# Agenda

1 Project context (Andrew Blaver, Western Power PMO)

2 WA DER Roadmap (Jai Thomas, Energy Policy WA)

3 Project overview (Andrew Blaver, Western Power PMO)
  ➢ Deliverables
  - Kathryn Granheim, Western Power
  - Ed Averill, Synergy
  - Bruce Redmond, AEMO

4 Alignment with other DER projects (Dani Alexander, UTS)

5 Q&A

Distributed Energy Resources (DER)

We are at the beginning of a **sustained expansion of Distributed Energy Resources (DER)**.
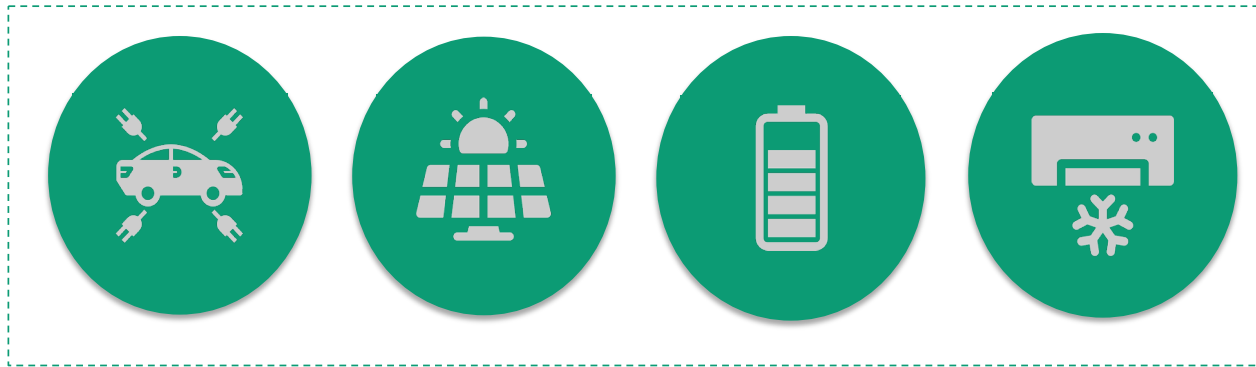
1.1GW
Solar Generation

Can Serve
45%
Underlying Demand

1 in 3

Aggregated rooftop solar is likely to become **the largest, cleanest and cheapest source** of electricity generation.

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Energy Policy WA

Challenges & Opportunities

Distribution networks have limits to the amount of renewable energy that can be connected (hosted) which if breached can cause local and system level power quality and reliability issues, including blackouts.

Increased penetration of rooftop solar has begun to cause technical issues in the Western Power network.

"Coordination of these distributed resources is essential to alleviate the challenges and convert what could otherwise be a challenge to the system into an asset." (AEMO/ENA)

"Other people see it as a problem, we see it as an opportunity, and so we really want to unlock that value." Energy Minister Johnston

Duck Hunting

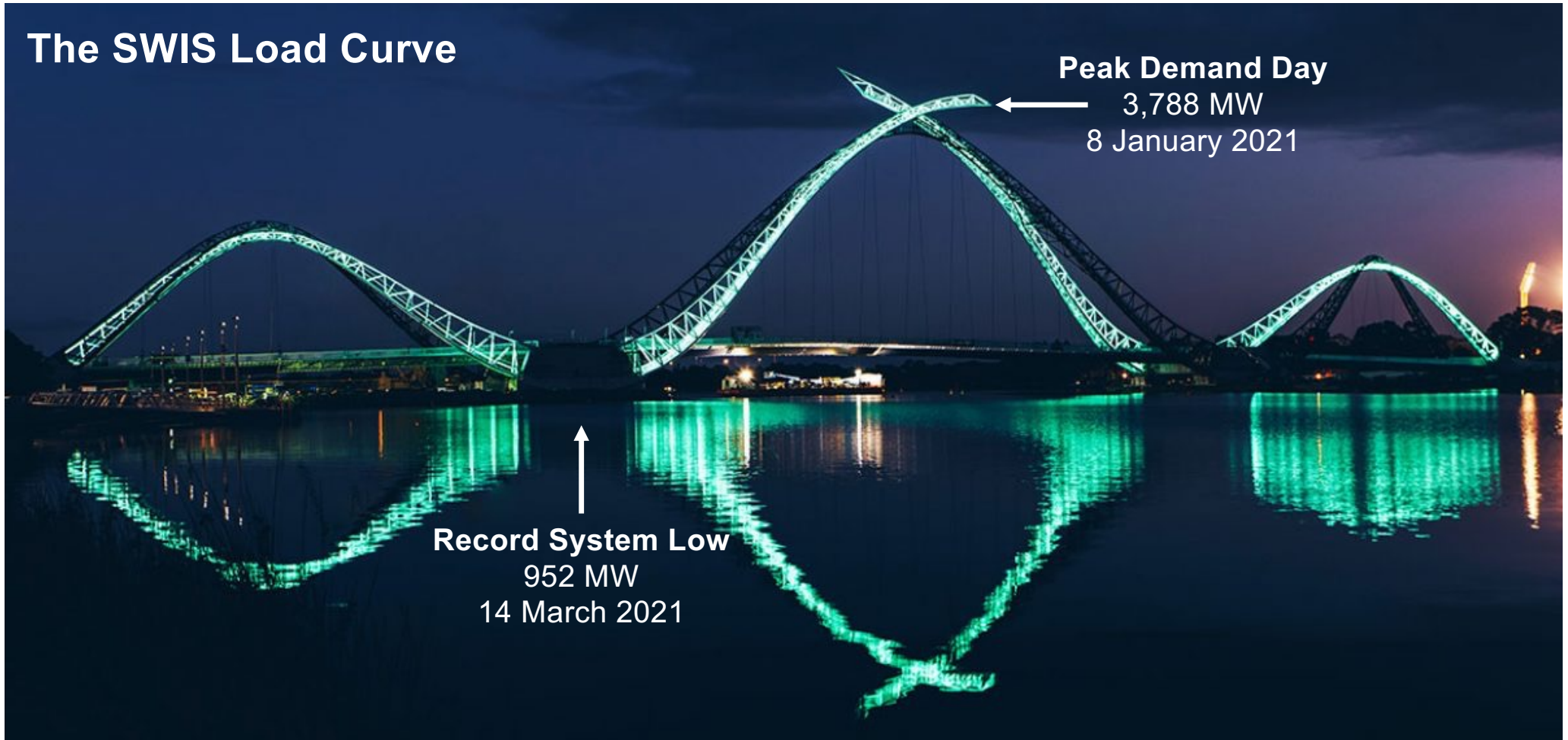SNR 540 SOUTHERN RIVER 4-Dec-2020 to 10-Dec-2020
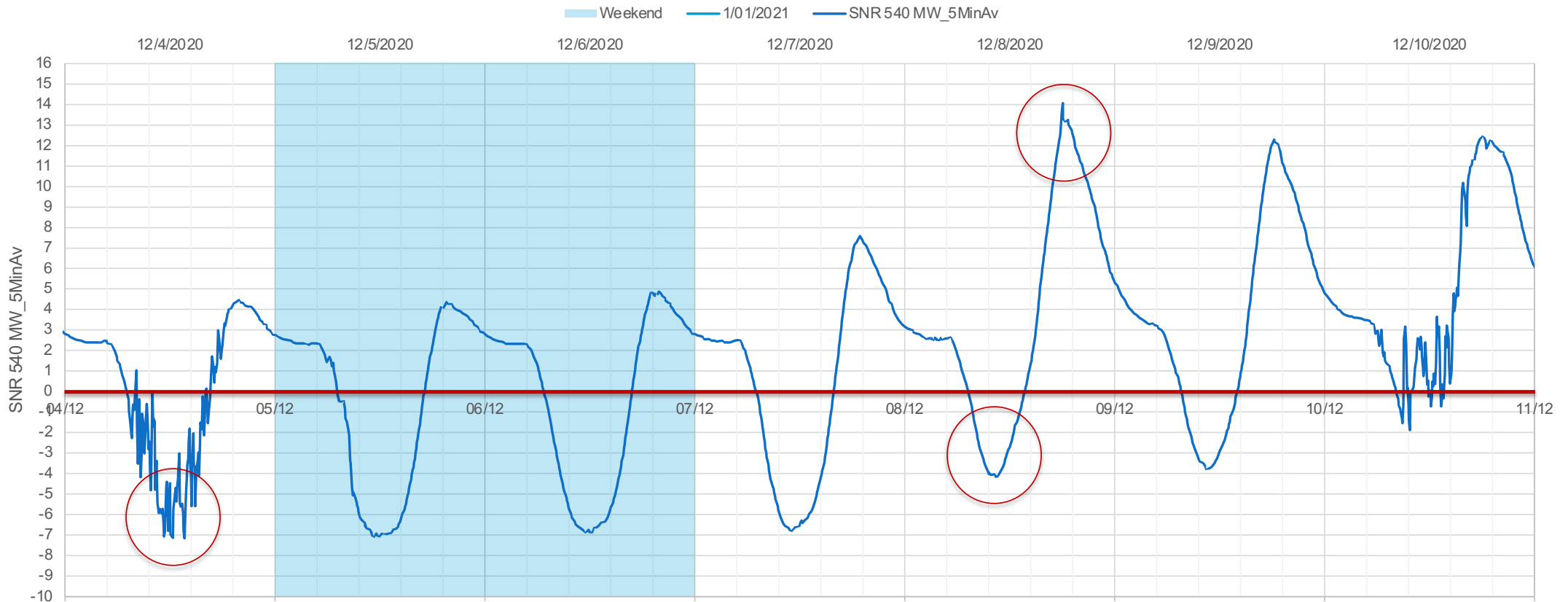
The SWIS Load Curve

Peak Demand Day
3,788 MW
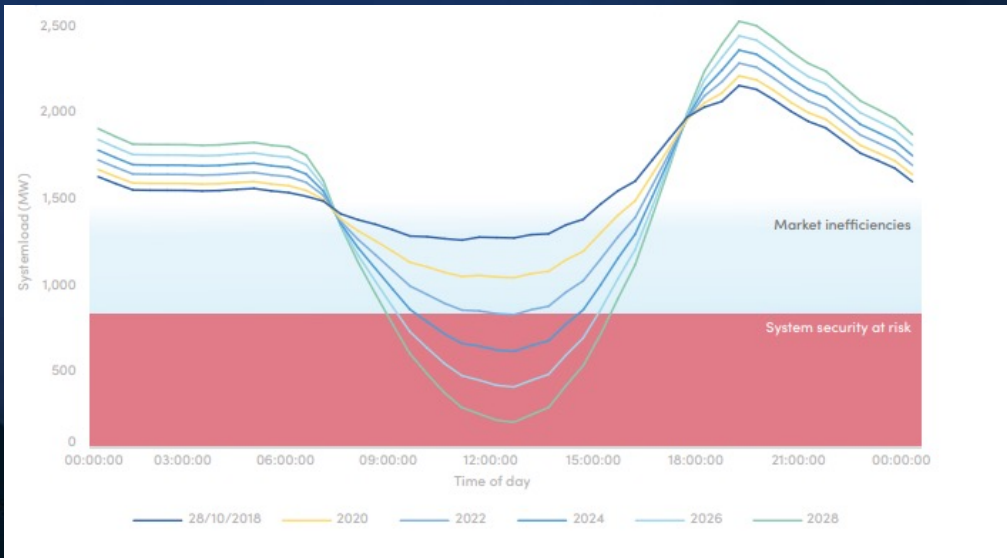8 January 2021

Record System Low
952 MW
14 March 2021

Peak Demand Day
3,788 MW
8 January 2021

Record System Low
952 MW
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Peak Demand Day
3,788 MW
8 January 2021
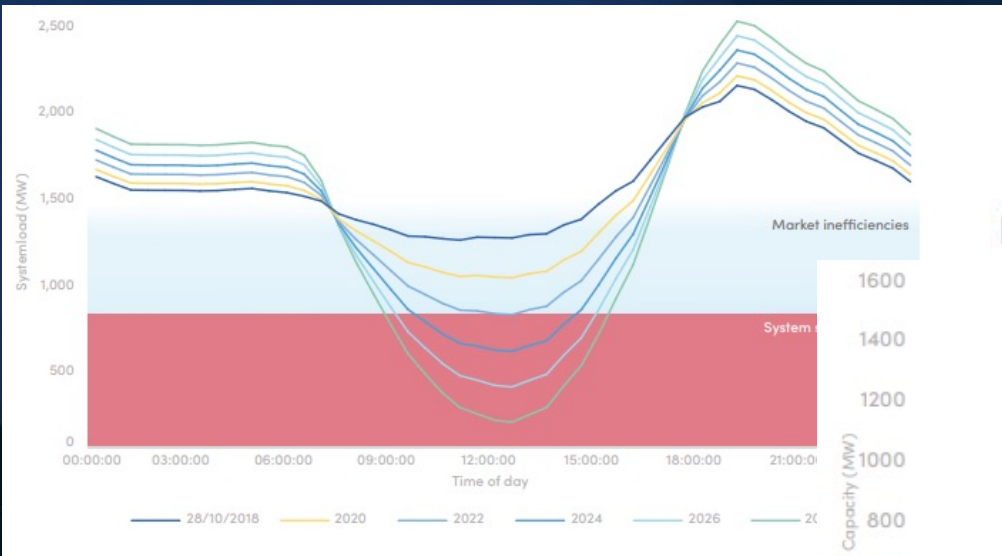
Installed solar generation capacity in the SWIS

Record Syste
952 MW
14 March 2
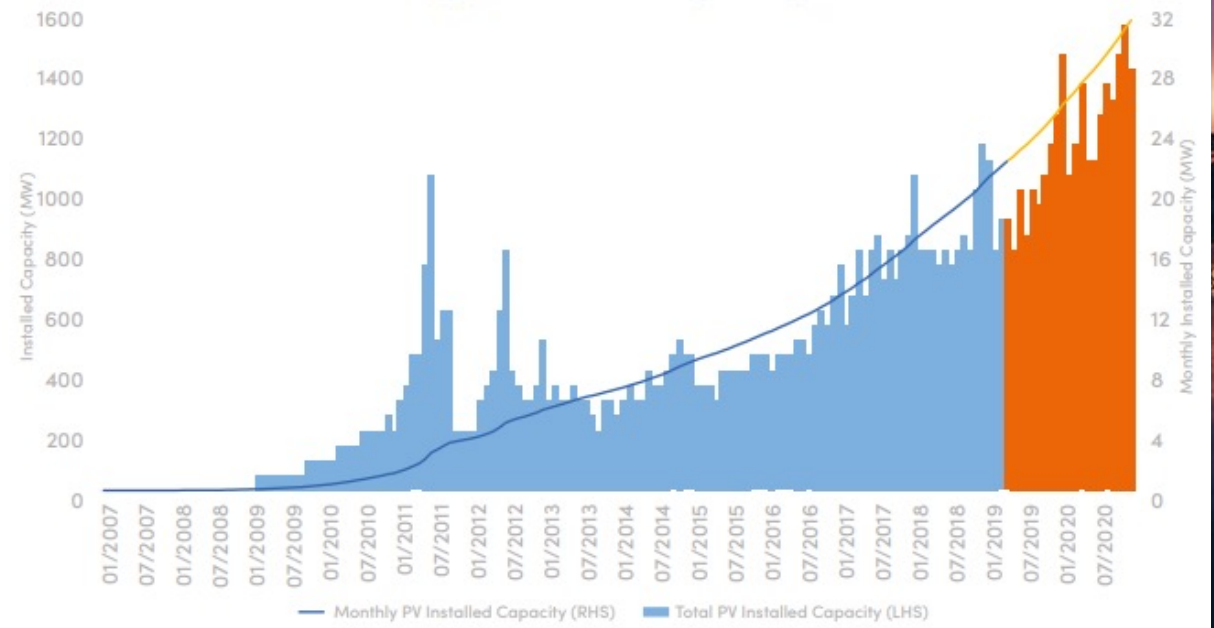
Data source: Australian PV Institute (APVI) Solar Map, funded by the Australian Renewable Energy Agency, accessed from pv-map.apvi.org.au on 23 March 2021

Monthly PV Installed Capacity (RHS)   Total PV Installed Capacity (LHS)

The WA Government's **Energy Transformation Strategy**
A program of work across three interrelated workstreams

October 2020

April 2020

Wholesale Market Redesign

Market Start
October 2022
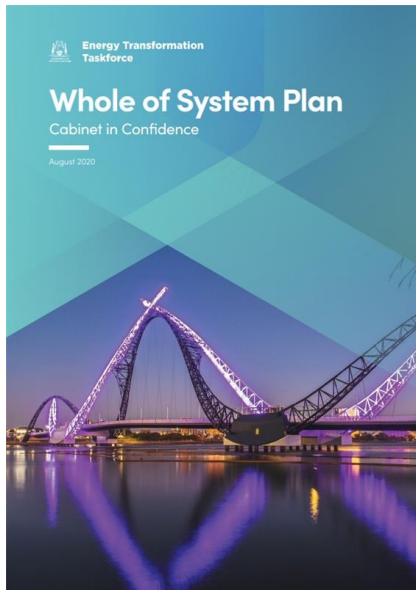
Five-year implementation

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

The DER Roadmap

36 actions under four themes and 14 work packages:

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

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

Roadmap model for participation

The WA DER Orchestration Project represents how we pilot DER aggregation and participation into business-as-usual

DER

VPP Independent

Many VPPs

Customer DER to VPP platform

VPP Retailer

Interoperable standards and open access via a common platform

Network Support Services

DER Information

Bids and Capabilities

Dispatch commands

DSO Western Power

DMO AEMO

WEM Energy ESS RCM

Coordination of aggregator dispatch and required data flows between DSO and DMO

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

Project vision and intention

Vision: A future where DER integration supports a safe, reliable and efficient electricity system where the full capabilities of DER provide value to all customers.

The project will orchestrate 900 DER assets – including rooftop solar, batteries and major appliances – as a VPP to participate in a future energy market, unlocking greater economic and environmental benefits for the Western Australian community.

55%
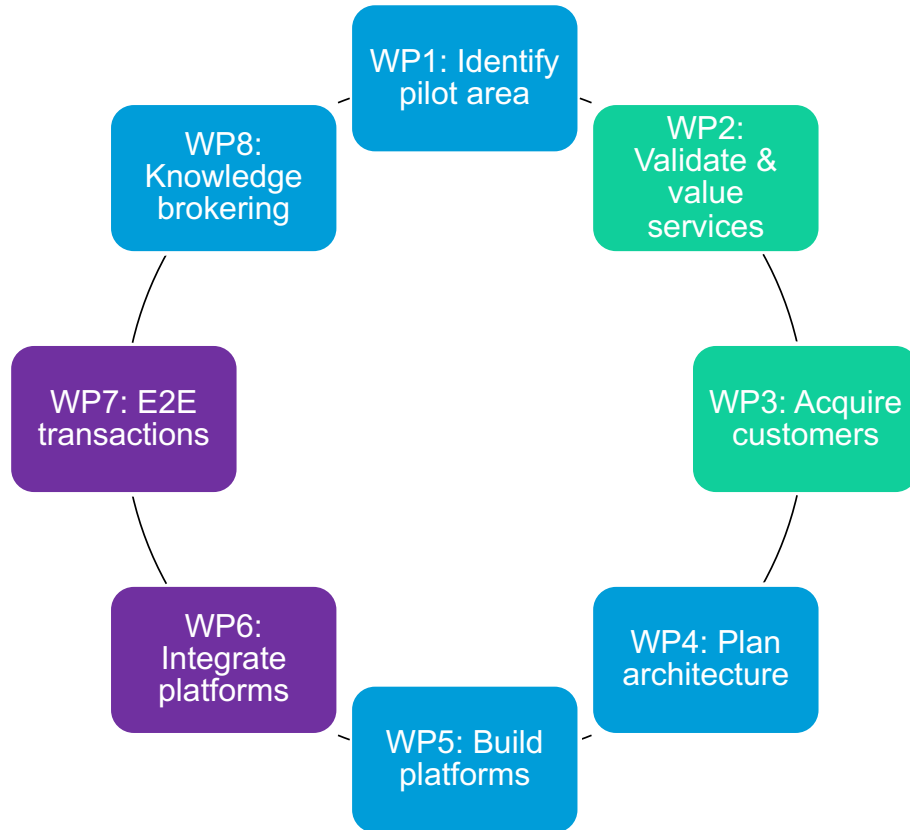**Existing**
rooftop PV
penetration

~500
Customers

>900
DERs

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Energy Policy WA

Project outcomes

	Technical	Network	Market	Customer	Policy
			Project objectives		
Identify methodology(ies) for integrating and managing high levels of DER	■	■			
Demonstrate how aggregated DER can support system safety and reliability	■	■			
Identify the functions/services DER can provide, and how they can be utilised	■	■	■		
Identify technical requirements for DER orchestration via DER aggregators	■	■	■	■	
Determine methods to maximise DER hosting capacity	■	■	■		
Identify alternatives to zero export limits and/or augmenting network	■	■			
Understand residential and business preferences for DER orchestration			■	■	
Increase customer understanding of DER and encourage participation				■	■
Improve understanding of the cost and benefits of DER integration	■	■	■	■	■
Inform the development of policy, market design and regulatory reform					■

Project Activities

WP1: Identify pilot area
WP2: Validate & value services
WP3: Acquire customers
WP4: Plan architecture
WP5: Build platforms
WP6: Integrate platforms
WP7: E2E transactions
WP8: Knowledge brokering

**Western Power:** Project Lead, network operator and Distribution System Operator (DSO)

Synergy: Residential retailer and responsible for DER valuation and customer acquisition

AEMO: System and Market Operator and the Distribution Market Operator (DMO)

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Deliverable 1: Identify Pilot Area

- Activities
  - ➢ Confirm the pilot area
  - ➢ Determine the hosting capacity
  - ➢ Extract the LV and MV static network model

- Outputs
 - ➢ Pilot Area Report (confidential)
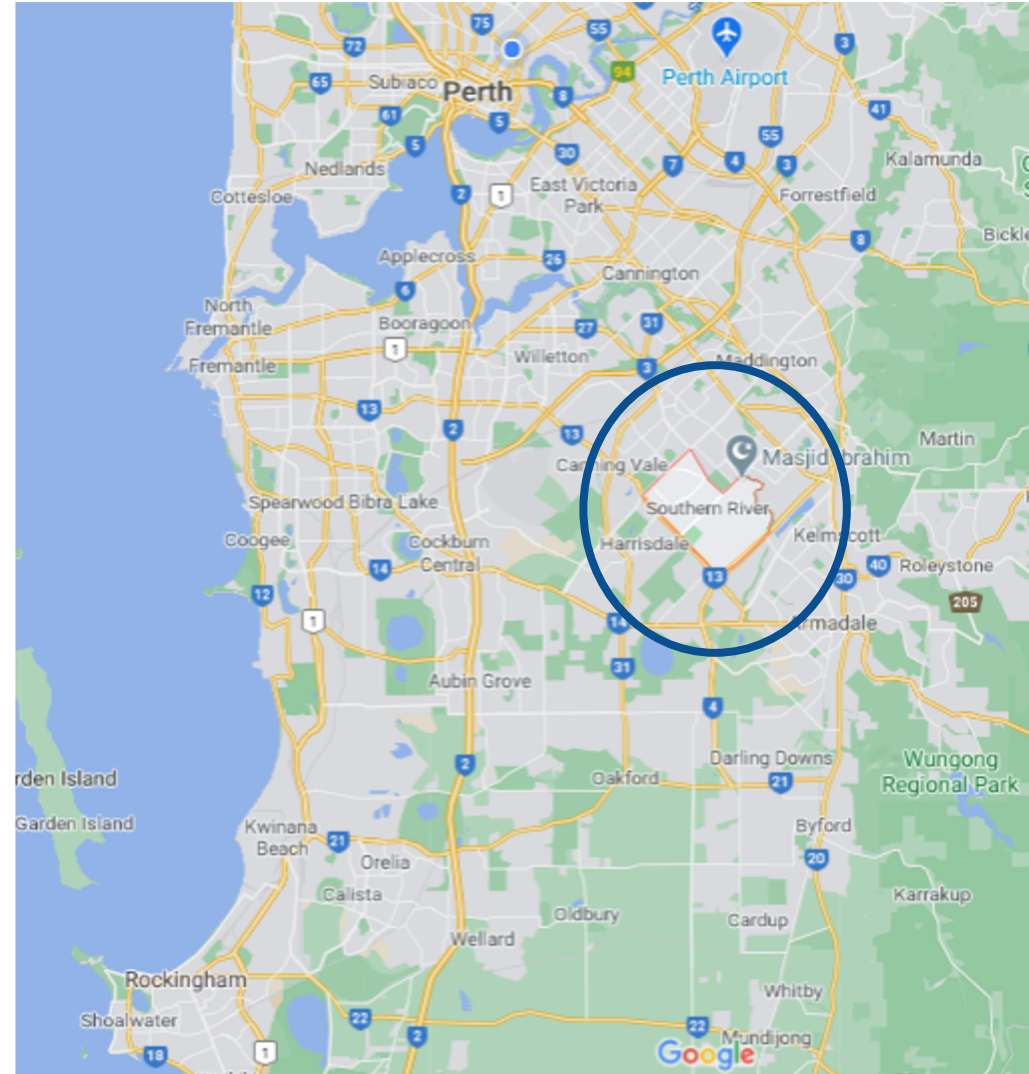
Deliverable 2: Value DER Services

- A three-stage approach:
    1. Identify of DER use cases for networks, markets and retailers
    2. Quantify the value of DER for the different use cases
    3. Quantify the risks and role of DER in the WEM wholesale financial markets

- Outputs:
    - DER Services Report (public)
    - Commercial Agreements Summary (confidential)
    - DER Service Valuation Report (public)

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Deliverable 3: Acquire DER Customers

- Activities:
  - ➤ Develop a customer acquisition plan
  - ➤ UTas to undertake social research
  - ➤ Synergy to acquire 900 DER assets
- Outputs:
  - ➤ Customer Acquisition Plan (confidential)
  - ➤ Aggregator Report (public)
  - ➤ Social Science Study (public)
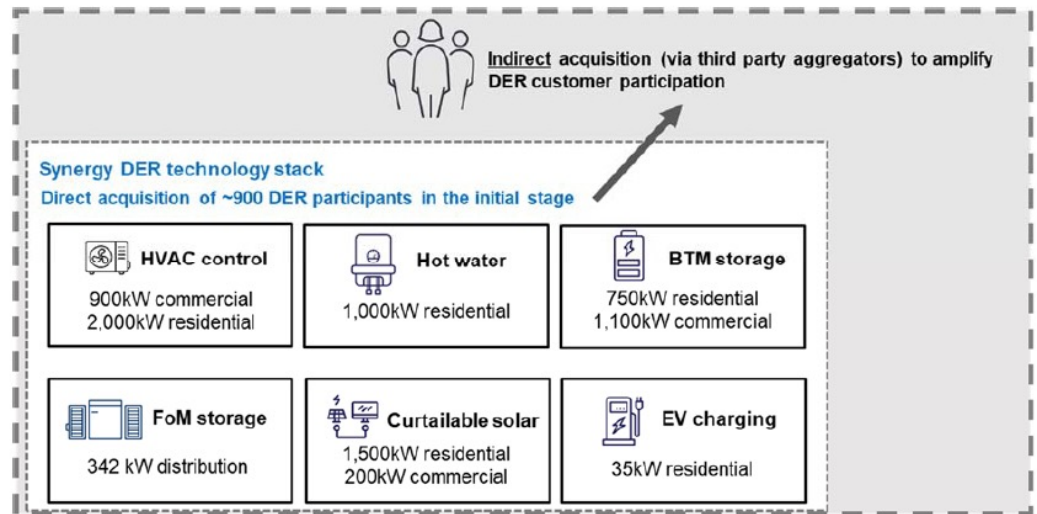
Anticipated customer participation

Deliverable 4: Plan Architecture

- Design the DSO-DMO-Aggregator platforms and tools required to test and deliver the project

- Outputs:
  - ➢ Distribution Constraints Optimisation Algorithm (DCOA) Report (public)
  - ➢ DMO, DSO and Aggregator Platform Requirements Reports (confidential)
  - ➢ DMO, DSO and Aggregator Platform Requirements Report (public)
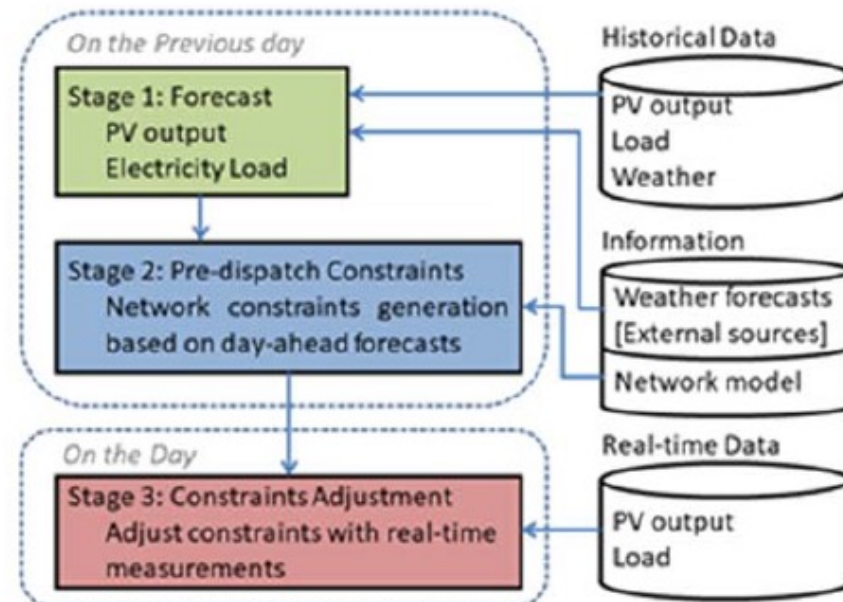
*Two-stage architecture of the proposed network DER Distribution Constraints Optimisation Algorithm*

Deliverable 5: Build Platforms

- Build the DSO, DMO and Aggregator platforms to orchestrate DER within the pilot area
- Outputs:
  - ➢ Report on DSO, DMO and Aggregator Platforms (confidential)
  - ➢ Report on DSO, DMO and Aggregator Platforms (public)
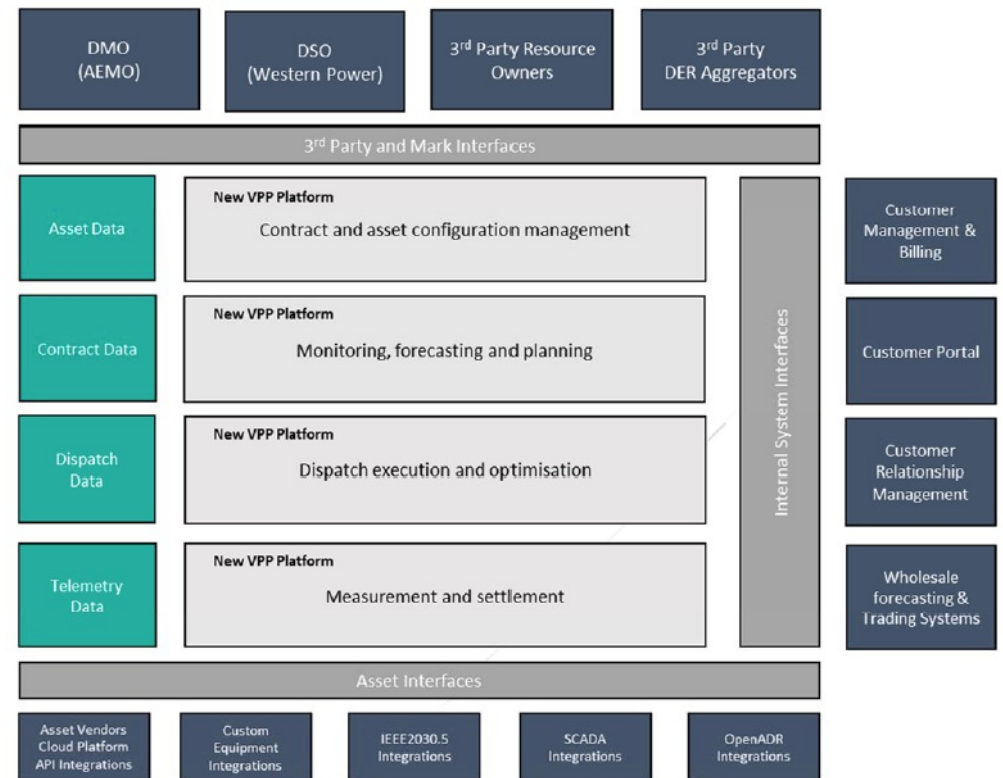
Deliverable 6: Integrate Platforms

- Activities:
  - ➢ Determine data visibility requirements and authorisations
  - ➢ Develop data sharing agreements
  - ➢ Develop the APIs
  - ➢ Test DER orchestration
  - ➢ Host DER and weather data on DSS
- Outputs:
  - ➢ Server Hosting and Data Sharing Agreements (confidential)
  - ➢ API Specifications (confidential)

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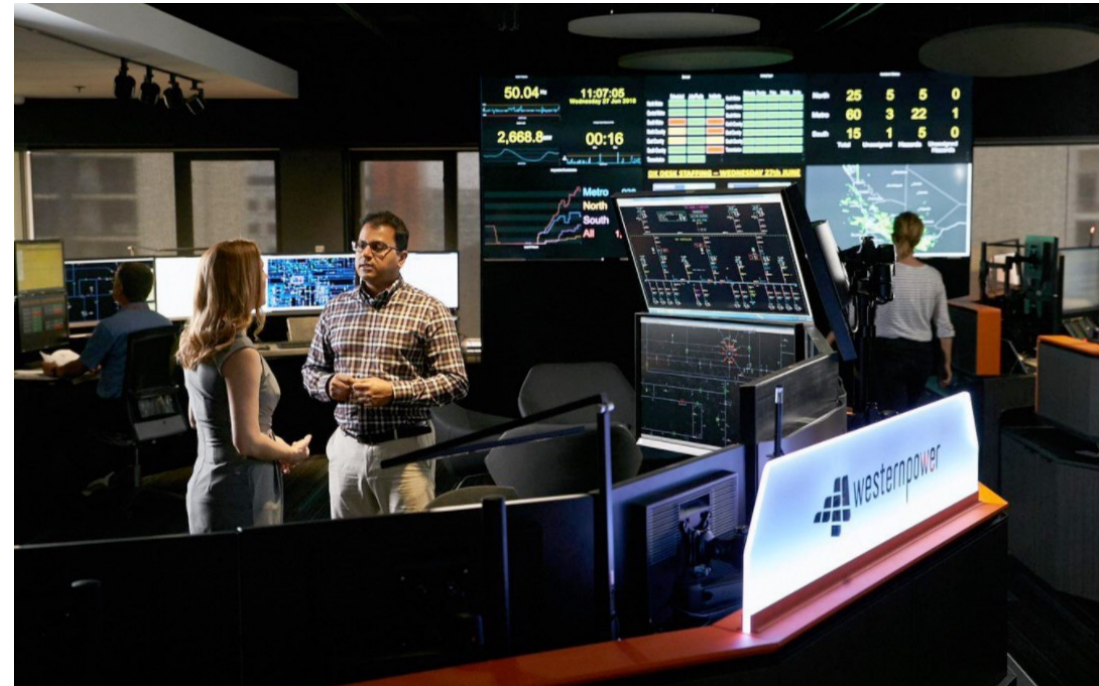
Deliverable 7: End to end transactions

- Activities:
    - ➤ Execute the three platforms
    - ➤ Measure the accuracy of the DCOA
    - ➤ Test the communications capability and the efficacy of the APIs
    - ➤ Test the performance of the platforms
- Outputs:
    - ➤ Regulation and Rules Report (public)
    - ➤ Future Market Participation Requirements Report (public)
    - ➤ DER Market Participation Principles Report (public)
    - ➤ AEMO Planning and Forecasting Report (public)

Discussion

➤ Do you have any feedback or comment on the project?

➤ How does this complement projects you are working on (EDGE)?

➤ What would you like to see delivered e.g. publicly or confidentially through this group?

WP1: Identify pilot area

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