

BCUC Project No. 1598941**INTRODUCTION**

Electric Vehicles (EV) are revolutionizing the automotive industry. They offer a simple solution to the complexities, constraints and negatives of the Internal Combustion Engine (ICE).

My wife and I purchased an EV 4 years ago in an effort to improve our environment. We soon realized there were other EV benefits: low operating and maintenance costs; spacious interior; quiet operation and so on.

There is, however, one characteristic which I believe will be the deciding factor in EVs becoming very popular. That is, EVs are fun to drive with rapid acceleration and excellent manoeuvrability. I believe EV sales and market share will increase more quickly than predicted.

One of the main impediments to increased sales is the driving range and recharging rates on most EVs currently available. The British Columbia Utilities Commission (BCUC) needs to ensure its activities contribute to the expansion and availability of Electric Vehicle Supply Equipment (EVSE or charging stations) in BC.

Some specific recommendations:

RECOMMENDATION:

The Utilities Commission Act (Act) should be reviewed and amended to ensure that it does not impede EVSE deployment.

The BCUC's primary responsibility is the regulation of the energy utilities under its jurisdiction to ensure that the rates charged for energy are fair, just and reasonable, and that utilities provide safe, adequate and secure service to their customers. I believe that rate fairness for resold electricity can be achieved by open competition among independent third party EVSE providers, without BCUC oversight.

The ACT was originally created to regulate utilities to ensure that they did not abuse their monopoly power. EVs were not envisioned at the time of enactment. There is only one mention in the Act of reselling power. A reseller is not defined. There is no explicit exemption from nor controls on reselling electricity.

If, according to the Act, only a 'Public Utility' can sell electricity in BC, then a privately-owned charging station is deemed to be a Public Utility. Does this mean that if a

merchant installs an EVSE and provides power at no cost (as a customer enticement), it is deemed a 'Public Utility'? If so, this is nonsensical.

The advent of solar panels and on-site battery storage to support third party EVSE sales to the public will further complicate the situation.

Local Governments are using their development bylaws to ensure new construction includes EVSEs. The City of Vancouver recently required new Strata projects to install EVSEs. Will each Strata be deemed a Public Utility?

I think the legislation designed to control a monopolistic situation has the potential unintended consequence of impeding EVSE deployment. The regulation and governance of third party charging stations by the BCUC needs to be reconsidered and the Act amended accordingly. Relying of 5 year Ministerial exemptions from the Act for third party EVSE providers is not a long term solution.

RECOMMENDATION:

Although I believe the Act needs to be revised to consider EVSEs, I think it is premature to make specific long-term decisions on EVSE installations, ownership, charge rates, etc. Any BCUC actions should be temporary or time limited until the EV market matures.

Major reasons:

Multiple EVSE vehicle connector standards

There are currently multiple connector standards. As the industry matures, there will be a convergence to one or two common connectors (similar to the existing ICE service stations with gasoline and diesel nozzles). EV manufacturers are still developing their EV production plans. Hyundai/Kia recently announced that they are switching from the CHdeMO standard to SAE J1772 Combo inlet (also called CCS Combo). More changes like this will occur.

Batteries are evolving quickly

Battery technology improvements have increased the density (greater range) and charge rate capabilities (shorter recharge times) of Lithium Ion batteries. Work on alternative batteries (e.g.: solid-state supercapacitors) is promising, and once scalability issues are resolved, these batteries may quickly become industry standard. The batteries used today will not have the same charge characteristics and requirements from those used in the near future.

Charge rate variability (Level 1, 2, 3 and 4)

Most EV owners charge their vehicles at home and/or at work. Third party charge stations are mainly required during extended daily use, long-range trips or emergency situations. The future focus will be Direct Current Fast Charging (DCFC) EVSEs, which are just now entering the market. This technology is also changing rapidly and near-term deployments could differ from long-term roll outs.

Small market percentage

Currently, EVs represent a miniscule portion of overall vehicle sales. Therefore there is limited data on EV usage versus that known for ICE. EV driving patterns and preferences are just now being developed. These could change quickly as EVs become a larger portion of the vehicle market and future EVSE deployments may be affected accordingly.

Low cost of entry

Unlike ICE service stations, the costs to enter the EVSE market are low. The ICE refuelling system requires expensive land in prime locations, costly underground storage tanks and fuel pumps, stand alone facilities to support the service, etc. An EVSE can be quickly established in an existing parking lot, with access to power and comparatively inexpensive charging station equipment. EVSEs could expand very quickly, once the EV industry matures.

EVSE payment management systems

The current proprietary EVSE hardware and software system has a limited number of providers (e.g.: ChargePoint) which may inhibit third party providers EVSE options. This system may change to one similar to that in Europe which offers greater flexibility. This is another EVSE aspect that could change in the near term.

Comments on Order G-9-18

Scope A: Basis for Regulation

1. Do EV charging stations operate in a competitive environment in BC or are they a natural monopoly service?

I don't think EVSEs are a natural monopoly in BC. There are several EVSE models emerging:

Manufacturer supported. Tesla is the first and best known manufacturer installing EVSEs in strategic locations to support its vehicle sales. Other manufacturers (e.g.: BMW) have also announced plans to develop and build similar networks of EVSEs designed to support their vehicles.

Government supported. The Federal and Provincial governments plan to spend \$100 millions on supporting EVSEs. This will provide public supported stations which will compete with private sector ones.

Third party supported. The EVSE costs of entry are low and retailers, hotel operators and others wanting to differentiate or enhance customer service levels have installed charging stations. Most offer the service without charge. Others will follow as EVs become a larger portion of new vehicle sales.

The combination of these models will prevent a monopoly service developing.

2. Are the customers of EV charging stations captive or do they have a choice?

Most EV drivers charge their EV at home and/or at work. In regular use, it's unlikely that drivers will need third party chargers, except for extended daily usage or on long out-of-town trips. As battery capacities and the number and type of DCFC stations continue to grow, the use of existing, public Level 1 and 2 chargers will drop.

EV drivers will have a choice due to in-home options and the increased number of public DCFCs.

3. Should the Commission regulate the services provided by EV charging stations? What are benefits and detriments to such regulation?

I don't believe the BCUC should regulate non-utility-owned EVSEs.

Benefits: Market forces from multiple EVSE suppliers will establish prices, much more fairly than the current gas station pricing model for ICE vehicles which is controlled by just a few organizations.

The BCUC should retain its role in regulating utility-owned EVSEs. As the monopolistic suppliers of power, utilities would be in a unique position to control supply while competing with third party EVSEs, which may rely on the utility for their power supply. There also exists the possibility that utilities could use its existing non-EV customers to subsidize the cost of power sold to its EVSE operations.

Benefits: BC power users are protected from the utility's monopoly advantage to potentially control EVSE supply pricing.

Scope B: Rate design and rate setting

4. Should the rate design of EV charging stations be established under a public utility's traditional cost of service model or some other model? And within that context, what are the customer pricing options (e.g. energy - based rate vs. time - based rate)?

BCUC should continue to regulate the cost of power provided to EVSEs, whether the EVSE is owned by the utility or a third party.

If third party EVSE providers are not subject to BCUC regulation, the EV charging rates to the public will be set by the market place. EVSE providers will pay similar power costs (regulated by BCUC) and may decide to discount their charge rates to encourage customers to shop/stay at their store/hotel or visit their municipality. Alternatively, the market may support higher rates, if an EVSE provides enhanced services or is in a preferred location. Not only will this system produce fair market driven charging rates, it is cost effective, not requiring a large bureaucracy to manage.

I believe an energy-based rate is preferred. Different batteries charge at different rates and an individual battery's charging rate slows as the battery approaches capacity. Both these factors affect the charging time. Outside factors, like temperature, can also impact the time, but not necessarily the amount of energy consumed.

There is some concern that EV drivers may leave their EV unattended after their vehicle is fully charged, preventing others from using the charging facility. Let the market determine short term solutions. Possibly, a 'parking fee' could be billed for unattended vehicles after the completion of the charging cycle.

More importantly, as DCFC and battery improvements come to market, the time required to charge will drop. If these times fall to levels approximating those to refuel an ICE, drivers will wait with their EV and move on once charged, negating the requirement for a time based penalty.

Some US jurisdictions are using time-based rates, in what appears to me as a tactic to avoid energy-based regulations.

We don't charge how long it takes to refuel an ICE. We charge by the amount fuel used. The same model should apply to EVs. Charge for energy provided to vehicle.

5. Should the EV charging station service rate be based on a public utility's existing wholesale or commercial retail rate or some other rate?

A rate structure for DCFCs should reflect the cost of providing the energy to the EVSE. This may require a rate different from existing rates to ensure third-party EVSE receive a fair rate. The rate may reflect the amount of demand and timing of that demand.

6. Should public utilities include EV charging stations in their regulated rate base or through a separate non - regulated entity?

The two must be kept separate. If the utility wants to compete with private EVSEs it should manage its EVSE service separately from its regulated business.

7. If public utilities provide EV charging services within their regulated business, is there a risk of cross subsidization from other rate classes to support this new service and if so, is the proposed rate design potentially unduly discriminatory?

I believe there is such a risk. If the sales price is left to market forces, utilities will have to compete with third parties. There may be a temptation to use existing rate payers to subsidize its EVSE operations to maintain a competitive advantage.

Other matters

8. Any other matters that may assist in the effective and efficient review of the Inquiry.

I believe BCUC needs to support and encourage the development and deployment of EVSEs, without being involved in the regulation of the EVSE market. The federal and provincial governments are contributing millions of dollars to fund EVSE expansion. Private sector organizations from international corporations (e.g.: Tesla) to small companies are installing charging stations. There will be sufficient marketplace competition to protect the consumer.

EVs and DCFCs are the future and BCUC should ensure that it contributes to BC's readiness for this.