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Lessons Learnt Report – September 2020

Lead organisation: Fast Cities Australia Pty Ltd (trading as Evie Networks)			
Project name: National Ultrafast EV Charging Infrastructure Network			
Project commencement date: May 2019		**Completion date:**	May 2022
Report date:	for the period ending 30 September 2020		
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Project Status

Evie Networks' National Ultrafast EV Charging Infrastructure Network involves the development and construction of at least 42 ultrafast EV charging sites located along Australian major highways in Queensland, New South Wales, Victoria, Australian Capital Territory, South Australia, Western Australia and Tasmania.

- Spaced approximately 150km apart, these charging stations will support the full range of passenger and light commercial EVs, with both the CCS2 and CHAdeMO connectors prevalent in the market.

- Each site will be built with at least two ultrafast DC chargers, each providing up to 350 kW, though many sites will be future-proofed for up to six chargers, including a high-capacity grid connection to match. All sites will be powered by accredited renewable energy sourced competitively from the market.

The Evie Networks project is on track to achieve its major ARENA milestones as planned:

- The first charging site was launched at Coochin Creek QLD in November 2019. The site includes several notable technical features, such as a high-capacity connection directly to the Energex 11kV distribution network via a custom-built isolation transformer, and a shade canopy with integrated solar PV. The site is designed for up to six 350kW chargers in anticipation of high traffic volumes in future.

- As of September 2020, a further six sites were launched at Tarcutta NSW, Avenel VIC, Taree NSW, Townsville QLD, Campbell Town TAS and Tailem Bend SA (Figure 1). These smaller regional sites are designed to host two 350kW chargers and are connected at LV with capacities ranging from 400-500kVA per site. A further five sites are effectively now "power contract complete" and are part way through their build.

Figure 1: New Evie Networks charging sites launched at Avenel VIC (left) and Cluden QLD (right), along with brand partnership announcements with Caltex/Ampol and Puma Energy, respectively.

Lessons Learnt

Lesson Learnt #1: Australian EV market growth is substantially slower than previous industry forecasts

Category:	Commercial / Social

Evie Networks' National Ultrafast EV Charging Infrastructure Network is designed to help stimulate growth of the Australian EV market. In turn, our commercial model is dependent on EV market growth to improve utilisation of our sites to grow our network revenues and drive down our power costs.

Since this project was first proposed to ARENA in mid-2018, there has been a material reduction in the forecast and realized growth of the Australian EV market. Evie Networks does not produce its own forecasts, but rather relies upon credible forecasts from relevant Australian government agencies and industry bodies. Our original project proposal to ARENA was based on forecasts produced for ARENA/CEFC by Energeia in 2018[1]. Evie's assumption was conservative, based on the "No Intervention" scenario as provided in Table 1 and also replicated in Figure 2. Whereas actual EV market growth is shown in Figure 2 as reported by the EV Council in its State of Electric Vehicles 2020 report[2]. This slower growth was also reflected in an updated Energeia forecast produced for AEMO in 2019.

The sustained increase in EV adoption is a major contributor to the financial viability of Evie's highway based a ultrafast-charging network through increased utilisation of the charging stations. This increased utilisation not only increases revenues, but also reduces energy costs by reducing the per kWh impact of demand charges.

COVID travel restrictions, lockdowns and general public concern throughout 2020 has resulted in a substantial underperformance in EV take up when compared with these 2018 forecasts.

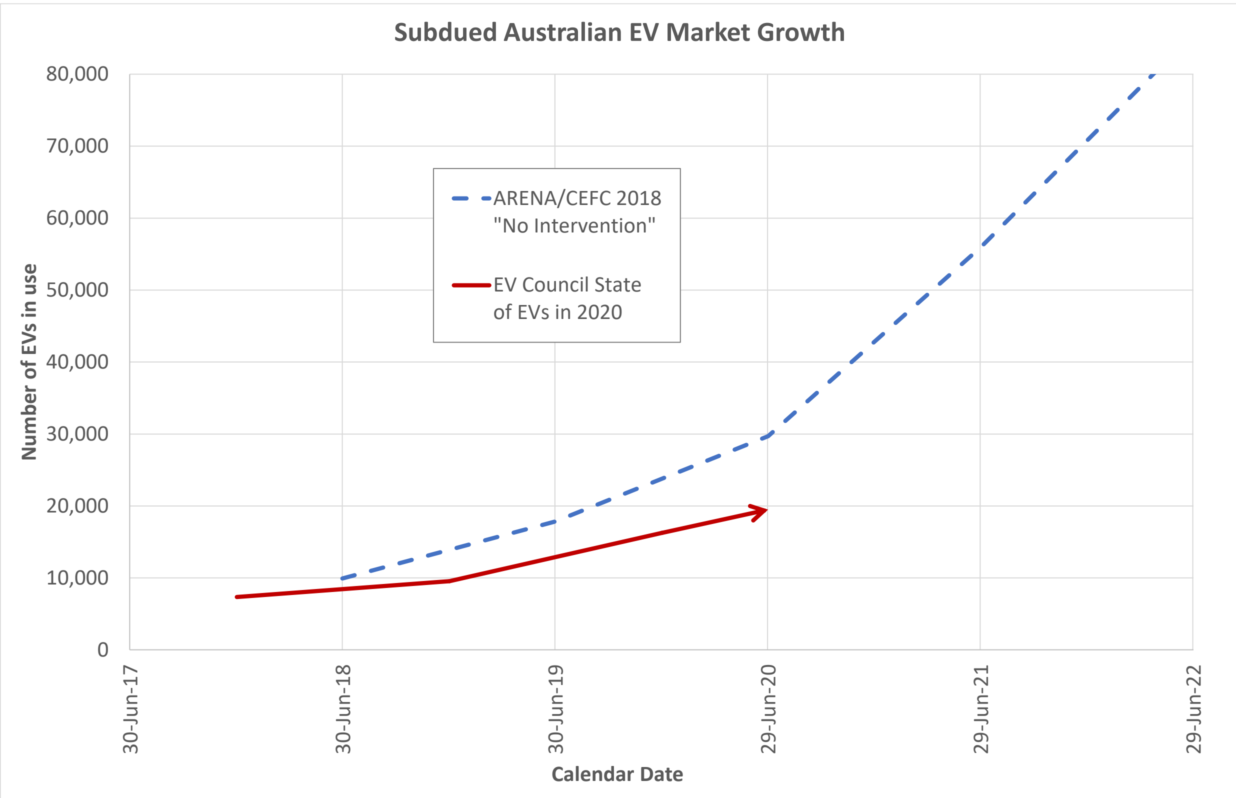

Figure 2: Subdued Australian EV market growth relative to earlier forecasts

[1] https://arena.gov.au/assets/2018/06/australian-ev-market-study-report.pdf

[2] https://electricvehiclecouncil.com.au/reports/state-of-electric-vehicles-2020/

Table 1: Australian EV uptake forecast produced for ARENA/CEFC by Energeia in 2018

Scenario	2018 Yrly Sales (%)	2018 Yrly Sales (000s)	2018 Stock (000s)	2020 Yrly Sales (%)	2020 Yrly Sales (000s)	2020 Stock (000s)	2030 Yrly Sales (%)	2030 Yrly Sales (000s)	2030 Stock (000s)	2040 Yrly Sales (%)	2040 Yrly Sales (000s)	2040 Stock (000s)
No Intervention	0%	3	10	1%	12	30	22%	257	832	73%	1,045	6,775
Moderate Intervention	0%	3	10	1%	12	31	49%	612	3,010	100%	1,895	13,078
Accelerated Intervention	0%	3	10	4%	44	79	64%	857	4,927	100%	2,247	17,315

Lesson Learnt #2: Highway charging sessions to-date

Category:	Technical / Commercial

All sites in the Evie Networks ultrafast highway charging network are equipped with the Tritium Veefil PK 350kW High Power Charging System and are deployed with both FCAI-recommended DC charging connectors with tethered cables. Figure 3 shows a *User Unit* installed at our sixth site deployed at Campbell Town, Tasmania that was commissioned on 13 August 2020.

In practice these *User Units* are current limited devices as follows:

- CCS2 plug (black): up to $500A_{DC}$
- CHAdeMO (blue): up to $200A_{DC}$
- The output voltage limit of the *User Unit* is up to $920V_{DC}$, but at Evie Networks sites there is also a power limit of 350kW per *User Unit* set by the *Power Unit* dedicated to each one.

Figure 3: Evie 350kW highway User Unit at Campbell Town, TAS

This physical limit of $500A_{DC}$ means that contemporary EVs with ~$400V_{DC}$ battery packs have a limit of ~200kW charging power, but in practice lower peak charging powers are observed due to the tapering that commences at a lower voltage / lower state of charge for most contemporary EVs. At the time of writing the highest charging powers observed to-date by Evie Networks have been for the Tesla Model 3 Performance drawing 190-195kW at the maximum current limit of $500A_{DC}$. In this sense the Evie Networks sites are already operating at their maximum performance. But these power limits will soon be exceeded in the field by the new breed of ~$800V_{DC}$ electric vehicles starting with the Porsche Taycan that will shortly commence delivery to customers in Australia. The peak charging power of this EV is known to be ~270kW which equates to ~$350A_{DC}$ at ~$770V_{DC}$ prior to tapering.

However, it is the average session power that is more relevant to our customers' overall experience, as well as in the planning, operations, and pricing of our highway network with multiple *User Units* per site. Figure 4 shows the distribution of average charging session powers for Evie Networks' highway sites. The average power of all charging sessions to date is ~50kW with a significantly skewed distribution towards lower average session powers. This network-wide average power implies that individual *User Units* are typically operating at 25-35% of their rated performance for contemporary ~$400V_{DC}$ EVs. In addition to the prevalence of competing EV products in the marketplace, the skew is as much a result of the significant charge tapering that occurs relative to EVs' peak charging powers. Several common EV products charge significantly slower in practice than their nameplate ratings would otherwise suggest.

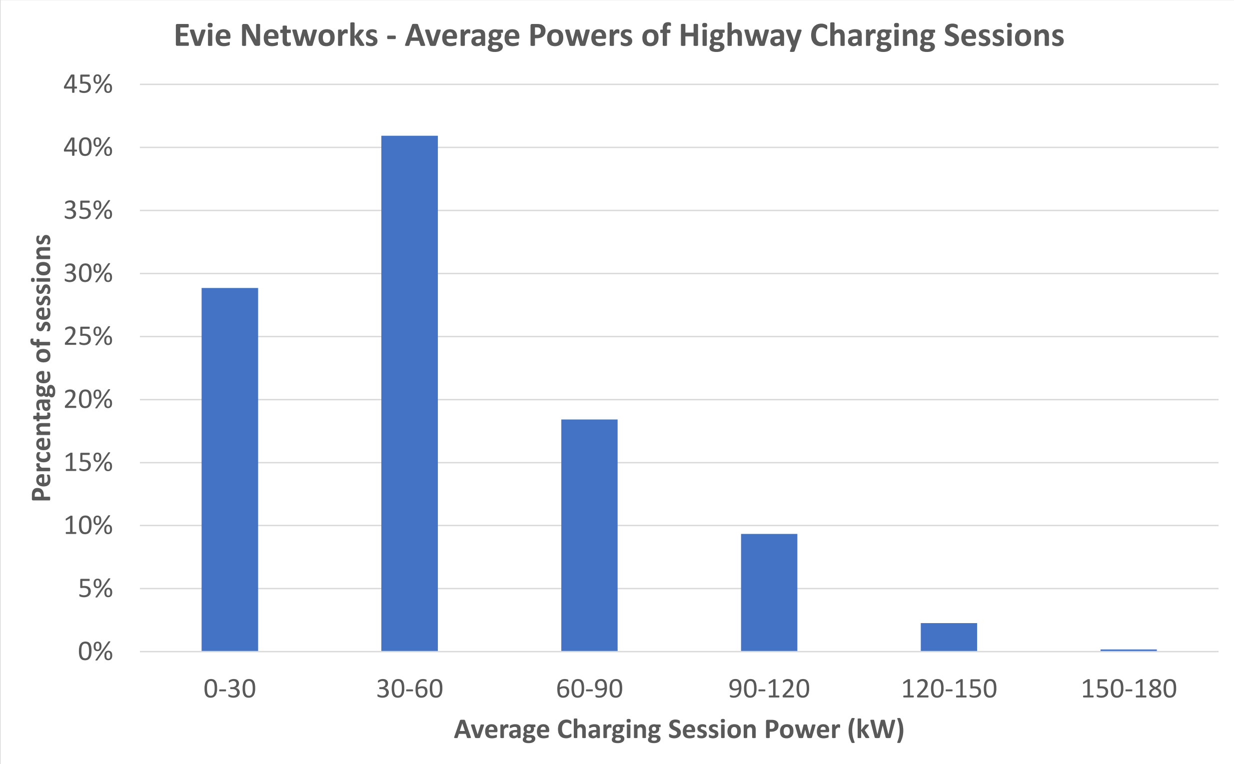

Figure 4: Distribution of average charging session power for Evie Networks' highway sites

Another pertinent observation is the typical size of each session. At Evie Networks, consistent with data also reported by our peer charging networks, we have observed that drivers are typically only doing "*top-up*" rather than "*fill-up*" charging with typical sessions of 20-25 minutes providing 15-20kWh of energy.

Lesson Learnt #3: Highway site load profiles to-date

Category:	Technical / Regulatory

While the above section describes per-session attributes, this section describes per-site attributes, and the load profiles of the Evie highway charging sites can be characterized in a variety of useful ways.

Site Utilization (time basis)

Site utilization is a time-weighted metric that characterizes occupation and congestion levels at a site. To-date Evie's seven live highway sites have accumulated approximately 1,000 days of site operations with more than 1,000 sessions delivered. The average site utilization has been ~1% (~30 minutes per site per day) after accounting for the multiple *User Units* installed at each site, though there has been significant variation between sites due to local factors such as traffic volumes and COVID lockdown impacts. Higher-traffic sites such as Coochin Creek QLD and Campbell Town TAS (Figure 5) have enjoyed higher utilization, whereas COVID-impacted sites such as Avenel VIC and Tarcutta NSW have been notably suppressed. Nonetheless, these overall low initial utilization levels are naturally expected given the early stage of the Evie rollout as well as the low national EV population.

Site Capacity Factor (energy basis)

Capacity factor is an energy-volume-weighted metric that characterizes the utilization of the site power assets across the network, in particular the ratings of the upgraded DNSP connections to sites, and it also accounts for the charging load diversity that arises across the multiple *User Units* at each site.

Figure 5: The Evie Networks 350kW charging site at Campbell Town TAS has enjoyed sustained levels of above-average patronage by EV motorists with a variety of makes and models.

At the time of writing, Evie Networks has deployed a cumulative highway charging network capacity of approximately 3MW and to-date the network has operated with a capacity factor of ~0.25%. This result is an intuitive combination of two factors: firstly, the low site utilization as describe above; secondly, the partial loadings of the charging heads as also described above. This low capacity factor is expected given the early stage of the Evie rollout and the low overall national EV population. However the Evie Networks sites are future-proofed and poised for substantial capacity factor growth of potentially 1-2 orders of magnitude over the coming decades as the Australian EV market develops and matures.

Site Peak Demand (metering interval basis)

The majority of DNSPs across the Evie highway network meter peak demand over 30-minute intervals, which is a timescale similar to the duration of typical charging sessions, and thus the individual session average powers will correlate relatively well with the interval-metered whole of site values.

With the current low levels of site utilization, coincident charging sessions at Evie sites are relatively uncommon, and thus the realized site peak demand levels are currently governed only by the individual charging sessions (see Figure 4 above). To-date the average monthly peak demand has been 100kW-120kW per site (over 30min intervals) but with significant variance on a month-to-month and site-to-site basis. Figure 6 shows the weighted-average peak load of our entire network is approximately 25% of total capacity but only for very short durations (noting that 0.1% equates to approximately 10 hours per year).

As above, this low network peak loading is expected given the early stage of the Evie rollout and the low overall national EV population. Over time as site utilization increases we expect to see site loadings approach their maximum capacities (capped by software), and for a greater proportion of the time – in both cases due to coincident sessions becoming common due to higher site utilization and congestion.

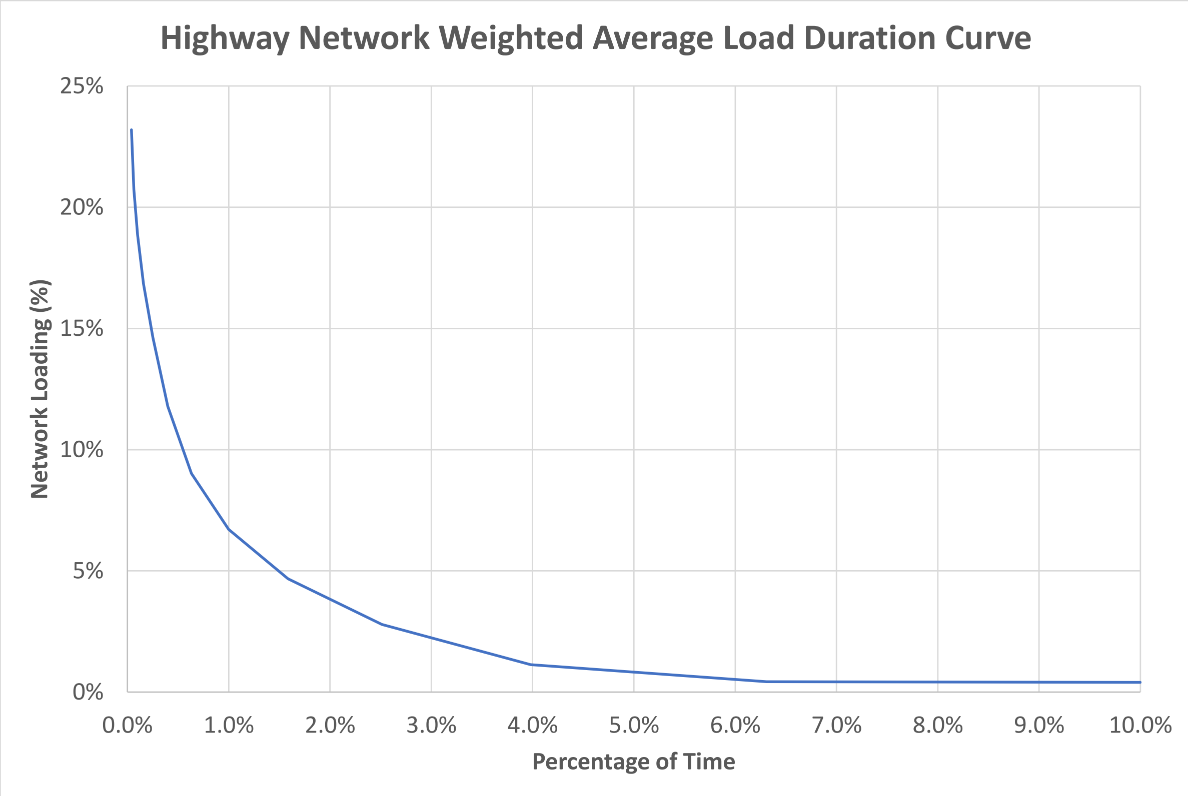

Figure 6: Weighted average load duration curve for Evie's ultrafast highway charging network

Lesson Learnt #4: Prohibitive distribution network tariff costs for ultrafast highway charging networks

Category:	Technical / Commercial / Regulatory

As a developer of high-capacity ultrafast charging sites future-proofed for high utilization in the coming years, a major commercial risk for Evie Networks is the ongoing cost of power. These sites are inherently more expensive to operate due to their inherently low utilization in terms of both energy volume and actual peak demand, with these effects severely exaggerated in the early market stage.

Power costs for grid-connected ultrafast highway charging sites

The total power costs are dominated by DNSP network charges that are typically passed through directly by energy retailers to commercial and industrial (C&I) customers. These legacy, large customer tariffs (with high demand and standing charges) result in a high equivalent cost per kWh at ultrafast charging sites since there is not much volume over which to amortize these monthly costs. Another major contributor in the early market is the site equipment idle losses that do not provide any value to our customers. These losses substantially amplify site energy consumption in the early market, and the power costs to our end customers become similarly amplified as a result, until the site volumes grow.

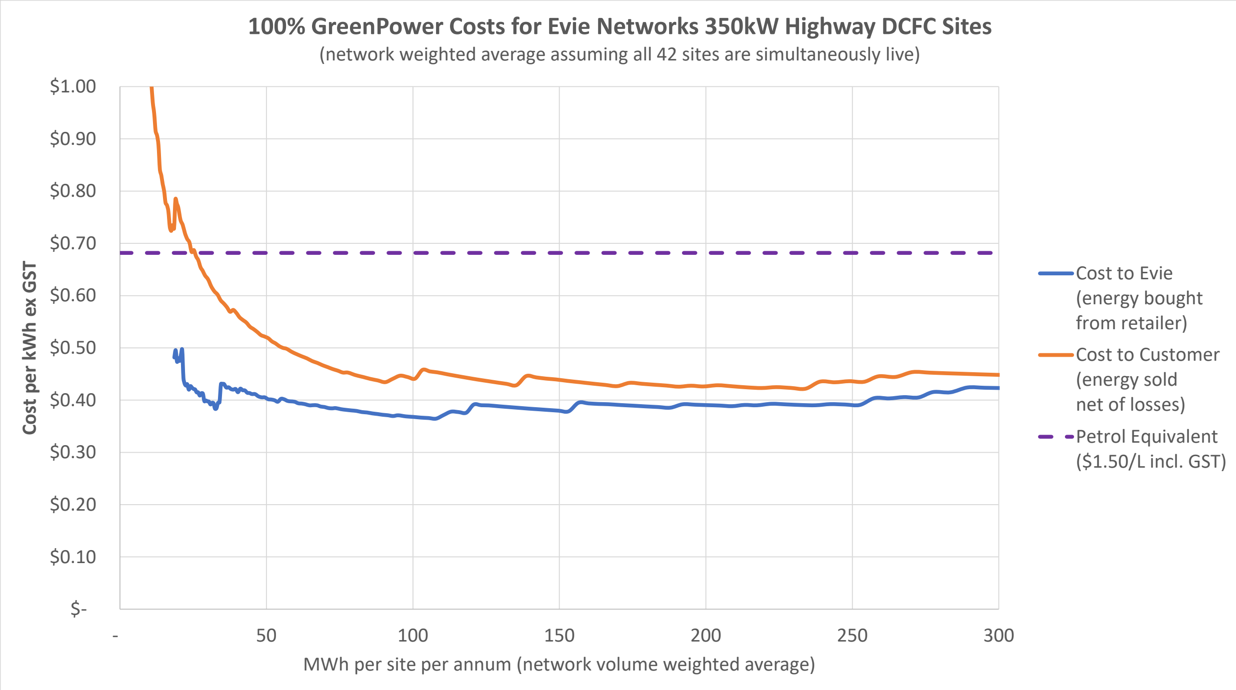

Figure 7: Forecast weighted average retailer power costs (per unit) for the Evie Networks 350kW highway ultrafast DC charging network of 42 sites nationwide

Figure 7 shows Evie's forecast whole-of-network weighted average power costs as a function of overall network volume. The forecast extends out to a materially large network weighted average volume of 300MWh per site per annum to capture the transition up through each DNSP's tariff structure statement from small customer (volume) up to large customer (demand) tariffs. The forecast also includes two relevant curves to demonstrate the influence of DNSP large customer tariffs coupled with site equipment idle losses as they both have a prohibitive cost impact in the early market stage:

- Power cost for Evie (energy cost as bought from energy retailers inclusive of site equipment losses). These costs are initially ~50c per kWh ex GST but do not fall much below ~40c per kWh through growing network volumes, in both cases due to the influence of standing charges and C&I customer peak demand charges (noting that peak demand also grows with utilization).

- Power cost to Customer (energy sold net of site losses). This curve illustrates the true underlying power cost for Evie to provide this ultrafast charging service to its customers. The influence of losses is especially pronounced for network utilization below 50MWh per site per annum, but it does also retain a material impact even at larger volumes.

It is important to note that the power cost curves in Figure 7 do not include any allowances for network operational overheads, company overheads, retail margins or site capital investment returns. These costs would necessarily need to be included to set our end-user price at a commercially viable level. Figure 7 also includes the estimated equivalent cost of fuel (shown ex GST in the chart). While this is helpful as a benchmark, it is also not a fair comparison because this end-user price for fuel does include allowances for refueling network overheads, corporate overheads, retail markups and capital returns.

The implications of Figure 7 are clear. Based on the real-world retail and DNSP tariff assumptions included in this forecast model, Evie Networks will need to set an end-user price approaching the equivalent cost of fuel in order for this highway charging network model to be commercially sustainable. Figure 8 provides an example of this total cost stack calculation for Evie's ultrafast highway network.

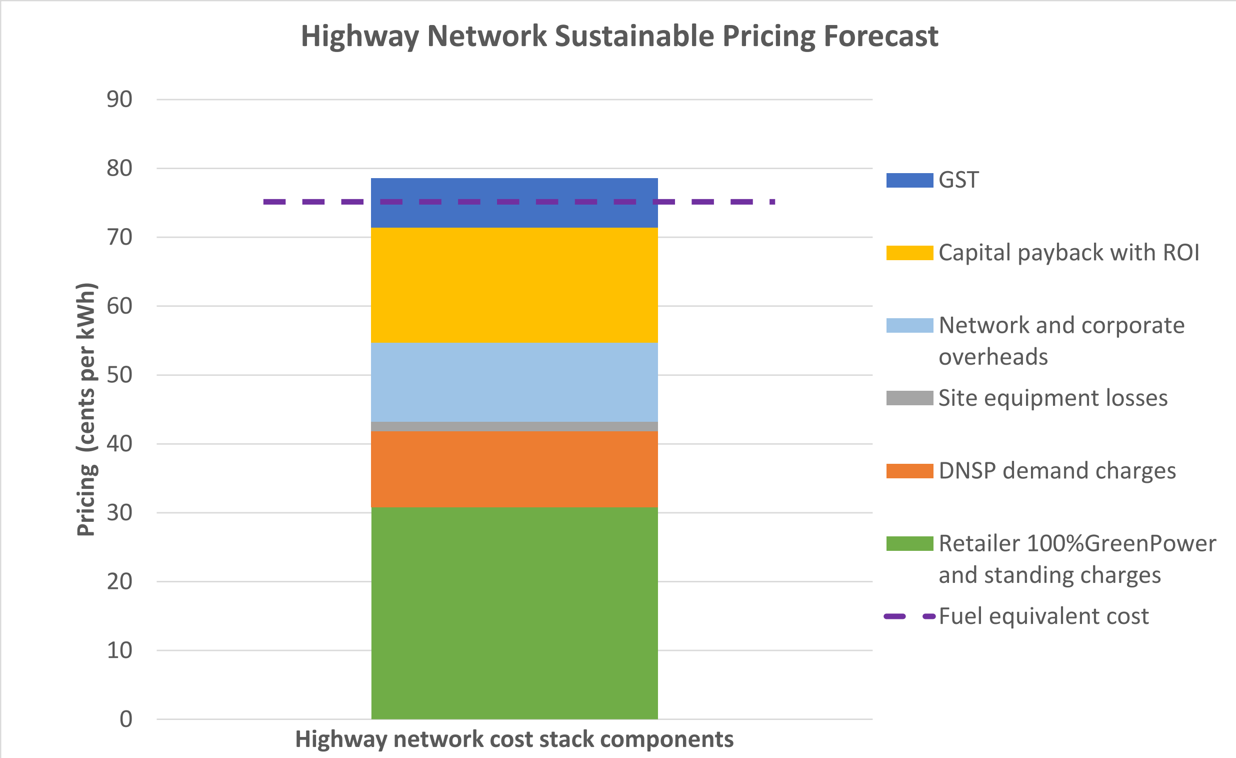

Figure 8: Total cost stack forecast for Evie ultrafast highway charging network

The application of these legacy large customer tariffs (with high demand and standing charges) are clearly prohibitive to the long term business case for ultrafast charging, so these tariffs warrant further scrutiny to assess their true suitability (cost reflectivity) for high power, new technology customers of this type.

Projected DNSP network impacts from grid-connected ultrafast highway charging sites

It is often presumed that ultrafast charging sites are inherently “costly” for DNSPs to supply due to the “peaky” nature of the load, but in practice this view does not reconcile with the available evidence:

1. These charging sites are typically underutilized such that concerns about maximum DNSP network impact does not actually materialize,;

2. The sections of DNSP networks that serve C&I customers generally have ample headroom to absorb this subdued charging site demand growth;

3. The timing of the charging sites’ actual diversified peak demands normally does not coincide with the (limited) durations of existing DNSP network peaks.

Figure 9 illustrates a sample analysis completed by Evie Networks for our target highway site locations in New South Wales using traffic interval data provided by Roads and Maritime Services along with matching location distribution network interval data from Ausgrid, Endeavour and Essential Energy. A key observation from this work is that traffic peaks do not coincide with distribution network peaks and there is a significant diversifying factor that applies to the ultrafast sites’ capacities in practice.

For the 10 target NSW highway charging site locations included in Figure 9:

- The relevant zone substations have 231MW of total network capacity with residual headroom of 64MW (28%) at the times of the existing DNSP network peak demands (by location).

- The planned ultrafast DC charging sites at these locations total 8MW of rated capacity that will only manifest over many years of EV market growth and corresponding charging site traffic growth. However, the partial traffic volumes at those times of existing DNSP network peaks (that don't coincide with road traffic peaks) would create fractional charging site load conditions such that only around 2.5MW of diversified, total marginal demand would be added to existing DNSP network peaks by these ultrafast charging sites.

- The net effect in Figure 9 would be that DNSP headroom would only reduce from 28% to 27% of total network capacity, and only in future years once the charging site loads had risen to their full potential peaks. Any local connection upgrades would already have been paid upfront by the charging network developer to connect the sites. From a perspective of setting DNSP tariffs for cost recovery, this would be an inconsequential impact in the overall life of the DNSP networks.

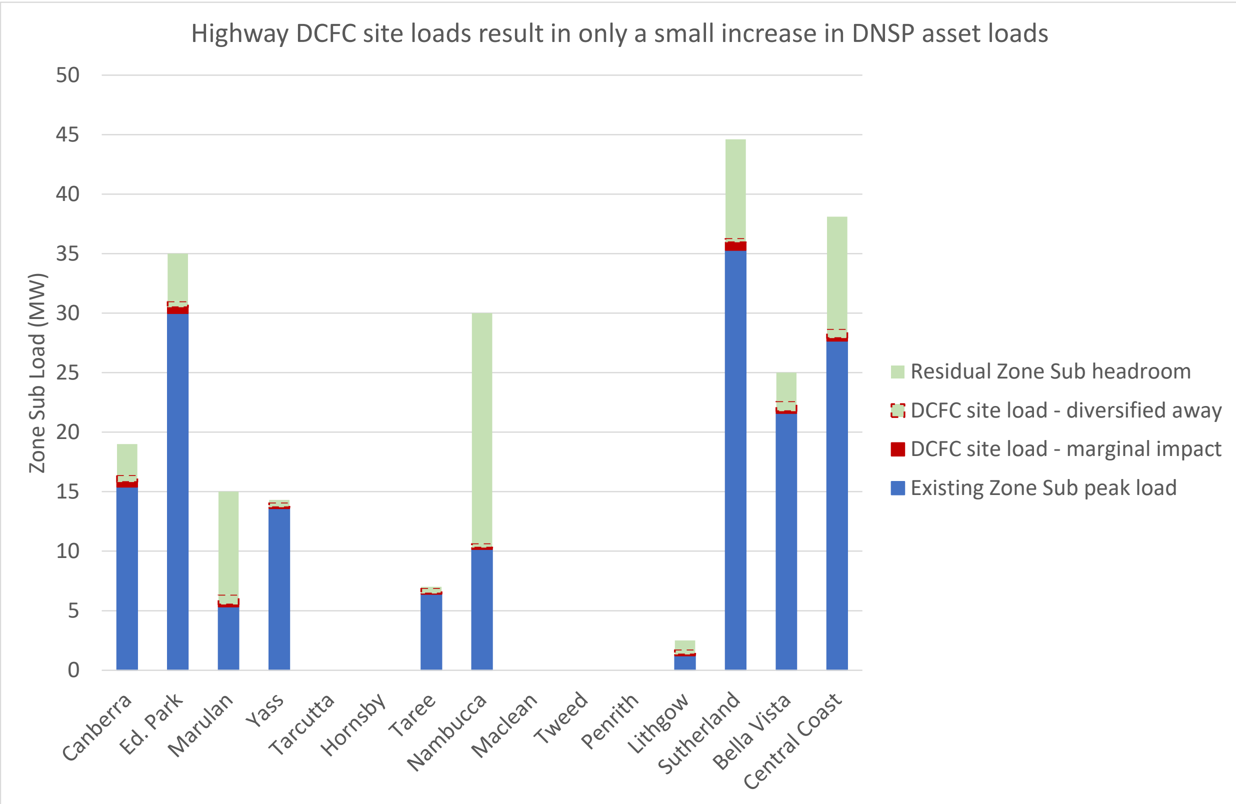

Figure 9: Sample analysis of diversified DNSP network impacts for Evie 350kW sites

<u>Cost-reflectivity of DNSP tariffs for ultrafast charging sites</u>

Evie Networks has engaged expert tariff analysis consultants in support of our recent regulatory submissions (such as the Victorian DNSP pricing determinations currently underway), and this research has concluded on a nationwide basis that these legacy, default C&I tariffs are not cost reflective for ultrafast highway charging sites.

The relevant large customer demand tariffs are dominated by a theoretical cost component known as *long-run marginal cost* (see Figure 10). This abstract technical concept implies that an individual charging site load will cause a material and sustained impact on available network capacity over the long life of the distribution network. However, the relatively underutilized nature of ultrafast charging sites is not consistent with this finding. In other words, ultrafast highway charging sites will pay for extrapolated future network impacts that they probably <u>will not cause</u> over the life of the network at most site locations.

Figure 10 illustrates how the necessary conditions for tariff cost-reflectivity cannot be satisfied for large customer tariffs when applied to public fast charging sites. Under this environment, public fast charging networks will likely be forced to pass through costs that end users may be willing to pay for, leaving established sites underutilized. This may negatively impact further private investment in the public charging sector, investment that is necessary to underpin forecast EV growth in coming years.

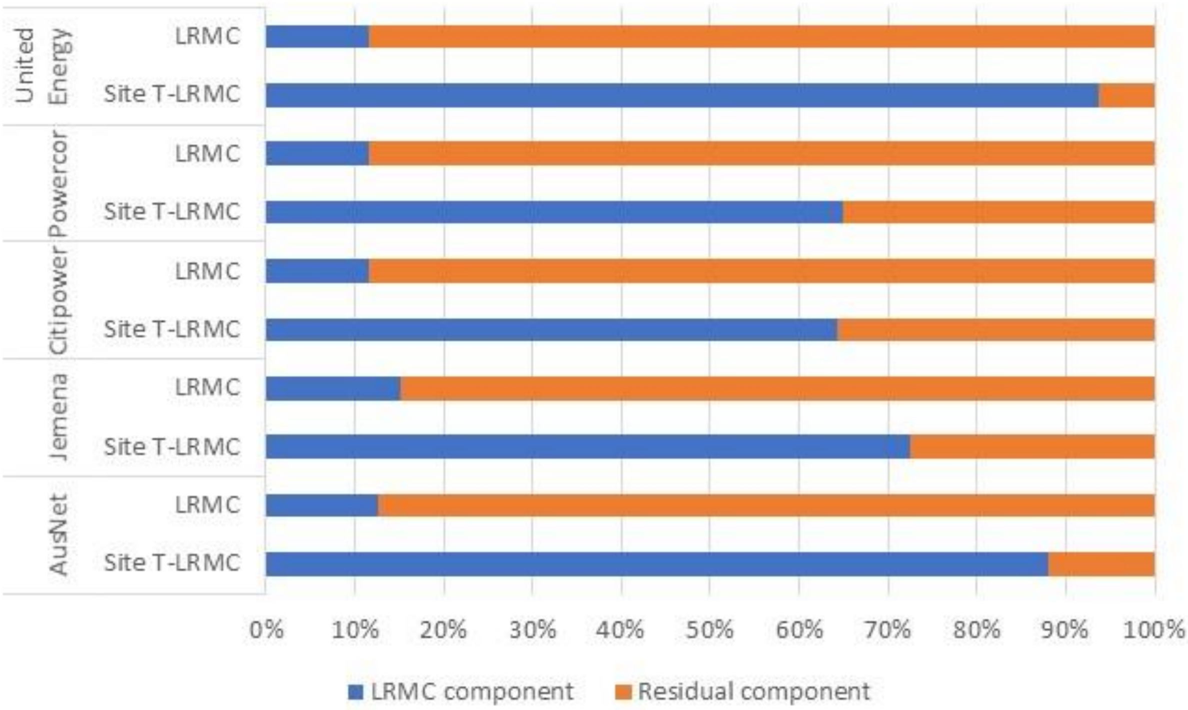

Figure 10: Long-run marginal cost analysis for Evie Networks highways sites relative to other customers under the Victorian DNSPs (Sapere Group analysis)

For more detailed information on this topic please see:

03-Jun-20: *Evie Networks original submission to the Victorian pricing determination for 2021-26*
https://www.aer.gov.au/system/files/Evie%20Networks%20-%20Submission%20on%20the%20Victorian%20Electricity%20Distribution%20Regulatory%20Proposal%202021-26%20-%20June%202020_3.pdf

17-Aug-20: *Evie Networks supplementary submission to the Victorian pricing determination for 2021-26*
https://www.aer.gov.au/system/files/Evie%20Networks%20-%20Supplementary%20submission%20on%20the%20AER%20Issues%20Paper%20Victorian%20electricity%20determination%202021-26%20-%2017%20August%202020_2.pdf

Lesson Learnt #5: The costs of DNSP capacity still favour grid connection upgrades over energy storage

Category:	Technical / Commercial

Given the prohibitive DNSP costs described above, Evie Networks' most frequently asked question received from other industry stakeholders is "*why not just deploy batteries instead*"? Evie Networks acknowledges that C&I scale energy storage solutions can be an extremely effective <u>technical</u> solution for avoiding the upfront costs of DNSP connection upgrades and then also limiting the ongoing costs of prohibitive DNSP demand charges. However, the overall relative costs of these solutions still favour grid connection over energy storage from a <u>commercial</u> perspective based on our assessment.

Evie Networks has recently collated its empirical grid-connection upgrade capital costs for its first 15 sites and reported to ARENA that our benchmark average connection cost is ~AU$220 per kVA (albeit with a per-site variance of >100%!). Furthermore, we have used our library of DNSP tariffs coupled with our network forecast models to determine that existing demand tariffs will plateau at $8 per kVA on a network weighted average basis once our long term target levels of site utilization are achieved. Lastly, Evie Networks has recently gone to market to solicit credible energy storage solution proposals for ultrafast charging sites and this exercise has established a current benchmark of ~AU$1,600 per kW for fully-installed C&I storage solutions in this application. (Note that we benchmark energy storage on a per-kW basis rather than the per-kWh basis more commonly cited in the media. The above figure is equivalent to a 2-hour duration C&I energy storage device with a fully installed cost of ~AU$800 per kWh.)

Figure 11 presents the results of our comparison with the full rate of demand charges discounted over 15 years (the assumed service life of the C&I battery) at a rate of 13% (typical of rates of return expected from infrastructure investors). Please note this model is optimistic for the storage in two key ways: firstly, it assumes the storage operates perfectly with no dispatch forecasting errors or performance degradation over its entire life; secondly, it assumes the charging site immediately operates at its full rated capacity (even though in practice it may take several years for demand growth to occur).

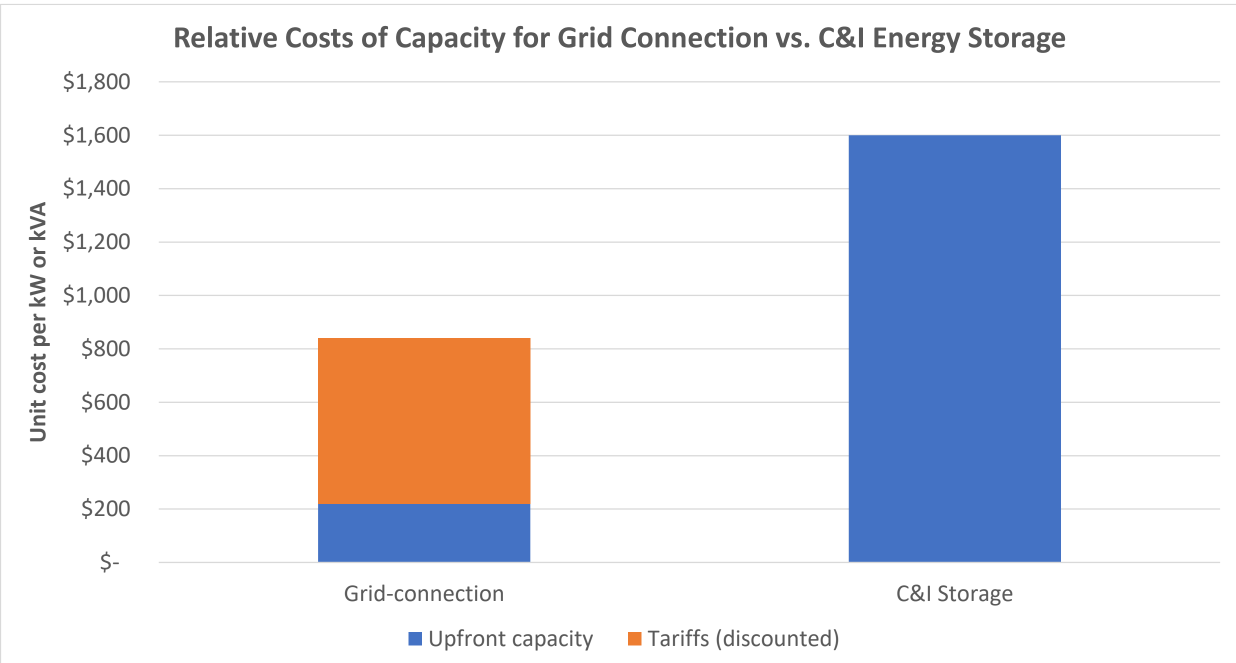

Figure 11: Evie Networks current assessment of the relative costs of capacity for grid connection upgrades vs. C&I energy storage solutions for ultrafast highway charging sites

The results in Figure 11 speak for themselves, but there may be exceptions of course. Some sites may have an extreme combination of site-specific connection costs and DNSP-specific demand charges that tip the balance. Furthermore, more layers may be added into the storage value stack, such as site backup power supplies, and/or trading of multiple energy storage devices in ancillary services markets via a 3rd party aggregator (although the long term viability of this particular opportunity is unclear).

As a counter though, there are also several practical impediments to the scaled rollout of energy storage at ultrafast charging sites that would need to be well managed for overall, commercial viability. Large onsite storage devices require significant additional space, complicating site layouts (which are often already tight) and adding to host site leasing footprints and rental costs. Energy storage inverters can also complicate grid-connections (as embedded generators) and the storage devices may be difficult to standardize across a national rollout as the “right size” is usually bespoke to a particular site and DNSP.

On this basis, Evie Networks remains committed to grid connection upgrades (Figure 12) as its standard practice for highway sites and we are pursuing tariff innovation and collaboration opportunities with DNSPs to reduce the challenging cost of large customer demand tariffs and to further optimize our grid connections too.

Figure 12: The Evie Networks 350kW charging site at Tailem Bend SA features a dedicated, upgraded grid connection from SA Power Networks. Even though this connection upgrade was quite expensive to deliver, it was more compelling than the relative cost of energy storage.

Lesson Learnt #6: Pricing tactics confusing the market

Category:	Commercial / Social

To cover the high power costs but also set a trajectory for long term network viability (as per Figure 8), Evie Networks has initially adopted a controversial pricing structure that includes a per-kWh rate plus a per-minute rate. This approach is not without precedent, as it has already been used with great success in the New Zealand public fast charging marketplace, and at least one other Australian public fast charging network has stated its intention to launch with a similar combination pricing structure also.

Evie Networks' current casual session price for ultrafast highway charging sites is 35c per kWh + 25c per minute (inclusive of GST). Given that the average session power is ~50kW (as described above in Lesson #5), this translates to an average total cost of exactly 65c per kWh incl. GST. This is lower than our presumed equivalent fuel cost of 75c per kWh incl. GST (though this does depend on assumptions).

However, the per minute component also creates unusual pricing outcomes across the full spectrum of EV makes/models that are currently prevalent in the marketplace. The resulting net session price is a simple inverse function of average session power (Table 2), and when these sites operate at the power levels they are designed and built for (>120kW per *User Unit*) the prices are competitive. However, as highlighted by Figure 4, many charging sessions are drastically slower than the ultrafast ideal, and this has led to feedback from some customers that Evie's casual pricing is deliberately inequitable or punitive.

Table 2: Evie Networks casual session pricing for ultrafast highway charging sites

Average session power	Net casual session price incl. GST
150kW	35c + 10c = 45c per kWh
100kW	35c + 15c = 50c per kWh
75kW	35c + 20c = 55c per kWh
60kW	35c + 25c = 60c per kWh
50kW	**35c + 30c = 65c per kWh**
30kW	35c + 50c = 85c per kWh

Of course, our actual true intention is to manage market expectations by setting a sustainable price for ultrafast charging sites that differentiates from the other, slower public charging options available and is also genuinely "cost-reflective" for the provision of this high-quality, high-power infrastructure. The underlying rationale for Evie Networks combo pricing is actually quite simple in concept:

- The power component (35c per kWh incl. GST) reflects our long-term aspiration to lower our network power costs to this level (relative to the ex-GST values shown in Figure 7). On this basis it can be viewed as a direct power cost recovery component, assuming scale is achieved.
- The time component (25c per kWh incl. GST) allows for our return on investment, based on our substantial upfront capital commitment ranging from $750,000-$1,000,000 for each site, and can be viewed as the literal result of the old adage "*time is money*" in this context. Given that our target power costs are recovered separately, the time component is a service fee for the use of our ultrafast site (with conveniences and amenities beyond the basic purpose of buying energy). Customers that take more time are of course enjoying more of this service, but they also create opportunity costs by occupying the parking bays (impacting other customers), and in future will increase the likelihood of problematic levels of site congestion (as the EV market grows further).

Therefore the Evie Networks combo pricing is intended to recover our costs and return our investment in a sustainable manner so that we can grow the network, but also manage expectations by price-signaling the factors that will contribute to a sustained, overall high quality of onsite experiences for all customers.

However, it has not helped our cause that several other networks offer prices that do not seem to reflect the underlying, sustainable costs of providing the service (Table 3), and in our experience this appears to be confusing the marketplace and not managing the longer term expectations of customers. We offer this statement of apparent fact based on our experiences, rather than as a criticism of any peer networks.

Table 3: Other public fast charging network pricing models in Australia

Network		**Casual session price incl. GST**
Network #1 (50kW)	Community based Publicly available	free of charge (for members)
Network#2 (50kW)	Government supported Publicly available	20c per kWh
Network #3 (350kW)	Commercially based Publicly available	40c per kWh
Network #4 (150kW)	Commercially based Private network	52c per kWh
Network #5 (50kW)	Community based Publicly available	45c per kWh

As it detailed in table 3 above, many of the networks in operation are not commercially oriented charge point networks. As such network objectives will differ. For example: community-based networks see value in providing a free service for their members; whereas state funded and built networks promote the transition for EV's in-line with state government policy objectives. Closed networks are built by EV manufacturers to support their own existing EV purchasers as well as promoting ongoing EV sales. As such pricing is more aligned with these objectives than on being cost-reflective and generating a return on infrastructure. This has created a wide range of pricing across the networks. From our own experience and ongoing analysis of charge point network operating costs, pricing offered by Network #5 is most reflective of commercial viability.

The overarching, long-term challenge for Evie and the other networks is that customers typically do not care to understand or appreciate the underlying pricing dynamics – they just take the prices at face value, preferring lower prices while questioning higher offers. In some cases this may even lead to a false sense of entitlement that public charging should match the (low) costs of charging at home, even though this is impractical without subsidies given the high capital investment and initial energy costs.

Evie believes that it would benefit all stakeholders in the long term if more explanations could accompany prices so that customer expectations are well calibrated. Regardless, Evie Networks is undertaking programs to test and refine its pricing offer(s) with a view to offering multiple, optional alternatives. For example, Evie recently undertook a week long promotional offer for World EV Day (9 September) with a discounted price of 20c per kWh (only) that allowed us to test the price elasticity of demand, and also evaluate the influence on our site utilization levels and power costs.