
DEIP Standards, Data and Interoperability Working Group

Meeting 5 – 18 August 2020

AGENDA

Item	Time	Description	Responsibility
1	14:00 – 14:05	Welcome, introduction and our legal obligations	AEMO
2	14:05 – 14:10	Actions from Previous meetings	AEMO
3	14:10 – 14:30	DER Device Standard Taskforce ToR <ul style="list-style-type: none">Member nominations	AEMO/ All
4	14:30 – 14:55	WA Roadmap - alignment	AEMO
5	14:55 – 15:30	Technical Integration of DER future priorities	AEMO
6	15:30 – 15:40	Other Business <ul style="list-style-type: none">Update from the API taskforceDiscussion on the Tech Integration maturity Assessment	ANU/ ARENA/ All

Agenda Item 1: Welcome and introductions

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

*We pay our respects to their
Elders past, present and emerging.*

Competition Law Protocol: Our obligations

What you must do

Participants in AEMO discussions must:

- Ensure that discussions are limited to the matters contemplated by the **agenda** for the discussion
- Make **independent and unilateral decisions** about their commercial positions and approach in relation to the matters under discussion with AEMO
- **Immediately and clearly raise an objection with AEMO or the Chair of the meeting** if a matter is discussed that the participant is concerned may give rise to competition law risks or a breach of this Protocol

What you must not do

Participants in AEMO meetings **must not discuss or agree** on the following topics:

- Which **customers** they will supply or market to
- The **price or other terms** at which Participants will supply
- **Bids or tenders**, including the nature of a bid that a Participant intends to make or whether the Participant will participate in the bid
- Which suppliers **Participants** will acquire from (or the price or other terms on which they acquire goods or services)
- **Refusing to supply a person or company access** to any products, services or inputs they require

Under no circumstances must Participants share **Competitively Sensitive Information**. Competitively Sensitive Information means confidential information relating to a Participant which if disclosed to a competitor could affect its current or future commercial strategies, such as pricing information, customer terms and conditions, supply terms and conditions, sales, marketing or procurement strategies, product development, margins, costs, capacity or production planning.

Agenda Item 2: Previous Actions

Agenda Item 2 - Actions from Previous meeting

No	Action	Status
2.1	AEMO to share letter of support on behalf of SDIWG members for battery standards – for approval	Complete – for approval
2.2	AEMO to respond to questions raised regarding to Agenda Item 4 – Rule Change Update.	Complete
2.3	SDIWG members to advise feedback on the DER Device Standard Taskforce discussion document by 31 July 2020.	Complete
2.4	AEMO to develop TOR for DER Device Standard Taskforce for review and discussion at August SDIWG	Agenda Item 4
2.6	AEMO to consider drafting a letter on behalf of SDIWG to support AS/NZS 4777.2 uplift for submission during public comment phase for member review and approval	Agenda Item 6

Agenda Item 3: DER Device Standard Taskforce

Terms of Reference

Terms of Reference

Terms of Reference DER Device Standard Taskforce

1. Mission

To support the development of fit for purpose standards that are implemented for the optimisation of DER for the power system and benefit of all consumers.

2. Scope

The taskforce will provide a pathway for the consideration of new technology, appliances and grid support requirements allowing for the development of new or uplifted standards, guidelines or technical protocols by providing expert advice, recommendations and building consensus amongst key industry stakeholders.

In scope

The taskforce will:

- Create interrelationships and provide feedback on the work programs of existing and new standards committees
- Provide a link between DER technical policy guided by the DEIP Standards, Data and Interoperability Working Group (SDIWG) and technical standard developments
- Undertake two-way communications with the DEIP SDIWG to support development of technical performance priorities that need to be addressed to better facilitate DER integration in the grid
- Development of recommendations and work package proposals for consideration by Standards Australia for the development of future or uplift of existing standards
- Provide recommendations to Network Service Providers and other key bodies regarding the development or uplift of industry guidelines
- Be accountable against timelines (as established on commencement of activities) and support acceleration of activities through consensus building and prioritisation
- Identify device compliance shortfalls and advise on device compliance and monitoring requirements
- Provide recommendations on the performance requirements of small and medium enterprises connected at distribution level

Out of scope

The taskforce is not:

- A decision-making body
- Responsible for electrical safety rules for equipment
- Providing recommendations on installer compliance

3. Interrelated activities

The DER Device Standard Taskforce sits directly under the DEIP Standards, Data and Interoperability working group. It will work closely with related taskforces including:

- DER Cyber Security Taskforce

- DER API and Data Taskforce
- EV Standards Taskforce
- EV Data Taskforce

It will also interact with various Standards Australia committees identified throughout the development of work packages.

4. Governance

The DER Device Standard Taskforce operate under the guidance of this Terms of Reference document. All decisions made by the group AEMO will provide support for the Taskforce, including provision of action items, and a register of key documents if appropriate. All members are expected to actively contribute to documents and actions throughout.

The DEIP SDIWG will provide policy direction and approval of activities to be taken forward.

5. Members

The DER Device Standard Taskforce will be made up of technical experts to support the Taskforce mission. Membership will be formed from:

- Consumer Groups
- Manufacturers (and representative groups) of appliances and DER devices
- Retailers
- Clean Energy Council members
- Smart Energy Council members
- Energy Networks Australia member (e.g. from an NSP)
- Standards Committee representatives

6. Meetings

This taskforce will be conducted via the most appropriate means, including videoconference, teleconference and face-to-face meetings, dependant on the nature of the meeting material. AEMO will provide meeting facilities for at least one of the AEMO offices listed below for each of the meetings (subject to the availability of AEMO meeting rooms).

Meeting Location: **AEMO Office:**
Adelaide Level 9, 99 Gawler Place, Adelaide SA 5000
Brisbane Level 10, 10 Eagle Street, Brisbane QLD 4000
Melbourne Level 22, 530 Collins Street, VIC 3000
Sydney Level 2, 20 Bond Street, Sydney NSW 2000

These meetings will be held on a monthly basis. Ad hoc meetings may be arranged as required to support outputs and will be scheduled according to member availability.

7. Administration

AEMO will prepare and distribute all meeting correspondence via email and manage the DER Device Standard Taskforce.

AEMO will endeavour to provide stakeholders with:

- A draft agenda and relevant meeting papers three business days prior to the meeting.

- A meeting outcomes paper five business days after the meeting.
- AEMO will provide Chair, secretariat services and subject matter expert(s) for each meeting.
- Once approved, copies of the meeting papers will be published on the DER Device Standards Taskforce Webpage.
- Any technical or working documents will be made available via a central repository for members to access.

It should be noted that any items of discussion are in the public domain unless clearly stipulated as confidential. Members are expected to provide technical expertise and should not be considered as representative of their employer.

8. Resourcing and Expenses

AEMO will provide Chair and Secretariat services to the Taskforce. AEMO will make the final decision on the level of resourcing available.

Any expenses incurred as a result of Taskforce members or invitees attending meetings, or undertaking activities associated with the Taskforce actions, agendas or meetings are at the expense of the member's employer.

9. Version control and contact details

Version	Effective date	Comments
1.	4 August 2020	Draft document (AEMO)

For more information on the DER Device Standard Taskforce please email DERSDI@aemo.com.au.

Member Nominations

The DER Device Standard Taskforce will be made up of technical experts to support the Taskforce mission. Membership will be formed from:

- Consumer Groups
 - Manufacturers (and representative groups) of appliances and DER devices
 - Retailers
 - Clean Energy Council members
 - Smart Energy Council members
 - Energy Networks Australia member (e.g. from an NSP)
 - Standards Committee representatives
- Please advise of any other members that should be represented in the taskforce.
- Submissions on members to be provided by COB Monday, 31 August 2020 to prepare for kick off meeting in September.

Agenda Item 4: WA DER Roadmap



AEMO WA DER Program Scope Overview for SDIWG

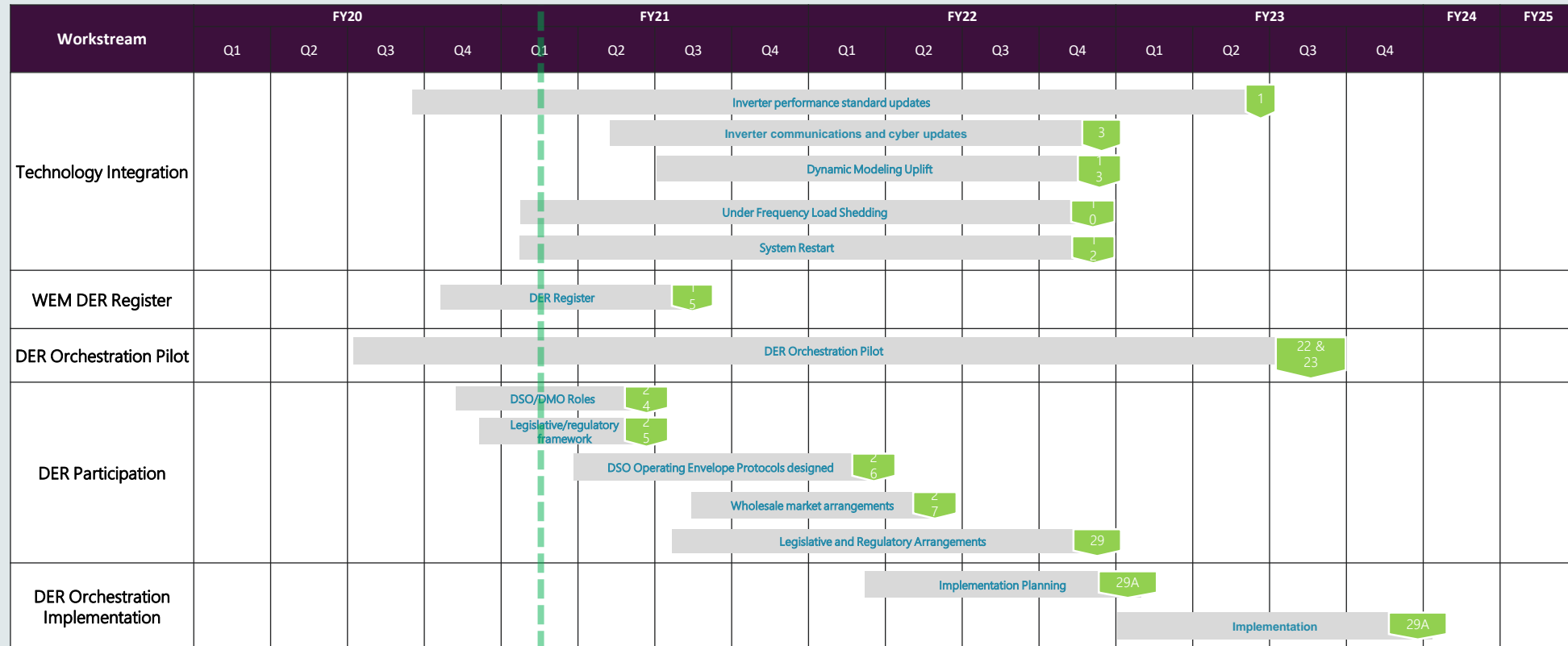
Delivering WA Government's DER Roadmap

August 2020

Agenda

1. Background: Ministerial endorsement
2. AEMO scope overview
 1. Technology Integration Workstream
 2. DER Orchestration Pilot
 3. DER Participation Workstream

Program overview

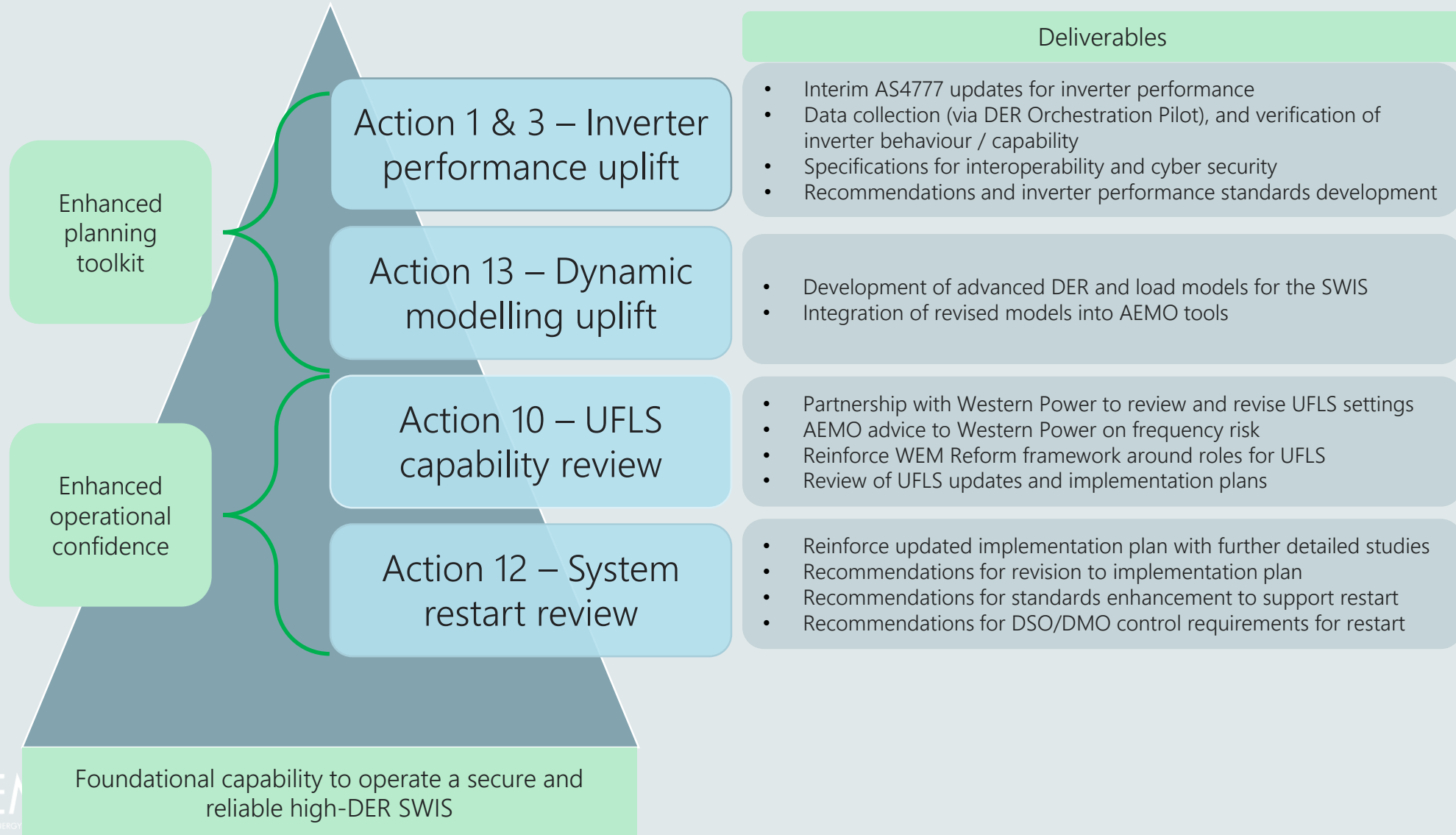


Technology Integration Workstream



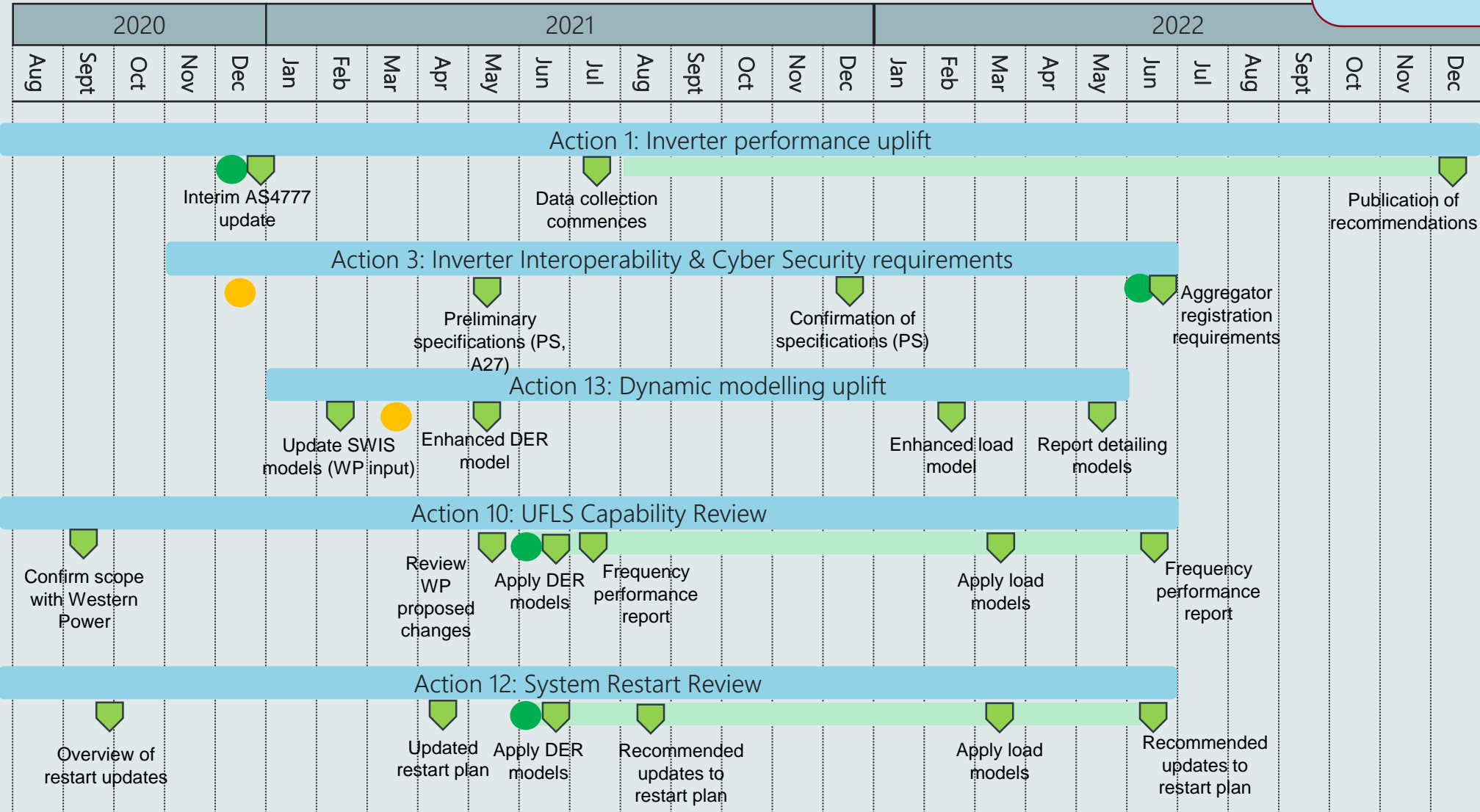
Description	AEMO-led Actions	Related Actions
<p>Activities to facilitate the integration of DER technologies into the South West Interconnected System (SWIS) to enhance management of power system security and reliability, including:</p> <ul style="list-style-type: none">a) supporting the uplift of inverter and communications standards in Western Australia, including through the Australian Standards process;b) revising power system security arrangements, including emergency frequency control schemes and power system restart schemes required in the event of a system black;c) evaluating and revising AEMO s requirements and processes for dynamic system modelling to better incorporate DER and its impacts on the power system;d) planning for establishment of a DER Register for the SWIS; ande) participating in collaboration and other consultation in relation to key DER Roadmap technology integration implementation activities.	<p>Action#1 Deliver improved inverter functions through the Standards Australia national review process for AS/NZS 4777</p> <p>Action#3 Introduce mandatory inverter communications functionality, including communications protocols, through AS/NZS 4777, to allow remote dynamic management of DER</p> <p>Action#10 Review Under Frequency Load Shedding arrangements, and assess implications for AA5 investment program</p> <p>Action#12 Revise system restart arrangements to consider DER</p> <p>Action#13 Ensure that the System Operator’s dynamic system modelling adequately incorporates DER, and arrangements adequately address power flows during system events</p>	<p>Action#2 Legacy inverter upgrades (WP)</p> <p>Action#4 DER Performance monitoring and compliance (WP)</p> <p>Action#15 DER Register</p> <p>Action#22 & 23 DER Orchestration Pilot</p> <p>Action#24-29 DER Participation Workstream</p>

Technology Integration - deliverables



Technology Integration – timeline

● ● DER Roadmap milestone
▼ AEMO milestone
 Analysis



Action 22 & 23

DER Orchestration Pilot



Description

Participation in a DER orchestration pilot (as described in the DER Roadmap) in collaboration with Synergy and Western Power, to develop and test the capability of DER orchestration in the SWIS, apply learnings to the planning and implementation of the DMO capability in the WEM, and integrate systems and processes with the DSO.

AEMO-led Actions

Action#22 To demonstrate technical capability of VPPs to provide services in response to coordination and dispatch signals.
Action#23 To test the integration/interaction of VPPs with market dispatch systems, piloting the deployment of VPPs in the "live" market environment.

Related Actions

Action#1 Inverter performance standards uplift

Action#3 Inverter interoperability and cyber security standards uplift

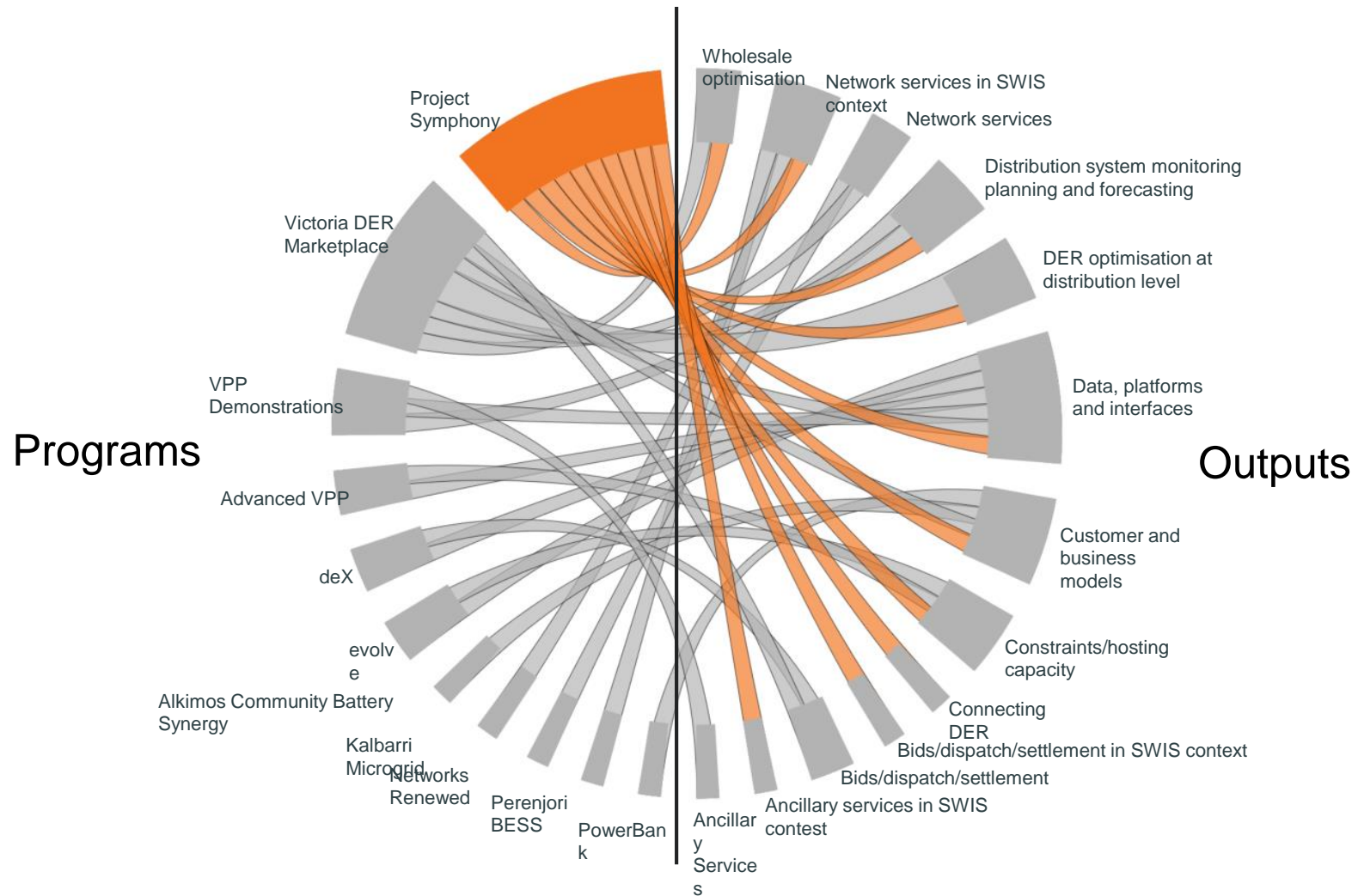
Action#4 DER Performance monitoring and compliance (WP)

Action#24-29 DER Participation Workstream

The DER Orchestration Pilot (AKA Project Symphony) will provide key learnings to the development of the DER Orchestration model in the WEM, and nationally

- Demonstrate the viability of the Hybrid Model (including roles for AEMO, DSO and Aggregator)
- Build integration components between actors, including demonstrating dispatch of DER
- Demonstrate capability of DER to participate in WEM markets (post WEM Reform), in parallel with providing network support services to the DSO
- Provide near real-time learnings into the DER Orchestration model and market participation model implemented in the WEM from July 2023
- Commence key stakeholder understanding of expectations for DER orchestration in the WEM/SWIS
- Demonstrated outcomes in line with AEMO's national strategy for DER Orchestration, and inform development of models in the NEM

Action 22 & 23 DER Orchestration Pilot – Outcomes



Actions 24-30

DER Participation Workstream



Description	AEMO-led contributions	Related Actions
<p>Activities to facilitate the participation of DER in electricity service markets to deliver more efficient market outcomes, including:</p> <ul style="list-style-type: none">a) developing and planning the roles and responsibilities for DER participation in markets, and the legal and regulatory frameworks and mechanisms to enable this participation;b) designing wholesale market arrangements to enable participation, including integration with emerging market participant classes and a distribution system operator (DSO);c) planning the design and implementation for an appropriately sized distribution market operator (DMO) to be implemented in line with the future security constrained economic dispatch systems;d) commencing the design of distribution service markets to support future trials; ande) participating in collaboration activities and consultation in relation to key DER participation activities under the DER Roadmap.	<p>Actions#24 Develop a plan for the establishment of a DSO and DMO in the SWIS.</p> <p>Action#25 Identify legislation and regulatory framework requirements to establish DSO and DMO functions.</p> <p>Action#27 Introduce changes to wholesale market arrangements necessary to enable the participation of DER in the wholesale market via a DER aggregator</p> <p>Action#29 Deliver a DSO/DMO legislative and regulatory framework, for transition to commencement by 1 July 2023</p> <p>Action#29A Plan for and implement DER Orchestrating model in the WEM</p>	<p>Action#6 Metering and settlement for battery storage (WP)</p> <p>Action#8 Technical rules for battery storage (WP)</p> <p>Action#14 Distribution network visibility (WP)</p> <p>Action#15 DER Register</p> <p>Action#22 & 23 DER Orchestration Pilot</p> <p>Action#26 DSO Operating Envelope Comms Protocols & Publishing (WP)</p> <p>Action#31 DER Marketplace Trial</p>

Agenda Item 5: Technical Integration of DER future priorities



Technical integration of DER future priorities

AEMO update for discussion

DEIP Standards, Data and Interoperability WG
Meeting #5 (18 August 2020)

Agenda

- Towards the 'integrated grid' vision
- Where we are today and where we want to get to...
- Identified priorities
- Questions and discussion

Purpose

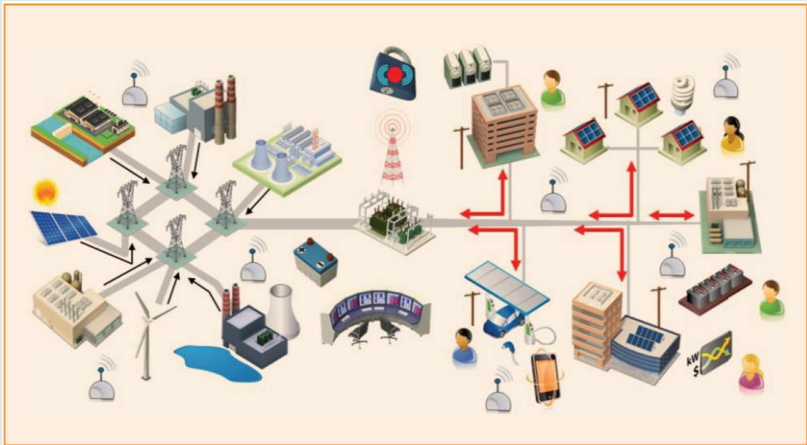
- Share with the WG our view of DER integration priorities.
- Gather feedback from the WG about these priorities.
- Contextualise these priorities across industry efforts.
- Establish interest within the WG on members able to contribute
- Include actions to address identified priorities in WG's forward plans.

The *integrated* grid vision

A complex system of systems serving the diverse needs of many stakeholders. It must support:

Devices and systems developed and operated by many different utilities and solution providers.

Millions of industrial, business, and residential customers.



A **cyber-physical** system requiring seamless integration and interaction of:

Physical systems

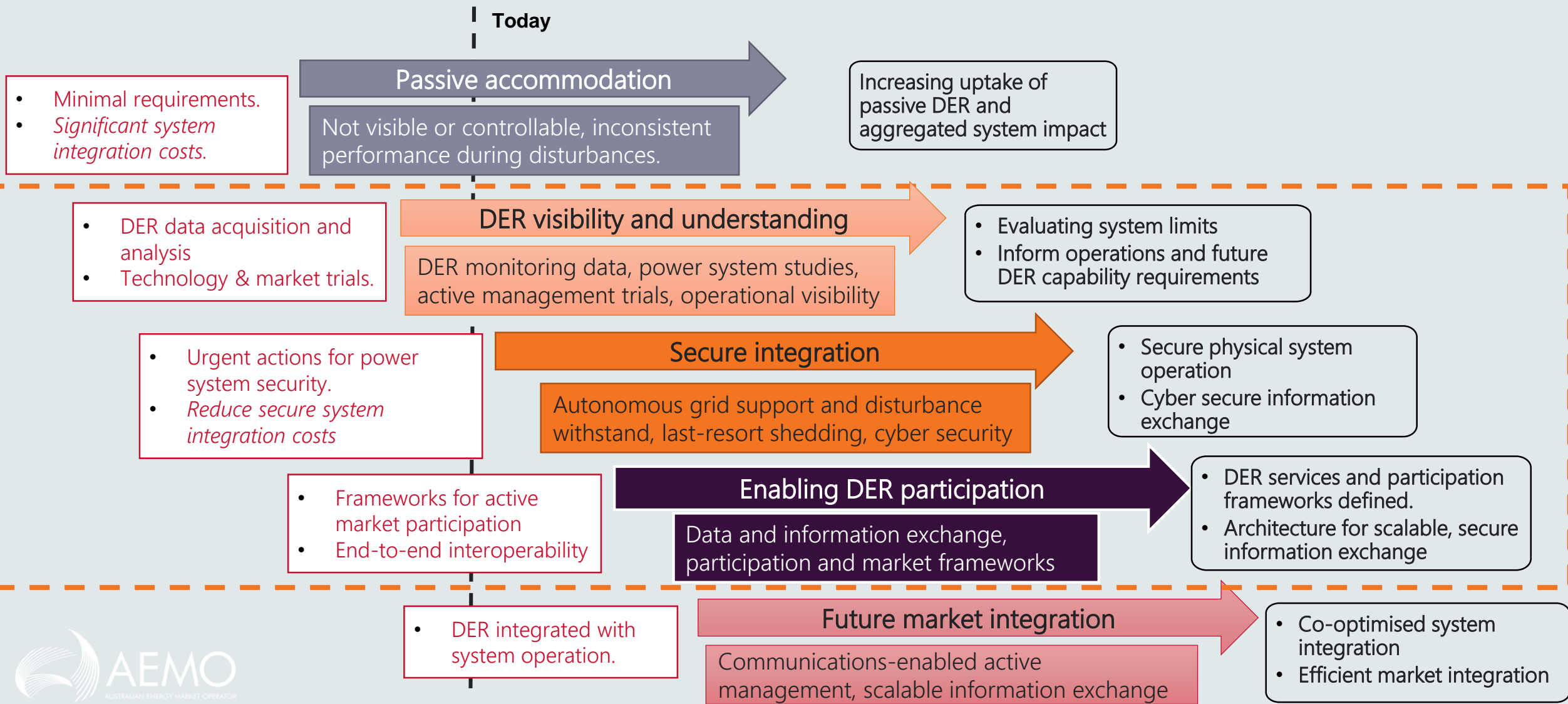
Power system infrastructure

Cyber systems

Information sensing, processing intelligence and control

How can we realise this vision?
How will all these systems work together?
What technical enablers are required?

Where we are today and... where we want to get to



Focus areas

Device capability and performance

- Bulk power system disturbance withstand, and autonomous grid support.
- Interoperability – the ability of the device to be communicated with and follow commands.

Aggregation and control

- Last resort backstop mechanisms
- Dynamic control for DER aggregations

Data and information exchange

- Static data for planning and forecasting, and representation in power system models
- Operational visibility, observability and predictability

Cyber security

- Whole of system architectural consideration of DER cyber security requirements

Device capability and performance (autonomous)

OUTCOME	TASK NAME	TASK DESCRIPTION	TIMING CATEGORY
Disturbance withstand and grid support	100kW to 5MW performance	Standardise performance requirements for generators from 100kW to 5 MW in size to better align with obligations for larger generators in NER Schedule 5.1.	Short term (18 m)
	Fast track VDRT	Urgently fast track requirement for short duration voltage disturbance ride-through for all new DPV inverters in SA and WA. If possible, without delaying SA or AS 4777 revision, encourage adoption in other regions.	Short term (18 m)
	AS 4777 revision	Grid support modes and disturbance withstand capability within AS 4777 revision to apply nationally (stretch goal but timing is not in our control).	Medium term (18 m to 5 y)
	EV performance	Grid interfacing performance requirements EV onboard charging and charging installations - potentially integrated within DNSP connection process.	Medium term (18 m to 5 y)

Device capability and performance (communication enabled)

OUTCOME	TASK NAME	TASK DESCRIPTION	TIMING CATEGORY
Demand response - residential appliances	AS 4755 revision	Ratify AS4755.2 setting out performance standards for dispatchable demand response demand response for selective types of residential electrical products (Air Conditioners, Pool Pump Controller, Hot Water Systems and Storage/Battery Systems) Public comment 9 weeks.	Medium term (18 m to 5 y)
Last resort backstop mechanism	Remote curtailability	Establish DPV device level requirements for emergency shedding and work with DNSPs to encourage inclusion in connection requirements. Could include: <ul style="list-style-type: none"> - installation of a demand response enabling device (DRED) - configuration of disconnect switching through a smart meter - enablement through HEMS or edge device 	Short term (18 m)
Protocol interoperability	AS 4777 interoperability	Interoperability requirements within AS4777 to enable remote interaction with DPV devices - specifying communication protocols inverters should be compatible with, given cyber security requirements.	Short term (18 m)
	EV interoperability	Interoperability requirements to enable managed charging.	Medium term (18 m to 5 y)
Remote settings update	Remote settings interactions - reqs	Establish robust processes for remote interaction with devices, including: polling/querying settings, updating settings and issuing commands. Specify minimum power system (and cyber security requirements).	Medium term (18 m to 5 y)

Aggregation and control

OUTCOME	TASK NAME	TASK DESCRIPTION	TIMING CATEGORY
Last resort backstop mechanism	100kW to 5MW generation shedding	Engage with DNSPs to establish emergency control of commercial-scale DPV systems.	Short term (18 m)
	DPV generation shedding	<p>Develop AEMO's emergency control capability for DPV systems: implementing simple one-way curtailment commands, using low-complexity communication protocols over low-bandwidth networks.</p> <ul style="list-style-type: none"> - Test implementation of this capability with trials. - Examine existing powers/mechanisms for achieving this. - If necessary, consider governance, roles and responsibilities as part of rule change proposal. Likely to require AEMO to demonstrate a system security need, then the AER granting funding to the DNSPs to physically implement. 	Short term (18 m)
Requirements for aggregated participation	Aggregation system security	Establish power system security requirements for aggregations (such as minimum reliability standard that may likely influence communication technology utilised by the market) and make mandatory when registration and market participation rules are established in the NER.	Short term (18 m)
Systems interoperability	Aggregated DER	Communication requirements for more dynamic, regular interaction with DER devices in an implementation guideline. Currently being considered within the API Technical Working Group. An underlying cybersecurity pathway will need to be established and incorporated.	Medium term (18 m to 5 y)

Data and information exchange (static)

OUTCOME	TASK NAME	TASK DESCRIPTION	TIMING CATEGORY
Remote settings update	Settings changes - data	Capture settings changes in DER register.	Medium term (18 m to 5 y)
Static data visibility	DR, EV in DER register	Provision for EVs and controllable loads to be included in the DER register.	Short term (18 m)
Representation in power system models	Nodal representation of DER	Standardise consistent representation of DER location data to a 'nodal' format reflective of where in the physical power system it is connected. Necessary for: <ul style="list-style-type: none"> - Mapping DER to the transmission connection point level for power system studies. - Communication of network limits and technical envelopes for DER orchestration. Develop industry implementation guidelines for adopting the IEC Common Information Model series of standards setting out information models and information exchange messages at the system-level. CIM adoption here, as per e.g. ENTSO-E in Europe, ERCOT in Texas.	Medium term (18 m to 5 y)

Data and information exchange (monitoring / real time)

OUTCOME	TASK NAME	TASK DESCRIPTION	TIMING CATEGORY
Operational visibility	Visibility of DER available for shedding	Establish minimum real time visibility/predictability requirements for DPV and other DER systems available for emergency curtailment.	Short term (18 m)
	Aggregation visibility	Establish consistent real-time SCADA for VPPs at the transmission node level. Implementation through interaction with aggregators in API working group and trials. Specification within AEMO's AEMO Power System Data Communication Standard.	Medium term (18 m to 5 y)
	Data consistency	Establish consistent data structure requirements for data collected by AMI and behind-the-meter data vendors so that this data can be readily utilised by AEMO and DNSPs for operational planning, and to assess standards compliance.	Short term (18 m)
	100kW to 5MW visibility	Establish consistent real-time SCADA for all non-scheduled generation in this size range. Implementation through interaction with DNSPs via OPWG resulting in updates to AEMO's AEMO Power System Data Communication Standard.	Short term (18 m)

Cyber security

OUTCOME	TASK NAME	TASK DESCRIPTION	TIMING CATEGORY
National DER cyber security risk framework	Cyber security framework	Engage and work with industry to assess cyber security risk associated with DER and to develop a framework for how these risks should be managed. - Industry consultation to socialise / agree cyber security aspects of DER and develop and agree DER Cyber threat model and detections / mitigations - “the why” - Articulation to market of each participant’s cyber security roles and responsibilities within DER - “the who” - Industry working group to extend threat model into pragmatic treatments sourced from standards and discuss and agree a DER Cyber security framework / standard - “the what”	Short term (18 m)
National DER cyber security risk framework	Cyber security framework implementation	AEMO to work with industry on developing an implementation blueprint - “the how” for the DER Cyber security framework / guideline. AEMO champions the compliance regime and delivery guidance across the energy market.	Medium term (18 m to 5 y)

Agenda Item 6: Other Business

- Update from the API taskforce
- Discussion on the Tech Integration maturity Assessment
- Letter of support for AS/NZS 4777.2

Meeting Summary

Agreed Actions

Next meeting: 16 September 2020