
Lessons Learnt Report – May 2022

Lead organisation:	Fast Cities Australia Pty Ltd (trading as Evie Networks)		
Project name:	Evie Networks Future Fuels Public Fast Charging		
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Executive Summary

Evie Networks' Future Fuels Public Fast Charging program commenced in August 2021. Evie's first charging station under this program was launched in October 2021. As of May 2022 Evie has commissioned 11 out of a total of 158 fast charging stations, with many more in the pipeline to be built. In addition to the Future Fuels Fund program, Evie operates approximately 50 other fast charging stations located in metropolitan areas, on highways and in regional towns. Operating a diverse network has enabled Evie to garner insights about utilisation, performance and costs associated with operating charging infrastructure.

This report focusses on public fast charging as a sustainable business. Long term planning is required to ensure there is strong demand for charging infrastructure as well as a reasonable cost base for electricity that powers the network. We identify the following challenges and impact:

1. Demand for charging is correlated with EV uptake, demonstrating the importance of securing EV supply.
2. Electricity costs are highly exposed to DNSP tariff structures and policies, with demand charges having a very large impact while network utilisation is low. This will result in consumers paying a higher price for public fast charging.
3. Further upward pressure on electricity costs and hence pricing will come from wholesale market prices.

To validate our hypotheses and demonstrate insights we use data from the wider Evie network, with data going back to January 2021.

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Project Status

Evie Networks' Metropolitan EV Fast Charging Infrastructure Network involves the development and construction of at least 158 fast EV charging sites located in Greater Sydney, Greater Melbourne, Greater Brisbane, Adelaide, Perth, Hobart and Darwin.

Evie's charging stations are designed to closely match the needs of drivers:

- Geographically spaced to provide complete coverage of metropolitan areas so that drivers are always close to a fast charge.
- Co-located with a diverse set of site hosts, including shopping centres, petrol and convenience, fast food and council sites.
- Supporting the full range of passenger and light commercial EVs, with both the CCS2 and CHAdeMO connectors prevalent in the market.
- Minimum 50kW DC fast charging technology enables meaningful range to be added with a turnaround time that matches natural driver behaviours.

As of May 2022, Evie has commissioned eleven fast charging sites as part of the ARENA Future Fuels Fund program, with many more in the process of being built.



Figure 1: New Evie Networks charging sites launched at Marrickville NSW (left) and Chelsea NSW (right)

Lessons Learnt

Lesson Learnt #1: Demand for charging is closely aligned with vehicle uptake and competition

Category:	Commercial
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Evie has been operating charging stations since 2019. We have observed a number of factors that influence demand for charging stations, including different site characteristics such as amenity and ease of access. However the factors that continue to demonstrate a linear relationship with average utilisation on the network are EV uptake and market share, or competition.

For purpose of analysis we compare average utilisation on the network and EV market uptake. We have normalised to January 2021 and have adjusted for market factors such as behaviour of early adopters of EVs. The purpose of this analysis was to test our hypothesis that there is a linear relationship between EV uptake and utilisation. The methodology used is relatively unsophisticated, given that the market is still very immature and market data is not reliable.

When considering that the time period shown was heavily impacted with COVID-19 lockdowns in NSW and Victoria, it is clear that the utilisation-EV uptake relationship is linear, supporting our hypothesis. This was the expected outcome, nevertheless it was important to validate the hypothesis for future planning.

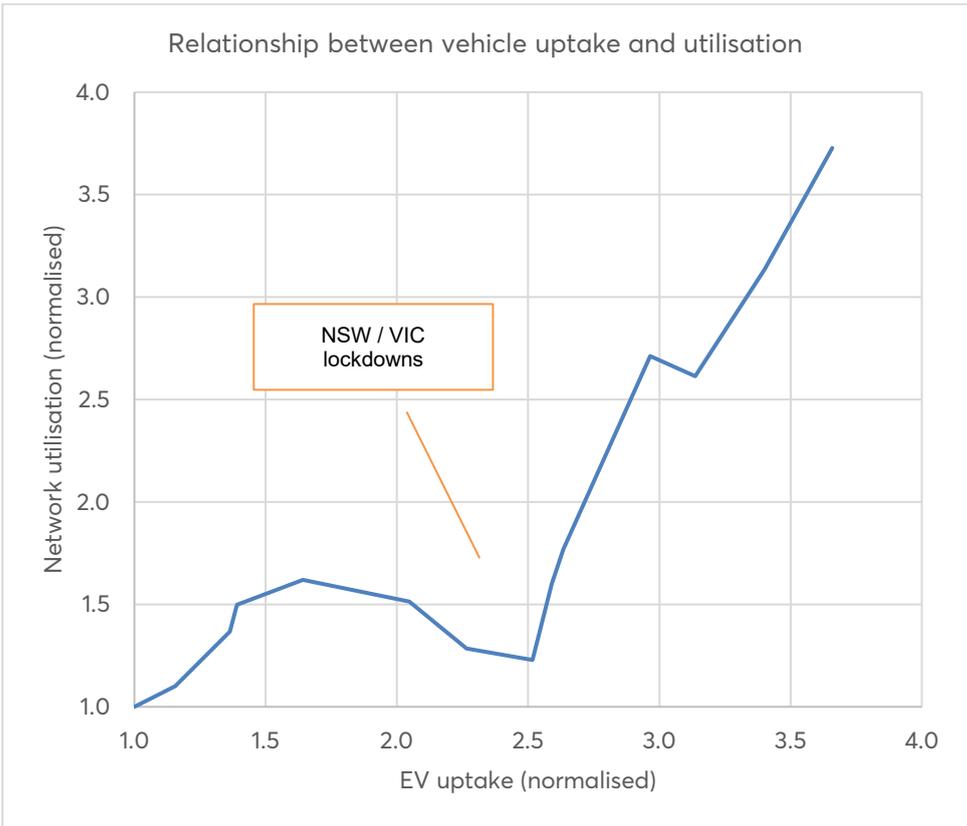


Figure 2: Relationship between EV uptake and network utilisation.

The risk for charging network operators is that vehicle supply to Australia slows due to international supply chain issues, with auto manufacturers directing vehicle sales to other markets, placing pressure on network utilisation. Compounding this will be the increased rate of charging infrastructure deployment from multiple operators. Charging network operators will need to carefully monitor market conditions to avoid investing too far ahead of demand.

Lesson Learnt #2: Ongoing challenges in securing cost-effective electricity supply due to tariffs and tariff assignment policy

Category:	Commercial / Regulatory
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In line with Evie’s objective to create a sustainable business for the long term, we closely monitor electricity connections and costs. Electricity costs will be the single biggest operational cost as the network and market matures, hence careful planning is required today to ensure future success.

Evie has connected sites with most DNSPs in Australia. We have analysed the different tariff rates in detail. Ausgrid rates and tariff assignment policy continues to be of concern, especially as Evie grows the metropolitan network in Sydney. Twenty-six of Evie’s forty-five Sydney sites that are part of the Future Fuels Fund program will be connected via Ausgrid. Evie’s experience is that Ausgrid tariffs are the highest cost in Australia at low utilisation levels and that discretionary tariff assignment policies result in significant overcharging for the first twelve months.

As a case study, below is an analysis of one of Evie Networks’ charging stations in an Ausgrid area. Tariff EA302 (a medium business commercial and industrial style tariff) was applied despite Evie requesting tariff EA225 (small business time of use). The impact is that:

- Evie is paying \$861 to Ausgrid in network charges in one month for a site that consumes <25MWh annually.
- 72% of electricity costs for the site are Ausgrid network charges.
- The network charges account for \$0.46 per kWh supplied ex GST.
- The total per kWh cost is \$0.63 per kWh supplied ex GST.
- Evie calculates the overpayment to Ausgrid in the first twelve months as approximately \$8700.

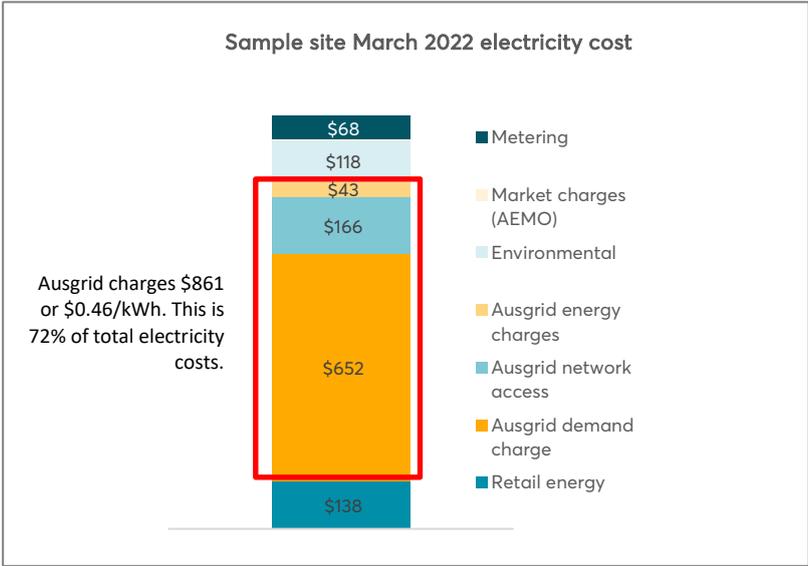


Figure 3: Electricity cost components for sample site – March 2023. Ausgrid network area.

Clearly with such high network costs it is very difficult to provide affordable public fast charging. The drivers most impacted are those that depend on public fast charging because they don’t have access to off-street charging, or professional drivers that need to top up during the day. Without affordable public fast charging these important driver segments will be disadvantaged to the extent that they will not be able to make the transition to electric. Other drivers may also reconsider making the transition, slowing

Australia's overall EV adoption.

The key message is that as the EV market is starting to grow in Australia, tariff structures for public fast charging must provide a realistic cost base, so that the affordable public fast charging can be provided for all driver segments. This is especially important as tariff design processes are underway in a number of states and the outcome of these processes will determine whether affordable public fast charging is possible or whether specific driver segments are left disadvantaged.

Lesson Learnt #3: Rising wholesale electricity costs will impact affordability of public fast charging

Category:	Commercial
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In addition to network tariffs, there has been a significant rise in wholesale electricity costs. This is illustrated by the CAL23 flat swap rate chart shown below. The impact of this doubling of wholesale network costs is an increase in electricity costs of approximately \$0.06 per kWh in NSW. Queensland exhibits an even sharper rise in the wholesale electricity cost, whereas Victoria has a lesser rise.

The impact of wholesale prices is starting to flow through to Commercial and Industrial contracts and will soon also flow through to small business and residential rates. It is not clear how long the current high wholesale prices will continue for as they are linked to current world events. Charging network operators will need to decide whether to absorb these cost increases or pass them on to drivers.

Supporting the case for charging higher prices is that price rises are already being felt at the petrol pump, so drivers will likely understand if charging network operators need to raise prices due to increases in the cost of running a charging network business.

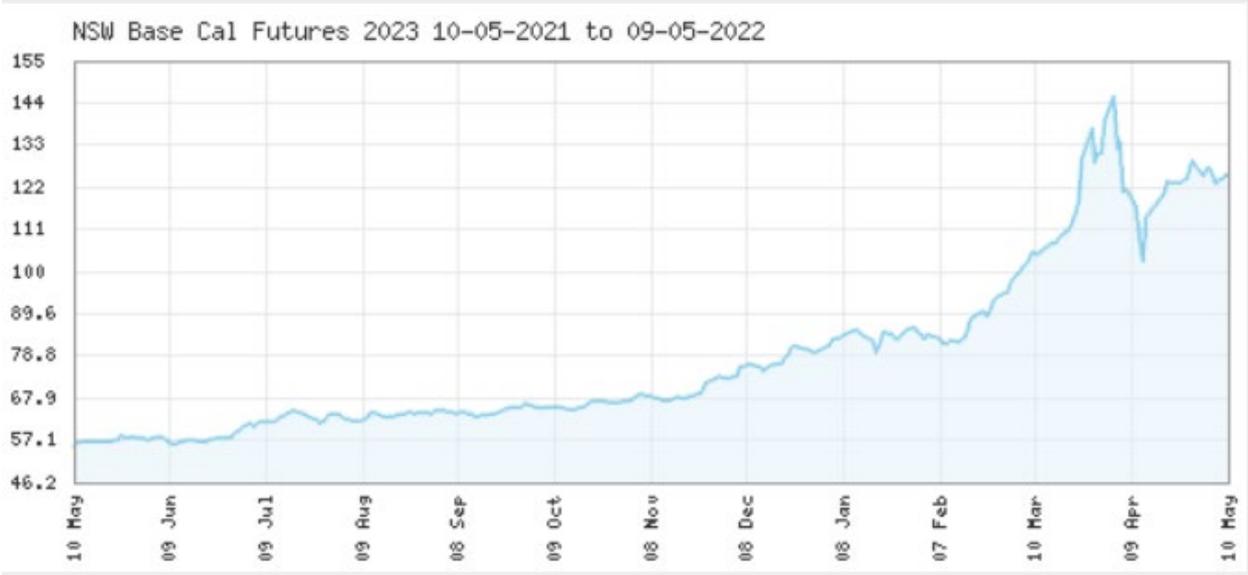


Figure 4: NSW CAL23 flat swap rates. Source: asxenergy.com.au