

**Date Submitted:** April 08, 2018

**Proceeding name:** BCUC Regulation of Electric Vehicle Charging Service Inquiry

**Are you currently registered as an intervener or interested party:** No

**Name (first and last):** Doug Beckett

**City:** Prince George

**Province:** British Columbia

**Email:** [REDACTED]

**Phone number:** [REDACTED]

**Comment:**

Please see the attached.

Dear British Columbia Utilities Commission,

Re: BCUC EV and EV charging station commission

I am very pleased the BCUC agreed to host a meeting via video link for April 16<sup>th</sup> in an attempt to gain more involvement and input. Thank you for agreeing to this requested action. Knowing there are over 20 EVs driving around Prince George, I sure hope this additional video link will improve the input and insight you gain from Prince George and area.

The following reflections and suggestions are based upon my experience of having driven an EV in Prince George British Columbia since 2009. First, a pick-up truck that was converted from gas to 100% electric by the mechanics classes at a Prince George High School (this electric truck (e-truck) now has another owner in Prince George) and now, a 2013 Nissan Leaf that we purchased as a used vehicle a little less than a year ago for \$13,240.

To begin with, it is a terrific feeling to drive an EV. EVs are responsive, fun to drive, less damaging to the local air shed, are likely an import part in developing a solution to mitigating climate change, are significantly less expensive to drive as compared to gas or diesel vehicles, and with less moving parts (EVs have about 30 moving parts compared to about 2,000 moving parts in gas and diesel vehicles) they require less servicing. They are also comparatively quiet – a benefit to individuals who are in close proximity, but also allows the music connoisseur to better enjoy the music as they drive.

It feels real good knowing that in driving an EV that we are not emitting small particulates into the local air shed that would be emitted if were we driving gas or diesel. Not only that, but due to the regenerative breaking EV driving also emits way less medium sized particulates into the local air shed (EVs do not wear down the brake pads nearly as quickly as gas and diesel vehicles do). For communities like Prince George (which has a reputation as being the community with the 3<sup>rd</sup> worst fine particulate air quality in Canada), all solutions that reduce deleterious mater into the local air shed means improved health of its citizens and reduced health costs to the BC Government.

At the same time as reducing the fine and medium sized particulates into the air shed, EV driving does not contribute nearly as much in the way of Green House Gas emissions as do gas and diesel vehicles. For interest, my records indicate that we paid about \$1,600 for 17,000 kWh of electricity to drive 57,000 kms in our e-truck. For all this driving we emitted 166 kg of CO<sub>2</sub>e Green House Gas. Had the truck still been fueled by gas, and getting 30 miles per gallon fuel efficiency, we would have paid about \$5,800 for 5,400 litres of gas and emitted over 12,600 kg of CO<sub>2</sub>e Green House Gas. The social benefits from driving our Nissan Leaf is even more impressive, as it is about twice as fuel efficient (at least 6 kilometers per kWh) as compared to our e-truck (3.4 kilometers per kWh).

Way back in 2009 when we got our e-truck onto the road, there were no Level 2 charging stations in Prince George. Even so, there were already more Level 1 charging stations in place than there are gas stations. But, initiating dialogue with the owners of the Level 1 charging stations to establish rules for using these Level 1 charging stations has not been successful. **As such, the BCUC must highlight the necessity for the owners of Level 1 charging stations to produce formalized use policies for EVs. Any means the BCUC can use to help facilitate the production of formalized use policies for EV use of Level 1 charging stations would be greatly appreciated.** It is interesting that gas vehicles can use these Level 1 charging stations to plug in their block heaters, but plugging an EV to the same Level 1 charging

station is viewed as theft. A perception that exists in part because the action of charging an EV is new, and in part from a lack of understanding how little electricity is used to drive an EV.

Using about 2 cents of electricity for every kilometer traveled, it costs about \$260 to drive an EV 13,000 kilometers (possibly the average an EV is driven in a year). Recognizing most EV charging is done at the EVs residence, the proportion of this annual expense that could be obtained from charging stations is reasonably small. Our Nissan Leaf will receive about 10 cents of electricity to for every hour of charging at a Level 1 charging station (assuming BC Hydro Residential Rate 1 of \$0.0858 + 5% rate rider + 5% GST = \$0.09459 per kWh).

As no standard for Level 2 charging stations had been established, our e-truck was equipped with a Recreational Vehicle (RV) style plug, and we had a RV Level 2 charging station installed in our driveway.

We were very excited when the first publicly available Level 2 charging station was installed with the construction of the University of Northern BC (UNBC) bioenergy facility. But, it was not to the same standard to allow us to charge our e-truck.

It was a good day when the Level 2 J plug standard was established. This standard clarified the future direction of EV charging station infrastructure and the EV configurations. It was shortly after the Level 2 J plug standard was established that we spent the money to up-grade the e-truck to enable charging with the Level 2 J plug, and to replace the Level 2 EV charging station in our driveway to the new Level 2 J plug standard. While the Level 2 J plug standard provided a more certain and positive future of being able to charge the EV in more locations, it did mean we paid an extra cost because we had our e-truck on the road prior to the standard being put in place.

A similar situation currently exists with Level 3 and Fast Charging technologies. I stopped by to check out the new Level 3 charging station at the Prince George Hub City Volkswagen dealership and was disappointed to learn that it is not compatible with our Nissan Leaf. **The BCUC must ensure a standard is put in place as soon as possible for Level 3 charging and Fast Charging to minimize the inconvenience and extra costs EV drivers will face into the future. This will also provide for a more certain and positive future for being able to charge the EV in more locations.** A standard will reduce the need to have charging stations with multiple plugs as shown in this image:



This article about charging station standards may provide the BCUC with a little more insight to this issue: <https://www.autovistagroup.com/news-and-insights/tesla-points-opening-its-supercharger-network-other-carmakers>

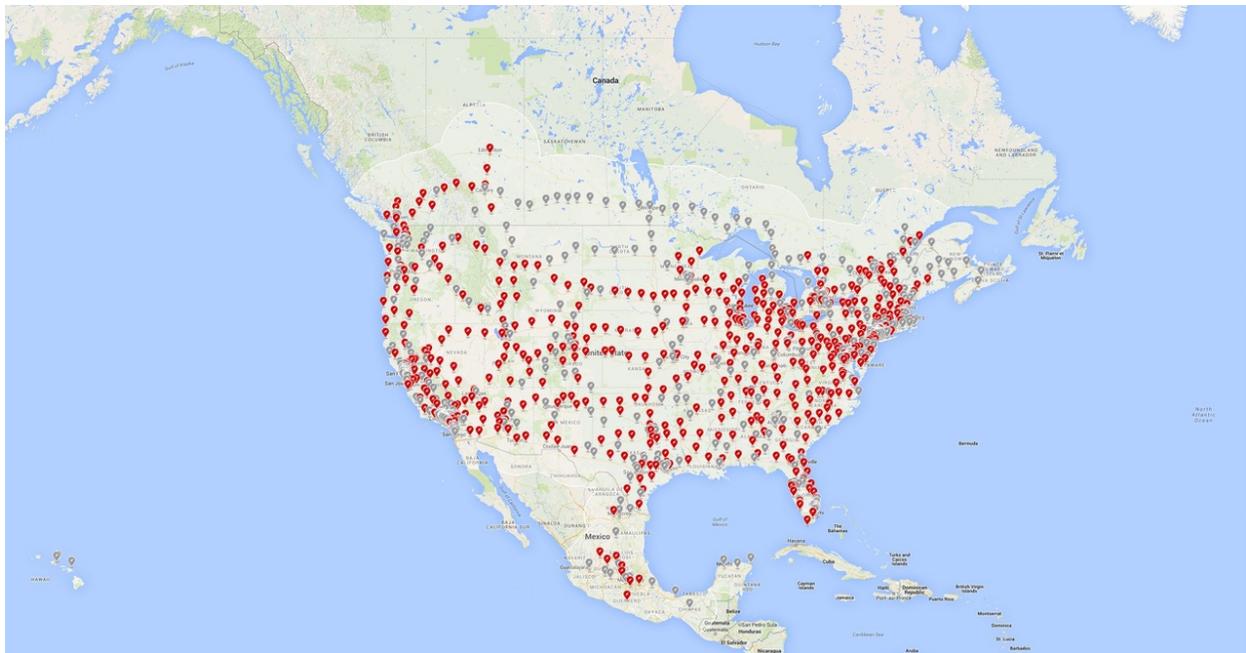
In deciding upon and establishing the Level 3 and Fast Charging standards, please respect that over 300,000 units of each the Nissan Leaf and Tesla models have been sold over the past decade. The 5,861 EV sales in BC between 2011 and 2017 include 1,717 Nissan Leafs, 1,522 Tesla Model S and 882 Tesla Model X (source: <https://www.fleetcarma.com/electric-vehicle-sales-canada-2017/>). Our Nissan Leaf has the [CHAdEMo](#) Level 3 / Fast Charging capability. It appears, there may be an opportunity to make the CHAdEMo and Tesla standards compatible. If so, this would accommodate most of the EVs that are already on the road in North America:

Charging standards  
Define hardware and software

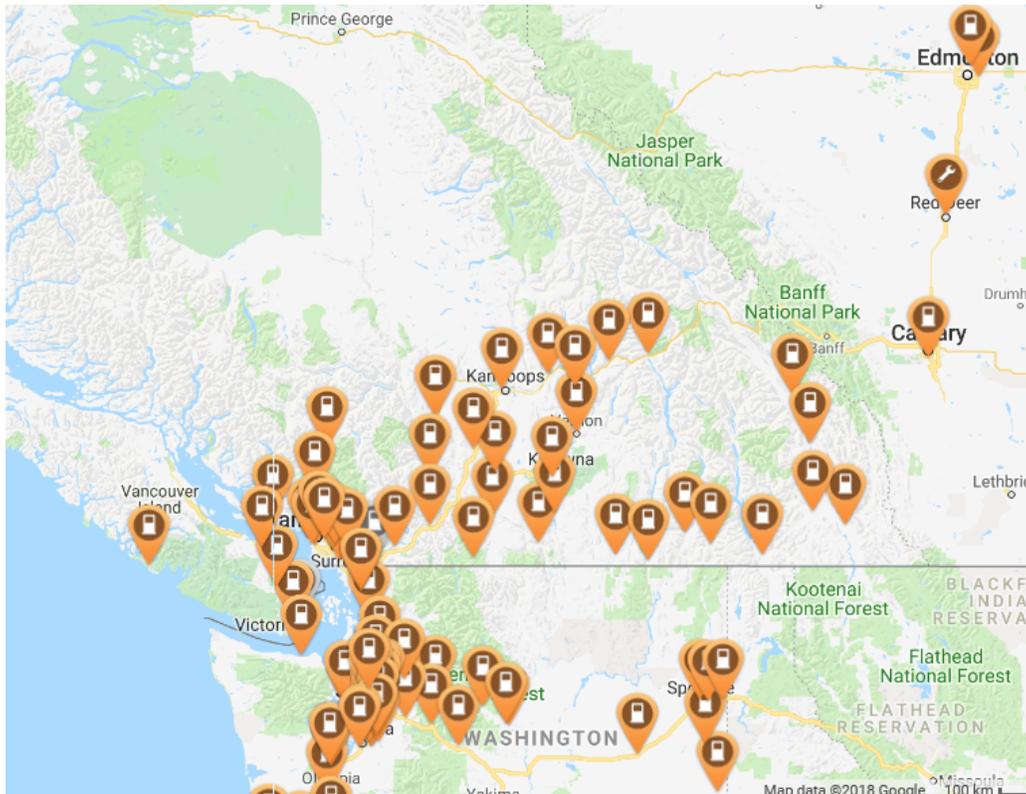
| SAE J1772 AC                                                                      | CHAdEMO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SAE J1772 CCS (Combo)                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC; < 19.2 kW                                                                     | DC; < 62.5 kW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | DC; < 90 kW                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Typical 3.3, 6.6 kW                                                               | Typical 20-50 kW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20-50 kW                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 4-8 Hour Charge                                                                   | 15-60 min. Charge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 15-60 min. Charge                                                                                                                                                                                                                                                                                                                                                                                                                      |
|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                      |
| "Universal"                                                                       |   <br> <br>  |  <br> <br> |

**ABB**

It would also enable access to the existing and quickly growing combined Tesla and CHAdEMo charging network. For example this is a recent edition of the existing and this year proposed expansion of the Tesla Supercharger network across Canada (with some information on the US included):



And this map indicating the location of CHAdeMo charging stations in BC:



Source: <https://www.chademo.com/about-us/fast-charger-maps/north-american-map/>

Since 2009, Prince George has eight Level 2 J-plug charging stations; one Level 2 Tesla charging station; and one Level 3 charging station – all of which are publicly available:

- Three Level 2 J-plugs at UNBC (pay for parking, charging is free – even though you activate the charging station with your credit card or ChargePoint card);
- Two Level 2 J-plugs at NEDCO (parking is free, charging is free – even though you activate the charging station with your credit card or ChargePoint card);
- One Level 2 J-plug plus one Level 2 Tesla at Coast Inn of the North (parking is free, charging is free);
- One Level 2 J-plug at the Hospital (pay for parking, charging is free);
- One Level 2 J-plug at Volkswagen Hub City Motors (parking is free, charging is free); and
- One Level 3 at Volkswagen Hub City Motors (parking is free, charging is free).

A few years back I was excited to see new Level 2 J plug charging stations with credit card activation being installed at the BC Hydro facility across from the College of New Caledonia (CNC) in Prince George. As I attend meetings at CNC on occasion, I was looking forward to utilizing these charging stations. But, these charging stations then had a locked fence put up around them, and they are not accessible for public use. The last time I took a look, there was a gas vehicle parked in the EV parking space behind the locked compound.

I was also excited a couple of years prior to the BC Hydro disappointment when public money supported the installation of four Level 2 J plug charging stations. One of these Level 2 charging stations, the one located at UNBC, is publicly available for all EVs. But, the other three Level 2 charging stations are intended to be used to charge 1 EV that is shared by the four institutions. That said, EV drivers have been permitted to charge at these other three charging stations (Prince George City Hall; Northern Health; and the Regional District of Fraser Fort George) with advance permission under special circumstances (emergencies of sorts).

I sure hope the Level 2, Level 3 and Fast Charging Stations being installed in various parts of the province with public funding (i.e. those being installed by various BC Government Ministries, and BC Government Crown Corporations and Agencies) are available for public EV charging. It is acceptable for Charging Station use agreements to be put in place that provides priority charging for EVs owned by the BC Government – but, it is imperative that these charging stations are available for others to utilize when not charging a BC Government EV.

The [PlugShare map](#) also indicates you can pay to charge your EV a little south of Prince George at Mama Yeh RV Park & Campground. I have not visited this site, and suspect they do not have standardized charging stations. Even so, many individuals who drive EVs longer distances have adaptors which enable them to charge from RV plugs, clothes drier plugs, welding equipment, etc. It will be very nice when this improvisation is no longer a necessary skill for driving an EV longer distances.

EVs are evolving quickly. Any regulations or standards established by the BCUC must accommodate and not inadvertently further penalize early adopters of EVs. As such, **payment for use of charging stations must be based upon the power provided, not on the time spent charging. And, there should not be any minimum charge associated with charging.** Older EVs likely charge at a much slower rate than newer EV models. Older EVs likely have batteries of diminished capacity from age and use, and as such accept less electricity per charge and require more frequent charging as compared to when they were new. In addition, the size of the battery varies by EV, with some having a full EV range of as little as 40 kilometers (Toyota Prius C) or as much as 700 kilometers Tesla Model S. Obviously, the amount of electricity involved in charging these vehicles varies immensely.

As we live outside of the Prince George City limits, the current 100+ km range of our Nissan Leaf will become a constraint when the capacity of our battery has deteriorated to less than 40% of what it was when it was new (to place into context, Nissan warranties the Leaf's battery to be better than 80% capacity after 5 years or 96,500 kms, whichever occurs first – the rate of capacity loss is quicker when the battery is new, following which the rate of capacity loss becomes much slower). In order to enable us to continue using the battery pack as long as possible, rather than facing the cost and environmental implications of replacing the battery pack earlier than would otherwise be necessary - **it is important the BCUC require the distribution of Level 2 charging stations within and close to communities to be no further apart than 1 kilometre; and the fee structure must be based on power provided, not based on charge time, and not permit the application of minimum fee charges.**

I appreciate charging our EV as frequently as possible. I charge the EV:

- when I stop at the Coast Inn of the North for lunch or supper;
- when I attend an event at UNBC;
- when I take my family dancing around the corner from NEDCO;

- when I stop in at the hospital for tests or to visit a friend; and
- when I am at home eating supper, watching TV and sleeping.

It would be terrific if I could charge the EV while having a coffee and donut at the local coffee shop; charge while shopping at the mall; charge while watching a show at the theater; charge while attending a sporting event; charge while attending an appointment; charge while visiting the library; charge while attending a meeting at the Prince George Civic Centre and charge while at work. Sometimes the charging is for 5 or so minutes while other times it could be for up to 4 hours (many EV Charging Stations request that you restrict parking to 4 hours – and out of common courtesy I attempt to move my EV as soon as I know it has finished charging).

My understanding is that it is better for the batteries (in that the total kilometers of driving and the years of service obtained from the batter pack will be greater) if:

- you do frequent partial charging, rather than fewer larger charging sessions;
- you do not discharge your lithium batteries to less than a 20% (thus, a quick charge to 80% charge is at most providing your battery 60% of a full charge);
- you limit how often you charge the batteries to a full 100%, and rather stop charging at an 80% charge;
- if you do charge to 100%, that you utilize your EV within 6 hours of charging;
- that you do not charge the batteries at all if they are already greater than 80% charged;
- that you wait awhile after using your EV to charge, to allow the batteries to cool somewhat (the batteries warm up as they are used for driving and as they are charged);
- it is better (at least with the current technology) to charge your batteries with a Level 2 Charging station than with Level 3 or with Fast Charging; and
- you do not want to quick charge your batteries, if the batteries themselves are over ~37.5 degrees Celsius (you can boil the battery).

Another item of interest, is that the regenerative breaking does not really function if your batteries are charged to 90% or greater. Thus, for locations on top of a large hill such as UNBC in Prince George, it is desirable to not fully charge your EV. With a charge less than 90%, you gain from having electricity produced by the regenerative breaking and added into your battery; and you gain through not having as much wear on the brake pads, thus less frequent brake maintenance; and society gains as less medium sized particulates are put into the local air shed.

Of utmost importance is for the BCUC to ensure locations where the EV can be parked for numerous days in cold environments (I.e. the Prince George airport) have at minimum sufficient Level 1 Charging available, though Level 2 Charging would be preferable.

The warranty book for my Nissan Leaf indicates the battery warranty is void if the vehicle is stored in temperatures less than -25 Celsius for greater than 7 days. The power from the battery will power the battery warming system as long as the battery has greater than 30% charge – but, it appears the EV must have power from a Charging station to maintain a warm battery when the battery charge fall below 30%.

Similarly for warm climate areas, the battery warranty is void if the vehicle is exposed to ambient temperature greater than 49 Celsius for greater than 24 hours. Again, the EV battery

has a coolant system, but it appears it is necessary for the EV to be plugged in to a Charging station to power the coolant system for extended time periods.

I would be comforted if agreements could be put in place around Prince George to permit EVs to plug in to Level 1 charging stations during periods of very cold weather (i.e. daily highs of -30 degrees Celsius and colder) to ensure the batteries can be kept warm while I am at work.

**I mention all of the above, as any regulations and pricing structure the BCUC puts in place must be designed to facilitate and not discourage or penalize through cost EV drivers that wish to do frequent charging. To do otherwise would be detrimental to the environment and add to the costs of EV driving. This means for the local market, EV drivers must only pay for the power they utilize; the cost of the power to the EV driver must be the same as or cheaper than the power they would obtain from home (BC residential Rate 1); and there must be no minimum charge fees. For the long-distance driving market, a reasonable cost (in proportion to the electricity provided) for utilizing the Level 3 or Fast Charging infrastructure may be added.**

One of the BCUC letters indicates FortisBC Inc. was recently approved to charge \$9.00 per 30 minutes Direct Current Fast Charging rate for FortisBC Inc. My Nissan Leaf would currently receive at the most \$1.15 worth of power within the 30 minutes, I consider paying the extra \$7.85 or greater per 30 minutes for the charging infrastructure too expensive. After a number of additional years of driving and having the battery capacity reduced further, the amount of power I would receive could be closer to \$0.60 with the cost of using the charging infrastructure at over \$8.00 per 30 minutes. This cost structure unfairly penalizes the early adopters of EVs; does not promote environmentally sound decisions as it causes an increase rate in disposal of used batteries; and unnecessarily increases the cost of EV ownership. This rate structure is not good for the environment; is not good for society; is not good helping to reduce the cost of owning EVs; and does not help to encourage more individuals to become new EV drivers.

At some point government will desire to have EVs pay for their equivalent share of the road tax (that is currently incorporated into the fuel cost for most other vehicles). While I see merit in incorporating the road tax into the fees charged at Charging stations, this will not easily address the collection of road tax for the portion of EV charging performed at home (which is where the majority of EV charging occurs). In the mean-time, the fact EV drivers are not paying the road tax is a small financial incentive to help encourage more individuals to consider driving an EV. **Recognizing the social and environmental benefits of EVs, I think the incorporation of the road tax into EV driving should be delayed until EVs have sufficiently dominated the automobile market, and adequate repair and maintenance support can be obtained locally.** This is similar to the designation of High Occupancy Vehicle (HOV) lanes, to promote preferred and desirable actions.

The limited local repair and maintenance support is a draw back from being an early owner of an EV in Prince George. I know of some EV owners in Prince George that have paid substantial expense to have their EV transported to Kamloops or Vancouver for warranty testing and work. **The BCUC should make it mandatory for all new car dealerships to have Level 2 and Level 3 charging stations, as this will help motivate these same dealerships to become certified electric dealerships which can sell new EVs and perform all maintenance, servicing and repair.**

**The BCUC must insure it is a requirement that all new commercial buildings and major commercial renovations install wiring to allow easy installation of charging stations.**

**Remote highway locations where the electrical grid is not present must have solar powered Charging stations (as they have in Ontario).**

**Recognizing the social and environmental benefits of EVs, the BCUC must ensure the price charged at charging stations is low. It may be necessary for the BCUC to ensure the owner of the charging station is provided an equivalent amount of electricity as is used through the charging station at the lowest rates charged in the province.**

**The BCUC must ensure all current subsidies that go towards the exploration, production, refinement and transportation of gas, diesel, oil and natural gas are removed.**

**The BCUC must ensure gas, diesel, oil and natural gas are taxed to cover the full environmental, social and health costs that they impart.**

I strongly advise the BCUC to respect that early adopters of EVs have often paid more in dollars and have dealt with more issues of range anxiety than future EV drivers will. For this, the BCUC must go out of its way to ensure the early adopters are not further penalized with the new standards and regulations that are established.

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

I believe there are two different markets: 1) the local market; and 2) the long-distance market. The long-distance market will overlap somewhat with serving the local market needs.

- a. At the local market, I envision the future of EV charging stations to be very competitive, with business establishments providing free charging, or charging at the cost of the electricity provided, as a means of encouraging customers to frequent their establishments. This also helps with the business image, as businesses with charging stations are seen as being environmental, social and technological leaders.

Some of these establishments will utilize charging station companies, such as [ChargePoint](#) so incoming EV drivers can more easily locate where the charging station is, establish whether the charging station is already in use, reserve the charging station for their incoming use, and to obtain other information on the charging station such as charge rate, fees, plug standards. These charging stations are able to communicate through the internet, thus can email the EV driver information on the time spent charging, the kWh of electricity that was provided to the EV and the amount the EV driver is being charged.

Other establishments will install charging stations on their own. I suspect most of these will not communicate through the internet and will be free to use (though the driver may be required to pay for parking while they receive their power for free).

The intent of using these local charging stations is not to fully charge the EV battery, but rather to provide short-term partial charging of the battery while the EV driver is tending to shopping or other short duration business.

The intent of the owners/providers of the charging stations is not to make money directly from the charging station, but rather to cater to the needs of their customers, to make it more convenient for their customers to visit their establishments, and to improve the image of their business – and thus, make more revenue through their establishment.

The charging stations serving the local market will primarily be Level 2 charging stations, as the speed of charge is not a primary motivating factor for an EV driver in selecting whether or not to charge at any specific charging station. Rather, an EV driver's primary motivation is the location of the charging station – and as there is a standard in place for Level 2 charging, there is no concern whether the EV driver can physically plug in to charge.

- b. The long-distance market will primarily provide Level 3 and Fast Charging. The provider of these charging stations will be looking to make money from these charging stations. But, the providers of these charging stations will also be looking to make money at adjoining establishments while the EV driver is waiting for their EV to charge. Coffee shops, restaurants, driving ranges.

Tesla has developed and tried out a [battery swap system](#) of charging. For a fee of about \$50 US, you drive your EV (at this time limited to Tesla's) into the battery swap bay, and in less than ½ the time to fill a gas vehicle with a tank of gas, an automated system unbolts and removes the discharged battery and installs and bolts in a fully charged battery. My understanding is that Tesla has not expanded this service through its Supercharger network as EV drivers actually enjoy a 20 to 45 minute break in their driving every 400 to 700 kms of driving and to receive a free (or much less expensive charge) rather than paying \$50 for a very fast power-up. Even so, this may become a limited option into the future.

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

EV drivers are relatively a captive customer today, but into the future they will become relatively less captive than the today's drivers of gas and diesel vehicles.

- a. In the local market:  
For the most part EV drivers will do most or all of their charging at home. But, in situations where the EV driver needs or would appreciate additional charging, the charging speed is rarely an issue . . .

In locations such as Prince George where the number of charging stations and their distribution are limited, the EV driver is captive to the selection available within the limitation of their remaining range. That said, the charging situation in Prince George

today is superior to the charging availability when we began driving in 2009.

We are captive more so to the lack of charging stations.

My experience has been that as more charging stations have been installed throughout Prince George: my range anxiety stress level has decreased; the more we have been able to drive the EV; and the driving area we are able to access with the EV has expanded. This is most noticeable when we vary from our normal routines – as, once we learn what is possible to drive with our EV, we just do it. The stress of range anxiety comes in when we want to add a new errand into our normal routine. This added stress is made worse knowing there are no charging stations where you really would be able to benefit from having one, thus there is no solution of just making some time to charge the vehicle, but not having anywhere to charge!

b. In the long-distance market:

As charging speed and location are usually issues, the customers are largely captive. If they are driving a well-established EV route with numerous charging stations, the EV driver may be able to decide a little between a few charging stations. The route taken must be pre-planned to ensure there are charging stations distributed along the entire route as necessary. Unless the frequency and variety of the charging stations are plentiful, the EV driver is captive to the charging station in the location where they are running low. The EV driver will become less captive over time as charging stations become more plentiful and through technological developments in the EV world (i.e. longer range batteries; EVs painted with spray-on solar panel). This article includes a little information on determining your EV route for longer distances

[https://www.greencarreports.com/news/1116106\\_why-i-traded-my-chevy-bolt-ev-for-a-tesla-one-readers-story](https://www.greencarreports.com/news/1116106_why-i-traded-my-chevy-bolt-ev-for-a-tesla-one-readers-story)

Once the BCUC has established the Level 3 and Fast Charging standard, the BCUC must facilitate the creation of one source for locating all of these charging stations, and for automatically planning potential routes with charge time calculations.

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

The BCUC must regulate charging station infrastructure provided by EV charging stations, to ensure the charging stations are safe, and to ensure all EV drivers are able to charge at all charging stations.

The BCUC should impart its influence to facilitate, promote, encourage and assist the installation of more charging stations throughout BC.

**The first issue the BCUC should address immediately, is the establishment of a plug standard**

**for Level 3 and Fast Charging.** This certainty will make it easier for individuals/companies to put in a charging station. This will also make the future of driving an EV easier.

The BCUC should make it mandatory for all new commercial construction and major commercial renovations to include wiring to allow the future plugging in of Level 3 and Level 2 charging stations.

The BCUC should make it mandatory for all new strata construction and major strata renovations to include wiring to allow the future plugging in of Level 3 and Level 2 charging stations.

The BCUC should make it mandatory for all new residential construction and major residential renovations to include wiring to allow the future plugging in of Level 2 charging stations.

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)?

Recognizing the social and environmental benefits of driving EVs as compared to driving gas or diesel vehicles, the rate design of EV charging stations must encourage EV drivers to continue driving their EVs, and must encourage more drivers to choose to drive an EV.

**The BCUC should remove all existing subsidies granted to the oil and gas industry. The BCUC should then ensure extra fees are added to oil, diesel and natural gas reflective of the harm they do to society. Similar to how we tax tobacco.**

The BCUC should establish a rate structure such that the providers of charging stations are charged the lowest rate possible for all power that flows through their charging stations. A rate structure that should remain in place until the adoption of EVs and the charging station infrastructure is well established.

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?

I do not know what the public utility's existing wholesale or commercial retail rates are.

Recognizing the social and environmental benefits of driving EVs as compared to driving gas or diesel vehicles, the BCUC should ensure EV charging stations are charged the lowest rate possible for all power flowing through the charging station. This low rate must encourage EV drivers to continue driving their EVs, and must encourage more drivers to choose to drive an EV. This rate must enable the charging station owner to sell electricity to the EV driver at the same cost or less than the BC Residential Rate 1 price.

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

It is not clear what you are asking with this question. The BCUC needs to clarify and provide more information to understand the consequences of this option.

If you are asking whether BC Hydro should establish, maintain and financially gain from the sale of electricity from charging stations, then the answer is yes. Recognizing the social and environmental benefits of driving EVs as compared to driving gas or diesel vehicles, government money should be provided to BC Hydro to establish a network of charging stations throughout the province. In this way, the entity of BC Hydro would not face the initial cost of establishing this infrastructure, and would not need to pass on this initial cost to EV drivers or its other customers.

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?

The current structure unduly discriminates against EVs to the advantage of gas and diesel fueled vehicles. Changes must be made to ensure the users of gas and diesel pay more to cover the social, environmental and health costs of their fuel choice. Changes must also be made such that EV drivers have easy cost effective access to electricity to charge their vehicles. While the electrical distribution system is well established within BC, the access to this electricity to EV drivers is extremely limited.

I look forward to hearing what from my input the BCUC will attempt to address, will attempt to get others to address and for the remaining issues, why they are not to be addressed.

I intend on joining the video meeting on April 16<sup>th</sup>. I am willing to answer questions or to provide any clarification during that meeting, or at any other time.

Thank you for providing me this opportunity to share my experience, thoughts and suggestions. I hope you find my input of some assistance with your review.

Yours truly,

Doug Beckett 