The 100MW Challenge Pilot

Are Flexibility Services a reliable and economic alternative to manage customer owned solar generation constraints?

June 2020

Understanding the DSO

(Distribution System Operator)

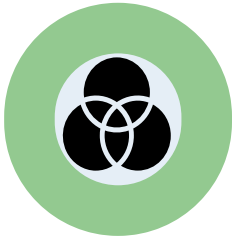
What is a DSO?

The Distribution System Operator (DSO) is a term used to describe a set of functions that are required to take place for effective network management at the distribution network level.

For these functions to be realised, there are ‘key enablers for DSO’: material improvements to the foundational building blocks on which smart, flexible networks and DSO function delivery will rely.

These step-change enhancements **will meet user’s needs**, and are built on a number of incremental individual technology, data and engineering improvements.

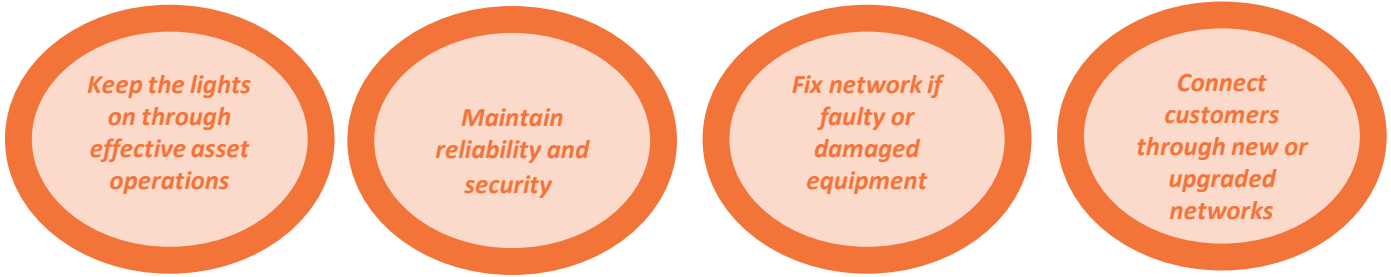
Customer Choice ↑ for non-network solutions



Optimised Investment ↑ in higher voltage networks

From DNSP to DSO

Current network roles



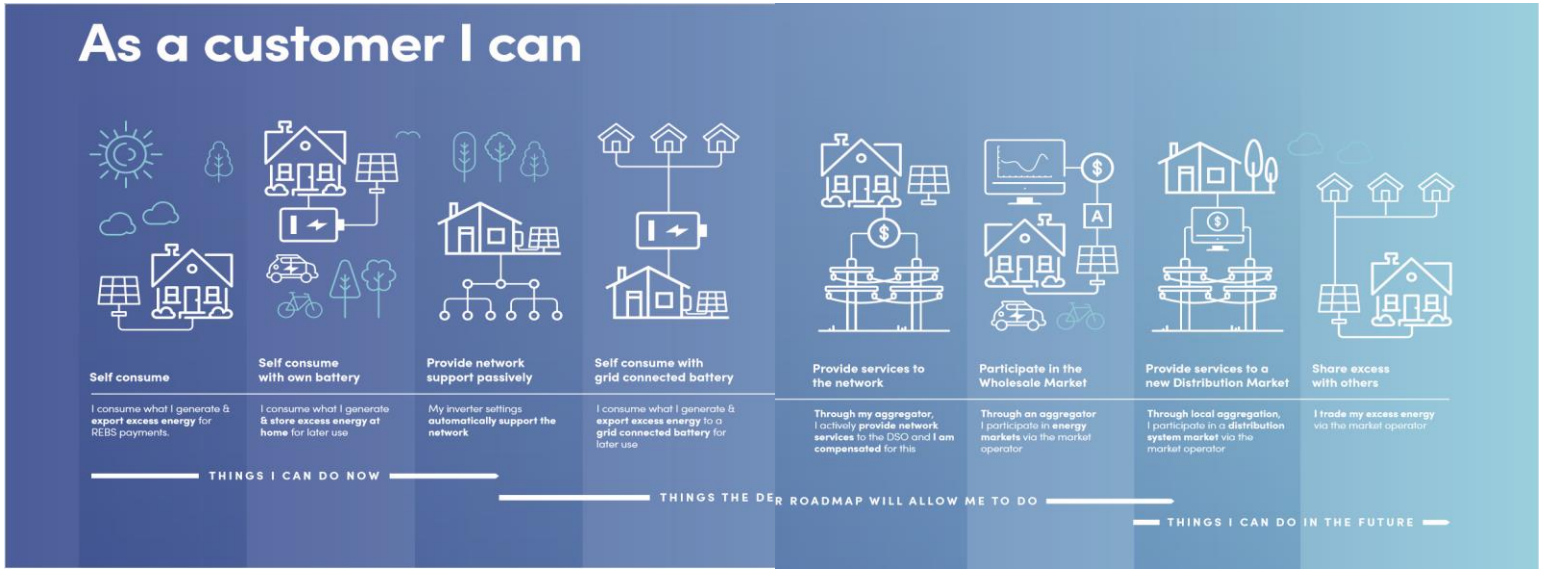
Expanding network roles → DSO

Why DSO?

Enter the Customer.

The evolution from a DNSP to a DSO is essential to driving performance and efficiency from our network and ensure it is fit for purpose and can meet future energy demands of all our customers.

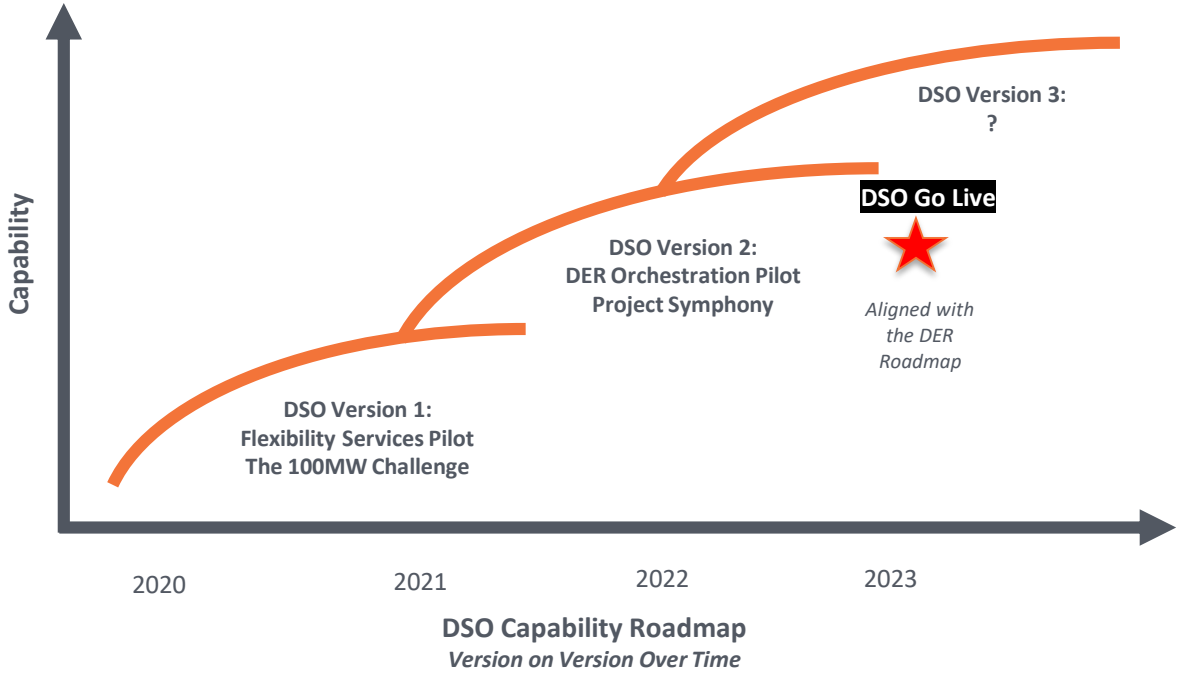
The enhanced DSO capabilities we are developing will enable customers to be both producers and consumers of energy; and will give them the freedom to access other value streams within the transitioning energy system.



Western Power's DSO Strategy

DSO Capability Roadmap

Aligning with the network constraints, the DER Roadmap 2023 DSO 'Go Live'



The DSO's DER Management Plan

From a duck

To a platypus

SHORT-TERM

- Operational responses
- Trials of alternative solutions
- No-regrets investments

MEDIUM-TERM

- Traditional responses – reactive support and augmentation
- Larger scale pilots of alternate solutions
- Move understanding forward

LONG-TERM

- Optimised mix of traditional and alternative solutions
- Active control

The DER Roadmap

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.

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

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

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

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

2022

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

2023

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

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

2024

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

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

The Flexibility Services Pilot

Version 1: The Flexibility Services Pilot – FY20

How do we verify that Flexibility Services are a viable service offering of a DSO?

- How can we engage and incentivise C&I customers to manage PV generation or shift/create load to the tune of 100MW to support distribution network constraints?
- Can we contract 100MW worth of flexibility services with both Commercial & Industrial (C&I) customers and aggregators – via bilateral agreements?
- What processes and capability do we need to deliver this initiative within Western Power?

Flexibility Services Explained

Owners of DER will be able to alter their behaviour to minimise conflicts on the network and maximise their potential revenues

1. Energy users and PV generators will sign up for voluntary increases in energy usage, in return for payment by Western Power. Through this model, Western Power will receive the support services it needs to help balance supply and demand and stabilise the distribution grid

2. Western Power are the ‘customer’ and are buying ‘flexibility services’ from Commercial and Industrial (C&I) organisations, and channel partners who may represent groups of these organisations

3. Flexibility Services are in the form of load offerings (such as a manufacturing plant, that needs lots of power ‘load’ to run the plant and can create more load when required) or solar PV offerings - a company solar PV generation that can be managed when required (a site that’s producing lots of solar power)

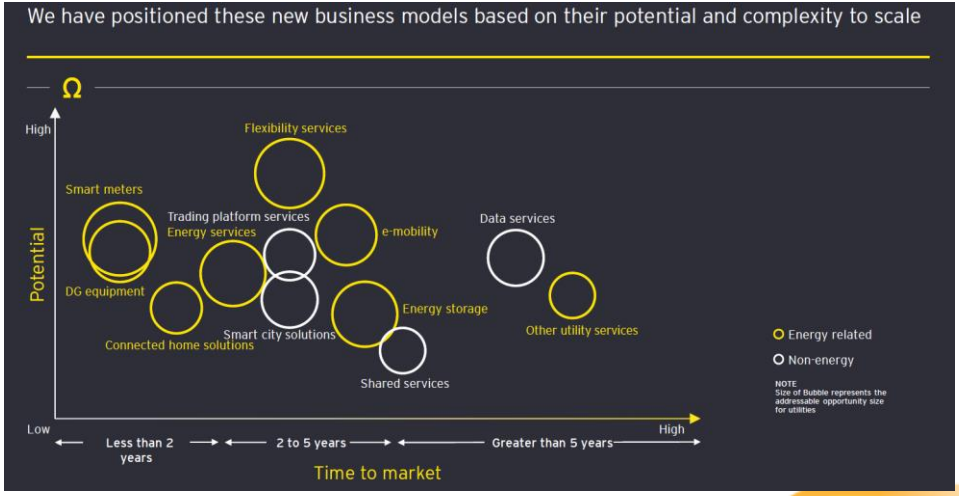
Why Flexibility Services?

Flexibility services can help distribution system operators run more efficiently through controlling power and energy flows across network infrastructure.

As electricity generation becomes much more distributed, much more flexibility will be needed across the distribution network.

This ‘flexibility gap’ will need to be covered by new flexibility options, some of which will be facilitated by a DSO.

Flexibility Services – A Global Context

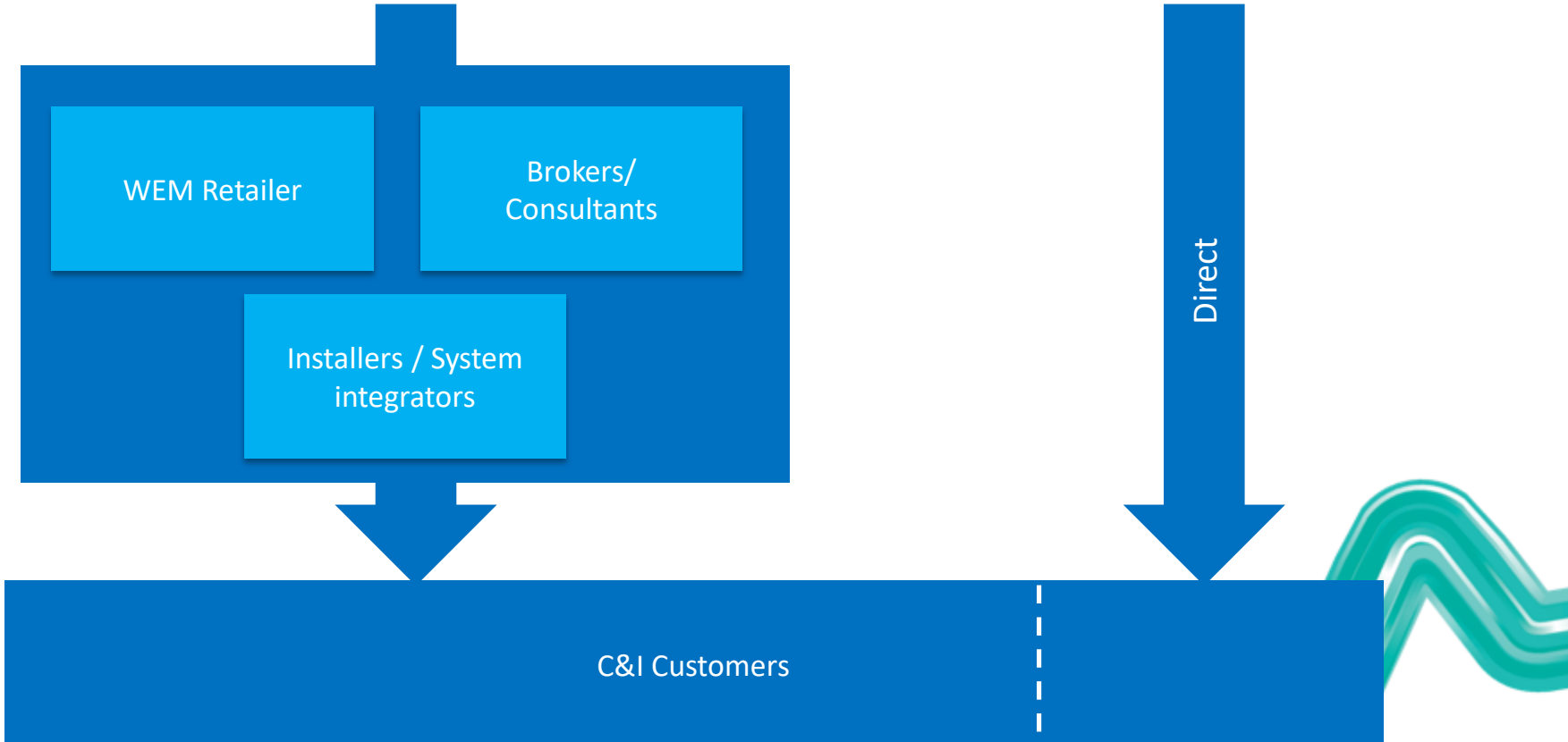


Credit: EY, Dec 2019

Engaging flexibility providers

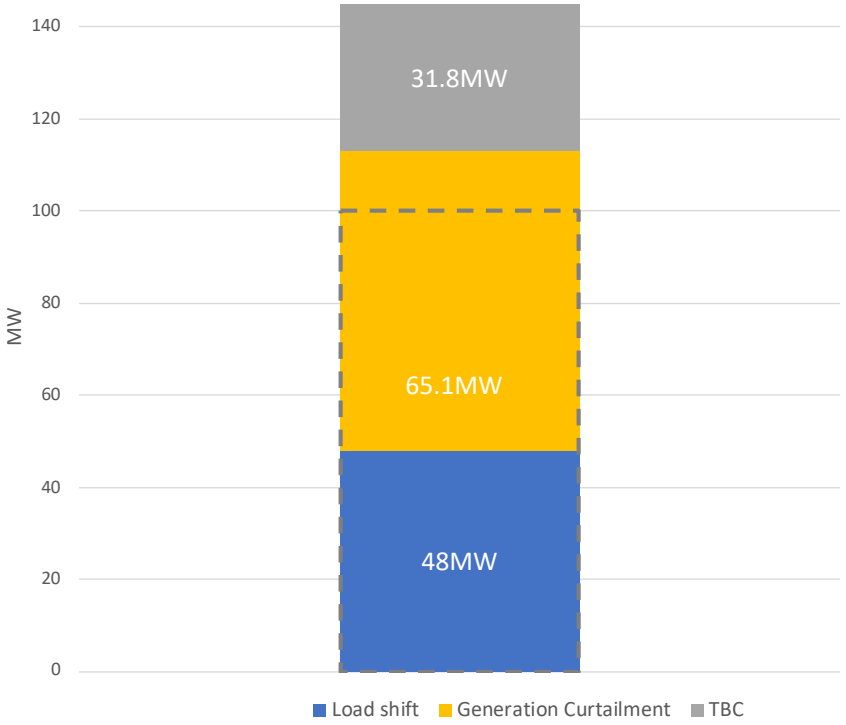
Two-pronged approach to engagement

Leveraging partner relationships with some direct engagement with customers



Customer Pipeline Breakdown (As at May 2020)

Prospective Participants by Load Type



Prospective Participants by Channel