



Electric Vehicle Focus Group Summary

Prepared for: Energy Security Board

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A focus group with Electric Vehicle (EV) owners was conducted to explore consumers' experience with EV charging

Program Background

Throughout 2023, Forethought and ESB engaged industry stakeholders to explore the current customer experience and develop a vision for the ideal customer experience for EV charging. Key to this process was to validate (or reject) the hypothesised pain points and drafted solutions with consumers.

Research Objectives



- Explore current EV customer experience for vehicle charging including key pain points, moments of truth, information gaps and key points that were not currently covered in the journey map developed by ESB and Forethought; and
- Co-ideate potential solutions simplify the consumers experience in the future.

This focus group of eight (8) Australian EV consumers was used as a tool to validate the current and future state journey maps

Gender



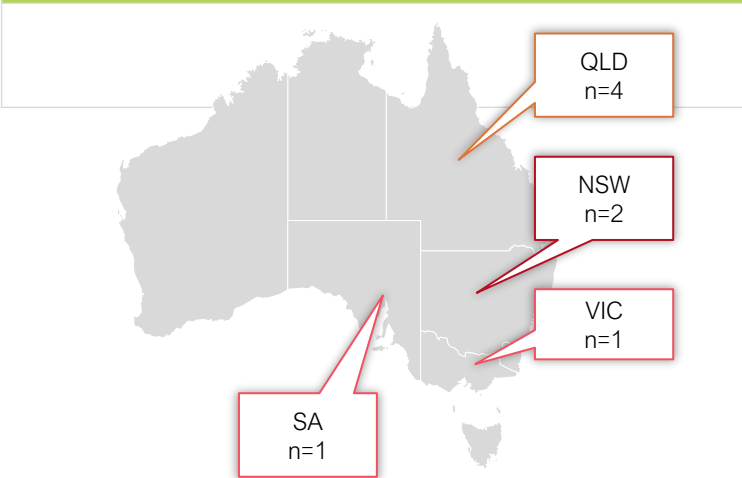
Car manufacturer

MG Motor	2
Tesla	2
Kia	2
BMW	1
BYD Auto	1

Owns a Charging Kit

Yes	6
No	3

Location



Kilometers driven in a typical week

Less than 100kms	1
100kms – 200kms	3
200kms - 300kms	2
300kms - 500kms	1
500kms+	1

Age (years)

35 – 49	50%
50+	50%

Area



Metro = 88%
Regional/Rural = 12%

Charging Habits

Charging at home	Weekly	8
	Weekly	1
	Fortnightly	2
	Monthly (7-12 times a year)	3
	Every two months (5-6 times a year)	1
	Less often (1-2 tomes a year)	1
Charging at a Public Station		

The focus group explored three key issues:



Chapter 1:
Understanding Current Charging Experience



Chapter 2:
Mitigating pain points

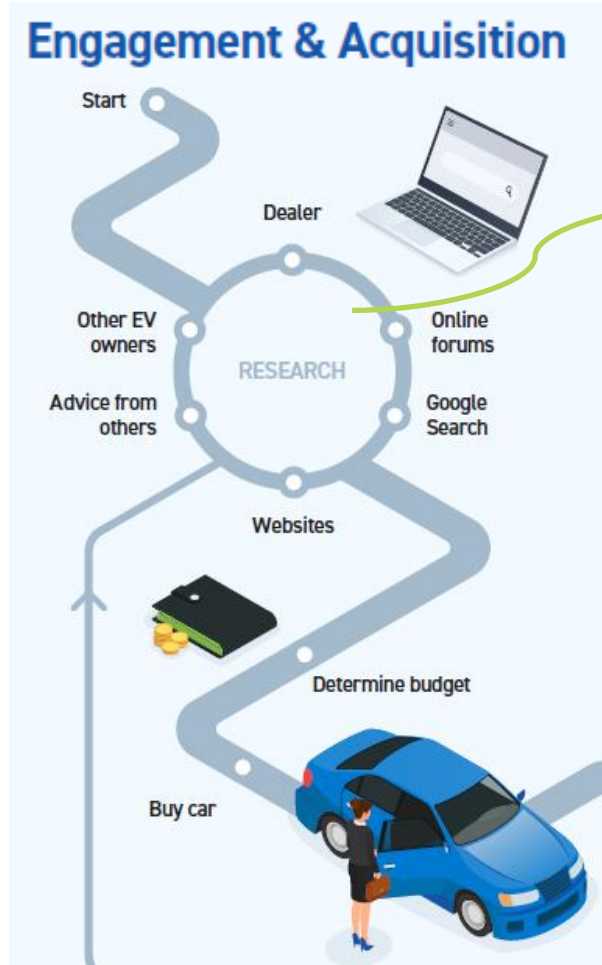


Chapter 3:
Awareness and understanding of future EV-related issues

A person with long blonde hair, wearing a dark jacket and jeans, is plugging a charging cable into the front of a light-colored electric car. The car is parked next to a brick wall. The image has a blue tint and a halftone dot pattern.

Understanding the current charging experience

EV owners gathered information about chargers through various channels, including international reviews, discussions with friends, and interactions with car dealers



Relying on reviews from overseas sources and YouTube videos

Many participants turned to YouTube videos and sought advice from friends who had purchased EVs.

Gathering information from these sources helped them:

- **Understand** charger options available
- **Deepen** their understanding on the overall charging process

*"We just sort of kept looking at the research and **lots of YouTube**. Then we started the social media pages where **everyone's sort of talking about what they're getting when they're getting all the all the bits and pieces**" - QLD, Metro*

Talking to friends

Seeking guidance from friends who already had experience with EVs **proved beneficial in navigating this learning curve**. This helped avoid the need to start learning from scratch, and EV owners received firsthand reviews from trusted sources.

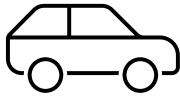
*"It was good that we could just ask our friends because they already have experience with it so we **don't have to start from scratch**, but it wasn't difficult as such it was just understanding this whole new concept" - NSW, Metro*

Talking to car dealers

There was a perception that **car dealers may be biased and not prioritising the best interests of the consumer and giving valuable insights about charging and charging options**.

*"I wanted to get charger first before I got the car because they [car dealer] said there would be a **waiting period**, but they **wouldn't let me get a charger first**" - QLD, Metro*

Currently, EV owners predominantly relied on home charging for their EV and utilised them primarily for short-distance travel



USAGE

- EV owners **predominantly chose to charge their EV at home**. However, if EV owners were travelling to work in the city or visiting a local shopping centre, it was common for owners to take advantage of the charging facilities available nearby.
- EVs were **primarily used for shorter trips around town**, with occasional longer journeys. Planning longer trips **involved careful consideration and research**. While some individuals had successfully travelled long distances, such as from Perth to Sydney, it was acknowledged that **such trips required meticulous planning**.



PAIN POINTS

Investing time to understand charging dynamics: While the overall process was not overly difficult, participants acknowledged that it required time and effort to grasp the intricacies of charging dynamics.

Key Information Needed:

The following factors were important for planning charging:

- The range achievable on a full charge
- The frequency of charging required per week
- The time it would take to charge the vehicle
 - The different cables available and their charging speeds
 - Who to contact to discuss further

“ [I want to know] how many kilometres I can get from a full charge, how many times I have to charge in a week, and how long it will take to get charge.” – SA, Metro

EV owners preferred the convenience of fast charging at their home or base location before commencing their journeys

EV owners predominantly chose to charge their EV at home, even if it was with a slow charger overnight. This was because EV owners:

- Found it convenient and suitable for their regular usage
- Did not want to change their lifestyle around charging
- EV owners were concerned about the reliability of public chargers, including occasional reports of chargers not functioning properly

*“We usually just charge at night at home because we **don’t want our lifestyle to work around charging**... if we are going to there for something and its there, then we do it.”*
– **NSW, Metro**



Overall, EV Owners were keen to gain a better understanding of:

- **Cost uncertainty and evaluation:** Some EV owners were uncertain about the actual cost of charging their EV, as they received quarterly payments from their energy provider and were still evaluating their expenses
- **Cost comparison:** EV owners expressed an interested in comparing the cost of charging with the cost of petrol

Currently EV owners were more likely to rely on trickle charging

Whilst EV owners know that fast chargers offer faster charging times, many owners primarily relied on trickle chargers. This was because:

- They found that the **slow chargers** which come with their EVs were **sufficient** for their driving needs
- Some EV owners **received advice** from others that a faster charger is **not necessary** based on their driving habits
- EV owners who already **have solar panels and a battery system did not see the need to purchase a faster charger**, as they can take advantage of daytime charging using their solar energy
- If feasible, some EV owners prefer to **drive a little further** to a charging station with fast chargers for quicker charging

For those that have solar panels, EV owners were likely to:

- Take **advantage of daytime charging**
- **Adjust their charging schedule** based on solar panel generation and weather conditions
- **Coordinate charging with other home appliances** to optimise energy usage

“So, we understood that the car is a slower charger but it was much cheaper than some of the other cars on the market and lots of lots of features and bang for your buck in the car” – Vic, Metro

“We haven’t [purchase a fast charger] because we have got solar panels we’ve got the Tesla battery, that if we I suppose if we got some spare money, that’s the next thing we’d probably do just to make it a little bit quicker to charge.” – NSW, Rural

The apprehension around embarking on long trips with an EV stemmed from a lack of charger availability

Many respondents expressed that they had reservations about embarking on long journeys with their electric vehicles (EVs), leading them to opt for their second car instead. Concerns primarily revolved around the following factors:



Range Anxiety:

Respondents expressed apprehension regarding the **limited range of their EV** and the **availability of charging infrastructure during extended trips**. They were uncertain about the feasibility of reaching their destinations without running out of battery.



Charging Logistics:

There was a **need for clearer information on when and how much to charge their EV for different travel distances**. Respondents sought guidance to effectively plan their charging sessions and ensure they had sufficient power for their journeys.

This also included **inaccurate charger availability information on apps**. Some drivers failed to download the relevant apps or check-in at charging stations, leading to false indications of charger availability.



Charging Efficiency:

Some respondents **lacked awareness of the different charging speeds associated with home charging**. They were unfamiliar with the charging rates and the number of kilometres their EVs could gain per hour during home charging.

Understanding the distinctions between slow, medium, and fast charging options was crucial for improving consumer confidence.



Functionality of chargers at Public Charging Station:

Respondents highlighted instances where chargers were found to be **faulty or out of order**. This further compounded the **challenges faced when relying on public charging infrastructure**.

*"You know which app to download... but **some drivers don't even download the app and check in** to let you know that they're there or how long they're going to be there for. And then as people said, like some of them are not working or broken."- NSW, Rural*

*"We did drive the hybrid and just paid for overnight parking but didn't take the EV because **you've then got to try and look up which parking station you park and get whether they have got EV facilities**, whether they're available, and that's **too much stress** when I'm trying to work out the whole rest of the weekend." – NSW, Rural*

EV owners utilised apps for various purposes including controlling charging speed and locating public chargers

The most popular apps mentioned by EV owners were Chargefox, PlugShare, and Evie.

EV owners relied on apps to:

- **Receive reminders** about their charging progress and how much time was left for a full charge
- **Locate nearby** public charging **stations**
- **Determine availability** of chargers
- **Schedule** charging and turn it on and off, if needed
- **Control charging speed**

Pain Points:

Reliance on crowd-sourced reporting:

Most apps available for charging relied on owners to report the status of chargers. However, **the lack of reporting by EV owners** about faulty or non-working chargers **led to others discovering the issue only when they arrived** at the charging station.

Confusion and lack of consistency in charging solutions:

EV owners experienced a variety of different charging solutions at different places, which caused **confusion**. This inconsistency made it challenging for EV owners to adapt to different charging systems.

Lack of information about charging costs:

The **costs for charging at different stations varied**, but this **crucial information was not available on the apps**. As a result, EV owners faced difficulties in comparing and planning their charging expenses effectively, leading to uncertainty and potential financial implications.

*"I had an experience staying in a **resort in Noosa** recently and there was a charger in the resort. Okay, right let's support them for putting that in. Then we go have a look at it and the organisation. I can't remember the name of it, but you have to have a minimum balance of \$15 just sitting in the app to use it to spend about four or \$5 charging and **they're the only people that I have ever seen using that particular app**. So, for us that just was not practical in any way."*

-QLD, Metro

There were three main themes identified regarding the selection of public charging stations

1 Security:

EV Owners were concerned about the security of their EV while charging in public. They expressed worries about **potential tampering or damage to their vehicles**.

Some mentioned the need for **monitoring systems or notifications to detect any unauthorised access or tampering attempts**.

2

Safety and location of public chargers:

EV Owners noted that public chargers were typically situated at the fringes or in dark corners of parking lots, rather than in well-lit and easily accessible areas. **This placement was of particular concern, especially among female EV owners, as it raised safety issues during night-time charging.**

3

Charger placement and cable convenience:

The **positioning of charger ports and the weight of charging cables** were significant factors. EV Owners pointed out that the placement of charger ports on certain sides of the vehicle made it challenging to connect the cable conveniently.

Moreover, **heavy cables** were deemed **inconvenient** and **difficult** to handle during the charging process.



Non-Tesla EV owners expressed frustration regarding their inability to utilise Tesla chargers at stations, while Tesla owners were allowed to use the chargers not specific to Tesla.

They're kind of like hidden gems if you find them. –NSW, Regional

And I suppose a lot of the EV chargers ... [are] usually sort of at the fringes of the car park of the shopping centre. And it's usually the last car parks to fill up so late at night. It's the empty dark corner of the car park rather than nice and close... where it might be a little bit more populated. – QLD, Metro

A woman with blonde hair, wearing a dark jacket and jeans, is plugging a charging cable into the front of a light-colored electric car. The car is parked next to a brick wall. The scene is dimly lit, suggesting an evening or indoor setting. The text 'Mitigating pain points' is overlaid in white on the left side of the image.

Mitigating pain points

EV owners emphasised the importance of acquiring knowledge about the different chargers available and their parameters

In their words...



“How much would the different types of charger be able to charge in kilometres, and how long would that take?”
– NSW, Rural

“Is anything more than a 10 amp GPA actually needed?”
– QLD, Metro

“How should I charge my car?”
– VIC, Metro



A **visual representation** illustrating the different types of chargers was suggested as something that would greatly benefit EV owners. This was because EV owners found the process of understanding different chargers **scary**. In particular, it was **challenging to understand**:

- The various **charging speeds** associated with each charger type (slow chargers, fast chargers, and rapid chargers)
- The **approximate distance** one can drive per charge
- The **potential ranges** of each charger type

EV owners were also **unsure what the different cable types used looked like**.

EV owners faced challenges in charging their EVs due to limited instructions, range limitations, and multiple charging standards

1 Lack of comprehensive charging instructions:

EV owners expressed a **need for more detailed instructions and guidance from car manufacturers or retailers** regarding the charging process, including:

- Guidance on how to use apps, e.g. what is the first, second and third step?
- Equipment operation

2 Range limitations and driving conditions:

Concerns were raised about understanding the **impact of driving conditions and terrain on battery depletion and driving range**. EV owners emphasised the importance of being informed about these factors to effectively plan for future journeys.

3 Multiple charging standards and connectors:

The existence of various charging standards and connectors created **confusion and complexity** for EV owners.

They emphasised the **need for clear explanations, education, and access to different adapters** to ensure compatibility and seamless charging experiences.

“No one’s explained anything... an explanation when you buy a vehicle would be fantastic. And if someone, if a company did it for you and got the whole thing installed and the app to show you how far you can go and the whole setup of everything would be like a good business to have. A lot of people would like instruction.” – QLD, Metro

“When I started with electric cars, there were a number of charging standards, so with type one, type two, ...looking at the cable was like what is that? It was probably the scariest thing especially when I started” – QLD, Metro

A person with long blonde hair, wearing a dark jacket and pants, is plugging a charging cable into the front of a light-colored electric vehicle. The scene is set against a brick wall. The image has a blue tint and a halftone dot pattern.

Awareness and understanding of future EV- related issues

Overall, EV owners opposed the notion of mandating off-peak charging for home chargers unless accompanied by incentives and clear benefits

- ✗ EV owners **expressed their dislike for the regulation that mandated specific charging practices, as it restricted their freedom of choice**. They emphasised the importance of personal choice in using electricity and paying for power. A comparison was made to situations where individuals were asked to modify their energy usage during periods of high demand.
- Furthermore, concerns were raised about the **current state of infrastructure to adequately support the increasing number of EVs**. The **management of the power grid in the future was questioned**, particularly in terms of accommodating the growing adoption of EVs and ensuring a sustainable and environmentally friendly approach.

- ✓ However, EV owners indicated that they would have **been more supportive of such regulations** if they were also incentivised to change their behaviour.
- Additionally, another suggestion was to **subsidise EV owners with batteries to provide them with additional power storage capacity**. This suggestion allows EV owners to have a reserve of power to use outside of peak and off-peak hours.

In their words, Vehicle to Grid was...

"It's basically once your car has a full battery or enough charging that you can run your house from the car. So, there's vehicle to grid, vehicle to load and vehicle to home. **The scary thing about vehicle to grid I think is wanting the electrical company to then use your car as a means of storing excess power and also a means of drawing that power.** If you've got surplus in your car, so depending on how it gets done, it's going to be interesting. I like the idea in concept but like most things, I prefer incentives as ... rather than mandates and if vehicle to grid ends up being something that gets controlled by energetics or the energy provider of the grid, if it could be problematic."

In the future, EV owners envisioned utilising their EVs for alternative purposes

Whilst EV owners would continue to look for smart chargers that could be integrated with their solar system and optimise energy usage, **in the future...**

- EV owners saw an **opportunity for using EVs for alternative purposes, such as offering rides or participating in a trading platform for power sales.** These were seen to be potential avenues for generating income and maximising the value of EVs.
- The concept of bidirectional energy flow, where EVs can supply power back to the grid during peak demand, was considered an innovative and beneficial idea. It would **allow individuals to buy electricity at lower prices when supply is high and sell it back at higher prices during peak hours.**
- The **concern about the potential strain on power generation infrastructure was raised**, as the transition to EVs would require a significant increase in electricity supply. **Exploring solutions such as using the unused storage capacity of EVs through Vehicle-to-Grid systems** was highlighted as a way to alleviate this concern.
- However, EV owners expressed concerns regarding **potential battery depletion over time associated with the Vehicle-to-Grid technology and the use of fast chargers instead of trickle charging.** Additionally, some EV owners also shared their worries that **continuously plugging in their EVs might have led to faster battery depletion.**



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