



Addressing Black Spots Fast Charging Program – QLD, NSW, VIC & WA

Lessons Learnt Report

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1. Introduction and Background

Round one of the Future Fuels Fund ('FFF'), administered by the Australian Renewable Energy Agency (ARENA) was made available to fund Battery Electric Vehicle ('BEV') public fast charging infrastructure in capital cities and regional centres.

The purpose is to install a network of BEV public fast charging stations that address "blackspots", or areas that do not currently have convenient access to public fast charging stations. Given the current early stage of the BEV industry, there are many blackspots within Australia's capital cities and large regional centres. The objective is to address blackspots by improving the availability of public BEV fast charging stations which will support BEV uptake by the public and businesses, including fleets.

Ampol applied for, and was successful in being awarded four separate FFF funding agreements for the installation of fast charging stations in QLD, NSW, VIC and WA (Ampol's addressing blackspots fast charging program). To date, Ampol has focused on and made significant progress in:

- Fast charging station site selection and screening through the engagement of network providers to understand supply availability, the completion of site assessments to refine site specific scopes of works, and landlord engagement.
- Procurement activities to identify suitable partners for the supply of fast charging hardware and the design and construction of fast charging stations.

Ampol has delivered 5 pilot sites and remains on track to deliver the remaining charging stations to be installed under the addressing blackspots fast charging program in early 2024, with the program on track to progress significantly throughout 2023.

2. Purpose of Document

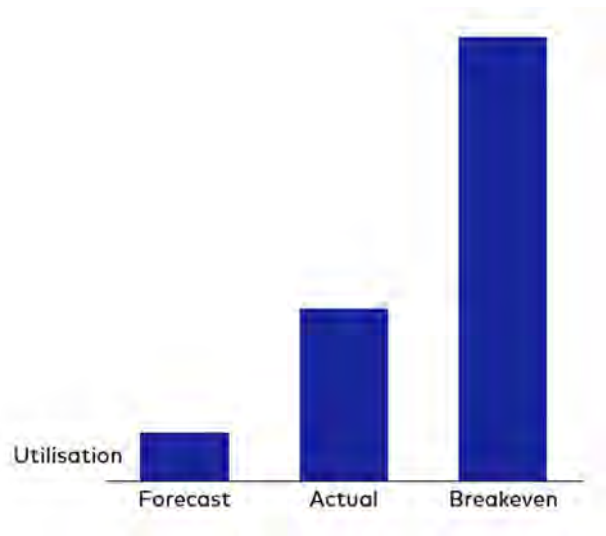
The purpose of this report is to provide an overview of Ampol's lessons learnt to date on the deployment of Ampol's pilot sites. Ampol has taken an open and collaborative approach to sharing the lessons learnt included in this report to ensure that ARENA's objective of accelerating the development and growth of Australia's renewable energy sector is met.

This Lessons Learnt report focuses on Ampol's findings around **EV charging utilisation, EV charger plug types, and EV charger deployment in fuel station forecourts.**

3. Lessons Learnt

3.1 EV Charging Utilisation

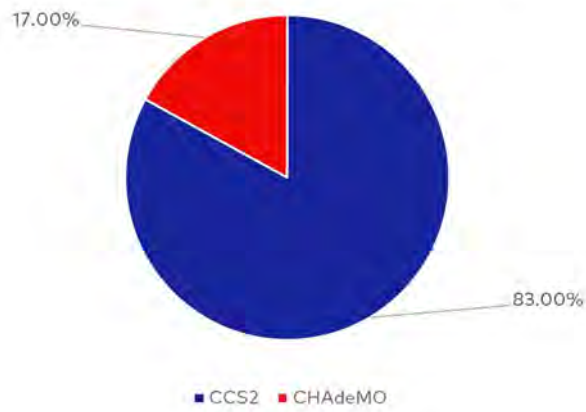
With 5 pilot sites operational, Ampol is continuously monitoring utilisation data to inform decision making in the future, and to re-baseline uptake forecasts based on actual market data. Whilst Ampol’s current sample size is small, it is promising to see that actual utilisation of sites is better than initially forecasted. However, this utilisation rate remains below what is required to make EV charging installations an attractive investment in today’s market – see figure below. This indicates that government support for EV charging infrastructure and EV uptake is advantageous in the short to medium term to assist in building this market.



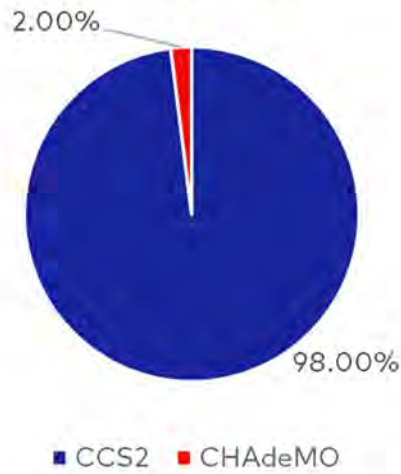
3.2 EV Charger Plug Types

When EVs were introduced to Australia, due to the few available models, there was a relatively even distribution across the fleet of CCS2 and CHAdeMO plug type. However, since 2017, with new models coming to Australia, there has been a significant shift in the EV market. The vast majority of EVs in Australia now requires a CCS2 plug type. Ampol understands that this trend is likely to continue and become even more concentrated as shown by the figures below.

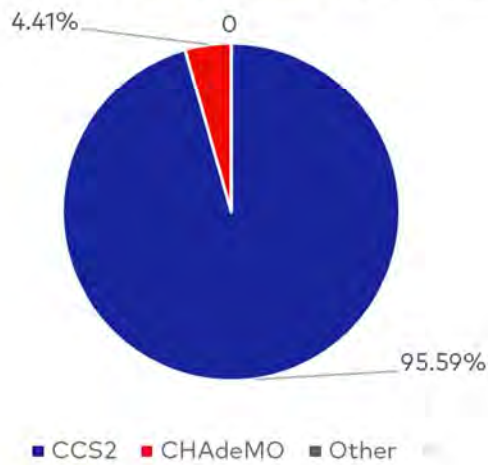
On the Road Vehicle Market Share



New Vehicle Market Share 2022 YTD



Utilization by Connector Type



Between 19th July and 1st October, we have supported more than 2000 charges across our first five AmpCharge sites. The vast majority of the charges have occurred via CCS2 plug type. Less than 5% of total charges occurred via a CHAdeMO plug type. This charge metric is broadly consistent across our five sites, with CCS2 plug type supporting over 90% of charging at each location.

Due to our AmpCharge stations offering 50:50 access to plug types, one bay per station is effectively under utilised.

The Federal Chamber of Automotive Industries (FCAI)'s EV Charging Standards published in 2017 recommends CCS2 and CHAdeMO. Ampol understands that this has not been reviewed since publication - the FCAI have indicated they will work with their members to see if the Technical Standard requires updating. Interestingly, other government grant programs are increasing not as prescriptive, with the NSW Drive Electric Program and the WA Super Highway Program not explicitly requiring both types.

Ampol believes that to successfully address EV charging black spots and support EV adoption, in addition to providing charging infrastructure in the right locations, Ampol needs to ensure that the Australian EV fleet is adequately supported. This means increasing CCS2 plug-type availability in our network.

3.3 EV Charger Deployment in Fuel Station Forecourts

A key learning from deploying Ampol's 5 pilot sites is around the challenges of installing EV chargers in fuel station forecourts. The below table summarises items to consider.

Item	Topic	Learning	Actions Taken
1	Working around liquid fuels infrastructure	<ul style="list-style-type: none"> • EV chargers are to be installed outside of hazardous area zones • EV charger location on the forecourt is important to the customer, for accessibility, visibility and safety reasons • Depending on site layout, cable trenching required can be longer than expected due to underground fuel infrastructure 	<ul style="list-style-type: none"> • Worked around the existing infrastructure to ensure safe and compliant operation from a hazardous area perspective • Took these costs into account for the remaining sites to be executed
2	Network works	<ul style="list-style-type: none"> • A second supply to site for EV chargers is not obtainable from most service providers due to safety requirements i.e., one single point of isolation for emergency services 	<ul style="list-style-type: none"> • Selection of majority of sites with sufficient capacity to support an EV charger without requiring significant network augmentation. • Ampol will continue to work with ARENA as we progress our site selection finalisation process.

		<ul style="list-style-type: none"> • With one supply to an operational petrol station, supply to EV chargers will be limited and will constrain the EV charger from reaching full charger capacity without significant network upgrades. 	<ul style="list-style-type: none"> • Close engagement with service providers to have a good view of financial feasibility of sites across our network
3	Switchboard compliance	<ul style="list-style-type: none"> • Without a second supply to site, existing switchboard on sites need to be used. In most cases, these need to be upgraded/replaced resulting in lost revenue and inventory for the site due to the outage • Variation across sites in switchboard age and configuration makes it difficult to forecast capital expenditure 	<ul style="list-style-type: none"> • Working with Ampol's retail group to realise capital expenditure efficiencies by executing retail's planned switchboard replacement program together • Design of a standardised switchboard design that can be rolled out on most sites

4. Conclusion

Ampol observes promising results as charger utilisation rate is better than originally expected. However, this rate still remains below what is required for EV charging to be an attractive infrastructure investment. This indicates that government funding support is needed to build this emerging market.

Additionally, Ampol sees from utilisation data that CCS2 will be the dominant plug type in Australia. This is also reflected by new vehicle market share data for 2022.

Lastly, EV charging installations remain a challenge especially for operating sites i.e., fuel station forecourts. This is mainly driven by the fact the electricity distribution networks are often constrained especially when electricity supply to the site is shared with current site operations. Ampol's approach is to identify sites where there is capacity available. However, we are seeing that even with our extensive network of Ampol locations, there will be some sites where it will be inevitable to consider substantial network augmentation works.

