

The logo consists of the letters 'D', 'E', 'I', and 'P' in a bold, black, sans-serif font, spaced out horizontally. The letters are positioned on the white side of a curved, light grey border that separates the white background from a dark blue background on the right.

DEIP

Distributed
Energy
Integration
Program

DEIP CEO Forum

15 November 2019

Context setting

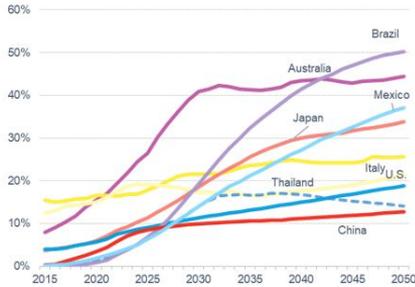
An aerial photograph of a residential neighborhood with several houses. The roofs are covered with solar panels. The image is overlaid with a semi-transparent blue filter. In the background, there is a dense forest of trees. The text 'Context setting' is written in white, sans-serif font in the upper left quadrant. The text 'DEIP' is written in white, sans-serif font in the bottom left corner.

Purpose of CEO Forum

- Reflect on our purpose and collective vision
- Discuss on DEIP achievements and provide feedback on the program's effectiveness in the first year
- Review and endorse the Work Packages to be presented
- Seek commitment for ongoing in-kind support through relevant resources which support the proposed working groups, as relevant to each organisation
- Discuss ongoing governance, resourcing and funding sources

Change is the only constant

Decentralisation Ratio
fraction of capacity behind-the-meter (BNEF)

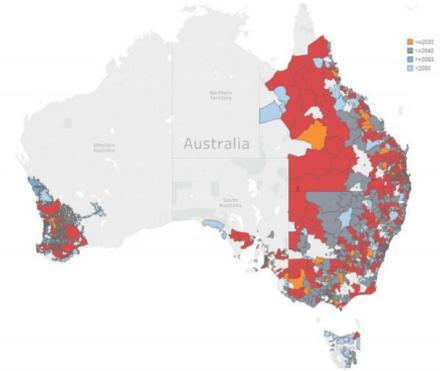


Australia can't look to others for a solution and must lead

Installed Capacity By State & % of Dwellings (APVI)



DER technology cost continue to fall and installations continue to rise



Uncoordinated integration is leading to network constraints and costs



Reviews are providing important insights



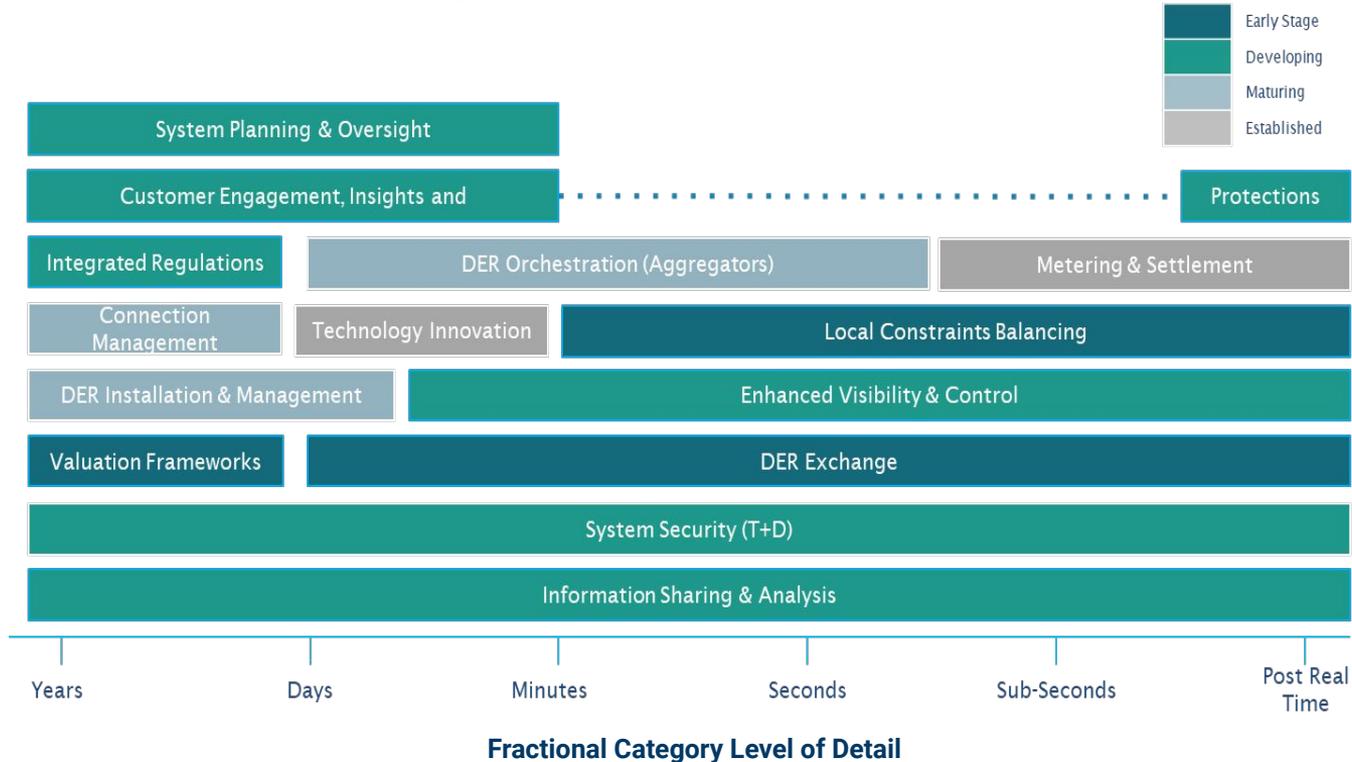
No one party has all the answers or can navigate a solution alone



Collaboration, innovation and knowledge sharing is required to build consensus and capacity

Overview of DER Functional Maturity

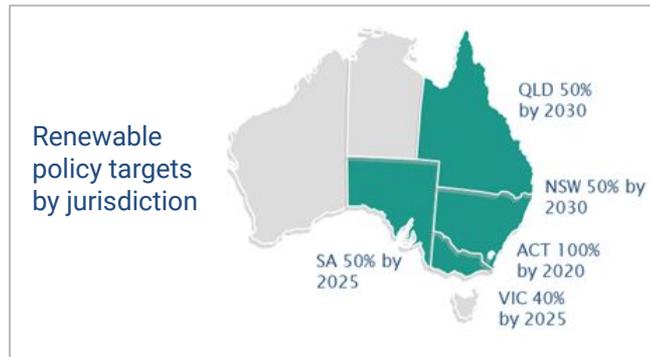
The functional maturity assessment below was developed using the outcomes of the DER Innovation projects stocktake and a survey of DEIP members in late 2018. We have made progress in key areas but there is still much to do.



Overview of DER initiatives landscape

POLICIES & PROGRAMS	
Federal	SRES subsidy to 2030
ARENA	ARENA funded until in 2022
Federal	Minimum Energy Performance Standards
CEFC	CEFC Act (including Innovation Fund)
Various	State programs supporting residential/commercial solar + storage

GOVERNANCE & SHARED VISION	
DEIP	Steering Group work program
AEMO	DER Register
ARENA	DER Round Table Discussions
ARENA	Insights Forum
CEC	Review of Rebate Eligibility Criteria
COAG	Energy Market Transformation Project Team (EMTPT)
ESB	Post-2025 Market Design



CUSTOMER	
ACCC	New Energy Tech Consumer Code
ACCC	Consumer Data Right
CSIRO	NEAR Program
Oakley	Pricing study
Greenwood	Energy Data Hub
Vic Govt	C4NET Centre for New Energy Technologies
Vic Govt	Bruny Island
TasNetworks	New Energy Compact
DEIP	

MARKETS	
AEMC	Short Term Forward Market Rule Change
AGL	'Power in Numbers' VPP Project
Simply Energy	'Simply Extra VPPx' Project
AEMC	Wholesale Demand Response Mechanism Rule Change
AEMC	Wholesale Demand Response Register Mechanism Rule Change
AEMC	Mechanisms for Wholesale Demand Response Rule Change
AEMO	VPP Demonstrations
ARENA/AEMO	Demand Response RERT Trial
ENA/AEMO	Open Energy Networks
Vic Govt	Microgrid Demonstration Project
Vic Govt	AMI Cost-Benefit Analysis
DEIP	DER market development
DEIP/AEMO	DER Marketplace Trials

FRAMEWORKS	
AEMC	ENERF Review
AEMC	National Electricity Amendment (DMIS and DMIA for TNSPs) Rule Review of SAPs
AER	Assessment of DER Integration CAPEX & OPEX
DEIP/AEMC	Network Access and Pricing

INTEROPERABILITY & RESILIENCE	
AREMI	NationalMap
CEC	Review of Grid Connection Rules
CSIRO/AEMO	Australian Energy Simulation Centre
CSIRO	Small-Scale Resource Projections
Zephen/ANU	Evolve DER Project
GreenSync	deX Project
CSIRO	LV Feeder Taxonomy Project
TasNetworks	Network Aware Coordination
DEIP/AEMO	Cyber Activation Blueprint
DEIP/AEMO	DER interoperability (communication) standard
DEIP/AEMO/CSIRO	Distribution Limits and Network Visibility
DEIP/AEMO	EV Grid Integration Working Group

DEIP Year in Review

DEIP has enabled targeted outcomes through collaboration

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.

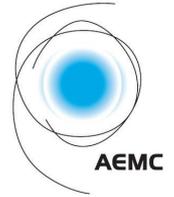
VISION

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 distributed energy resources ('DER'), enabled through Distributed Energy Markets.

WHO IS INVOLVED

The DEIP Steering Group involves 13 organisations who communicate regularly.

DEIP Steering Group



DEIP Guiding Principles and Collaboration Approach

DEIP guiding principles...

Collective Leadership

DEIP prioritises developing and projecting a shared vision for change.

Outcome focussed

DEIP focuses on solvable challenges that can impact outcomes over the near term (1-3 years).

Agile and fit for purpose

DEIP builds on existing work, approaches challenges flexibly, and selects the best suited techniques for each task.

Collaborative approach

No one party can affect systemic change in isolation and the DEIP is a useful medium to collaborate and reach consensus.

DEIP collaboration approach...



DEIP delivery structure...

WORK PACKAGES

Delivering

Activate stakeholders through collaboration forums to share learnings and building consensus around agreed outcomes

STEERING GROUP

Solidifying

Consensus oriented
Builds cross-collaboration

SECRETARIAT

Forming

Forward planning for DEIP
Stress testing initiatives

Review of achievements to date

- Sep 18**
 - **Prioritisation exercises and DER stocktake** to inform DEIP strategy
- Oct 18**
 - **DEIP launch** at 2018 All Energy Conference
- Nov 18**
 - **Customer DEIP Dive** identified key challenges and opportunities for customers in high DER electricity system and identified the need for a customer insights and informed the AEMO VPP Demonstration
- Feb 19**
 - **VPP Knowledge Sharing Workshop** to share best practices of VPP initiatives with NEM jurisdictions to inform policy processes
- Jun 19**
 - **Regulatory DEIP Dive** to discuss AEMC's approach to regulatory reform and led to the Network Access and Pricing package
- Sep 19**
 - **Network Access and Pricing package** to determine how the economic regulatory framework should evolve to meet user expectations, which are changing as we move to higher penetration of DER

Year 1 - Key Achievements

✓ DEIP has held four industry events bringing together over 270 attendees and numerous **DEIP forums targeted at tackling the industry/stakeholder wide challenges.**

✓ Development of a set of **energy user design principles 'New Energy Compact'** that has been led by customer representatives, which will be used to assess future reforms and used to navigate decisions that affect customers.

✓ A refocus of ARENA funded customer facing projects toward **targeted customer insights knowledge sharing** to ensure we better understand what customers really want (e.g. AEMO VPP trial customer insights).

✓ Greater acknowledgement by industry and customers of the importance of greater **collaboration and consensus building** to navigate the reforms to harness the potential of customer owned DER.

✓ Specifically AEMC through its *Electricity Network Regulatory Frameworks Review* outlined that DEIP was pivotal in **supporting future two-way network access and pricing regulatory reforms.**

✓ Greater collaboration between market bodies, ARENA and jurisdictions on the importance of **open communications standards and navigating the risks** of creating legacy infrastructure from DER funding programs.

✓ Informed by the DEIP priorities, ARENA undertook a stocktake to **improve its focus and feedback on priorities to potential ARENA funded DER projects.**

✓ A **structured Work Package outlining high priority** activities that enables key stakeholders to focus resources on targeted no-regrets activities (see DEIP work packages enclosed).

✓ Establishment of a **national API taskforce** focused on development a common DER interface protocol.

DEIP Steering Group Survey Results 2019

Change is complex

- *Change is complex and the responsibility is scattered... it is difficult to keep track of all the moving parts.*
- *We need systemic changes in the market design and network operations... but solutions are diverging and being developed in isolation.*
- *The public is being left behind in the technical debate... but energy consumers need to be at the centre of policy design.*
- *We need a coherent narrative for change.*

Feedback

Great news

- All respondents see DEIP as a **valuable knowledge sharing forum**
- More than 70% of respondents thought that the DEIP principles of **collective leadership** and **collaborative approaches** were effectively demonstrated
- More than 70% of respondents think DEIP is **focusing on the right priorities** to achieve our shared objective

What to work on

- Less than 30% of respondents think the current DEIP **governance structure supports effective decision making**
- Less than 30% of respondents feel they are **effectively engaged in DEIP decision making**

Taking stock of our current state

1.

The DER transition continues to require systemic changes in the market design and network operations to deliver customers expectations.

2.

Prior to DEIP there was no party or mechanism to coordinate and prioritise effort across industry and consumer groups.

3.

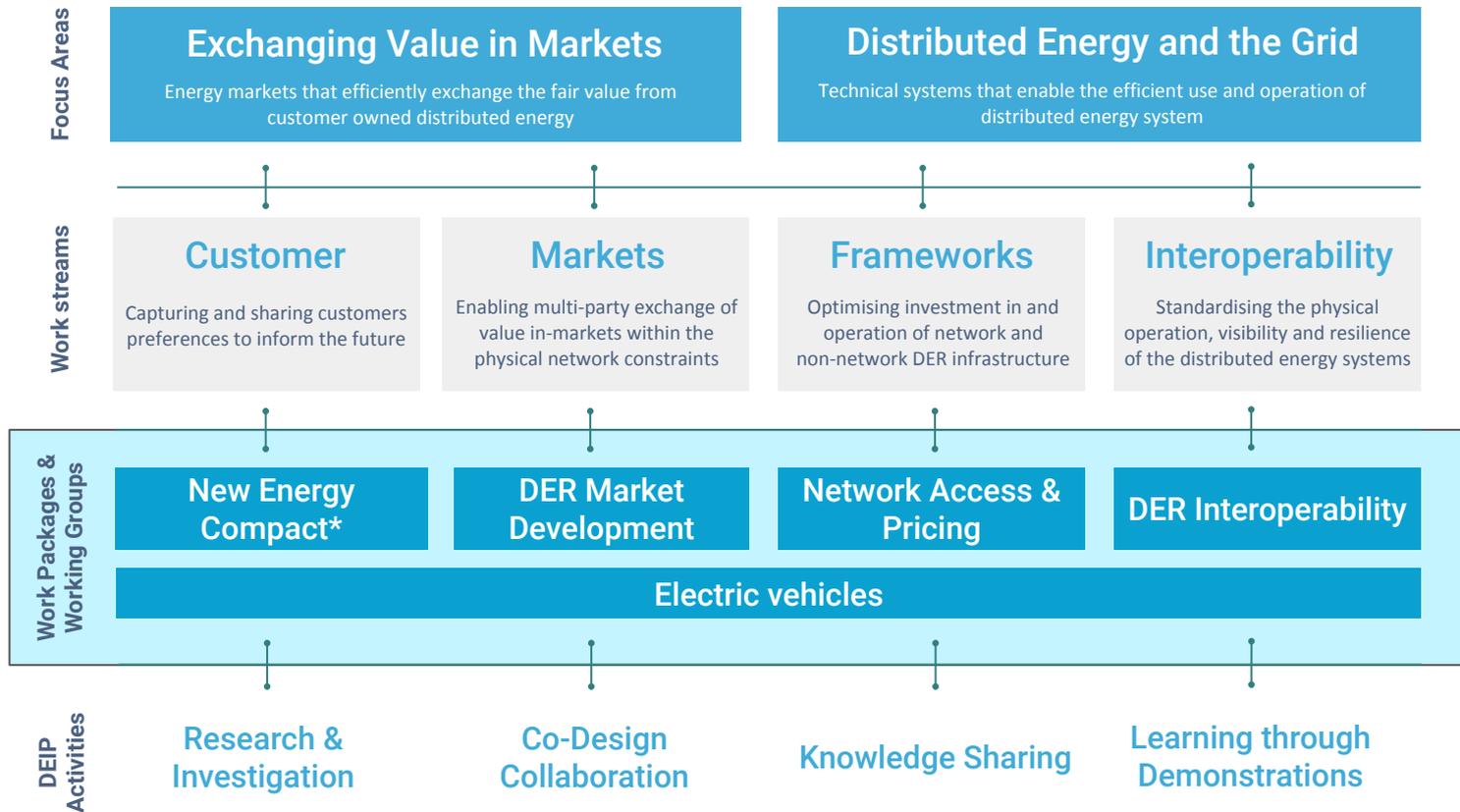
The first phase of DEIP has been successful although governance, communications and consensus on priorities held us back.

DEIP is now at a point where a **targeted cross industry work plan** can be implemented through formalised coordination and co-design process with customers.

DEIP work packages

Four clearly defined packages with targeted customer outcomes

Proposed 2020 DEIP Priorities



What is a work package?

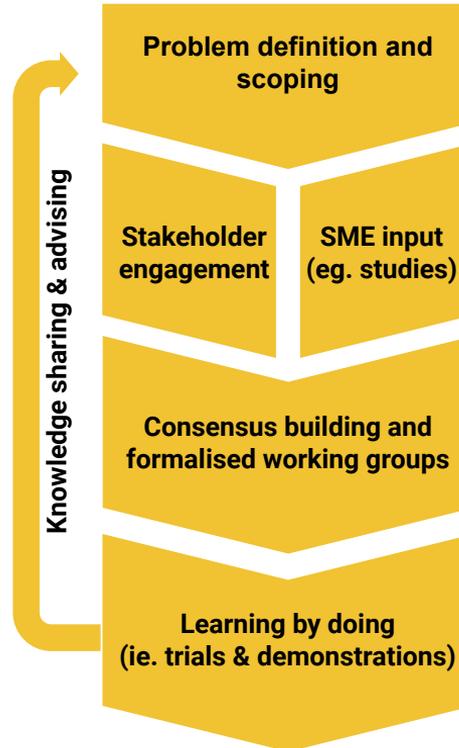
DEIP Packages will involve a suite of complementary initiatives focused on a particular topic or challenge...

Work items could be:

- Stakeholder consultations
- Studies and knowledge sharing
- Trials and demonstration projects
- Reform recommendations (eg. Rule Change Requests)

Outcomes could be:

- A consensus document or report
- Informing an industry activity (eg. OpEN)
- Commitment to further studies or trials



DEIP packages must:

- Define a problem that needs collaboration
- Identify work items to solve this
- Obtain commitment from the lead and 'sponsors'
- Outline resources and timeframes
- Establish governance processes

Four priority DEIP work packages

1. DER Access and Pricing

Building consensus and developing arrangements to support evolving regulatory frameworks to meet changing community expectations and higher penetration of DER

- ▶ Equitable DER access arrangements
- ▶ Two way pricing model (6.1.4)
- ▶ Complementary measures (incentives, demand response)
- ▶ Regulatory investment frameworks
- ▶ Customer insights and engagement

2. DER Interoperability (Data, Communications & Cyber Security)

Coordinated industry wide support and implementation of DER interoperability platform, cyber security & device standards

- ▶ Data scope, quality and access
- ▶ Communications protocols (API working group)
- ▶ Cyber security and controls
- ▶ Device standards

3. DER Market Development

Testing the theory in practice for how DER marketplaces may deliver the most efficient outcome for consumers

- ▶ Market trials - do & learn (e.g. Vic DER Mkt PI)
- ▶ Connectivity middleware (deX + others)
- ▶ Test OpEN and alternative models
- ▶ Network monitoring and operating environment (Evolve & State Estimate Tools)
- ▶ Aggregators, planning and forecasting

4. Electric Vehicles

Facilitating the efficient integration of EVs into existing networks and markets

- ▶ EVs as DER (flexibility and coordination of EV demand)
- ▶ EV specific integration issues
- ▶ Fleet charging demonstrations (cars, buses, trucks)
- ▶ Demonstrations of V2X (including both V2G and V2H)
- ▶ Managed/smart charging demonstrations
- ▶ Connecting EV industry to electricity market reform

What is the purpose?

Explore alternative distribution network access, connections and pricing models for a high DER future – taking into account electricity system users' expectations

What are the key outputs?

- Suggested changes to the regulatory framework
- Materials to support potential rule change request

Timeframes

- Commenced: September 2019
- Completion: April 2020 (expected)
- Demonstrations ongoing

Key package components

- 1. User access and pricing workshops**
Identifying user needs, developing consensus
- 2. Access and pricing options study**
Identifying alternative models, and changes required to the regulatory framework
- 3. Value of customer exports**
Developing a standard methodology

Why was this package developed? Who is involved?

Network access and pricing

Context

- **Grid of the future:** a dynamic and integrated future electricity system where DER plays an important role
- **The role of distribution networks** will evolve to become a platform to enable customers to access a variety of energy services; facilitating two-way flows

Implications for the regulatory framework

- **The vision:** optimising the benefits of DER for all electricity system users
- AEMC's *2019 Grid of the future* review considered actions needed to realise the vision
 - Crucial regulatory reforms needed to overcome near to medium term challenges
 - Setting foundations for any future market designs (developed through ESB's 2025 market design review)
- DEIP provides a platform for all stakeholders to work collaboratively to develop options

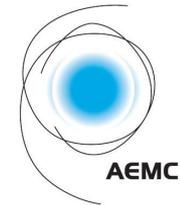
Who is involved?



ARENA



Australian Government
Australian Renewable
Energy Agency



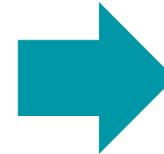
What is the problem to address?

- Standards, system tools and models do not adequately integrate DER
- Inadequate interoperability and cyber security



How will these be addressed?

- New standards, models and system operating tools
- Grid support
- Interoperability
- Cyber security
- Distribution Limits



What will be the impact of this work?

Coordinated industry wide support & implementation of DER interoperability platform, system operating tools, models & device capabilities

Current state activity stocktake

DER interoperability

AS 4777 Review

(AEMO lead, Standards Australia Industry Committee)

Grid Support modes

ENA

Standardising power quality response modes across DNSPs

AS 4755 Review

(AEMO lead, Standards Australia Industry Committee)

Dispatchability & standardisation of dispatch response

Interoperability

(AEMO & Industry Working Groups)

API Working Group defining data sets / operating platform

SAPN & ANU trials and API development

Cyber Security

(Commonwealth security agencies & AEMO)

Reviewing Standards to protect communications to the DER device and between participants

Reviewing implementation options

Compliance

(CER & SA Govt. AEMO)

Review existing, create & implement improvements

AEMO & CSIRO: Distribution System Modelling & Power System Operating Tools

These new DER capabilities underpin development of real-time distribution network operating models, power system operating tools, and the DEIP Markets work package (Trials and development of DSO / DMO model)

CSIRO / ARENA Distribution Network Taxonomy project:

Develop a standard representation of low-voltage network characteristics for Australia, and a distributed energy resources model.

Stakeholders engaged across these (and proposed) work packages

CSIRO, AER, AEMC, ENA, CEC, Consumer groups, DNSPs, Manufacturers, State Governments, Universities

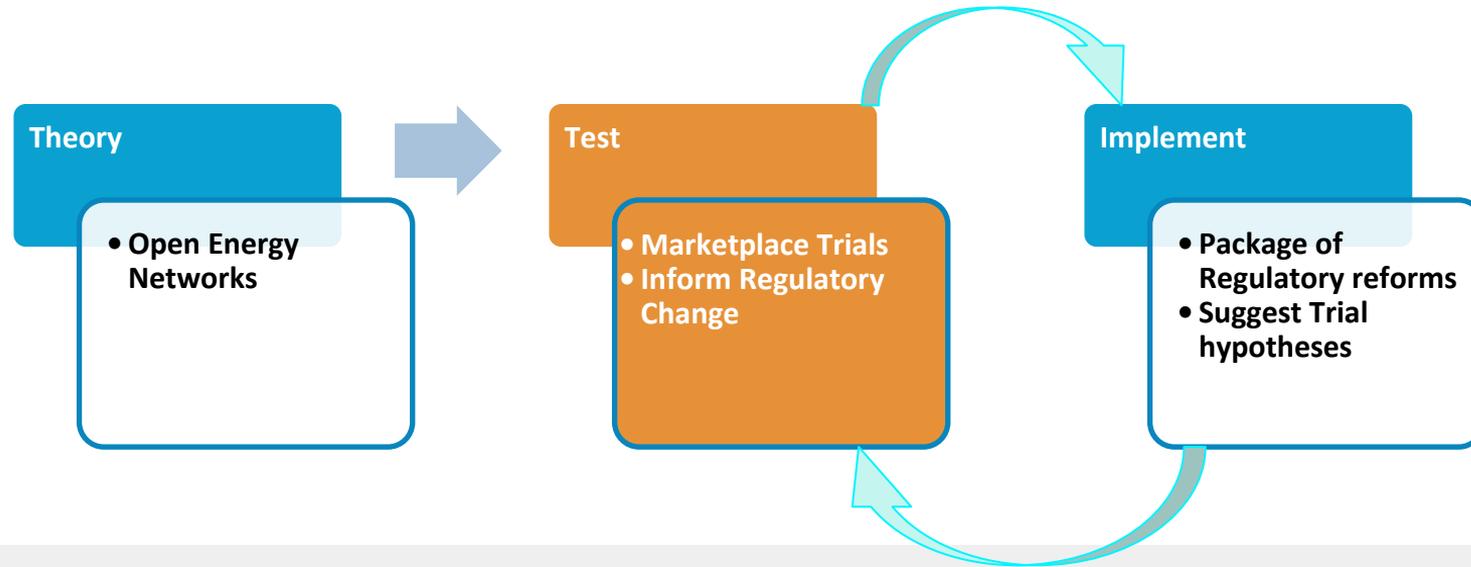
Cyber Activation Blueprint

- Lead and implement DER cyber-security capabilities across NEM
- Clarify market participant roles and responsibilities
- Develop cyber standards, threat matrix map and technical capabilities to mitigate
- Identify cyber resilience measures
- Implementing encryption and authentication of communications between DER and market participants

DER interoperability

- Lead and implement common DER interoperability (communication) standard to enable customer switching
- Investigate the need and regulatory options to implement and ensure uptake
- Establish and coordinate new industry wide technical committee to provide top-down support for implementation

- The scope of work is to determine the limits for DER penetration under a range of conditions at which grid resilience and stability is substantially negatively impacted.
- Enabling more DER to be connected and export to the grid benefits all customers.
- High DER export can create voltage, power quality and minimum demand / load level issues on both distribution and transmission networks.
- Visibility (by AEMO) and control of DER (by DNSPs) can help lower network investment to manage these peak export issues.
- Better models of Australia's distribution systems will improve overall system planning, inform regulators and networks on the most appropriate investments, and help DNSPs and AEMO keep the power system in a secure state and in managing contingencies.



- Developing an outcome as complex and uncertain as a DER market should follow a structured process.
- Testing the theory in practice before wide-scale roll out is vital to deliver the most efficient outcome for consumers, by collecting an evidence base to inform appropriate regulatory changes
- Regulatory Reform should be informed by theoretical underpinnings and trialled hypothesis and should use trials to test refinements to final regulatory arrangements

1. Open Energy Networks (OpEN)

Final report recommending a framework for Distributed Optimisation including key roles and responsibilities due by end 2019.

An implementation plan, including a regulatory change plan will follow final publication.

2. DER Marketplace Trials

A coordinated program of initiatives to allow DER, using dynamic operating envelopes and dispatch, to provide wholesale and network services.

The aim is to trial and test market frameworks identified by OpEN. Multiple working groups (next slide) will also be established to collaborate with industry on tackling.

3. DER Integration

New Models for DER integration into wholesale markets and customer protections review.

Recommend rule change (as required).

DEIP SPONSORS

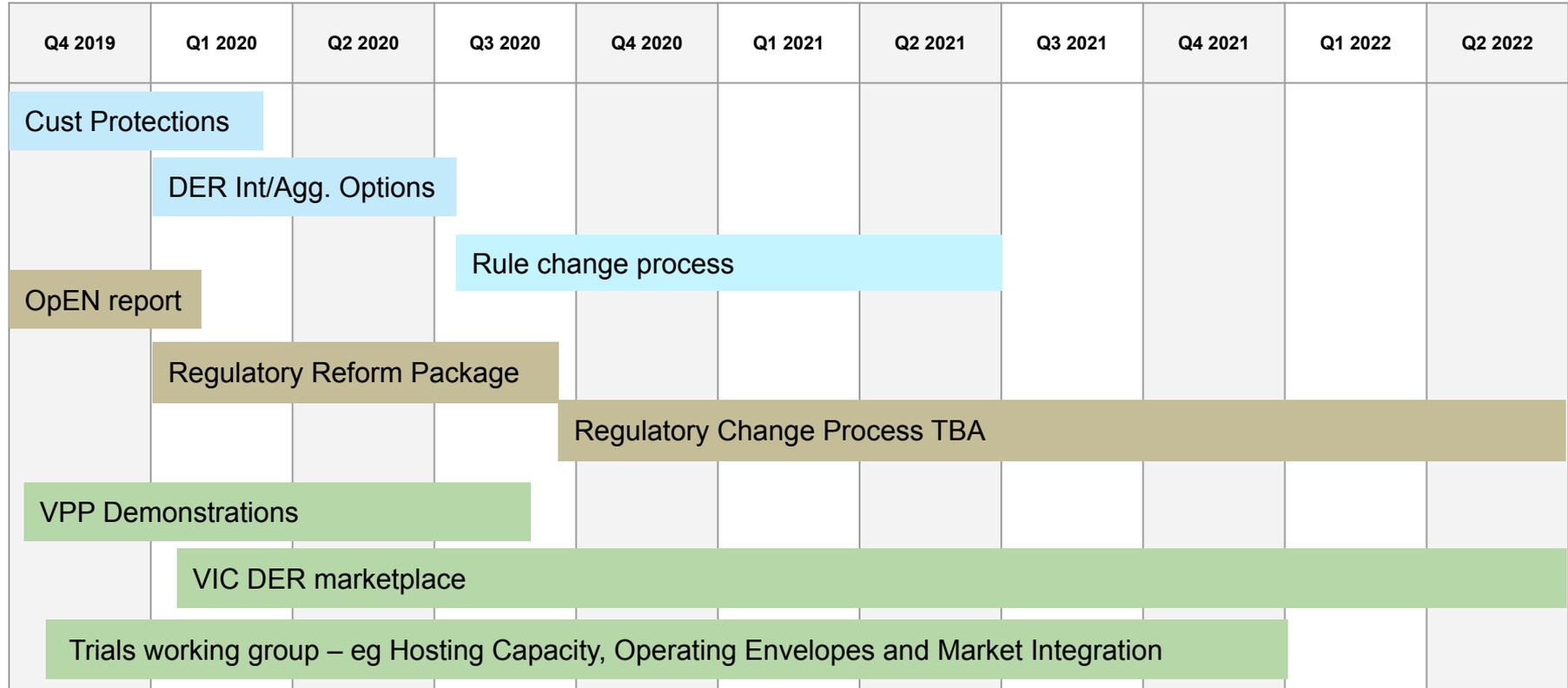


Various ARENA projects – Evolve, SA VPP, Tesla VPP VPP Demonstrations, Networks Renewed Solar enablement etc.



Package delivery

DER market development



The EV Grid Integration Working Group will be merged into DEIP in 2020 as a dedicated EV workstream.

Problem

There is no one forum, work stream or organisation responsible, or focussed on EV integration

Solution

Form a Working Group to discuss the issues and opportunities associated with the transition to electrified transportation and facilitate efficient integration of EVs into existing networks and markets.

Participants

The group was established in 2019 by nine organisations:

- AEMO
- AEMC
- AER
- ARENA
- Department of Environment and Energy
- Australian Energy Council
- Electric Vehicle Council
- Energy Networks Australia
- Energy Consumers Australia

Wider industry has been consulted and will participate in future events, including:

- State and Federal government departments
- NSPs
- Retailers
- Research organisations
- Peak bodies

Purpose

- Provide a central forum for key industry and government stakeholders to collaborate and coordinate EV activities
- Approach EVs from an energy sector perspective but with transport and infrastructure partners
- Promote policy and regulatory development before wide scale EV adoption begins

Value

- Assess impacts and opportunities to networks and markets
- Targeting and coordination of priorities, projects and budgets
- Policy and regulatory advice and development
- Demonstrate where investment is needed to provide optimal outcome for consumers

Path to 2020 Package Work Plan

Electric vehicles

Activity to date:

- Working Group established in August 2019
- 'Discovery phase' initiated
- Scoping surveys distributed

Work plan development:

- Survey data collation (20+ responses to date), key themes and issues identified
- Workshop scheduled for December 11 to determine 2020 work plan

Work plan finalisation and execution:

- Stress testing & approval by the group and by DEIP
- Delivery phase of Working Group will then be managed as DEIP work plan

August 2019

Scoping survey contains questions on:

- Key EV activities within each organisation
- Risks and opportunities
- High priority actions
- Related bodies of work

November 2019

December workshop:

Core working group members and wider industry meet to discuss and prioritise work plan for 2020

- Discuss the major themes identified through survey process
 - Where possible, match themes to existing bodies of work (eg. other DEIP work streams)
- Refine operational matters
 - Mission / terms of reference
 - Resourcing options
 - Communications plan
- Establish high level Work Plan

January 2020

Themes identified by the scoping survey used to guide work plan development during the Dec 19 workshop

Consumer behaviour & access to information

Network and system management

Aggregation & orchestration

Charging infrastructure

Charging management & control

Network and retail tariffs

Standards

Data acquisition and access

Regulation and policy

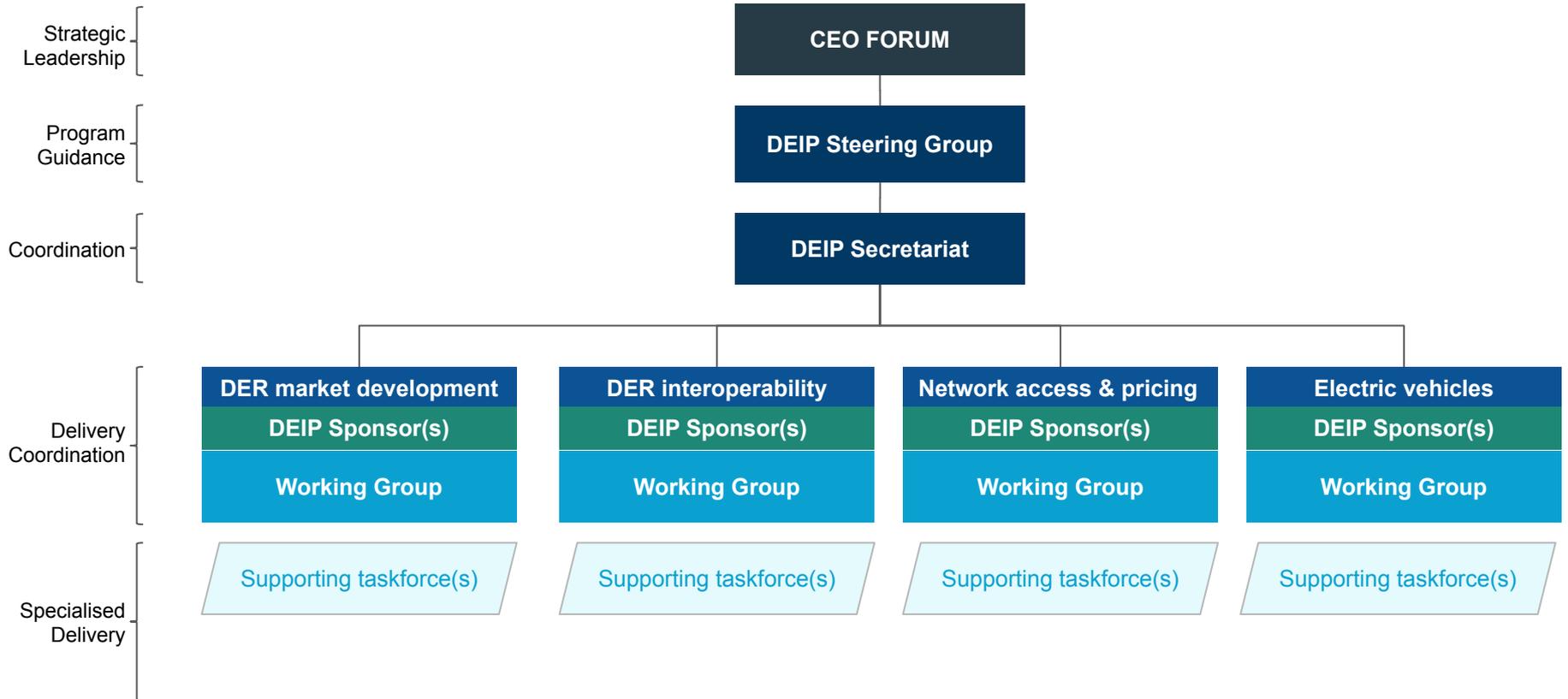
Future goals, governance & resourcing

A cooperative focused on coordinating the transition

DEIP Goals 2020

1. Formalisation of the **New Energy Compact** that reshapes the narrative and parameters for reform (Feb/Mar 2020)
2. A 'wholistic' rule change request submitted to AEMC that considers network **regulatory reforms for a two-way power system** (Mar/Apr 2020)
3. Convergence on outcomes from ARENA and industry funded trial toward **establishment of a DER marketplace** that considers energy, ancillary and network services (2020)
4. A report on the existing status of functional development '**State of DER Integration Report**' (Jun/Jul 2020)
5. Implementation of **common communication and cyber security standards** for Australia (2020)
6. Establish a Work Plan for the **Electric Vehicle Grid Integration Working Group** (Jan/Feb 2020)
7. Improved knowledge sharing and collaboration through **formalised working groups focused on targeted high priority areas** (2020)

DEIP Program Governance



Roles and Responsibilities*

CEO Forum

The CEO Forum will meet at least once a year and set the year ahead program priorities for DEIP. The forum will also support the allocation of organisation resources and commit to the outcomes agreed.

DEIP Steering Group

The Steering Group provides 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. It meets on a bi-monthly basis with representatives from all DEIP members.

DEIP Secretariat

The Secretariat adopts an agile coordination approach, supporting Steering Group engagement and knowledge sharing. This provides a centralised coordination function for DEIP activities ensuring governance, coordinating communications and leveraging resources. They meet on a three weekly basis and will champion the DEIP Principles.

Package Sponsor

The Sponsor is responsible for package oversight by monitoring risk, coordinating resources, managing timelines, budget, project outcomes and maintaining the DEIP principles. They report to the CEO Forum and Steering Group on progress.

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.

Taskforces

A taskforce is a small group, usually made up of cross sector subject matter experts to accomplish a short-term task as defined under a work package by the Working Group. There may be multiple taskforces per work package.

***Note:** DEIP does not have any authority over any of its members. It is only a collaboration forum for knowledge sharing, consensus building, debate and priority setting to support Australia's energy decentralisation transition.