

GO ELECTRIC FLEET SHOW

Learn More: Electric Vehicle Charging Standards

Canada's push toward a sustainable future includes robust standards and infrastructure for electric vehicle (EV) charging, ensuring compatibility, safety, and accessibility for EV drivers. In British Columbia, these standards are especially relevant due to the province's focus on expanding EV infrastructure, notably through the BC Electric Highway. This article reviews essential EV charging standards and highlights the adoption of the North American Charging Standard (NACS).

1. Overview of EV Charging Levels

Canadian EV charging is categorized into three levels, each catering to different use cases:

- Level 1 (120V): Suitable for home use, with slower charging speeds; often used overnight.
- Level 2 (240V): Faster charging, commonly found in public locations, workplaces, and multi-unit residential buildings.
- Level 3 (DC Fast Charging): High-speed chargers that can replenish up to 80% of an EV's battery in 30–45 minutes. These chargers are essential for longer trips and are strategically located along highways and transit routes.

In British Columbia, all chargers installed under government programs must meet technical standards set by the Canadian Electrical Code (CEC) and the Canadian Standards Association (CSA), ensuring safe, efficient, and consistent performance across charging stations (Canadian Standards Association, 2022).

2. SAE J1772: developed by the Society of Automotive Engineers, is commonly used in North America for Level 1 and Level 2 AC charging. It features a five-pin connector design that supports charging at voltages up to 240V and power levels up to 19.2 kW, making it suitable for home and workplace charging. J1772 connectors are compatible with most electric vehicles sold in North America, allowing users to charge their EVs across multiple networks without needing adapters.

3. CHAdeMO: short for "Charge de Move," is a DC fast-charging standard originating from Japan, primarily used for high-speed Level 3 charging. The CHAdeMO connector can deliver up to 62.5 kW and, with newer versions, up to 400 kW, providing rapid charging suitable for public charging stations and highway corridors. While CHAdeMO was once the dominant fast-charging standard, many automakers are now transitioning toward the Combined Charging System (CCS) and the North American Charging Standard (NACS) for fast charging.

4. The Combined Charging System (CCS): a versatile charging standard that supports both AC and DC fast charging through a single connector, offering flexibility and faster charging options for electric vehicles (EVs). CCS combines the J1772 connector for AC charging with two additional pins for DC fast charging, enabling charging at higher power levels up to 350 kW.

5. The North American Charging Standard (NACS): Recently, the North American Charging Standard (NACS) has gained traction as a common EV charging connector standard, primarily led by Tesla. Recognizing the growing adoption of NACS, Canada is integrating this standard alongside the Combined Charging System (CCS), which supports most other EV brands. The presence of both NACS and CCS at public charging stations will improve compatibility across various EV makes and models, simplifying access for EV drivers (Electric Mobility Canada, 2023).

4. Safety and Certification Standards

EV charging safety standards are stringent in Canada, especially for high-power Level 3 chargers. The CSA Group and Underwriters Laboratories of Canada (ULC) set robust safety requirements for these chargers, including protection against electrical overloads, impact resistance, and safe operation in extreme temperatures. The Canadian Electrical Code requires protective devices, such as ground-fault circuit interrupters (GFCIs), to be installed at all public charging stations to prevent electric shocks and safeguard users (Canadian Standards Association, 2022).

Conclusion

British Columbia's commitment to creating a reliable and accessible EV network is ensuring that EV drivers have seamless, safe, and universal access to charging infrastructure.

References

- Canadian Standards Association. (2022). EV Charging Standards and Guidelines. Retrieved from CSA Group
- Electric Mobility Canada. (2023). North American Charging Standard and EV Charging Interoperability. Retrieved from Electric Mobility
- Natural Resources Canada. (2023). Zero-Emission Vehicle Infrastructure Program (ZEVIP). Retrieved from Natural Resources Canada



Fraser Basin Council

Plug In BC is a program of the Fraser Basin Council and works in collaboration with government, industry, academic institutions, EV owners, NGOs and utilities to advance the uptake of electric vehicles in British Columbia.

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