BCUC REGULATION OF ELECTRIC VEHICLE CHARGING SERVICE INQUIRY EXHIBIT C28-3

Tesla Motors Canada ULC
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Canada

June 06, 2018

Via Email
Commission.Secretary@bcuc.com

British Columbia Utilities Commission
Suite 410, 900 Howe Street Vancouver,
BC Canada V6Z 2N3

RE: **British Columbia Utilities Commission – An Inquiry into the Regulation of Electric Vehicle Charging Service – Project Number 1598941 – Information Request No. 1**

Dear Commission Secretary:

Attached please find Tesla Motors Canada ULC Information Request on written evidence with respect to the British Columbia Utilities Commission – An Inquiry into the Regulation of Electric Vehicle Charging Service – Project Number 1598941.

For any clarifications or further information please do not hesitate to contact the undersigned.

Yours Sincerely,

Iain Myrans
Manager, Government Relations, Canada.

cc: Registered Interveners

British Columbia Utilities Commission
An Inquiry into the Regulation of Electric Vehicle Charging Service

RESPONSES TO INFORMATION REQUEST NO. 1
MADE OF TESLA MOTORS CANADA ULC (EXHIBIT A-26)

INTRODUCTION

Tesla thanks the British Columbia Utility Commission (BCUC) for the opportunity to respond to its request for information in regards to its public testimony and formal submission (Exhibit C28-2).

Please note that Tesla has released its 2019 Supercharger construction plan by way of an update to content filed in Exhibit C28-2.[1] Of particular note are Tesla's plans to develop a southern Supercharging corridor along Highway 3, between Princeton and Fernie, BC, with additional stations in Osoyoos, Grand Forks, Caslegar, and Creston. Tesla is now also planning and additional in White Rock. These are in addition to Tesla's existing British Columbia network and plans to open Supercharger stations in 2018 in Victoria, Downtown Vancouver, West Vancouver, North Vancouver, Richmond and Secaucus. Tesla is also planning to grow the number of level-2 Destination Charging stations in BC throughout 2018 and 2019.

Responses to questions:

A. BASIS FOR EV CHARGING SERVICE REGULATION EXEMPTION

1.0 Reference: Exhibit C28-2, pp. 5, 9
Competitiveness

On page 5 of Exhibit C28-2, Tesla Motors Canada ULC (Tesla) states:
In those few situations where the competitive market is not providing an adequate supply of EV charging infrastructure (such as in remote communities and multi-unit dwellings) it may be appropriate for regulated utilities to participate more actively in the EV charging market. Unlike competitive charging companies which do not use ratepayer funds, a regulated utility that participates in the EV charging market with ratepayer funds should have their activities overseen by the Commission.

1.1 Please clarify or confirm that Tesla is of the view that a regulated public utility participating in this market will have an unfair advantage due to the existence of utility ratepayers (e.g. uneven playing field).

1.1 RESPONSE
Tesla notes that if regulated utilities are permitted to use ratepayer funds to invest in end-use charging services, utilities would have an advantage over private entities as they would be able to accept a longer return on investment period. As such utilities are uniquely positioned to be a major influencer in the acceleration of EV adoption. Broader participation in the charging market by multiple participants, and through various regulated and non-regulated business models would support public policy objectives and help accelerate the growth of the EV market in general. In addition, please see Tesla's response to Question 6 on page 8 of Exhibit C28-2 regarding Tesla's recommendation on utility involvement.

[1] See Tesla website: https://www.tesla.com/findus

1.2 In Tesla's view, would public utility involvement potentially stifle competition and discourage third-party investments in the EV charging service market?

1.2 RESPONSE
Please see Tesla's response to 1.1

1.3 In Tesla's view, if the regulatory definition of public utility did not apply to EV charging infrastructure to site hosts / third-parties, would commercial entities be able to charge a fee for EV charging services and still successfully compete with free EV charging from entities such as municipalities? Please provide any supporting evidence available.

1.3 RESPONSE
Yes. In the United States and Canada, several states and provinces allow commercial entities to charge a fee for EV services. There are a mix of charging options in those states, including some chargers that are free to use. Because of the wide variety of business models available there is plenty of opportunity in the market for a wide variety of service providers. Customers are attracted to certain charging stations for a number of reasons. Price may be one factor. Nearby amenities, convenience of use, reliability and alignment with every-day needs and travel patterns are also important factors.

On page 9 of Exhibit C28-2, Tesla states:
As such, utilities should be permitted to engage in make-ready projects or deploy charging infrastructure while generating a return. Make ready projects are more suited to recovery through the regulated rate base, while charging station installations may be more suited to nonregulated operations given that charging station operations are an end-use service and should not be deemed to be the retailing of electricity.

1.4 Please discuss, in the view of Tesla, what criteria or key considerations could define whether the supply of EV charging infrastructure is "adequate". For example, should this be the number of EVs fleet in BC, number of EV charging stations/ports per EV, distance measured between public EV charging stations, or some other considerations?

1.4 RESPONSE
Factors to consider in assessing adequacy include whether drivers have access to home charger, type of chargers available (Level 1, 2, or 3), geographic location relative to the EV population and highly traveled routes, and the typical driving distance in the region. For example, areas in which there are more renters and residents in multi unit dwellings, it likely makes sense to have a higher ratio of chargers to EVs than a suburb comprised predominantly of resident-owned single-family homes. In general, a jurisdiction's infrastructure portfolio should consist of a large number of Level 2 charging options, located in areas where people are likely to spend time (public parking garages, workplace parking lots, and major regional destinations like shopping centers or downtowns). This would be complemented with a robust program that ensures renters and multi-unit dwellers have a clear pathway to installing private charging at their residence, as well as a decent amount of fast-charging stations to create a convenient safety net of convenient solutions in case an EV owner's typical Level 2 solution wasn't available.

1.5 Does Tesla consider that in an environment where public utilities participate more actively in the EV charging market (or a defined segment of the market such as remote communities and multi-unit dwellings) that the public utilities' involvement should continue indefinitely? If not, does Tesla have a view on the circumstances that should lead to a "deregulation" of the market or segment of the market over time?

1.5 RESPONSE
Regarding make-ready infrastructure provisions, education and awareness, and rate design, the utility role

should continue indefinitely. Regarding eventual "deregulation," it is difficult to forecast when and if that would be appropriate. Instead, Tesla suggests that the BCUC continue to monitor the development of EV infrastructure and utility involvement to determine whether reforms are necessary.

2.0 Reference: Exhibit C28-2, p. 4
Consumer protection and safety standards

On page 4 of Exhibit C28-2, Tesla states:
The Commission should not regulate competitive, end-use services such as EV charging. While effective consumer protections and safety standards must apply, the provision of EV charging services is not a monopoly service and does not represent distribution or retail of electricity. EV charging is a comprehensive end-use service that requires substantial planning and coordination with site hosts and permitting authorities in condensed periods of time to keep pace with growing EV adoption and to provide a good EV driver experience.

2.1 Please elaborate on the consumer protections and safety standards that are mentioned in Tesla's submission. Please include specific aspects that are applicable at Tesla's EV charging stations located in BC.

2.1 RESPONSE
In BC, charging networks and site hosts are subject to the Business Practices and Consumer Protection Act, SBC 2004. Among other protections this Act affords consumers with protection against any misrepresentation of a business's products or services, including quality or performance. Further, the federal Competition Act, RSC 1985, provides protections against anti-competitive behaviour for Canadian businesses and, among other things is intended to ensure consumers are provided with competitive choices and prices for products and services.

Regarding Electrical Safety, Tesla EV charging stations are designed in accordance with the British Columbia Electrical Code. Depending on the type of station, there may also be components that are designed in accordance with the BC Building Code. All EV charging station components are also Canadian Standard Association (or BC recognized equivalent) approved for their intended use.

Public Tesla EV charging stations require a valid Electrical Operating Permit from Technical Safety BC, which has a range of requirements, including a bi-annual operational inspection completed by a Technical Safety BC certified Field Safety Representative.

2.2 Please discuss the installation, operations, and maintenance requirements of public EV charging stations. For instance, are there any requirements established for which installations, operations, and maintenance of public EV charging stations must be handled by trained and certified electricians? Are there any permit/inspection process?

2.2 RESPONSE
Tesla is unable to comment on the requirements of all public EV charging stations. Tesla's approach to installation and operations is proprietary and cannot be extrapolated to the broader industry. Yes, various permit, approvals and inspections are required.

2.2.1 Please distinguish any differences between public EV charging stations and home EV charging.

2.2.1 RESPONSE
DCFC stations and some Level 2 stations often take electrical service separate from the site host's service, while home charging is integrated into the home's existing service. Unlike home charging public stations are

often privately owned, operated and maintained. With regard to Level-2 charging, often the technologies used at home can be identical to those used for public charging. While private home charging can be billed to a home-owner's meter some site hosts and charging operators may opt to levy a fee in which case chargers typically require sophisticated billing mechanisms. In the case of multi-unit residential buildings various solutions and models may apply.

2.3 Please discuss whether there are any existing minimum requirements of the owner and/or operator of public EV charging stations to purchase liability insurance, or other insurance, to cover against potential losses.

2.3 RESPONSE

Tesla is not aware of any legal requirement in British Columbia that the owner or operator of public EV charging stations carry specific insurance. However, it is common for real estate leases to include minimum insurance requirements.

B. INVESTMENT DECISION

3.0 Reference: Exhibit C28-2, pp. 3–4
Competitiveness, captivity and investments

On page 3 of Exhibit C28-2, Tesla states:

Tesla is planning significant investment in additional EV charging infrastructure in the province during 2018 and beyond.
…
Tesla has developed a global network of over 8,400 Superchargers – Tesla's DC Fast charging solution
…
Currently, the majority of Tesla customers have complimentary use of the Supercharger network and the electricity is paid for by Tesla or site hosts.
…
For customers without a referral code, they get 400 kWh of complimentary Supercharger credits a year. For use above that amount, and for all Model 3 owners, customers are charged $0.20 per minute of charge when the connector is operating at or below 60 kilowatts, and $0.40 per minute of charge when it is operating above 60 kilowatts.

3.1 Please summarize the market share of Tesla in BC for:

- Electric vehicles
- DC Fast Charging Infrastructure

3.1 RESPONSE

This data is available from sources such as IHS Market Insight[2] (vehicles) and Natural Resources Canada[3] (chargers).

3.1.1 Please describe how the capital costs and technical specifications of Tesla's Superchargers compare to other DCFC stations.

3.1.1 RESPONSE

[2] See: https://ihsmarkit.com/product-type/market-insight.html
[3] See: http://www.nrcan.gc.ca/energy/transportation/personal/20487#/find/nearest

Tesla is not privy to the capital costs and detailed technical specifications of other DCFC stations.

3.2 Please explain why different Tesla vehicle owners are subject to different rates.

3.2 RESPONSE

Today, new Model S and X customers receive an annual 400 kWh Supercharging credit included with the purchase of their vehicle. Some Model S and X customers receive free unlimited Supercharger access which has been used as a promotion to encourage the purchase of a vehicle. Model 3 customers do not receive either Supercharging credits or free unlimited Supercharger access. Every customer that uses a Supercharger without credits or free Supercharging pays service fees equal to all other paying customers.

3.3 Please identify other jurisdictions where the Tesla Supercharger network is subject to utility regulation.

3.3 RESPONSE

No jurisdiction has considered Tesla Supercharging to be a utility service or subjected Tesla to utility regulation.

3.3.1 Please identify other jurisdictions where the Tesla Supercharger network is granted a utility exemption. Explain whether Tesla was granted a full exemption or partial exemption.

3.3.1 RESPONSE

Tesla Superchargers have not been deemed a utility in in any jurisdiction and therefore have not required an exemption.

3.4 Please briefly summarize any market entry opportunities and barriers specific to automaker funded charging stations.

3.4 RESPONSE

Tesla believes all commercial entities interested in developing EV charging stations are subject to the same general barriers and opportunities. Barriers to DC fast charger development include finding property owners or managers interested in hosting charging stations, high interconnection costs, and demand charges and low utilization in the initial years that make the economic viability of charging stations challenging.

Opportunities for all commercial entities include building a network of reliable and conveniently located EV charging stations that provide a great customer experience. Doing so will ensure customers continue to visit charging stations and properties that host charging stations, and the customers will be more likely to recommend EVs and the charging network to others.

On page 4 of Exhibit C28-2, Tesla states:
80% of charging activity typically happens in the home and the vast majority of trips require no public fueling infrastructure.
…
There are, however, areas in the province where there is less competition to supply charging infrastructure and areas where consumers may have less choice and access to charging solutions. Consumers in multi-unit buildings or renters of homes, often feel captive by their homeowners association or landlords when they request EV charging and are denied due to electrical system upgrade costs. Additionally, consumers in remote areas of the province have seen less privately funded charging infrastructure developed.

3.5 Please clarify if the 80% figure quoted refers to all Evs or Tesla vehicles only, and whether this refers to BC or otherwise.

3.5 RESPONSE

This figure is representative of all EV drivers in the USA. An Ontario-based survey conducted by Plug 'n Drive[4] found that, in that province, an even larger percentage of charging sessions occur at home.

3.5.1 Please comment on the extent to which, in the view of Tesla, an increased supply of EV charging stations will affect patterns of home based charging.

3.5.1 RESPONSE

Home-based charging will likely remain the most desirable option for most drivers. Moreover, Tesla believes it is important to educate customers that home charging is the most convenient and affordable option for a driver's daily needs. One factor that may affect the pattern is that as the EV market expands, not all owners will have access to home charging because they rent their home, don't have access to a dedicated parking space, or live in a multi-unit dwelling.

3.6 Please discuss whether the expansion of EV charging options for consumers in multi-unit buildings or renters of homes without electrical outlet access will increase naturally with increased uptake of Evs.

3.6 RESPONSE

As more residents in MURBs drive electric vehicles, there will be increased demand for electrical capacity in these locations. Therefore, policy changes to building standards, strata policy, and enabling utilities to install make-ready infrastructure in these locations would likely help to increase uptake of Evs.

3.7 Please discuss any barriers to third-party funded charging infrastructure funding in remote areas of BC.

3.7 RESPONSE

The most significant barrier impacting the development of third party charging in remote areas is discussed in some detail on pages 7 and 8 of exhibit C28-2 and relates to rate and demand charge structures levied to end-use EV charging service providers like Tesla. In brief, the combination of high demand charges and the risk of limited usage may be contributing to less competition in these charging markets.

4.0 Reference: Exhibit C20-2, p. 6
Exhibit C15-2, p. 2
DCFC – third-party investment

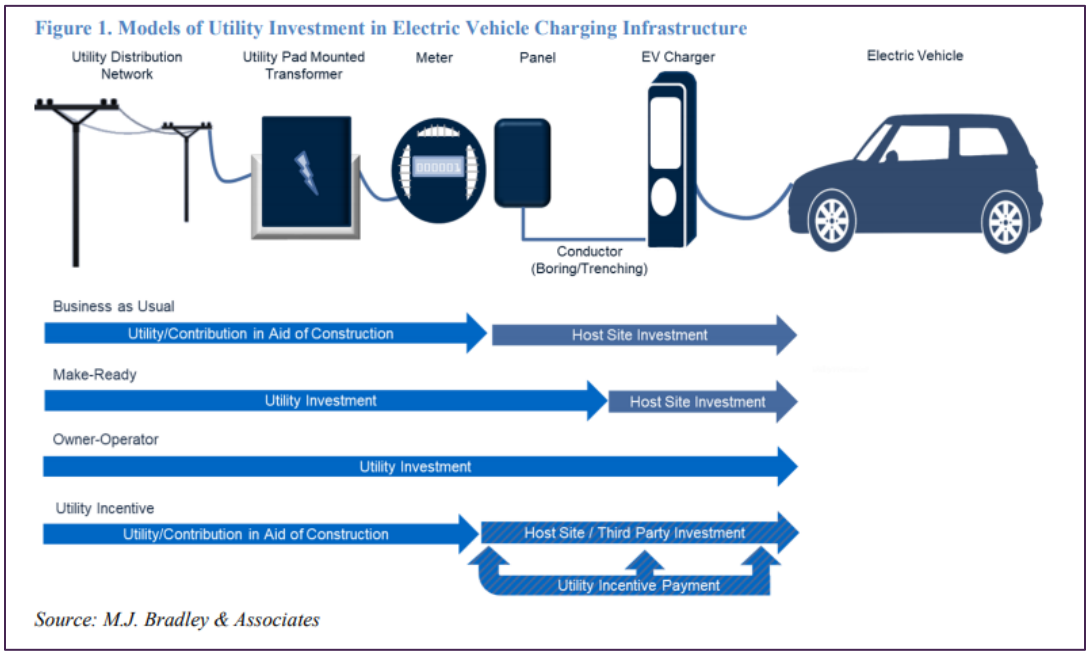
On page 6 of Exhibit C20-2, AddÉnergie Technologies Inc. (AddÉnergie) states:
That the major barrier to EV charging station competitiveness is that British Columbia lacks a comprehensive network of charging stations and that one is unlikely to be developed by [third-party] investment alone.

On page 2 of Exhibit C15-2, Greenlots states:

[Unfortunately] a sustainable, competitive market is aspirational, and is unlikely to arise prior to the adoption of a critical mass of electric vehicles. This is primarily on account of a lack of a business model for the ownership and operation of public charging stations based on sustainable revenues from charging activities, and this has thus far resulted in a fundamentally inadequate amount of [third-party] investment in such charging infrastructure.

[4] See: http://www.plugndrive.ca/wp-content/uploads/2017/07/EV-Survey-Report.pdf

In a report authored Georgetown Climate Center and by M.J. Bradley & Associates, titled "Utility Investment in the Electric Vehicle Charging Grid: Key Regulatory Considerations" dated November 2017[5] (GCC-MJBA Report), on page 9, Figure 1 provides the models of utility investment in EV charging infrastructure: (i) business as usual, (ii) make-ready, (iii) owner-operator, and (iv) utility incentive.



4.1 Please discuss the pros and cons of the four business models that are noted in the GCC-MJBA Report. Include considerations such as market growth, business sustainability, customer impacts, public interest, competition, and appropriate level of utility regulation.

4.1 RESPONSE

The pros of "business as usual" are that several different business models can be developed to determine the right approach to serve customers. The cons are that growth can be slow and network coverage may not be adequate because of the significant development risks.

The make-ready and utility incentive models can encourage greater investment because of cost sharing arrangements that make EV charging more attractive for charging providers, site hosts and customers to invest in.

An Owner-Operator model can help fill gaps in coverage that may have low utilization or high investment costs and would likely not be served by commercial entities. However, relying solely on the model may stifle innovation and opportunities for commercial entities to participate in the market.

5.0 Reference: Exhibit C28-2, p. 3
Exhibit C12-2, p. 5
DCFC – business model and economics

On page 3 of Exhibit C28-2, Tesla states: "At present, Tesla's B.C. Supercharger stations tend to have between four and twelve DC fast charging stalls."

[5] See: http://www.georgetownclimate.org/files/report/GCC-MJBA_Utility-Investment-in-EV-Charging-Infrastructure.pdf

On page 5 of Exhibit C12-2, FortisBC Inc. (FBC) indicates that there are 42 DCFC stations and 43 DCFC ports in BC excluding Tesla Superchargers.

5.1 Please discuss what are the most relevant factors when determining the number of ports per station.

5.1 RESPONSE

Tesla strives to develop Supercharger stations that meet peak demand so that customers have a good experience and are not subject to frequent congestion or wait times.

Some additional relevant factors considered at a site when determining the connector count include:

- **Forecasted peak charging demand**
- **Forecasted off-peak demand**
- **Availability of parking / dedicated parking**
- **Distance to other Superchargers**
- **Electrical service and cost considerations**

5.2 Please comment on the benefits and costs of having multiple ports per station as compared to a single port per DCFC station.

5.2 RESPONSE

Costs are generally linear as additional connectors are added at a station (station referring to a geographic location, not EV servicing equipment) since larger stations tend to require larger electrical services and more on-site equipment. Multiple ports/connectors at one station help to minimize site congestion and wait times, improving the driver experience. Multiple connectors also increase redundancy and will reduce the risk of "ICE'ing" – a situation that arises when and EV driver is unable to charge because an internal combustion engine vehicle is blocking access to the connectors.

5.2.1 Please explain if there are any economies of scale by adding multiple ports per DCFC station? What is the incremental cost for additional charging ports?

5.2.1 RESPONSE

Generally, the only benefit of having multiple charge cables is to be able to employ two different standards of charging (I.e. ChadeMo and CCS) at the same post, so different vehicles can charge at once. The other benefit may be potentially easier access to vehicle charge ports (on different sides of the vehicle). However, multiple cable per post are not necessary for Tesla vehicles in Canada because all vehicles have the same Tesla-type charge port, so Tesla does not have responsive incremental cost data.

5.2.2 Please elaborate on the technical limitations or right of way concerns of having multiple ports at stations.

5.2.2 RESPONSE

Tesla is unaware of any technical limitations.

6.0 Reference: Exhibit C20-2 , p. 2
Multi-Unit Residential Buildings (MURBs) & Curbside Parking

On page 2 of Exhibit C20-2, AddÉnergie states:

Direct current fast charger (DCFC) and multi-unit residential building (MURB) home charging are unlikely to be widely and comprehensively deployed in British Columbia without public utility involvement because of the current economic barriers facing charging providers and still-emerging demand for EV charging in many parts of the province. Curbside public charging faces similar cost and also regulatory challenges that are likely to inhibit its widespread deployment.

6.1 What difficulties have Tesla observed regarding the installation and operation of charging infrastructure in MURBs and curbside charging? What products or services does Tesla offer for this market?

6.1 RESPONSE

Challenges for MURB installation include electrical panel capacity that would enable Level 2 charging for multiple parking spaces; the location of the electrical panel relative to the parking spaces; and the required wiring, conduit, and construction to enable a charging station.

Tesla has not participated in curbside charging programs and currently does not offer curbside products or services. For MURB applications, Tesla offers Level-2 wall connectors that a resident of a MURB can purchase directly from Tesla and have installed at a MURB site.

6.2 Please discuss which EV charging business model that is most suitable for MURBs (e.g. a public utility or third-party site host owned or operated).

6.2 RESPONSE

As discussed in exhibit C28-2, increasing competition for charging services in MURBs is largely predicated on the ability for utilities to invest in (and recuperate their costs for) "*make-ready*" infrastructure such as: electrical power capacity upgrades, conduit, subpanels, and breakers in shared garages. Tesla believes make-ready infrastructure should be the primary model for regulated utilities in regard to MURBs. Utility involvement would also bring additional expertise with regard to new metering solutions.

Power capacity upgrades in MURBs benefit a broad number of ratepayers and will do so for several decades. As such, make-ready infrastructure is well-suited to be recovered through the rate base. Doing so will increase competition for charging services in the MURB marketplace significantly.

6.3 Please discuss which EV charging business model that is most suitable for curbside public charging (e.g. a public utility or third-party site host owned or operated).

6.3 RESPONSE

Tesla does not have sufficient experience with curbside public charging products to provide a recommendation.

C. TECHNOLOGY

7.0 Reference: Exhibit C28-2, p. 3
Exhibit C4-2-1, pp. 3–8
Exhibit C12-2, p. 44–46
Transcript , Volume 7, p. 338
Upgrades in technology

On page 3 of Exhibit C28-2, Tesla states it "is planning significant investment in additional EV charging infrastructure in the province during 2018 and beyond."

FBC's Appendix 1 to Exhibit C12-2 (pages 44-46), and Flintoff's Exhibit C4-2-1 (pages 3-8) discuss the rapidly changing and upcoming technology in the EV charging market, for example wireless charging.

7.1 What is Tesla's vision for the changing technology in the EV charging market?

7.1 RESPONSE

Level-2 charging technology is relatively static. Tesla offers among the fastest Level-2 EVSE options available in the market, delivering up to 72A at 240V. This product has been available for several years.

For DCFC, faster charge rates are not necessarily better. While innovation in charging speed will be important, ensuring that charging technology continues to align with other uses at a property, along with a charging customer's expected dwell time at that site, will also remain important.

7.1.1 Could EV charging reach a point in the future where charging is as quick as it is to fill up on gasoline today? If yes, when is Tesla's estimate of this occurring in the EV charging market?

7.1.1 RESPONSE

Tesla has no assessment on this matter.

7.2 Please discuss the benefits and drawbacks to participants in the EV charging market of rapidly changing technology. In particular, what can be done to keep current while minimizing the drawbacks?

7.2 RESPONSE

The benefits of a rapidly changing market are the innovations that improve the customer experience. As new technology is developed, it is reasonable to expect that charging operators and site hosts will assess that technology and determine whether making use of it would improve the customer experience and attract additional business. Ultimately, charging technology and speed need to be properly aligned with the use case at a given property. For example, long-term parking lots at airports which installed Level-1 infrastructure continue to use it today because their customer will be away for several days. New technologies provide additional choice and may increase the number of different business models that are viable, but typically will not render an existing investment obsolete.

7.2.1 If EV charging service is regulated, please discuss Tesla's view on what would be BCUC's role as a regulator in relation to rapidly changing technology.

7.2.1 RESPONSE

EV charging services are end-use services which should not be subject to utility regulation. In the unfortunate event that the BCUC regulates EV charging services, Tesla recommends extremely limited regulations that allow for competition to govern a free market and encourage program flexibility by not requiring or excluding specific technologies, and to monitor development in stages so programs can be modified as innovation occurs.

At the Nanaimo Community Input Session, Ms. Turner suggested:

… The research that I've done so far has indicated that the battery capacity for a full EV used to be 250 kilometres. It's now up to 383 in the particular vehicle that I was looking at.

In two or three years perhaps that capacity will have increased, and therefore the need for charging stations will

be reduced, just by virtue of not being concerned.[6]

7.3 Please comment on Ms. Turner's submission that when vehicle capacity increase, the distance range available will also increase. Thus, the need for charging stations will be reduced.

7.3 RESPONSE

While it is true that individual drivers will be able to travel further on a single charge as batteries increase in size, the total number of EVs on the road will grow dramatically and thus more charging stations will be required. Moreover, not all EVs will have high capacity batteries due to costs and customer preferences. For example, some battery electric vehicles on the market today have batteries a little larger than 33 kWh, and others like the Model S and Model X can have batteries up to 100 kWh in size.

7.3.1 Please discuss how Tesla's public EV charging station investment decisions differs with non-Tesla public EV charging stations. Does Tesla consider the possible inverse relationship between longer EV distance range and number of charging stations required? How does Tesla determine where to place EV charging stations?

7.3.1 RESPONSE

Tesla cannot speak to the "investment decisions" of non-Tesla public EV charging stations. Business investment decisions are competitive and highly sensitive business decisions for Tesla. Tesla assumes they are protected and treated in the same regard by its competitors.

However, as EV distance range increases, drivers are likely to see EVs as a viable primary vehicle option due to their preferences and perceptions, whereas if the battery capacity is lower, they may use the EV as their second vehicle. As EV kilometers driven increases, the more charging stations are required.

Generally, Supercharging has two distinct applications and is planned accordingly. The first is intended to enable long-distance travel. The second is intended to make charging ubiquitous in urban centers where charging in condominiums or workplaces remains a challenge. More about our approaches can be found in the Tesla blog post titled "Charging is our Priority."[7]

D. RATES

8.0 Reference: Exhibit C28-2, p. 3
Rate design – Charging Station to EV Customer

On page 3 of Exhibit 28-2, Tesla states:

For use above that amount, and for all Model 3 owners, customers are charged $0.20 per minute of charge when the connector is operating at or below 60 kilowatts, and $0.40 per minute of charge when it is operating above 60 kilowatts.

Tesla's website states: "Where possible, owners are billed per kWh (kilowatt-hour), which is the most fair and simple method."[8]

8.1 If possible, please explain the business model of Tesla charging stations that are not complimentary to

[6] Transcript, Volume 7, p. 338.
[7] See: https://www.tesla.com/blog/charging-our-priority?redirect=no
[8] See: https://www.tesla.com/en_CA/support/supercharging

Tesla owners. For example, are the rates for Tesla EV charging stations designed to compete with other EV charging service providers, or to breakeven?

8.1 RESPONSE

Tesla uses internal analysis to determine pricing at State and Provincial levels[9] and it is informed by different factors, including underlying electricity prices paid for by Tesla, and other internal, sensitive, and competitive operations and maintenance costs. However, charging revenues are solely meant to offset costs of providing charging services. Tesla's Supercharger network is not meant to be a profit center.[10]

8.2 Please clarify whether the $0.20 per minute of charge when the connector is operating at or below 60 kilowatts, and $0.40 per minute of charge when it is operating above 60 kilowatts rate structure is unique in the province of BC, applied universally across Canada, across North America, or other.

8.2 RESPONSE

Tesla's pricing structure can be found at the following links:

Canada: https://www.tesla.com/en_CA/support/supercharging?redirect=no
USA: https://www.tesla.com/support/supercharging?redirect=no
Europe: https://www.tesla.com/en_GB/support/supercharging?redirect=no

8.3 Please explain why Tesla's chosen rate design is most preferable for its existing Supercharger network. What other rate design options have Tesla considered and why were they rejected?

8.3 RESPONSE

Tesla believes that owners should pay for energy delivered to the vehicle and therefore it prices the service on a per kilowatt-hour (kWh) basis for the global network. In some regions, regulations and requirements make it difficult for companies that are not utilities to sell electricity for vehicle charging per kWh. In these places, Tesla offers the Supercharger service at a per minute price, with two tiers to account for the dynamic charge rate.

8.3.1 If any different, what is Tesla's most preferable rate design for its Supercharger network around the world? Would the preferred rate design structure vary based on EV charging station voltage availability or other technical specifications?

8.3.1 RESPONSE

See 8.3 Response

8.3.2 Does Tesla provide any Level 2 charging stations? Please provide the most preferred rate design if any different than the Tesla Superchargers.

8.3.2 RESPONSE

Yes. Tesla has a Level-2 "Destination Charging" network.

Tesla does not currently require fees for using its Level 2 Destination Charging network, but it is supportive of pay-for-use business models and believes they should continue to be permitted to operate as end-use, non-

[9] See: https://www.tesla.com/en_CA/support/supercharging
[10] See: https://www.tesla.com/blog/update-our-supercharging-program

utility services where site hosts or charging providers are able to set fees on a kilowatt-hour basis.

9.0 Reference: Exhibit C20-2, p. 7
DCFC – Measurement Canada

On page 7 of Exhibit C20-2, AddÉnergie states: "that as of March 6, 2018, Measurement Canada has not certified any commercially available DCFC device to bill on the basis of energy (kWh) or time-related demand (kW)."

9.1 Has Tesla sought certification for Tesla-built supercharging meters from Measurement Canada?

9.1 RESPONSE
No.

9.1.1 If so, please provide any details available of the current status of any application.

9.1.1 RESPONSE
Not applicable.

9.1.2 If not, does Tesla have any plans to file a request in the future?

9.1.2 RESPONSE
No.

9.2 Please clarify whether Tesla's $0.20 per minute of charge when the connector is operating at or below 60 kilowatts, and $0.40 per minute of charge when it is operating above 60 kilowatts rate structure requires certification from Measurement Canada.

9.2 RESPONSE
It does not require certification.

9.2.1 If so, please indicate whether this measurement is certified by Measurement Canada.

9.2.1 RESPONSE
Not applicable.

9.2.2 If not, please explain why certification by Measurement Canada is not necessary.

9.2.2 RESPONSE
Tesla's pricing schedules are based on time, so they are exempt from certification with Measurement Canada.

E. STORAGE AND GRID STABILITY
10.0 Reference: Exhibit C28-2, pp. 8–9
Grid optimization and impact

On page 8 of Exhibit C28-2, Tesla states that "the Commission should also allow customers to combine host and

charging loads for billing purposes, which would encourage more efficient use of existing capacity and prevent potential double-charging for use of the same utility infrastructure."

10.1 Please elaborate on how combined billing could facilitate efficient capacity use and prevent potential double charging.

10.1 RESPONSE

When EV charging load is metered separately from a customer's site load, customers who are billed demand charges must pay a demand charge for their maximum demand assessed on both meters, regardless of whether the demand at both sites increases demand on the grid during peak hours. This method of assessing site and EV demand separately overestimates a customer's cost to serve, as it ignores the fact that the highest demand from the customer on the grid is the *combined (*i.e. concurrent) demand of both meters, not the aggregate demand, which may occur at different times. For example, if a customer's max site demand of 500 kW occurs at a different time than the customer's max EV charging demand of 150 kW, the customer must pay in full for 650 kW demand, regardless of whether the combined site demand of both meters was less than the site max demand, resulting in double charging of demand-related costs.

Tesla is supportive of a billing structure which does not assess an additional demand charge on separately metered EV load when EV demand does not cause an increase in the maximum site demand. In cases where EV demand results in increases to the max site demand, the demand charge should only be assessed on the incremental portion of the EV demand that caused the increase in max site demand.

Tesla is also supportive of metering options, and believes it should be left up to the customer whether or not they want to separately meter their EV load. For example, some customers that procure EV fleets will be capable of charging EV load from the existing service provided to a facility, such as an office building or warehouse, which would reduce the amount of infrastructure the utilities must build to support this EV charging, and thus reduce the overall costs of deploying charging infrastructure.

10.2 Please identify specific jurisdictions that have implemented a billing practice as described.

10.2 RESPONSE

The billing structure identified above, which minimizes EV charging costs for customers with separately metered site and EV load by only charging customers the incremental portion of the EV demand that caused the increase in max site demand, is pending approval before the California Public Utilities Commission. Several key parties supported this structure in a recent stipulation, including one of California's largest investor-owned utilities, Southern California Edison, in addition to ORA (ratepayer advocate), NRDC, Siemens, Sierra Club, EDF, and the Coalition of California Utility Employees.[11]

On page 8 of Exhibit C28-2, Tesla states: "Combining loads could also facilitate the use of onsite storage and generation to help the customer and utility meet some of the increased capacity."

10.3 Please elaborate on specific ways combining loads can facilitate onsite storage and generation.

10.3 RESPONSE

Requiring new service connections, metering, and rate plans for the charging infrastructure separate from the building may end up reducing the overall benefits of a solar and storage system to the customer due to a suboptimal system design, suboptimal tariff optimization, and additional administrative costs. Typically, a solar and storage system is designed to maximize savings (or minimize costs) associated with a load forecast

[11] Stipulation, A.17-01-021, November 2, 2017.

and utility rate tariff. Separate metering for a building and charging infrastructure may require project development, design, sizing, and interconnection for *two* systems based on *two* load profiles on *two* rates rather than one, significantly complicating the project and likely resulting in higher overall costs. A single solar and storage system serving a combined building and charging load could share resources and benefit from the economies of scale of having a single large system rather than two smaller systems.

On page 9 of Exhibit C28-2, Tesla states: "Increasing the utilization of the fixed costs, especially during off-peak periods, reduces the per unit cost of the fixed assets."

10.4 Please elaborate on methods for increasing utilization during off-peak hours.

10.4 RESPONSE

The addition of electricity sales during off peak hours increases system utilization without requiring the need for additional infrastructure. Typically, these additional sales place downward pressure on the total cost of the utility's fixed assets associated with each unit of electricity delivered. Methods for increasing utilization during off-peak hours include educating customers, sending price signals through rate design, or actively contacting customers during specific events to let them know when to charge off-peak.