

DER Roadmap Update

Presented to WA Electricity Consultative Forum

By Tom Butler, Manager, Distributed Markets WA

10 February 2021

DER Roadmap – Program status review



Status: Green

- Green status recognising the detailed planning and early execution undertaken post ERA determination.
- Status reporting to ETIU is green and AEMO remains committed to meeting the established DER Roadmap activity milestones.
- Revised planning anticipates program scope can be managed within amount determined by ERA, and AEMO is seeking additional contribution from the Federal Government for Project Symphony.
- Significant planning and early execution undertaken in 2020 positioned the program for ramp up and success across 2021-23.



Technical activities / actions

- AEMO shifted focus late in 2020 to expedite analysis on the behaviour of DER during system disturbances, leveraging leading national capability and experience. Now also feeding into detailed examination of system security risks during low load conditions, and the development of dynamic models of DER and load being undertaken with deeper understanding of DER behaviour.
- Reviews of under frequency load shedding under way in partnership with Western Power, and system restart review to commence.



Market Design and trial activities

- Significant design effort has already gone into Project Symphony including development of market use cases to be tested within the project alongside network support services (conceptually within a 'Hybrid model' for DER orchestration).
- Architectural design undertaken for DMO capability, and Aggregator and DSO platform integration design underway.
- Commencing early consideration of arrangements for DER Participation under post WEM Reform environment, and engagement with ETIU.



Resourcing

- Successfully established core SME team with project support in place, leveraging WEM and NEM experience.
- Ramp up of technology specialists required to support Project Symphony.



Implementation

- DER Register implementation progressing well with progressive go-live expected over March-June this year.

The DER Roadmap

2020



Distribution Storage

Western Power PowerBank installations commence, providing opportunities for network and customer benefit whilst adding to power system stability



Distribution Network Visibility

Distribution network visibility program commences to enhance the understanding of distribution network power flows and constraints



Inverter Settings & Functionality

SWIS-specific autonomous inverter settings that provide better performance during disturbance events are enabled



Customer Engagement

Customer engagement program commences on challenges and opportunities of the high-DER future

The Energy Transformation Taskforce's DER Roadmap provides an integrated set of actions designed to deliver a future where DER contributes to a safe, reliable and efficient system where all customers can enjoy the benefits of DER.



Technology Integration

- Inverter Standards
- Distribution Battery Storage
- Grid Response
- Power System Operations
- Distribution Network Visibility
- Planning for EV Integration



Tariffs and Investment Signals

- Tariff Pilots
- DER for Tenants



DER Participation

- Network Investment Process
- DER Orchestration Pilot
- DSO/DMO Function Set



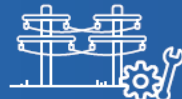
Customer Protection and Engagement

- Data
- New Business Models
- Customer Engagement



DSO/DMO

DSO/DMO roles, functions, practical operations, regulatory requirements, as well as costs and benefits have been identified



Grid Response

Investment in grid support technologies (including reactors, storage and voltage control equipment) by Western Power is contributing to maintaining system stability on low demand days



Tariff Pilots

Pilots for alternative tariff structures have commenced, demonstrating value to consumers who can move electricity use to the middle of the day



DER Orchestration Pilot

A comprehensive VPP technology and market participation pilot has commenced, testing the incorporation of aggregated DER into the WEM

2021



Distribution Storage

Western Power has identified emerging network needs and has access to network storage services from the market



System Operations

The System Operator's dynamic system modelling adequately incorporates DER and arrangements adequately address power flows during system events



Tariff Pilots

Learnings from tariff pilots are guiding the transition to new pricing, driving system-efficient behaviours and investment in storage that have the potential to lower energy bills



DSO/DMO

Changes to wholesale market arrangements necessary to enable the participation of DER in the WEM via a DER aggregator are introduced



Customer Engagement

Customer engagement program continues



Network Investment Process

An amended Access Code is providing increased opportunities for DER innovators to provide services to Western Power and receive revenue for doing so

2022

DER Roadmap Complete

- DER is being leveraged for value across the supply chain, including to secure the network, and providing value to customers;
- Innovative business models with appropriate licensing are providing value to customers and the system as a whole; and
- The DSO and DMO are coordinating effectively to ensure customers can continue to connect their DER into the future

2024



Distribution Storage

Distribution storage continues to be deployed under a variety of business models, and can access value across the supply chain

2023



DSO/DMO

DSO and DMO goes live in the SWIS, with DER able to respond to meet network needs as well as be dispatched into the WEM, and be compensated appropriately



DER Orchestration Pilot

A comprehensive VPP technology and market participation pilot has tested the incorporation of aggregated DER into the WEM (including market dispatch and settlement arrangements)



Inverter Settings & Functionality

Communications-linked inverter standards are enabled, providing for DER orchestration and the capability to participate in multiple markets

Figure A: the DER Roadmap workplan and priority actions

DER Roadmap – Implementation timeline

Workstream	2020				2021				2022				2023				FY24	FY25	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Technology Integration			Action 1: Inverter performance standard updates																
				Action 13: Dynamic modeling uplift															
				Action 10: Under Frequency Load Shedding															
					Action 12: System restart														
					Action 3: Inverter communications and cyber updates														
					Action 4: DER monitoring and compliance														
WEM DER Register			Action 15: DER Register																
DER Orchestration Pilot		Action 22 and 23: Project Symphony																	
DER Participation				Action 24: DSO/DMO Roles															
					Action 27: Wholesale market arrangements														
					Action 26: Operating envelope protocols														
					Action 25: Reg. review														
						Action 29: Legislative and regulatory arrangements													
DER Orchestration Implementation								Action 30A: DMO planning											
										Action 30B: DMO Implementation							Action 31-32: Network Services Market Trial		

Questions and Feedback

Email to WADERProgram@aemo.com.au