EV Ready Requirements





Introductions







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Outline

- 1. Why make EV charging infrastructure requirements for new construction?
- 2. How have jurisdictions structured EV charging infrastructure requirements?
- 3. Why include energy management in EV charging requirements?
- 4. Recommended requirements:
 - 100% EV Ready EV Ready Residential
 - 10-20% EV Ready Non-Residential

1. Why make EV charging infrastructure requirements?

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The Future of Mobility Is Electric



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-Bloomberg New Energy Finance, EV Outlook 2020

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Access to EV charging at home and work is critical

- + Access to "At Home" charging is critical to enabling EV uptake
 - 70% of charging is at home
 - Most households will not adopt an EV without access to home charging
- + Workplace & destination charging are also important
 - Supplement "at home" charging
 - Catalyze EV adoption
 - Sometimes replace access to at home charging



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Most Canadians have insufficient access to the basic electrical infrastructure needed for EV charging at home

100% 90% 80% % of survey respondents 70% 60% 50% 40% 30% 20% 10% 0% Single-family Multi-family Attached Level 1 (110 V) Level 2 (240/208 V)

Access to electrical infrastructure for EV charging

And...

Retrofitting for EV charging can be expensive and complex, especially in multi-family and commercial buildings



Source. SFU. 2015. *Electrifying Vehicles: Insights from the Canadian Plug-in Electric Vehicle Study*.



Retrofits more costly & complicated - MURBs

Cost per Parking Space (4-way sharing on 40A circuit)



Source: Derived from AES 2017. Electric Vehicle Charging Infrastructure in New Multifamily Developments - Requirement Options and Costing Analysis. Prepared for City of Richmond.

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Properly designed EV charging infrastructure requirements for new construction will make it <u>cheaper</u> and easier for owners and tenants to install charging stations in multi-family and commercial buildings as demand for EVs rise



2. How have jurisdictions structured EV charging infrastructure requirements?



How have different jurisdictions structured requirements for EV charging infrastructure?

- + Conduit only
- + EV Capable
- + EV Ready → Most common in Canada; recommended approach
- + EV Supply Equipment Install (i.e. EVSE Install)







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Infrastructure installed by consumer as a retrofit





EV Ready

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EV charger installed when there is demand







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EV charger installed regardless of demand

EV Charging Infrastructure Requirements Comparison – Residential Parking



Infrastructure Option	Minimize upfront costs	Minimize retrofit costs	Simple for condo assn. / owner	Equitable for residents	Simple to enforce	Future- proof		
Percentage- based EV Ready or EVSE (e.g. 20%)								
Conduit								
EV Capable (all stalls)							Lege	nd
EV Ready							Impacts	
(all stalls)							Some Challenges	
EVSE Installed (all stalls)							Major Challenges	

Source: Derived from AES Engineering, Fraser Basin Council, C2MP. 2018. *Residential Electric Vehicle Charging: A Guide for Local Governments*. Prepared for City of Richmond and BC Hydro.

3. Why support EV Energy Management Systems as part of new construction requirements?

A key technology enabling more cost effective EV charging in multifamily & commercial buildings



 Imagine you have enough capacity to charge 2 cars at the same time





- Imagine you have enough capacity to charge 2 cars at the same time
- + But you have more than 2 drivers





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One option is to **get a bigger panel** but that is **costly**



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- + Imagine you have enough capacity to charge 2 cars at the same time
- + But you have more than 2 drivers

Another option is to give each drive less power...







- + Imagine you have enough capacity to charge 2 cars at the same time
- + But you have more than 2 drivers

Another option is to give each drive less power... ... but the charging speed is slow even when one vehicle is charging





- Imagine you have enough capacity to charge 2 cars at the same time
- + But you have more than 2 drivers

A better option is to use **Energy Management**





- Imagine you have enough capacity to charge 2 cars at the same time
- + But you have more than 2 drivers

A better option is to use **Energy Management**



Charge 2-4x more cars with the same power capacity!



Multi Level Power Management



EV Energy Management Systems

- Reduce the cost of EV-ready new construction requirements by minimizing cost to supply to provide EV drivers with sufficient charge every day
- + Enable cost-effective installation of EV-ready parking in 100% EV Ready of stalls
 - Cost to serve 100% EV Ready of stalls w/ EVEMS is almost the same as serving 20% w/out EVEMS
- + Supported in most EV-ready requirements in Canada
- Deployed in multi-family and commercial installations across Canada
- + Enabled in 2018 Canadian Electrical Code



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EVEMS Reduces cost of EV Ready Parking





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Source: Derived from AES 2019. EV Energy Management Systems: Technology Review and Application Considerations. Prepared for FortisBC.

4. Recommended Approach

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Recommended Approach

+ 100% EV Ready "EV Ready" with EVEMS Level 2 Residential Parking

- Cost-effective for new developments
- Provides all residents with equitable access to charging

- Can represent less than 0.1% of total cost of development
- EVSE is installed when there is demand and install costs are minimized because of EVready infrastructure

+ 10% - 40% "EV Ready" Level 2 Non-Residential Parking

- Provides designers flexibility to choose optimal design (e.g. workplace; destination)
- EVSE is installed when there is demand and allows ultimate occupants to choose EVSE that best meets their needs

EV Charging requirements

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Jurisdiction	Residential	Commercial	
City of Vancouver	100% EV Ready	10% EV Ready	
City of Richmond	100% EV Ready		
City of Port Coquitlam	1 EV Cap. / dwelling		
City of Burnaby	100% EV Ready		
City of Coquitlam	1 EV Ready / dwelling		
City of New Westminster	100% EV Ready		
City of North Vancouver	100% EV Ready		
City of Port Moody	100% EV Ready		
District of Squamish	100% EV Ready		
City of Surrey	100% EV Ready	20% EV Ready	
Township of Langley	1 EV Ready / dwelling		
District of Saanich	100% EV Ready	Varies	
City of Nelson	1 EV Ready / dwelling	10% EV Ready	
District of West Van.	100% EV Ready		
City of Victoria	100% EV Ready	5% EV Ready	
City of Toronto	20% EV Ready or EVSE 80% Conduit/Partial	20% EV Ready / EVSE 80% Conduit/Partial	



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Mechanisms to Require EV Ready parking

- + Parking requirement
 - Zoning bylaw
 - Land use bylaw
 - Parking bylaw
- + Building requirement
 - Building Code
 - Building Bylaw
- + Policy
 - Green Standard
 - Council policy Consideration for development permit or rezoning

All mechanisms are viable! Consider how this will be implemented locally.

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If you're going to build onsite parking, allow drivers to choose an EV by making parking "EV Ready".





For further information on this topic, please contact:

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