

# **Electric Vehicle Grid Integration Working Group**

Post-Workshop  
Summary Pack

**DEIP**

20 December 2019

# What is this Summary Pack?

- This document presents a record of both
- the material presented, and
  - the activities and major discussions points

that occurred during the EV Grid Integration Working Group workshop on 11 December 2019.

# Welcome and Context Setting Summary

During this initial session, Scott Beltman (ARENA) provided an introduction to the workshop.

He provided background on the EV Grid Integration Working Group highlighting the purpose and intent of the group:

- to be a central forum for stakeholders to collaborate and coordinate EV activities,
- to approach EVs from an energy sector perspective but with transport and infrastructure partners; and
- to promote development before wide scale EV adoption begins.

He also communicated the ultimate intent of the workshop which was to

- discover areas the EV Grid Integration Working Group should focus on, and
- establish the foundations of a 2020 Work Plan

Scott also described that the EV Working Group is one of four Working Groups operating under the DEIP umbrella

# Intended Workshop Outcomes

- Update industry on **ongoing government activities**  
Representatives of the National EV Strategy and the COAG Transport and Infrastructure Council Low Emission Vehicle Working Group will present
- **Prioritise EV opportunities and issues** that emerged from Discovery Phase
- **Agree on areas of focus** for the Working Group
- **Establish Task Forces** and foundations of **2020 Work Plan**

# Attendees

The following organisations were represented at the Workshop

- ARENA
- AEMO
- AGL
- AEC
- AEMO
- DELWP (Vic)
- Infrastructure Victoria
- DITCRD (Cth)
- Clean Energy Regulator
- AER
- DOEE (Cth)
- CitiPower / Powercor
- Standards Australia
- CEFC
- RACV
- DTMR (QLD)
- Infrastructure Australia
- IntelliHub
- PlusES
- EV Council
- AGL
- Jemena
- Jetcharge
- NHP
- Origin
- SAPN
- Schneider
- Small World Social
- Vicinity
- Yurika
- Energy Queensland
- AusNet
- Tritium
- Transport for NSW
- CSIRO
- Energy Networks Australia
- Evie Networks

# Context Setting

# EV Grid Integration Working Group Overview

## PROBLEM

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

## SOLUTION

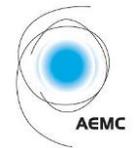
- Form a Working Group to discuss the issues and opportunities associated with the transition to electrified transportation and facilitate efficient integration of EVs into existing electricity networks and markets

## PURPOSE

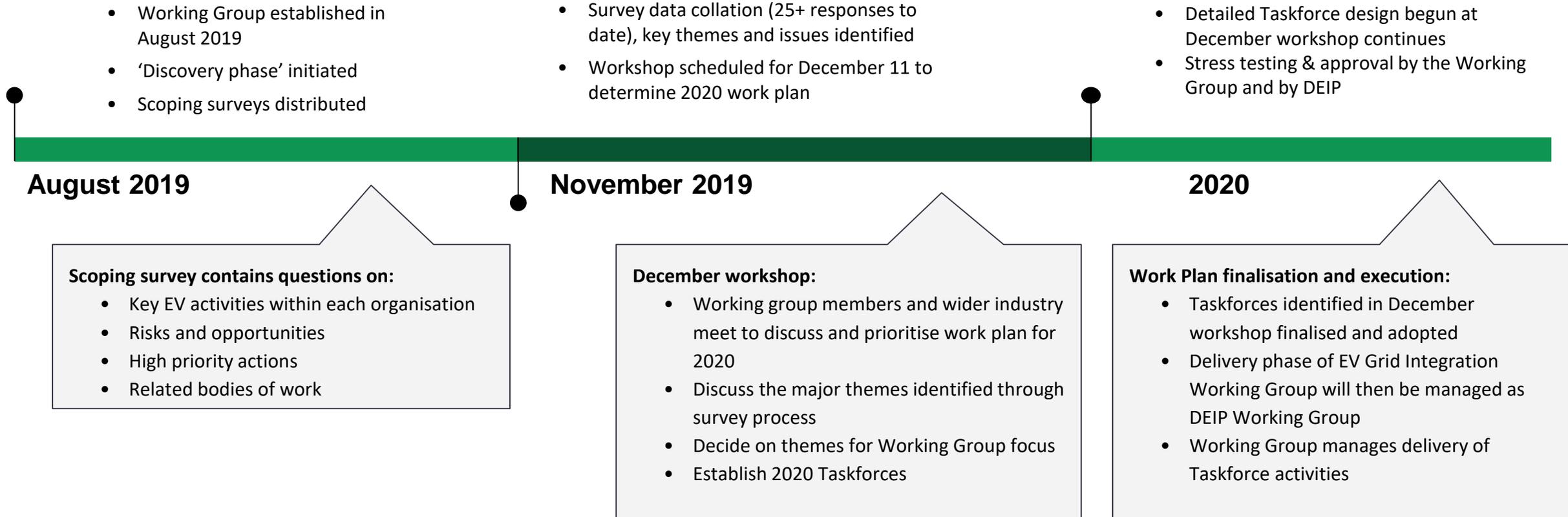
- Provide a central forum for key industry and government stakeholders to collaborate and coordinate EV activities
- Approach EVs from an energy sector perspective but with transport and infrastructure partners
- Promote policy and regulatory development before wide scale EV adoption begins

## 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



# Timeline



# DEIP Overview

## PURPOSE

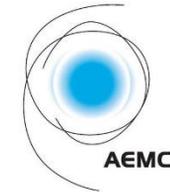
- The Distributed Energy Integration Program (**DEIP**) is a collaboration of government agencies, market authorities, industry and consumer associations aimed at maximising the value of Distributed Energy Resources (**DER**) for all energy users.

## VISION

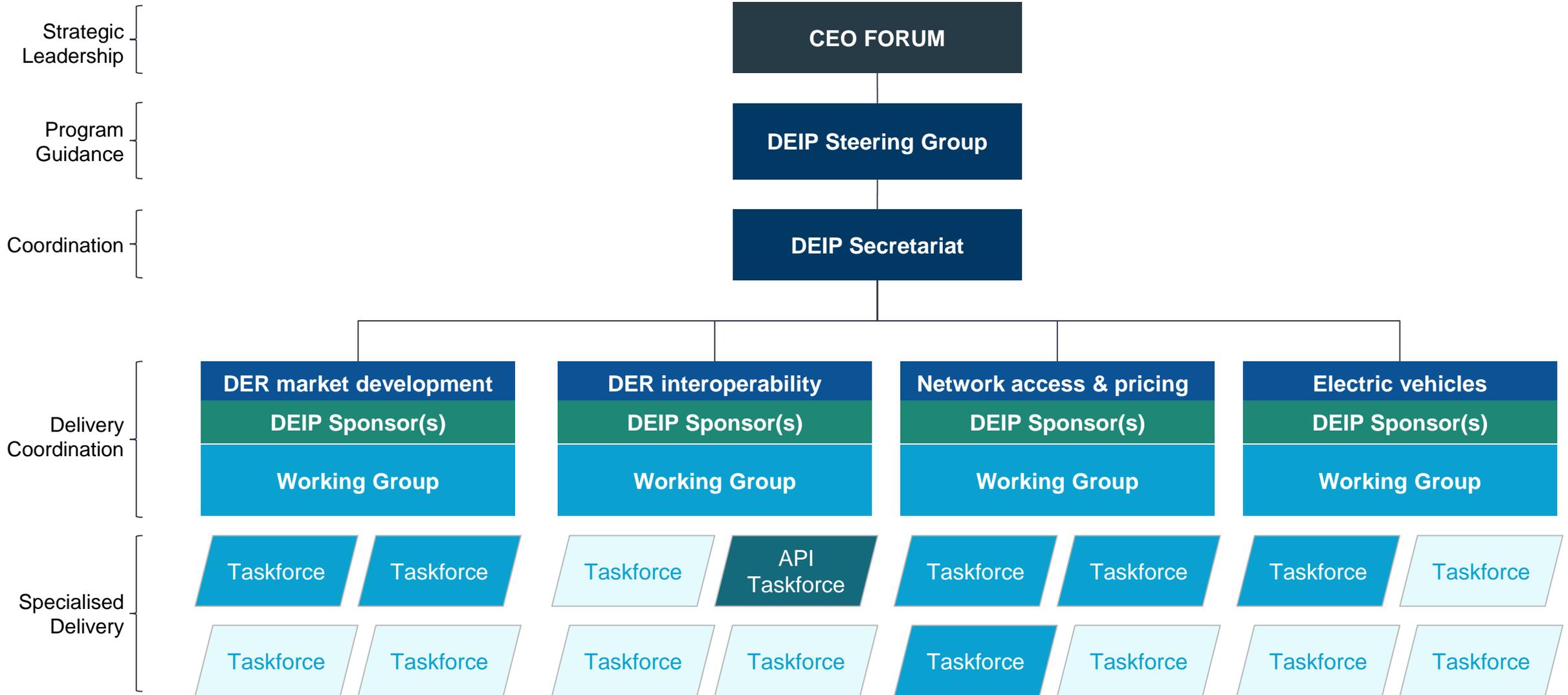
- DEIP members have a shared interest in supporting our evolution toward a Distributed Energy System that is secure, reliable, resilient, affordable and efficiently integrates and utilises customer's distributed energy resources ('DER'), enabled through Distributed Energy Markets.

## OBJECTIVE

- Led by a steering group, the collaborative supports DER knowledge sharing and coordination through:
  - Establishment of taskforces to overcome identified priorities, tackle reforms and overcome functional gaps in the decentralisation of the energy industry.
  - Building networks for knowledge sharing of high value developments and creating opportunities to test assumptions and build consensus.



# DEIP Program Governance



# Four priority DEIP work packages

## 1. DER Access, Pricing and Engagement

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 a Taskforce?

A Taskforce can be almost anything.

They should suit the task required.

But they have some common elements

## **A Taskforce is**

A group of engaged, cross sectoral subject matter experts, working together to complete activities that achieve an agreed objectives.

## **A Taskforce has**

Members

Objective

Workplan

Activities

Timelines

Budget

There may be multiple Taskforces per Work Package.

*Today's objective is to establish which Taskforces the EV Grid Integration Working Group should establish; and begin their workplans.*

# Discovery Phase results

# Discovery Phase Results Summary

Chris Mock from AEMO provided a summary of results from the Scoping Survey:

- 22 organisations responded to the survey
- Almost 600 line items of response were received
- Each item was assigned a theme to facilitate development of an overall view of responses, presented on the following slides

# Scoping Survey Themes

The Working Group circulated a survey to selected industry and government stakeholders in September 2019 to gain insight into how these organisations perceived EVs from a grid integration perspective.

Responses to the survey were qualitatively assigned to categories to help visualise areas of priority. The width of each segment indicates the number of responses relating to that category.



Responses to three questions were used to identify common themes relating to EV grid integration:

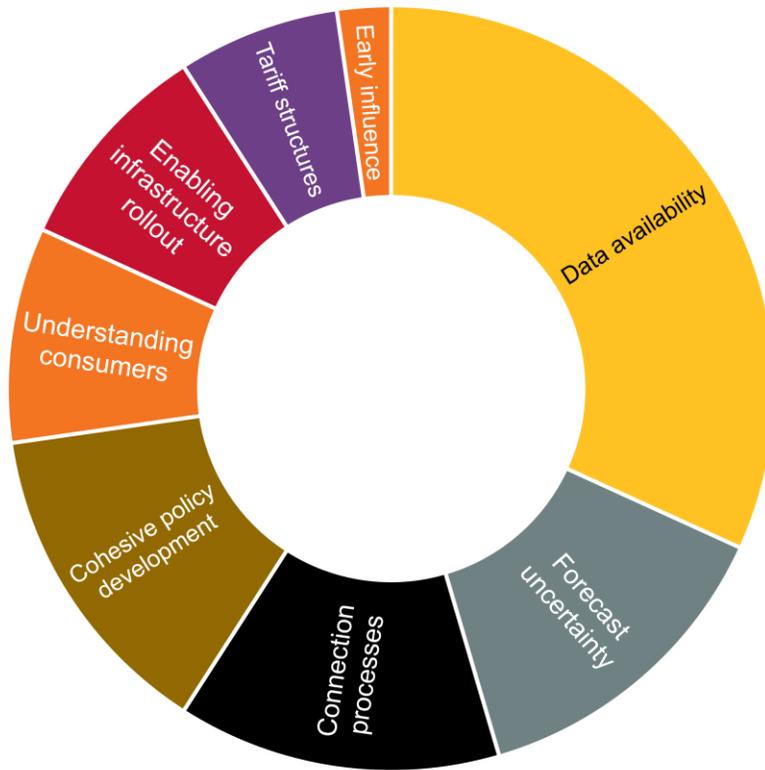
- What are the key EV-related focus/interest areas within your organisation?
- What significant long-term issues relating to the energy system does your organisation believe will need to be resolved if wide-scale EV deployment is to be successful? When might these issues start to arise?
- What are some potential opportunities that wide-scale EV uptake might provide your organisation, or the broader energy system? What would need to happen to facilitate these?

# Scoping Survey Priorities

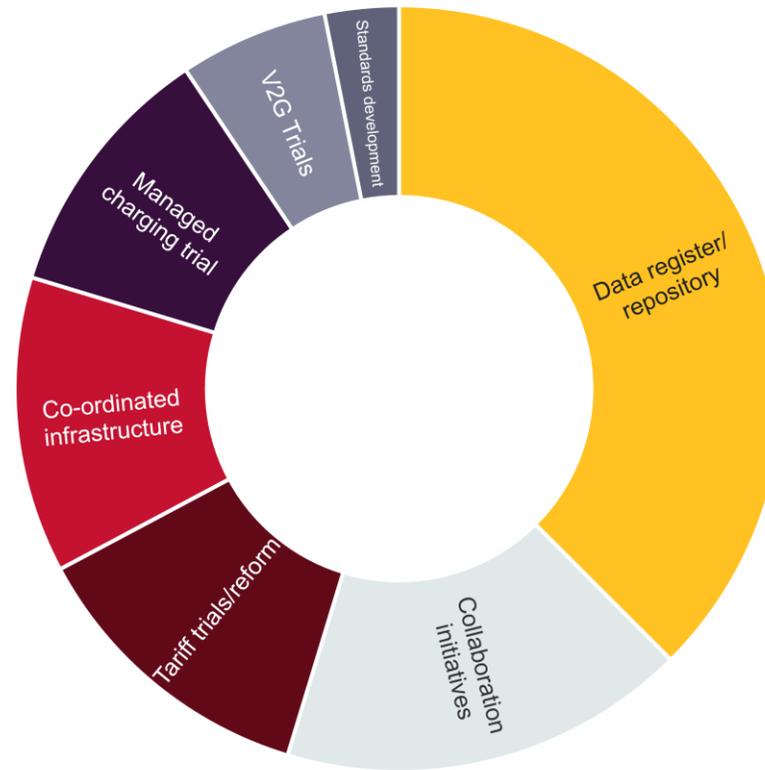
The survey asked questions about key priorities over three different time horizons

These responses will be used today as ideas for potential taskforces

Immediate Priorities



Quick Wins



Long Leadtime Tasks



# Theme – Network / System Management

**EVs could have both positive and negative impacts on networks and the wider electricity system.**

**What can be done to maximise benefits and minimise overall cost to the consumer?**

## Network Utilisation

*“Increase network utilisation through filling of daytime demand trough – beneficial impact on network tariffs”*

*“Management of distribution network – resource co-ordination could lead to improved utilisation, unmanaged charging could lead to expensive augmentation”*

## Demand Profile

*“Management of system demand profile – maximum demand and ramp rates are increasing, minimum demand is falling. Can EVs assist rather than exacerbate this?”*

## Optimisation with VRE

*“Using the vehicles as a form of “solar-soak” which would take advantage of excess solar generation during the day by storing it in your car.”*

*“The potential to use EVs electrical storage capacity to provide increased stability to grid also allows for greater penetration of VRE.”*

## Operating Envelope

*“Distribution network impact – constraints, power quality, reverse flow, DER markets”*

## Market Participation

*“Large numbers of EVs, if appropriately integrated, may provide benefits to the grid through increased asset utilisation, demand management and other system services.”*

*“Opportunities to create market solutions for network services should be explored further”*

## Fleet Impacts

*“In the context of public transport fleets, there may be opportunities for system-wide optimisation. ... Opportunity charging nominally uses battery-buffered high-powered fast-charging stations to regularly charge the vehicles along their service route during passenger on/off-boarding”*

## Connection Process

*“Consistent network conditions/connection agreements and public messaging around constraints to the use of EV chargers across Australia”*

# Theme – EVs as DER – Aggregation & Orchestration

**EVs share many characteristics with other forms of DER.**

**How can industry ensure benefits available from orchestration and aggregation are available to EVs?**

## **Vehicle-to-Grid (V2G)**

*“There would be value in undertaking innovative trials to manage vehicle charging and vehicle-to-grid generation (V2G) to understand the value of V2G and assess how EVs could be incorporated into VPP models in the future”*

*“Need to understand what other values can EVs provide to their owners, and how we can develop framework to maximise them”*

## **Network Benefits**

*“Establishing appropriate mechanisms for EVs to assist with managing system stability through participation in Virtual Power Plants.”*

*“Potential to leverage EVs to participate in a distribution DER marketplace by participating in various ancillary services.”*

## **Facilitating Orchestration**

*“Orchestrated residential EV charging – how, who (roles/contractual) and what will be acceptable to customers”*

*“Charging points need to be aggregated and ready to respond to network/grid conditions”*

# Theme – Consumer Behaviour / Access to Information

**Industry needs to have a clear understanding of the behaviour and expectations of EV owners in order to act in the long-term interest of consumers.**

**Consumers need access to information from industry in order to make informed decisions.**

## Education & Engagement

*“Improved consumer engagement to build consumers ability to engage in energy market or access agents who can do so on their behalf.”*

*“Informing consumers today will help guide behaviour toward cost efficient pathways, rather than trying to change behavioural norms later”*

## Charging Preferences

*“What would consumers expect? How do they expect to charge or discharge their vehicles?”*

*“Customer requirements for EVs – social science behind EV adoption”*

## Cost and Impact Visibility

*“Empowering consumers to safeguard the electricity grid from over investment: Introduction of pricing reform and technology. ... Giving consumers visibility over the costs and emissions consequences of their charging decisions.”*

*“The true cost of some charge profiles may not be immediately visible to consumers, eg. network augmentation costs are passed on over long periods of time, across a wide customer base.”*

## Benefit Flow-through

*“Impact of new technologies on consumers long term interests and role of economic regulation”*

*“Consumers need to benefit from the value their EV chargers can provide to networks”*

## Insurance

*“Unknown impact on insurance premiums for home owners and commercial building operators where EVs are charged”*

## Unintended Outcomes

*“EVs can be a double-edged sword. Would customers, responding to appropriate price signals, cause unintended issues? (e.g. ramp rate issues?)”*

# Theme – Forecasting and Planning

**Projecting the timing and distribution of EV rollout is difficult this early in the uptake curve.**

**What is needed to improve the accuracy of industry forecasts?**

## **Uptake Projections**

*“Uptake rates of distributed energy resources, including EVs”*

*“We expect that clustered pockets of EVs in the network might start to reach thermal or power quality limits during the 2025-2030 timeframe unless management solutions are developed and deployed.”*

## **Integrated Modelling**

*“Integrated modelling – energy/transport/infrastructure”*

*“Transport modelling: Generating strategic transport models, which forecast EV travel patterns, demand for infrastructure and services, and simulation of passenger and vehicle flows to determine levels of services.”*

## **New Technology**

*“In theory, autonomous EVs could be most profitably put to use at certain times of the day/month/year by providing additional capacity to parts of the network rather than by providing transport.”*

# Theme – Charging Management / Control

**Intelligent control of EV chargers could help minimise network costs and facilitate access to demand management markets.**

**How might this work from a consumer perspective?**

## Network Impacts

*“EV charging management strategies (tariff design, dynamic management based on network conditions)”*

*“We could potentially defer significant network investment if we were allowed to pursue active charging management by regulation”*

## Load Control

*“Will direct load control be required for EV (Like Hot water) and hence dedicated metering elements”*

## Demand Side Participation

*“Understand EV charging’s role in demand response - assess the viability of different types of EV charging to participate in demand response programs (direct load control, behavioural, etc.).”*

## Technology

*“Control and intelligent integration of EV charging, particularly through solar, batteries, and load control (e.g., HVAC).”*

*“Residential customers that install smart EV chargers will enable managed charging. This will take into account TOU tariffs and dynamic network conditions.”*

## Cost Optimisation

*“Charging must be automated so that total long-term system costs can be minimised including impacts on total generation and network investment.”*

*“Wide scale demand management signals. This could be used to avert events such as load shedding. EV customers would be able to benefit from incentives to participate.”*

# Theme – Network and Retail Tariffs

**Tariffs can help influence consumer behaviour by signalling to them the cost of their charging decisions.**

**What types of tariff could be used to encourage EV owners to charge in ways that complement the demand profile of networks and the wider electricity system?**

## Tariff Reform

*“Tariff analysis & change - identify optimal residential & public charging tariffs that balance the customer & network requirements.”*

*“Reform network tariffs to encourage consumers to make informed choices about their network use by transitioning customers to more cost-reflective network pricing.”*

## Influence on Load Profile

*“Use of network tariff signals or network connection/access rights to incentivise EV charging during times of low congestion and discharging during times of high congestion to maximise network utilisation and avoid unnecessary network costs”*

*“Proper implementation of time of use tariffs will ensure that charging EVs occurs when solar or wind generation is peaking highest.”*

## Retail Business Models

*“Development of innovative retail market offers associated with EVs”*

*“How would retailers react to a high penetration of EVs? Would new products be developed specifically? What would the contractual relationship look like? Would it be between a retailer and a ‘charging station’?”*

# Theme – Data

**How can industry access the data it needs today to make informed decisions, and how can that data be tracked over time?**

## Availability of Local Data

*“We need better data on the statistical breakdown of EV charging in Australia to inform what the true impacts of (non-managed) EVs will be on the grid.”*

## Standing Data

*“Lack of visibility of small-scale charging stations (typically residential chargers, that don’t require connection upgrade etc) will make it difficult to forecast demand growth and plan network operation / augmentation. Especially in the early stages of mobility transition (when uptake is accelerated) we require data around charger locations, EV adoption, charging behaviour.”*

## Data Repository

*“Investigating the requirements/options for an ongoing EV monitoring program”*

*“Industry information and access - Robust channel of quality-assured data sources”*

## Time-series Data

*“Lack of visibility and sparsity of data: Understanding of EVs’ time and locational charging patterns. Greater visibility of these assets to assist in planning, investing in and operating the electricity and transport systems more effectively.”*

# Theme – Standards

**Standards can provide benefits to the consumer by enabling more efficient interaction with markets and networks, as well as helping to avoid unnecessary cost in the overall system by reducing duplication.**

**What standards should be considered, and how can we maximise benefit while avoiding excessive regulation?**

## Charger Capability

*“Promoting interoperability through technical standards and protocols governing charging infrastructure and data interfaces will be a key enabler for system-wide optimisation. Considerations will range from management of network capacity to data sharing arrangements to guard against whole-of-system risks, alignment with international standards/ protocols and transactional traceability.”*

## Interoperability

*“Ensuring charger standardisation and interoperability.”*

*“Interoperability and the development of appropriate technical standards”*

## Grid Connection

*“The role of connection/network interface standards”*

## Communications

*“Lack of standards, business models, protocols to allow a cohesive communication to charge points.”*

# Theme – Non-energy

**Factors outside the ‘grid integration’ context may still impact the energy system**

## **Waste**

*“Whole-of-life environmental and social costs associated with battery manufacturing and disposal, as well as ethically sourcing key materials.”*

## **Economy**

*“The uptake of EVs presents substantial opportunities for job creation”*

*“The increased uptake of EVs in Australia has the potential to deliver a range of benefits, including lower costs for vehicle owners, improved air quality and lower emissions, increased fuel security, and the creation of wider benefits for the national economy.”*

## **Emissions**

*“EVs can help decarbonise the transport sector and reduce airborne pollutants.”*

## **Fuel Security**

*“EVs can improve Australia’s fuel security.”*

# Theme – Charging Infrastructure

**How can the energy sector help facilitate cost-effective rollout of charging infrastructure?**

## **Public Charging**

*“Addressing barriers to establishing public charging infrastructure – for both EV industry and electricity industry”*

*“public charging options to soak up excess renewable electricity generation during the day”*

## **Co-ordinated Planning**

*“Infrastructure planning including government coordination and potential for competitive grant programs”*

*“Co-location or optimisation of charging infrastructure to spare network capacity”*

## **Metering**

*“Will EV drive an increased conversion to 3 phase for home charging and hence increased need for meter installations”*

*“EV are likely to drive demand for smart meters and hence increase the number of meters needing to be installed to support EV charging and tariffs”*

## **Equitable Access**

*“Ensuring EV benefits are equitably distributed: Access to EVs and charging infrastructure in rural and regional areas.”*

# Theme – Regulation / Policy

**What regulation is needed to facilitate efficient integration of EVs into existing networks and markets?**

## **Uptake Encouragement**

*“Introducing EVs at the right scale and at the right time: Reducing barriers and market failures restricting optimal EV uptake, while ensuring that risks to the electricity network are managed.”*

## **Information Visibility**

*“Ensuring energy market regulation remains fit for purpose to guide and implement reforms that advance consumers long term interests and where possible increase control over their energy choices. An important aspect of this is ensuring market information is as transparent and accessible as possible to enable innovation.”*

## **Industry Impact**

*“Regulation, education and training of the installers of charging points is critical for the long-term success of a large uptake of EVs”*

## **Financial Impact**

*“We are interested in understanding how our regulated determinations may be affected by sudden EV uptake”*



# Updates

National EV Strategy

Transport and Infrastructure Council Zero and Low Emission Vehicle Working Group

EV Council

# Update summary

During this session, updates were to attendees by the

- **Australian Government's National EV Strategy (Strategy)**
- COAG Transport and Infrastructure Council Low and Zero Emission Vehicle (LZEV) Working Group
- EV Council

Major points presented by Trent Kohlhagen on the Strategy team included:

- A public discussion paper will be released in late 2019 or early 2020 and will be followed by another a period of consultation
- It is anticipated the Strategy will be released mid 2020
- Four workstreams are being considered: market readiness, grid integration, charging infrastructure and industry opportunities
- Opportunities may exist for the EV Grid Integration Working Group to assist consultation related to preparing the Strategy or as a potential delivery mechanism for elements of the finalised Strategy

# Update summary

During this session, updates were to attendees by the

- Australian Government's National EV Strategy (Strategy)
- **COAG Transport and Infrastructure Council Low and Zero Emission Vehicle (LZEV) Working Group**
- EV Council

Major Points presented by Amanda Hill on the Low and Zero Emission Vehicle (LZEV) Working Group included:

- TIC decided to form the WG in late 2018.
- The Working Group's work program has been developed in 2019 and is due for finalisation by the TIC in early 2020
- The work program will address barriers to EV uptake in Australia, and recognises the need for a market-based response.
- Elements include
- Leadership
- Infrastructure availability
- Upfront purchase cost and model availability
- Lack of public information
- Individual elements of the work program will be led by different jurisdictions

The National EV Strategy and the LZEV Working Group are working closely to ensure complementarity rather than replication

# Update summary

During this session, updates were to attendees by the

- Australian Government's National EV Strategy (Strategy)
- COAG Transport and Infrastructure Council Low and Zero Emission Vehicle (LZEV) Working Group
- **EV Council**

Major Points presented by Larissa Cassidy from the EV Council included:

- The EV Council has created an Electricity Working Group after concerns from members about the electricity markets readiness to integrate EVs
- The working group consists of EV industry participants (such as charging infrastructure providers) as well as distribution companies and retailers.
- The working group has held multiple forums and developed an Issues Register which fed into the Discovery Phase of the EV Grid Integration Working Group.
- The EV Council and members are interested in continuing to collaborate with the electricity sector to ensure the smooth integration of EVs into the electricity grid.

A photograph of a white electric car at a charging station, overlaid with a semi-transparent blue filter. The car's front headlight and grille are visible on the left, and the charging cable is plugged into the car on the right. The text 'Prioritisation exercise' is centered in white.

# Prioritisation exercise

# Prioritisation – Team exercise summary

## Aim

The aim of the prioritisation exercise was to establish one priority list of opportunities for the EV Grid Integration Working Group based on the results of the Discovery Phase questions on Immediate Priorities, Quick Wins and Long Leadtime tasks

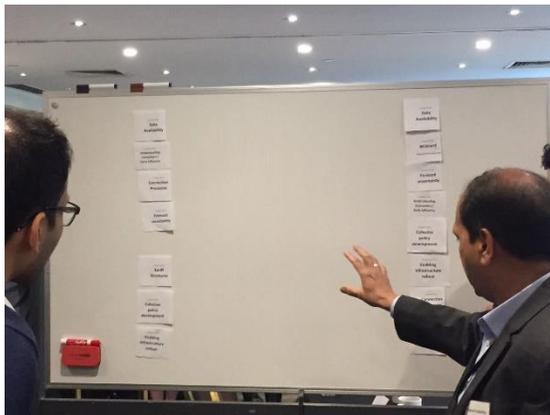
## Exercise

Six teams were formed, each was given the task of prioritising the opportunities identified in the scoping survey from one category – Immediate Priorities, Quick Wins or Long Leadtime tasks

Next, the groups paired up to gain consensus on the preferred order of tasks within each of the categories

## Outcomes

Each of the teams identified different key priorities, but there was sufficient alignment to produce the three combined lists



# Prioritisation – Group exercise summary

## Exercise

The group came together to merge the three prioritised lists into one master list, taking into account the requirement to address near-term priorities as well as the need to begin effort on long-term tasks

Tasks were then assessed and grouped based on the ability and appropriateness of the Working Group to act upon them

## Outcomes

Six priority areas were identified for the group to focus on for the afternoon:

<i>Data availability</i>	<i>Standards development</i>
<i>Residential tariffs and incentives</i>	<i>High capacity tariffs and connection</i>
<i>Understanding consumers</i>	<i>Collaboration initiatives</i>



It was noted that the Working Group will ultimately decide which priorities to pursue in 2020.

A photograph of a white electric car parked at a charging station. The car is on the left, and the charging station is on the right. A charging cable is plugged into the car. The entire image has a blue overlay. The text "Taskforce Design exercise" is centered in the upper half of the image.

# Taskforce Design exercise

# Taskforce Design – Team exercise summary

## **Aim**

The aim of the Taskforce Design exercise was to develop a detailed view on what a Taskforce under each of the six prioritised topics could achieve: why the Taskforce should exist, its objectives and what activities could be undertaken to achieve them.

## **Exercise**

Workshop participants self-selected into six groups to build out each of the prioritised concepts. The exercise was broken into three parts: the first focusing on why a Taskforce should exist and its objectives, the second focussed on detailing the activity the Taskforce might undertake to achieve the objectives and the third session which allowed Workshop attendees to provide comment on Taskforces they had not worked on.

A series of templates were used to assist refine the concepts and identify key dependencies.

Attendees were also able to indicate their interest in working on the Taskforce in 2020.

## **Outcomes**

The following slides contain a summary of the Taskforce Design exercise, with additional detail on each potential Taskforce available as an appendix.

It was noted that the EV Grid Integration Working Group will make the ultimate decision on which Taskforces will be created in 2020.

# Taskforce Proposal – 1. Data Availability

## Problem / Concept

- To survey, collate and make available data
- Gap analysis
- What will the data be used for?
- Who is going to hold the information
- Charge / cost of data access
- Understanding 1. where the vehicles are and 2. impact of charging
- What data will be collated?
- How will it be collated and why?
- How will it be stored and by whom?
- How will it be used?
- Who can get access to it?
- Applicability of existing DER Register

## Activities Identified

1. EV Data needs – prioritise by cost/benefit
2. Survey & Collect
3. Audit & Analysis
4. Manage & Communicate

## Outputs

- Data List
- Data set (closed)
- Data set & Gap analysis
- Data Repository (open)

# Taskforce Proposal – 2. Understanding Consumers

## Problem

- We don't know customer charging behaviour or how they would respond to incentives/disincentives
- Need to understand drivers/behaviours/needs of different segments
- To what extent can managed charging of aggregated fleets reduce peak demand and reduce/obviate need for network infrastructure?

## Concept

- Behavioural insights studies/customer trials of current EV owners' experience
- Test what opportunities there are to influence charging behaviour
- Draw insights from other customer segments
- Insight on interaction with other DER

## Activities Identified

1. International desktop study regarding comparable grids and consumer behaviours vis-à-vis charging
2. Study or audit of current Australian EV consumer charging behaviour
3. Develop trial questions on charging management to be progressed through competitive grant program

# Taskforce Proposal – 3. Standards Development

## Problem

- Absence of standards, or development of unique Australian Standards (co-ordination with property/buildings) relating to EV charging will inhibit EV uptake
- Lack of engagement with IEC/ISO standards leads to local industry getting blindsided by standard changes

## Activities Identified

1. Map all standards and standards gaps potentially relating to EV charging
2. Identify suitable international standards for adoption
3. Engage with and influence locally created standards where necessary

## Concept

- Map all standards and standards gaps potentially relating to EV charging, and
  - adopt internationally where possible
  - influence locally created standards where necessary
- Mirror international committees

## Outputs

- List of standards deemed relevant by the taskforce
- List of committees to engage with
- List of international standards to consider for adoption

# Taskforce Proposal – 4. Residential Tariffs and Incentives

## Problem

- Unmanaged charging will drive excessive cost for all customers and inefficient outcomes
- Currently don't have customer facing tariffs/incentives to enable efficient EV charging outcomes
- Forecasting is a large challenge

## Activities Identified

1. Literature review on existing incentives in Australia and globally / behavioural economics study
2. Establish baseline do-worthy case
3. Investigate spatial & temporal impacts of EVs on tariff structure
4. Trials

## Concept

- Opt out provisions for managed charging
- Portfolio management of EVs
- Look at international case studies/learnings
- Standards require smart chargers
- Consider portfolio interface
- Access & pricing work stream should be involved
- Test alternative Tariff/Incentive models – Social science

# Taskforce Proposal – 5. Collaboration Initiatives

## Problem

- Groups missing – Transport/property/energy + Agriculture/Mining
- Focus areas – Truly national & International experience
- Auxiliary markets – Carbon, Air Quality, Fuel Security
- Muddled rules & responsibilities
- Impact of Automation
- Privacy & IP issues

## Activities Identified

1. Hold forums that capture all relevant stakeholders to discuss issues & target broader areas via Briefing pack
2. Online forum (eg. LinkedIn, newsletter) to share information, leverage what is already available
3. Industry ecosystem mapping to identify key stakeholders
4. Identify existing working groups/task forces
5. Identify gaps on taskforce

## Concept

- Understanding key players (stakeholders)
- Develop information sharing pathways
- Monitor Emerging Tech
- Understand the ‘customer’

## Outputs

- Produce briefing pack
- Centralised data hub/information sharing platform
- Inform political leaders
- Developing a stakeholder map/list

# Taskforce Proposal – 6. High Capacity Tariffs and Connections

## Problem

Enable rather than inhibit high capacity EV Charging

- Tariff Trial – The existing tariffs form/structure and amount are perceived to not be cost reflective and are cost prohibitive
- Connections – The existing NSP connection processes are onerous (in terms of requirements and data), no consistency across jurisdictions, and have unreasonable response times

## Activities Identified

1. National Public infrastructure EV Charging Tariff/Pricing Trial
2. DNSP & Infrastructure provider perform shared modelling exercises & use/develop appropriate tariff (demand management)
3. Test Tariff & 'Real life' charging behaviour
4. Review & feed into regulatory change process

## Concept

- Tariff trial – explore the 'true cost' to NSPs on EV charging & design/trial tariffs which are 'fit for purpose' (Explore dynamic management of load)
- Standardised Connection 'Template' – Develop a minimum connection specification for NSPs to adopt which outlines the data requirements, timeframes etc.

## Outputs

- Recommendation for a new Tariff regime for EV public infrastructure
- Knowledge sharing in relation to how EV public infrastructure will be used
- Reduce barriers to uptake to installation of EV Public Infrastructure

A photograph of a white electric car parked at a charging station. The car is on the left, and the charging station is on the right. A charging cable is plugged into the car's port. The entire image is overlaid with a semi-transparent blue filter. The text "Next steps" is written in white in the upper left area, and "DEIP" is in the bottom left corner.

Next steps

# Next steps Summary

Scott and Chris outlined the steps that will follow the workshop

A summary of the work undertaken today will be circulated before the Christmas break (this document)

EV Grid Integration Working Group will meet and make a decision on which Taskforces to establish in 2020.

- Its not possible to establish six (6) Taskforces
- The Working Group will be the ultimate decision maker on which Taskforces get established
- This decision will be made in January or February 2020

Following a decision on the Taskforces, the Working Group will:

- Notify DEIP of the decision; and
- Reach out to industry for Taskforce membership

# End Thanks

## Contacts

Scott Beltman

ARENA

[scott.beltman@arena.gov.au](mailto:scott.beltman@arena.gov.au)

0424 967 898

Chris Mock

AEMO

[Chris.Mock@aemo.com.au](mailto:Chris.Mock@aemo.com.au)

03 9609 8453

Additional material

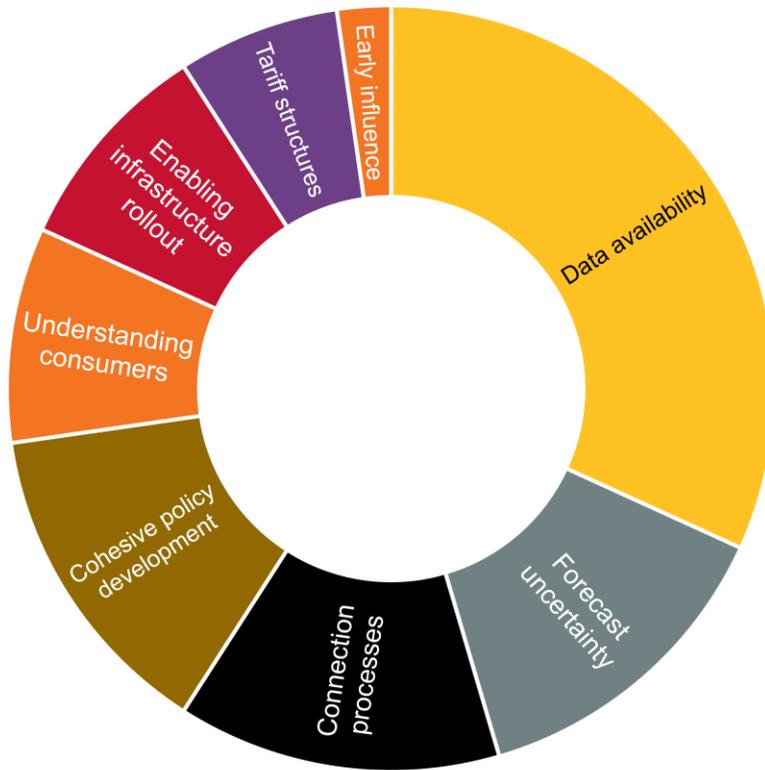
# Taskforce concept sheets

# Scoping Survey Priorities

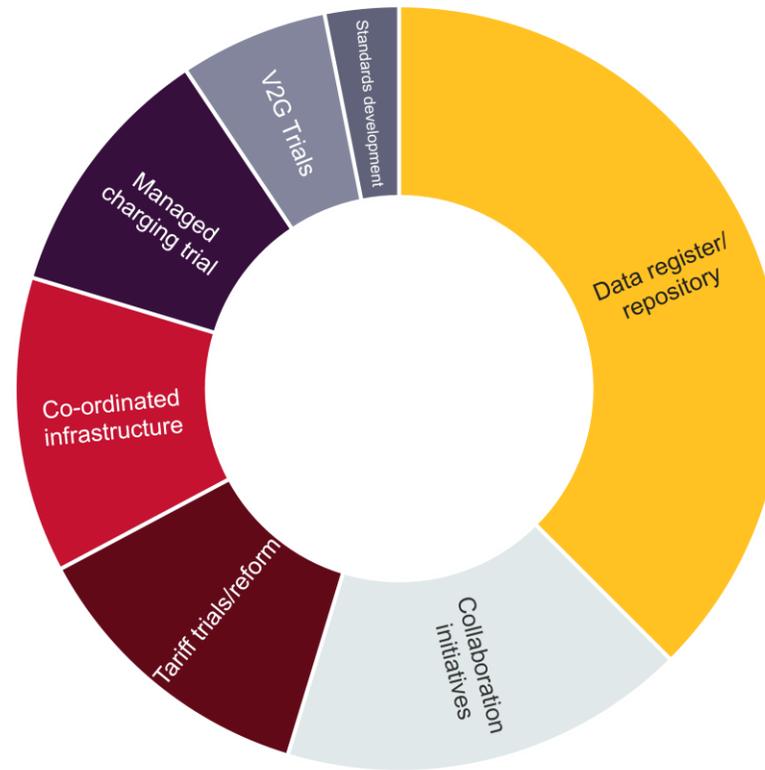
The survey asked questions about key priorities over three different time horizons

These responses will be used today as ideas for potential taskforces

Immediate Priorities



Quick Wins



Long Leadtime Tasks



# Immediate Priorities – Data Availability

## Theme(s): Data

### Brief:

- A lack of available data is impeding the ability of industry to make informed decisions about EV operation and investment. Requirements include:
- A register of charger and/or vehicle locations with associated standing data
- Time-series data of charger operation to inform the development of charge profiles
- Visibility of grid capacity at potential charging sites
- Try to approach this from an ‘immediate priorities’ perspective – noting that similar categories exist in the other two groups

### Response quotes:

*“Data availability is limited. Where are the chargers, where are the vehicles? How will industry track the growth of EVs as uptake rates rise? What charging profile do existing (early adopter) customers exhibit? How will that change in the future”*

*“Quest for data – where are the residential EV chargers and how drivers are charging. (Whilst the DER register is ramping up, is there a view to trying to capture EVs as well?)”*

*“Lack of access to information about grid capacity in potential charging sites”*

# Immediate Priorities – Forecast uncertainty

**Theme(s):** Forecasting/Planning

**Brief:**

- Predicting uptake of EVs and their future charging behaviour is extremely difficult this early in the adoption curve
- An integrated modelling approach including energy, transport and infrastructure is needed
- A better understanding of consumer behaviour (current and future) is needed to refine forecasting scenarios

**Response quotes:**

*“Planning and understanding the implications of charging stations on land-use planning and transport system integration: EVs’ effect on the way people live and work, and demand on the transport network and the urban environment.”*

*“Forecast EV uptake varies significantly depending on scenario inputs – how can we refine these estimates?”*

*“Significant uncertainty around customer expectations, future charging behaviour and the associated expected impacts on the grid.”*

*“Forecasting – a crystal ball would be useful”*

# Immediate Priorities – Connection Processes

**Theme(s):** Network/system management

**Brief:**

- Connection processes, particularly for high capacity public chargers, can trigger investigation into power quality impacts and review of local network capacity
- These processes can be time consuming, and may result in tariffs/charges that are unfavourable for low duty cycle business models
- How can infrastructure developers and networks work together to ensure efficient investment?

**Response quotes:**

*“Public charging infrastructure connections processes – timeframes, uncertainties, inconsistencies”*

*“We are receiving some fast charging station applications in weak network areas which require consideration of power quality impacts.”*

*“...connections standards for EVs to the grid”*

*“...tariffs for public fast charging with limited vehicles”*

*“EV charging infrastructure suppliers that require network connections are requesting a higher capacity than required for the immediate demand for EV charging. ... to future proof their investment ... could trigger unnecessary upgrades in the network thereby resulting in inefficient investment in the network.”*

# Immediate Priorities – Cohesive policy development

**Theme(s):** Regulation/policy

**Brief:**

- A lack of regulation/policy in the EV sector could lead to inefficient outcomes and necessitate expensive network investment
- Consultation across industry is required to ensure issues are worked through appropriately
- Stable and consistent policy is needed to guide the industry as it develops

**Response quotes:**

*“If unmanaged, EVs have the potential to significantly increase peak demand, leading to necessary network and generation investment and can cause network security issues”*

*“Risks associated with mandating demand response capability through technical standards in advance of appropriate industry consultation ... appropriate timeframe to work through technical considerations and align with relevant international markets”*

*“Building policy consensus on EV uptake.”*

# Immediate Priorities – Understanding Consumers / Early Influence

**Theme(s):** Consumer behaviour/access to information

**Brief:**

- Understanding the behaviour of consumers is key to making accurate predictions and efficient network investment
- EVs straddle both the transport and energy sectors. How will consumers relate to these new products, and how might that change over time?
- Consumers are likely to approach EVs from a transport perspective, and may not fully appreciate their complex interaction with the electricity system. How can industry better communicate with consumers to inform them of new opportunities?
- What steps can industry take to guide consumers toward cost effective pathways now, before behavioural norms are established?

**Response quotes:**

*“...the lack of current data on EV charging behaviour leading to uncertainty about where and when network congestion issues may arise”*

*“Customer values - Social research – understanding the attitudes, expectations and values of customers with regards to an asset that straddles energy and transport. Also, whether these change with time/experience of owning an EV. This feeds into how we approach dynamic residential EV charging and questions of tariff and incentives.”*

*“How can consumers make informed choices between simple retail offers and packages that might combine EV charging, fast charger, home energy management system ... More effort may need to be devoted to explaining the opportunity for EV consumers to participate in energy markets (notably large fleet managers that feed the second hand market”*

*“We will need to set the scene and influence stakeholders’ thinking now before there is significant uptake. Changing behaviour will be difficult as we will have to deal with winners/losers.”*

# Immediate Priorities – Enabling infrastructure rollout

**Theme(s):** Charging Infrastructure

**Brief:**

- Developing public and fleet charging infrastructure is challenging, with complex interaction between site location, existing infrastructure and network capacity making investment decisions difficult
- How could the energy sector make this process easier, particularly for brownfield locations?

**Response quotes:**

*“Charging infrastructure rollout: location, congestion impacts, repurposing existing infrastructure.”*

*“Rolling out public and fleet recharging infrastructure in an industry-led scalable model is also presenting a challenge in the Australian market. Competitive grant programs could play an important role in supporting efficient industry investment in fast charging infrastructure.”*

*“Barriers to installation of charging infrastructure in brownfield areas: Building standards in strata, SMEs and carparks. Adequate charging infrastructure for trucks and buses.”*

# Immediate Priorities – Tariff Structures

Theme(s): Network and Retail Tariffs

Brief:

- With EV uptake predicted to rapidly climb toward the end of the 2020s, networks are quickly approaching the time where EVs could play a significant role in their regulatory reset submissions
- Mechanisms exist to trial network tariffs prior to formal establishment
- What might a tariff trial look like? Is there scope to include time-of-use, dynamic load control, critical peak influences etc.
- Try to approach this from an 'immediate priorities' perspective – noting that this is also a category in the other two groups

Response quotes:

*“Tariff reform - deployment of EV specific tariffs dependent on government bodies. Advocacy for this from relevant bodies ... will be advantageous. DNSPs to reach an aligned view.”*

*“Pricing/tariff - Get traction on pilot/trials in lead up to the next regulatory reset period. Our work to date suggests that TOU tariff will increase the coincidence of residential EV charging, in turn increasing overall daily demand. We don't want to do that.”*

# Quick Wins – Data register/repository

Theme(s): Data

Brief:

- Access to high quality data is key to effective planning for EV uptake, particularly for network businesses. Currently, there is no central repository of EV data in Australia, and no clear mechanism for tracking the location and capacity of chargers
- Data needs can broadly be classified into three areas:
- Standing data relating to the location & specifications of chargers (and vehicles?)
- Time-series data logs from chargers across a range of customer types
- Research publications and their associated results
- A data repository could take a number of forms:
- Simple website to store publicly available data to aid planning & research
- Integration of EV datasets into existing repositories (data.gov.au, near.csiro.au)
- A comprehensive register of chargers and/or vehicles
- A register would require regulatory/legislative change to establish, but starting now would ensure data is captured as EV uptake climbs
- Capturing sensitive data from consumers (eg. time-series charger logs) would require consideration of privacy and confidentiality
- Try to approach this from a 'quick wins' perspective – noting that similar categories exist in the other two groups

Response quotes:

*“Collection of data relating to EV customer locations to enable better network planning. This could be via a reporting framework for installation of EV charging equipment.”*

*“Improve transparency of EVs and charging infrastructure by adding these devices to the AEMC Register of Distributed Energy Resources.”*

*“Vic DBs can leverage their smart meter capability to potentially identify EVs on their network. The issue is we need good quality data to “train” our analytics algorithms.”*

*“Understanding consumers/vehicle owners charging preference – development of some kind of charging profile”*

*“There have been multiple trials of EVs, EV charging etc in Australia alone – a consolidation of the reports and associated data into an accessible database would provide a valuable resource and both minimise rework and give insight into areas that have not yet been investigated”*

*This slide contains content provided by survey participants, and may not represent the views of the EV working group organisations or DEIP*

# Quick Wins – Collaboration Initiatives

**Theme(s):** Several

**Brief:**

- Efficient integration of EVs into existing electricity markets and systems requires collaboration across the energy, transport and infrastructure sectors
- Sharing knowledge from domestic and international sources will help accelerate learning across the industry
- Pilots and trials may need to involve partnerships between several organisations in order to manage complex interactions

**Response quotes:**

*“Improve collaboration between energy and transport agencies, as well as other organisation and agencies.”*

*“Ensuring successful initiatives from other jurisdictions can be applied in the near term. For example, how can the upcoming Victorian network regulatory processes support efficient integration of increases in distributed energy resources, such as EVs.”*

*“Building connections with international trials, IEA working groups etc., from regions where EV uptake is already significantly higher than Australia”*

*“Industry led pilots: To address the quality and availability shortcomings of data, and to understand unique Australian preferences, electricity retailers and networks, alongside market bodies and transport agencies, should work in partnership to design pilots to better understand changing transport and energy interactions.”*

# Quick Wins – Tariff trials/reform

**Theme(s):** Network and retail tariffs

**Brief:**

- Trials of new network tariffs can be conducted via several mechanisms prior to formal establishment as part of a regulatory reset
- Understanding how consumers react to various types of incentive could help develop more efficient tariffs in the longer term:
- Daily price incentives
- Critical peak price incentives
- Direct load control
- Dynamic load adjustment
- Partnerships are key to understanding consumers who are exposed to both network and retail tariffs
- Try to approach this from a 'quick wins' perspective – noting that this is also a category in the other two groups

**Response quotes:**

*“Trial different tariff arrangements, and how a combination of price incentives and some form of direct load control could provide an optimal solution”*

*“Trial of new network tariffs – better understand how consumers react to different incentives. Include both home charging and public charging (eg. DCFC)”*

*“Encourage EV proponents to partner with existing energy market participants to conduct trials that gather information on usage patterns and consumer preferences with respect to EVs.”*

# Quick Wins – Co-ordinated Infrastructure

**Theme(s):** Charging Infrastructure

**Brief:**

- Optimising the value of charging infrastructure will require co-ordination between organisations across the EV sector
- To minimise the cost of charging, both locational and time-of-day factors need to be considered
- Charging during periods of high solar export aligns with low wholesale prices and low emission generation, as well as assisting with network/system minimum demand and ramp rate issues

**Response quotes:**

*“Improved coordination of fast charging station rollouts to better utilise existing network capacity or complement locations of high solar exports”*

*“Encourage daytime charging which correlates with high solar – e.g. workplace and commercial premise charging.”*

*“Providing network capacity information in priority areas”*

*“Ensuring that trials and programs to promote the uptake of EVs include the ability for EVs to communicate intelligently with the electricity grid.”*

# Quick Wins – Managed Charging Trial

**Theme(s):** Charging management/control

**Brief:**

- Third party control of customer chargers by NSP, VPP operators etc. may be a way to reduce the total cost of charging, by:
- Avoiding the need for costly network upgrades
- Allowing the customer to offer valuable services to the network/system
- A managed charging trial could take a number of different forms:
- Technology trial – test methods of communicating with chargers, ability to follow setpoints etc.
- Customer preferences trial – learn how customers will react to different forms of third party control
- Metering trial – determine ways to measure and settle the energy flow to a single appliance
- Optimisation – control charging in response to available solar generation, network capacity etc.

**Response quotes:**

*“Managed charging-trial assessing how EV charging can be managed to accommodate customer preferences, network conditions, tariffs and electricity market needs.”*

*“More demonstration projects related to vehicle charging, particularly managed charging, especially in areas with high penetrations of solar and/or areas with relatively low amounts of network capacity.”*

*“Management of EV charging through smart meters (similar in concept to solar soaking through residential hot water systems)”*

# Quick Wins – Vehicle-To-Grid (V2G) Trials

**Theme(s):** EVs as DER

**Brief:**

- V2G technology offers the potential for consumers to use their EV as a bi-directional resource, participating in markets and providing services to the electricity system
- V2G is in its infancy in Australia, trials could help the industry understand the potential for this technology and how it could operate as part of a Virtual Power Plant (VPP)

**Response quotes:**

*“Innovative trials to manage vehicle charging and vehicle-to-grid generation (V2G) to understand the value of V2G and assess how EVs could be incorporated into VPP models in the future”*

*“V2G technology trial to address:*

- *Battery degradation (address OEM’s concerns)*
- *Integrate technology with standards*
- *Service delivery models”*

# Quick Wins – Standards Development

Theme(s): Standards

Brief:

- Standards can provide benefits to the consumer by enabling more efficient interaction with markets and networks, as well as helping to avoid unnecessary cost in the overall system by reducing duplication
- Several standards that affect EV charging are currently under review:
- AS4755 – Demand Response Capabilities for Selected Appliances (including EV chargers)
- AS4777 – Grid Connection of Energy Systems via Inverters (including V2G chargers)
- Try to approach this from a ‘quick wins’ perspective – noting that this is also a category in the ‘long leadtime tasks’ group

Response quotes:

*“Avoid charging infrastructure duplication and stranded assets by agreeing a national charging standard based on international best practice. Adoption of a formal Australian standard for charging infrastructure and design. The early stages of a transition is the ideal time to establish standards to ensure uniformity. Adopting common standards makes information more accessible to market operators, commercial stakeholders and network businesses who all have a stake either in how EVs charge or their effects on the grid. From a user perspective, charging standardisation allows certainty and reduces range anxiety concerns.”*

*“Progress on the AS4755 standard is likely to take some time so commencing work as soon as possible is recommended.”*

# Long Leadtime Tasks – Standards Development

Theme(s): Standards

Brief:

- Standards could assist the efficient integration of EVs into the energy system by
- Ensuring chargers are capable of assisting with network operations
- Providing a single means of communication/control to limit integration costs
- Giving all consumers the ability to participate in demand side markets and to offer valuable system services
- Standards need careful design to ensure they do not add undue costs
- Adopt international norms where available
- Ensure that adding a new standard will result in a net benefit
- Consider all relevant stakeholders
- EVs may need to comply with standards from both the transport and energy sectors – assessing standards requirements using a framework approach could help avoid overlap/duplication
- Try to approach this from a 'long leadtime tasks' perspective – noting that this is also a category in the 'quick wins' group

Response quotes:

*“Promoting interoperability through technical standards and protocols governing charging infrastructure and data interfaces will be a key enabler for system-wide optimisation”*

*“Development of standardised approaches to dynamic charging management that can be ready before the exponential growth wave of EVs hits”*

*“Identify appropriate international standards that we should emulate as much as possible”*

*“Development of vehicle charge management protocols and operating signals to deliver V2G or demand management services”*

*“If direct control tariffs are going to be required (like Hot Water control), standards will need to be updated and new metering equipment made available”*

*“Develop common and industry accepted communication standards/protocols to allow DNSP management of EV chargers (public and residential)”*

# Long Leadtime Tasks – Regulatory Change

**Theme(s):** Regulation/policy

**Brief:**

- Some aspects of energy system regulation may need to specifically account for EVs where their characteristics differ significantly from other categories of demand. In other cases, regulation applying to demand (or DER) more generally may cater for EVs without need for modification
- Which regulatory areas may require specific EV policy, and how should that distinction be determined?
- Distribution networks are likely to be significantly impacted by the growth in EV demand. Are there any funding implications for these businesses that need to be addressed?

**Response quotes:**

*“Nature of network access for EVs – do they need special or different levels or types of access?”*

*“Connecting the EV and transport industries to electricity industry and energy market reform”*

*“Consider models for the incorporation of innovative, at-risk network investments to support long-term customer outcomes. This could include providing distribution providers with more flexibility to invest in local networks to support EV uptake, or alteration of AER revenue proposals from distribution businesses for projects to better integrate EVs.”*

*“Exploration of how EV trials in active management could be undertaken using regulatory ring-fencing”*

# Long Leadtime Tasks – Tariff Reform

**Theme(s):** Network and Retail Tariffs

**Brief:**

- Network tariff reform can take time to implement, with detailed modelling required
- There are arguments for having an EV-specific network tariff, equally there may be opportunities to consider new tariffs that apply more generally
- Cost reflective tariff options may give consumers visibility of the true costs of their EV charging decisions
- How might retail and network tariffs interact?
- Try to approach this from a 'long leadtime tasks' perspective – noting that this is also a category in the other two sections

**Response quotes:**

*“Tariff reform. Currently there are no specific EV tariffs other than standard control load tariffs currently used for hot water systems etc.”*

*“Tariff reform for cost reflective pricing under time-of-use and demand tariffs”*

*“Explore uptake of cost reflective pricing, retail price packages and EV special tariffs.”*

# Long Leadtime Tasks – Data Collection

Theme(s): Data

Brief:

- Beginning to gather data now will enable trend analysis in the future, and provide visibility of changing consumer values over time
- Regulatory and legislative change processes take time – if new rules need to be made to facilitate the collection of this data, the change process may need to begin soon
- Data collection may need to occur outside of the electricity sector
- New legislation such as the Consumer Data Right may influence the ways in which data is collected and managed
- Try to approach this from a ‘long leadtime tasks’ perspective – noting that similar categories exist in the other two groups

Response quotes:

*“Begin capture of EV/charger data – to ensure sufficient information is available for trend analysis in the future”*

*“Inclusion of new data sets collected from software providers including charging behaviour under customer data right.”*

*“Gather data – watch for how customer values change with time and experience.”*

*“Changes to the operations of government bodies such as VicRoads to develop processes to better identify EV uptake”*

*“Additional data collection powers under existing rules including the Distributed Energy Register”*

# Long Leadtime Tasks – Build Behavioural Pathways

**Theme(s):** Consumer behaviour/access to information

**Brief:**

- Giving consumers visibility of the costs and benefits of their charging behaviour will help them to make informed purchasing and operating decisions
- Behavioural norms are difficult to change – educating early adopters, and avoiding misinformation may help establish behavioural pathways that benefit consumers in the long term
- Engaged consumers could harness additional non-transport benefits from their EVs (or other DER)

**Response quotes:**

*“Educating consumers on the benefits and costs of electrification of transport and ensuring they make decisions based on efficient pricing signals.”*

*“Exploration of the most appropriate methods to facilitate consumer education and subsequent engagement with products that involve DER, including EVs”*

*“Consumer awareness – build behavioural pathways now, avoid risk of needing to later change habits formed on basis of incorrect information”*

*“Establish recommendations of preferred consumer charging behaviour to minimise negative impacts on wider electricity industry, then begin to educate consumers on optimal charging behaviour”*

# Long Leadtime Tasks – Infrastructure Development

Theme(s): Charging Infrastructure

Brief:

- Planning for future investment in network infrastructure will need to consider the impact of charging infrastructure, particularly fast charge and fleet facilities
- Over time, electric trucks and buses are projected to make up a significant component of EV demand. The charging needs and locations of these vehicles may be very different from those of light passenger vehicles
- What is the best way to facilitate collaborative planning between networks and the transport sector?
- Tip: Try to limit this to the 'grid integration' aspects of infrastructure development

Response quotes:

*“Understanding where mass fast charging facilities will be located and what network augmentation may be needed”*

*“Investment or co-investment in charging infrastructure.”*

*“Joint electric bus and network planning”*

*“Streamlining charging infrastructure for electric trucks”*

# Long Leadtime Tasks – Market Access

Theme(s): Network/system management

Brief:

- As the EV fleet grows and charger technology develops, the value of co-ordinating groups of assets to provide services to the network and system is likely to increase
- Consumers may wish to participate in future markets for demand management or grid support services, either directly or as part of a Virtual Power Plant (VPP)

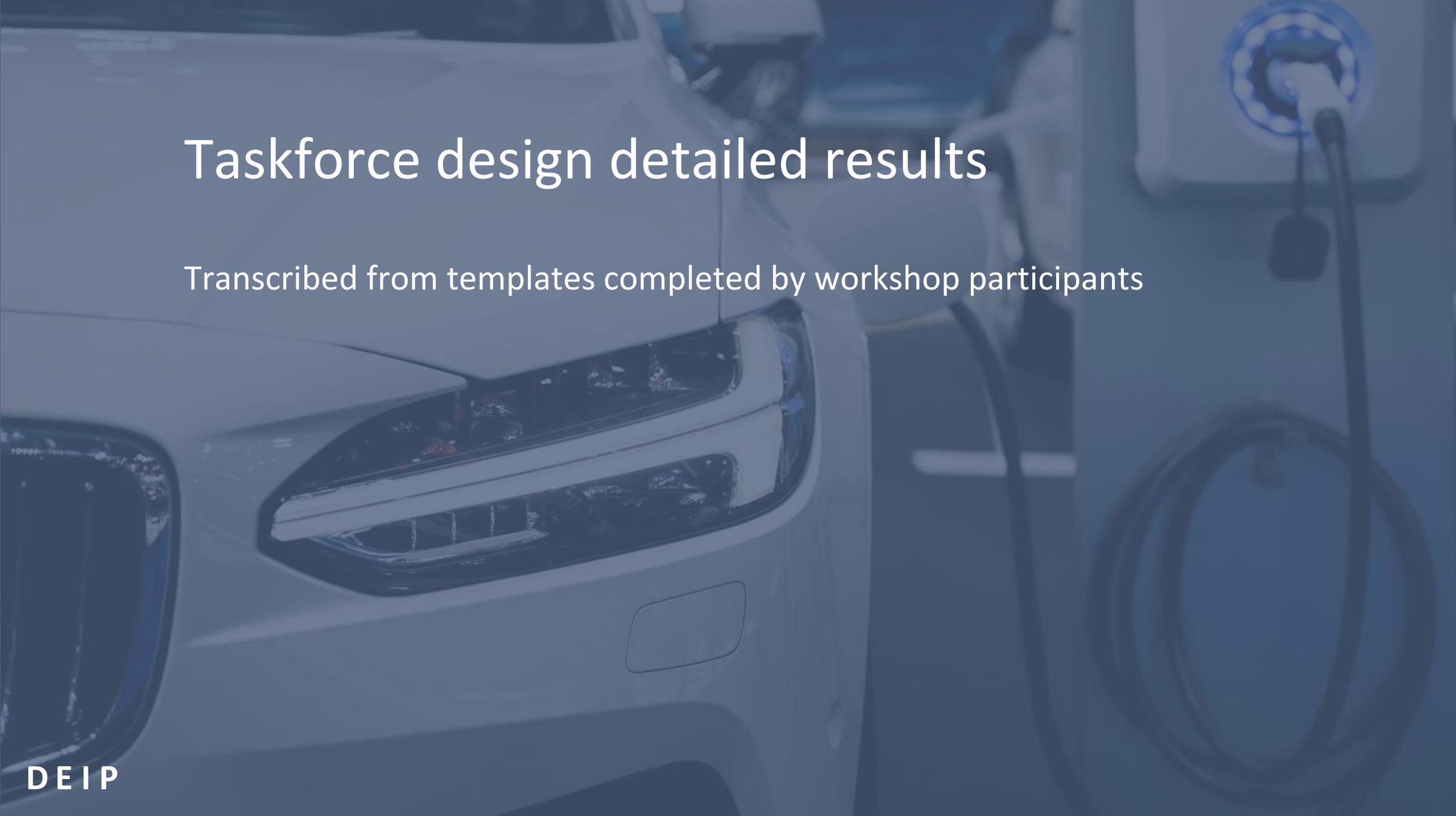
Response quotes:

*"Understanding how V2G can be used by network and system operators and how EVs can be aggregated through VPPS to participate in various energy markets along with other DER types."*

*"Consider the desirability of third parties coordinating consumers' aggregated distributed energy resources as virtual power plants."*

*"Development of demand management programs or dynamic load contracts."*

*"Exploring opportunities to create market solutions for the provision of network grid support services"*

The background image shows a white electric car parked at a charging station. A charging cable is plugged into the car's port. The entire image is overlaid with a semi-transparent blue filter. The text is centered in the upper half of the image.

# Taskforce design detailed results

Transcribed from templates completed by workshop participants

# Taskforce Proposal – 1. Data Availability

Concept

## Problem statement

- To survey, collate and make available data and information
- Gap analysis
- What will the data be used for?
- Who is going to hold the information?
- Charge/cost of data access
- Understand
- 1) where the vehicles are
- 2) Impact of Charging

## Outcomes

- What data will be collated?
- How will it be collated and why?
- How will it be stored and by whom?
- How will it be used?
- Who can get access to it?
- Applicability of existing DER register

# Taskforce Proposal – 1. Data Availability

## Activity Planning

### Describe Activity

- EV Data needs – Define list of EV Data needs priorities by cost/benefit
- Survey & Collect
- Audit & Analysis
- Manage & Communicate

### Outputs

- A List
- Data set (closed)
- Data set & Gap analysis
- Data Repository (open)

### Market Transformation:

Understand the problem  
Raw/ Incomplete data set  
Process data set & Gap analysis  
Data warehouse & benefits realisation via other taskforce activities and beyond

### Dependencies:

Identify/Engage relevant stakeholders (& Data owners?)  
Data owner support (!!)  
Data manager ID & Resourcing

### Project Development Plan:

Three Steps:  
Convene Stakeholders  
Compile/validate list  
Manage list with time

### Timeline:

3 – 6 Months = List  
6 – 12 Months = Survey/Collect  
3 – 6 Months = Audit/Analysis  
3 – 6 Months = Manage/Communicate

# Taskforce Proposal – 1. Data Availability

## Activity Planning

### Participants & Partners:

Data Experts & EV Market Stakeholders  
Data Owners  
Data Managers & EV Market Stakeholders  
Data Managers

### Resources Required:

EV Data Needs - 0.25 FTE Secretariat  
Survey & Collection of data - 0.25 FTE Data  
Manager  
Audit & Analysis of data - 0.25 FTE  
Secretariat + 0.25 Data Manager  
Manage and communicate data - 0.25 FTE  
Data Manager

### Consumer impact

No

### Risk:

Big Brother Outrage  
Explain within context  
Emphasize cost/benefit model  
Data Owner support/ Capability  
Roads/Vehicle Registration bodies

# Taskforce Proposal – 2. Understanding Consumers

Concept

## Problem statement

- We don't know customer charging behaviour (when, where, how much) or how they would respond to incentives/disincentives
- Need to understand drivers/behaviours/needs of different segments. I.e. Fleets (light), fleets (heavy), commercial, individual/residential
- To what extent can managed charging of aggregated fleets reduce peak demand and reduce/obviate need for network infrastructure? (charge with surplus solar)

## Outcomes

Audit of current charging activity  
Tangible insights on can charging behaviour be shaped through incentives

## Concept

Behavioural insights studies/customer trials of current EV owners' experience (survey would also need to speak to incentives/opportunities)

- Base case – no incentives
- multiple test cases of incentives (Private & Public charging – house vs destination [ie. Work/shop])

In context of shared mobility fleets test what opportunities there are to influence charging behaviour (and how this compares with ownership model)

Draw insights from other customer segments (including mass market versus first mover & disengaged)

Insight on interaction with other DER – eg. Solar/home battery

# Taskforce Proposal – 2. Understanding Consumers

## Activity Planning

### Describe Activity

International desktop study regarding comparable grids and consumer behaviours vis-à-vis charging

Study or audit of current Australian EV consumer charging behaviour

- try to capture charges over time horizon

- customer segments, models

- fleets (light & heavy), commercial, individual/residential

Develop trial questions on charging management to be progressed through competitive grant program. Eg. Incentives for home and destination charging

- opportunities in shared mobility fleets

- interaction with other DER such as solar/home battery

# Taskforce Proposal – 3. Standards Development

Concept

## Problem statement

Absence of standards, or development of unique Australian Standards (co-ordination with property/buildings) relating to EV charging will inhibit EV uptake  
Lack of engagement with IEC/ISO standards leads to local industry getting blindsided by standard changes

## Concept

Map all standard and standards gap potentially relating to EV charging, and  
a. adopt internationally where possible  
b. influence locally created standards where necessary  
Mirror international committees (SA Process)

# Taskforce Proposal – 3. Standards Development

## Activity Planning

### Describe Activity

Map all standards and standard gaps potentially relating to EV charging  
Identify suitable international standards for adoption  
Engage with and influence locally created standards where necessary

### Outputs

List of standards deemed relevant by the taskforce  
List of committees to engage with  
List of international standards to consider for adoption

- High level critique/summary of each
- Assessment of suitability for Australian Conditions
- Australian context for these standards
- Suggested modifications

### Market Transformation:

By providing better quality information to regulators & decision makers  
Support the private sector in developing & deploying cost-effective, safe and future proof solutions

### Dependencies:

Collaboration with other taskforces  
Data to support assessment  
DEIP – Grid interoperability

### Project Development Plan

Create list of stakeholders  
AS a starting point, review SE list of standards  
Create map  
Create participation cases

### Timeline

Approx. 12 months for identification & mapping, and starting to influence local standards  
Years to actually impact standards, and associated regulatory environment

# Taskforce Proposal – 3. Standards Development

## Activity Planning

### Participants & Partners:

Industry (equipment manufacturers & suppliers)  
DNSPs  
Regulators  
Retailers/Generators  
Standards Australia

### Resources Required:

Time  
Not much money  
Forum could be hosted by Standards Australia

### Consumer impact

In the medium term - yes  
Improvements to:  
- Confidence in safety of EVs  
- Cost of outcome  
- 'future proofness' of solutions

### Risk:

Backing the wrong standards  
Wide stakeholder support  
Failure to engage all impacted stakeholders leading to delays or ineffective standards  
Regulatory change might implement a standard in a manner not envisaged by the taskforce  
Excessive regulation could block uptake

# Taskforce Proposal – 4. Residential Tariffs and Incentives

Concept

## Problem statement

Unmanaged charging will drive excessive cost for all customers and inefficient outcomes

Currently don't have customer facing tariffs/incentives to enable efficient EV charging outcomes

Forecasting is a large charging

## Concept

Opt out provisions for managed charging

Portfolio management of EVs

Look at international case studies/learnings

Standards require smart chargers

Consider portfolio interface

Access & pricing work stream should be involved

Test alternative Tariff/Incentive models  
[Network/Retailer/Aggregator] – Social science

# Taskforce Proposal – 4. Residential Tariffs and Incentives

## Activity Planning

### Describe Activity

Literature review on existing incentives in Australia and globally / behavioural economics study  
Establish baseline do-worthy case  
- Distribution business, renewables, energy  
Investigate special & temporal impacts of EVs on earning tariff structure  
Trials

### Outputs

Literature review  
Range of possible tariff options

### Market Transformation:

Communication could lead to improved tariff/incentive structure

### Dependencies:

Broader tariff work underway  
Residential demand tariff – AER  
Energy Consumers Australia

### Project Development Plan

If do nothing, what is the base case  
- quantify problem  
Go out to other markets and see what works  
Trials  
Investigate dynamic tariffs – EV as solar storage

### Timeline

List review – 3 Months  
1 year for Trials

# Taskforce Proposal – 4. Residential Tariffs and Incentives

## Activity Planning

### Participants & Partners:

Consumer groups  
Consumers  
DB  
Retailers  
Aggregators  
EV manufacturers  
Installers

### Resources Required:

Customers for trials  
Funding for trials & business case

### Consumer impact

Direct impact on tariffs

### Risk:

Competition risks  
Blunt instruments  
Funding

# Taskforce Proposal – 5. Collaboration Initiatives

## Concept

### Problem statement

Groups missing –  
Transport/property/energy +  
Agriculture/Mining  
Focus areas – Truly national & International  
experience  
Auxiliary markets – Carbon, Air Quality, Fuel  
Security  
Muddled rules & responsibilities  
Impact of Automation  
Privacy & IP issues

### Concept

- Understanding key players  
(stakeholders)
- Develop information sharing pathways
  - In – Group, Taskforce
  - Out – broadcast of information
- Monitor Emerging Tech (Hydrogen)
  - Invite to participate
- Understand the ‘customer’  
(who/whatever that is)

### Outcomes

- Coordinated effort in sharing  
knowledge
- Clear Stakeholder group (fluid)
- National Framework (Global inputs)
- Faster technology uptake

# Taskforce Proposal – 5. Collaboration Initiatives

## Activity Planning

### Describe Activity

- Hold forums that captures all relevant stakeholders to discuss issues & target broader areas via Briefing pack
- Online forum (eg. LinkedIn, newsletter) to share information, leverage what is already available (eg. Daimler)
- Industry ecosystem mapping to identify key stakeholders
- Identify working groups/task forces that are already available
- Identify gaps on taskforce & right people on taskforce

### Outputs

- Produce briefing pack
- Centralised data hub/information sharing platform
- Inform political leaders
- Developing a stakeholder map/list

### Project Development Plan/Timeline

- Build stakeholder/industry map (via a single day workshop) – cost \$0 (exc. Possible cost of event) -> leverage parallel processes eg. EV Strategy etc.
- Communications/engagement process (ongoing) – cost \$0 (could be covered by 0.2 FTE provided by contributing partners)
  - Social media – build a virtual community
  - promote the group via speeches etc.
- Refresh industry map & taskforces to add new stakeholders – cost \$0
- Share information (ongoing)
  1. Hold a forum/event – cost up to \$80,000 for 200 people (however preferred to leverage broader EV event)
  2. Create an online data hub/portal – cost \$0 - \$20,000 based on web portal set up (ongoing 0.2 FTE to coordinate portal and communication)
  3. Create a newsletter/e-news sharing knowledge and research (utilise 0.2 FTW for coordination of portal & communication)
  4. International knowledge sharing – cost unknown – scope could include sharing of existing research (\$0) or sponsoring/funding benchmarking study (up to \$200,000)

# Taskforce Proposal – 5. Collaboration Initiatives

## Activity Planning

### Participants & Partners:

- Taskforce members, industry stakeholders, govt groups, cross-section of transport, energy property, consumers/community
- International forums – eg. IEA

### Resources Required:

- Web-based resources & communication/engagement staff
- Corporate sponsors/advertisers for events and communications
- Industry groups eg. EVC
- Funding to cover costs

### Market Transformation:

- Help planning for future infrastructure – better data = better modelling & forecasting
- Reduce waste & duplication of work
- Support innovation & build new industry build pipeline of education & upskilling
- Help form consensus & impartial view - > helps inform political leaders/decisions
- Shared data sources

### Risk:

- Resource needs could group – mitigate by clearly scoping actions & costs
- Stakeholders could be overlooked – mitigate through core work program and engagement with parallel groups

### Dependencies:

Identify key stakeholders & working groups (eg. TIC, Australian Logistics Council)  
Need EV uptake  
Submission for National EV strategy  
Work being undertaken by Electric Vehicle Council  
Hydrogen Strategy

### Consumer impact

- Consumer/community groups should be consulted/involved

# Taskforce Proposal – 6. High Capacity Tariffs and Connections

Concept

## Problem statement

1. Tariff Trial – The existing tariffs form/structure and amount are perceived to not be cost reflective and are cost prohibitive
2. Connections – The existing NSP connection processes are onerous (in terms of requirements and data), no consistent across jurisdictions, and have unreasonable response times

## Concept

1. Tariff trial – explore the ‘true cost’ to NSPs on EV charging & design/trial tariffs which are ‘fit for purpose’ (Explore dynamic management of load)
2. Standardised Connection ‘Template’ – Develop a minimum connection specification for NSPs to adopt which outlines the data requirements, timeframes etc.

# Taskforce Proposal – 6. High Capacity Tariffs and Connections

## Activity Planning

### Describe Activity

- National Public infrastructure EV Charging Tariff/Pricing Trial
  - > QLD/NSW/VIC/SA
  - > Site & DNSP – Choose willing peak demand site and other site
- DNSP & Infrastructure provider perform shared modelling exercises & use/develop tariff appropriate (demand management)
- Test Tariff & ‘Real life’ charging behaviour
- Review & feed into regulatory change process

### Outputs

- Recommendation for a new Tariff regime for EV public infrastructure
- Knowledge sharing in relation to how EV public infrastructure will be used
- Reduce barriers to uptake to installation of EV Public Infrastructure

### Market Transformation:

- How public charging will be utilised
- Effects on grip infrastructure and real costs of Public EV charging
- Test demand management & tariff where peak demand problems exists

### Dependencies:

- Standardised connection process for EV public infrastructure (activity 2)
- Customer behaviour on fast charger usage vs charging at home
  - > do EV Drivers want to charge?

### Project Development Plan/Timeline

- Announce Trial
- Define Trial Participants
  - AER / DNSPs & TNSPs / Infrastructure / Fast Charging Suppliers / ARENA (?) / CEFC (?)
- Define Governance and Timeframe
- Find sites, define technologies
  - > Peak demand/No peak demand problems
- Desktop Modelling on EV Charging infrastructure usage and network impacts
- Adopt or Develop Network Tariff arrangements for the trial
- Define use of Demand response or reduction technologies

# Taskforce Proposal – 6. High Capacity Tariffs and Connections

## Activity Planning

### Participants & Partners:

- Taskforce members, industry stakeholders, govt groups, cross-section of transport, energy property, consumers/community
- International forums – eg. IEA

### Resources Required:

- Web-based resources & communication/engagement staff
- Corporate sponsors/advertisers for events and communications
- Industry groups eg. EVC
- Funding to cover costs

### Consumer impact

- Consumer/community groups should be consulted/involved

### Risk:

- Resource needs could group – mitigate by clearly scoping actions & costs
- Stakeholders could be overlooked – mitigate through core work program and engagement with parallel groups

### Timeline

- 6-12 months
- Initiation
- Enrol Participants
- Find sites
- Desktop modelling
- Tariff choice
- Trila EV Public Charging Infrastructure