Submission on Victorian Electricity Revenue Proposals 2021-26

The Electric Vehicle Council (EVC) is the national peak body representing the electric vehicle industry in Australia. We represent members involved in providing, powering, and supporting electric vehicles. We are a cross sectoral organisation whose engagement with a wide range of stakeholders supports the advancement of a collaborative and strong electric vehicle industry.

Thank you for the opportunity to comment on the Victorian electricity revenue proposals for 2021-26. This submission relates to all five Victorian distribution businesses.

It is important to now be considering the appropriate settings for the integration of electric vehicles onto the grid that support optimal outcomes for customers.

This is why the Electric Vehicle Council has been leading efforts to collaborate on grid integration issues between the EV industry, the energy sector (including all five Victorian distribution businesses), governments, and energy regulators (including the AER). We are also leading two taskforces looking at tariff structure for household and public charging through the Distributed Energy Integration Program EV Working Group.

Households

The *Residential Tariffs and Incentives Taskforce* has been established under the DEIP EV Working Group to lead work to inform tariff and incentive design for household EV charging. This Taskforce will consider how tariff and incentive design for EV charging can result in optimal outcomes for customers.

The draft scope of this Taskforce is at *Attachment A*. The work of this Taskforce will inform the AER's and DNSP's consideration of the appropriate settings for household EV charging tariffs and DNSP revenue requirements.

The EVC notes the intention by Victorian DNSPs to allocate EV households, where they can be identified, onto time-of-use (ToU) tariffs to encourage off-peak pricing. There is some international evidence to demonstrate that ToU pricing does encourage EV owners to charge during off-peak periods[1], but this is also an area where the Australian energy sector has acknowledged it seeks more understanding.

We also recommend that a distinction is made between residential customers in standalone or semi-detached dwellings, and residential customers living in multi-residential strata developments.

In a multi-residential development, supply of electrical energy to the EV associated with the residence is unlikely to come via the metered supply to the residence. For practical wiring reasons, it is more likely to be supplied via the common power to the complex.

[1] Chris Nelder, James Newcomb, and Garrett Fitzgerald, Electric Vehicles as Distributed Energy Resources (Rocky Mountain Institute, 2016), http://www.rmi.org/pdf_evs_as_DERs pp.51-52.

Given this, TOU tariffs may not be effective in reducing demand presented by EVs during peak periods. This is because placing the EV-owning apartment dweller on a ToU tariff may not modify their charging behaviour from the default 'convenience' method, if the supply of electricity to their vehicle does not show up on their bill.

Public charging

Having access to adequate fast and ultra-fast public charging infrastructure is important to support existing EV drivers, as well as encouraging consumers to transition to EVs.

Current operating costs for public charging infrastructure are affecting the viability of current public fast charging operators, acting as a barrier for rolling out further infrastructure.

A significant proportion of these operating costs stem from the existing network tariff structures applied to these customers, which generally include significant demand charges. Given the current overall utilisation of public fast charging sites, fixed demand charges have a disproportionately large impact on the cost per kWh.

There are sufficient concerns that the existing tariff framework may not result in cost reflective tariffs for high capacity EV charging, based on the current load profile. However, further analysis and trials need to be undertaken to find the most cost-reflective tariff for high capacity EV charging.

The *High Capacity Tariffs and Connections Taskforce* is currently undertaking work to address this very issue. The scope of this Taskforce and more background on this issue is at Attachment B. There are a number of DNSPs represented on this Taskforce.

We recommend that the AER continues to engage on this Taskforce. We also recommend that the AER incorporates the evidence provided by the EV charging industry about concerns around the suitability of current tariff structures allocated to high capacity EV charging sites in its determination of revenue proposals and tariff structure statements. We also encourage the AER to endorse trialling alternative tariff structures as is flagged in the Issues Paper.

Conclusion

Thank you for the opportunity to comment on these proposals. Please contact Larissa Cassidy at [redacted] if you would like to discuss any of these issues.

Attachment A

DEIP EV WORKING GROUP

Residential Tariffs and Incentives Taskforce

Purpose

Identify and undertake joint actions to help the design of tariffs and incentives for residential electric vehicle (EV) customers that support optimal outcomes for customers (both EV and non-EV customers). These actions should achieve beneficial outcomes for the energy market by incentivising optimal charging behaviours from a grid perspective while empowering EV customers with choice and ensuring a consistent customer experience.

Context

If EV charging is left unmanaged, it could lead to increased electricity costs for all customers as the grid invests to accommodate increased peak demand. Some networks have also experienced challenges associated with higher than ideal voltages on low-voltage networks. EVs present an opportunity to provide grid services and support the resolution of these challenges.

The energy market needs to ensure that the interests of EV and non-EV customers are reflected in any tariff or incentive design. Customers' increased engagement and expectation to exert more control over their energy supply arrangements necessitate the development of customer centric solutions to charging tariffs. A customer centric approach would enable customers to benefit economically from their charging behaviour decisions.

It is expected that a range of approaches will be used to manage EV charging while enabling consumer choice. EV charging is a large and generally deferrable load, suggesting that there is much potential to shape it. However, in the industry trials that have been run to date, there have been challenges in developing options to incentivise customers to shift their EV load. These challenges have included:

- The complications of tariff design to address EV charging; and
- The ability to separate out EV load through separate connection points or sub-metering.

There are currently only a few electricity retail products targeting EV customers and not all are structured to promote efficient EV charging outcomes from a grid perspective.

Networks are using various existing tariffs for EV customers but generally have no way of identifying EV customers.

At the consumer level, the challenges of tariff design include that:

- Flat rate residential tariffs which customers can opt into voluntarily (if they are not already on one) provide no incentive to charge outside of traditional peak times.
- Time varying tariff structures provide an opportunity for owners to charge their EV during periods of lowest cost, however low consumer awareness and understanding of electricity tariffs may limit their effectiveness as a means of

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managing EV charging loads; for example, consumers must weigh the potential benefits from shifting EV charging into off-peak periods against the impact of a peak tariff on the rest of their household load – a complex calculation characterised by uncertainty.

- Traditional 'off peak' times occur overnight, however with the high penetration of rooftop solar there is an increasing need in certain network zones to shift load to the middle of the day in order to soak up excess solar generation.
- Demand-based tariff structures are unfamiliar to most Australian consumers and may result in significant bill impacts on the introduction of EV home charging that were not foreseen prior to the EV purchase decision and hard to solve for in practice.

Membership

This Taskforce should have representation from DNSPs, retailers, consumers, and EV charging industry. It is being led by EVC and AGL.

Actions

1. Information Sharing

There are already several existing and proposed trials and projects underway relevant to this Taskforce. While some arrangements for information sharing are included in these projects, there is scope to better share the outcomes of these projects, including interim results.

Given the infancy of the EV sector in Australia, further work is required to understand EV customers' preferences and behaviours to inform appropriate tariff design. There is a need to understand:

- Customer charging behaviour and how they would respond to incentives/disincentives;
- Drivers/behaviours/needs of different segments; and
- To what extent can managed charging of aggregated fleets reduce peak demand and reduce/obviate need for network infrastructure.

Information sharing should therefore encompass insights on:

- EV customers' preferences and behaviours;
- DNSPs' desired outcomes in how EVs interact with the grid; and
- Retailers' capability in product and service offerings (including technology, consumer insights and market trials).

ACTION: Set up process to share outcomes of relevant projects, consumer, network and retailer insights to help inform tariff design and future trials.

2. International learnings

Given many jurisdictions have made further progress with the uptake of EVs and incorporating them into the grid, Australia should learn from their experiences including the types of tariffs and incentives used. This should focus on customer experience and behaviour and could entail an international desktop study regarding comparable grids and consumer behaviours vis-à-vis charging.

ACTION: Collate international learnings.

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3. Networks and retailer collaboration

The interaction between network tariff structures and retail product incentives is important for the optimisation of the grid, to ensure good outcomes for consumers, and encourage the uptake of EVs. Now is the time to adopt sustainable behaviours for the long term. However, there is no existing forum for retailers and networks to have these discussions.

Related to this issue is the broader topic of where incentives should sit – directly passed through to the consumer or left with retailers to manage across their load? This issue is being explored as part of the DEIP Access and Pricing Working Group. The discussions of this Taskforce could provide an EV perspective into this work.

ACTION: Set up a process to enable network and retailer collaboration on EV tariffs and incentives.

4. Demand management

While tariffs are considered to be the main tool to optimise charging times, demand management and orchestration also have the potential to address localised grid constraints. Further understanding of the contribution that demand management can deliver and the associated value streams is needed. The projects underway should help to inform this.

There is also a need for greater understanding of what are the minimum regulatory and technical requirements needed to enable demand management for EV owners to achieve desired outcomes for the energy market. These requirements will need to reflect the differences between consumers in standalone dwellings and multi-residential dwellings. Considerations may encompass:

- The development and adoption of international and Australian technical standards to promote interoperability (noting the link with the Standards Development Taskforce);
- The establishment of separate connection points or separate FRMPs at the CP (enabled with agreed sub-metering standards) and sub-metering (including improvements to the legislative framework governing measurement); and
- The broader policy and regulatory framework governing distribution market design, including the establishment of a distribution market operator and the network expenditure assessment framework

The Taskforce should also identify how to work with the EV industry and consumers to enable the adoption of these minimum regulatory and technical requirements (for example through incentives, standards, voluntary guidelines and/or regulatory reform).

ACTION: Jointly identify and agree principles for minimum regulatory and technical requirements and develop recommendations for actions to enable adoption.

5. Tariff design

The existing approach is to treat EVs as consistent with other loads in the market. However, given the challenges associated with delivering a tariff that incentivises EV load shifting, it is important to assess whether the existing tariff system is fit-for-purpose for EV loads.

ACTION: Identify opportunities for tariff design that accommodate EVs in the most optimal way having regard to consumer preferences and behaviours and assess whether a separate tariff approach to EVs is appropriate. This will be drawn from insights from formal information sharing arrangements (EV customers' preferences and behaviours, DNSPs' desired outcomes and retailers' capabilities) and agreed guiding principles on demand management.

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Timeframes and deliverables

	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021
Information sharing	Roundtable 1 DNSPs' desired outcomes in how EVs interact with the grid – insights from trials (2-3 presenters, Q and A)	Roundtable 2 EV customers' preferences and behaviours (with consumer groups) (2-3 presenters, Q and A)	Roundtable 3 on Retailers' capability and insights from trials (2-3 presenters, Q and A)	Report synthesising local and international learnings	
International learnings	Research lead by nominated sub-group and based on comparable jurisdictions (UK, US, other)	Deep Dive workshop based on research		Report synthesising local and international learnings	
Network and retailer collaboration	*Ongoing through Taskforce mechanism*				
Demand management	Demand management workshop 1 – connection points and sub-metering; technical standards and interoperability	Demand management workshop 3 – distribution market design	Demand management workshop 3 – synthesis on principles for minimum regulatory and technical requirements		
Tariff design				Tariff design workshop 1 – collating insights	Synthesize opportunities report

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Attachment B

DEIP EV WORKING GROUP

High Capacity Tariffs and Connections Taskforce

Purpose

1. Address unsuitability of current network tariff structure/customer allocation for fast public charging by:
    a. identifying an optimal tariff options for fast charging networks, drivers, customers and energy networks; and
    b. trialling these options tariff for high capacity EV charging with several DNSPs across the various states and jointly progressing any required regulatory changes.
2. Address delays and inconsistencies with connecting high capacity charging stations to the grid by agreeing to a simplified and transparent end to end connection process recognised by the DNSPs and EV charging networks.

Background is provided in the Attachment.

Actions – Tariff Stream

1. Undertake a study to identify optimal tariff(s), inform a trial and identify areas of regulatory change

This work could include:

- A review of best practice tariff structure
- A review of current and future demand impacts of high capacity EV chargers, including under various utilisation scenarios
- Identifying opportunities surrounding allocation methodologies of network tariffs to high capacity EV chargers
- A case study for how network tariffs flow through to retail tariffs for high capacity EV chargers.

To undertake this work, Taskforce members will collate all existing analysis that could be used to inform this work. In the case of key gaps in knowledge, the Taskforce will work to address these gaps by conducting further analysis.

This work will:

- inform trial design and support DNSP participation in a trial; and
- identify any required areas of regulatory change for optimal tariff design/allocation.

2. Trial participants determine trial conditions

Trial participants will work to determine the details of the trial. The trial may comprise a new tariff design or trial allocation of fast EV charging to a new customer class.

3. Commence process for regulatory change

If it is determined that regulatory changes are also needed, the Taskforce will initiate work on delivering these changes. This process would happen alongside and be informed by the trials.

4. Commence trial

The trials will commence and will continue for 12-18 months. The results of these trials will be shared and will be used to inform the regulatory reviews commencing in 2022.

Actions – Connections Stream

A work plan for addressing connections will be developed at the start of the second half of 2020.

Milestones

ACTION		**TIMEFRAME**
Determine membership of taskforce		April 2020
Determine and agree workplan and milestones		5 May 2020
Tariff Stream	Collate existing tariff/EV analysis and undertake further analysis as needed	May-June 2020
	Identify trial participants	July 2020
	Trial participants determine trial conditions	August-November 2020
	Initiate process for regulatory change	August 2020
	Commence trial	December 2020
Connections Stream	Determine workplan to commence in H2 2020	July 2020

Membership of the Taskforce

This Taskforce will be led by EVC and Evie Networks. Members of the taskforce are senior members within their organisations and have the authority to make decisions on direction of strategic, policy and technical matters on behalf of their organisations.

Key stakeholder representation required from EV charging networks, DNSPs, AER, and governments. Other representation from retailers, ENA, AEMC and AEMO is welcome.

Taskforce participants will need to ensure compliance under the Competition and Consumer Act 2010.

Problem Summary

The existing regulations governing network tariff structures for high capacity charging may not result in cost reflective tariffs and may inhibit the rollout of public charging stations. However, there are no relevant tariff reform processes or trials of new tariff structures underway that address this problem.

Connecting public chargers to the grid is also a variable process which creates uncertainty for public charging networks, while adding to cost and building times for public charging infrastructure. The connection process varies between each DNSP.

Importance of public infrastructure charging

In a survey of 1,939 motorists conducted on behalf of the Electric Vehicle Council, 73% stated that concerns over electric vehicle range would discourage them from purchasing an electric vehicle. The same survey found that 70% of respondents agreed that the availability of public fast charging is important.[1]

The International Council on Clean Transportation (ICCT)[2] also examined 350 cities around the world and found a positive correlation between the availability of charging infrastructure and the uptake of electric vehicles. The ICCT concluded that while most electric vehicle drivers charge their cars at work or at home, public charging infrastructure forms an important part of the electric vehicle ecosystem.

Based on global and domestic research to date, it is believed that a network of highway-based fast-charging stations will reduce consumer range anxiety resulting in the acceleration of electric vehicle uptake in Australia.

Since 2019, Infrastructure Australia has included the rollout of National electric vehicle fast-charging network as a High Priority Initiative in its Infrastructure Priority List. As of July 2019, there were almost 2,000 public electric vehicle stations across Australia, with just over 250 of these were DC chargers.[3]

Opportunities for the Power Grid

The role of electric vehicles in the future power grid is recognised as having potential to positively impact the energy system, including contributing to network support services to address the management of frequency, energy, and voltage. If appropriately integrated into the existing electricity grid, EV chargers can also have significant benefits in increasing network utilisation and will not necessarily drive the need for costly network upgrades.

Growth in new electricity consumption from electric transport has the potential to allow greater utilisation of the existing electricity distribution networks, ensuring that customers receive more value out of the infrastructure that already exists and reducing the scale of asset write-downs or rebates for underutilised assets recommended in the recent ACCC Report (Australian Competition and Consumer Commission, 2018).

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[1] Electric Vehicle Council (2019) *State of Electric Vehicles*

[2] https://theicct.org/sites/default/files/publications/US_charging_Gap_20190124.pdf

[3] Electric Vehicle Council (2019) *State of Electric Vehicles*

EV Charging Infrastructure Technology

It is important to highlight EV charging infrastructure technology can be divided into the following types, with different applications, deployments modes and implications for the electricity industry:

- Slower AC Chargers, which are relatively cheap to install, operate and maintain and are suitable for non-time critical or short-range travel. They will typically be installed in homes and businesses in local areas and are predicted to grow organically with the uptake of EVs. The capacity of local grids to support this type of charging will need to be considered.

- DC Fast Chargers are more expensive and more complicated to install, operate and maintain. The power ranges from 50 to 150kW enabling charging in a matter of hours. The installed cost of DC Fast Chargers in the tens of thousands. Such chargers typically support destination charging, i.e. hotels, supermarkets, small towns; as well as basement charging in multi-family residences.

- Ultrafast Chargers range from 350kW and upwards enabling charging in tens of minutes, fast enough for highway charging of commercial fleets. Ultrafast chargers are an essential requirement for highway driving, which equates to greater than 15% of total travel (Australian Bureau of Statistics, 2017). The installed cost of a charging station is in the millions of dollars depending on the number of charging heads and cost of augmenting the electricity network. Therefore, these chargers are most likely to be deployed by specialist asset owners, highway rest stops or commercial fleet operators. Ultrafast chargers have much higher power draw, are typically connected at High Voltage level of the electricity network and must be carefully planned to integrate into the existing electricity systems.

Charging technologies can have remote controllable capability to manage the energy throughput, (hence not contributing significantly to critical peak electricity demand events) and positively contribute to electricity affordability by reversing the declining consumption patterns currently experienced by the electricity network companies in Australia.

While we highlight the three different technology types, the focus of the Taskforce will be focused on the DC Fast and Ultrafast chargers.

Tariffs

Currently, the electricity profile of ultrafast chargers (UFCs) can be classified as having high peak demand but overall low utilisation. Below are two sample load profiles of fast chargers:

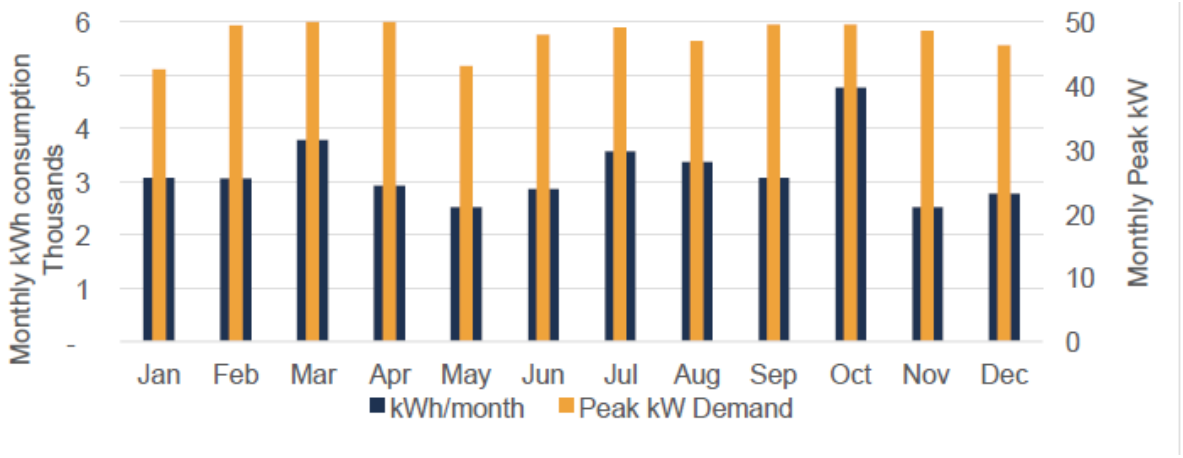

Figure 1: Sample monthly load profiles of a Northern Californian Direct Current Fast charger[4]

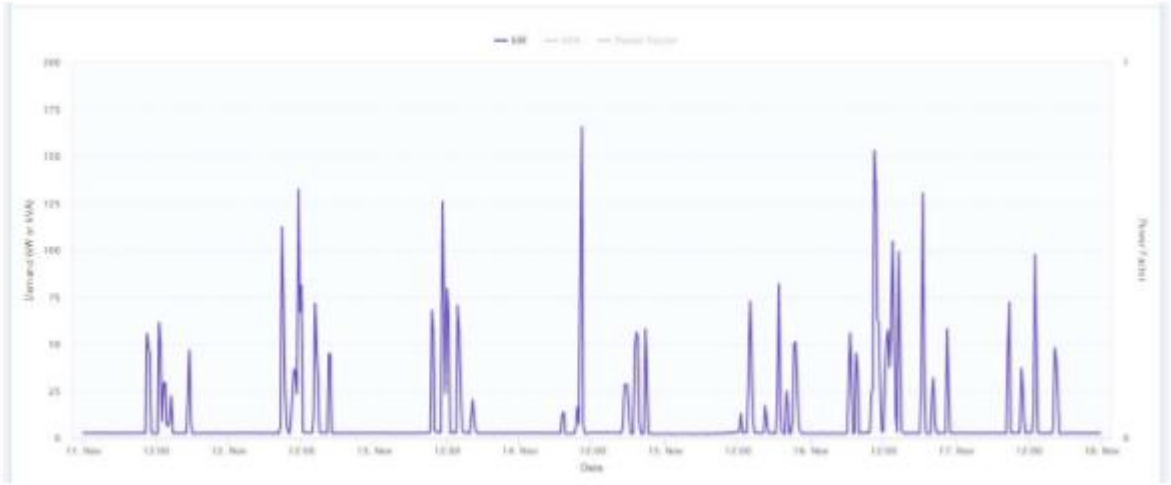

Figure 2: Evie Networks' Site loads (15 min intervals) for the first week of operation at Coochin Creek QLD

Charger energy throughput is naturally low in these early stages of the Australian EV market but is forecast to rise substantially over time. For example, Evie Networks predicts that a six-charger site rated at 1,000kVA may deliver approximately 1GWh per annum, equivalent to more than 100 houses.

However due to their high capacity applications, UFCs are generally categorised within existing large commercial and industrial customer classes that include significant fixed demand charges. However, the overall low utilisation of UFCs means that fixed demand charges have a disproportionately large impact on the cost per kWh.

[4] Rocky Mountain Institute () *EVgo Fleet and Tariff Analysis*

The mobile nature of EVs as a load makes EV customers different from other customers as EVs will access different points on the grid, therefore existing tariff structures may not lead to an equitable outcome for EV customers. Things to consider include:

- Incidence of customer charges: EV customers will incur greater proportion of network costs if they access different charging locations (e.g. home, public charging).
- Time of use: Usage of fast chargers will naturally occur throughout the day when people are most likely to be in their vehicles, which provides a substantial degree of inherent demand smoothing at an aggregated level.
- Treatment of network costs in connection charges: do tariffs need to recover network capacity costs or are these captured through connection costs?
- Technology neutral treatment: DNSPs are required to structure network tariffs based on the nature of the load presented to the network rather than the type of appliances. This is how cost-reflectivity is determined.

The high cost of existing demand charges is a barrier to the development of viable business models for public fast charging networks and therefore the roll out of public charging.

Connections

Connecting to the grid is generally the most time-consuming process of setting up a public charging site. The requirements, processes and response times for grid connections varies between DNSPs and there is a lack of clarity and certainty about how long the process will take. Some of the variance is attributed to different requirements between state regulators e.g. dual supply rule, however the interpretation of this rule is also variable. As a result, the lengthy and uncertain timeframe for a network connection affects the viability of the public charging networks.

Power connectivity which includes DNSP guidance and approval of the network capacity, connection application and site connection design are taking upwards of 6 months to receive a response from DNSPs, leading to overall deployment timelines of 1 year or more once landlord negotiations and site construction & commissioning are also completed.

The application fees alone can vary between $2,000 to $20,000, depending on the number of times resubmission is required. The sites may also require 3rd-party connection design fees and network augmentation contributions that can exceed $500,000 upfront. These costs and variances are determined by the timeliness of the site-specific design requirements as advised by the DNSP for each individual site.

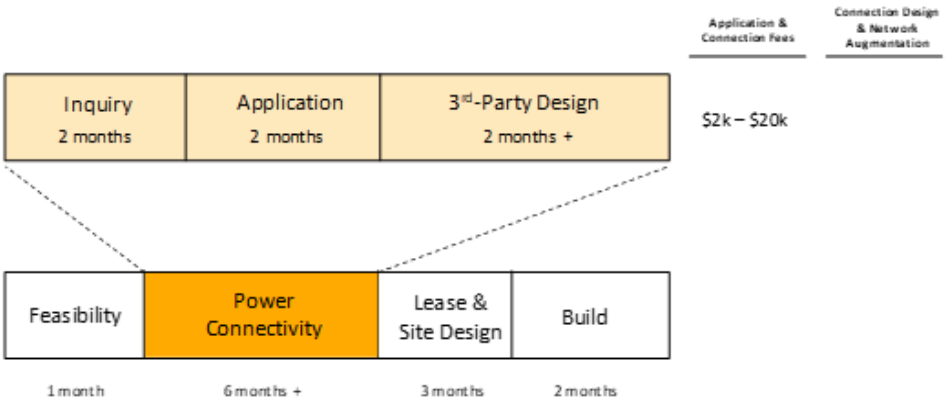

Figure 3: Typical process for new ultra-fast charging sites

While these issues can be attributed to the general lack of obligations in the NER, there remains scope for DSNPs to better align connection requirements and provide more consistency and transparency in approval responses and timeframes to facilitate this new customer segment.

Furthermore, existing information gaps about grid capacity requires undertaking a significant level of work to assess capacity in order to decide on the viability of the site. Grid upgrades are often required which add further to costs and connection times.

Context for action

There are no existing actions underway to trial an applicable new tariff or the allocation of high capacity EV chargers to an existing tariff that may accommodate the needs of ultrafast charging while also ensuring they reflect the true costs.

Undertaking a trial is necessary to provide real-life tangible data and insights that will assist DNSP and regulator understanding of how to recover costs from high capacity EV chargers.

A trial will allow DNSPs agility which is important at this early stage of the industry; once regulatory changes are enacted it is much harder to seek change. In addition, now is a logical time for a trial because the low volume of fast charging means a low risk environment. Trials are also time-restricted further minimising revenue risk.

Any trial of a new tariff will need to ensure it does not contravene regulations ensuring technology neutral treatments for customers which is why the involvement of the regulators is vital.

If the Taskforce concludes regulatory change is also needed, this should happen alongside and be informed by the trials.

While there are some guidelines for connections, these do not adequately incorporate the needs of high-capacity EV charging customers. There remains scope for determining best practice, better aligning between DNSPs, and identifying any areas of regulatory change to suit the needs of customers and DNSPs.

Key desired outcomes

- Tariff trial with each of the DNSPs across the various states, in particular VIC, QLD, SA, NSW & TAS
- Simplified and transparent end to end connection process recognised by the DNSPs and EV charging networks.

Timeline

The below is a high-level timeline. Our aim is to ensure the establishment of evidence-based data that feeds into the next distribution regulatory pricing determinations which vary by state.

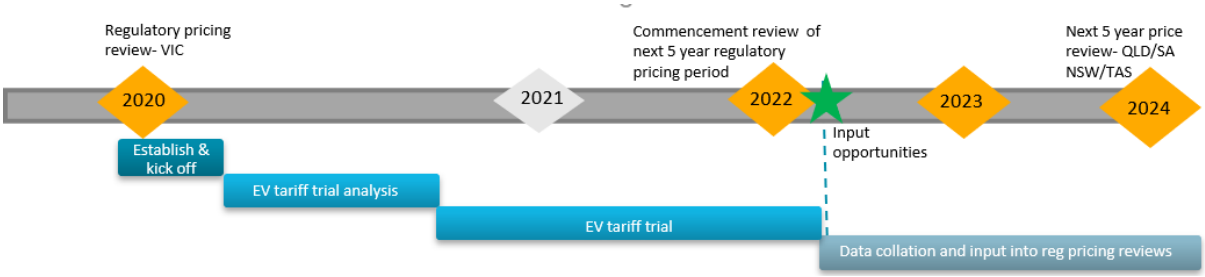

Figure 4: high level timeline (for context)

This timeline is indicative to demonstrate the critical path for a trial commencement period by the end of 2020 with at least 2 willing DNSPs to provide stakeholders with enough data that can be used to inform the next tariff regulatory period in NSW, QLD and SA.