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House of Commons Standing Committee on Environment and Sustainable Development

Merci/Thank you Mister Chair for inviting us today to share our industry knowledge with the Committee for the Zero Emission Vehicles study.

LeadingAhead Energy is a Canadian company operating in the electric vehicle charging infrastructure industry across Canada and recently in the US. We believe in providing innovative solutions disturbing the industry status quo by providing advisory on industry best practices supporting solutions offering flexibility, futureproofing, and market competition. As a result, we have worked on multiple level 2 and 3 charging infrastructure projects providing turnkey solutions assisting with the entire process from government grant applications, project management, to supplying and installing the charging equipment. After designing and completing the first handicap accessible Fast Charger site in Squamish, BC Hydro used our model for its new DCFC guideline as innovative design. As president of the company, I also sit on the Electric Mobility Canada's Board of Directors.

As we are engaging with all industry stakeholders, from our experience, the significant lack of education on EVs in general is clear -- from range anxiety, to knowledge of existing charging infrastructure, to the misunderstanding of the EV life cycle, all of which contribute to the spread misinformation. Further, EVs still come with a higher price tag today. Unfortunately, lending companies do not factor in the savings for financing. The lack of education is also current by professionals being educated by corporate interests instead of industry learning.

Time of charging is major concern before buying an EV. Several utility companies and other private investors have done incredible work to deploy DCFC chargers coast to coast. We consider this "stage one" of deployment, since the vast majority are 50kw of charging speed and are only equipped with one unit on site. With longer range batteries, 1 to 2-hour of fast charging is required on 50kw, assuming there is no "line-up." We are now at the "second wave" of DCFC deployment bringing High Power Charging ranging from 100 to 350kw with the

capability of charging multiple vehicles at the same time at a faster rate, thereby reducing charging time for long range EVs.

LeadingAhead Energy has been working on many charging infrastructure projects using Open Charge Point Protocols (OCPP). We believe this is essential to create market competition, industry innovation, avoid stranded assets, and to reduce costs. There is also something to be said about the importance of flexibility and futureproofing of the equipment that is using government funding in a growing market, adding industry players instead of creating monopolies. Contrary to some beliefs, OCPP is not an inferior protocol as we have experienced 100% uptime on our latest projects. Following Europe's lead a few years ago, Open protocol OCPP 1.6j has been added as a requirement in the latest CleanBC Public Charging rebate program, which is an important step toward interoperability between charging stations and network providers. An initiative that other government programs should follow.

The Clean Fuel Standard (CFS) is definitely one of the most important and unknown pieces of legislation to help achieve the goal of reducing Canadian carbon emissions. LeadingAhead Energy like many others in the industry, is very supportive of the new CFS format allowing generation of carbon credit from the EV charging stations. It would be important to ensure that the credits are being returned to the investors of the projects and not the network providers as written in its current format. This would help incentivize investors - mostly real estate managers and utilities - to reinvest the proceeds into the further expansion of charging infrastructure. By having network providers receiving these credits, we are running a high risk of further creating a market monopoly by shifting the buying power from the investors' hands into the network providers' hands as network providers typically do not currently invest in EV charging infrastructure projects.

Canada has already put several successful programs into place to accelerate the adoption of electric vehicles across the country. The implication of provincial support has also been a key factor in further adoption of EVs, which was mentioned multiple times on the November 2, 2020 meeting. The uptake in EVs in Quebec and British Columbia is a clear indicator of that, due to provincial support. Programs like ZEVIP, EVAFIDI and iZEV are still required until we reach a higher number of EV adoption in order to attract private investments to carry all of the financial risk.

Like many other countries have proven, a ZEV mandate also plays a crucial role in ensuring the supply of EVs in Canadian dealerships. It is important for people who lease vehicles to be able to have access to an EV without the 3-6 months waiting period that Canadians are experiencing. It has been a great win for Canada to reopen the GM plant to build electric vehicles, however, it would also be prudent to ensure that it supplies domestic dealerships as well as international markets.

LeadingAhead Energy is grateful to have the opportunity to share its market knowledge with the committee. The benefits of electrifying Canada's transportation will not only come from electric vehicles, but the industry as a whole who support the entire life cycle of an EV -- from resource extraction to recycling to repurposing, engineering, consulting, and so on. There is a tremendous number of opportunities in the electrification of transportation and government regulations as well as incentives that will all be major players in determining the success of Canada on the national and international front.

Since we are deeply involved in many areas of the industry and consistently in communication with all stakeholders, we would like to cover a few points in detail that we deem of great importance for the zero-emission vehicle committee.

Education

There has been a lot of effort to provide government incentives to build the EV charging stations across Canada on the level 2 and level 3 infrastructure. Even though we are not at a point were incentives should be removed especially for level 3 charging stations, the amount of infrastructure has increased significantly since I purchased my first EV four years ago, in BC. (It has not been the case in other provinces.) The issue is around educating people on where the charging stations are. Most Canadian drivers are not aware of the many EV mobile apps available showing where charging stations are located. Since a DCFC sites aren't typically positioned on a major street corner with a branded canopy like gas stations, they are going unnoticed by most people. There is also the education about charging times, battery sizes, sustainability of a vehicle in which studies show that 98% of a battery pack is recyclable, with infrastructure and knowledge to recycle it here in Canada. Many articles about EV on the news that aren't always accurate further spreading the anxiety and misinformation of Canadians about EVs.

Providing accurate information on the market about retrofits in a condo building process and costs can be quite alarming. NRCan will be publishing an "EV Condo Guideline" in a few weeks in which we proudly contributed. We have been invited to focus groups conducted by municipalities where an average of a thousand dollars to bring electricity to each underground stall has been mentioned without any consideration for potential upgrades, electrical room capacity, new transformers, new panels, and potential services upgrade. In which case the cost of installing just the electrical infrastructure may not make financial sense for a condo building. These people will rely mostly on public infrastructure for the majority of their charges.

Job Creation Opportunity

Many jobs are creating from this industry and LeadingAhead Energy is a great example of that. There are many small businesses that don't make the news but are creating a real impact on innovation as well as adding work and hiring staff. Often forgotten, there is a lot of additional work created for electrical contractors coast to coast as well as engineering, civil work, consulting only for charging infrastructure projects. This isn't counting manufacturing, battery recycling, mining, charging infrastructure, and so on.

New Build EV Regulations

This is an essential for the increase in EV adoption. The ability to charge at home is one of the greatest conveniences of owning an EV which statistics showed that 80% of charging is done at home. New build EV Ready regulations like most municipalities around Metro Vancouver have adopted is crucial for future-proofing a building that will last over fifty years. The essential part of a building isn't to install charging stations but ensuring that the electrical infrastructure is there to then install charging stations at any stalls. Failing to do so will create additional garage orphans relying on public infrastructure and building new "obsolete" buildings.

With new load sharing technology from circuit sharing, panel sharing, smart panels, dynamic load management and more, it is important to also keep investing innovation on vehicles and charging solutions. Regulations can mandate the ratio of load sharing to fulfill a minimum of kWh hour of charge required in a period of time. It results in reducing the developers' costs of construction and lower the pressure on the utility provider. Smart solutions can also manage the electrical load around peak demand for example as well as V2G when market ready.

Public Charging

Why increasing public charging if 80% of all charges are made at home? Because that percentage will rapidly change. Most people who could initially afford any EV at an early stage were wealthier households where they typically live in a single-family unit making it easy to install a home charger. As the market increases with more EV models available and the beginning of the used EV market, it is now accessible to the average household on a lower budget. This is where public infrastructure is so important. In urban areas, many will be parking on the streets or won't have the capacity to upgrade and retrofit an older condo building (garage orphans). All of these people will rely on public infrastructure like they have been relying on gas stations. We believe that charging once a week on a level 3 charging stations, as it is already the case in Europe, will be the norm for garage orphans making the business case for level 3 charging more appealing to the private market.

Direct Current Fast Charger (DCFC)

As technology advances, so should the regulations and government incentives program. One of the strong arguments against EV is also charging time. Most of Canada's DCFC infrastructure is on 50kw charging stations requiring a mid-size EV one hour for a full charge, two hours for any incoming SUV or light duty vehicle (pick-up). That charging time will never be acceptable for the majority of the public. What is needed is a High Power Charging (HPC) system where the charging unit is separate from the user unit making the system scalable from 100kw to 350kw+ while charging multiple EVs simultaneously. Essentially, the power unit can load manage the power depending on the vehicle charging capacity. Installing single use 50- 100kw fast charging stations is not efficient, especially when better solutions are available. If a Nissan Leaf capable of charging at a 50kw rate, there will be 50kw of unusable power creating a potential line-up of EVs waiting to charge; the EV drivers' worst nightmare. If you had a HPC system, it would be possible to provide the unused 50kw to charge a second vehicle and potentially adding more

user units at a later date, therefore future-proofing the sites. There are also new technologies capable of charging two EVs simultaneously on the same charger, which wasn't possible in the past. It isn't just about providing charging infrastructure but rather building the right infrastructure that will last especially if Canada is to use taxpayers' money to help develop public charging infrastructure.

Government Incentives

Incentives are clearly essential to kick start the industry like it has been used to kick start many others and keep supporting some. The private market is still currently on the fence to install public EV charging stations. As we have seen in Ontario, without incentive we would see very little public infrastructure until the number of EVs rises.

As there is still a strong case for a scrap-it program like the one in BC, we believe it should only be applicable to pure battery electric vehicles used or new. If we were to want to install a lot more stations in condos at half the costs, we would highly suggest removing the mandatory networking element of it. Many condo buildings would like to install a few level 2 charging stations in the visitor stalls but are deterred by the hefty monthly networking fees from some of the companies especially when the related equipment cost can also be significantly higher. Network solutions are bringing numerous advantages which is important in the evolution of the market and future electricity management, however in no means is it required in all scenarios.

Incentives for DCFC are still very well needed as it's become less important for level 2 even though we are still seeing the need for a foreseeable future. It would also be important to look into the business models of businesses in which the grants are being allocated. In some cases, the business model of a EV charging and network provider can lead into creating a monopoly on the marketplace as the model works on a proprietary solution locking the proponent of the government incentive program with the vendor for the lifetime of the charging stations. The new CleanBC rebate for public charging is a great example of advancement mandating Open Charge Point Protocol (OCPP) 1.6j to avoid future monopoly scenarios allowing charging stations to freely connect to other network providers.

Manufacturers

We are not best suited to speak about OEMs as we are not directly related to the EV manufacturers. However, there is a clear need of supply in Canada preventing months of wait time for a new vehicle. A strong ZEV mandate nationwide would be a great initiative to resolve the issue as well as mandating a certain amount of EVs manufactured in Canada to supply the Canadian market.

Open Charge Point Protocol (OCPP)

OCPP 1.6j (and higher) is the main protocol used in Europe and elsewhere on the planet. It is widely adopted because the charging station (hardware) and the software (network provider) are offered by two different companies. In North America, we have major players who are working on a proprietary business models where they manufacture the charging stations and

build their own communication protocol to their own software making their network the only network to work on the charging unit, therefore locking-in the client into their services for the lifetime of the hardware. This is highly concerning since a lot of the charging infrastructure has been, in-part, subsidized by various level of governments slowly creating monopolies in a very young industry. There are Canadian companies doing great innovative work providing open solutions however, they are not heard of due to lack the fund for full-time lobbying/PR staff. Most of European countries have implemented OCPP mandates on all government programs and public RFP further helping innovations and interoperability on the market. CleanBC has been the first government entity to move ahead with such requirement in Canada with its new Public Charging program. An initiative we would recommend other governments to follow.

Open solutions create market competition increasing the amount of technologies available at a cost reduction on hardware and networking fees. It also gives the chance to new Canadian companies to be created and being competitive in the marketplace.

Sustainability and Charging Infrastructure

Coming from a business sustainability background, LeadingAhead Energy is always cautious about the overall impact of market opportunities. In this case, it's worth mentioning that while working toward making the vehicles cleaner, it's just as important to ensure the sustainable lifetime of the charging infrastructure that we are implementing in the market. Currently, we are seeing instances where workable charging stations are being replaced with new ones for software updates incompatibility or a new network provider gained a contract replacing 2-5-year-old equipment. Even though no known studies have been conducted on the topic, it would be important to avoid creating an industry similar to cellphone where charging stations become a disposable item.

Clean Fuel Standard (CFS)

This new piece of legislature is a key component in reducing Canada's green gas emission. The CFS could easily replace a many government led incentives to public infrastructure depending on the format it chose to go for. In the current format, the network providers would collect the carbon credits to reinvest in the EV charging infrastructure, which is a great risk to further increasing monopoly of network providers, deterring additional private funding for projects, and shifting the buying power from the investor to the network provider. If the investor is spending money on a project, they should be getting the carbon credits generated from the charging stations they paid for, not the network providers. A similar analogy would be the if an investor goes to the bank to invest money, the investor will put the upfront capital, pay bank fees, and the bank would keep the interests generated from the investors' initial capital.

It also removes the Open hardware manufacturers out of the game (such as Siemens, ABB, EVBox, and others) since they do not provide their own network but rely on open network operators to integrate with their equipment. Since there has been no consultation with the investors on the CFS committee, we highly suggest conducting studies with all stakeholders involved in the process of EV charging implementation and not only with the EV industry.

Other Vehicles

There are a lot of other vehicles to be electrified such as long-haul, marine transports, air traffic, and rail. Even though we are not directly related to the industry, we do believe this would be best served with hydrogen in the future for as technology is in constant improvement.

Thank you once again for having us today as a witness for the Zero Emission Vehicle study. We believe that there is an abundance of market opportunities to be seized from this worldwide growing industry. We also believe that education and a fair distribution of public funding to futureproof Canada's charging infrastructure in order to deliver what is required by the market are key ingredients to the success of zero emission vehicles. There is a tremendous amount of quiet, profitable Canadian small businesses in this sector that people are not aware of, due to the lack of public relations budget and overwhelming noise. These companies are creating employment every week and are creating new technologies and services in a fast-changing industry. Electrifying the transportation sector in Canada is not just about the environment objectives but building an economy for the future.

Please do not hesitate to contact us for any further questions.

Sincerely,

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