduce household bills.

Action 19b has been added to reflect the development of aggregation tariffs that reward customers who participate in Synergy VPPs and provide services to the market. Synergy's 'Solar Rewards'

product is an example. Delivery of this action will be informed by behavioural and technical learnings acquired through Project Symphony, and will consider the role of third-party aggregators. It is likely that learnings from the execution of this action will inform any considerations regarding the structure of customer contracts.

DER for tenants

The **Smart Energy for Social Housing** (SESH) pilot, a collaboration between Synergy and the WA Department of Communities, commenced in 2020. The pilot aims to install rooftop solar and electric hot water systems at 500 social housing properties. Its objective is to help alleviate financial hardship and provide customers who are otherwise unable to install solar with access to its benefits. Customers are offered the 'Future Communities Plan', a time-of-use tariff specifically designed for SESH. The product features a discounted rate for electricity consumed during the day, 9am-3pm, thereby encouraging energy use outside the peak and maximum solar energy use.

Over 250 smart-enabled rooftop solar systems have been installed. Timing of **Action 20**, which speaks to installation of rooftop solar on rental properties, has been extended to reflect delivery timeframes.

VPP pilots

To enable VPPs to participate in market services across the SWIS, testing and trials must take place. Project Symphony, the flagship VPP pilot for the state and the response to **Action 23**, was a critical step toward this goal.

Project Symphony secured 911 DER assets across 514 customers to participate in a VPP. The assets included rooftop solar, hot water systems, reverse cycle air conditioning, and battery storage. Most assets (excluding heating and air conditioning which were unable to be effectively integrated) were used to develop and test the technical capabilities of project partners within simulated and real market scenarios.

Scenarios included the delivery of energy to the balancing market; constraining customer export to net and gross zero; providing a ESS to help restore a deviation in frequency (contingency raise); and managing network constraints through contracted NSS.

Action 23b – Project Encore – reflects continued testing over the 2023-24 summer period using Project Symphony assets and infrastructure already in place. Project Encore is testing scenarios that could not be completed in Project Symphony timeframes and is leveraging the lessons learned. This has included the use of DER to provide reserve capacity and assessing the orchestration of air conditioning units.

Taking VPP development to the next stage, **Action 23c** requires the scoping of a project to enable and road test commercial VPPs at scale. The project will move beyond a simulated environment and will enable and demonstrate VPP operation in the market, and put the necessary technical and regulatory infrastructure in place.

Function and capability development

The new DMO and DSO roles are central to the efficient and reliable management of the low voltage network and enabling aggregation of non-contestable customers. The roles and capability requirements of Western Power (as the DSO), AEMO (as the DMO) and Synergy (as parent aggregator for non-contestable customers) have been defined through the DER Orchestration Roles and Responsibilities work program (**Actions 24** and **25**) led by EPWA, and trialled through the Project Symphony pilot. Advancement of DER Orchestration Roles and Responsibilities Phase 2 as an extension of **Actions 24** and **25** in late 2023, has provided clarity over

each role's obligations, the implications for meeting them, and the proposed steps to get there. An Information Paper outlining the outcomes of the Phase 2 work will be released in 2024.

Actions 24b, 24c, and **24d** move the agenda forward. The first speaks to the requirement for DSO, DMO and Synergy (as parent aggregator for non-contestable customers) to develop business cases for the technical infrastructure to enable their new roles. The latter two identify markets for services that Western Power as DSO, and Synergy as parent aggregator, will need to develop.

In **Action 24c**, the DSO needs to be able to clearly signal what its network support needs are and facilitate ways to procure them as part of its business-as-usual operations. A key part of this will be developing a procurement process and making it clear how prospective service providers can engage. A vital part of this development will include procurement testing and standardised service requirements. In **Action 24d**, Synergy as parent aggregator will establish a framework for how third-party aggregators can engage with them and offer their services for market participation. This process will also consider interaction and engagement with customers to ensure clear information provision and a positive experience.

Project Symphony tested the use of DOEs to guide the level of electricity that can be exported from customer's solar and battery system, as managed by an aggregator. **Action 26** focuses on Western Power finalising data and technology needs to set and publish DOEs, and has been updated through extended timeframes. It also looks at the approach for Western Power to share information regarding scheduling and dispatch of DER resources providing NSS with AEMO as DMO, and to source the information it needs from the DMO.

In **Action 26b**, Western Power is required to develop the business processes to publish DOEs for network users to operate within, and to be able to confirm adherence with them. Business processes will include internal testing to determine hosting capacity and capacity allocations. Implementation of DOEs will allow customers to export as much solar as the grid can handle. In future as capability improves, this action may evolve to consider a DOE forecasting framework.

Actions 27a, 27b and **29** are now addressed through activities under the ESMR and regulation workstream.

Action 30 has been revised to reflect the objective of foundational VPP service provision with the ability to 'value stack' and pass value through to customers, by the end of 2025. (See DER Roadmap Evolution, p15).

Customer protections and engagement

New business models

Action 35 refers to regulation changes proposed in the AES Bill (see Key Achievements, p8). Under this legislation a framework will be developed to ensure that the protections currently available to customers for traditional electricity supply services will be afforded to customers of new energy service business models. In future this may include VPP services.

Customer engagement

Action 36 continues as an ongoing endeavour and is consistent with both Project Symphony recommendations and DER Orchestration Roles and Responsibilities work. Examples of engagement to date include EPWA's stall at the Australian EV Association's annual conference in 2023 and promotion of daytime EV charging, and

Synergy's "Greater Connected" campaign that commenced in September 2022. Greater Connected provides simple allegories for how small-scale DER connects to the broader power system to provide benefits to all on the network. Information about Project Symphony is also included on the WA Government's Climate Action website. Over the final two years of the Roadmap, this action will involve communication on priority developments that impact customers, such as new VPP products or changes to the DER connections process.

New **Action 36b** focuses on Synergy building awareness about VPP participation opportunities specifically, consistent with Project Symphony recommendations to improve customer buy-in, experience and retention.

ESMR and regulation

DER Bill enabled

The passage of the DER Bill (see Key Achievements, p7) provides the Minister for Energy with transitional powers to bring priority regulation change into effect. It also provides a pathway for how changes to the WEM Rules and various regulatory instruments under the EI Act will be made and given power as it becomes part of the new ESMR (p8). **Action 37** refers to the work being undertaken by EPWA to determine the order in which ESMR changes will be made. It will also in turn identify the sequencing for what needs to occur sooner rather than later to align with DER Roadmap priorities. Some of these changes have already been identified and have their own DER Roadmap actions assigned to them, below.

Action 38 is underway and refers to revising WEM Rules and service definitions to accommodate market participation of VPPs as soon as possible (superseding **Actions 27a** and **27b**). Consistent with the staged approach outlined earlier (figure 4), this is an area that is likely to evolve beyond the scope of the DER Roadmap to accommodate efficiencies and more sophisticated service provision.

As outlined through **Action 30**, priority changes include enabling VPPs (largely consisting of aggregated batteries) to certify for Capacity Credits in AEMO's 2025 RCM cycle (for operation in October 2027). Ensuring the DMO has visibility of VPP activities that affect market operation and planning is also a key focus.

Actions 39 and **40** are regulatory reforms following earlier actions laying the groundwork for improvements to customer equipment connection (**Action 4b**) and compliance (**Action 4**) processes, and to govern the application of DOEs to allow flexible solar exports (**Actions 26** and **26b**).

Actions 41, 41b and **41c** are new. **Action 41** involves reviewing, and then enacting changes, to Western Power's Access Regime. This includes setting up the framework and resources to enable Western Power as DSO, to account for export potential when considering network infrastructure investments. **Action 41b** builds on the Access Regime review and focuses on integrating NSS procurement via the NCESS framework into business-as-usual operations. This will include an assessment of any changes needed to the Electricity Networks Access Code to enable DOEs or to the NCESS framework. **Action 41c** is to review the structure of Western Power's non-reference services (network tariffs) to incentivise VPP participation and to identify any barriers to which aggregators may be subject.

Department of Energy, Mines, Industry Regulation and Safety,
Energy Policy WA

Level 1, 66 St Georges Terrace
Perth WA 6000

Locked Bag 100 East Perth WA 6892

Telephone: 08 6551 4600

Email: **EPWA-info@dmirs.wa.gov.au**

www.energy.wa.gov.au

DEMIRSJUNE24_8949