

DEIP

DISTRIBUTED ENERGY
INTEGRATION PROGRAM

DEIP CEO Forum

4 March 2022

Introduction

Darren Miller

Today's Purpose

- 1 Reflect on the **purpose of DEIP** and the collective challenges we face
- 2 Discuss **DEIP's achievements** and feedback on the **program's effectiveness**
- 3 Review and endorse the **2022 work plan**
- 4 Seek **commitment for ongoing in-kind support** for the proposed work plan

DEIP member organisations



DEIP overview

PURPOSE

The Distributed Energy Integration Program (DEIP) is a collaboration of government agencies, market authorities, industry and consumer associations aimed at maximising the value of Distributed Energy Resources (DER) for all energy users.

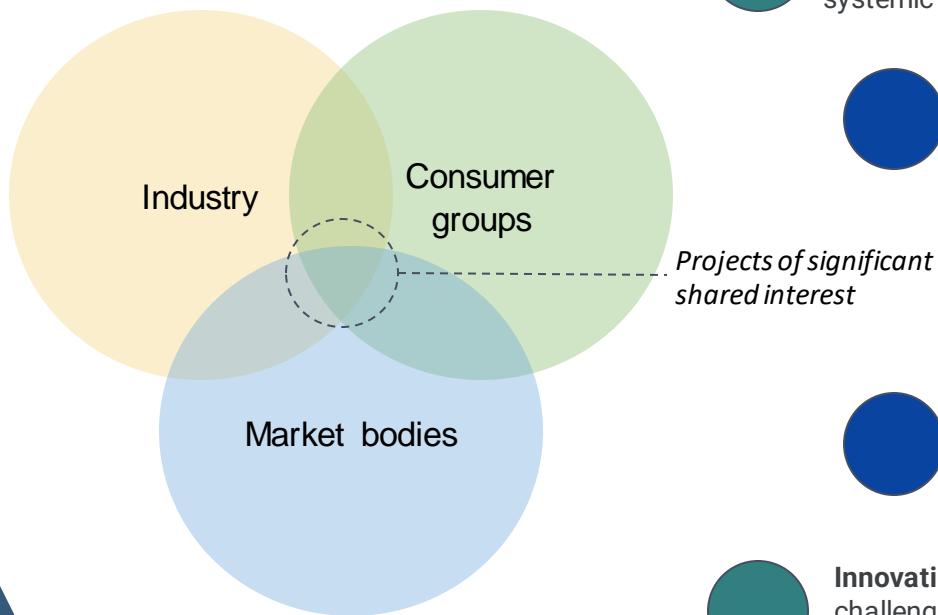
VISION

DEIP members have a shared interest in supporting our evolution toward a distributed energy system that is secure, reliable, resilient, affordable and efficiently integrates and utilises customer's DER.

WHO IS INVOLVED

The DEIP Steering Group involves 13 organisations who communicate regularly and collaborate with a wider cross section of stakeholders.

DEIP drives collaboration in areas of shared interest



Collective leadership, DEIP operates on discretionary support and leadership from a variety of stakeholders. No one party can affect systemic change in isolation and DEIP supports consensus building.

Collaboration, an openness to work with others and consideration of alternative perspectives.

Resources, support from member organisations is essential to progress objectives. DEIP will build on existing work, approach challenges flexibly, and select the best suited techniques for each task.

Outcome focused, DER has traditionally not been a high priority for the sector and alignment with policy and customer outcomes needs greater focus. DEIP operates in 1 year sprints.

Innovation, the integration DER and more renewables is likely biggest challenge the energy system will face in our generation and a commitment to ongoing innovation will help this transition.

Contents

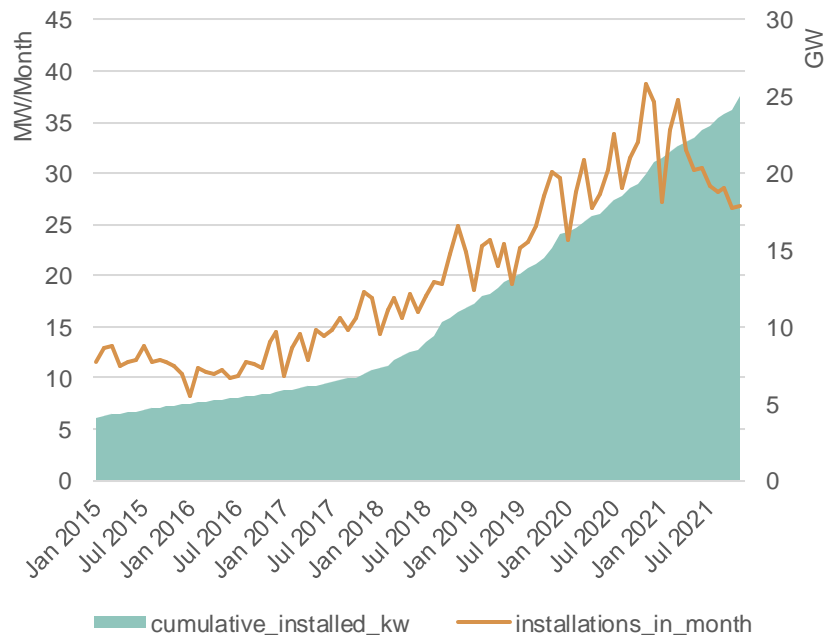
#	Item	Who	Description
1	Introduction	Darren Miller (ARENA) Craig Chambers (ARENA)	<ul style="list-style-type: none">- Welcome and introduction- Outline today's purpose & agenda- Revisit DEIP's purpose and principles
2	Status update on DER transition	Violette Mouchaileh (AEMO) Anna Collyer (ESB)	<ul style="list-style-type: none">- State of DER- The challenges and plan of DER reform
3	DEIP's year in review	Craig Chambers (ARENA) Anthony Seipolt (ARENA)	<ul style="list-style-type: none">- Review DEIP's achievements in 2021- Review Dynamic Operating Envelopes
4	2022 work plan	Rachele Williams (ARENA) Lachlan Blackhall (ANU) Kate O'Callaghan (ARENA) Jon Sibley (ARENA)	<ul style="list-style-type: none">- Interoperability Steering Committee- EV Grid Integration- DER Market Innovation
5	Summary	Jon Sibley (ARENA)	<ul style="list-style-type: none">- Review DEIP governance

State of DER

Violette Mouchaileh

DER Penetration Continues Apace

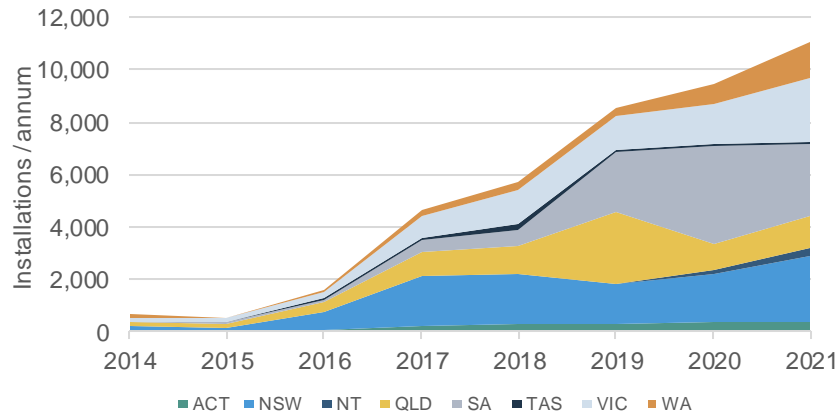
PV has seen an average annual growth rate of 32%¹



Source: APVI

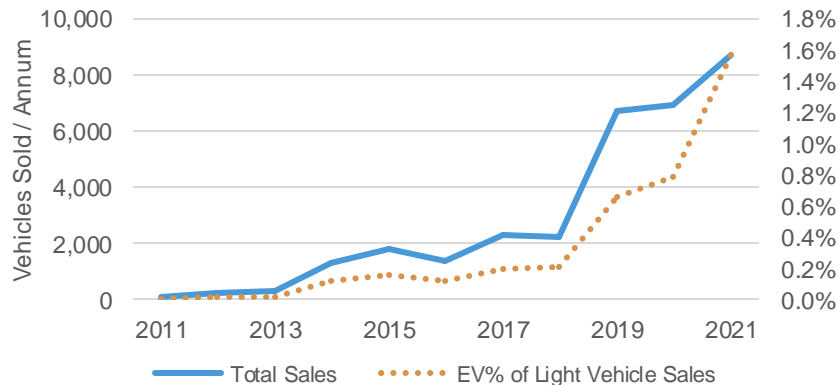
¹ Figures quoted are from 2017 to present

Small batteries have an average annual growth rate of 28%¹



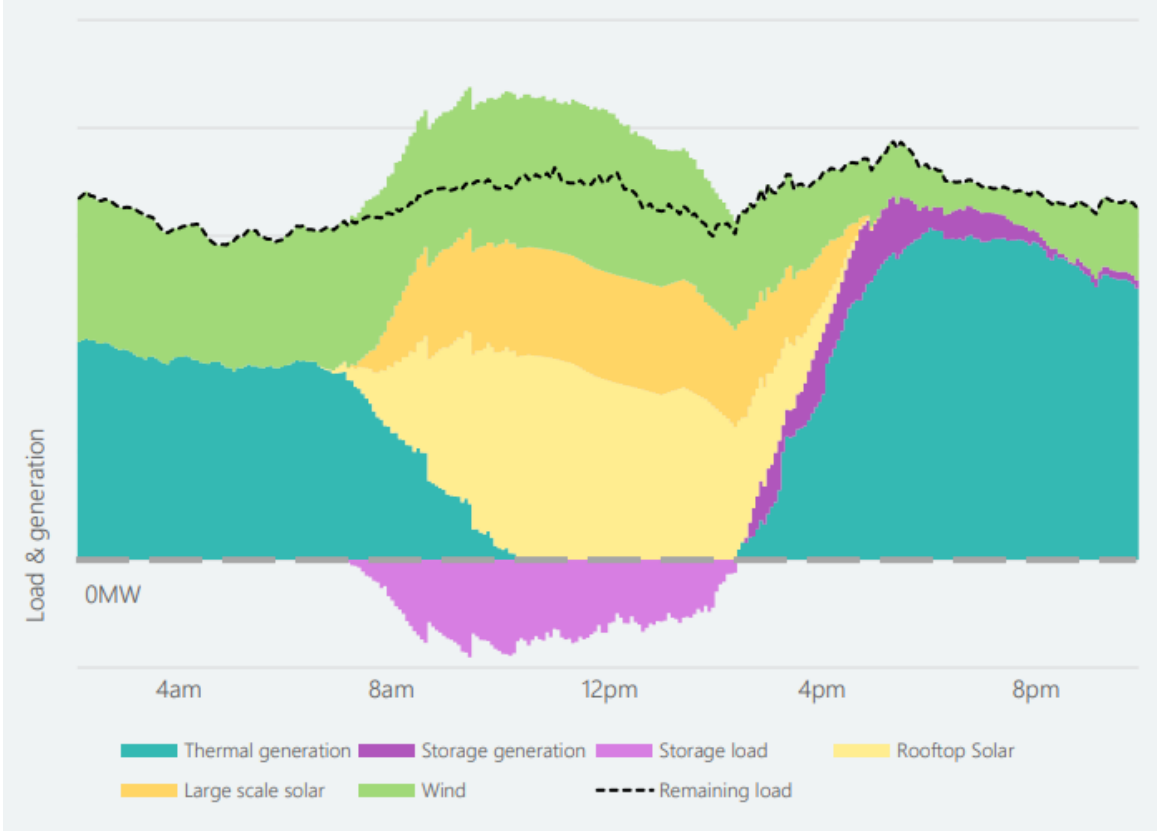
Source: CER

EVs have an average annual growth rate of 59%¹

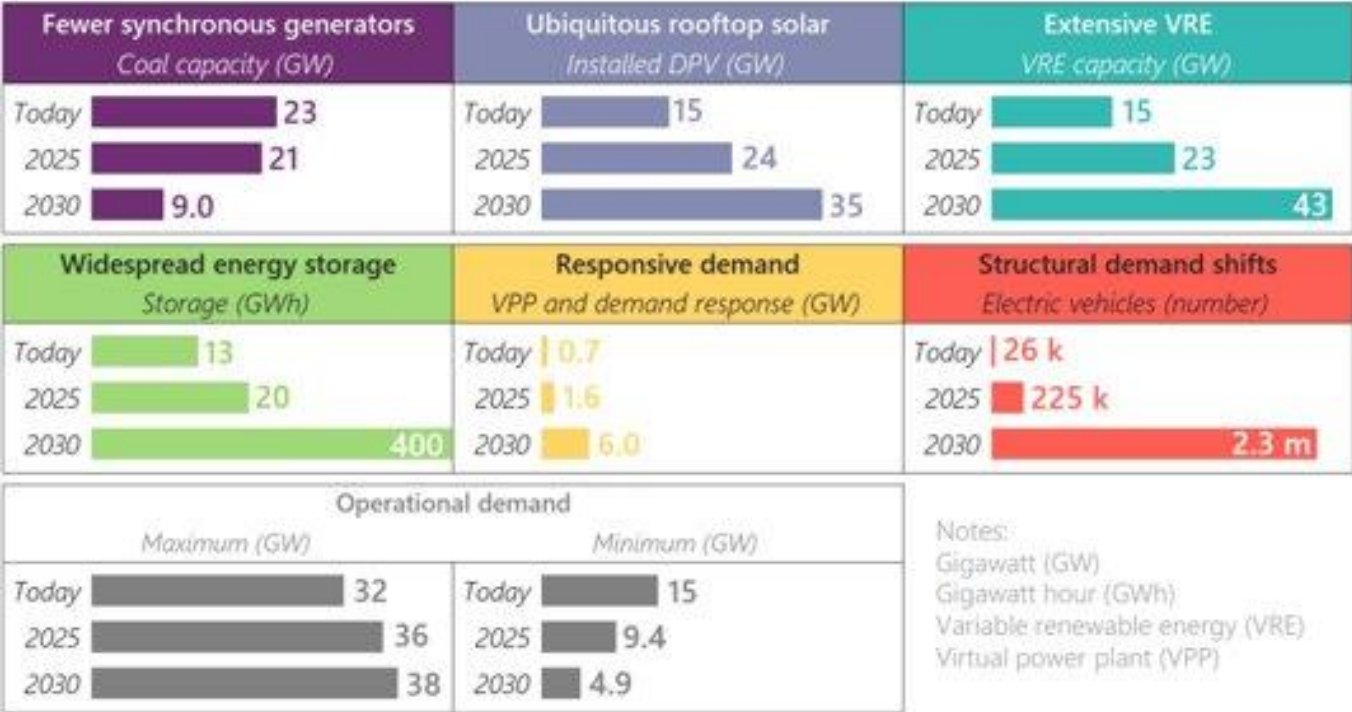


Source: EVC State of EVs 2021

Consequence of Instantaneous Penetration of Renewables



AEMO Forecast Generation Mix



ESB Post 2025 Reform Agenda

Anna Collyer



ESB and market bodies AEMO, AEMC, AER

DER Implementation Plan

DEIP CEO Forum, March 2022

HORIZON ONE – SCOPE OF WORK

REFORM ACTIVITIES UNDERWAY OR PLANNED FOR 2022



Getting the most out of our shared network infrastructure for all customers

How might regulatory and market frameworks adapt to unlock value and choices to all customers from DER assets or flexible demand?

Customer Insights Collaboration

Flexible Trading Arrangements

Technical standards

Policy advice for tech. standards

Governance technical standards

DOEs

DOE policy / reg framework

DSO roles & responsibilities

Metering services

Ongoing tariff reform

Shared capabilities – IT roadmap

Consumers can realise the value of their flexible demand and DER

*How might we reform the wholesale market to remove barriers for service providers to enter and offer new products and services?
How can we adapt current settings to better value the flexibility customers may choose to offer?*

Customer Insights Collaboration

Flexible Trading Arrangements

Scheduled Lite

ARENA trials to facilitate load flexibility

Project Edge

WDRM

Emergency backstops

Minimum System Load conditions

Enhancing customer choice with fit for purpose protections

How do we enhance choice for customers and promote innovation while keeping them protected and maintaining their access to essential services?

Customer Insights Collaboration

Flexible Trading Arrangements

Retailer Authorisation Review

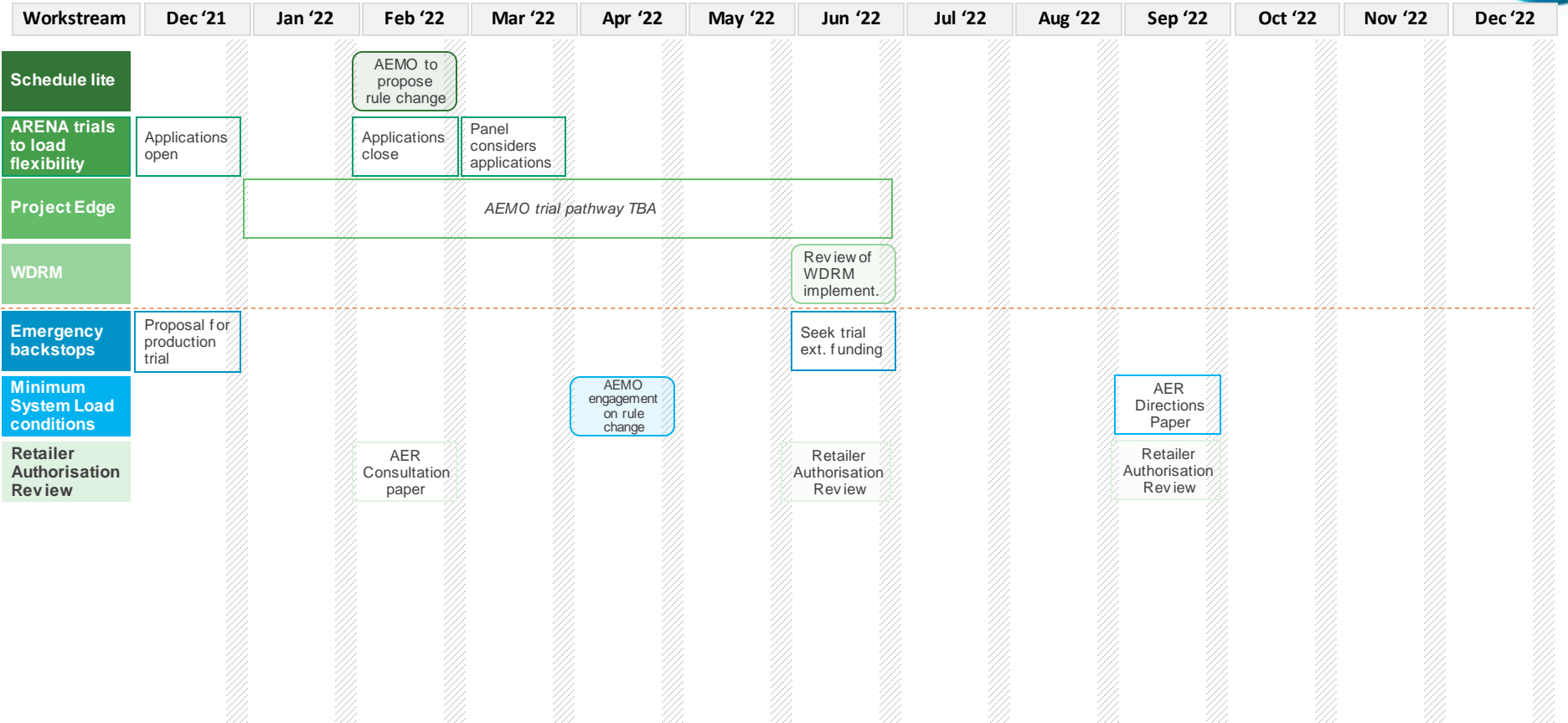
Metering services




Market body activities underway today as part of **DER Implementation Plan**

ESB	AEMC	AEMO	AER	ARENA / DEIP
Interop Stage 1 – solar / storage	Governance of DER rule change draft determination	FTA Model 2 consultation and rule change submission	Retailer Authorisation and Exemption Review	DOE Whitepaper
Interop Stage 1 – Roles and Responsibilities	Metering review	Schedule-lite consultation	DOE regulation and governance	Flexibility for minimum demand trials
Customer Insights collaboration		Reform Development Committee, technology roadmap		ISC, DER Technical standards working groups
EV policy discussion paper workshops				

DER Implementation Plan – Horizon 1



 Stakeholder engagement

 Workstream report / paper

 Rule change / review

DEIP 2021 – Year in Review

Craig Chambers

ARENA's DER & EV portfolio investment landscape

To date ARENA has provided \$154.7m in grant funding to 93 projects in our DER portfolio.
In addition, ARENA will inject up to \$250m in EV grants via the Future Fuels Fund.

DER Integration

Symphony: DER marketplace of wholesale and local network services (within constraints) in WA

EDGE: DER marketplace of wholesale and local network services (within constraints) in VIC

Converge: "Shaped" operating envelope demonstration

Evolve: DER participation in energy and ancillary markets

ANU Project Consort: battery orchestration

SHIELD: Network visibility via data

UNSW Project Match: DER behaviour under power system disturbances

Greensync deX: DER integration middleware

Flexible Connections (SAPNAusnet): Dynamic operating envelopes trials that enables inverters to adjust export limits.

Interoperability Steering Committee: Funding DEIP workstream

Batteries & Load Flex

Pooled Energy: Demand management through pool automation

Rheem: Active hot water control

AEMO: VPP Demonstration

United Energy: Pole Mounted BESS

Tesla: VPP in South Australia

AGL: VPP in South Australia

Monash: Microgrid

Horizon Power: Project Highgarden

UTS: Networks Renewed

ANU: Community Batteries Study

EVs

ActewAGL: V2G Pilot - 51 fleets EVs

Origin: 150 private EV smart charging

AGL: 500 private EV smart charging

Jemena: 223 private EV smart charging

Evie: Ultrafast EV public chargers

Chargefox: EV charging project

Future Fuels: 403 public charging stations (Evie, Ampol, Engie, Chargefox, Electric Highways Tasmania)

Future Fuels (next rounds) yet to be announced

+ many other projects beyond ARENA's portfolio

DEIP's Reach in 2021

7

External workshops
& webinars

5

Specialist
Reports

11

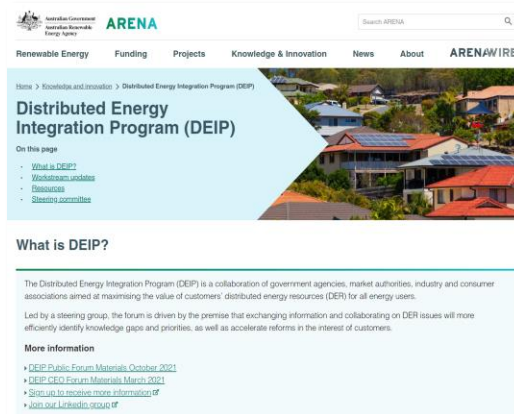
DEIP Secretariat
meetings

4

DEIP Steering
Group meetings

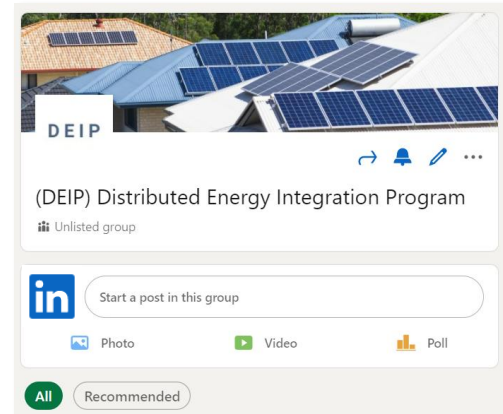
30+

DEIP Working
Group meetings



3,758 unique page views

500+ unique downloads



247 LinkedIn Group
members

2021 Workstream Highlights

Interoperability Steering Committee

- ✓ Established the **Interoperability steering Committee**, appointed Independent Chair and formally requested resourcing
- ✓ Published the **Common Smart Inverter Profile – Australia (CSIP)** in Sept 2021
- ✓ Established the **Cyber Working Group**

EV Grid Integration

- ✓ Established the **EV Grid Integration Knowledge Sharing Reference Group**, with 50+ industry organisations to deep dive into topics like UK smart charging standards, outcomes of residential tariffs workstream & DISER EV Grid Ready package
- ✓ Finalised the **EV data availability outcomes report and workstream** and the **EV interoperability and standards outcomes report and workstream**

Dynamic Operating Envelopes

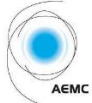
- ✓ Facilitated **4 x industry consultation workshops** exploring DOEs (over 200 people)
- ✓ Published the **DOE Working Group Outcomes Report** in Feb 2022
- ✓ Published the **Customer Energy Management Systems study** by ENEA and the **DNISP benchmark on DOE uptake** by CutlerMerz

DEIP Dive: Dynamic Operating Envelopes

Anthony Seipolt

DOE Workstream

Workstream Review



What are DOEs?

Operating envelopes represent the technical limits within which customers can import and export electricity. Dynamic operating envelopes (DOEs) vary export limits over time and location based on the available capacity of the local network or power system as a whole.

Why are these valuable?

DOEs enable more solar generation while reducing wholesale electricity prices, network charges and the costs of ensuring power system efficiency and security. Recent DOE modelling suggests major increases to exports with rare curtailment. In its current trial, SAPN has indicated that “flexible export limits will typically be at 10kW (i.e. doubled) for 98% of the time.

What did we do?

Purpose: DEIP established the DOE workstream to explore the value that DOEs could offer customers in the energy transition. The workstream built a shared understanding of the opportunities and challenges, shared insights on approaches currently under investigation and identified next steps that could be implemented to establish DOEs.

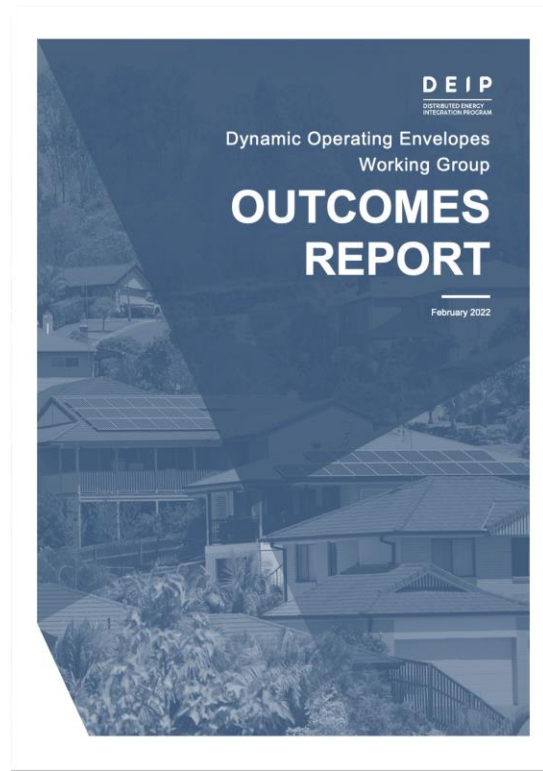
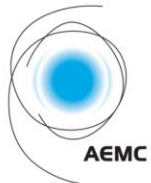
Activity: From September 2020 to July 2021, the DOE Working Group delivered a series of activities:

- DOE knowledge sharing workshop
- Allocation principles workshop
- National regulatory and policy design issues workshop
- Consumer perspectives workshop
- Dynamic Operating Envelopes Benchmark Study by CutlerMerz

Outcomes Report: Following these activities, the Working Group collated the findings of into the “DOE Outcomes Report”. The purpose is to identify the current “state of play” across the energy industry, DER providers, customer engagement and capture the future policy, regulatory, technical and industry actions needed to implement a working model for DOEs.

Outcome Report – Now Released

- 2 Expert reports supporting
- 4 Industry workshops
- 30 Working Group Members
- 16 Months of collaboration
- 27 Findings



DOE Outcomes Report

Overview

Findings from the DOE Outcomes Report

Supporting the roll-out of DOEs

- DOEs do not need to be mandated.
- Learnings from trials should continue to be shared.
- Social license and international links will improve outcomes.

Supporting customers in their choices

- Focus needed on customer protections, information, compliance and reporting.
- Existing regulatory structures are working and will need to continue to adapt.

Nationally consistent approached to implementation

- Strong industry alignment is increasing standardisation and reducing costs for customers.
- DOE roll-outs are impacted by many factors that are specific to each DNSP.

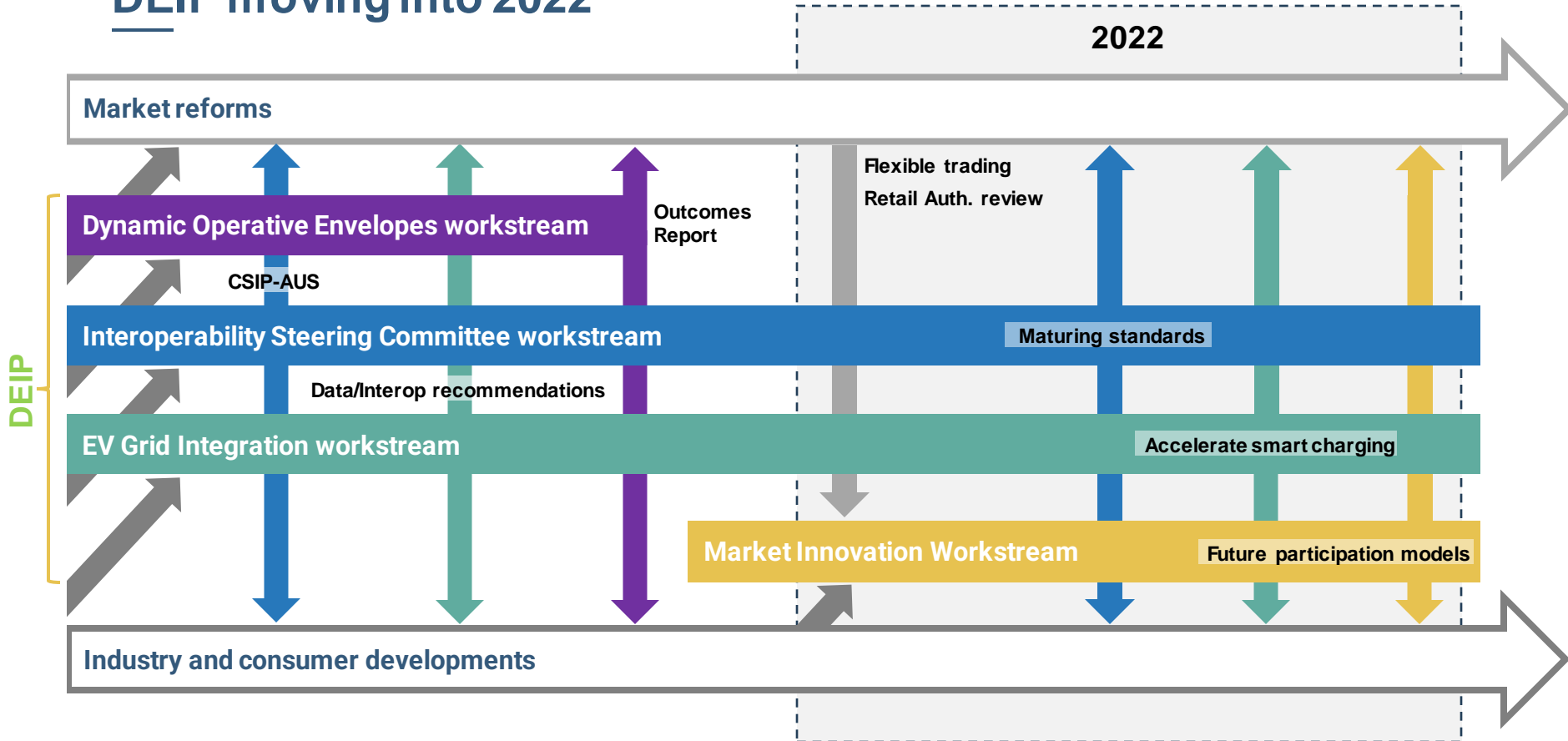
Next Step for DOEs

- **Market bodies and industry** will take forward and consider the findings from the DOE Outcomes Report.
- **ARENA** will continue integrate the findings and support knowledge sharing / discussion on the learnings from DOE trials in 2022.
- **ARENA** will look at opportunities to support the Market Bodies progressing the development of the DOEs.

2022 Work Plan

Rachele Williams

DEIP moving into 2022



Summary of 2022 DEIP work plan

DEIP Cross Cutting



OBJECTIVE

- DEIP to continue to be a forum for consensus building, debate, design and knowledge share
- Be outcomes focused on agreed priorities
- Improve our outreach and communications

Interoperability



OBJECTIVE

- Further development of CSIP-AUS.
- Develop no-regrets cyber security work plan for DER integration.
- Facilitate industry readiness for standards co-existence.
- Explore standardisation of EV charging and integration.
- Investigate and recommend appropriate BTM interoperability standards.

DER Market Innovation



OBJECTIVE

- Consolidate and report on outcomes from major industry trials.
- Deliver findings on how the Energy as a Service models can be applied in the energy sector.
- Demonstrate the greater role flexible demand can play in the market.

EV Grid Integration



OBJECTIVE

- Guide development and implementation of the EV workstream and share information on major initiatives.
- Provide a forum for a broad range of industry and government stakeholders to discuss EV grid integration initiatives.

Interoperability Steering Committee

Lachlan Blackhall

Interoperability Steering Committee

Background

Background

Interoperability is the ability of different IT systems, devices and software applications to **leverage two-way communication and to use, and exchange data accurately.**

The DEIP Interoperability Steering Committee (ISC) has been operating in various forms since May 2020 to **support the development and adoption of DER technical and interoperability standards.**

Challenge and Opportunity and Value

Customers are driving a distributed energy revolution in Australia through the uptake of DER. However, **DER are contributing to dynamic two-way flows of energy** which must be coordinated effectively.

New interoperability standards and capabilities are vital to **giving customers choice and certainty about their DER uptake and usage**, whilst ensuring energy reliability and energy security.



Interoperability Steering Committee

2022 Workplan

Key Stakeholders



- DERIAPITWG
- Industry stakeholders



- Industry stakeholders



- Industry stakeholders



2022 Planned Activities

Further development of DER communication protocol – CSIP - Australia

- A testing guide to allow stakeholders and vendors to validate conformance to CSIP – AUS.
- Continued engagement with Standards Australia and the IEEE.

Progress Cyber Security for DER Integration

- A DER Cyber Security no-regrets technical work plan.
- Design capabilities and system framework for security of communications platforms.
- Support DISER identifying regulatory lever to implement minimum cyber security capabilities.

Standards co-existence

- Drive industry understanding that multiple standards and protocols are required to enable interoperability. This includes the potential for different communications protocols that are applicable to different devices (EVs, inverters, load).
- A workshop to identify the issues related to standards coexistence and gaps for further work.

Impact

1. **Supports the rapid uptake of DER** for the benefit of consumers.
2. Simplifies system integration of DER and **enables existing infrastructure to be used in smarter ways.**
3. **Allows DER to create value for individuals and communities** by supporting network and system operators.

Interoperability Steering Committee


2022 Workplan

Key Stakeholders



- DEIP EV Grid Integration WG
- Industry stakeholders



- State governments 
- Industry

2022 Planned Activities

EV interoperability and integration

- Develop a framework for identifying and recommending the adoption of relevant EV interoperability and integration standards.
- Explore national standardisation of EV managed and V2G integration and interoperability standards and protocols.

BTM interoperability

- Establish the evidence base for how best to support and achieve BTM interoperability (e.g. EVs/CEMS/HEMS standards).
- Investigate existing and emerging BTM interoperability standards and technical capabilities.

Impact

1. **Supports the rapid uptake of DER** for the benefit of consumers.
2. Simplifies system integration of DER and **enables existing infrastructure to be used in smarter ways.**
3. **Allows DER to create value for individuals and communities** by supporting network and system operators.

DER Market Innovation

Jon Sibley

DER Market Innovation

Background

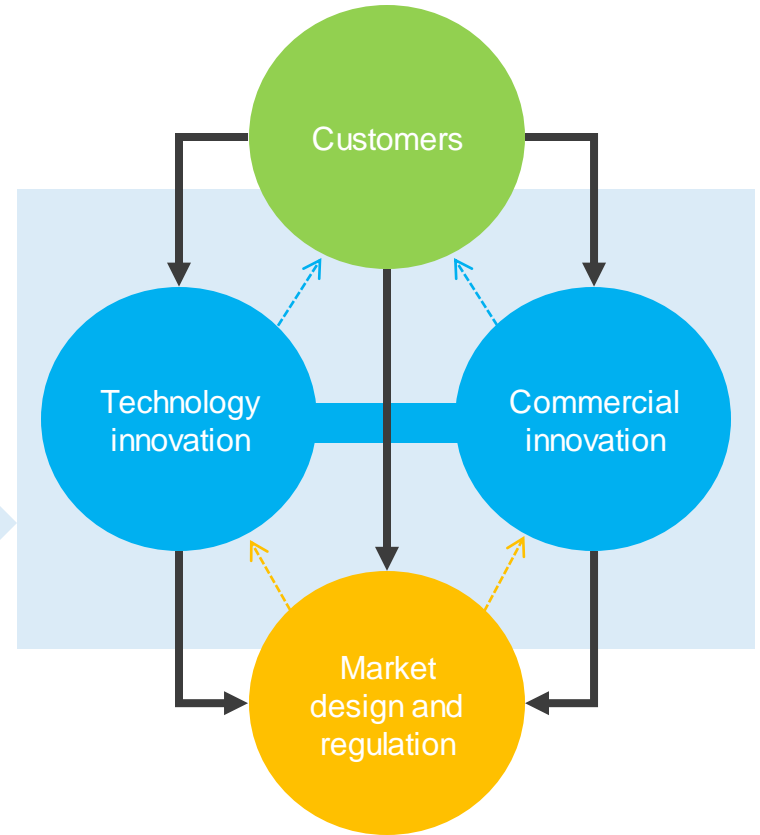
2022 in context

Innovation in DER technical and commercial models continues to accelerate to manage energy spot market exposures, including more active management of solar exports and greater utilisation of flexible demand. A range of potential and longer-term DER use-cases are emerging and their adoption will be shaped by customer demand, technology and commercial innovation and market design and regulation.

The role of DEIP in 2022




The work of the market bodies over the course of 2021 has greatly enhanced industry's understanding of the potential for DER to contribute to Australia's energy transition and the associated technical and market design challenges. The ESB's DER maturity plan, and a number of Rule Change processes, are setting the course for reform in the NEM.

In support of future reforms, **DEIP will provide a vehicle for industry collaboration and knowledge sharing around the commercial and technical innovations that will drive future market development.**



DER Market Innovation

2022 Workplan

Key Stakeholders	2022 Planned Activities	Impact
	<p>Market participation trials summary report & knowledge sharing workshops Objective: Consolidate and report on outcomes from major industry trials ARENA consolidate and report on outcomes from current DER market participation trials (e.g. EDGE, Symphony, Edith, Converge). This will include industry consultation, workshops and oversight by a reference group made up of market bodies, industry and consumer groups.</p>	<ul style="list-style-type: none">• Inform future market design considerations for DER participation.
	<p>Energy-as a-Service (EaaS) study Objective: Deliver findings on how the XaaS* models can be applied in the energy sector ARENA, ECA, AER and AEMC will collaboratively consult, investigate and report on domestic and international best practice for emerging EaaS models to contribute to enhanced customer outcomes in the energy sector (including the efficient utilisation of DER), while identifying technical, commercial and/or regulatory barriers to adoption.</p>	<ul style="list-style-type: none">• Inform market bodies & industry of emerging business models.
	<p>Load flex trials Objective: Demonstrate the greater role flexible demand can play in the market ARENA is seeking project proposals that can demonstrate a market-based response to low/negative market prices. This includes the opportunity to demonstrate a response to AEMO's MSL notice framework consistent with ESB's recommendation to trial flexible demand 'front stop' capability.</p>	<ul style="list-style-type: none">• Demonstrate the contribution flexible demand technologies can have towards supporting the renewable energy transition.

EV Grid Integration

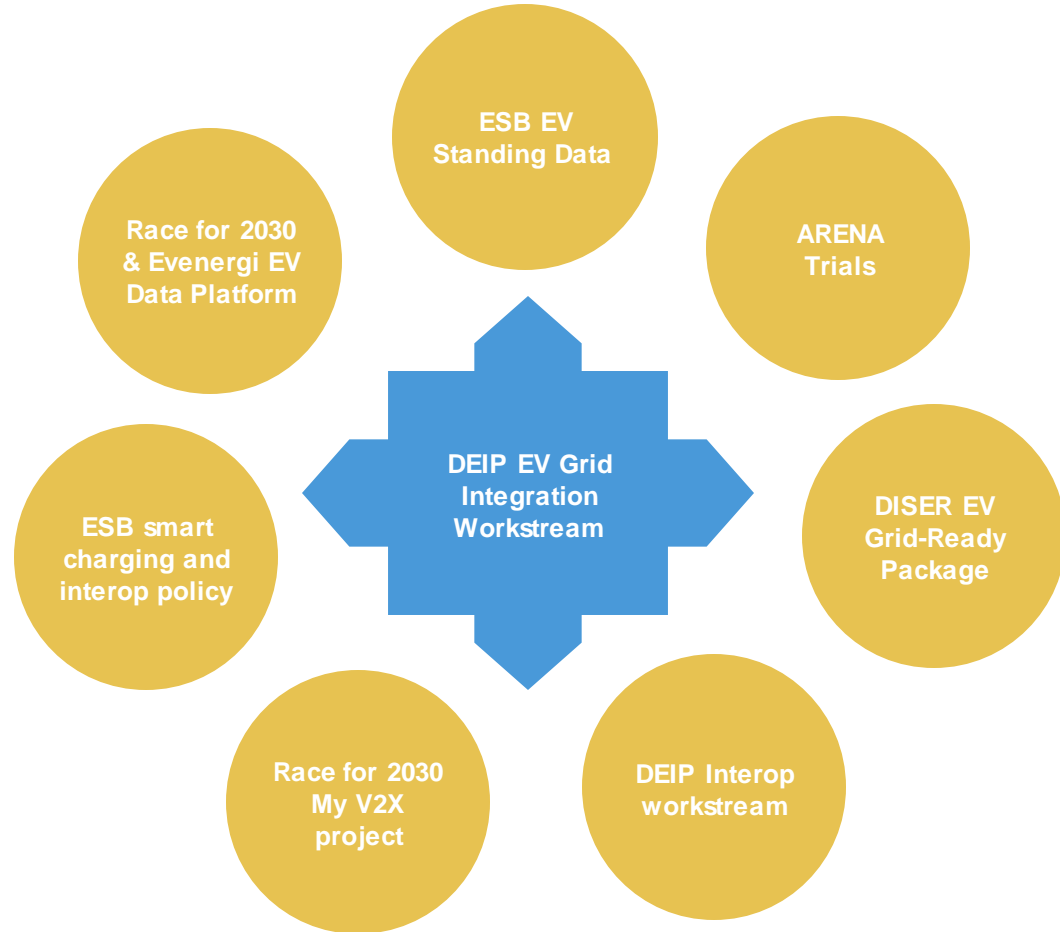
Kate O'Callaghan

EV Grid Integration

Background

Our Challenge

- EV Grid Integration workstream purpose is to **facilitate the efficient integration of EVs** into existing networks and markets.
- **Many significant yet separate industry initiatives** to inform policy and regulatory frameworks around EV integration/ smart charging.
- Need for **enhanced coordination & communication** of major initiatives.
- Need to **accelerate smart charging** uptake.



EV Grid Integration

2022 Workplan

Key stakeholders



Representatives from 50+ industry organisations (i.e. market bodies, state & federal government, OEMs, retailers, distribution networks, consumer groups, researchers)

2022 Planned Activities

EV Grid Integration Steering Group

Objective: Guide development and implementation of the EV workstream and share information on major initiatives.

Description: Leadership group to expand and meet more regularly to exchange information and guide delivery of the workstream. This will include two initial projects:

- Piloting an **EV Grid Integration Virtual Information Hub** to assist with consolidating and communicating information about major EV grid integration initiatives. The platform will consolidate descriptions of all major initiatives, web links, contact information, upcoming events, latest reports and status updates.
- Leading identification of **priority knowledge gaps** to focus the reference group and steering group's knowledge sharing activities.

EV Grid Integration Reference Group

Objective: Provide a forum for a broad range of industry and government stakeholders to discuss EV grid integration initiatives.

Description: Each meeting will include a deep dive presentation on a relevant initiative with time for audience Q&A. Presentations may be from domestic or international initiatives.

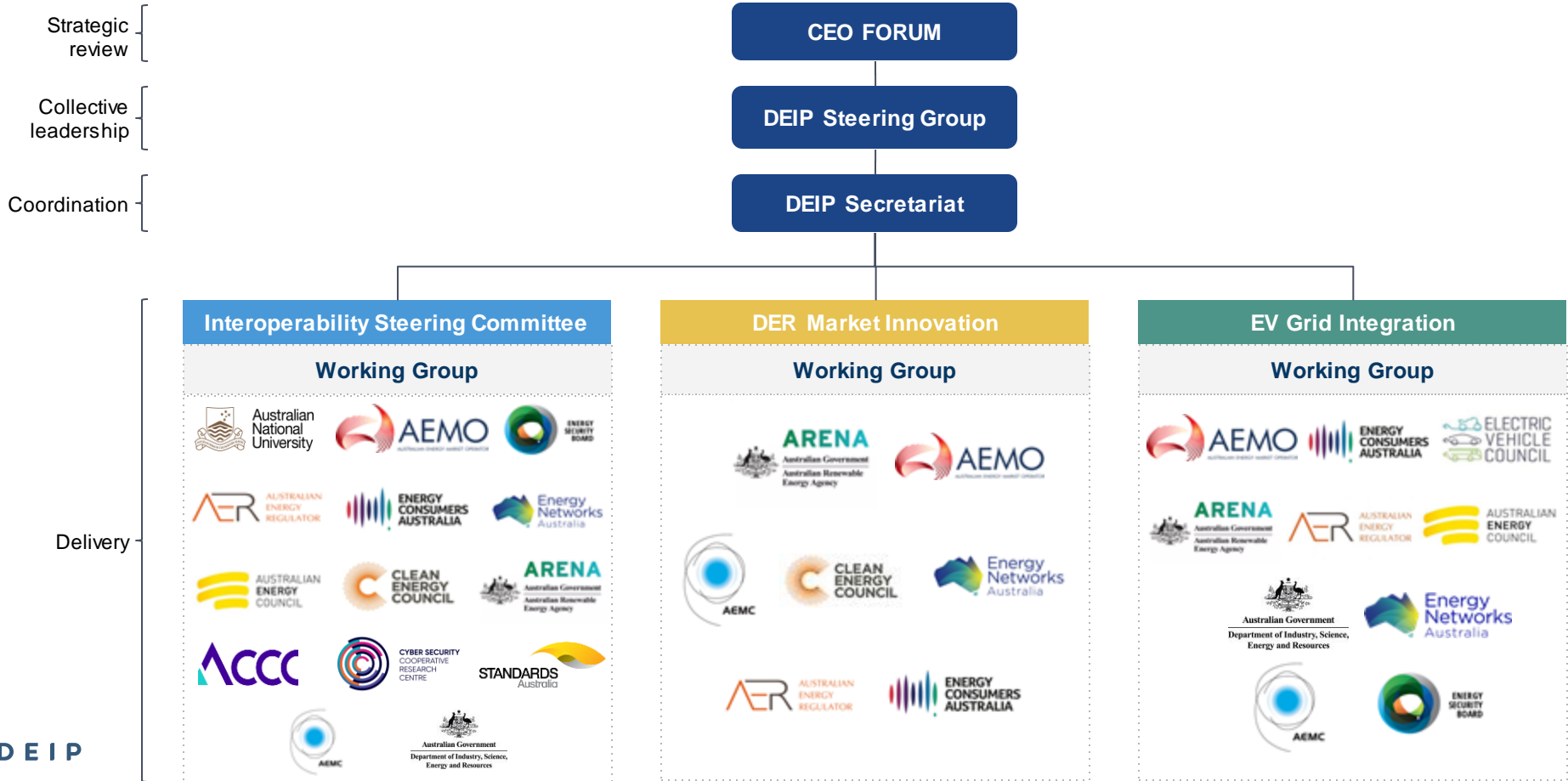
Output

- Regular Steering Group meetings
- Ad hoc workshops / meetings / presentations as identified
- Virtual information hub
- Priority knowledge gaps
- Monthly Grid Integration Reference Group meetings
- Ad hoc workshops / meetings / presentations as identified

Summary

Jon Sibley

DEIP Program Governance



Appendix

Summary of 2022 DEIP work plan

Current State

Proposed DEIP 2022 Priorities

Market Bodies & ESB

DER Market innovation

- A number of DER market trials underway, there is a need for more flexible demand and addressing a lack of knowledge about emerging business models internationally.

- Through DEIP, **ARENA** to consolidate and report on outcomes from current **DER market participation trials** (e.g. Edge, Symphony, Edith, Converge).
- **ARENA and AEMO** to coordinate development of **flexible demand trials and demonstrations** including demonstrating innovative retail and aggregator models.
- **ARENA, ECA and AER** to collaboratively deliver consultation and report on local and international best practice and emerging **Energy-as-a-Service (EaaS)** models and how they can contribute to enhanced load flexibility, efficient DER integration, consumer choice, and potential technical, commercial and regulatory barriers to local adoption.

- Evidence based knowledge sharing from DER market trials – consult on next steps.
- Consider network and market led flexible demand interoperability.
- AEMO to present on EDGE to DEIP.

Electric Vehicles Grid Integration

- Identified & reported on near term data requirements and knowledge sharing priorities.
- Identified & reported on priorities for standards development for EV smart chargers.

- Through DEIP, **ARENA and Industry** will consult and report on outcomes from trials and options to **accelerate smart charging uptake** (technology and commercial models) including international best practice.
- The **EV Grid Integration Steering Group** will lead development of **key questions/knowledge gaps** and a **DEIP EV Integration Information Hub** to support enhanced knowledge sharing.

- **ESB** to commence consultation on national implementation **policy for smart charging**.
- **ESB** to consult on rationale and design options for collection of **EV Standing Data**.

Interoperability Steering Committee

- Cyber Working Group established with ToR and priority workplan agreed.
- Developed device standard to enable DER interoperability (based on a common global standard).

- **API WG** to develop interoperability standard **testing and compliance guideline**.
- **Cyber WG** to progress **technical design for securing interoperability communications**.
- **Interoperability Steering Committee (ISC)** to progress **EV interoperability and integration standards** by building on work from the EV WG.
- **ISC** to workshop options to progress **Standards Co-existence**.
- **ISC (with ECA)** to consult and report on options for voluntary standards that could support continued product innovation and informed customer choice in **BTM device ecosystems**.

- **ESB** consulting and developing DER interoperability policy to enact capabilities emerging from the work of the ISC.
- ISC to hand over work items to **market bodies and ESB** in 2022.

DEIP Roles and Responsibilities*

CEO Forum

Purpose: To set the year ahead program priorities for DEIP. The forum will also support the allocation of organisation resources and commit to the outcomes agreed.

Cadence: The CEO Forum meets at least once a year.

DEIP Steering Group

Purpose: To provide collective leadership to ensure all the right people are involved in the right way. It steers DEIP by providing advice about its priorities and direction.

Cadence: It meets on a bi-monthly basis with representatives from all DEIP members.

DEIP Secretariat

Purpose: To provide a centralised coordination function for DEIP activities ensuring governance, coordinating communications and leveraging resources.

Cadence: It meets on a three weekly basis and will champion the DEIP Principles.

Working Groups

Working Group members will have oversight and responsibility to deliver a specified DEIP Package outcome in a specified timeframe.

Members can come from DEIP members (on an opt in basis) and can include other relevant stakeholders.