

EV charger installation at Heddlestone Village, Nelson BC

A 24-unit residential development in the West Kootenays is now EV ready—and the number of electric vehicles has tripled—thanks to rebates to support infrastructure upgrades and some pro bono contributions from innovative residents.

Description of the property

Heddlestone Village is a 24 unit co-housing development about 14 kms north of the City of Nelson, in BC's Central Kootenay region. The Village consists of 12 duplexes, privately owned residences with a mix of owners and tenants. There is a large “common house” with a kitchen and dining area, recreational and living space, guest rooms, and laundry facilities. The residents manage their private property and the shared spaces are co-managed through the strata corporation.

The community is pedestrianized, with a gravel parking lot at the entrance to the property, a distance of up to 100 metres away from the residences. The parking lot has two utility sheds with simple electrical service and one NEMA 14-50 outlet. Before 2022, three residents owning electric vehicles (EVs) shared these outlets to charge their EVs.

As the Heddlestone community is in a rural area, access to convenient home charging makes EV ownership much more feasible, especially for those who commute to work. Heddlestone resident, Andrew, described the benefits of commuting by EV in this video: <https://youtu.be/bs8eqOx5hbc>

Overview of the project

In 2021, the Village residents did an assessment of their greenhouse gas emissions. They decided the best way to collectively lower their emissions was to switch their personal vehicles to EVs. This would require the installation of dedicated EV chargers in the parking lot for each unit.

A few interested residents took the lead in 2022, investigating the available government rebates, consulting with an electrician, and writing up a proposal for how the strata could invest in EV chargers. They estimated it would cost \$1,000 per household for needed infrastructure upgrades. At a general meeting of the strata, residents considered the proposal and voted to move forward. With the long-term availability of rebates uncertain, the strata agreed to cover the cost for installing infrastructure to all 24 units. Residents could then “buy-in” by paying back the strata at-cost. At the time, 18 of 24 households committed to the project and a nineteenth unit has since bought-in.

The strata approved a budget and two residents, Andrew and Diane, acted as co-project managers. Diane, a retiree, focused on administration, securing the rebates, and scheduling the various contractors. Andrew, an environmental engineer, focused on the technical aspects to the rebate applications and supported the electrical design and installation. These project management services were provided pro bono.

“We gave people the opportunity to say, I'm just not ready to pay for it at this time. But if I ever sell my house, part of the proceeds can help pay for it. Or I can buy in later. We aren't charging interest, so whenever somebody wants to buy in, they'll just pay \$1,600. We tried to keep the barrier to entry as low as possible.”

—Andrew, Co-Project Manager

EV Charger rebates

The strata applied for two rebates which significantly improved the financial viability of the project. The **CleanBC Go Electric EV Charger Program** offers a series of rebates specifically for apartment, condo and townhome complexes, also known as multi-unit residential buildings (MURBs). In the Nelson area, these rebates are administered by FortisBC on behalf of CleanBC.

The co-project managers selected the **MURB EV Ready Electrical Infrastructure** and the **MURB EV Ready Charger** rebates. They received the full \$600 per parking unit for infrastructure, which supported the cost of new electrical panels, conduit, excavation, and labour. They also received the full 75% rebate on the chargers and installation—though, unexpectedly, this rebate was exclusive of taxes, increasing the project cost by a small margin.

FortisBC administered EV charging rebates for MURBs

MURB EV Ready Plan

This rebate helps MURBs get ready to retrofit their parking to support EVs. The subsidized EV Ready Plan is prepared by a licensed electrical contractor and/or electrical engineer. Essentially, the plan provides a strategy to ensure there is dedicated electrical wiring to every parking stall and capacity in the system to support EV charging.

MURB EV Ready Electrical Infrastructure

This rebate helps MURBs install electrical infrastructure required by an EV Ready plan, including engineering design services, construction and equipment installation, permitting, utility extension fees and signage. Up to 50% of costs can be reimbursed to a maximum of \$600 per parking unit and \$120,000 per MURB. Eligible costs include engineering design services, electrical and communication infrastructure installation, construction, and utility extension fees.

MURB EV Ready Charger Rebate

Applicants who received the Electrical Infrastructure rebate can also apply to help with the cost of the actual chargers. In FortisBC administered areas, this rebate covers up to 75% of the cost of a charging station, to a maximum of \$1,400 per charging station and \$14,000 per MURB. Eligible costs include equipment, installation, site assessment, and permits.

MURB Charger Rebate

There is also a standalone rebate for MURBs to purchase and install new Level 2 networked chargers. In FortisBC administered areas, this rebate can be up to 75% of purchase and installation costs to a maximum of \$5,000 per station and \$25,000 per MURB. Eligible costs include equipment, installation, permits, signage and environmental assessments.

FortisBC EV Charger Incentive Program for MURBs and workplaces

FortisBC direct-billed electricity customers can apply for \$1,920 per Level 2 charger, up to seven chargers per site. This incentive is available to new construction as well as retrofit applications.

 <https://www.fortisbc.com/rebates/business/ev-charging-solutions-for-multi-unit-residential-buildings-and-workplaces>

Equipment and infrastructure

Due to the strata owning an open-air parking lot, the chargers needed to be fully weatherproof outdoor units. The project managers chose the Grizzl-E Smart charger, a Canadian-made product that is well reviewed (the junior model, Grizzl-E Classic, was named “Best EV Charger for Basic Functionality” by New York Magazine). Through negotiation, and because they were buying multiple units, they were able to access lower bulk pricing, paying under \$800 per unit after shipping and taxes.

A local excavation contractor was hired to trench the parking lot in order to lay new cable. This was a significant cost, up to \$10,000. A local master electrician was hired to install the chargers and the necessary infrastructure. His previous experience installing EV chargers included the Flo network chargers at Selkirk College and at Whitewater Ski Hill. The electrician installed new electrical panels in each utility shed, laid tech cables, hard-wired the chargers, and arranged for all permits and inspections. The electrician was also consulted early on in the process to support the initial proposal, project plan, and rebate applications.

To network the chargers locally (instead of using a commercial service), the Village uses an open-source software application called SteVe, installed on an affordable Raspberry Pi server. A resident and software engineer, Keith, modified the software to communicate with the chargers and implemented the network capabilities.

Successful outcomes

After navigating complicated rebate applications, juggling construction schedules, and figuring out some technical solutions, the EV chargers were successfully installed. Once the rebates were received, the final cost to Heddlestone Village was roughly \$1,600 per parking unit.

Providing dedicated EV charging to every unit spurred an immediate boost in EV interest within the strata. In the first year after installation, the number of EVs in the community more than tripled—rising from 3 to 10.

A number of circumstances and opportunities came together to make this project a success:

- Three residents had already demonstrated to the rest of the community the viability of owning an electric vehicle. With infrastructure costs rising and the rebates available for a limited time, the other residents could see that it would be worthwhile to buy into a charger now, even if it would be some time before they themselves purchased an EV.
- Awareness of the government rebates was high, fueling interest in the initiative. When the final savings were known, 30% off infrastructure and 75% off the chargers proved a very significant cost difference. “We wouldn't have pursued this project if we weren't able to get the level of [government rebate] funding we did.”
- Convincing close to 20 units to join at the outset made the rebates viable. The CleanBC rebate program is not designed for small numbers of units. Initially only 6 residents were interested in purchasing chargers, which would not have been viable under the current program.

Additionally, there are two factors that made the project considerably more affordable.

- Early on, while working on the proposal, an electrician was consulted. By measuring the strata's actual consumption, they were able to show that they were only using one third of their

electrical capacity. This professional opinion was used to advocate to the local utility that an extension was not required; on paper, supporting two dozen EV chargers would require the addition of new capacity.

- The project received considerable pro bono support. The two residents who became co-project managers did not charge for their services, saving upwards of \$5,000 compared to hiring a professional project manager. Andrew also conducted the EV usage assessment pro bono as a personal learning opportunity, while Keith volunteered his software engineering expertise, and the electrician they hired also provided free expertise in the planning stages.

Lessons for other strata

1. Take advantage of rebates while they last.

It is an opportune time for any strata to consider installing EV chargers—whether their members are currently EV owners or not. Currently, subsidies and rebates are available to support the purchase of EV chargers. CleanBC EV Ready program means funding is even available to just start planning; no strata needs to tackle this challenge alone.

2. Create an EV Ready plan so you can leverage other planned work.

A plan enables a strata to integrate EV charging into other infrastructure plans—any time there is civic work happening or the ground is going to be excavated, it's an opportunity to consider electric upgrades. Just having conduit in the ground or a panel upgrade will make it more affordable to purchase chargers years into the future.

3. Communicate with residents and plan for parking disruptions.

The Heddlestone Village experience will be most relevant to any other strata with an exterior parking lot. If the parking lot requires new electrical conduit to be installed, the excavation will end up taking away parking for two weeks or more. Project managers will need to tightly coordinate the construction schedule as the excavator begin work until the electrical contractor is ready, who can't begin until the permits and inspector are ready to go.

4. Work with a licensed electrician experienced with EV chargers.

The electrician hired by Heddlestone Village had previous experience installing EV chargers and therefore contributed to project timelines. An electrician who can support permitting, proposals, and planning is an asset.

5. Find resident champions.

Heddlestone Village demonstrates the significant cost savings of finding a resident who can serve as project manager pro bono. The co-project manager, Andrew, thinks any interested person with some technical skill could manage relationship with an electrical contractor. More crucially, the project manager must have the soft skills to pitch the project successfully to their fellow residents, and to communicate with and coordinate contractors throughout the project.

“We put together a plan based on what the rebates were like and got it costed from the electrician. And then we took that to our community, through a general meeting—basically gave a presentation on the opportunity. We put out sheets for people to sign up, and once we realized the level of interest we had, we had a vote, and the vote was yes.”

—Andrew, Co-Project Manager

Addendum: Unique challenges overcome

Heddlestone Village's experience highlights some shortcomings in the rebate process and with the state of EV charging technology.

Avoiding commercial subscription costs

The CleanBC rebate program requires the chargers to be networked using a protocol such as the Open Charge Point Protocol (OCPP) or a proprietary system. This limits the selection to predominantly commercial-oriented chargers. Equipment vendors often try to lock-in a vendor solution for software, limiting compatibility and adding subscription costs. For large property managers (100+ chargers), these subscription costs can be amortized, but for a strata with 5 to 25 chargers, \$1,000 a year for simple data aggregation is less tenable.

Most strata likely would not have the technical know-how to find an alternative to a commercial subscription. In Heddlestone Village, however, a resident software engineer volunteered to help. They identified a possible solution: SteVe, an open-source software application that could provide basic functions for the administration of charge points, user data, and RFID cards for user authentication.

The co-project managers found two equipment vendors that supported the use of open-source software and went ahead with the Grizzl-E charger. The volunteer software engineer installed SteVe on a Raspberry Pi server and made customizations to better meet their specific needs.

While it is quite unusual for a strata to run their own charger management software, this solution does save the strata considerable money every year which would have been paid for a commercial charger management solution.

Accurate power metering

While the equipment's charging performance has been good, the Grizzl-E charger's integrated power meter has proven finicky and unreliable, not reporting time of connection and consumption consistently. For example, the equipment has reported phantom data—at the end of a charging session, the power disconnects but sometimes the meter continues to read a steady charge for several more hours. At other times, the chargers dispense power but the meter shows nothing.

The Grizzl-E vendor, United Chargers Inc., is in Richmond Hill, Ontario, and could update the firmware on the chargers, but the strata would have to pay for shipping back and forth, a prohibitive cost. United Chargers' software partner, Charge Labs, was offered as a fix, but that would mean taking on the significant subscription fee of joining Charge Labs.

Equitable billing

With some residents commuting daily by EV, and others only driving occasionally, the strata needs a way to equitably apportion their single utility bill. However, in BC, only utilities and municipalities can assign energy-based rates to EV chargers; all other entities must charge based on the *amount of time* an EV is plugged in. Additionally, Measurement Canada requires meters to be accurate to the nearest \$0.0001. If the strata could bill by kWh, this would provide greater flexibility and transparency and would reduce the administrative burden of operating EV chargers in a MURB.