Clear Energy Solutions

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Electric Vehicle Charging Preparation Guide

This document is a high-level guide to position your community to be ready for Electric Vehicle (EV) adoption. EV's are gaining ground here in BC, with an increasing number of stratas and Multi-Unit Residential Buildings (MURBs) receiving requests from members about EV charging. In a competitive housing market combined with rapid EV adoption, communities that have charging or are proactive in planning for charging are opening doors and increasing the value of their homes. All communities will soon need to have some form of EV charging to keep up with the rapid adoption of EV's in BC.

A major factor for successful EV adoption is to be ready to take action when there is an incentive program available to assist with funding. To do this your community may need to begin the process years in advance in order to take advantage of the available incentive program when it becomes active.

The steps below have been gathered from our experience and external resources. Some of these resources are in links located at the bottom of this document. We recommend visiting these links and reaching out to these organizations for more in-depth information and to develop a balanced perspective.

Step 1: Educate yourself and your community

Get acquainted with the terminology and Electric Vehicle Service Equipment (*EVSE)* options:

- Browse through the links and resources we have included in this document.
- Definitions for *italicized* words are provided in the definitions section.
- Stay informed about the current incentive programs to ensure you act at the appropriate time.
- Learn about different charging levels (L1, L2 and L3). We recommend a focus on L2 charging.
- Consider current needs and future needs

Review strata rules and bylaws:

- Are there existing bylaws or rules for electric vehicle or electric bike/scooter charging?
- Develop an EV policy
- Do any strata rules or bylaws need to be amended or created?
- Can visitor parking be used for charging?
- Can parking stalls be interchanged, relocated or altered?
- Review Strata approval process and AGM schedule to coincide with EV policy and *EV Ready Plan*

Assess existing electrical and parking infrastructure:

- Determine initial desired areas for charging
- Consider communications access for EV areas – is there a cellular or Wi-Fi signal?
    - Please note that a cellular signal available to a phone may not be strong or consistent enough for an EVSE communications system; however, this is a good place to start.
- Where is the electrical room in relation to the desired EV parking areas?
    - Typically, the closer they are to each other will result in less expenditure.

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Assess existing electrical and parking infrastructure, continued:

- Does the building contain post tension cabling?
- Does the parking area require any accessibility considerations (wheelchairs, etc.)?
- It may be necessary for the strata to provide **letters of authorization** to inspection authorities (permitting - see Step 3 for detail).

Step 2: Survey the Strata Members to gauge their interest and understand their needs

- Who currently owns an EVSE, who will in 1 year, who will in 5 years?
- Are the residents interested in *shared charging* or *private charging?*
- Suggested location(s) of charger(s)
- Collect a high-level description of demographic: retired, families, number of people in the household, etc.
- Average commuting distances
- Is the strata in consensus about the installation of EVSE infrastructure? Is there approval to move forward with EVSE installations?
- Survey strata members for their level of interest in dedicating funding of electrical infrastructure upgrades (especially those who currently do not have EV's)
    - Full parkade electrification is far more cost effective and is more aesthetically pleasing compared to individual stall installations. Typically this option requires a buy-in from all strata members.
    - Some strata members may not want to participate in overall EVSE implementation, but they do want to have access to a communication system for improved cellular signal in the parkade in case of emergencies.

Step 3: Investigate your building's suitability with an Electrical Contractor (EC) or Engineer

- Engage with an EC or engineer to develop an EV Ready Plan
- At the time of your initial evaluation or when having an EC or engineering firm on site, be sure to have access to all areas. Have a person who knows the facility well and has the keys.
- Request *peak loading information* from your electrical utility provider (ex. BC Hydro). This will require a representative from the strata to be given authorization to interact with the utility on the strata's behalf. This can also be done by the EC or engineer with the correct paperwork.
- Request final drawings for the building to aid in the design process (ex. electrical, architectural). These can often be provided by the city and/or property manager. If the plans are not available, the EC or engineer may be required to develop plans for the supply authority, permitting and for tendering purposes.

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Step 3, continued:

- A **letter of authorization** to inspection authorities (from Step 1) often applies to EVSE installations where the whole strata is not moving forward in a unified system. These letters may need to describe that the owners (strata) understand the implications of allowing early adopters moving forward on their own:
    - When adding chargers prior to a full adoption strategy, some users may have more than their fair share of energy availability
    - Energy use and accountability - is the charging free? Are people paying for their power use?
    - Chargers made by different manufacturers can pose challenges with energy management
    - The strata should acknowledge and understand the available electrical capacity before and after installation of individual owners' EVSE and/or a unified EV system, as this may have impacts on other kinds of equipment (ex. new HVAC unit)
    - Private chargers located in common areas and/or accessing common electrical systems or communal chargers - who is responsible for the maintenance of chargers and ancillary equipment?

Step 4: Engage with the professionals

- Hire a certified electrical contractor
- Develop a parkade workflow plan
- Determine the needs for electrical shutdowns
- Determine appropriate work periods for concrete drilling and chipping

Common challenges and considerations:

- No appropriate stalls available for communal parking
- Non-EV owners not having interest in contribution to the system. This can result in needing to take a minimalist approach, which may soon result in the demand outweighing the capacity of the equipment
- Plan for the future ex. larger electrical panels, larger conduit, etc.
- Emerging technologies (it is important to support a developing industry, but this needs to be balanced with technology that is proven to be reliable)
- Equipment certifications - it is important to make sure that all equipment in an installation is certified by CSA, ULc, or equivalent to operate as a unit (ex. *EVEMS*)

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Definitions

EVSE: Electric vehicle service equipment (EV charger)

EVEMS: Electric vehicle energy management system. This is a control system that allows for charging where the electrical capacity is not sufficient to have full power charging at each stall 100% of the time. This approach can negate the need for an electrical service upgrade.

EV Ready Plan: a strategy for your building based on current electrical infrastructure or the addition of new electrical infrastructure to provide EV charging for each residential unit.

Shared Charging: Shared charging typically relates to a system of charging where multiple members will have access to one or a small group of chargers located in a common space. In this context these chargers would be fully managed, where anyone (resident or guest) can pay through the unit or app directly to the strata. This strategy will give anyone who is not participating in overall EV adoption the assurance that they are not paying for another's electricity use. The strata can set the charging rate to cover installation costs, ongoing maintenance and cloud services costs. It is also a strategy in situations where uptake within the strata is not high enough to move forward with 100% EVSE adoption or the electrical service is limited in its capacity.

Private charging: Private charging typically relates to a system that has EVSE located directly in the end user's parking area. In this context the EVSE will be managed through a cloud service and the end user will be billed directly and the strata reimbursed.

Accessibility standards: Accessibility standards, in this context, refers to a parking stall configuration and paths of egress that take into account the needs of people with requirements related to mobility and the equipment that aids in their mobility, such as wheelchairs and larger vehicles designed for this purpose.

Peak loading (information): Peak loading is a measure of the maximum electrical demand at any one point of electrical energy use. It is an essential measure for understanding what remaining electrical capacity an electrical system has available for use for other equipment such as EVSE. This is not the same as "the total kilowatt hours" (kWh) you may see on your electricity bill.

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Supporting Reference Material

Note that some of these documents are to be taken as a general guide. Please note the date on these documents. If there is any discussion on budgeting, those numbers may no longer be accurate and there are new advancements in technologies.

Simplified Reference Material:

Plugin BC

BC Hydro EV

https://www.fortisbc.com/services/sustainable-energy-options/electric-vehicle-charging

Natural Resources Canada

To what degree does temperature impact EV range? | Geotab

Temperature Tool for EV Range | Geotab

Technical Reference Material:

Residential Electric Vehicle Charging:

Electric Vehicle Charging Infrastructure - Requirements for New Developments

Guide to Electric Vehicle Charging in Multi-Unit Residential Buildings

Capital Region Local Government Electric Vehicle (EV) + Electric Bike (E-Bike) Infrastructure Planning Guide Prepared by: WATT C

Electric Vehicle Energy Management Systems