BrightSide
Solutions

2855 128 Street, Surrey, BC, V4A 3W9
Ph: 604-314-1990 www.brightsidesolutions.ca

June 5th, 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:

Please fine attached BrightSide's reply to BCUC IR1

Sincerely yours,
BrightSide Solutions

Mark Grist
President

BrightSide Solutions Inc. Response to BCUC IR 1

A. INVESTMENT DECISION Reference: Exhibit C23-2, p. 4 1.0 Competitiveness

On page 4 of Exhibit C23-2, BrightSide Solutions Inc. (BrightSide) states: 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.

1.1 Please elaborate further, in the view of Brightside, the reasons that public utilities' involvement in EV charging owning/operating would constitute unfair competition. 1.2 Does BrightSide view that private third-party investments will favour a certain level of charging (e.g. Level 1, 2, and/or 3)? Please explain the investment considerations for each. 1.3 Which market segment will be better served by private third-party investments as opposed to public utilities? Market segments may be considered as shopping malls, fueling stations, apartment buildings, rural highways, etc. Please explain. 1.3.1 Conversely, which market segments will be better served by government spending and/or utility investments? Please explain. 1.4 In BrightSide's view, if the regulatory definition of public utility did not apply to EV charging infrastructure to site hosts/third-parties, would private investors 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. Reference: Exhibit C20-2, p. 6 2.0 Exhibit C15-2, p. 2 Exhibit C23-2, 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.

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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.

BCUC IR 1.1.1 - Please elaborate further, in the view of Brightside, the reasons that public utilities' involvement in EV charging owning/operating would constitute unfair competition.

BCUC IR1.1.1 Response: Public Utilities have many levels of staffing that may contribute to the EV Charging business activities. These range from back office systems through to technicians. The true costs of providing these services including overheads are generally covered by all rate payers and the EV

charging activities free ride on this existing infrastructure. In contrast new entities wishing to provide such services have to recover all costs from the market that they are serving.

BCUC IR 1.1.2 Does BrightSide view that private third-party investments will favour a certain level of charging (e.g. Level 1, 2, and/or 3)? Please explain the investment considerations for each.

BCUC IR 1.1.2 Response: Third party investments would track the strength of the business opportunity and not the type of charging. For example, a charging station provider may build a business case around a minimum purchase at a restaurant during the charging. The type of charging provided would depend on the typical length of time spent during the other activity – likely Level 3 in this example. Alternatively, the charges might be based on a convenience factor – such as having a guaranteed reserved spot for a fee to charge quickly along a major transport corridor such as Hwy 3. A longer duration activity, such as shopping at a mall, may provide only a level 2 solution. By changing who can provide solutions, a myriad of alternatives will emerge, at different price points targeted on what is providing value to the customer.

BCUC IR 1.1.3 Conversely, which market segments will be better served by government spending and/or utility investments? BCUC IR 1.3.1 Conversely, which market segments will be better served by government spending and/or utility investments?

BCUC IR 1.1.3 Response: It is not clear that government involvement or utility involvement is required. There are many companies who have expressed interest in serving this emerging market as is evidenced by the respondents to this enquiry. A mix of govt and private sector solutions creates business case uncertainty and this will slow down the development of private sector solutions. Particularly if public sector or utility solutions do not bear the full costs of their service.

BCUC IR 1.1.4 In BrightSide's view, if the regulatory definition of public utility did not apply to EV charging infrastructure to site hosts/third-parties, would private investors be able to charge a fee for EV charging services and still successfully compete with free EV charging from entities such as municipalities?

BCUC 1.1.4 Response: Free EV charging from govt entities should not be encouraged. It undercuts the business case for the development of a private sector network of charging solutions. The continued provision of free charging is actually retarding the development of the longer term solution. As indicated in BrightSide's earlier submission, EV's have a strong competitive advantage with respect to fuel cost. There is no need to subsidize this activity. If subsidies are desired to encourage more EV's they should be provided directly to the EV owners through capital cost incentives, which is where EV's presently have a competitive disadvantage.

2.1 Please comment on AddÉnergie and Greenlots' statements with regard to a lack of private thirdparty investment.

BCUC IR 1.2.1 Response: The primary reason that privately provided public fueling infrastructure has not emerged is that it is not possible under today's regulations. In addition, private investment is not flowing to this area because there is uncertainty regarding how much "free" charging will be provided by govt entities. This has effectively polluted the market for private investments.

On page 2 of Exhibit C23-2, BrightSide states: There are no significant barriers to entry into this market, other than the present regulatory barrier and there are a number of [third-party] entities that wish to provide this service.

2.2 Please discuss the investment returns and risks for private third-party entities to enter into the EV charging market. 2.3 In a competitive market, there are low barriers to enter and exit. Please discuss the potential issues, if any, should EV charging service providers freely exit the market at any time. For example, are there concerns that certain market segments (e.g. low density areas) may be underserved by private third-party entities if those markets tend to be uneconomical or unprofitable? If there are concerns, how could they be resolved? If no concerns, please explain why. 2.4 What regulatory barrier do private third-party entities face when owning or operating the various levels of charging stations? Please elaborate.

BCUS IR 1.2.2 Please discuss the investment returns and risks for private third-party entities to enter into the EV charging market.

BCUC IR1.2.2 Response – A high level example is the business case for provision of a Level 3 Charging station for $150,000 located along a major Hwy such as Hwy 3. If the station provider establishes a reservation system for a charge of $10 for an hour of charging, and is successful in booking 10 vehicles per day, the revenue generated would be $35,000/yr which would payback the investment in only 4 years. The certainty of having charging available is well worth the reservation fee. Alternatively, if the customer purchases $50 from an associated restaurant while charging the fee may be reduced or eliminated. An alternative service may also be provided to those that wish to use the charger without guaranteed access or who may have time to charge from a Level 2 charger. Various pricing models may emerge to serve the wide variety of needs and interests. It should also be noted that if the price for charging was $0.11/kwH, that the cost per Gasoline Litre Equivalent would be $1.09 and the reservation fee would add ~20 cents per GLE based on a 50 litre equivalent charge. This would still leave the EV with a substantial competitive advantage versus gasoline, even when it is using a premium fueling service.

The relatively low cost to enter this market, the synergies with existing businesses such as restaurants and the very large potential upside as the EV market continues to grow indicates that the investment would be attractive. The major risk that needs to be eliminated is the potential that a public entity can move into the space and provide free or heavily subsidized pricing to undercut the private station owner's investment. If that risk is removed station investment with creative business models will follow.

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 20171

(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.

1 http://www.georgetownclimate.org/files/report/GCC-MJBA_Utility-Investment-in-EV-Charging-Infrastructure.pdf

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2.1 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.

Response to BCUC IR 1.2.1 – BrightSide believes that all 4 models are inappropriate. The proper role for the utility is to provide electricity to the charging station at a cost that reflects the true Cost of Service of providing that energy. Continued involvement downstream of the meter pollutes the market for private service providers and generates business risk to creative business models because the utility or government entity generally has an ability to provide service for less than the true cost. Eliminate this risk to private investment and BC will see private sector providers step up to provide creative solutions.

B. TECHNOLOGY Reference: Exhibit C23-2, p. 2 3.0 Safety of EV charging

On page 2 of Exhibit C23-2, BrightSide states: 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: vi. The safety of EV charging has been demonstrated to be at least equivalent to the dispensing of conventional vehicle fuels.

3.1 Are there any reports and/or studies to support that the “safety of charging has been demonstrated to be at least equivalent to the dispensing of conventional vehicle fuels”?

BCUC IR 1.3.1 Response – BrightSide does not hold itself out to be an expert in the area of the relative safety of EV charging versus gasoline charging. A search on the subject indicates that there is not a body of evidence around safety incidents associated with EV charging. The reported incidents are related to the operation of the EV’s and damage to them from road hazards. Nevertheless, the reported rate of incidents is far lower than the reported 150,000 vehicle fires from gasoline.

https://www.energy.gov/eere/electricvehicles/electric-car-safety-maintenance-and-battery-life

https://www.nfpa.org/-/media/Files/News-and-Research/proceedings/AlternativeEnergySimonian2.ashx?la=en&hash=095149F2B1F1CCAF528FD1D15A6E839FAFE69C64

https://www.scientificamerican.com/article/battery-fires-in-electric-cars-danger/

C. RATES Reference: Exhibit C23-2, p. 3 4.0 Rate design

On page 3 of Exhibit C23-2, BrightSide states: 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)

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From this high-level assessment, it is clear that even with a [Cost of Service] 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.

4.1 Please explain what considerations BrightSide has made regarding capital expenditures and other operating costs outside of fuel costs when assessing a COS based rate.

BCUC IR 1.4.1 Response: As indicated in the quote, BrightSide did not make any provision for allocating the capital cost of the charging station in the referenced section above. This was because the capital cost of a charging station can vary substantially based on the type of charging. Please refer to BrightSide Response to BCUC IR 2.2 above that shows how one particular scenario involving the recovery of the most expensive charger would affect rates paid by the driver. In the example a $10 reservation fee results in a capital recover over 4 years and would add ~20 cents per Gasoline Litre Equivalent cost to fuel. This recovery still leaves EV users with a strong competitive advantage over conventional fuels.

D. HYDROGEN FUEL CELL TECHNOLOGY Reference: Exhibit C23-2, p. 1 5.0 Fuel Cell Electric Vehicle (FCEV)

On page 1 of Exhibit C23-2, BrightSide states: 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.

5.1 Please discuss whether BrightSide has involvement in FCEV and/or FCEV fueling infrastructure.

BCUC IR1.5.1 Response BrightSide has previous experience with FCEV fueling infrastructure dating back to 2001

5.1.1 To the best of BrightSide's knowledge, what is the typical business model of public hydrogen fueling stations?

BCUC IR1.5.1.1 Due to very few FCEVs on the road, the typical business model for a fueling station relies on heavy levels of subsidization by government entities. Typically, developers are private entities, but the capital and operating cost of the installations is heavily subsidized. An example is the recently announced set of 6 hydrogen stations for Vancouver and Victoria which is being subsidized by Part 3 credits under BC's Renewable and Low Carbon Fuels Regulation.

5.2 In BrightSide's view, from a charging infrastructure perspective, please compare and contrast the pros and cons of FCEVs relative to battery electric and plug-in hybrid electric vehicles.

BCUC IR 1.5.2 Response: In general the market for EV's is far more advanced than the market for light duty H2 powered FCEV's. There is no ability to generate a profitable business model for fueling H2 FCEVs given the level of market penetration, without heavy subsidies. The cost for H2 fueling stations is also much higher than the cost for EV charging.

5.3 In BrightSide's view, from a user perspective, please compare the pros and cons of FCEVs relative to battery electric and plug-in hybrid electric vehicles.

BCUC IR 1.5.3 Response: This is beyond the scope of an IR to properly address, However some general points can be made:

- The reliability of EV's is far higher than FCEVs.
- Both platforms suffer from range anxiety and limited fueling options
- Fueling options for EV's are more available than for H2
- Hydrogen is expensive to distribute and H2 storage is expensive and bulky
- FCEV technology has not been developed to the same commercially ready standards that EV's have.