

EV Charging in BC's Social and Indigenous Housing Communities

An overview of current barriers and recommended solutions

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EXECUTIVE SUMMARY

Despite provincial and federal funding programs that aim to increase the deployment of EV charging infrastructure across the Province of British Columbia (BC), evidence suggests that the uptake of EVs in equity-deserving communities, and the availability of charging in housing that serves equity-deserving populations, remains low. As charging access is a major driver for EV adoption, Fraser Basin Council (FBC) is interested in exploring the barriers to charging in equity-deserving communities. Recognizing that the needs of equity-deserving communities are diverse, we have focused this research on social and Indigenous housing communities, in particular. Improving access to EV charging in social and Indigenous housing communities is critical to ensuring that residents of these communities can benefit from the benefits of EV technology, including low operational costs, as well as reduced air pollution and GHG emissions.

Through this research project, Dunsy Energy + Climate Advisors (“Dunsy”) is supporting FBC in:

- Identifying and understanding **barriers to the deployment of EV charging** faced by social and Indigenous housing providers.
- Exploring **opportunities to remove these barriers** and **improve access to EV charging** in social and Indigenous housing.
- Providing **targeted recommendations** to key stakeholders in the EV charging, and social and Indigenous housing ecosystems that are well-positioned to implement change within these communities.

Three primary methods were employed to collect information and data in support of our research objectives:

- Surveys with social and Indigenous housing providers and residents
- Interviews with funders, administrators, providers and non-profit organizations supporting social and Indigenous housing
- A literature review

Findings from our interviews with housing providers, the survey results and our literature review revealed several barriers to the deployment of EV charging in social and Indigenous communities. These barriers generally fall into the following six themes:

1. Residents face **additional barriers** to EV adoption
2. EV charging is **not a top priority** for building operators
3. Limited access to information and the need for **targeted engagement** on topics such as existing funding programs, the benefits of EVs, the EV charger installation process
4. The sector faces **funding and resource constraints**
5. **Varied building stock** means no one-size-fits-all solution
6. **Limited electrical capacity** in older buildings

We have identified a number of actions that the BC Government, Aboriginal Management Housing Association (AHMA), non-profit housing providers, BCPHA, local governments and

others can take to alleviate these barriers. A summary of our recommendations is provided in the table below.

Table ES1. Summary of recommended solutions and appropriate delivery organizations

Recommendation	BC Gov.	Local Gov.	BC Hydro	Fortis BC	Plug In BC	BCNPHA	AHMA	Housing Providers
Conduct targeted outreach and education								
Conduct targeted outreach to social and Indigenous housing providers to increase awareness of the Plug In BC EV Advisor program.					✓			
Host an EV education session at the next annual BCNPHA conference.					✓	✓		
Explore the use of non-electronic service delivery methods to increase the awareness of existing EV rebate programs among social and Indigenous housing residents.	✓		✓	✓	✓			
Support strategically timed EV Ready retrofits								
Incorporate a residential 100% EV Ready bylaw for all new construction of residential parking.		✓						
Identify strategic opportunities for housing providers to develop future-proofing plans for EVs and other electrification loads during building upgrades or capital planning processes.	✓							
Offer a zero-cost utility extension for electrification projects in social and Indigenous housing.	✓		✓					
Develop a capacity assessment strategy with stakeholders so that detailed historical load values and nominal capacity data can be readily available.			✓	✓				
Identify opportunities for workforce training and development that equip electrical engineers and contractors serving social and Indigenous housing	✓							

Recommendation	BC Gov.	Local Gov.	BC Hydro	Fortis BC	Plug In BC	BCNPHA	AHMA	Housing Providers
communities with the knowledge they need to conduct comprehensive EV Ready retrofits.								
Identify strategic opportunities to educate non-profit housing providers on the benefits of integrating EV Ready retrofits (including electrical upgrades) with other major building retrofits.	☑					☑	☑	
Streamline and enhance funding programs								
Offer a concierge service for EV charging-related funding applications.						☑		
Identify opportunities to streamline EV charger program offerings and simplify the application process.	☑		☑	☑	☑			
Collaborate and explore opportunities to offer top-up funding for the EV Ready rebate program for organizations that serve equity-deserving groups including social and Indigenous housing providers.	☑	☑	☑	☑				
Explore opportunities to offer increased funding amounts or alternative program delivery methods that support the installation of EV chargers in social and Indigenous housing communities.	☑	☑	☑	☑				
Ensure businesses and organizations can easily access information on residential EV charger funding programs through the recently re-designed CleanBC Go Electric webpage.	☑							
Find alternative ways to bring EV chargers to these communities								
Explore opportunities to pilot an EV car-share service for residents with shared EV charging infrastructure.		☑						☑

Recommendation	BC Gov.	Local Gov.	BC Hydro	Fortis BC	Plug In BC	BCNPHA	AHMA	Housing Providers
Establish near-term targets for fleet electrification and explore opportunities to make EV charging accessible to residents.	☑					☑	☑	☑
Explore opportunities to amend the Go Electric Fleets program to enable the installation of multi-purpose chargers	☑							

1. Introduction

Access to charging infrastructure is a major driver of electric vehicle (EV) adoption. Despite provincial and federal funding programs that aim to increase the deployment of EV charging infrastructure across the Province of British Columbia (BC), evidence suggests that the uptake of EVs in equity-deserving communities, and the availability of charging in housing that serves equity-deserving populations, remains low.¹ It is essential to develop a better understanding of the hurdles these communities face.

As it stands today, EV owners are disproportionately wealthy, male, middle-aged and live in detached homes.² Furthermore, public EV charging tends to be concentrated in wealthier neighbourhoods in many communities.³ However, low-income and racialized populations stand to benefit from the adoption of EVs. Individuals in these populations tend to spend a disproportionate share of their income on vehicle-related expenses. Research shows that households in the U.S. earning less than \$25,000 (USD) per year spend 50% of their income on vehicle ownership-related expenses.⁴ As the cost of EV technology decreases, lower-income individuals will benefit from a lower vehicle total cost of ownership (TCO) that is driven by significant reductions in fuel and maintenance costs.

Low-income and racialized people also face a disproportionate burden from the air pollution and GHG impacts of traffic pollution. These individuals are more likely to live in areas that are impacted by air pollution from mobile sources. Furthermore, they often live in areas that are more likely to be negatively impacted by climate change. These communities, therefore, stand to reap greater health benefits from electrification.

As EV charging is a major driver for EV adoption, Fraser Basin Council (FBC) is interested in exploring the barriers to charging in equity-deserving communities. Recognizing that the needs of equity-deserving communities are diverse, we have focused this research on social and Indigenous housing communities, in particular. FBC is uniquely positioned to carry out this study as an administrator of EV education and rebate programs in the province. In collaboration with government, industry, community groups and institutions, FBC administers

¹ The term “equity-seeking groups” is increasingly being replaced with “equity-deserving” or “equity-denied” groups, to recognize that the burden should not be placed on disadvantaged groups to “seek” equity. Some other commonly used terms include “priority communities” and “disadvantaged communities.”

² International Council on Clean Transportation, *Expanding Access to Electric Mobility in the United States* (2017). https://theicct.org/wp-content/uploads/2021/06/Expanding-access-electric-mobility_ICCT-Briefing_06122017_vF.pdf

³ BlastPoint, “EV Charging Deserts: Where They Are & Why They Might Exist.” <http://blastpoint.com/blog/ev-charging-deserts-where-they-are-why-they-might-exist/>

⁴ International Council on Clean Transportation, *When Might Lower Income Drivers Benefit from Electric Vehicles* (2021). <https://theicct.org/sites/default/files/publications/EV-equity-feb2021.pdf>

Plug In BC, a program that provides information and support around plug-in vehicles and charging throughout BC.

EQUITY IN TRANSPORTATION ELECTRIFICATION

The Smart Electric Power Alliance (SEPA) defines Transportation Electrification Equity⁵ as:

- Ensuring that the benefits and burdens of a program are as fairly distributed as possible
- Engaging the communities that a program is designed to serve and meeting their needs
- Improving the reliability, accessibility, and affordability of the overall transportation system
- Addressing public health concerns about mobile source emissions
- Building the community's capacity to participate in decisions about transportation programs

Through this research project, Dunsky Energy + Climate Advisors (“Dunsky”) aims to support FBC in:

- Identifying and understanding barriers to the deployment of EV charging faced by social and Indigenous housing providers.
- Exploring opportunities to remove these barriers and improve access to EV charging in social and Indigenous housing.
- Providing targeted recommendations to key stakeholders in the EV charging, and social and Indigenous housing ecosystems that are well-positioned to implement change within these communities.

Improving access to EV charging in social and Indigenous housing communities is critical to ensuring that residents of these communities can benefit from EV technology, including low operational costs, as well as reduced air pollution and GHG emissions.

⁵ Smart Electric Power Alliance, *Benchmarking Equitable Transportation Electrification* (2022), 10. <https://sepapower.org/resource/benchmarking-equitable-transportation-electrification/>

2. Approach

Three primary methods were employed to collect information and data in support of our research objectives:

- Surveys with social and Indigenous housing providers and residents
- Interviews with funders, administrators, providers and non-profit organizations supporting social and Indigenous housing
- A literature review

Survey Approach

FBC developed and disseminated two surveys - one for individuals, and another for organizations and property managers. These surveys targeted people who live and work in social and Indigenous housing communities in BC to gather information on the barriers and challenges of EV adoption and access to charging. These surveys were designed to evaluate the following:

- Financial and economic hurdles to EV adoption
- Capacity and ability to devote time and effort to researching EV options
- Challenges associated with EV charging in renter-occupied and multi-unit residential housing
- Level of awareness of benefits associated with EV ownership and charging options
- Level of awareness and understanding of provincial rebate and support offerings
- Barriers associated with policy, codes, and standards

Surveys were circulated in October 2022 as a part of the FBC Plug In BC newsletter, as well as through newsletters of partners at the Aboriginal Housing Management Association (AHMA) and BC Non-Profit Housing Association (BCNPHA). Respondents were given the opportunity to participate in a gift card prize draw. A total of 493 responses were received from individuals, and 40 from organizations and property managers.

No personal information was collected as part of the survey, however, an email address and contact name were collected for individuals who wanted to participate in the gift card prize draw.

Due to the limited demographic information that was collected as a part of the surveys (e.g., individuals were not asked to identify which of the two groups, if either, they belonged to) and the fact that the survey link and prize draw were public, we face some challenges in attributing findings from these surveys to individuals and organizations within the social and Indigenous housing community.

Interviews

Dunsky interviewed representatives from a range of organizations in the social and Indigenous housing sector to gain insight into the following:

- The geographic context and size of populations living in social and Indigenous housing
- The lifestyle and needs of social and Indigenous housing residents
- The range of housing stock in each community
- Operational challenges of non-profit housing providers
- Levels of personal car ownership and parking availability among residents
- Baseline EV awareness in these communities
- Barriers to EV charger installation and EV Ready retrofits

The table below outlines the six organizations we interviewed.

Table 1. Overview of the organizations interviewed as a part of this study

Organization	Role	Location
BC Housing	Government agency funding social and Indigenous housing development, and in some cases, owning/operating social housing sites	Province-wide
Aboriginal Housing Management Association (AHMA)	Non-profit organization overseeing the administration of Indigenous housing supports	Province-wide
BC Non-Profit Housing Association (BCNPHA)	Non-profit organization strengthening BC's non-profit housing sector through advocacy, education and support	Province-wide
Dakelh & Quesnel Community Housing Society (DQCHS)	Non-profit Indigenous housing provider	Quesnel
Mamele'awt Qweesome/To'o Housing Society (MQHS)	Non-profit Indigenous housing provider	Fraser Valley
Vernon Native Housing Society	Non-profit Indigenous housing provider	Vernon

Literature Review

To ground truth and complement our findings and recommendations, we conducted a review of academic and grey literature examining the barriers and potential solutions to improving EV charging accessibility in equity-deserving communities. While we did not encounter any studies examining these issues in the specific context of social and Indigenous housing, there is a wide range of studies that exist for low-income and other equity-deserving communities, for which we expect there to be some overlap.

3. Social and Indigenous Housing Context

Social housing in British Columbia is defined as a housing development subsidized by the government, and that is either owned and/or operated directly by the government or a non-profit partner. BC Housing is the provincial entity that oversees social housing development and supports approximately 800 housing providers across the Province. For residents of B.C. to be eligible for subsidized long-term social housing, a tenant's gross household income must be below a region-specific income limit. There is a diverse mix of demographics that social housing supports, including families (defined as a minimum of two people, including one dependent child⁶), seniors, people with disabilities, single people and couples. Some social housing programs target support for specific populations, such as individuals experiencing homelessness or women fleeing violence.

Indigenous housing provides subsidized housing for Indigenous youth, singles, families, women and children fleeing violence, seniors, elders, and those experiencing homelessness. With funding support from BC Housing, the Aboriginal Housing Management Association (AHMA) oversees and administers Indigenous housing solutions across the Province. In June 2018, the Province announced a new \$550 million investment over 10 years to build and operate 1,750 units of social housing for Indigenous people both on- and off-Nation.⁷ Indigenous housing is available in 17 communities across BC: Dawson Creek, Duncan, Fort St. John, Kamloops, Kelowna, Langford, Metchosin, North Saanich, Oak Bay, Prince George, Saanich, Sidney, Sooke, Surrey, Vancouver, Victoria, and View Royal. Notably, Indigenous individuals in BC can also access long-term subsidized housing through other social housing channels, not just Indigenous housing.

Building stock varies greatly in both social and Indigenous housing developments due to the need to support diverse communities (e.g., families versus individuals) across diverse geographic locations in the Province. This geographic variation also leads to a wide range of reliance on personal vehicle ownership. In dense urban locations, we heard from housing providers that few tenants rely on a personal vehicle to get around and there may be limited parking available. Meanwhile, in more suburban contexts, it's more common for social and Indigenous housing residents to own a vehicle.

According to the organizations we interviewed, EV adoption in social and Indigenous housing communities is currently extremely limited. However, when individual survey respondents were asked about their willingness to adopt an EV considering current policies to encourage

⁶ BC Housing, "Subsidized Housing." <https://www.bchousing.org/housing-assistance/rental-housing/subsidized-housing>

⁷ BC Government, "Indigenous Housing." <https://www2.gov.bc.ca/gov/content/housing-tenancy/Indigenous-housing>

electric vehicle adoption in BC, roughly two-thirds of respondents indicated that they would either be very or moderately willing (see Figure 1).

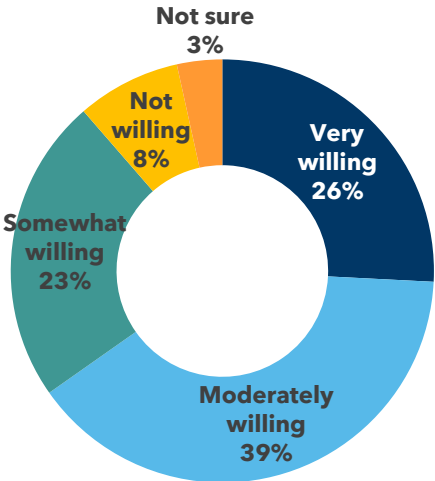


Figure 1. Survey responses from individuals showing willingness to adopt EVs

4. Barriers to EV Charging in Social and Indigenous Housing Communities

Findings from our interviews with housing providers, the survey results and our literature review revealed several barriers to the deployment of EV charging in social and Indigenous communities. We have organized these barriers into the following six themes:

1. Residents face **additional barriers** to EV adoption
2. EV charging is **not a top priority** for building operators
3. Limited **access to information** and the **need for targeted engagement** on topics such as:
 - Existing funding programs
 - The benefits of EVs
 - The EV charger installation process and ongoing operation
4. The sector faces **funding and resource constraints**
5. **Varied building stock** means no one-size-fits-all solution
6. **Limited electrical capacity** in older buildings

We discuss each of these barriers in more detail in the following sections.

4.1 Residents face additional barriers to EV adoption

Access to EV charging is undoubtedly a crucial factor in increasing the adoption of EVs. When survey respondents were asked to rate the degree to which access to home charging impacts their willingness to adopt EVs, three-quarters of individuals noted that access to charging has at least a moderate impact on their willingness to adopt an EV (see Figure 2).

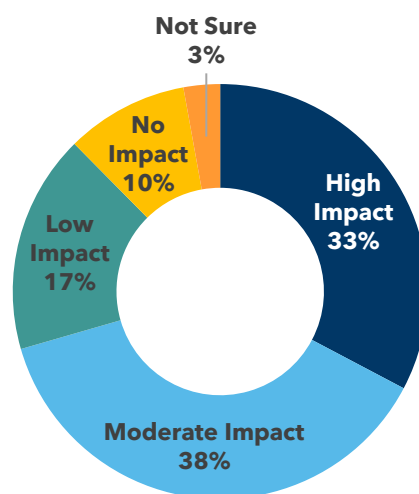


Figure 2. Survey responses showing the impact of home charging access on willingness to adopt an EV

However, it is worth noting that the lack of EV charging infrastructure in social and Indigenous housing communities is just one of the many barriers that residents of these communities face. In fact, several other obstacles may be more significant and need to be addressed to promote EV adoption in these communities.

Generally speaking, we do not expect lower-income individuals or those facing other precarious situations to be early adopters of new, expensive technology. For one, the high capital cost of EVs is a barrier that some residents of social and Indigenous housing may not be able to overcome given their lower average income. While existing provincial rebates can reduce the upfront cost of a new EV, the main barrier lies in the fact that we expect social and Indigenous housing residents to be more likely to buy vehicles from the second-hand market. However, up until recently, the second-hand EV market was nascent. Despite the fact that resale values were high due to limited supply, these vehicles only qualified for the very limited \$300 SCRAP-IT incentive. As the used EV market grows, and prices come down, the purchase price of an EV may become less of a barrier.

In dense urban communities, we expect lower levels of private vehicle ownership among residents of social and Indigenous housing communities relative to the broader population in those regions. Thanks to reliable public transit and walkable amenities in dense urban areas, lower-income individuals do not need to rely on an expensive personal vehicle to get around. Another deterrent to private vehicle ownership in dense urban areas may be the limited availability of parking.

This, however, may not be the case for residents of social and Indigenous housing located in suburban regions. We heard from staff at DQCHS in Quesnel, BC that one of the first things their tenants do is purchase a vehicle to get around. Similarly, staff at Vernon Native in Vernon, BC estimated that 80% of residents own a vehicle. Given the lower levels of transit in both of these areas, personal vehicle ownership is essential for residents to be able to access the amenities they need.

4.2 EV charging is not a top priority for building operators

When it comes to the maintenance and operation of social and Indigenous housing buildings, maintaining comfort and safety (e.g., through reliable building heating), and keeping energy costs low for residents are some of the primary objectives of operators. The non-profit housing stock in BC is aging, with approximately half of its buildings being built before 1990.⁸ BCNPHA estimates that there are 3 billion dollars in deferred maintenance within social and Indigenous housing communities in BC.⁹ Ultimately, the age and condition of the housing stock lead to significantly higher rates of energy use intensity compared to the BC average.¹⁰ As a result of this, proactive actions like EV Ready retrofits or the deployment of

⁸ Tom-Pierre Frappé-Sénéclauze, Dylan Hereema and David Bobyn, *Aggregation of energy retrofits in affordable housing* (Pembina Institute, 2017), 3. <https://www.pembina.org/reports/affordable-housing-retrofits-2017.pdf>

⁹ BCNPHA email communication

¹⁰ *Aggregation of energy retrofits in affordable housing*, 3.

EV chargers in the absence of immediate demand are likely to be cut in favour of more urgent and reactive building priorities, including tackling the long list of deferred maintenance. Making the case for EV charger installations becomes even more difficult when electrical capacity is limited as this only increases the capital required.

Unfortunately, delaying the installation of EV chargers hinders access to home charging as well as EV exposure, thereby further hindering EV adoption within these communities. This acts as a feedback loop that results in a chicken-and-egg problem of what comes first: the EVs or the charging infrastructure?

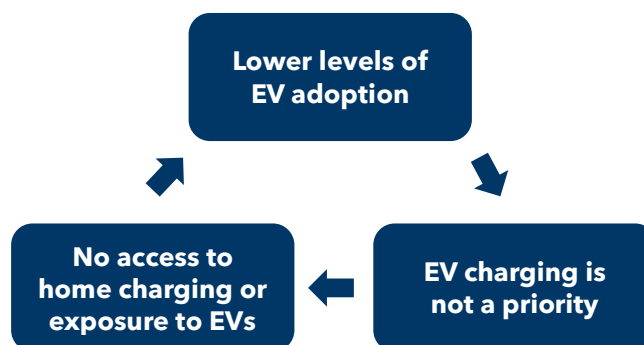


Figure 3. Feedback loop perpetuated by lack of EV charging

WHAT WE HEARD (SURVEY ANECDOTES)

“Charging infrastructure is a bit of a problem for me, which is one reason I haven't bought an electric car.”

“I think most people would be willing to buy an electric car if it could be charged more easily.”

“Charging electric vehicles is a problem. It needs to be accessible, convenient, and cost efficient.”

4.3 Limited access to information and the need for targeted engagement

Awareness of EV-related information was limited among the housing providers we interviewed. The awareness limitations spanned the following categories: (1) knowledge of existing funding programs, (2) knowledge of the benefits of EVs, and (3) knowledge of EV charging installation processes and ongoing operations.

Knowledge of existing funding programs

A wide range of provincial funding programs exist to support the adoption of EVs and the deployment of EV charging infrastructure. Housing providers we spoke to were either unaware of these programs or were only aware of a limited subset of programs.

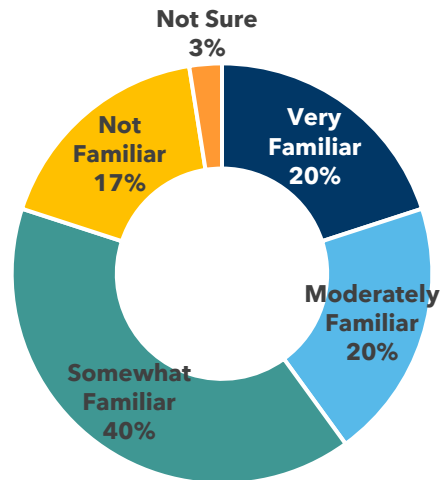


Figure 4. Organizational survey responses indicating the level of awareness of EV rebates

This demonstrates that while there are many resources and channels of dissemination, information on EV funding programs may not always be reaching the intended audience. This may be a result of either the housing provider having limited time to take in this new, non-critical information, the information is not being disseminated in the right way, or a combination of these factors. For instance, staff at AHMA noted that they share information on new funding programs through their email newsletter. However, newsletter open rates are low.

Of the organizations we surveyed, 80% find the high capital costs of EV charging infrastructure prohibitive. This, however, may also be a result of limited knowledge of funding opportunities available. With proper information dissemination, organizations may find programs or funding sources that can reduce capital costs of charging installations.

WHAT WE HEARD (SURVEY ANECDOTES)

"I'm afraid the charging ports are too expensive. And can't afford it."

Knowledge of the benefits of EVs

While EVs have historically cost more than internal combustion engine vehicles (ICEVs), this is quickly changing. As the upfront cost of EVs declines and a wider range of EV models come to market, many EVs already offer a lower total cost of ownership when compared to their ICEV equivalent. These savings are principally driven by lower maintenance and operating costs. Through our conversations with housing providers, we heard some misconceptions about the true cost of owning and operating an EV. Not only was there limited awareness of the wide range of non-luxury EV models available, but there were also misconceptions related to the cost savings that can be achieved.

Knowledge of EV charger installation and ongoing operation

Based on interviews and survey results with housing providers, another barrier lies in the uncertainty of the process and best practices for EV charger installations in different settings and locations. In addition, housing providers also had fundamental questions related to the ongoing operation and maintenance of these electrical installations - especially when it comes to billing residents and users of EV chargers.

Moreover, organization survey results outlined that one-quarter of housing providers are still unsure whether residents have permission to install an electric vehicle charging station (or plug into an existing outlet) where they park their vehicle. While still representing a minority of housing correspondents, the lack of certainty from housing providers may disincentivize residents and building operators from exploring EV charger installation opportunities within their own buildings.

4.4 The sector faces funding and resource constraints

As with many public and social initiatives, barriers can be broadly tied to funding and general resourcing constraints. As previously mentioned, other priorities such as the \$800 million in deferred maintenance work in BC would normally take capital and administrative precedence over the installation of EV charger installations - especially when the amount of funding for social and Indigenous housing providers in the Province is limited.

There is a set amount of funding for social and Indigenous housing providers in the Province, and thus providers need to prioritize how that money is spent. While the Province of BC has been proactive in creating programs and allocating funds through its *Community Housing Fund* and *Indigenous Housing Fund* programs, these programs' funds are dedicated towards the construction of new housing - not the installation of EV charging infrastructure.^{11,12}

Resourcing constraints also extend to staff. The administrative staff we interviewed highlighted that they are tasked with a wide range of administrative responsibilities as part of their daily operations. Staff at AHMA estimated that the average staff member supports approximately 27 single-family homes. This limits the opportunity for employees to dedicate time to learn and act on advancing the deployment of EV chargers in their communities.

4.5 Varied building stock means no one-size-fits-all solution

Variations in both the building stock and parking availability within each building segment can make planning for EV Ready retrofits challenging and limit the applicability of standardized market solutions across the social and Indigenous housing stock.

¹¹ BC Housing, "Community Housing Fund Program Overview". <https://www.bchousing.org/projects-partners/Building-BC/CHF>

¹² BC Housing, "Indigenous Housing Fund Program Overview". <https://www.bchousing.org/projects-partners/Building-BC/IHF>

Varied Building Stock

The social housing stock within the Province of BC consists of a mixed portfolio of building types with 38% of units being low-rise apartments, followed by 34% of units being categorized as a group of single-room occupancies, group homes, strata, and market-rental rent supplements. The remaining building type categories consist of townhouses (15%), high-rises (9%), and single-family & duplexes (4%).¹³ Overall, this variety in the housing stock leads to additional effort when it comes to identifying:

- Which rebates and funding programs are applicable (e.g., multifamily vs. single-family charger rebates)
- Best practices in charger deployment by building type
- Best practices for metering and cost-allocations in each building

Varied Parking Locations

Like the housing stock, there is no one-size-fits-all solution to installing EV infrastructure based on where residents park their vehicles. As shown in the table below, 45% of vehicles are parked in a garage whereas 30% of vehicles can be found in a parking lot and the remaining 25% of vehicles are located in driveways, public parking, and on-street parking.

While the results of this survey's particular question should not be used to extrapolate the parking location of the entirety of the Province's social and Indigenous housing, it should be noted that diversity in parking locations creates another potential barrier to EV charging infrastructure deployment in social and Indigenous housing.

Table 2. Parking location of residents who own a vehicle

Parking Location	Share of Survey Respondents
Garage	45%
Parking Lot	30%
Driveway	16%
Public Parking	5%
Street Parking	3%

4.6 Limited electrical capacity in older buildings

The electrical load impact of EVs was highlighted as a particular concern for housing operators during our interviews. Increased EV adoption in any type of building or residence may require electrical upgrades, thus impacting the capital budget of buildings and potentially electricity costs for its residents. Moreover, there is competition for any remaining electrical capacity with other initiatives like building heating electrification or the installation

¹³ Tom-Pierre Frappé-Sénéclauze, Dylan Hereema and David Bobyn, *Aggregation of energy retrofits in affordable housing* (Pembina Institute, 2017), 3. <https://www.pembina.org/reports/affordable-housing-retrofits-2017.pdf>

of air condition systems. It would not be surprising for initiatives that provide a more immediate benefit to residents, such as improving the safety and well-being of residents, to take priority over EV charging. Ultimately, housing providers face the challenge of balancing several, sometimes conflicting, priorities when prioritizing building upgrades.

In parallel with electrification priorities and decarbonization initiatives outlined by the Province of BC, higher building electrical demand and unmanaged EV charging loads could lead to significantly higher peak demand charges stemming from unmanaged electrical loads. Given the significance of demand charges on some electrical bills, housing operators would benefit from smart infrastructure upgrades within their buildings to monitor and manage their electric loads (potentially adding further strain on capital budgets - with the benefit of reduced operational savings in the future).

LOOKING AHEAD: ELECTRIC VEHICLES AND BUILDING-LEVEL RESILIENCY

In the long term, housing providers may have the added benefit of being able to leverage EVs as a source of building resiliency. In the event of a power outage, the energy stored in EV batteries can be leveraged to provide power for vital building-level operations like heating or elevators. This bidirectional flow of energy from EVs to buildings is often referred to as “vehicle-to-home” or “V2H.” Bidirectional V2H capabilities are already built into some EV models on the market today, although some additional hardware may be required. Building operators can also leverage V2H technology to reduce their energy costs during periods of peak demand by leveraging energy stored in EV batteries rather than purchasing it from the grid when it is most expensive.

5. Solutions to Accelerate Deployment

There are a number of actions that the BC Government, AHMA, non-profit housing providers, BCPHA, local governments and others can take to alleviate the aforementioned barriers to EV charging in social and Indigenous housing. Through our research, we have identified four overarching areas of opportunity:

1. Conduct targeted **outreach and education**
2. Support strategically timed **EV Ready retrofits**
3. Streamline and enhance **funding** programs
4. Find **alternative ways** to bring EV chargers to these communities

We discuss each of these opportunities in more detail in the sections below and outline specific actions that organizations in BC can take. Importantly, many of these actions will require additional funding to implement. Higher orders of government, including federal and provincial governments, will need to play a role in providing funding. Moreover, several of these actions require collaboration and coordination across multiple branches of government and various organizations. Instead of working in silos, all stakeholders will need to work together to address the greater need.

Finally, given that many of these recommendations are informed by our interviews with funders, administrators, providers and non-profit organizations supporting social and Indigenous housing - rather than the residents themselves - it's important to note that any future program design should include individuals with lived experience from these communities.

5.1 Conduct targeted outreach and education

While many educational resources exist to inform communities on various aspects of the EV ecosystem, anecdotal evidence from our interviews suggests that these resources aren't always reaching their target audience. Further, targeted education within the social and Indigenous housing community on a wide range of topics, including the benefits of EVs, the availability of current funding programs, and best practices in installing EV chargers.

Non-profit housing providers who administer a large share of social and Indigenous housing in the Province of BC have a critical role to play in enabling EV charging in these communities. It's crucial that staff in these organizations are aware of the benefits that EVs can offer their residents, and the supportive role staff can take around ensuring access to home charging to ensure residents can take advantage of those benefits. We heard from staff at non-profit housing providers that many are resource-constrained and have limited ability to invest time in learning more about new technologies like EVs. To reduce the burden on staff, it's critical to find better ways to educate these communities by meeting people where they are. This means making direct points of contact with individuals and tailoring the engagement approach to better meet their needs. In particular, finding ways to conduct targeted outreach

as opposed to relying on staff to read through newsletters or other online ads is more likely to ensure a captive audience.

Recommendations

- **Plug In BC** should conduct **targeted outreach** to social and Indigenous housing providers to increase awareness of the EV Advisor program. If leveraged, we expect this program could improve education about EV charging in multifamily buildings. There is no cost barrier to participation as EV Advisor sessions are free. Staff would also have the opportunity to receive tailored advice.
- **BCNPHA**, in partnership with **Plug In BC**, should host an **EV education session** at the next annual BCNPHA conference. These conferences are widely attended by non-profit housing providers across the Province and would therefore serve as a great forum to increase awareness of the benefits of EVs and to discuss strategies for the installation and operation of EV chargers in social and Indigenous housing contexts.
- The **BC Government, BC Hydro, Fortis BC, Plug In BC** and any other funding program administrators should explore the use of **non-electronic service delivery methods** to increase the awareness of existing EV rebate programs among social and Indigenous housing residents. One housing provider we interviewed noted that physical brochures would be helpful. We encourage organizations to conduct additional outreach to housing providers to know what alternative methods of dissemination would best meet their residents' needs.

5.2 Support strategically timed EV Ready retrofits

A large portion of the BC social and Indigenous housing building stock is aging and not expected to have the electrical capacity needed to support electrified heating, cooling and EV charging. To unlock EV charging in these communities, it's expected that in many instances, electrical and other building upgrades will be required. However, rather than taking a piecemeal approach and undergoing multiple major upgrades to support building heating electrification, housing providers should explore opportunities to conduct comprehensive building electrification assessments and identify not only what is needed to support electrification opportunities in the near-term, but also the long term.

The development of a comprehensive building electrification assessment does not mean that all upgrades are done at the same time but rather helps to ensure that actions are phased in a logical and cost-effective way. This approach can result in significant cost savings by, for example, reducing the need for a second electrical panel upgrade within a short period of time or by laying cables when conduits are exposed rather than spending additional construction costs down the line. Organizations like BCNPHA are taking this approach and looking at opportunities to phase retrofits to manage loads as they support housing providers with portfolio planning, while also supporting the identification of appropriate funding opportunities. Some barriers they currently face are limited data on buildings' electrical capacity to aid in better building decision-making and sometimes a lack of approved contractors to conduct assessments.

Recommendations

- **Local governments** should incorporate a residential **100% EV Ready bylaw** for all new construction of residential parking. Making parking stalls EV Ready is significantly less expensive during the initial building phase versus retrofitting later.
- **BC Housing** should identify strategic opportunities for housing providers to develop **future-proofing plans** for EVs and other electrification loads during building upgrades or capital planning processes.
- **BC Hydro**, with support from the **BC Government**, should offer a zero-cost **utility extension** for electrification projects in social and Indigenous housing.
- **BC Hydro** and **Fortis BC** should develop a **capacity assessment strategy** with stakeholders so that detailed historical load values and nominal capacity data can be readily available.
- The **BC Government** should identify opportunities for **workforce training and development** that equip electrical engineers and contractors serving social and Indigenous housing communities with the knowledge they need to conduct comprehensive EV Ready retrofits.
- **BC Housing** and **AHMA** should identify other strategic opportunities to **educate** non-profit housing providers on the benefits of integrating EV Ready retrofits (including electrical upgrades) with other major building retrofits, including cost estimates for different approaches to adding charging infrastructure and the potential cost savings achieved through future-proofing vs incremental installations. Importantly, AHMA would require additional funding to support an initiative like this.

5.3 Streamline and enhance funding programs

We have identified several ways to adapt funding programs to better meet the needs of social and Indigenous housing community members and providers. First, we have heard from organizations that the time it takes to identify relevant programs and then fill out demanding applications can be a deterrent to housing providers accessing funding. As an organization that is experienced in delivering concierge-style services for energy efficiency, and as a reliable resource for housing providers in both the social and Indigenous housing sectors, BCNPHA is well-suited to delivering a concierge service for EV charging-related funding applications. However, first and foremost, program applications should be as streamlined and simple as possible. Any opportunities to reduce the time burden of funding applications on staff will go a long way in ensuring equity-deserving groups like social and Indigenous housing providers can access the funding they need while these programs are available.

The BC Government has taken important steps in ensuring funding for EVs and EV charging reaches the communities that need it the most. For one, they have geared EV rebate amounts to income level. Second, Indigenous organizations can access higher funding amounts under the single-family, multifamily and workplace charger rebate streams. While we commend the BC Government for taking these steps, there is still more that can be done to ensure organizations serving equity-deserving groups - like social housing providers - can access the funds needed to promote EV adoption in the communities that would stand to benefit the most. Given that some of the biggest barriers to home charging exist in multifamily buildings, the EV Ready rebate program is critical to unlocking home charging access for a large share

of social and non-profit housing residents. We recommend that the BC Government, BC Hydro, FortisBC and local governments collaborate and explore opportunities to offer increased funding amounts for Indigenous and other equity-deserving groups under the EV Ready funding stream.

Third, to ensure that non-Indigenous social housing providers can access the funding they need to increase home charging access in their communities, the BC Government, BC Hydro, FortisBC and local governments should explore opportunities to offer increased funding amounts for other non-Indigenous equity-deserving groups under the single-family, multifamily and workplace charger rebate program streams, or alternative program delivery methods. The City of Vancouver's [Electric Vehicle Charging for Rental Buildings](#) program in which rental building owners can apply to have City-owned EV chargers installed in their buildings is a great example of municipal leadership in this space. Under this program, most of the cost and administrative work for installing and maintaining EV chargers are covered by the City. Programs like these not only reduce the capital constraints of EV charger installations but also reduce the ongoing administrative burden for housing providers.

Finally, to ensure that individuals are educated on the range of current funding opportunities, a streamlined online experience is critical. The BC Government recently re-designed the Go Electric webpage to offer a much more user-friendly experience than was previously offered. We expect this will alleviate some past confusion. However, one minor opportunity that exists is to ensure organizations like the non-profit housing providers can see the range of incentives that are available for residential charging by linking to these incentives under the "For Businesses and Organizations" page.

Recommendations

- **BCNPHA** should offer a **concierge service** for EV charging-related funding applications. Importantly, additional funding would be required for BCNPHA to implement a program like this.
- The **BC Government, BC Hydro, FortisBC** and **PlugIn BC** should identify opportunities to streamline EV charger program offerings and **simplify** the application process.
- The **BC Government, BC Hydro, FortisBC** and **local governments** should collaborate and explore opportunities to offer top-up funding for the **EV Ready rebate** program for organizations that serve equity-deserving groups including social and Indigenous housing providers.
- The **BC Government, BC Hydro, FortisBC** and **local governments** should explore opportunities to offer increased funding amounts for **EV charger installations** in equity-deserving groups like social and Indigenous housing communities.
- **The BC Government** should ensure businesses and organizations can easily access information on **residential EV charger funding programs** through the recently re-designed CleanBC Go Electric webpage.

5.4 Find alternative ways to bring EV chargers to these communities

While certain social and Indigenous housing communities show higher rates of personal car ownership, it's important to note that this trend doesn't apply universally across all communities in BC. To ensure that all communities can benefit from EVs - including the reduced levels of air pollution and lower operating costs - there are alternative ways to bring EVs into these communities. For one, car-share organizations can help to overcome barriers to EV charger deployments by initiating the installation process and using alternative funding available to them as fleet operators. Survey results indicate that access to an EV car share could improve adoption. Second, the electrification of corporate fleets (e.g., vehicles operated by BC Housing, BCNPHA or non-profit housing providers' staff) may benefit these communities by providing additional exposure to EVs and potentially resulting in the installation of EV chargers on-site. Unfortunately, multi-purpose chargers that serve both fleets and residents aren't currently eligible for funding under the provincial rebate program for fleet charging. The program would need to be amended in order to enable this.

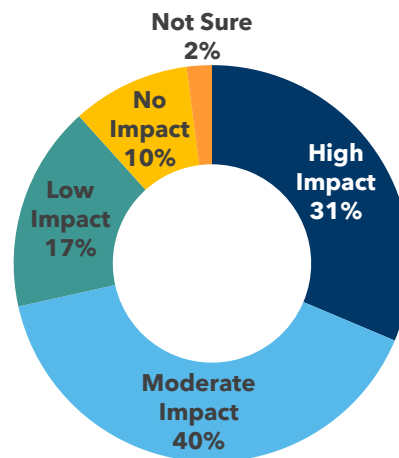


Figure 5. Individual survey responses indicating the impact of EV car share access on EV adoption

Recommendations

- **Housing providers** should explore opportunities to pilot an EV **car-share** service for residents with shared EV charging infrastructure.
- **BC Housing, BCNPHA, AHMA** and **housing providers** should lead by example and establish near-term targets for **fleet electrification**, as well as explore opportunities to make EV charging accessible to residents.
- The **BC Government** should explore opportunities to amend current fleet EV charging rebate programs under the Go Electric Fleets program to enable the installation of **multi-purpose chargers**.

6. Summary of Recommendations

Social and Indigenous housing providers in BC face a wide range of barriers to the installation of EV chargers. However, there are several actions that governments, utilities and non-profits in the space can take to alleviate some of these barriers. A summary of our recommendations is provided in the table below.

Table 3. Summary of recommended solutions and appropriate delivery organizations

Recommendation	BC Gov.	Local Gov.	BC Hydro	Fortis BC	Plug In BC	BCNPHA	AHMA	Housing Providers
Conduct targeted outreach and education								
Conduct targeted outreach to social and Indigenous housing providers to increase awareness of the Plug In BC EV Advisor program.					✓			
Host an EV education session at the next annual BCNPHA conference.					✓	✓		
Explore the use of non-electronic service delivery methods to increase the awareness of existing EV rebate programs among social and Indigenous housing residents.	✓		✓	✓	✓			
Support strategically timed EV Ready retrofits								
Incorporate a residential 100% EV Ready bylaw for all new construction of residential parking.		✓						
Identify strategic opportunities for housing providers to develop future-proofing plans for EVs and other electrification loads during building upgrades or capital planning processes.	✓							
Offer a zero-cost utility extension for electrification projects in social and Indigenous housing.	✓		✓					

Recommendation	BC Gov.	Local Gov.	BC Hydro	Fortis BC	Plug In BC	BCNPHA	AHIMA	Housing Providers
Develop a capacity assessment strategy with stakeholders so that detailed historical load values and nominal capacity data can be readily available.			✓	✓				
Identify opportunities for workforce training and development that equip electrical engineers and contractors serving social and Indigenous housing communities with the knowledge they need to conduct comprehensive EV Ready retrofits.	✓							
Identify strategic opportunities to educate non-profit housing providers on the benefits of integrating EV Ready retrofits (including electrical upgrades) with other major building retrofits.	✓					✓	✓	
Streamline and enhance funding programs								
Offer a concierge service for EV charging-related funding applications.						✓		
Identify opportunities to streamline EV charger program offerings and simplify the application process.	✓		✓	✓	✓			
Collaborate and explore opportunities to offer top-up funding for the EV Ready rebate program for organizations that serve equity-deserving groups including social and Indigenous housing providers.	✓	✓	✓	✓				
Explore opportunities to offer increased funding amounts or alternative program delivery methods that support the installation of EV chargers in social and Indigenous housing communities.	✓	✓	✓	✓				
Ensure businesses and organizations can easily access information on residential EV charger funding programs through the recently re-designed CleanBC Go Electric webpage.	✓							

Recommendation	BC Gov.	Local Gov.	BC Hydro	Fortis BC	Plug In BC	BCNPHA	AHIMA	Housing Providers
Find alternative ways to bring EV chargers to these communities								
Explore opportunities to pilot an EV car-share service for residents with shared EV charging infrastructure.		✓						✓
Establish near-term targets for fleet electrification and explore opportunities to make EV charging accessible to residents.	✓					✓	✓	✓
Explore opportunities to amend the Go Electric Fleets program to enable the installation of multi-purpose chargers	✓							



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This report was prepared by Dunsky Energy + Climate Advisors, an independent firm focused on the clean energy transition and committed to quality, integrity and unbiased analysis and counsel. Our findings and recommendations are based on the best information available at the time the work was conducted as well as our experts' professional judgment.

Dunsky is proud to stand by our work.