

# WA DER Market Participation Forum

26 June 2024





# Welcome

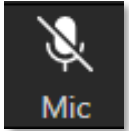
Tom Butler – Manager, WA Distributed Markets



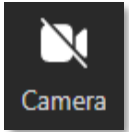
We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

**We pay respect to Elders past and present.**

# Online housekeeping



- Please mute your microphone during the presentation.



- Please leave your camera off as well, but we'd love to see you during Q&A.



- We have a Q&A session at the end of today's session.



- We will share a copy of the presentation as a pdf after the meeting on our forum webpage: [WA DER Market Participation Forum](#)

- We welcome feedback via [WADERProgram@aemo.com.au](mailto:WADERProgram@aemo.com.au)

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# Agenda

1. **Welcome** by Tom Butler
2. **DER Roadmap Third Progress Report** presented by Energy Policy WA
3. **Project Symphony final report and recommendations including Q&A**
  - Aden Barker, Energy Policy WA
  - Tom Butler, AEMO
  - James Giblin, Synergy
  - Megan Allan, Western Power
4. **Q&A and closing remarks**





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

# DER Roadmap Third Progress Report

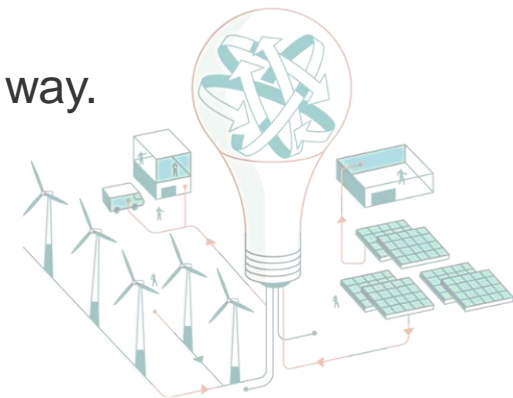
June 2024

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

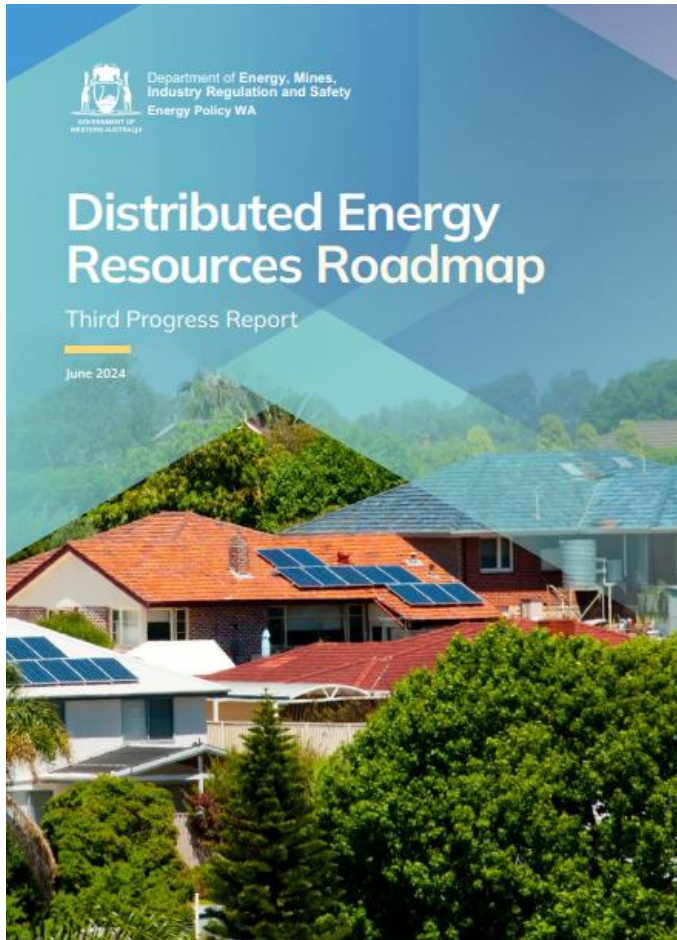
# DER Roadmap Third Progress Report

## What is the DER Roadmap?

- In April 2020, the Western Australian Government released the ***Distributed Energy Resources (DER) Roadmap*** as a key deliverable of its Energy Transformation Strategy.
- The DER Roadmap addresses the challenges caused by the uptake of customer energy devices, especially rooftop solar, while supporting continued installation and decarbonisation.
- It outlines specific actions to be undertaken through to 2025 to drive the efficient integration and eventual market participation of DER, and includes the ***Electric Vehicle (EV) Action Plan***.
- Delivery is led by Energy Policy WA in close collaboration with project partners: the Australian Energy Market Operator (AEMO), Western Power, Horizon Power and Synergy.
- The WA Government has released two progress updates to date, with a third on the way.



# DER Roadmap Third Progress Report



- Key Roadmap Achievements
- The Clean Energy Transition
- Evolution of the Roadmap agenda
- Actions going forward
- Action detail

Major milestones & developments

Energy context

Next steps and 2025 objectives

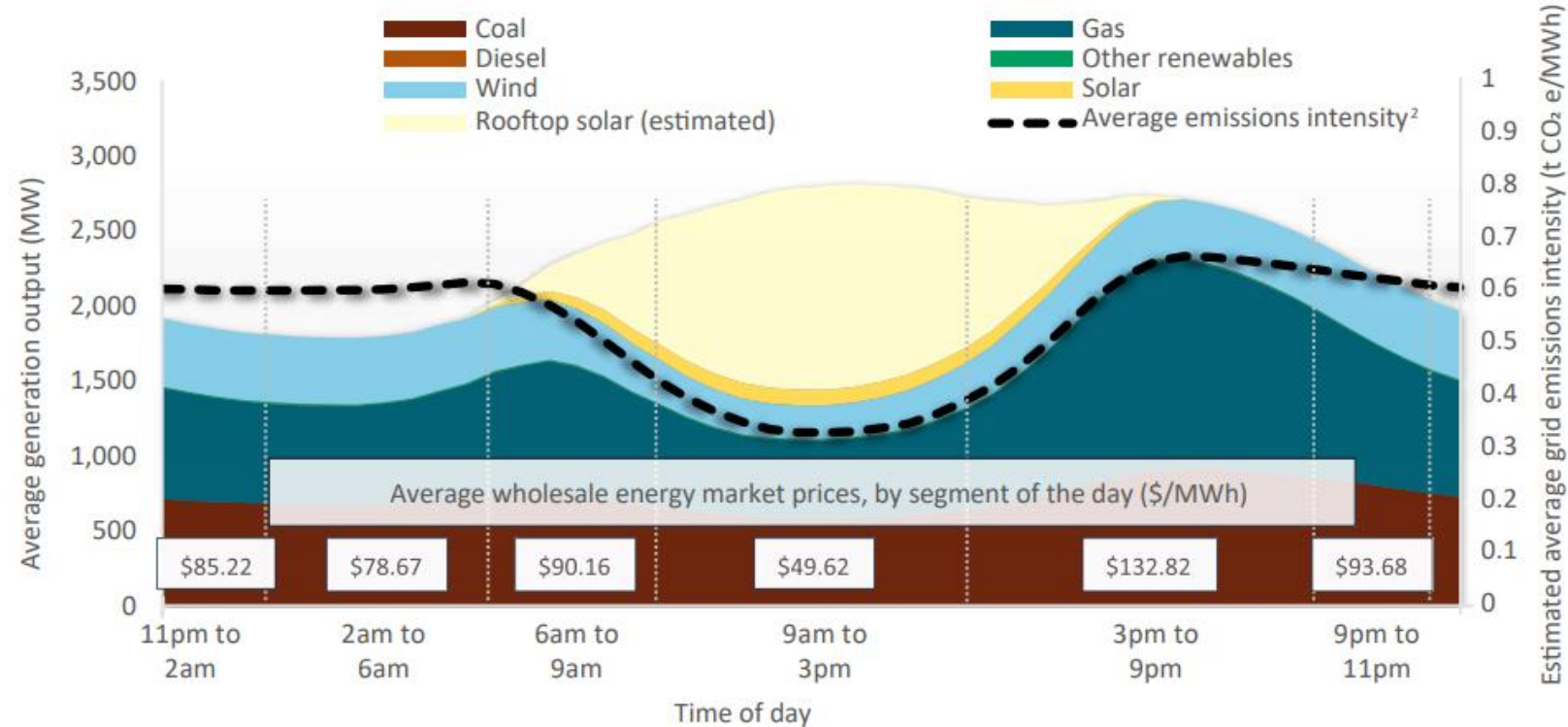
Operational information



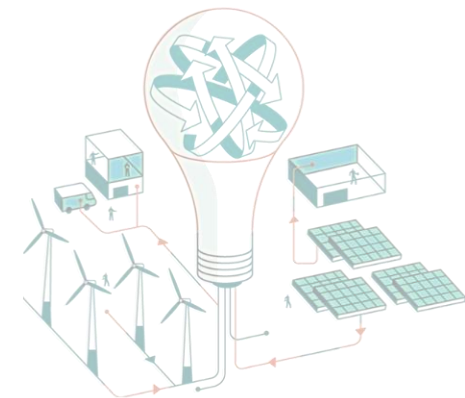
# DER Roadmap Third Progress Report

## Energy context

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.



# DER Roadmap Third Progress Report

## Clean Energy Transition

- In November 2023, the WA Government introduced the Climate Change Bill 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.
- The uptake of DER, such as rooftop solar and batteries, are key options for household and businesses to reduce emissions.
- The DER Roadmap complements & supports the WA Government's Sectoral Emissions Reduction Strategy (SERS) and Whole of System Plan (WOSP).



# DER Roadmap Third Progress Report

## Key achievements

- ✓ Project Symphony VPP pilot finished
- ✓ Emergency Solar Management (ESM) operationalised
- ✓ DER Orchestration Roles & Responsibilities Phase 2 being finalised
- ✓ DER Act 2024 & Alternate Electricity Services (AES) Act 2024 legislated
- ✓ Synergy & Horizon Power Time of Use tariffs
- ✓ Horizon Power's Smart Connect Solar
- ✓ EV Action Plan – modelling and charging behaviour study
- ✓ Community batteries – Commonwealth program





# DER Roadmap Third Progress Report

## Project Symphony

- WA's flagship VPP pilot has now concluded.
- 514 customers, 911 assets, Synergy & two third party aggregators.
- Project Symphony's Final Report was released in early June 2024.
  - See ARENA website.
- 18 recommendations
  - Focused on enabling and supporting the development of scalable, commercial VPPs in the SWIS.
  - Four themes: technical, customer, value, and policy and regulation.
  - Solar & storage as priorities delivering energy, capacity and network support.

Development area	Tier one	Tier two
<b>Technical</b>	1.1 Adopt a single communications protocol for all inverter-based DER (CSIP-AUS) to maximise asset interoperability. 1.2 Develop the business case for a 'DER Data Hub' to facilitate effective and efficient DER data exchange between the DMO, 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.
<b>Customer</b>	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.
<b>Value</b>	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.
<b>Policy and regulation</b>	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.

# DER Roadmap Third Progress Report

## ESM roll-out & benefits

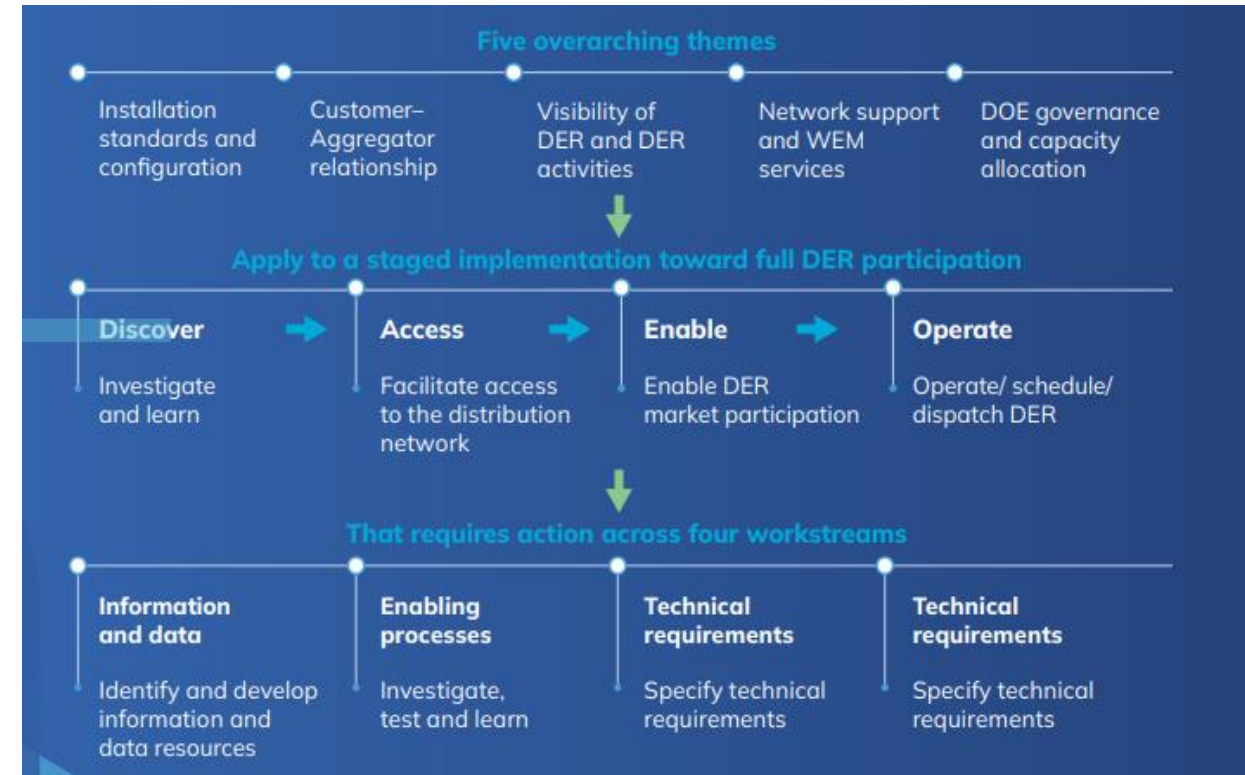
- Since its introduction in 2022, ESM can now reliably offer over 100 megawatts (MW) of generation reduction from residential customers' rooftop solar systems under emergency operating conditions.
  - Supports system security and growth in rooftop solar.
- The roll-out highlighted:
  - new ways to engage with customers and installers
  - highlighted gaps in the DER connection process
  - VPP opportunities



# DER Roadmap Third Progress Report

## DER Orchestration Roles & Responsibilities Phase 2

- The DER Orchestration Roles and Responsibilities Phase 2 Information Paper is being finalised.
- Builds on the work completed through the Phase 1 Information Paper (published in 2022).
- Articulates the foundational requirements and implementation pathways for the Distribution System Operator (DSO), Distribution Market Operator (DMO), and DER Aggregator functions in the SWIS.
- Proposes activities across five themes and four workstreams to collectively facilitate network and power system service provision by aggregated DER at scale.





# DER Roadmap Third Progress Report

## New legislation: DER Act 2024 and AES Act 2024

- The passage of the DER Bill 2024 into law amends the *Electricity Industry Act 2004*.
  - It enables most aspects of electricity regulation, including the Wholesale Electricity Market (WEM) Rules, to be centralised within a single instrument named the **Electricity System and Market Rules (ESMR)**.
- The new AES Act 2024 enables the introduction of mandatory codes of practice to improve customer protections in new and emerging electricity business models.



# DER Roadmap Third Progress Report

## DER Roadmap Evolution

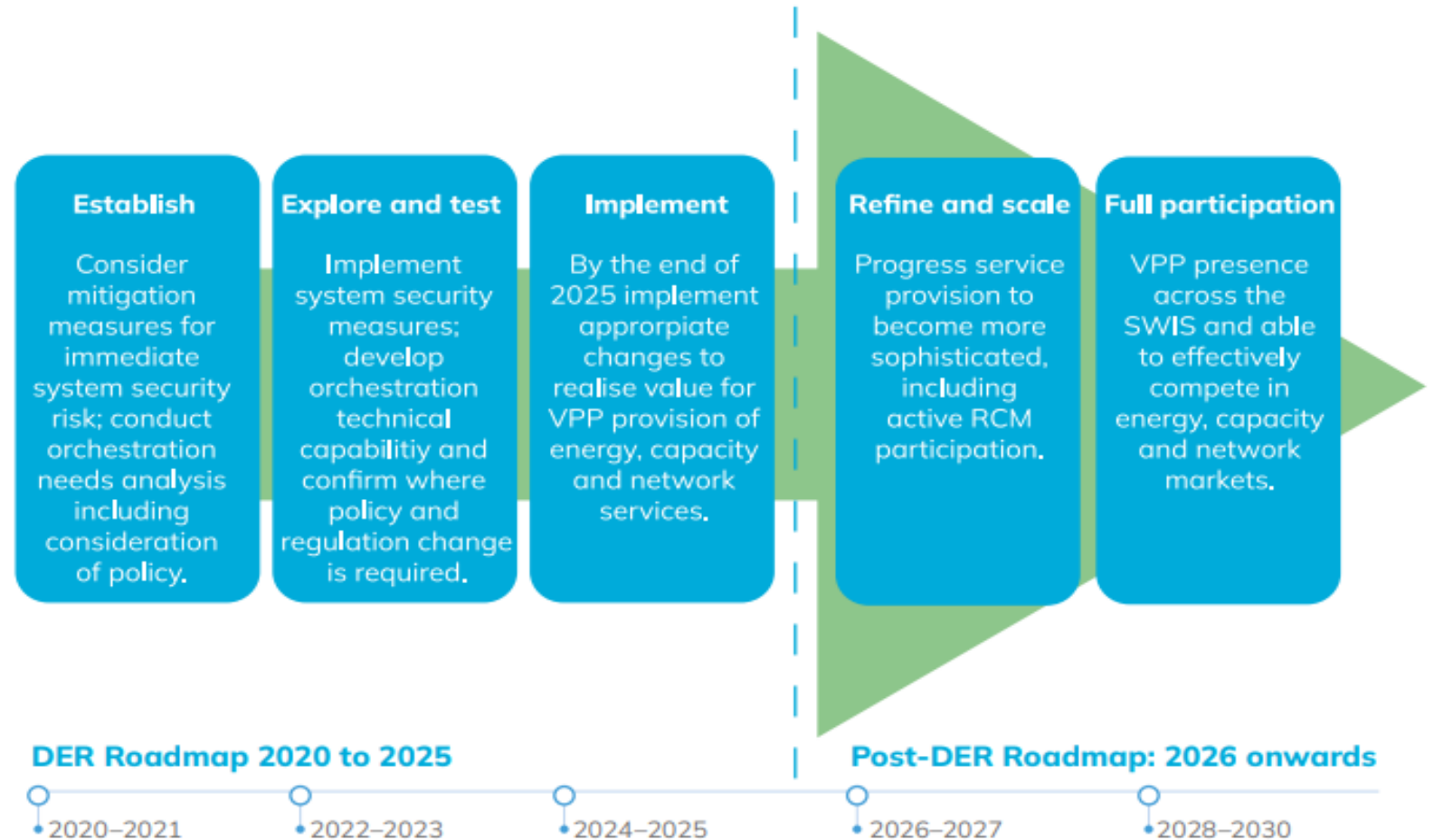
### Realising value for VPPs by 2025

**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 (NSS):** 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.



# DER Roadmap Third Progress Report

## DER Roadmap Evolution

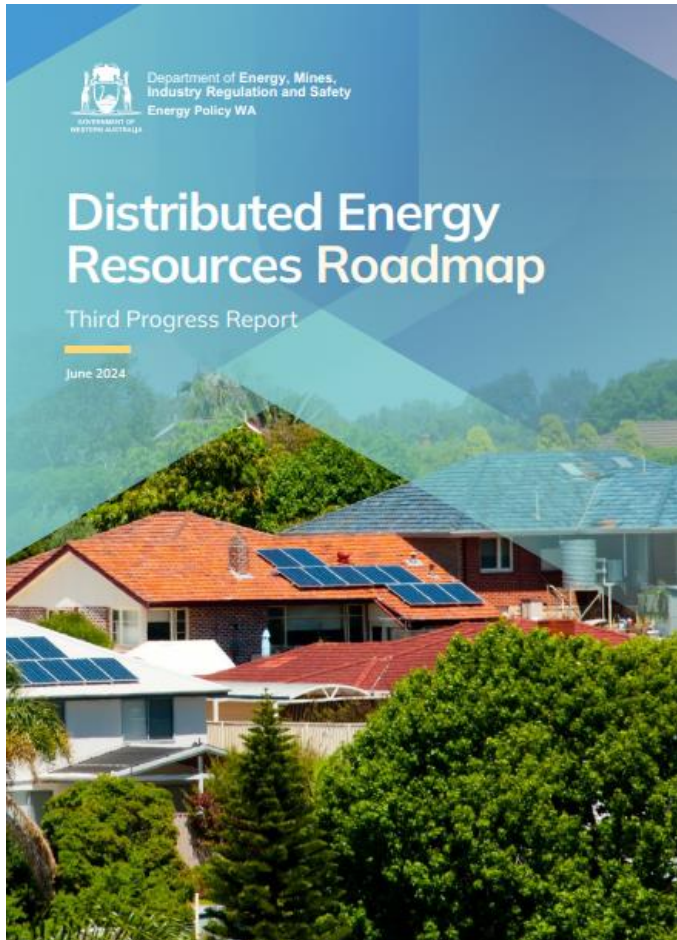
- ‘ESMR & Regulation’ – a new section has been added to the Roadmap to house all market rule & regulation related Actions.
- New actions cover off on:
  - Finish Project Encore and commence scoping for a VPP pilot to develop a commercial, scalable model
  - Assess DER connections process and implications for equipment compliance, data collection and VPP benefits
  - Aggregation-style tariffs and VPP-specific customer education and promotion
  - Capability development of DSO, DMO & parent Aggregator, including as it relates to technical platform infrastructure, network support service procurement and flexible exports
  - WEM rule and regulation review and change – identifying priority revisions and implementing those that are time sensitive to support VPP service provision
  - Commonwealth community batteries program

ACTION EVOLUTION	TALLY
Completed	25
Updated	11
<b>New</b>	<b>25</b>
Unchanged/ongoing	2



# DER Roadmap Third Progress Report

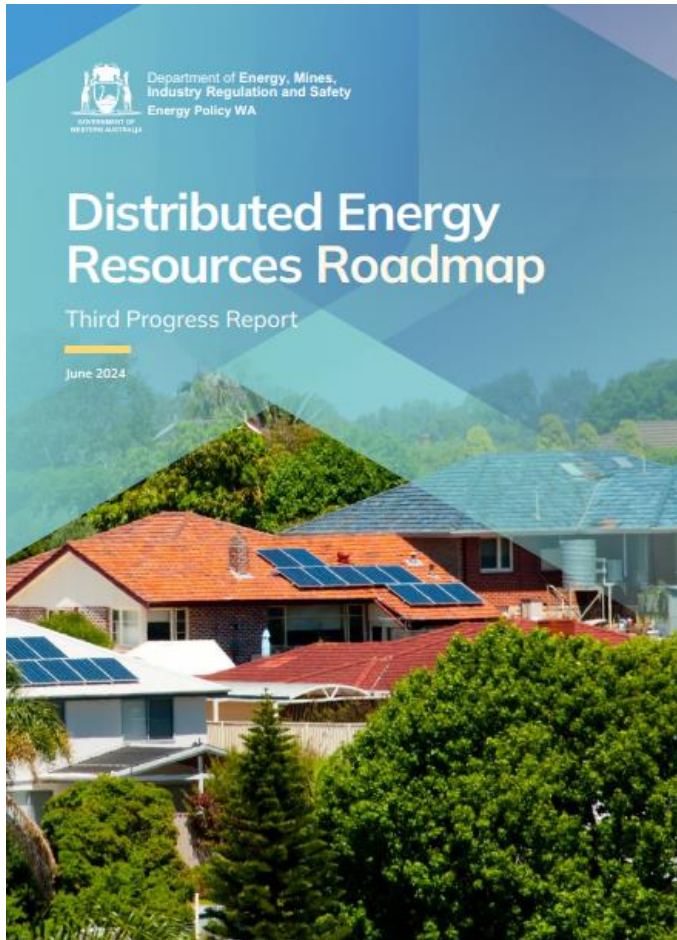
## Recap



- ✓ Significant Roadmap milestones achieved.
  - Completion of Project Symphony VPP pilot
  - Roll-out of Emergency Solar Management
  - Advancement of the DER Orchestration Roles & Responsibilities Phase 2 work program
  - Passage of *DER Act 2024* & *AES Act 2024* into law
- ✓ Roadmap supports and complements clean energy agenda.
- ✓ Progress shapes and informs direction and remaining actions of the DER Roadmap as it heads to its conclusion in 2025.

# DER Roadmap Third Progress Report

Find out more



Please sign up to EPWA to be alerted when the progress update is available.

- Subscribe to EPWA's email circulation list.
- Follow EPWA is on LinkedIn.

Any questions in meantime?

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# Project Symphony

Our energy future

## Project Symphony final report and recommendations including Q&A

Facilitated by Bruce Redmond, Principal Analyst, WA  
Distributed Markets, AEMO

In partnership with:





# Project Symphony

Our energy future

## Aden Barker

Director Electricity Networks &  
Customer Participation

Energy Policy WA

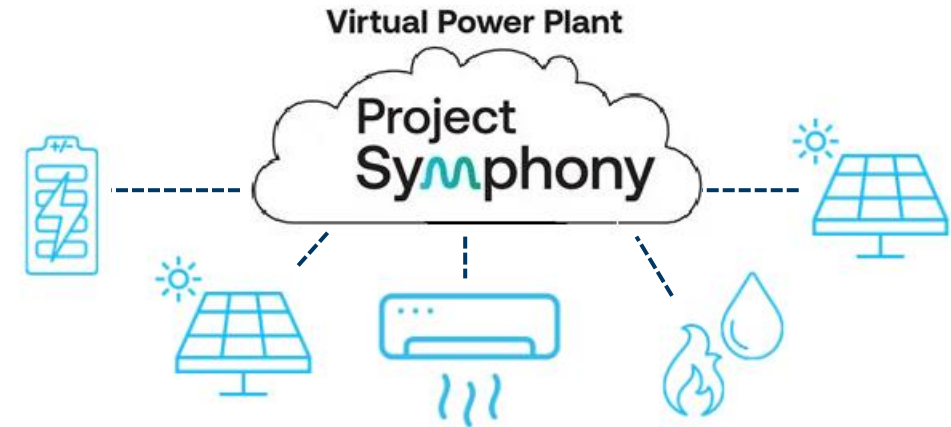
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# Project Symphony

## Overview

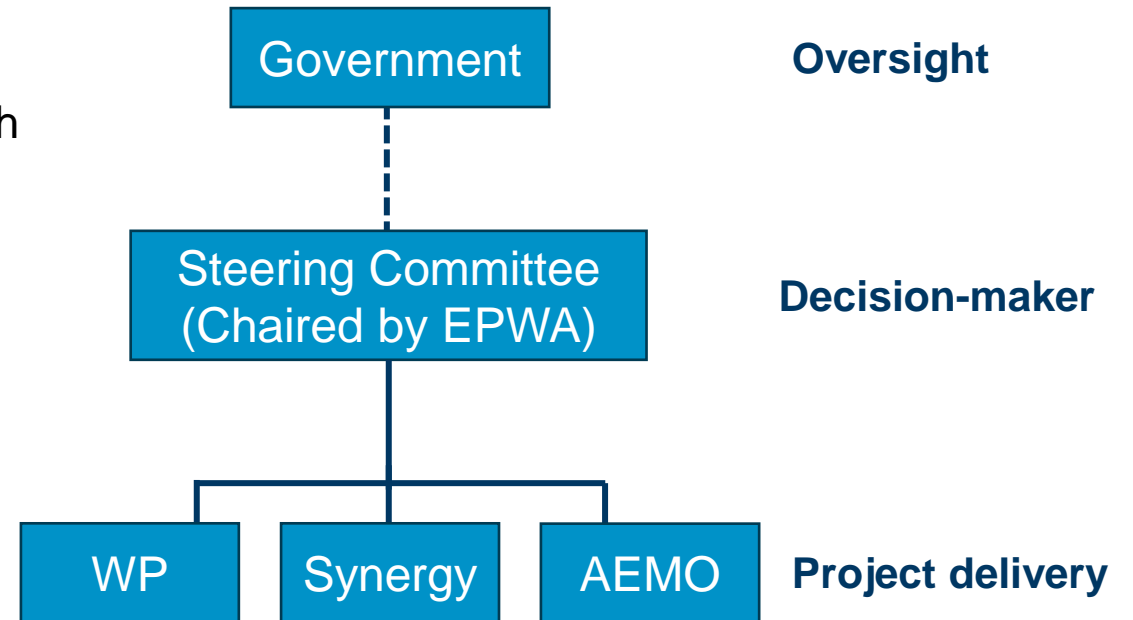
- Project Symphony was the WA Government's flagship Virtual Power Plant (VPP) pilot.
- Its commencement and implementation gave effect to DER Roadmap Actions 22 and 23.
- Its objective was to:
  - develop the necessary **technical requirements** to establish and operate a VPP in the South West Interconnected System (SWIS);
  - gain an understanding of **customer communication needs** for VPP participation;
  - **test new market functions** of 'aggregator', distribution system operator (DSO), and distribution market operator (DMO) including how they should engage with one another;
  - gain insight into the **value of DER** and its ability to provide network and market services; and
  - provide detailed use cases to **inform future policy** settings for wide-scale VPP operation in the SWIS.
- The final report was published by the Australian Energy Renewable Agency (ARENA) in June 2024 and features 18 recommendations to enable the future roll-out of VPPs across the SWIS.



# Project Symphony

## Pilot in action

- Delivered in partnership between Western Power (WP), Synergy, and the Australian Energy Market Operator (AEMO) with oversight and policy guidance by Energy Policy WA.
- Its **governance structure** was critical to success
- Over the 2.5 years it recruited and tested:
  - **514** customers in the Southern River area of Perth
  - **911** DER assets including rooftop solar and household batteries
  - **2** third-party aggregators, in addition to Synergy as ‘parent aggregator’
  - **2** large scale batteries
  - **4** core capabilities/market scenarios



# Project Symphony

## Policy impact

- Governance structure is the preferred approach for DER projects moving forward, and has led to development of the **DER Roadmap Coordination Committee**
- Insight has enabled new and updated actions to be added to the **DER Roadmap** to advance WA's DER pathway toward commercial, scaled VPP operation in the SWIS
- The four themes of Symphony's recommendations – technology, customer experience, value and policy – support the policy settings being developed as part of Energy Policy WA's **DER Orchestration Roles and Responsibilities Phase 2**
- Use-cases and experience of service provision is a key input into market rule and regulation change, now enabled through the ***DER Act 2024***



# Project Symphony

Our energy future

## Tom Butler

Manager, WA Distributed Markets, AEMO

In partnership with:



# DER Participation Principles

Any DER market participation model must actively promote critical prerequisites for effective operation of the power system to enable an overall net benefit from participation for the system, aggregators and customers.

**Visibility:** Necessary for effective and efficient decision-making by system operators

**Predictability:** Supports effective real-time operation and short-term planning of the power system

**Controllability:** Required for aggregated DER to provide market/network services, to support PSSR\* and support efficient market operation

**Scalability:** An effective participation framework is required to minimise barriers to entry, aligning with DER technical capabilities to enable value and the participation of VPPs

Aggregated DER can act similarly to existing Facility Classes in some ways...

**Finding 1:** DER aggregations demonstrate capabilities that can support system needs for the secure and reliable operation of the SWIS.

**Finding 10:** Project Symphony has demonstrated a range of capabilities, suggesting value can be derived by an appropriately designed DER participation framework.

e.g. dispatch, energy, capacity, flexibility, monitoring, compliance, forecasts

... but is substantially differently from existing Facility Classes in many other ways

**Finding 2:** Flexibility in registration is a requirement for customers, DER equipment and network changes.

**Finding 3:** VPPs are coordinated via a single orchestration platform but located across the SWIS.

**Finding 11:** The WEM's current Facility Classes do not accommodate all the observed capabilities.

i.e. VPP growth and change should be assumed, VPP operating modes considered, orchestration ecosystem needs to be enabled

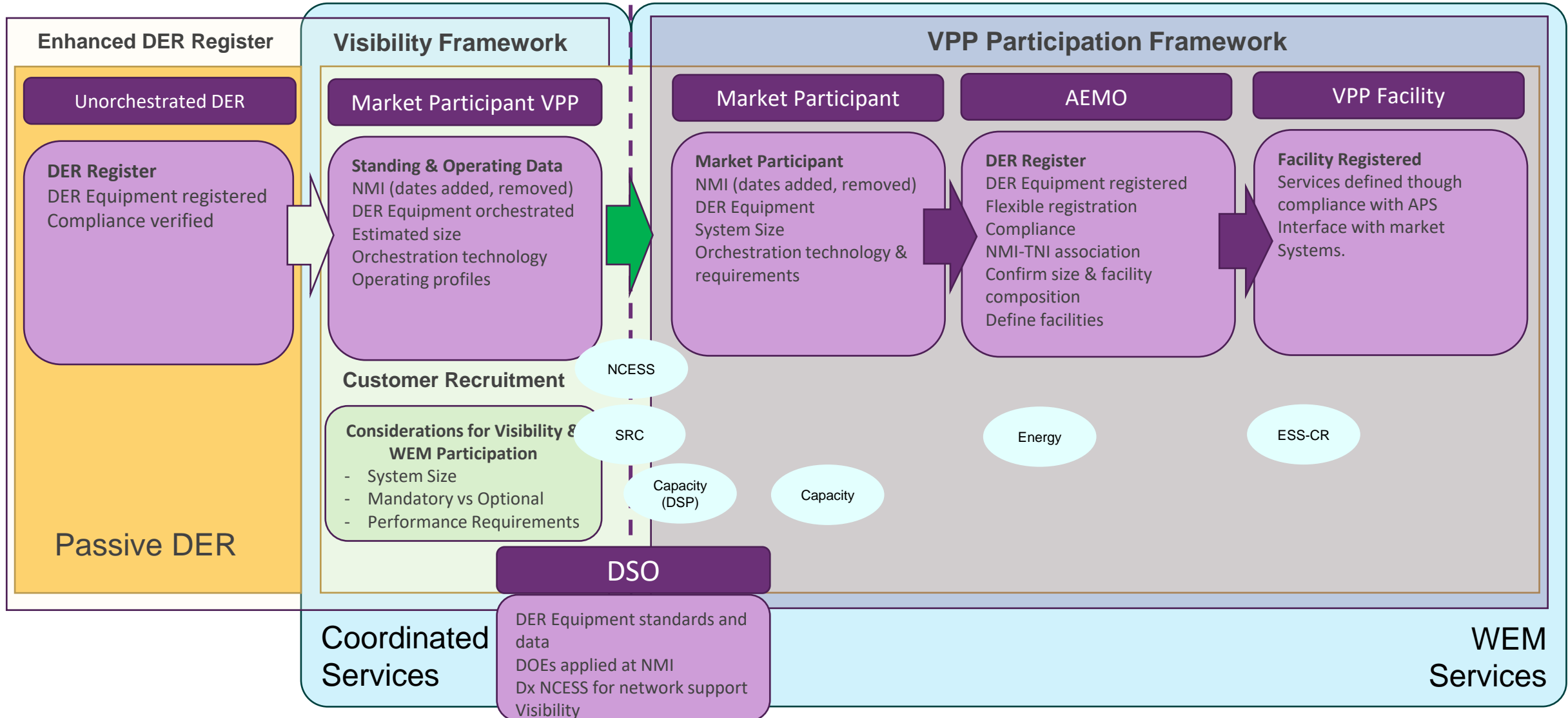
## Summary

Symphony showed what can be achieved, with strong evidence of significant capability from VPPs given guiding technical framework and investment signals.

VPPs and DER orchestration is effectively conversion of passive demand into very flexible supply + demand, and then distributed across thousands of connections – this concept has not been envisaged in the WEM.

# Framework Design Considerations

Market participation of DER via WEM registration can provide value to the DSO, WEM and customers, however this opportunity needs to be created within a deliberate framework, noting that the absence of this framework will encourage inefficient investment and potentially pose security and reliability risks as VPPs scale. Adjustments to registration and participation frameworks and new information exchanges will be required.



# Summary of Recommendations

## Participation Principles

1. Visibility
2. Predictability
3. Controllability
4. Scalability

- The Participation Model must actively promote these principles to support the benefits from participation for the system, VPPs and customers
- Barriers to entry, value streams or achieving the four principles need to be addressed to enable benefits to be balanced across all actors
- Extracting full value from Aggregated DER may not be feasible under current Facility Classes - Registration is largely based around centralised capacity, with some recognition for aggregations
- To enable the above, participation arrangements must encourage and facilitate participation through a fit-for-purpose and planned framework

### Central Recommendation 3.1

#### *Value (New Energy Market)*

3.1 Commence work on policy solutions to establish market frameworks that support the participation of DER aggregations in the WEM.

### Central Recommendation 4.1

#### *Policy & Regulation*

4.1 Support VPP visibility for the DMO and DSO through implementing amendments to wholesale electricity market rules as required.

**Fulfilling the recommendations 3.1 and 4.1 requires deep consideration of the end-to-end DER orchestration ecosystem, and WEM participation arrangements including whether the existing Facility Classes enable all four principles to be met by registering VPPs in the WEM.**



# Project Symphony

Our energy future

## James Giblin

Head of DER and OT, Synergy

In partnership with:



# Technical & Asset Learnings

## Lessons & Challenges



### Complex Installation Processes:

- Multiple site visits were required for installation and troubleshooting of DER assets.
- Significant resource investment for retrofitting existing installations.
- Resource requirements and complexity for the implementation limits the scalability of solution rolled out in the pilot
- Complex and lengthy process for onboarding assets onto the platforms



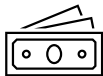
### Compatibility Issues Across OEMs:

- Variability in customer equipment necessitated extensive customization
- Limited interoperability with existing DER assets due to diverse manufacturers and modes,



### Air Conditioning Challenges:

- Only 35% of A/C units were compatible with the AS4755 demand response standard.
- Technical difficulties integrating A/C units with DRM systems. Infrared control systems were unreliable for remote management.



### Additional Technical Challenges:

- High costs and delays due to customization for diverse asset specs
- Non-compliance issues, such as PV inverters set to incorrect country codes, affecting power quality and reliability
- HSDR installation and utilization turned out to be challenging, due to incorrect installations and limited asset performance in ESS events

## Recommendation & Path Forward

### Standardization Needs:

- Adoption of uniform standards for installation and configuration to streamline processes.
- Development of clear guidelines and training for installers to ensure consistent quality.

### Enhanced Integration Protocols:

- Robust, standardized communication protocols are crucial to handle diverse DER assets.
- Importance of interoperability in reducing integration complexity and costs.

### Compatibility of Assets:

- Ensuring compatibility across various DER assets is essential for seamless integration.
- Development of interoperable systems to handle the diversity of DER assets effectively

### CSIP – AUS

- Adopt a single communications protocol for all inverter-based DER (CSIP-AUS) to maximise asset interoperability.

# Customer Key Insights & Learnings



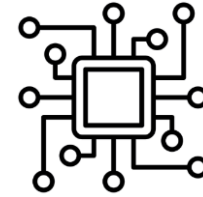
## Communications

- Clear & simple communications were needed (less jargon)
- Customers wanted regular informative updates with more information around the 'why' of the pilot
- The project listened to feedback and was prepared to pivot their approach



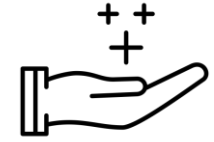
## Orchestration

- Orchestration caused behavioural changes to customer energy consumption
- Greater transparency around orchestration activity was desired including the ability to 'opt out'
- There was a fear of bill impact that wasn't realised
- Customers noted a disruption in their solar optimisation
- Giving up control of assets was challenging for some



## Technology

- More detail was needed around the technology required for asset orchestration and the installation process
- There was a lack of familiarity of technology in homes
- Time & effort was required by customers for installation, information seeking & site assessments



## Perceived benefits

- **Monetary** – cost savings, asset subsidies
- **Functional** – future energy savings (battery), technological upgrades
- **Personal values & social good** – contribution to environment / community / future energy solutions

# Synergy DER Platform

Where we are heading

## DER Platform Program Objectives

1. We want to develop technical capability to aggregate and orchestrate at scale in a low cost, 'future ready' manner
2. Work with partners to aggregate and orchestrate in an efficient and cost-effective way

How do we measure progress

### Progress indicators

Reduced Costs of compliance by driving standards  
Flexibility to adapt to changing needs quickly  
Ability to scale on demand

How are we navigating

### Guiding Principles

Reduce Vendor Reliance  
Modularised Platform approach  
Defined Architecture Patterns  
Conformity to Standards

Where we are

Expensive Operating Costs  
**Fragmented Technology Landscape**  
Lack of standards and guardrails  
**Reactive platform and technology build**  
Vendor immaturity / Vendor Lock In / Volatile vendor market



# Project Symphony

Our energy future

## Megan Allan

DSO Enablement Manager, Energy Transition –  
Distribution, Western Power

In partnership with:



# Learnings and Opportunities

## Technical

Delivered pilot Distribution System Operator (DSO) capabilities including Dynamic Operating Envelopes (DOEs) and Network Support Services (NSS) to enable customer owned DER to participate via Virtual Power Plant (VPP).

## Customer

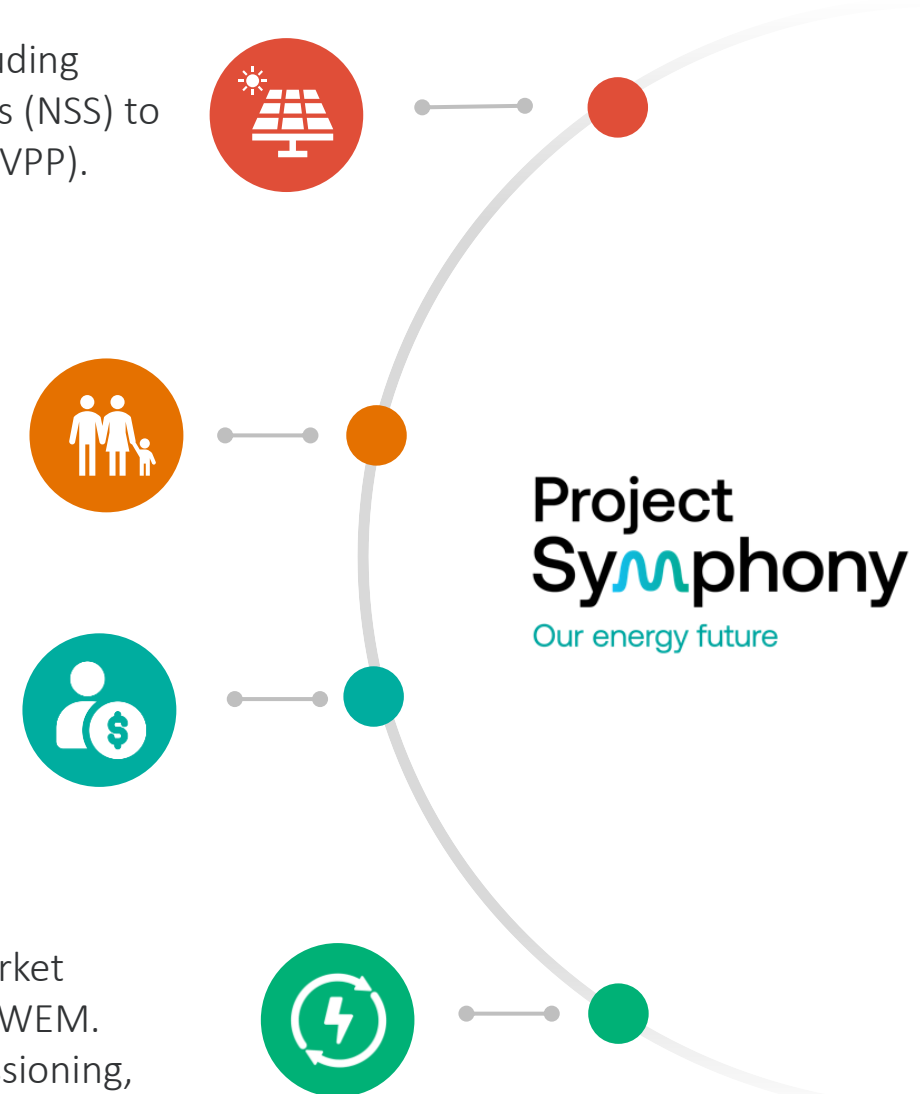
Customer engagement and participation is key to aggregating DER and unlocking greater benefits for customers, the network and the broader energy system.

## Value

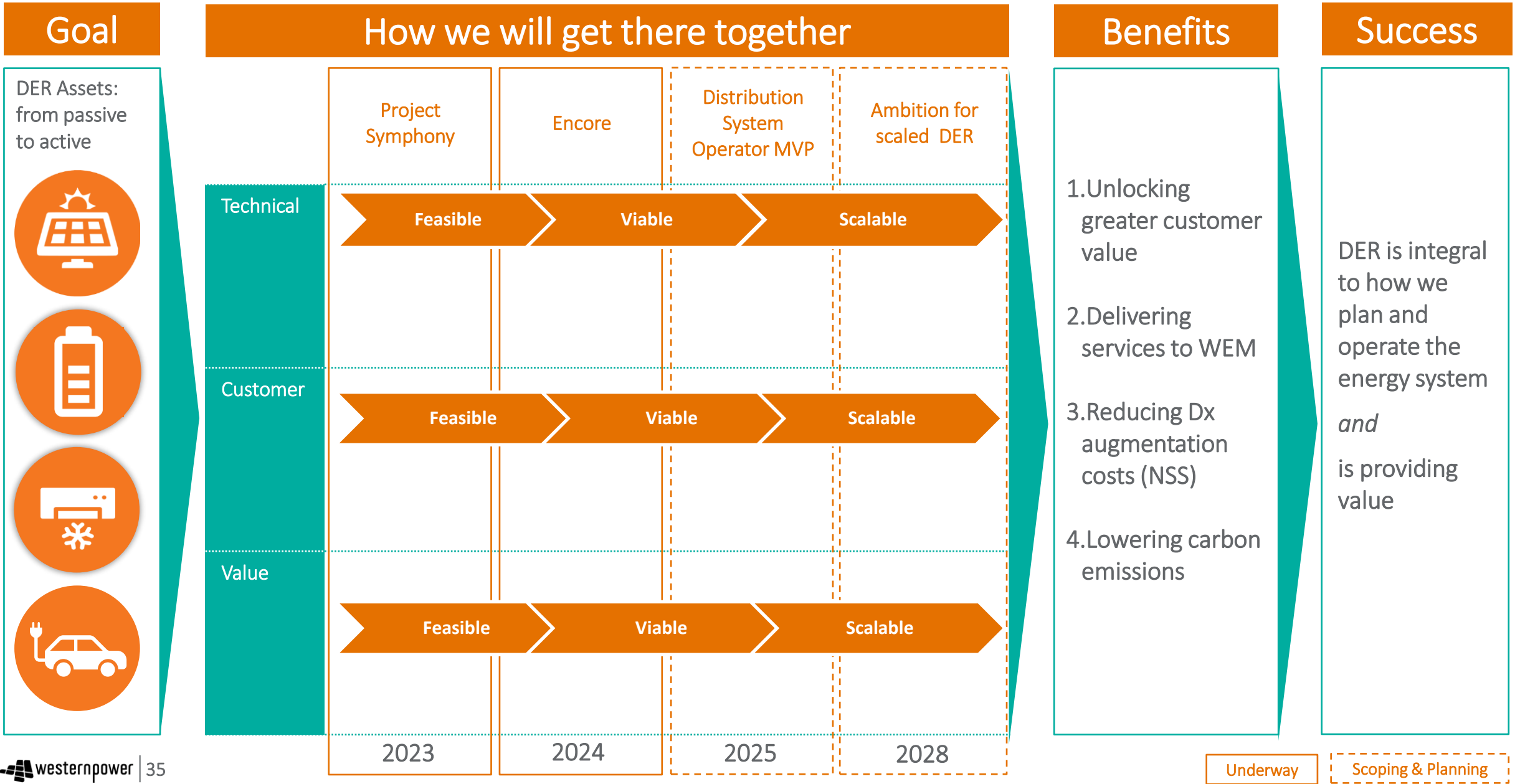
Accessing and distributing benefits across the value chain is essential to VPP growth. Utilising battery storage at all levels of the distribution network for multiple services (value stacking) including the opportunity to reduce peak demand and defer costly network augmentation is key.

## Policy and Regulation

Further progress policy and WEM Rule development to establish market frameworks that support the participation of aggregated DER in the WEM. Review and reform end to end DER installation, connection, commissioning, monitoring, and compliance processes and regulatory framework.



# The Distribution Network as a platform to unlock greater benefit



# Distribution System Operator

## Our DSO Vision

The Distributed System Operator will enable **orchestrated** Distributed Energy Resources (DER) to deliver the social, environmental, and economic benefits for our community while maintaining a safe and reliable energy supply.

DSO/DNSP **understands** orchestrated DER and uses improved network visibility to **maintain delivery of safe and reliable electricity services**. This is achieved by evolving **outage management; system/network security and DER compliance activities**.



DSO **enables** aggregators & customers to use orchestrated DER to provide **energy and essential services to the wholesale market**. This is achieved through publication of increasingly sophisticated **operating envelopes**.

DSO **understands and uses** orchestrated DER to maintain efficient and reliable electricity supply. This is achieved through **procurement of network support services, dynamic connections and whole of system planning**.



# Q&A

Facilitated by Bruce Redmond





For more information visit

[aemo.com.au](http://aemo.com.au)