C23-2
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March 6th, 2018

Patrick Wruck
Commission Secretary
BC Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC Canada V6Z 2N3

Re: Commission Inquiry into the Regulation of Electric Vehicle Charging Service ~ Project No.1598941
BrightSide Solutions Submission

Dear Mr. Wruck:

BrightSide Solutions is a clean energy consulting and project development company that focuses on advancing clean energy projects in BC. BrightSide works with customers to help them make informed decisions regarding adoption of clean energy fuels and technologies. BrightSide's customers are involved in transportation applications using a variety of fuels including Compressed Natural Gas, Liquefied Natural Gas, Hydrogen and Electricity, in addition to conventional fuels. As founder of BrightSide, I bring over 30 years of experience in clean energy and transportation markets to this discussion.

BrightSide's submission with respect to the present enquiry is focused on the following issues:

1. How should the sale of electricity to Electric Vehicles (EVs) be structured and regulated?
2. How should electricity be priced and sold from the utility to the EV charging stations?
3. Will a true Cost of Service rate impair EV adoptions rates?
4. Should utilities be allowed to continue to provide charging solutions?
5. What is the definition of EV under this proceeding?
6. How should other government policy measures (such as BC's Renewable and Low Carbon Fuel Requirement Regulation and motor fuels taxation) be aligned to maximize adoption of EVs?

Each of these will be addressed below:

1. **How should the sale of electricity to Electric Vehicle (EV) market applications be structured and regulated?**

BC Hydro is a regulated monopoly that distributes electricity to BC's residential, commercial and industrial applications. There are natural monopoly characteristics associated with the distribution of electricity that justify establishing a regulated monopoly franchise. Simply put, it does not make economic sense to have more than one electrical grid competing for customers in the same geographic region. The typical regulated utility role is to supply electricity to the meter located on the customer's property. In general, all assets downstream of the meter are non-utility assets and are non-regulated.

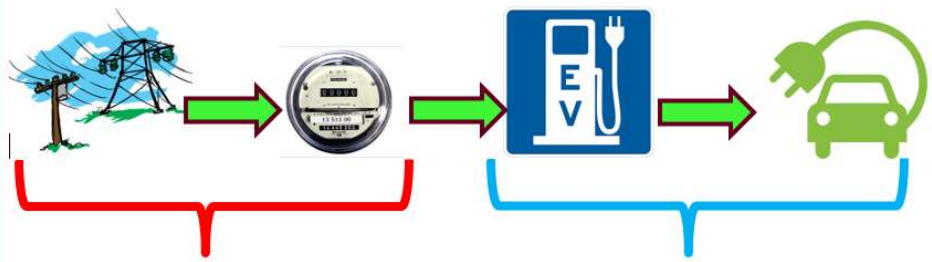
EV demand for electricity is simply another customer segment that the utility needs to serve. As with other customer segments, the utility should concentrate on supply of electricity to the main meter serving the EV charging station. This is the natural monopoly part of the business.

The ownership and operation of the charging stations, however, is a completely separate matter. BrightSide submits that there is no need for utility involvement or economic regulation of EV charging services downsteam of the main meter for the following reasons:

i. There are no significant economies of scale or scope that would lead to a non-competitive market for vehicle charging.
ii. Costs associated with installation of charging stations, even Level 3 charging equipment, are relatively modest (installed cost of ~$100k per station) and well within the means of those that wish to provide charging services.
iii. There are no significant barriers to entry into this market, other than the present regulatory barrier and there are a number of private entities that wish to provide this service.
iv. The natural monopoly aspects of providing electricity apply upstream of the charging station's meter.
v. The present situation constrains the development of charging infrastructure solutions and potential new business models which could finance additional charging stations. (e.g. Advertising based models, parking fee based models, customer attraction models etc.)
vi. The safety of EV charging has been demonstrated to be at least equivalent to the dispensing of conventional vehicle fuels.
vii. There are no market failures that need to be addressed through economic regulation; and,
viii. The market has progressed beyond infant stage to a point where open market competitive service providers are capable of providing charging solutions.

If the regulatory barrier to providing charging stations is removed, the competitive market will develop a variety of charging solutions under a variety of economic models. The end result will be faster build out of charging infrastructure and charging solutions better suited to customer needs. Prices for end customer EV charging will be determined by the charging station owner/operator based on their specific economics. They may be based on consumption, or on how long the vehicle is parked in the location, or they be provided as part of a larger service. E.g. free charging included while shopping, subject to minimum goods purchased. The competitive market will likely develop a variety of innovative solutions and should be relied upon to develop, own and operate the charging stations.

Figure 1 – Supply Chain, Regulated versus non-regulated activity



2. How should electricity be sold from the utility to the EV charging station operator?

BC Hydro should develop a specific tariff designed to recover the specific Cost of Service (COS) of supplying electricity to EV charging stations. EV demand has characteristics that drive cost of service in ways that are somewhat different to other demand. For example, addition of EV demand often requires bolstering of the distribution system (e.g. transformer additions and supply line system improvements) BC Hydro should be directed to develop a tariff for EV charging that is based on and incorporates the following:

i. Full recovery of the Cost of Service of delivering electricity, including system improvements and upgrades required to accommodate the new demand.
ii. Recovery of incentives and other support provided to encourage EV adoption over a reasonable time frame (e.g. 10 years)
iii. The energy charge should reflect the cost of capacity additions required to serve the new demand. (e.g. Cost of energy from Site C) Legacy benefits of existing generation assets, should be applied to existing demand, not used for new demand in an environment where rate increases required to pay for new generation assets are difficult to implement.

3. Will a true COS based rate impair EV adoption rates?

A benefit of owning and operating an EV is that electricity is inexpensive relative to conventional vehicle fuels. Gasoline in Vancouver is presently priced at ~$1.50per litre and the overall efficiency of a gasoline based vehicle is ~30%. Thus the cost of useful energy for a gasoline vehicle is ~$144/GJ ($1.50/.3 * 1000/34.7 MJ/L energy content)

EV's on the other hand have high efficiency (~90%) and low (often free) energy charging costs. If we assume a COS based electricity rate of $0.15/kWh, the cost of useful energy for an EV is $46/GJ. (Not including amortization of charging station capital, which may or may not be free to the end user depending on the business model of the station operator. In any event amortization of this cost will not significantly reduce the competitive advantage of electricity as a vehicle fuel)

From this high-level assessment, it is clear that even with a COS based rate, EV's will enjoy a very large operating cost advantage over conventional fuels. There is no pressing need to artificially increase this advantage through free or subsidized charging rates.

If for policy reasons, incentives are to be provided for EV's they should be applied to the cost of the vehicle, where EV's have significantly higher costs than conventional vehicles. As demonstrated with FortisBC's incentive programs for Natural Gas Vehicles, vehicle incentives are the main driver to encourage adoption, with fuel pricing being secondary. It is far better to apply the incentive to reduce the economic pain of the early adopter at the point in time when he or she is committing to the purchase.

The present situation also creates a distorted and perverse situation where EV owners who can afford to lay out >$150,000 for an EV are getting free electricity, subsidized by other BC Hydro rate payers. The optics and fairness of the present approach are clearly in question. More importantly, the EV user

community would far prefer to have more charging stations available to deal with range anxiety, than to save a few dollars on charging.

In addition, as adoption rates for EV's increase the demand from this sector will become a significant portion of BC Hydro's load. A plan to transition to COS based rates is needed, especially given that BC Hydro is not recovering its overall costs even without subsidizing EV's.

It might be argued that subsidized electricity should be provided to EVs because of their beneficial impact re GHG emissions and climate change. In reality, however, there are at least two policy measures where this issue is already being addressed in a more direct fashion. The first is through the Carbon Tax on BC fuels and the second is through credits generated under BC's Renewable and Low Carbon Fuel Requirement Regulation. The economic benefits these two policy measures presently generate for EVs in the range of $12/GJ, which translates to approximately $0.40/Gasoline Litre Equivalent[1]. Again, this would support the argument that subsidized charging is not required.

4. Should BC Hydro and FortisBC be allowed to continue to provide charging solutions?

Regulated utilities should not be involved in providing EV Charging stations or in the ownership and operation of such facilities. The involvement of utilities presents challenges re fair competition with private sector participants. (See the Alternative Energy Services Enquiry) To the extent that utilities do provide charging station services, the activity should be conducted by their non-regulated entities without the benefit of guaranteed returns on investments. Care should also be taken to ensure that the non-regulated affiliates fully compensate the regulated affiliate for any services provided by the regulated affiliate at reasonable rates including overhead burdens.

Existing charging stations should be transitioned to private sector operators through a competitive bid process.

5. What is the Definition of EV Under this Enquiry?

Solutions and directives generated under this enquiry need to recognize that there are EVs other than passenger vehicles in operation in the province that need to be considered when considering how to structure and regulate the charging market. Example of other vehicles include:

i. Golf carts
ii. Utility vehicles
iii. Commercial vehicles
iv. Electric gantry cranes
v. Mine haul trucks
vi. Trains and transit systems
vii. Lift trucks

[1] LCFRR value of ~$10/GJ based on present credit value of $170/credit, plus ~$2/GJ Carbon price differential EV vs Gasoline

Charging stations for Golf Carts are already in place and the electricity is part of the costs recovered through the rental rate. The new rules for charging stations need to be designed so as not to impair or impede these applications. For example, a golf course may want to install charging stations capable of selling electricity for both carts and passenger vehicles. The definition of who can sell electricity for motor vehicle applications is an important one with respect to ownership of Low Carbon Fuel Regulation credits. See discussion under Issue 6 below.

6. How should other government policy measures (such as BC's Renewable and Low Carbon Fuel Requirement Regulation) be aligned to maximize adoption of EVs?

The regulation of EV Charging will affect and overlap with a number of other areas of both Provincial and Federal Regulation. Three such areas are identified below:

i. BC's Renewable and Low Carbon Fuel Requirements Regulation - The intent of the LCFRR is to reduce the carbon intensity of the fuels used for motive applications in BC. The regulation applies both a carrot, in the form of credits which can be sold for monetary benefit and a stick in the form of a $200/te penalty for non-compliance.

Ideally, to encourage higher EV vehicle adoption, the revenue from the LCFRR program should flow to the parties that are using the vehicles or to those that are investing in the charging infrastructure. At present they flow into BC Hydro as general revenue and do nothing to incent greater vehicle adoption rates. (The utility is prevented at present from directly flowing such revenues back to the customers that generated the benefits or from using these revenues to pay for charging infrastructure) The revenue received by the utility is spread out and diluted amongst all rate payers which is a waste of the intended incentive.

If the present enquiry changes the rules re who can supply electricity to customers in BC for EV applications, it would be possible for the Ministry of Energy to change its policy on who can earn credits under the LCFRR program. This would be a beneficial change that would result in greater EV adoption.

As the number of EV owners is significant and growing, transaction costs may make it impractical to award the credits to end customers. A more practical approach would be to award the credits to the owner/operators of the charging station. As the charging activity is a competitive market, it is probable that the benefit would flow through in large part to the users through reduced charging rates. In any event the additional benefit would greatly speed up the installation of a comprehensive charging station network.

ii. Transit and road taxation – As more EVs are adopted in BC, the revenue generated under existing taxes on fossil fuels will decrease. A strategy is needed to address the impact of this change on transit and road system funding. It is recommended that a transparent policy be created to manage the transition from an untaxed, early adopter friendly tax environment to the one that will need to be in place to ensure adequate revenues are generated for transit and roads. For example, taxes might be phased in at incremental amounts after market share hits some level of significant penetration – e.g. 10% share. Ultimately EV market participants need to pay their fair share of these costs through appropriate taxes. At present there is potential for

a bait and switch perception because EV users may expect such tax advantages to continue indefinitely. Clarity is required to allow customers to make informed decisions.

iii. Federal Excise Tax – This is the same issue as with provincial taxes, but the impact is federal so the programs will need to be harmonized.

In closing I would like to thank the Commission for the opportunity to raise these issues and to suggest potential solutions and policy improvements with respect to EV Charging. I look forward to being an active participant in the balance of the enquiry.

Sincerely yours,
BrightSide Solutions

Mark Grist
President