

**TO:** CHAIR AND MEMBERS  
SUSTAINABLE CITY ADVISORY  
COMMITTEE

**DATE:** 2017 October 20

**FROM:** DIRECTOR PLANNING AND BUILDING

**FILE:** 76500 20  
*Reference: Environmental Planning*

**SUBJECT: DEVELOPMENT OF ELECTRIC VEHICLE POLICY FOR BURNABY**

**PURPOSE:** To outline an approach for development of policy supporting electric vehicles in Burnaby in support of the approved Environmental Sustainability Strategy (ESS) and Community Energy and Emissions Plan (CEEP).

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**RECOMMENDATION:**

1. **THAT** Council approve the scope and process for development of an Electric Vehicle (EV) Policy in support of Burnaby's approved ESS and CEEP, as outlined in this report.

**REPORT**

**1.0 INTRODUCTION**

Electric vehicles (EVs)<sup>1</sup> represent a small but rapidly growing segment of the automobile market today. EVs are gaining popularity due to factors such as vehicle performance, costs savings (in fuel and maintenance), and environmental values. Rate of uptake has also benefitted from improvements to vehicle and charging technologies, more widely available charging, and the falling price of vehicles. EVs have higher efficiency and lower emissions overall compared to gasoline vehicles, especially in areas with low-carbon electricity sources such as BC<sup>(2,3)</sup>. From a broader societal perspective, greater adoption of EVs has the potential to significantly reduce air pollution and associated health impacts and costs, as well as greenhouse gases, helping to address climate change and other community energy goals. However, access to charging is an influencing factor for EV uptake by consumers.

**1.1 Relationship of EVs to Sustainable Transportation Planning**

Burnaby's Environmental Sustainability Strategy (ESS) and related Community Energy and Emissions Plan (CEEP), described below, outline several strategies and a range of suggested actions in support of the Move goal: "A walkable, bikeable and transit-supported city that

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<sup>1</sup> This report defines an EV as a personal automobile that can be plugged into the electrical grid (see Section 2.1).

<sup>2</sup> <https://www.fueleconomy.gov/feg/atv-ev.shtml>

<sup>3</sup> For example see: <http://shrinkthatfootprint.com/electric-car-emissions>;  
<http://www.ucsusa.org/clean-vehicles/electric-vehicles/life-cycle-ev-emissions>

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supports a healthy community and environment.” Encouraging the use of transit and walking/cycling is an important part of this goal. Similarly, Burnaby’s Transportation Plan update, currently in progress, will address themes including accessibility, safety, health, environmental protection, the economy, and community connections.

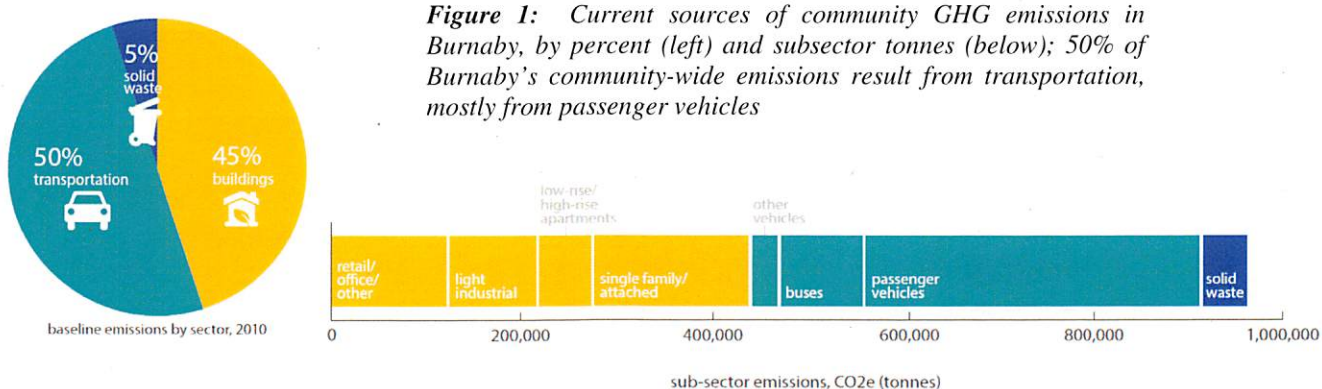
Within this context, the Electric Vehicle Policy addresses the opportunity to improve the sustainability of personal vehicles, recognizing that this mode is likely to remain a significant component of the transportation system for the foreseeable future. This policy is intended to complement, and not compete with, other transportation policy aimed at improving sustainability and health.

## 1.2 Electric Vehicle Policy Basis in ESS and CEEP

Burnaby’s ESS and CEEP were approved by Council on 2016 November 11. The ESS and CEEP, combined with the pre-existing Economic and Social Sustainability Strategies, are intended to build on Burnaby’s successes and set a course toward world-leading sustainability. Policy to support electric vehicles is addressed in a strategy under the “Move” goal in the ESS, and is designated a Big Move (priority strategy) in the CEEP. This strategy and supporting actions are summarized in *Appendix A*.

The CEEP includes targets for reducing community greenhouse gases (GHGs): a City-Only target of **5% below 2010 levels by 2041**, and a City-Plus-Others target<sup>4</sup> of **30% below 2010 levels by 2041**.

Fifty percent (50%) of Burnaby’s community-wide emissions result from transportation, and of this the large majority is from passenger vehicles (*Figure 1*). The CEEP identified electrification of vehicles as a significant potential opportunity for reducing community GHGs.



<sup>4</sup> These dual targets recognize the limits of jurisdiction, and commit the City to the **City-Only** target (5% below 2010 levels) in areas over which it has direct control or significant influence, while also illustrating the potential reduction in GHGs that could be achieved with the support of others (**City Plus Others** target). It should be noted that the **City Only** target entails a substantial (~20%) reduction in GHGs in year 2041 compared to a scenario where no specific action is taken.



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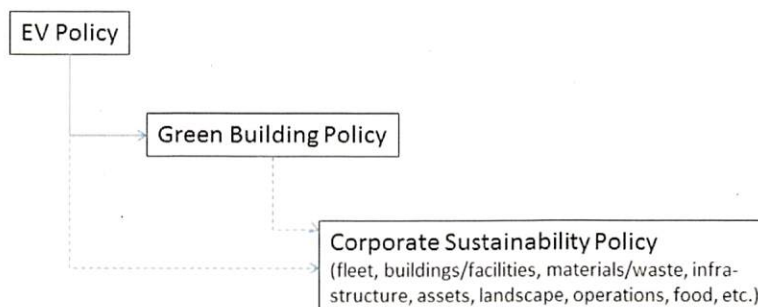
### 1.3 ESS and CEEP Phase 1 Priorities

Council approved the following three priority policy areas for Phase 1 ESS and CEEP implementation, as outlined in the Sustainable City Advisory Committee Report dated 2017 September 06:

- Green Building Policy
- Electric Vehicles
- Corporate Sustainability

Green Building Policy and EV Policy are proposed to be developed as separate but concurrent initiatives, since buildings are a primary location for EV charging, and for efficiency in stakeholder consultation. Once established, the standards for EV charging in new development will likely be expressed as a component of Green Building Policy. Both EV Policy and Green Building Policy would include direction for City facilities and fleets. These and other opportunities would form part of a Corporate Sustainability Policy, to be initiated at a future date. The relationship between these policies is shown conceptually in **Figure 2** below.

**Figure 2:** Conceptual relationship between Phase 1 ESS/CEEP policy areas



This report outlines additional details for development of Electric Vehicle Policy, in **Section 4**. Further background and details about Green Building Policy will be addressed in a separate report, while Corporate Sustainability Policy details will also be advanced in a separate report, after conclusion of the EV and green building policy development process.

In addition, at its open meeting on 2016 April 12, the Environment Committee of Council received correspondence from EV users encouraging municipalities to support and accelerate the adoption of EVs. Arising from discussion, the Committee requested that staff review the issues related to electric vehicle markets and develop policy to support electric vehicle charging. This report also responds to that request by providing an overview of EV technology, markets and policies at various levels of government and in the City of Burnaby.

## 2.0 TECHNOLOGY AND MARKET BACKGROUND

### 2.1 Vehicles and Charging Infrastructure

The following types of vehicles are considered “electric vehicles”, based on their requirement to plug into the electrical grid. This definition is standard in the industry, and does not include hybrid vehicles which, although they have an electric component to their engine, are recharged from driving and do not require plugging in.

- **Battery Electric Vehicle (BEV):** A vehicle that is solely powered by an electric powertrain recharged from the electric grid. Also sometimes called “Pure EV” or “100% Electric”. *Examples: Nissan Leaf, Tesla Model S, BMW i3*
- **Plug-in Hybrid Electric Vehicle (PHEV):** A Hybrid Electric Vehicle that can be recharged from the electric grid, typically with the ability to travel significant distances without burning fuel, but with a combustion powertrain that can enable longer distances. *Examples: Chevrolet Volt, Ford C-Max Energi*

Examples of vehicle specifications for some of the most popular EVs in BC, and two models recently released and on the verge of release, are shown in **Table 1**.

**Table 1: Examples of some of the most popular EVs in BC\***

	Type of EV	Total # sold in BC up to June 2017	Electric range (km) **	Time to charge (Level 2 AC )	Price (new), CAD approx.
<b>Nissan Leaf</b>	BEV	1520	172	4.5h	\$37,000
<b>Tesla Model S</b>	BEV	1315	435	9h	\$95,000
<b>Chevy Volt</b>	PHEV	902	85	4.5h	\$39,000
<b>BMW i3</b>	BEV/PHEV	406	183	4.5h	\$47,000
<b>Kia Soul</b>	BEV	360	149	4.5h	\$35,000
<b>Chevy Bolt</b>	BEV	131 – note, just released in 2017	383	9h	\$43,000
<b>Tesla Model 3</b>	BEV	N/A - ordering for mid-2018 delivery	350	7h	\$47,000

\*sources: [www.plugndrive.ca](http://www.plugndrive.ca), Powertech 2016<sup>5</sup>, [www.chevrolet.ca](http://www.chevrolet.ca), [www.tesla.com](http://www.tesla.com)

\*\*Range is shown for most recent model, which may differ from earlier models included in count in column 3.

Charging technology is also rapidly evolving. In addition to various power levels, there are technologies to deliver, meter and share power among multiple charging facilities, which can help to reduce costs and improve efficiency.

The most commonly used charging facilities are classified as follows, summarized in **Table 2**.

<sup>5</sup> Powertech Labs Inc. 2016. [EV Technology and Market Overview](#). Background Report, produced for Metro Vancouver, City of Abbotsford and Township of Langley.



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- **Level 1 AC** charging is compatible with home outlets, for plug-in with a vehicle's supplied charging cable or dedicated equipment. Due to the long charge times, they are only suitable for long-term parking, and even overnight parking would not fully charge the longer-range BEVs coming on the market. For this reason Level 2 AC is becoming the new standard for most common locations including home charging.
- **Level 2 AC** charging is typically provided in a wide range of residential, commercial, workplace and public locations. One to two hours of charging can provide an effective "top-up", four to five hours can fully charge most BEVs on the market, and seven to nine hours can charge the longest range BEVs available (and pending), as shown in **Table 2**.
- **DC Fast Charging** is typically provided in strategically located public areas, to provide charging for drivers on the go, for top-up and to support longer distance driving. DC fast charging can provide an 80% charge to most BEVs in approximately 30 minutes.
- **Tesla Super Chargers** are proprietary systems designed to service Tesla vehicles only, and to deliver even more rapid charging than DC Fast Charge, at around 273 km per half hour. Tesla vehicles can also use most other charging facilities with an adaptor.

**Table 2: Summary of EV charging types\*** (note: charging times are approximate and likely to change with future evolution of technology)

Type of Charging	Power level(s)	Est. km of range per time charging	Most common locations
<b>Level 1 AC</b>	120v, 15A	≤ 7 km per h	Home and long-term parking
<b>Level 2 AC</b>	240v 3.3-3.6kW, 16A 240v 6.6-7.2kW, 40A	15-45 km per h	Home, workplace, commercial, public facilities
<b>DC Fast Charge</b>	25kW 50kW	90-150 km per h	Public facilities, stand-alone
<b>Tesla Super Charger (DC)</b>	135kW	273 km per <u>half hour</u>	Stand-alone

\*sources: Powertech 2016, [www.tesla.com](http://www.tesla.com), [www.pluginbc.ca](http://www.pluginbc.ca)

Detailed information on costs of charging infrastructure is beyond the scope of this report, as it can vary widely depending on the type of system, number of chargers, whether or not electrical upgrades are required, and systems to distribute electrical loads (load-sharing). Generally, Level 2 AC charging can cost less than \$1000 per "energized" parking stall if the necessary electrical infrastructure is installed at time of construction as part of a load-sharing system; the EV owner would then add the charging equipment itself at the time of vehicle purchase, at an additional cost. Level 2 retrofit costs may range from approximately \$5,000 to \$10,000 (or more) as a single retrofit installation, depending on electrical system capacity. DC Fast Charge stations cost between \$50,000-\$100,000 to install.

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## **2.2 EV Market Trends**

### **2.2.1 Current Market Share and Trends**

Overall, EV markets today are relatively small compared to the total vehicles sold. However, growth over the past five years has been rapid and appears to be accelerating.

#### **Global**

Worldwide, EV sales are still less than 1% of all light duty vehicles. In 2016, 1.26 million EVs were sold worldwide, almost 50% more than 2015; whereas in 2005 sales were still in the hundreds.<sup>6</sup> The United States and China account for the most vehicles. Bloomberg New Energy Finance forecasted that worldwide EV penetration would reach 35% by 2040, and this year that prediction was increased to 54% by 2040<sup>(7,8)</sup>. Other studies predict even faster uptake, particularly in combination with autonomous vehicles<sup>9</sup>.

#### **Canada**

In Canada, EVs represented 0.8% of the new vehicles sold in 2016. This percentage has grown rapidly, from just 0.03% in 2011<sup>10</sup>. 95% of Canada's EV sales occurred in BC, Ontario and Quebec.

#### **British Columbia and Lower Mainland**

In 2016, EVs accounted for 1% of new vehicle sales in BC (approx. 2135 out of 221,600 total vehicles), up 38% from the previous year. In the first half of 2017 EV sales in BC have increased to 1.2% (approx. 1500 out of 120,300 total vehicles).<sup>11</sup>

#### **Metro Vancouver and City of Burnaby**

According to ICBC in June 2016 there were 2,925 EVs registered in Metro Vancouver and 222 EVs registered in Burnaby (out of 1,368,900 and 126,702 total vehicles, respectively). In comparison, in 2012 there were only 12 EVs registered in Burnaby (out of 112,668 total vehicles).

### **2.2.2 Forecasts**

There are several reasons for the recent surge in EV sales and use that will likely continue to influence trends in the near future:

- Improved and lower-cost battery technology;
- Increased range of newer EVs;

<sup>6</sup> International Energy Agency, [Global EV Outlook 2016](#).

<sup>7</sup> Bloomberg New Energy Finance, "Electric vehicles to be 35% of global new car sales by 2040"

<sup>8</sup> BNEF VIP Comment July 1, 2017, "EV Bandwagon Is Accelerating. But Is It Unstoppable?"

<sup>9</sup> [Rethinking Transportation 2020-2030](#), The Disruption of Transportation and the Collapse of the Internal-Combustion Vehicle and Oil Industries. James Arbib and Tony Seba. May 2017.

<sup>10</sup> Matthew Klippenstein for Green Car Reports.

<sup>11</sup> Sources: [www.tinyurl.com/CanadaEVSales](http://www.tinyurl.com/CanadaEVSales) ; <http://www.fleetcarma.com/ev-sales-canada-2016-final/>;  
<https://www.fleetcarma.com/electric-vehicle-sales-canada-q2-2017/>



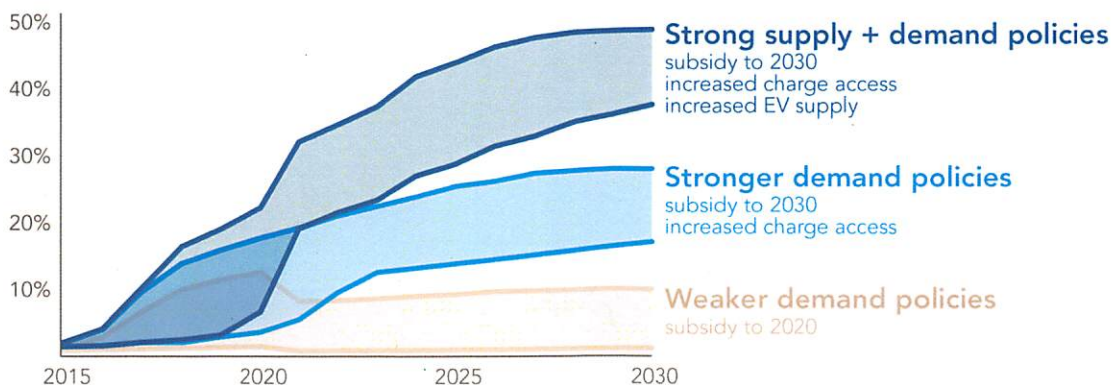
- Increasing variety of types and models of EVs including plug-in hybrids and SUVs, with 40 models now available in Canada;
- Expansion of charging infrastructure; and
- Incentives/rebates.

Forecasting market uptake of EVs is complex due to many factors and uncertainties. An SFU study<sup>12</sup> estimated low and high scenarios of EV market penetration of 24-27% in the Lower Mainland by 2030. A study commissioned by Metro Vancouver<sup>5</sup> estimated that the SFU “high” scenario was more likely, based on new developments in the market since that report. BC Hydro has included EV market estimates in their resource plans, most recently updated in 2013. BC Hydro modeled a reference of 5% EV market share by 2020 and 20% by 2028 as well as a “high” case of just under 10% by 2020 and just over 50% by 2028<sup>13</sup>.

Policy has a strong influence on the potential rates of EV uptake. As shown in **Figure 3**, the highest levels are associated with both demand-side policy (e.g. federal support for research and development) and demand-side policy (e.g. provincial subsidies), together with provision of access to charging.

#### EV new market share in BC under policy scenarios

with shading representing uncertainty



**Figure 3:** EV new market share in BC under different policy scenarios<sup>14</sup>

Should automakers follow through on recent statements that they are moving towards all-electric fleets, the barrier of model availability will be removed. The key remaining barrier will be charge access, which local government can influence and assist.

<sup>12</sup> Axsen, J and others (2015). Electrifying Vehicles: Insights from the Canadian Plug-in Electric Vehicle Study. Simon Fraser University, Vancouver, Canada. [Web link.](#)

<sup>13</sup> BC Hydro, Integrated Resource Plan, 2013, Appendix 2A, Appendix 4, Electric Vehicles. [Web link.](#)

<sup>14</sup> Adapted from Wolinetz, M. and Axsen, J. (2016). How policy can build the plug-in electric vehicle market: Insights from the REspondent-based Preference And Constraints (REPAC) model. Technological Forecasting and Social Change. [Web link.](#)

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## 2.3 Greenhouse Gas Reduction Potential of EVs

The transition from fossil fuel to electric fuel for passenger vehicles is one of the actions with highest potential to reduce overall greenhouse gas emissions within communities. The amount of greenhouse gas reduction depends on the GHG intensity of the electricity grid, the total numbers of conventional vehicles displaced by electric vehicles, and the type of EV (full battery electric or plug-in hybrid). Due to BC's predominantly hydro-electric grid and relatively high rates of EV adoption, the greenhouse gas reduction potential in BC is estimated to range from 79% to 98% per vehicle.<sup>15</sup>

In terms of life-cycle emissions, GHG reductions have been modelled to range from 55% to 80% for PHEVs and BEVs respectively, when calculated over the life-cycle of the vehicle (manufacture, fuel production and tailpipe emissions) for vehicles driven in BC.<sup>16</sup>

In addition to GHGs, other tailpipe emissions would decline with greater uptake of EVs, including carbon monoxide, nitrogen oxides and volatile organic compounds. Some of these emissions also contribute to global warming, while others impact human health.

EV Policy is a good example of an action for GHG reduction that can be taken by both the City and "others," reflecting how Burnaby's CEEP was structured. The roles of various levels of government are further described in *Section 3*.

## 2.4 Barriers to EV Uptake

Aside from limitations in familiarity with EVs as relatively new technology, the main barriers to uptake are related to vehicle range and ability to recharge to complete longer trips. "Range anxiety" is gradually fading as longer-range vehicles (PHEVs and BEVs) are coming on the market. However, broad access to charging remains a constraint.

In the SFU study noted above<sup>12</sup>, various user groups were surveyed to determine their interest in EVs. Among non-EV owners about one-third expressed interest in buying some type of EV. Availability of home charging was seen as a strong factor in determining interest in buying an EV among this group, whereas access to public charging was less of a factor. Other factors limiting uptake included availability of EVs, choice of EV makes and models, and finally, familiarity with EV technology. Overall, the study highlighted the need for policy to support EV charging.

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<sup>15</sup> The lower reduction number occurs when a mix of BEV and PHEV adoption is assumed, with home charging access and some public charging. The highest reduction (98%) occurs when the vehicles are battery-electric only, made possible by an extensive charging network (home, work and public network).

<sup>16</sup> Studies have found that emissions from vehicle disposal are equivalent across EV and conventional vehicles, with the exception of the batteries; however, battery re-use and recycling is possible and will offset some of the emissions associated with manufacturing the batteries.



## **2.5 Autonomous Vehicles**

Autonomous vehicles (AVs), also known as “self-driving cars,” represent another rapidly developing component of the future EV market. The scenario of future electric AVs combined with ride-sharing or shared ownership has been called a “disruptive technology” that may substantially transform the entire transportation industry and related markets<sup>17</sup>. Although the timing and nature of future AV deployment remains highly uncertain at this time and is beyond the scope of this report, it is noted here since it relates to the need for EV charging generally, along with cellular servicing which is also required by most networked EV charging systems.

## **3.0 EV POLICY BACKGROUND**

EVs are a technology that can provide potential benefits for society (reduced pollution and improved health), but as a new technology, faces constraints. Many of these constraints align with the purview of the various levels of government. Government policy at the federal and provincial level may address the supply of EVs, such as funding for technology research and development, or the demand, such as with financial incentives. Local government policies and programs typically focus most strongly on the provision of charging infrastructure, related to the regulation of land use and development and in support of adopted community energy and emissions plans.

### **3.1 Federal Government**

In 2016, the federal government announced funding for EV charging, and subsequently Natural Resources Canada funded the installation of 30 DC Fast Charge stations in communities along highways. The 2017 budget commits \$21.9 billion over 11 years in green infrastructure, including funding for a national electric and alternative fuel network, and adds to 2016 commitments to fund EV charging by an additional \$120 million. The federal government recently (May 2017) announced they are working with provincial/territorial partners, industry and stakeholders to develop a Canada-wide Zero Emissions Vehicle Strategy by 2018.

### **3.2 Provincial Government**

The Provincial Climate Leadership Plan sets direction to expand the Clean Energy Vehicle Program and to provide incentives for EV charging. The Province is involved in a range of programs supporting EVs:

- The BC Clean Energy Vehicle Program provides vehicle point-of-sale incentives for EVs, applicable to B.C. residents, businesses, non-profit organizations and local government organizations.
- The Charging Infrastructure Program entails two programs administered by Fraser Basin Council:

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<sup>17</sup> Arbib and Seda, 2017. [Rethinking Transportation 2020-2030](#), The Disruption of Transportation and the Collapse of the Internal Combustion Vehicle and Oil Industries.

- The Multi-unit Residential Building (MURB) Charging Program, offering grants for installing EV charging in existing buildings; and
- The Fleet Champions Program, offering an evaluation of fleets for business, non-profit and public organizations, for opportunities and business case to incorporate EVs, and incentives for installing charging.
- Emotive is a provincial program administered by the Fraser Basin Council and Metro Vancouver for public outreach to raise awareness about EVs ([www.emotivebc.ca](http://www.emotivebc.ca)).
- Plug-in BC is a program co-chaired by the Province and BC Hydro, hosted by the Fraser Basin Council and supported by academic institutions, regional governments, EV user groups, businesses and individuals, that undertakes research, and provides information, training, outreach and guides/tools (<http://pluginbc.ca>).

Other Provincial policies/programs include the Scrap-It Program which offers incentives to “scrap” older vehicles and purchase low-emissions vehicles including EVs, and the High Occupancy Vehicle (HOV) lane policy which allows EVs displaying a decal to use the HOV lane regardless of the number of passengers.

### **3.3 Regional EV Policy in Metro Vancouver**

Metro Vancouver plays a role of coordination, research and information sharing among municipalities to support EVs, and undertakes public outreach under the provincial Emotive program described above. As noted below Metro Vancouver also provides public charging at its headquarters in Burnaby.

### **3.4 Municipal EV Policy in Metro Vancouver**

Four other municipalities in Metro Vancouver currently have formal policy requiring certain levels of charging in new development: City of Vancouver, City of Richmond, District of North Vancouver and City of North Vancouver. Of these, two (Richmond and Vancouver) are in the process of updating their policies to require higher levels of charging. In addition, at least three municipalities (Surrey, Delta, Port Coquitlam), are in the process of developing policy. Burnaby’s policy and practice as summarized below is proposed to be updated through the process outlined in this report.

Generally, local government policy addresses the provision of charging in new developments and the provision of charging at public facilities for staff and public. Retrofitting existing development for EV charging is the responsibility of individual property owners/stratas, although local governments may provide information about funding programs to property owners.



### **3.5 BC Hydro**

BC Hydro has partnered with the federal and provincial government to install DC Fast Charge stations and is exploring opportunities to expand the network. They also support research in EV technology and policy, and provide services and information for installing EV charging. BC Hydro is actively engaged in planning for the expansion of EV charging and considers uptake scenarios in province-wide electrical supply planning.

### **3.6 EV Users**

The Vancouver Electric Vehicle Association is a non-profit organization that undertakes education and advocacy on behalf of EV drivers. Their members attended the recent 2017 Environment Day at Burnaby City Hall, and provided a display of a range of EVs and opportunities for the public to ask questions of EV drivers.

### **3.7 Existing Burnaby Policy and EV Charging Network**

As noted in *Section 1.1*, Burnaby's Environmental Sustainability Strategy (ESS) and related Community Energy and Emissions Plan (CEEP) include a strategy and supporting actions under the Move goal for supporting deployment of electric vehicles (see also *Appendix A*).

Among the individual areas for action modeled as part of development of the CEEP, electrification of the vehicle network was noted to have one of the largest potential benefits for reducing the community's greenhouse gas emissions.

#### **3.7.1 Existing Burnaby EV Policy and Practice**

The City of Burnaby's current requirements for EV charging in new large residential developments is linked with the supplemental density policy which specifies transportation demand management measures that can be included in RM3s, RM4s and RM5s sites pursuing the supplemental bonus density provisions, in exchange for reduced parking requirements. Generally, a target of 10% of parking stalls supplied with charging is sought through CD rezoning applications. Some developers have chosen to exceed this target for market reasons. For example, the Concord Brentwood development has committed to providing 100% of parking stalls with fully serviced EV charging.

City records indicate that, in 41 rezonings subject to provisions for increased density through the supplemental density policy (RMs zoning) since 2012<sup>18</sup>, about 1600 parking spaces have been provided with some level of EV charging, and an additional 100 spaces pre-wired for future EV charging. This represents about 8% of total parking spaces. Of these 1700 spaces, 51% are or will be Level 2, 23% Level 1, and 26% do not specify a level of charging. Shared electric vehicles have also been secured through the rezoning process.

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<sup>18</sup> This includes individual development rezoning applications under the RMs category that have advanced to at least Public Hearing stage, and do not include Master Plan rezonings.

This has been a successful program given current EV use.

### **3.7.2 Public EV Charging in Burnaby**

City-owned public EV charging is provided at Edmonds Recreation Centre (one Level 1 charging stall<sup>19</sup>) and Deer Lake 1 building (two Level 2 charging stalls). EV charging opportunities can be considered in the design of future facilities and retrofitting of existing facilities, as supported by the future EV Policy.

Other jurisdictions operating within the city can also play an important role in the local EV charging network, serving both staff, visitors and the public. These include:

- *Institutions* such as BCIT, SFU, Burnaby General Hospital and some schools. BCIT operates a public DC Fast Charge station at its Burnaby campus that is part of the Energy OASIS project, integrated with a solar panel array as the primary energy source<sup>20</sup>.
- *Businesses*: There are currently approximately 35 publicly accessible Level 2 charging stations operated privately within the City of Burnaby; mapped locations and specific details about these stations can be viewed on the [www.plugshare.com](http://www.plugshare.com) website. Metro Vancouver is currently undertaking research and outreach with local businesses to gauge opportunities for encouraging installation of EV charging in the workplace.
- *Metro Vancouver*: Level 2 charging is available in the current headquarters building on Kingsway, and there are plans to install a publicly accessible DC Fast Charge station in the Metrotower III building (new headquarters location) in 2018.

## **4.0 APPROACH FOR DEVELOPING EV POLICY**

EV Policy is one of three Phase 1 policy areas being advanced in support of Burnaby's approved ESS and CEEP, as outlined in the Committee report dated 2017 September 06 and approved by Council for further development. As outlined in the preceding sections in this report, the EV market share, although still relatively small, is forecast to grow quite rapidly.

Development of EV policy is proposed to entail the following scope, key tasks and timeline, as a basis for advancement of specific policy for Council consideration. As previously noted, EV policy will also form part of broader green building policy, proposed to be developed concurrently; further background for green building policy, including addressing the provincial Energy Step Code, will be advanced for Council's consideration in a separate report.

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<sup>19</sup> Comments from the public have confirmed that Level 1 is not sufficient for most visitors to this facility due to the long time required, thus Level 2 would now be the likely type of charging installed in new facilities.

<sup>20</sup> <http://www.bcit.ca/microgrid/energyoasis/>



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## **4.1 Scope and Key Components of Policy**

Since most EV charging happens at home and at the workplace, and the cost of retrofitting can be prohibitive, inclusion of EV charging in new developments would be a focus for the Electric Vehicle Policy, as a part of broader green building policy, to be developed concurrently. Policy direction for public charging at City facilities (existing and new), and consideration of EVs in City fleets, will also be considered at a high level.

### ***4.1.1 Provision of private and public charging within New Private Development***

The Electric Vehicle Policy is proposed to address the relevant Big Move strategies from the ESS and the CEEP listed in *Appendix A*. This would include developing standards or guidelines for the types, number and minimum performance requirements of charging infrastructure in or alongside larger/complex buildings such as mixed use, commercial, and mid-rise and high-rise multi-family residential buildings (Part 3 in the BC Building Code), and single, two-family and ground-oriented residences (Part 9 in the BC Building Code). Consideration will be given to both private and public (e.g. guest parking) standards.

The Electric Vehicle Policy will also look at a range of implementation considerations, based on the best available information, including: expected benefits and costs to building occupants/owners, developers and the City; industry readiness; administration and legal structure (i.e. within a Bylaw and/or as formal policy); opportunities for incentives; and compliance and enforcement. The policy will also consider providing anticipated timelines for future updates.

As Electric Vehicle Policy would apply only to personal vehicles, broader transportation planning for other modes (walking, cycling, transit and goods movement), and planning of road networks, will be addressed through Burnaby's Transportation Plan (currently being updated), and supported by the Move goal in the ESS and CEEP.

### ***4.1.2 City Facilities and Fleets***

Publicly accessible charging provides a valued service to customers that can supplement home and workplace charging. Like in new residential and commercial buildings, the costs of retrofitting City facilities can be prohibitive, thus including EV charging in new facilities can be a fiscally-responsible investment that is also future-oriented. This can include a combination of providing charging to serve near-term demand, and provision for future expansion (e.g. by sizing of electrical supply and installing conduit). The policy would consider the general direction for EV charging at City facilities (new and existing), and consider options for equitable fee-for-use, which are also being investigated by other jurisdictions in the region.

The policy would also aim to provide direction for consideration of EVs in City fleets, at a high level, in support of a future detailed analysis.

Should specific time-sensitive opportunities arise for EV charging at City facilities or fleets prior to finalization of the Electric Vehicle Policy, staff may advance such initiatives for Council's consideration on a case-specific basis.

## **4.2 Scope and Process for Policy Development**

The following process and scope is proposed in support of development of EV Policy. The process would include collaboration with other local governments and jurisdictions that are actively involved in EV policy development including research and analysis. It is anticipated that the following program would be undertaken between November 2017 and September 2018. Some preliminary/background work has already been initiated.

### ***1. Review of existing policy approaches, best practices (Nov. – Dec. 2017)***

This will include review of policy approaches in other jurisdictions, review of available research for Burnaby-specific data and implications, and information sharing among staff in other local governments. During this phase Burnaby City staff will also be engaged to raise awareness and understanding of EV related technologies and issues, and identify issues specific to Burnaby.

### ***2. Development of policy options and stakeholder consultation (Dec. 2017 – Mar. 2018)***

Stakeholders would be engaged, including developers (e.g. Urban Development Institute), EV users (e.g. Vancouver Electric Vehicle Association), businesses (e.g. Burnaby Board of Trade), industry (EV charging providers) and representatives of building owners/stratas, to discuss opportunities, concerns and considerations related to provision of EV charging in new development. This work is proposed to be coordinated with concurrent consultation on broader Green Building Policy where possible.

Public EV charging at City facilities would support and complement charging on private sites, and incorporation of EVs in the City's vehicle fleets can support corporate emissions reduction and may present opportunities to reduce operational costs. General guidelines or criteria for consideration of EV charging opportunities in new and existing City facilities would be drafted in this phase.

### ***3. Public Consultation (May – July 2018)***

The proposed policy, expressed as a component of Green Building Policy, would be shared with Council and subsequently provided to the public and stakeholders for comment, via printed, online and in-person formats. A summary of results from public consultation would be reported to Council along with the proposed policy framework.

### ***4. Council Approval of Policy (Sept. 2018)***

In responding to the feedback from public and stakeholders a proposed policy would then be advanced for Council's consideration.



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From: Director Planning and Building  
Re: Development of Electric Vehicle Policy for Burnaby  
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### 4.3 Resources and Budget

Existing City staff will lead and support this work, supplemented with additional external resources as appropriate. Budget has been allocated from existing operational budgets. As the work progresses, should a need arise to seek additional resources to address particular needs or data gaps, a request to that effect will be advanced for Council's consideration.

There are also some external resources and partnerships that City staff can draw upon to support this work. This includes the work of agencies such as Metro Vancouver, the Province, BC Hydro, and SFU, which includes facilitation of dialogue among local governments, hosting education events and resources, and undertaking research and analysis.

### 5.0 CONCLUSION

Electric vehicles represent a significant opportunity to achieve community health and sustainability goals including reducing greenhouse gas (GHG) emissions and improving air quality. The market is rapidly evolving, but faces current constraints including a lack of sufficient charging infrastructure. It is recognized that the technology and solutions in this field is also subject to rapid change. As such, specific policies will need to be responsive to this environment to ensure any City efforts are sound, efficient and appropriate over time.

Policy is in place and being developed at the federal, provincial and local government levels to support EV uptake. In Burnaby, the recently adopted ESS and CEEP frameworks support development of City policy to support EVs as a priority area for action. On this basis, it is recommended that the Committee recommend that Council authorize staff to undertake development of an EV Policy, together with development of broader green building policy, as outlined in Section 4 of this report.



Lou Pelletier, Director  
PLANNING AND BUILDING

LT:sla

**Attachment**

cc: City Manager  
Director Engineering  
Director Finance  
Director Parks, Recreation and Cultural Services  
Chief Building Inspector  
City Clerk

## APPENDIX A

### ELECTRIC VEHICLE POLICY DIRECTION AS STATED IN ESS AND CEEP

The following text is excerpted from the approved Environmental Sustainability Strategy and Community Energy and Emissions Plan.

**Table A1.** *Electric Vehicle Policy - Strategy and Suggested Actions in ESS and CEEP*

	ESS	CEEP
"Move" goal	A walkable, bike-able and transit-supported city that supports a healthy community and environment.	
Strategy No.	5.6.	C2.5 – Big Move
Strategy	Transition to more efficient (including zero-emission) vehicles and more efficient use of vehicles.	
Suggested Actions	a) Consider developing policy to strategically support and encourage the use of electric vehicles, including charging infrastructure in new developments and publicly accessible areas.	a) Consider developing policy to strategically support deployment of electric vehicles, including appropriate types and density of charging infrastructure in new development and publicly accessible areas, and consideration for public fast-charge station(s).
	b) Support and encourage car-sharing and bike-sharing.	c) Encourage and develop partnerships to expand car-sharing and consider bike-sharing opportunities in new development.
	c) Consider developing a parking policy to encourage fewer automobile trips, and prioritize more efficient and low-emissions vehicles like priority parking for carpool/vanpool, electric vehicles, and car-share vehicles.	b) Consider opportunities for demonstrating leadership by accelerating EV adoption by including EVs in corporate fleets, and providing public charging in municipal buildings and parking lots.
Quick Start	<i>13. Undertake a preliminary review and policy recommendations to support deployment of electric vehicles.</i>	