



LESSONS LEARNT REPORT – APRIL 2022

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LESSONS LEARNT

Lesson Learnt #1: Australian EV uptake is higher than previous forecast

Category: Commercial, Social

At the time of applying for funding ENGIE had based its commercial modelling on a set of government policies and a predicted uptake of electric vehicles. This modelling was used to estimate the commercial returns that a network of charging stations in Australia would provide but also to allow ENGIE to scale its level of investment in the region. This modelling assumed that Australia would continue to have relatively minor policy interventions and that supply of EV's would be prioritised to markets with higher incentives even after price parity is achieved in certain market sectors within Australia.

Overall these assumptions have been seen to be acceptable with the Australian market growing at a relatively modest pace when compared to similar economies. In particular, the increased rate of EV adoption in Europe and the USA. The global surge in demand for EV's has resulted in an overall shortage for all markets with Australia being no exception. Wait times for many top performing models in the Australian EV market have therefore increased to more than 6 months. This has not, however, lead to a contraction in the Australian market with some OEM's outperforming the expectation namely Tesla and SIAC (MG). These manufacturers have grown more rapidly than their peers. Their success appears to be leading to new market entrants (notably BYD and potentially LDV) along with increasing supply and model availability from the more traditional car manufacturers in Australia such as Hyundai, Nissan, Toyota / Lexus, Mazda, Audi, BMW, Mercedes, etc. This increase in model availability combined with increased interest in EV's has led to greater than expected growth in the market.

From a charging perspective the increased volumes are likely to be manageable in the short term. In regional area's that have benefited from strong state-based funding programs. These regional areas are in general low density and hence once a network is established there is limited chance of utilisation rates reaching a point where there is significant queuing at these sites. However, urban charging networks face the prospect of high levels of congestion over the medium term at high utilisation sites. This would become problematic if the level of congestion reached a point where it began to impede the uptake of zero emission vehicles in the Australian market.

There are 2 potential ways to alleviate the congestion at urban DC charging sites:

- Installation of additional charging stations in a region
- Expansion of the number of charging stations at a site

ENGIE anticipates that both measures will need to occur to counteract the potential congestion at urban DC charging sites in the medium term. However, based on the time required to secure new sites and deploy new charging infrastructure, ENGIE's preference is to include facilities that allow future expansion of charging stations at existing sites that encounter high utilisation and potential congestion more effectively.



Future funding programs focused on expansion of urban charging networks should consider provision in the funding for site expansion as well as new site construction, particularly if the funding objective is to rapidly address congestion at EV charging sites.





Lesson Learnt #2: Low uptake of the Chademo standard within Australia

Category: Technical, Economic

There are 2 main DC charging standard types that are used within Australia, CCS type 2 and Chademo. Recent announcements of new vehicle releases for Australia are heavily favouring the CCS type 2 standard with only Nissan, Mitsubishi and Lexus offering vehicles with this charging standard. Tesla also offer a product that allows the charging of their vehicles via an adapter. This leads to more than 80% of the market being equipped with the CCS charging standard. ENGIE is committed to supporting all EV drivers and is technology agnostic. However, the disparity in adoption between the 2 standards makes it challenging to provide cost effective charging solutions as inevitably the Chademo charging connection is underutilised.

ENGIE are exploring options to be able to cost effectively provide additional capacity at sites for CCS equipped vehicles whilst still supporting Chademo vehicles. This inevitably results in the provision of additional CCS bays.

It is unclear if manufacturers will continue to support Chademo in the future or if manufacturers will offer Chademo to CCS adapters equivalent to the Tesla to Chademo adapter. ENGIE will continue to monitor the use of each charging standard and look to evolve it's network as the market develops.



Lesson Learnt #3: Digitising workflows

Category: Logistical

ENGIE plan to roll-put 103 sites across four geographical regions had introduced some logistical challenges which was exacerbated by the COVID-19 pandemic during 2021 and early 2022, namely:

- Restrictions to travel interstate (and in some instances within the geographical regions) and access sites,
- Mandatory home quarantine measures causing staff shortages, including facilities management personnel at site locations to facilitate site assessments,
- New starters joining the Future Fuels program team being onboarded and undertaking program activities in a remote working environment.

This challenge prompted ENGIE to explore opportunities to digitise workflows to minimize travel and site access requirements and enable effective onboarding and upskilling of new starters across geographical regions. ENGIE and its delivery partner JET Charge identify the following project opportunities, which have been subsequently implemented with notable success:

- **Digital site audits:** ENGIE has developed a digital audit tool with JET Charge using third-party software. The digital audit provides standardised and user-friendly way to obtain the requisite site information to complete robust site assessment and drive optimal project decision-making. The audit tool can be used safely on site via mobile device. This has resulted in the following outcomes:
 - Improvement in the quality of site assessments
 - Reduce administration time to covert and transmit site audit into complete site assessment reports
 - Reduced onboarding requirements (including time and resource allocation) for new starters
 - De-risk project in relation to interstate travel requirement and site access requirements
- **Site screening and prioritisation tool:** ENGIE has built a site screening and prioritisation tool utilising multiple datasets from both public and proprietary sources (via site partners) to prioritise sites. The intent is to undertake a top-down approach to screening and prioritising sites for site assessment, using the following:
 - Building data, carpark structure
 - Amenity and customer footfall
 - Location and EV market data (i.e. EV penetration, no. chargers).
 - Site host supplied data (available capacity, power supply location, proximity to suitable EV charging bays)

The tool has contributed to high site conversion rate (>80%) and ensure effective allocation of resources to target sites during periods where states / regions were subject to travel restrictions and lockdowns.

- **Desktop assessment (via online collaboration tools):** ENGIE and its partners have used online collaboration tools to undertake desktop assessment using site obtain provided by facilities team. This has enabled ENGIE to progress site assessment in the absence of site visits, due to imposed travel restrictions or lockdowns. In addition, it has streamlined the site assessment time through fast-fail of technical options (due to insufficient electrical capacity, unfavourable location) and to prioritise options with preferred attributes to ensure high site conversation.



Lesson Learnt #4: Applying technology agnostic approach to address stakeholder pain points

Category: Commercial

ENGIE has identified multiple pain points with its key stakeholders in relation to the implementation and operation of EV rapid charging infrastructure, including the end-user (EV driver) and site hosts. ENGIE has applied a technology agnostic approach to identify and formulate solutions to address these pain points. This approach recognises the EV market is rapidly growing in Australia (driven by recent government and private investment) and this is bringing new technology and product offerings to the Australian market.

The following technology has been assessed and developed by ENGIE using an agnostic approach

- **EV charging hardware:** ENGIE has engaged with short-list of prequalified OEMs that can supply OCPP compatible hardware to meet program requirements, manage supply chain risk and provide flexible technical solutions that support future scale-up. ENGIE recognises that due to ongoing supply issues and market disruptions across its supply chain there was a need to diversify the mix of hardware providers.
- **Load Management System:** Sites that include multiple EV charging installations or complex loads (i.e. shopping centres) require load management systems. This is typically controlled using a Building Management System (BMS) and therefore requirement to interface EV charging system with BMS is necessary, particularly for sites without energy storage and subject to peak demand periods. There are technical challenges with the integration of OCPP EV charging systems with traditional BMS and ENGIE has undertaken a market assessment to select suitable technology solutions (including proprietary, third-party control hardware, and API solutions) to address this requirement.
- **Customer Payment & Driver Support** ENGIE undertook a market assessment to understand customer payment preferences and the availability of contactless payment solutions for EV public charging in Australia. Due to the early stage of the EV charging market in Australia, there is currently no standardised system for contactless payment. Majority of payment method for CPOs in Australia is via individualised mobile apps or RFID cards. This is primarily due to there being limited payment solution that provides direct integration with EV hardware OCPP.