



EV Charging and Jobs in Canada

The Job Creation Potential of EV Charger Installations

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Notes From the Authors & Sponsors

This report was prepared by Dunsky Energy + Climate Advisors and was funded by ChargePoint Canada Inc. and Accelerate. The findings in this report provide a snapshot of the potential for EV installation jobs based on projected demand for EV chargers in an [analysis](#) conducted for NRCan by Dunsky Energy + Climate Advisors. The findings presented in the report should be interpreted as illustrative of the rough magnitude of EV charging installation jobs hours needed to support charging demand in line with Canada's ZEV regulation sales targets; additional study is needed to fully assess, in-depth, total employment impacts and gaps. Further, study findings on future installation jobs reflect installation needs for the total EV charging market and should not be interpreted as job hours for just stations installed on the ChargePoint network.

"At ChargePoint, we know the future of mobility is electric. As such, we wanted to quantify the EV charging installation industry's impact on the Canadian economy. Developing and maintaining a robust charging network throughout Canada is a significant opportunity for skilled workers in various fields. As you'll see in this report, installing charging infrastructure can create 300+ job hours per site, on average, spread across several vocations, and involving numerous highly skilled trade professionals working for utilities, civil contracting firms, engineering firms, and electrical contractors. All across the country, the focus must continue to be funnelling people into sustainable skilled trades such as the ones cited in the report, where qualified individuals do meaningful and well-paid work."

- Suzanne Goldberg, Sr. Director of Public Policy, ChargePoint Canada Inc.

"To be ready for - and to fully benefit from - the transition to zero-emission mobility, it's critical we know the types of labour that will be in demand, identify gaps and adjust public policy and investment accordingly. As detailed in this report, installing a national charging network represents an important job creation opportunity and we have to make sure we have the necessary skills and capacity to get the job done in order to meet Canada's ZEV targets."

- Matthew Fortier, President and CEO, Accelerate

About Dunsky



Dunsky supports leading governments, utilities, corporations and others across North America in their efforts to accelerate **the clean energy transition**, effectively and responsibly.

With deep expertise across the Buildings, Mobility, Industry and Energy sectors, we support our clients in two ways: through rigorous **Analysis** (of technical, economic and market opportunities) and by designing or assessing **Strategies** (plans, programs and policies) to achieve success.

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The map displays logos for various client organizations across North America, categorized into Governments, Utilities, and Corporate + Non-Profit. Government logos include British Columbia, Alberta, Saskatchewan, Ontario, Québec, and Nova Scotia. Utility logos include BC Hydro, SaskPower, Manitoba Hydro, Hydro Québec, and others. Corporate and non-profit logos include Google, PSE&G, and many others.

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1. EV Charging in Canada

The Government of Canada has adopted a mandatory target of achieving 100% zero-emission vehicle market share for new light-duty vehicle (LDV) sales by 2035. A key component of this transition will include the build-out of electric vehicle (EV) charging infrastructure. There are already many Canadians working behind the scenes to support the build-out of EV charging infrastructure across the country. As our EV charging needs grow, this further bolsters the opportunity to create well-paying jobs and stimulate Canada’s economy. In this study, we look to get a general sense of the expected number of jobs the installation of EV chargers will create during this decade.

1.1 EV Ownership Projections and Charging Needs

While there were just over 200,000 light-duty EVs in circulation in Canada in 2020, it’s anticipated there will be over 4.6 million by 2035 (see Figure 1 **Error! Reference source not found.**). Canada has already made significant progress in building out a network of EV chargers to support the growing number of EVs on Canada’s roads. As of January 2023, there were over 19,000 public EV chargers available across Canada, according to [data](#) from Natural Resources Canada (NRCan). Between 2020 and 2021, the number of public EV chargers increased by nearly 20% (Source: [Electric Autonomy Canada](#)).

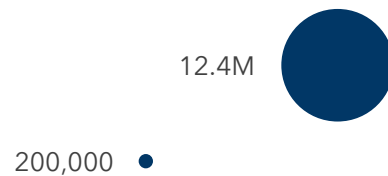


Figure 1 EVs in circulation in Canada in 2020 (left) and projected for 2035 (right)



Company Spotlight: ChargerCrew

ChargerCrew Canada was founded in 2016 in Woodstock, Ontario to deploy an EV infrastructure for businesses, municipalities, corporations, and individuals to reduce their greenhouse gas (GHG) emissions and fight climate change. Since inception, ChargerCrew Canada has installed hundreds of EV charging stations throughout Canada.

ChargerCrew collaborates with local businesses to support local communities. Installers are trained and fully supported by ChargerCrew Canada in the installation of field-proven EV chargers and, where possible, local electricians are subcontracted and trained. Initially focused solely on Ontario, increased interest in electric vehicles has led ChargerCrew Canada to expand throughout Canada, creating jobs and training employees and partners in the deployment of an EVSE infrastructure. See ChargerCrew installers in action.

In an [analysis](#) conducted for NRCan, Dunskey Energy + Climate Advisors forecasted the number of EV charging ports that will need to be installed in the coming decades. By 2035, it’s estimated that Canada will require up to **475,000** public charging ports and over **2 million** ports in multi-unit residential buildings (MURBs). While two scenarios were explored in Dunskey’s analysis - high and low

home charging access - we focus on a high home charging access scenario in this analysis given the importance of home charging to EV adoption and the growing trends of EV-ready requirements for new construction across Canada. Notably, [80% of EV owners charge at home](#) and [74% expect to be able to charge most often at home](#), as it tends to be the most convenient and affordable option.

1.2 Key Roles in the Installation of EV Charging Infrastructure

Although not an exhaustive list, here are some of the key job functions and roles involved in the installation of EV charging stations.

Electrical contractors: responsible for installing EV charging infrastructure (e.g., EV chargers; wiring; electrical equipment; etc.) and ensuring that installations are compliant with applicable electrical safety codes. May also lead the application and submission of any required permits. Includes those working at dedicated electrical contracting businesses, as well as those working within utilities.

Electrical engineers: responsible for feasibility analysis and costing, conceptual electrical and site design, detailed design, tendering processes, field review, and other engineering duties. Includes those working at dedicated electrical engineering firms, as well as those working within utilities.

Utility employees: responsible for reserving and directing electricity supply to an EVSE site and determining whether additional infrastructure is required to deliver it.

EV charging technology distributors and providers: responsible for the distribution and sale or resale of charging equipment, and in some cases, the coordination or project management of EV charger installations.



Company Spotlight: ZENO

Zeno is an Alberta-based purpose-driven and community-minded solar and EV solutions provider that delivers best-in-class products and exceptional customer service to Canadian homeowners and businesses who want to create a sustainable future. Over the years, they have seen the electric vehicle industry go from 3-4 chargers installed a quarter to 3-4 chargers a week. This rapid expansion is due to an increase in demand from users across the province who have found EVs to be a viable and reliable form of transportation. For Zeno, it has made their business more stable and reliable, resulting in well-paying jobs in a rapidly growing industry.

Civil and general contractors: may be required to support construction required on-site, such as trenching to bury cables when installing EV chargers in surface-level parking lots.

Heavy equipment operators: operate heavy equipment needed for some EV charging installations (e.g., a crane, bucket truck, or lift operator will be required to ensure that electrical contractors are able to access existing electricity lines located at height).

Study Methodology

This study is intended to provide insight into the potential for EV installation jobs based on a snapshot of installations across the country. We surveyed six firms specializing in electrical contracting services, electrical engineering, and parking management solutions to determine the types of labour involved and effort required across the following three types of installations:

- Two single-port Level 2 charging stations in a multi-unit residential building (MURB)
- Two dual-port Level 2 charging stations in a public or commercial setting
- Two single-port direct current fast charging (DCFC) stations in a public or commercial setting

Each company was asked to indicate the number of people required within each of the following job functions and typical number of hours required by each individual for each installation type:

- Electrical contractors
- Electrical engineers
- Utility employees
- Permit review
- Site validation and activation
- Civil contractors
- General contractors
- Heavy equipment operators
- Other (travel)

We took the average number of hours reported for each job function across each installation type and multiplied this by the number of additional chargers required each year to estimate the expected annual job hours required. Total hours were divided by 2,000 hours (50 working weeks per year x 40 hours per week) to identify the number of full-time equivalent (FTE) positions required each year.

2. Job Market Impacts

2.1 Job Functions Required for Typical EV Charger Installations

A breakdown of the survey responses we received indicating the number of hours required across different job functions for the three typical EV charging installation types examined is provided in Figure 2. Given that these results are representative of only six surveyed firms - a small sample size - they are meant to be interpreted as indicative of general trends across the industry. These are estimates of average job hours for each site type, and job hours can vary based on the complexity of install or upgrades required (e.g., in rural or remote areas). Further, it is worth noting that while some of the labour that goes into EV charging installations needs to happen sequentially (e.g., site assessments need to occur before any trenching or drilling on-site), there is also a notable portion of the work that can happen concurrently (e.g., civil and general contracting).

Survey results suggest that DCFC installations tend to be more labour-intensive than Level 2 charger installations. As these chargers require electricity from the grid at a significantly higher rate than Level 2 chargers, they require more specialized pre-assessments and equipment. DCFC installations often require new or upgraded electrical services, which requires more time from electrical, civil and general contractors, as well as crane or boom truck operators. These various individuals are required to prepare the site and make space for new equipment, and physically move the equipment into place.

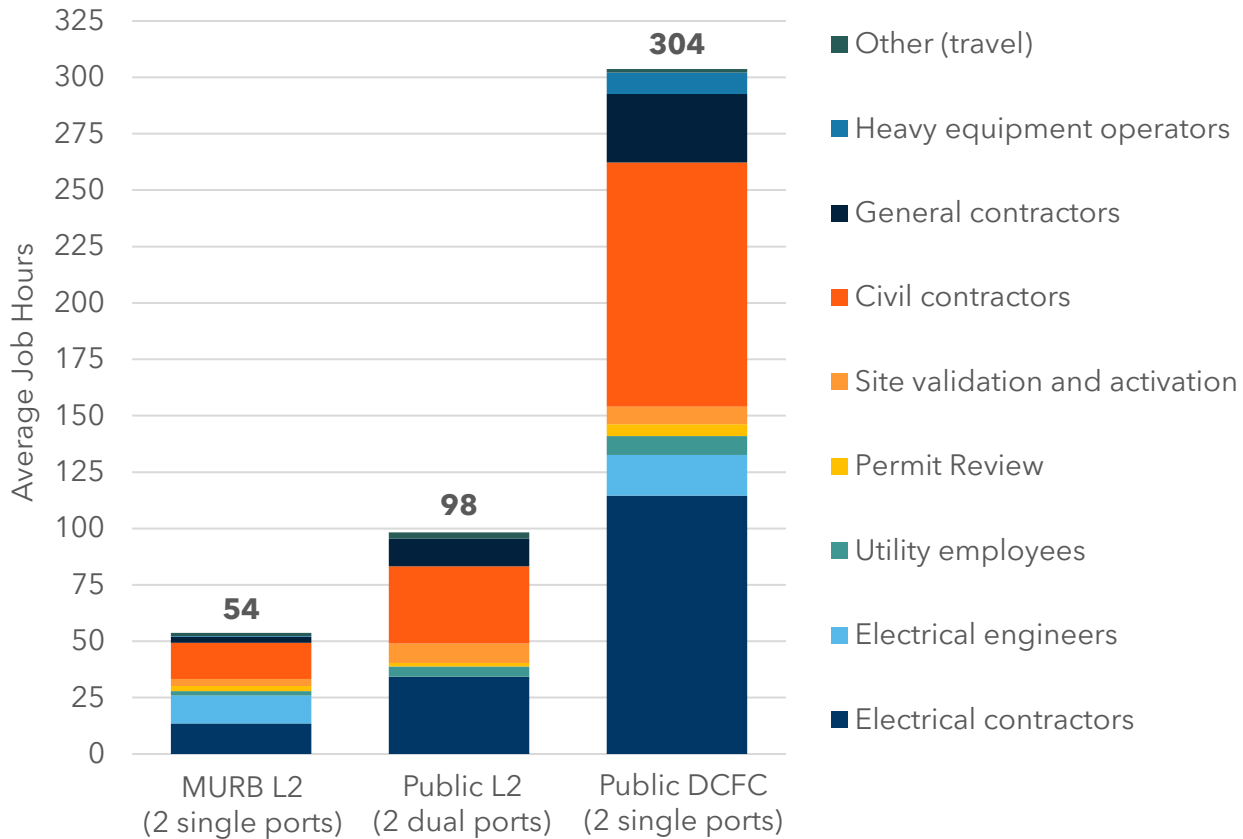


Figure 2. Typical hours required across job functions for three types of EV charger installations

The survey results we received also suggest that more time is required of civil contractors in public versus MURB Level 2 charger installations. This may be due to the fact that these chargers are often installed in surface parking lots and in these instances, cables need to be buried rather than installed along the surface of walls in indoor parking facilities.

Future Evolutions in EV Charger Installations

Job estimates have only been projected out until 2035 in order to account for the fact that significant efficiencies in the installation of EV chargers exist and may become more commonplace over time. For one, some emerging approaches to large-scale EV charging installations may become increasingly commonplace. In MURBs, for instance, it is significantly more time- and cost effective to make a building “EV-ready” all in one go and simply install EV ports in response to each new EV that is adopted. Moreover, it is expected that installations may simply become faster as workers become more familiar with the equipment and challenges that commonly arise. On the other hand, fast charging station capacity is increasing as new vehicles enter the market that can take on higher levels of charge (50 kW +). Higher power charging will require additional electrical capacity and likely panel or service upgrades, thereby increasing job hours.

2.2 Forecasting Job Creation Potential of EV Charger Installations

Taking into account the sample of survey results we received on average hours of labour per EV charger install, we've estimated that approximately **3,500 FTE positions** may be required by 2035 to meet the EV charging needs of Canadians (see Figure 3). It's expected that demand for this labour will ramp-up relatively quickly: by 2025, up to 2,720 positions may need to be filled for critical roles such as electricians, or civil and general contractors.

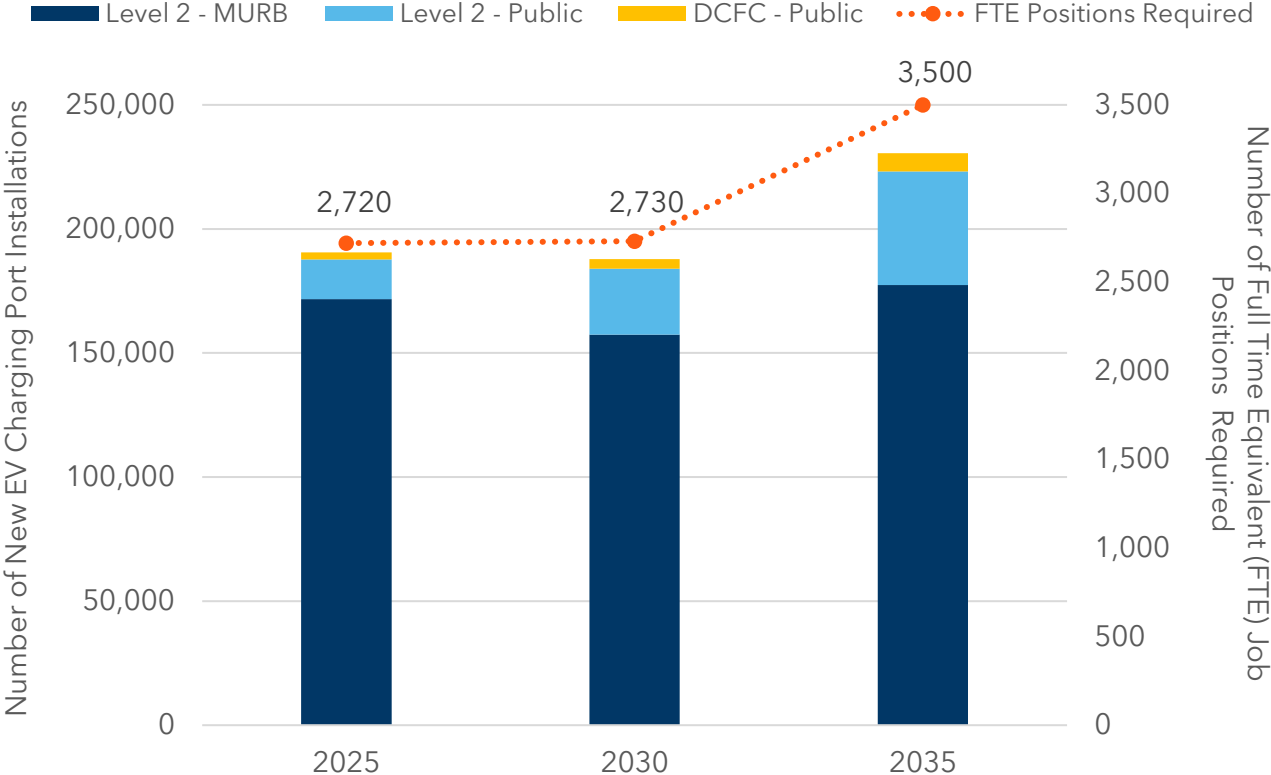


Figure 3. Projected number of full time equivalent (FTE) positions needed each year to support forecasted EV charging port requirements

Forecasts from the Government of Canada's Canadian Occupational Projection System (COPS) suggest that during the period of 2019-2028, there will be over 98,000 job openings across relevant sectors like electrical contractors or heavy equipment operators, and a similar number of job seekers to fill these roles (see Table 2 in the Appendix for a breakdown of job numbers by sector). It's unclear, however, how many of these positions are or will be filled by individuals with the specialized knowledge needed in many cases to support the build-out of charging infrastructure. Moreover, more recent data from Canada and the US suggest that we will soon be facing a labour shortage as more skilled tradespeople are retiring than entering the workforce.¹

¹ For example, the National Electrical Contractor Association, a trade organization representing electrical contractors and their chapters in Canada and the US, noted in a [2019 article](#) that in the United States, 7,000 electricians join the field each year, but 10,000 retire. Similar trends have been noted in Canada.

2.3 Impacts on Other Industries

Our estimates above quantify the direct job creation associated with the installation of EV chargers. There are, however, many other job creation benefits that trickle throughout the supply chain. For instance, there are upstream jobs associated with:

- Electricity production to fuel the site,
- Any necessary changes to the transmission and distribution network,
- Manufacturing of electrical distribution equipment and transformers, and
- Transportation of equipment to each site.

Downstream, there are jobs associated with:

- EV charging network operators and producers, and
- Charging station maintenance.

More broadly, the transition towards EVs has the potential for significant job creation opportunities across the entire EV supply chain, including vehicle and parts manufacturing and mining of critical minerals.

3. Looking Ahead

Meeting Canada's target of 100% light-duty ZEV sales by 2035 will require a significant increase in charging infrastructure deployment in public places as well as EV drivers' homes. Several job functions are required to support the installation of EV charging stations including electrical, civil and general contractors, electrical engineers, utility operations representatives and heavy-duty equipment operators. Canada's ZEV sales target will undoubtedly increase demand for these job functions and is likely to result in both direct and indirect job creation across Canada. Growing demand for EV infrastructure-related jobs will require more skills development and training and will require efforts to attract high school and post-secondary students, as well as underrepresented communities like women and First Nations.

While this study only provides an initial assessment of the potential jobs demand for EV charging installations based on a small sample, it is clear that investments in workforce development and training will be needed to support a successful transition to ZEVs in Canada. A more in-depth study on the full picture around employment demand, potential job growth in these areas, as well as any gaps is needed to identify skills training needs and investment. Programs such as the Sustainable Jobs Training Centre which was recently [announced](#) as a part of the federal government's \$250M funding announcement to support workers in emerging job markets will be critical to ensuring we are well-prepared to seize this opportunity and ensure a smooth and successful transition to ZEVs.

Appendix A

Table 1. Aggregated survey results: average number of job hours required per function by installation type

Labour Function	Public Level 2 (2 dual ports)	MURB Level 2 (2 stations)	Public DCFC (2 stations)
Electrical contractors	13.5	34.3	114.6
Electrical engineers	12.4	0.0	18.0
Utility employees	2.0	4.5	8.4
Permit review	2.3	1.7	5.2
Site validation and activation	3.2	8.7	7.8
Civil contractors	16.0	34.1	108.3
General contractors	2.7	12.4	30.4
Heavy equipment operators	0.3	0.0	9.5
Other (travel)	1.5	2.6	1.5
TOTAL	54 hours	98 hours	304 hours

Table 2. Projection of Cumulative Job Openings and Job Seekers over the Period of 2019-2028 (Source: [Canadian Occupational Projection System](#))

Sector	Job Openings	Job Seekers
Contractors and supervisors, other construction trades, installers, repairers and servicers (7205)	22,400	20,100
Contractors and supervisors, electrical trades and telecommunications occupations (7202)	12,600	13,100
Electricians (except industrial and power system) (7241)	23,400	20,300
Electrical and electronics engineers (2133)	13,300	16,600
Heavy equipment operators (except crane) (7521)	26,400	28,100
Electrical and electronics engineering technologists and technician (2241)	14,900	14,000
Electrical power line and cable workers & Telecommunications line and cable workers (7244)	6,800	7,800
TOTAL	98,100	98,200



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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.**