

Electric Vehicle Adoption Proposals in Alberta

Terms of Reference

Introduction:

Electric vehicle adoption in Alberta may be one of the best initiatives that our government and the people of Alberta can make for long term drops in greenhouse gas emissions and sustainability of our environment. This document is an attempt to open up the conversation and stimulate this action.

We hope that by making the suggestions to government, it will show a grassroots movement for positive change.

Thank you for taking the time to review this document and our proposals.

Who We Are:

This set of documents represents Alberta electric vehicle owners. We are electric vehicle enthusiasts, renewable energy supporters, environment supporters, friends, neighbours, taxpayers and voters.

Why Electric Vehicles Are Important:

Electric vehicle adoption in Alberta has been a very slow process, but has a very progressive and forward thinking group of trailblazers attempting to turn it to the preferred version of vehicle ownership.

Electric vehicle (EV) ownership is a very important piece of changing our way of life. EVs hold the potential of significantly cutting back on our greenhouse gas emissions (GHGE), resolving urban noise pollution, cutting health care costs, creating a stimulation of the economy and even effect change to the Alberta energy portfolio.

At the moment, transportation causes an estimated 23% of greenhouse gas emissions in Alberta and is said to be the second largest only behind the oil and gas sector, according to the Government of Canada^(*1). Alberta has over 3,565,275 registered vehicles as of 2015^(*2), which is an increase of almost 50% since 2004. When we combine this with 90% of our electrical power creation being from burning of coal and natural gas, it is no surprise that Alberta was the top emitter of GHGE in Canada for 2014^(*3).

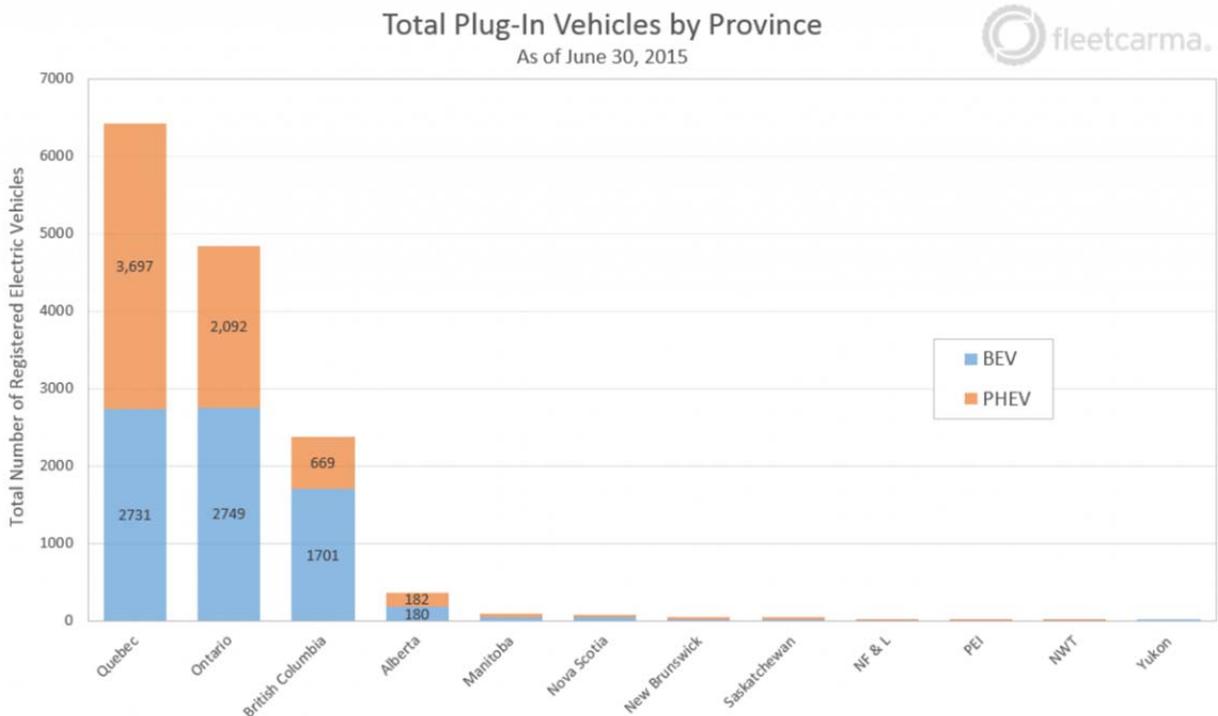
For roughly 87%^(*4) of the North American population, electric vehicles are the most practical means of transportation based on the range the vehicle is able to drive, distance required to travel for daily use, cost of operation, fuel consumption and pollution created.

The average internal combustion engine (ICE) vehicle creates 4.7 metric tonnes of CO₂ per year^(*5). Based on the 2014 numbers of registered vehicles in Alberta of 3,310,749^(*6), we are producing 15,560,520 metric tonnes of CO₂. If we could migrate just 50% of the ICE vehicles to EVs, we would save 7,780,260 metric tonnes of CO₂ emissions per year.

By migrating away from ICE vehicles and their burning of fossil fuels, we could meet and exceed GHGE goals set in the Alberta Climate Leadership Plan of 2016. Moreover, this is a transition that could be made by the public, making a real difference without a major impact on daily living or lifestyle; in fact, it would improve not only air quality and health, but also cut down noise pollution.

We have the ability to take this farther if we compound this migration of electric vehicles with the creation of renewable energy systems like wind and solar, cutting our requirements of coal and natural gas for energy creation, thereby resolving the problems of migrating from one fossil fuel source to another for transportation.

Alberta currently has a slow adoption rate of electric vehicles when compared to Quebec, Ontario and British Columbia, where the provincial governments have supported EV adoption.



BEV (Battery Electric Vehicles)

PHEV (Plug-in Hybrid Vehicles)

Table 1 ^(*7) ^(*8)

It should be noted that compared to other provinces, the interest in migration to electric vehicles is present in Alberta based on the purchases of the early adopters.

Understanding Electric Vehicles and the Issues:

Electric vehicles have a few problems that need to be understood and overcome.

First and foremost for the consumer is the fear of range the vehicles offer for use. Electric vehicle technology is becoming better and battery technology is increasing the ranges of the vehicles yearly; however, this is doing little to resolve the belief that the electricity is going to run out before the trip is complete.

For this reason, there are several options in the EV world.

We have hybrid electric vehicles (HEV) which use fossil fuels to produce electricity to power the vehicle. Although somewhat more efficient than a straight fossil fuel vehicle, they still require fossil fuels, oil changes and standard combustion engine maintenance. They also still produce GHGE. What these do offer is the ability to relieve the fear of there not being enough power to complete a trip. These are the most common in the marketplace and have the least positive impact on change.

The second choice is the Plug-In Hybrid Electric Vehicle (PHEV). These vehicles, like the hybrid electric vehicles, still have a combustion engine that can produce electricity to power the vehicle; however, they also offer up a plug-in adapter to allow for direct charging. The battery electrical storage distance in these vehicles is usually small (around 30 – 50 kilometers) before the engine must cut in to produce power or the vehicle requires a charge. These vehicles still require fossil fuels, oil changes and standard combustion engine maintenance; they also still produce GHGE. Like the HEVs, they offer an ability to relieve the fear of there not being enough power to complete a trip. These vehicles are less common and offer a limited positive impact on change.

The third choice is the Electric Vehicle or Battery Electric Vehicle (EV or BEV). These vehicles run completely on electrical power stored in a battery. The distances achievable are determined by the battery size, with the lower end distance being around 100 kilometers on a charge to the new ground-breaking battery levels of 507 kilometers on a charge. These vehicles make up less than 2% of registered vehicles on the road today in Alberta, but have the highest levels of positive impact on change.

The options in the vehicles are impacted by a secondary issue of price. When compared to combustion engine vehicles, entry level EVs are 15% – 35% more expensive on average to purchase new, even when excluding high end models that can be thousands of dollars more expensive. Although the potential savings on fuel and maintenance over time can compensate for the difference in initial expense, cost is a deciding factor and inhibitor for making the transition.

Other provinces (British Columbia^(*9), Quebec^(*10) and Ontario^(*11)) have established support for the transition to electric vehicles by offering up incentives and rebates for EV ownership, as well as installing infrastructure for charging stations. This has had a dramatic increase in adoption of EVs.

Total Canadian EV Fleet

As of June 30, 2016



Row Labels	Province/Territory													Grand Total
	Alberta	British Columbia	Manitoba	New Brunswick	Newfoundland & Labrador	Northwest Territories	Nova Scotia	Ontario	Prince Edward Island	Quebec	Saskatchewan	Yukon		
BEV	282	2917	65	16	3	2	67	4045	8	4689	29	2	12125	
BMW I3	1	129						79		39	1		249	
CHEVROLET SPARK		2		1				14	1	78		1	97	
FORD FOCUS	6	61					1	85		147	2		302	
KIA SOUL	1	185						124		364			674	
MITSUBISHI IMIEV	12	121	5	3			4	127	1	408	1		682	
NISSAN LEAF	48	1084	36	6	2	1	31	967	6	2157	9	1	4348	
SMART FORTWO	10	219	2					543		337			1111	
TESLA MODEL S	179	1036	20	6	1	1	31	1998		1112	12		4396	
TESLA MODEL X	9	61						52		33	1		156	
TESLA ROADSTER	16	18	2					54		14	2		106	
TOYOTA RAV4		1						2			1		4	
PHEV	255	1192	60	41	12	1	27	3202	3	5814	31	0	10637	
AUDI A3	5	45		1	1			98		62			212	
BMW I3 REX		184		1	1			191		128			505	
BMW I8	8	114		1				155		48			326	
CADILLAC ELR	2	12	1					26		38			79	
CHEVROLET VOLT	114	543	41	30	7	1	14	1989	2	4624	22		7387	
FISKER KARMA	9	24						40		27			100	
FORD C-MAX	21	66	6	3	1		1	209		330	3		641	
FORD FUSION	17	54	5	2	1		1	170		268	2		522	
HYUNDAI SONATA	1	4						14		22			43	
MCLAREN P1	3	2						3		1			9	
MERCEDES S550E	1	2						2					5	
PORSCHE 918	4	6	1					9		3	1		24	
PORSCHE CAYENNE	20	50	3	1			1	95		42	1		213	
PORSCHE PANAMERA	1	10						6		3			20	
TOYOTA PRIUS	10	30	3	1	1			94		149	1		289	
VOLVO XC90	39	45						103		72			262	
FCV	0	0	0	0	0	0	0	1	0	0	0	0	1	
HYUNDAI TUCSON FCV								1					1	
Grand Total	537	4109	125	57	15	3	94	7248	11	10503	60	2	22763	

Table 2 (*7) (*8)

In Alberta, government support has not been as forthcoming, seemingly leaving it up to the market to develop on its own. Standard commerce is not going to allow for the transition to electric vehicles to happen in a timely or effective manner without the assistance of government. In short, we are stuck in a combustion engine world until government is willing to step up and assist the changes.

Limitations in power generation, transmission and resale hinder businesses from establishing power creation and charging systems to accommodate the EV market, as it is illegal in Alberta to resell electricity and there are dramatic limitations on creation of electrical power, let alone its resale.

Compiling the problems are building code issues and permitting in municipalities for the allowance of public parking lot charging stations, urban charging stations, urban and rural land use laws and even permitting for setting up a charging station in a home.

The charging stations break down to three types at the moment that are categorized by 3 levels:

Level 1

This is plugging your vehicle into a standard 120 Volt AC outlet and trickle charging the vehicle's battery. It provides about 7.24 kilometers of range per hour plugged in. For the lower range battery vehicles, a full charge can take upward of 22 hours. This charging type is highly restrictive when attempting longer

trips, and in extreme climates, more power may be required to charge while maintaining the battery at a proper temperature. Although there is no special equipment required as they come standard with EVs and almost any plug-in will work, other than for home overnight charging, the lengthy times required to charge make this a far from optimum choice.

Level 2

This is a charging station which supplies 240 Volts AC for power. These systems are more complex than a Level 1 plug-in as they are smart and able to deliver a range of voltages which equate to charging speeds. The high end of these charging stations can reach 19.2kW per hour or about 112 kilometers of range per hour of charge time.

These charging stations are an add-on option with most EVs, and are recommended for installation for home use by most EV manufacturers. These charging stations are pricey to purchase, usually require modification to home locations that require permits and electricians for installation and may not be able to be installed at all in many circumstances in an urban setting. Level 2 charging stations are also used as the mainstay of the charging infrastructure throughout Canada now. These charging stations are limited in number and locations even within urban centers.

Level 3

This level of charging station is also classed as a “DC fast-charge” and is currently the fastest charging method for EVs. These systems can provide around 64 kilometers of range for every 10 minutes while charging. Although highly efficient for charging, the stations themselves are expensive and thereby rare.

One of the issues EV drivers face is that even with the larger battery ranges offered by the new technology breakthroughs, the problem then turns to a limitation of time to charge or the ability to charge at all.

At this time, there is a lack of level 3 DC fast-charge stations in both urban and rural areas. This rural inadequacy is a major hindrance for long distance EV commuting.

Many businesses are unwilling to install chargers due to the perceived inability to recoup cost. In that power cannot be resold, the infrastructures in place for ICE vehicles (gas stations) have little reason to accommodate electric vehicles.

Businesses where offering charging for vehicles makes sense for bringing in customers, such as coffee shops and malls are met with land use, electrical use and zoning issues on top of high implementation costs.

High density urban areas, which have some of the most compelling reason to use an EV, are some of the most difficult places to establish charging stations. Apartments and condo parking structures usually will not accommodate even a standard 120 volt plug in, let alone a level 2 or level 3 charge station. Worse, for many locations willing to look at the installation, land use and permitting are stumbling blocks

hampering installation.

The last hurdle is one of information on EVs. Currently in Alberta, consumers have to be self-motivated to research and acquire an EV. Misinformation and lack of reliable resources even from dealerships make buying an EV challenging at best and an effort most consumers are unwilling to pursue.

Within commerce, the best advertising is word of mouth advertising by consumers who already own and use the product. This kind of information transfer is usually the most honest in representing the product and services offered, while also being one of the most cost effective means of advertising.

By establishing a joint effort with a non-profit, non-brand centric group such as the Electric Vehicle Association of Alberta (EVAA), EV owners could be an informational share and resource for advertising EV adoption. An Alberta-wide group doing rallies and shows, offering up their own vehicles and experiences while answering questions, would go a long way in bridging the gap in the information share.

All of these challenges are potential opportunities and prospective successes for the future.

Methods of Support:

There are several things that the Federal Government, Alberta Government and Municipal Governments could do and implement that would not only encourage electric vehicle ownership, but also bring into alignment the strategies and results desired in the Alberta Climate Leadership Plan. Many of these actions have already been adopted in other provinces (Ontario, Quebec and British Columbia) and shown to be successful.

It should be pointed out that these recommendations could be adopted across Canada in every province offering up even more positive change.

Rebates and Incentives on Electric Vehicles:

Other provinces such as Ontario, Quebec and British Columbia offer incentives and rebates, which have increased the adoption rate of electric vehicles. For example, British Columbia set aside \$10.6 million over 3 years and Ontario set aside \$20 million over 6 years. Incentives/rebates range from \$5,000 to \$18,000 for the purchase or lease of new electric vehicles (depending on province and conditions).

Products offered at a discount usually result in an increase in purchases by the consumer. This appears to be the case in the EV rebates offered by provinces. With the 15% – 35% higher cost of the EV over ICE vehicles, a rebate would even the playing field and make the initial purchase of an EV more palatable.

It is requested that the Alberta Government institute a 5-year (or until a minimum number of electric vehicles have been adopted in Alberta) incentive and rebate program for clean energy vehicles. The incentives need to be established for personal, business, and non-profit groups as well as fleet vehicles and should be available for both sales and leases.

Green Highway - Fast Charging Stations for Electric Vehicles:

Current battery technologies in electric vehicles have limitations on the distance, with smaller battery capacities being able to travel to around 140 kilometers on a charge in perfect situations, less with running heaters, heavier loads, in steep incline terrains or in high winds. Travel between cities for electric vehicles requires fast-charge stations to accommodate the power requirements.

At the moment, there are a limited number of available DC fast-charging stations in Alberta, with many pockets of “energy deserts” making travel across Alberta with electric vehicles impractical or impossible. In order to increase the adoption of electric vehicle ownership, the experience must be similar to that of combustion engine vehicles. One electric vehicle DC fast-charging station within 100 kilometers of another on every major highway is required for minimum coverage.

A “Green Highway Initiative” should be established where funding for the DC fast-charging stations can be distributed to municipalities for implementation. Government needs to encourage both public and privately funded charging stations in rural locations (such as gas stations, rest areas, parks, campgrounds and other recreational facilities), by providing government funding and/or incentives for establishing them.

This Green Highway Initiative could also be used as a marketing tool, showcasing the Government of Alberta’s commitment to the GHGE reductions and an introduction of eco-tourism and travel in Alberta while creating jobs during the establishments of the infrastructure.

Public Urban Charging infrastructure:

Urban dwellers are the largest positive potential group of electric vehicle adopters, but they have limitations in the ability to charge the electric vehicles due to not having a garage capable of supporting a charge station or no private parking space at home to charge an EV overnight.

The British Columbia Government established a Community Charging Infrastructure Fund to implement 570 level 2 charging stations throughout the province in urban areas, provided funding to businesses and municipalities for implementation.

A minimum of a 1 to 1 DC fast-charging station to gas station needs to be established in all cities and towns across Alberta. Incentives and rebates should be offered to stores, gas stations, malls, parking lots and other facilities for implementation of DC fast-charging stations in urban areas.

Home Retrofit Rebates:

Implementing the ability to charge an EV at home can be costly due to the equipment needed as well as permits, electrical installation and construction. The additional costs impede the abilities of adoption, especially in Multi-Urban Residential Buildings (MURBS) where EVs offer some of the biggest gains.

Charging at home is usually the primary and preferred location, offering off-peak charging to level load demands on the electrical grid and the convenience of get in and go traveling.

Establishing a charging station can cost a few hundred dollars to several thousands of dollars per plug, depending on location. The lack of being able to charge the vehicle at a home location ahead of purchase impedes the buying of the vehicle by the consumer. Being able to ready the location for a charge station and purchase a charger ahead of EV purchase would be an added benefit.

Rebates should be offered for the installation and retrofitting for charging stations in home settings with rebates based on per plug for MURBS.

Building Code Requirement for Electric Vehicles:

Many homes in Alberta, including those of rental suites and multifamily structures, are not equipped for electric vehicles owners to charge their vehicles. The lack of available electrical outlets for charging in the home environment creates an obstacle for electric vehicle adoption. Retrofitting EV chargers is more expensive than building them in at the time of construction.

As the expected requirement of EV chargers will rise, making changes to the building code to implement them at the time of building construction in accordance with the Alberta Electrical Code would offer the biggest impact for transitioning, with the least amount of government expense where the cost would be nominal and picked up by the consumer at purchase.

The Alberta Building Code should be modified to require that all new residential construction have at least one suitable 240 volt electrical outlet for each residence installed and wired in accordance to the Alberta Electrical Code for the purpose of EV charging.

Infrastructure Development And Migration:

The province should require that all new gas stations and malls – as well as gas station and mall upgrades – include a 24-hour accessible DC fast-charging station.

There should be a removal of regulatory obstacles for being able to produce electricity for businesses and individuals, and allow for the sale of electricity. At minimum, the modification of the term of “Public Utility” with a caveat of “a person not otherwise a public utility who provides the service or commodity only for the purpose of electric vehicle charging” may open up doors for private individuals and businesses to take advantage of establishing more charging stations.

Modification to Power Creation and Distribution Regulations:

Some of the biggest arguments against mass adoption of EVs in Alberta are that the transition from combustion engines is just migrating from one fossil fuel source to another, and thereby creating a limited net gain. In 2015, Alberta used coal and natural gas for around 90% (*12) of the electrical power creation.

Electric vehicles make the most practical sense when they can be powered by renewable, non-GHGE sources. Seeing as the preferred location for charging is in the home setting, having renewable energy creation directly at the home would make the most practical sense.

On a larger scale, if every rooftop had solar for power production, it would offset the requirement of the coal and natural gas and massively reduce GHGE in Alberta. It would minimize the investments required to establish clean energy systems infrastructure, stimulate the economy as skilled tradespeople and builders installed the solar arrays, diversify the Alberta Energy Portfolio away from the stigma of the oil sector to a sustainable green energy that could be sold all over Alberta, Canada and even internationally.

New technologies such as the Tesla Power Wall are now enabling the homeowner to create energy via solar and wind and then store that power to a battery, able to be used for EV charging, home electrical backup and even power collection and distribution to the grid during peak hours.

While renewable energy is more available than ever for installation and power creation, limitations on the amount of power created and the inability to sell or distribute that power is a stumbling block within Alberta. Creation of electricity is limited to that equal of what you consume, and does not include offsets for riders or other fees. Redistribution or resale of electrical power by the general public is not allowed in the regulatory process. In essence, this creates a protected monopoly and leaves Albertans in a GHGE trap long-term.

All homes must be connected to the grid legally within the cities and municipalities of Alberta, and the homeowner/resident must pay for service of power, infrastructure fees and taxes.

To install a photovoltaic solar electric (aka PV) system, it is required that an application for microgeneration of power be submitted. Part of this application is an agreement stating any electrical power created over that used by the household goes to the power company and that said power company does not have to pay for the power. This application agreement also states that if the owner of the PV system creates more power than used on a regular basis, the PV permit can be withdrawn, effectively shutting down the solar array.

The average limitation of a solar array for installation is around 5kW, where the average home requirement for electricity is a 7kW array. This ensures that the home owner is unable to get away from paying for electrical service even if they are willing to make the investment. The limitations lengthen the payback time of the investment. If extra power is created, it goes free of charge to the power company for resale and the array is then under scrutiny for being shut down.

With the adoption of an EV on an already established construct, there is no room for modification or enhancement of the solar array to accommodate the extra electrical demand within the permitting process or legislation.

Over that, Green Power Generation Credits (carbon credits) for the solar structure that could be sold to GHGE generating companies to offset carbon emissions are given to the power companies rather than to the owner of the array, negating the sale of them as another means of the homeowner getting

payback and instead rewarding the power companies.

Unlike the USA and Australia, where there are grants and tax deductions for the implementation of PV systems, Alberta offerings went strictly to municipalities and farms with no such offerings for the average urban homeowner or business. This limits the number of people willing to make the investment in renewable energy and stagnates the industry as a whole.

Wind generation at this point is virtually outlawed within cities except for the power companies, due to land use and permitting.

By modifying the legislation, the Federal, Provincial and Municipal governments can make implementing solar and wind energy more palatable and fair for everyone. They can allow the renewable energy market to act as a means of extra power generation for the general public, cut the costs of infrastructure for government and power companies as a whole, and create a fair electrical sales market for power generation. This can also encourage education while migrating the unemployed people of Alberta to renewable energy source employment, stimulate the economy, diversify the energy portfolio and create an environmental impact that would long-term meet the GHGE targets in the Alberta Climate Leadership Plan.

Revision of the legislation is paramount for making a transition to renewable energy in Alberta. The general public and businesses should be able to establish renewable energy systems, with the ability to sell that power to the power distribution companies at a fair rate – equal to that of large scale power companies. Limitations and restrictions of power creation sizes (outside of location where infrastructure is unable to handle the loads until the infrastructure can accommodate) should be abolished.

Incentives and rebates should also be offered for homeowners and businesses for the purchase and installation of renewable energy systems in Alberta. Additionally rebates and incentives should be offered for technology such as the Tesla Power Wall for power storage and distribution.

Agreements in the microgeneration application should be nullified for already installed arrays.

Land use amendments allowing for rural and urban development for solar and wind energy generation should be implemented.

Allowance should be made for electricity created to be sold at the same rate as other power generations systems by businesses and general public.

Green Power Generation Credits (carbon credits) should be awarded to the owner of the array and allowed to sell in the open market or sold directly to the Alberta Government as a tax rebate.

Enforcement of CAFE Regulations with Minimum Requirement for Zero Emission Vehicles:

CAFE regulations are the standards for vehicle emissions for the automotive industry. For the most part, they are a weak level of implementation, with California having the hardest minimum base to meet. In California, dealerships are mandated to sell a minimum number of EVs and other clean emission vehicles. The dealerships are fined \$5,000.00 per vehicle shortage of the minimum per annum.

This has led to some EV only car manufacturers being able to sell a bulk number of EV car vouchers (think of carbon offsets for the oil and gas companies) to other dealers for around \$1,000.00 each.

The objective is that it forces dealers to attempt to sell the EVs and potentially rewards those who make excess sales with being allowed to sell the extra vouchers as a sin tax savings.

Alberta should impose the CAFE regulations similar to California on EV sales minimums for all vehicle dealerships.

Incentives for Retraining Automotive Technicians for EV Repair and Maintenance:

Many dealerships in Alberta are unable to sell EVs due to requirements imposed by manufacturers of having to have a minimum number of trained EV repair technicians on staff. The training is proprietary for each company and usually involves going to the USA for the course. Retraining is an expense for the dealerships and for the employees; given that the market is low, dealerships instead forgo being able to be certified and selling EVs altogether.

This has made going out of province to purchase an EV the norm for many Alberta consumers, which stifles our own economy.

By offsetting the course costs for technicians to become certified for both the dealership and the employee, this hurdle can be eliminated, allowing for more sales of EVs, a better support network for maintenance and repairs, and keeps business in Alberta.

The Alberta Government should allow for bursaries and course cost rebates for technicians looking to become EV repair technicians.

Electric Vehicle Ownership Incentives:

Incentives are going to be some of the major deciding factors in getting an EV for early adopters. Some of these incentives can be low cost but create a very large impact.

Allowing EVs to travel in HOV lanes, regardless of the number of occupants in the vehicle, would be a cost effective incenting for many drivers, rewarding the lack of emissions with a potentially easier commute. This could also relieve the power consumption fears of being powerless and stuck in traffic for early adopters.

Free parking and preferential parking for EVs, especially in city downtown cores would be a serious

incentive and cause of stimulation for early adopters. Designated Green Parking Spots for EVs-only would also be a valued incentive.

Free access to toll roads for EVs and free admission to the National Parks in Alberta would again reward the early adopters for their clean emission choices while protecting some of our most sensitive environments.

Electric Vehicle Marketing:

There are many misconceptions about electric vehicles that impede the transition for the average consumer. Questions on distance of the vehicle's battery, maintenance, performance, comparison of makes and models - which should be easy to get information about - is surprisingly difficult for those who are seeking it. Moreover, there is an underlying fear that an electric vehicle is a "new technology" that is untested or unproven.

Going to sales locations (car dealerships) are met with a distinct lack of information, as they are not invested in selling electric vehicles. Over that, the normal conversation leads to a high pressure sales attempt at a combustion engine vehicle, with misinformation being provided to dissuade the consumer from the electric vehicle path.

For a group of people to attempt to give out that information, organize and put on the rallies and shows, getting insurance or even keep something as simple as a website going takes time and money. As there is no other means of being able to generate funding, this is a few and far between venture.

A local group doing rallies and shows, offering up their own vehicles and experiences while answering questions, would go a long way in bridging the gap in the information share.

The fastest and easiest way to get people into electric vehicles is to give them the opportunity to see the vehicles in person, go for a ride and interact with people who actually own and use them and who are not attempting to sell them anything.

Being able to take people for rides in an electric vehicle to show them how quiet they are, the level of performance, cost savings, comfort and effectiveness, as well as how well they do fit into the average lifestyle, is the true conversion factor for the transition. Putting a person in the seat is one of the most convincing means of winning over even the most hard-core ICE fan.

Having resources available on a maintained website and a Wiki available would also be a huge asset.

Funding of an already established non-profit, non-brand affiliated group such as the Electric Vehicle Association of Alberta (EVAA) comprised of EV owners, offering information and events across Alberta would be an asset and a chance for direct partnership with the Alberta Government as it pertains to the initiatives.

Funding and Implementation:

It is easy to make recommendations on spending money when the issues of finding that funding is left up to others. We would be remiss if we did not suggest opportunities for funding that may already be set aside and thus far are unallocated for these exact kinds of initiatives.

At the moment, there seems to be an opportunity for tapping into the Federal Government and Infrastructure Canada’s^(*13) \$120 Billion investment over the next 10 years through Infraconsults, located at <http://www.infraconsults.ca/>. Although a Federal Government initiative, the narrative of the funding seems to break down into provincial offerings of which Alberta may be able to leverage. (It may also be pointed out to the Federal Government that this initiative set could also be implemented across Canada, in every province, for an even greater GHGE reduction at the national level.)

As a secondary method of funding, the Alberta Energy Efficiency Panel^(*14) is currently taking suggestions on how best to use the \$645 Million in funding earmarked for the agency. Using some of the funds available for these initiatives is perceived to be a perfect fit for the agency and the resources available.

By leveraging off these already earmarked and budgeted funds, the government should be under less pressure to justify funding and initiating the proposals and by using already established agencies; it may also speed up the process of implementation.

Overall, adoption of these initiatives could be a win for everyone involved. Electric vehicle ownership will increase, GHGE levels will drop, skilled Alberta workers will be employed building the infrastructure, business in Alberta will be strengthened, green energy can be created and the energy portfolio could be modified all while implementing the Alberta Government’s Climate Leadership Plan.

Proposal of Support:

Attached to this document you will find a number of breakout proposals for consideration based off of the information listed above.

These proposals have been broken down into individual submissions in an attempt to ensure that at least some of the initiatives will be adopted by the government, and so that they can be easily distributed to the appropriate ministers and chairs, with this document being a reference and basis of discussion.

Initiative	Cost	Impact
Rebates and Incentives on Electric Vehicles	Medium - High	High
Green Highway: Rural DC Fast-Charging Stations For Electric Vehicles	Medium - High	High
Public Urban Charging Infrastructure	Medium	High
Home Retrofit Rebates For Setting Up EV Charging Connectivity	Low	Medium
Building Code Requirement For Electric Vehicles	Low	High

Infrastructure Development and Migration	Low	High
Modification To Power Creation/Distribution Regulations For EV Charging.	Low	High
Enforced CAFE Regulations With Minimum Sales For Zero Emission Vehicles At Dealerships	Low	High
Incentives For Retraining Automotive Technicians To Specialize In Electric Vehicle Repair And Maintenance	Low	Medium
Electric Vehicle Marketing	Low	Medium - High
EV Ownership Incentive - HOV Lane Access	Low	Medium
EV Ownership Incentive - Parking Incentives	Low	Medium
EV Ownership Incentive - Toll Road and National Park Pass	Low	Medium

Reference / Sources

- (*1) –Environment and Climate Change Canada - <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=F60DB708-1>
- (*2) – Citation of MIT study – Journal, Nature Energy - Aug. 15, 2016
- (*3)) –Environment and Climate Change Canada - <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=F60DB708-1>
- (*4) – USEPA – Greenhouse Gas Emissions From A Typical Passenger Vehicle - <https://www.epa.gov/sites/production/files/2016-02/documents/420f14040a.pdf>
- (*5) – USEPA – Greenhouse Gas Emissions From A Typical Passenger Vehicle - <https://www.epa.gov/sites/production/files/2016-02/documents/420f14040a.pdf>
- (*6) - Transportation Alberta- Alberta Vehicle Statistics - <https://www.transportation.alberta.ca/Content/docType47/Production/VehStyle20112015.pdf>
- (*7) - Graphics used courtesy of Fleetcarma – www.fleetcarma.com - Data is sourced from R.L. Polk & Company registration data, industry executive interviews, and rounded out by Matthew Klippenstein’s Canadian EV Sales Summaries.
- (*8) - Matthew Klippenstein’s Canadian EV Sales Summaries - https://docs.google.com/spreadsheets/d/1dLFJwZVdvNLRpmZqPznIzz6PB9eHMe5b-bai_ddRsNg/edit#gid=5

Resources for provincial incentives:

- (*9) British Columbia – LivesmartBC - <http://www.livesmartbc.ca/incentives/transportation/>
- (*10) Quebec – Propelling Quebec Forward With Electricity - <http://vehiculeselectriques.gouv.qc.ca/english/>
- (*11) Ontario – Minister of Transportation - http://www.mto.gov.on.ca/english/vehicles/electric/index.shtml?utm_source=hootsuite
- (*12)) –Environment and Climate Change Canada - <https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=F60DB708-1>

Financial opportunities for funding:

(*13) Infrastructure Canada - <http://www.infraconsults.ca/>

(*14) Energy Efficiency Advisory Panel - <http://www.alberta.ca/energy-efficiency.aspx>

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