36th International Electric Vehicle Symposium and Exhibition (EVS36)
Sacramento, California, USA, June 11-14, 2023

Emerging Trends in North American Light Duty EV Charging Regulation

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Executive Summary

Emissions from transportation are significant contributors to greenhouse gas emissions in developed countries, meaning the electrification of transportation has become a significant focus in state and provincial decarbonization efforts. Building consumer confidence in electric transportation has, therefore, become paramount and leading North American national and subnational governments are experimenting with creative regulatory approaches to this end.

This paper reviews regulation aimed at encouraging adequate deployment of charging stations, including legislation aimed at expanding and facilitating charging in residential buildings, monetizing electric vehicle charging, and streamlining zoning. It also examines ways regulators have addressed consumer protection concerns, such as by developing specific requirements relating to metering, billing and price display, payment, reliability, and installation and maintenance of charging stations. Finally, the paper considers regulatory approaches leading governments have taken to promote accessibility, such as ensuring charging stations are physically accessible and providing charging services in more than one language. As EV sales increase, we expect more states and provinces to consider expanding their interest in these areas.

light vehicles, electric vehicle supply equipment (EVSE), regulation, policy, government

Introduction : categories of regulation in an emerging industry

An increasing number of national, subnational and municipal governments across North America seek to reduce transportation emissions, which are often the largest or second largest sectoral contributors to greenhouse gas (GHG) emissions in developed economies. Electrification of transportation has been selected by most as a leading decarbonization approach to address trips that cannot be shifted to active transportation, with the expectation that, as transportation modes are electrified, electrical generation will also be

decarbonizing with widespread programs to phase out coal and increase the use of renewable generation in many states and provinces.

One of the major challenges to achieving mass electric transportation adoption has been convincing consumers they will be able to charge their vehicles at home, in transit and at their destinations. Governments are experimenting with creative regulatory approaches to (1) encourage adequate deployment of charging stations, (2) address consumer protection concerns and (3) promote accessibility as they seek to balance sometimes competing regulatory psriorities. The authors believe that an overview of some of the most innovative regulatory developments is useful both as a resource for those interested in the emergence of this industry, but also as a point-in-time picture of regulation in a novel and dynamic industry. While they are very important, we have not generally included discussions of incentive programs, which can function as de facto regulation because of their importance to the economics of charging station deployment. We have similarly excluded vehicle regulation, vehicle and charging subsidies and education, all of which have a major impact on market size, shape and velocity, but are beyond the scope of this discussion.

1 Encouraging adequate deployment of charging stations

Most owners of detached homes with dedicated garages or driveways are able to install home "Level 2" electric vehicles supply equipment (EVSE; typically 240V AC) easily and relatively cost effectively. Some (particularly those with early generation vehicles) even charge using a standard 120V outlet (called "Level 1"). Users who can charge at home tend to charge at home a lot, meaning that home charging, especially overnight charging, tends to make up 60-80% of a typical vehicle's charging time.[1] The ease of typical installation means that most governments are not devoting significant regulatory effort to ensuring home charging access in detached homes or homes that otherwise have dedicated parking. However, given the importance of access to residential charging, leading regulators are increasingly focused on trying to ensure equivalent levels of charging access to residents who are not able to easily install home charging.

1.1.1 The Challenge of Multi-Family Homes ("MFHs")[2]

Many residents of MFHs, including condominiums, stratas and apartments, face significant barriers to charging installation. The legal setup of MFHs varies between and even within states and provinces, but, at a general level, many residents face challenges having dedicated charging installed because they don't have a legal right to modify common areas needed to service the parking space, the electrical room, and the electrical service generally. Installing charging often requires costly civil works and upgrades to electrical services that were designed before large numbers of vehicle chargers were contemplated by electrical system designers, meaning MFHs or residents are often subject to much higher costs than detached home occupants. Even after installation, billing issues can create complexity, since not all EV users have the same driving-and therefore charging-needs, requiring MFH governance boards to sub-bill or contract out billing services to fairly allocate fees for charging, all of which typically requires special network charging stations and typically some administrative time. Surveys have found that MFH residents are, understandably, more reluctant to adopt EVs,[3] which is concerning both because it means a significant portion of the population is less likely

[1] The US Department of Energy has previously cited 80% as a general estimate, while some studies have found rates even higher depending on vehicle model. These numbers are predicted to change as more public and workplace charging becomes available, but generally underscore the importance of residential charging from a convenience and cost perspective (home charging is typically much cheaper than public fast charging per kWh dispensed) for those who have access.

[2] We use the term "condominium" generally to avoid unnecessary words, but the description relates to alternative forms of owned common property developments with central corporations like stratas, apartments, and other regional names.

[3] See e.g. Axsen, Goldberg and Bailey "Electrifying Vehicles Insights from the Canadian Plug-in Electric Vehicle Study", (Simon Fraser University, 2015), available here: electrifying-vehicles-final-v2-8-july-10-high-res-download-rgb-no-bleeds_executivesummary.pdf; see also L. Davis "Evidence of a homeowner-renter gap for electric vehicles" in *Applied Economics Letters* 2019, Vol. 26, No. 11, 927–932 which focuses on renters vs. owners, but notes the overlap between renters and multi-family residents.

to reduce their transportation emissions, but also because, in many areas, this may result in inequities in accessing the cost and performance benefits of electric vehicles[4] for MFH occupants.

1.1.1.1 New buildings

For new buildings, there are strong examples of regulatory innovation that have been successful in addressing MFH barriers. British Columbia municipalities, in particular, have advanced creative municipal by-laws that are now being considered widely in other regions of North America. Initially, some focused on requiring a percentage of parking spaces to be built with charging stations. These types of requirements are common in many municipalities, but the City of Metro Vancouver was an early leader, with a 2009 requirement that 20% of parking stalls in multi-unit residential buildings be equipped with EV charging infrastructure.[5] These requirements were widely influential, but did not guarantee that buildings would be able to support levels of EV adoption beyond the minimum. Refinements made by a number of cities, led especially by the City of Richmond, focused on requiring the installation of a basic minimum physical infrastructure (for example an energized electric vehicle outlet), which allows developers to choose between installing a charging station or an energized outlet that allows for easy installation of an EV charging station in the future and the capacity to provide 100% of vehicles charging at a Level 2 station with a minimum power capacity. This latter requirement allows electrical building designers to assume that stations are using power sharing to efficiently provide a certain agreed minimum power level, and that 100% of stalls could be energized in a future full adoption scenario.[6] This latter model allows for more flexibility to building developers and electrical designers in a rapidly evolving technology environment (by focusing on the minimum available power available to EVs and alleviating key physical barriers). The Richmond approach is particularly innovative because it can be adjusted based on the average driving distance, and therefore typical daily charging needs, of typical EV drivers in a province or region. The model has since been adopted by numerous other BC municipalities including Metro Vancouver. There has been considerable debate in various provinces over whether these requirements should be implemented in provincial or city building codes, standalone by-laws or local zoning by-laws. While some advocates favour consistency within provinces, which would be best achieved via provincial statute or regulation (e.g. a building code), the BC approach, which has led to the most innovation, has been implemented primarily via municipal zoning or other by-laws.

1.1.1.2 Existing buildings

The large stock of existing MFHs presents an even more complicated challenge. As a general matter, existing buildings in North America tend to be exempted from new building code or zoning requirements unless a major renovation is undertaken. Widespread regulatory requirements to install EV charging stations are not, therefore, easy to achieve, and also raise concerns for regulators around adding additional costs to buildings or owners who may not have budgeted for unplanned upgrade costs, or may not all wish to purchase EVs in the near future, either because of consumer preference or because they simply do not drive. There is no complete regulatory solution to this issue, so most jurisdictions are providing incentive funding. However, two innovations stand out as being particularly promising: Ontario passed a "right to charge" regulation to support condominium residents being blocked by condominium boards. More recently, California has implemented an innovative utility regulatory structure known as line extension policy to provide consistent direction and funding to utilities related to expenses up to the meter to enable charging.

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[4] While EVs often have a higher up front purchase cost, they tend to have substantial operational cost benefits compared to internal combustion engine or fossil fuel powered vehicles. See US Department of Energy "Electric Vehicle Benefits and Considerations, available here; https://afdc.energy.gov/fuels/electricity_benefits.html. See also C. Harto "Electric Vehicle Ownership Costs: Today's Electric Vehicles Offer Big Savings for Consumers in *Consumer Reports* available here: EV Ownership Cost Final Report (consumerreports.org), conducted in 2020, which suggests lifetime savings could lead to thousands of dollars of savings for a typical user, including an estimated 50% savings on maintenance.

[5] City of Vancouver "Electric Vehicle Ecosystem Program Update" (2018), available here: Report - Electric Vehicle Ecosystem: 2018 Mar 14 (vancouver.ca) at p. 3.

[6] The City of Richmond commissioned a useful guide for local governments on the issue available here: Residential_EV_Charging_Local_Government_Guide51732.pdf (richmond.ca).

1.1.1.3 Right to Charge

Residents of some MFHs, particularly those run by condominium (or equivalent) boards of directors, have complained that their requests to install EV charging at individual parking stalls have been ignored or denied, even when the resident was prepared to pay the costs. Addressing this issue has been particularly complex because the legal relationship between unit owners (in the case of condominiums) is often governed by contractual terms issued by developers when the building was first built, often with no contemplation of EV charging issues. Ontario has addressed this issue via regulating a "right to charge" on behalf of condominium owners. The regulation deems the inclusion of regulatory provisions facilitating EV charging in the declaration of condominium corporations. It sets out minimum application materials including relevant drawings and specifications, an application process, timelines for responses and an obligation to approve applications to install charging, provided that certain reasonable requirements are met by the applicant, including cost responsibility and insurance requirements. The regulation also provides a pathway for condominium corporations to refuse custom installations if they already have a process in place that meets certain regulatory requirements, meaning that residents are required to follow properly developed EV charging policies.[7]

1.1.1.4 Line extension

A second promising regulatory innovation seeks to address the unequal cost barriers many MFH occupants face because of the electrical upgrades required to allow charging deployment in parking areas. While many jurisdictions have offered incentive programs, either via government programs or public utility commission mandated funding programs, these programs have typically been limited in time, amount and region. California has pioneered the use of line extension policy, which requires a utility to provide certain connection costs to drivers and allows the utility to recover the costs for such connection as part of their ratebase, meaning their standard funding process for capital expenditures. California's public utilities commission (the "CPUC") passed resolutions in fall 2021 allowing utilities to recover costs associated with service line extensions and distribution infrastructure for separately metered EV charging for customers that are not single-family residents. While this does not address customer side costs (including trenching or running cables, panel upgrades or actual charging equipment), it addresses a major source of utility side costs that often otherwise fall on a homeowners' association, resident or require funding via finite grant programs.[8]

1.1.2 Low Carbon / Clean Fuel Standards

While most incentives for EV charging installation have been provided via federal, subnational, municipal or utility incentive programs, one of the most important funding streams in California and Canada is a tradable emission permit system, called a low carbon - or clean - fuel standard, which applies to the importation or refining of fossil fuels, and offers credits for EV charging. Similar programs have been developed and are emerging in Oregon, Washington, and British Columbia. Unlike incentives, which are typically dependent on budget negotiations, properly constructed fuel standards provide longer term funding streams, although pricing is highly dependent on credit prices, which in turn tend to vary based on a number of factors including program stringency and fuel consumption, as well as supply and cost of alternative credit generation activities, such as biofuel blending or mixing. In addition to the many regulatory design elements applicable to any carbon or other tradable emission permit system, one of the major areas of regulatory variation involves determination of which entity is entitled to generate, and therefore collect the credit, with most systems choosing some variation of the charging station owner, the charging network or the electricity provider (usually a utility), and most systems allowing for assignment of credits between those and other system participants.

[7] See O. Reg. 48/01 to *Condominium Act, 1998* (Ontario) ss. 24.1-24.7

[8] An overview of the California line extension policy can be found at Transportation Electrification; the specific resolution applicable to large investor owned utilities (E-5167) can be found here: 413061495.PDF (ca.gov). The resolutions were passed pursuant to CPUC's implementation of AB 841 (Ting, 2020) available here: Bill Text - AB-481 Law enforcement and state agencies: military equipment: funding, acquisition, and use. (ca.gov)

1.1.3 Removal of barriers to instasllation and rate structures

A typical EV charging installation can involve utility connections, civil and electrical works and, in some jurisdictions, zoning approvals. In many US states, municipal zoning approval is often cited by networks as a major source of scheduling uncertainty and delay in the deployment of fast charging stations. California has shown particular interest in accelerating zoning approval processes, which often impact public deployment schedules in US jurisdictions, through the use of legislation that streamlines permitting procedures and effectively deems properly prepared permit applications approved, if they are not responded to within a given period.[9] In both Canada and the United States, utility connection requirements, timelines and costs are another source of schedule variation for many types of charging installation, particularly those involving significant loads. Utility rates, particularly demand charges, which tend to go into effect if a load (such as a charging station) exceeds a certain preset amount, can render public charging stations, particularly those with low forecasted utilization, uneconomic. Leading utility regulators in both countries are starting to consider actions needed to standardize and expedite connection timelines and approving rate structures that improve the business case for fast EV charging.[10]

2 Addressing consumer protection concerns

One of the first regulatory controversies related to EV charging, now largely resolved, related to whether billing for EV charging services triggered regulation as a utility, based on the legal question of whether it constituted "retailing electricity" or an equivalent test under applicable state or provincial electricity regulation. This question is largely considered settled in the negative in most states and provinces, under various regulatory theories.[11] It is fair to say, however, that most regulators do not consider public EV charging services to have the same natural monopoly characteristics as electricity distribution. While several states and provinces require registration of public EV charging stations, EV charging site hosts and networks generally are not required to obtain utility regulatory approvals that would apply to a typical electricity distributor or retailer. For pay EV charging is, however, often subject to several regulatory protections that can be broadly classified as focused on consumer protection ranging from requirements regarding metrology, billing and price display, payment, station reliability and installation and maintenance.

2.1.1 Metrology

As charging stations and vehicles enable the transfer of more energy, regulators are increasingly focused on ensuring that consumers are billed accurately and reliably, to the extent that they are paying based on energy dispensed. This has led to the development of metrology standards for EV charging in both the United States and Canada. In the United States, the Federal government and California have largely led development: in 2020 the Department of Food and Agriculture, Division of Measurement Standards (DMS), which is responsible for oversight of fuel quality, dispenser accuracy, advertising and labeling of all motor vehicle

[9] See, for example, AB 970 (McCarty, 2021) to deem a permit for EV charging "approved" if a local government does not respond within a specified timeframe. The California Office of Business & Economic Development ZEV Market Development Unit has also been working to implement AB 1236 (Chiu, 2015) that streamlines the permitting process for EV charging stations. For further information, see: Permitting Electric Vehicle Charging Stations: Best Practices | California Governor's Office of Business and Economic Development.

[10] In Quebec, an experimental demand-charge free charging rate was developed and is available here: Rate BR – Business | Hydro-Québec (hydroquebec.com). The British Columbia Utilities Commission also recommended the development of a separate rate and tariff for any customers or operators utilizing more than Level 1 or Level 2 chargers: see "An Inquiry into the Regulation of Electric Vehicle Charging Service Phase Two Report" (2019) available here DOC_54345_BCUC-EV-Inquiry-Phase2-Report.pdf at p. 42. The Ontario Energy Board is also considering this issue and further information available is here: Electric Vehicle Integration | Ontario Energy Board (oeb.ca).

[11] In Ontario, the Energy Board found that owning or operating an EV charging station was not considered distribution or retailing; see Bulletin dated July 7, 2016, available here: Bulletin: Electric Vehicle Charging (July 7, 2016) (oeb.ca). Many other provinces and states have also determined that charging services provided by non-utility third parties are not to be regulated by utilities commissions; see, for example, in British Columbia: British Columbia Ministerial Order No M104 available here: DOC_53650_G-66-19-BCUC-EV-Inquiry-Exemption.pdf and in Kentucky: Order in the matter of Electronic Investigation of Commission Jurisdiction Over Electric Vehicle Charging Stations, (Case No. 2018-00372, filed June 14, 2019), available here: 201800372_06142019.pdf (ky.gov).

fuels sold at retail, including low and zero-emission alternative fuels, adopted metrology regulations for commercial electric vehicle supply equipment. The regulations largely adopted National Institute of Standards and Technology (NIST) Handbook 44, Section 3.40 regarding devices used for commercial purposes that dispense electricity as motor vehicle fuel, though, notably, made some changes specific to California, such as requiring that AC charging stations (AC EVSE) subject to the regulation display the price based on MJ or kWh and providing an additional accuracy requirement class for fast charging stations until 2033.[12] The regulations require that any AC EVSE installed after January 1, 2021, or DC fast charging stations (DC EVSE) installed after January 1, 2023, undergo testing to obtain a certificate of approval evidencing compliance with the regulation as well as be placed in service by an authorized person who must confirm the accuracy of the device before providing a seal of approval. Charging stations installed prior to these dates have 10 years to comply. Other states, including but not limited to Michigan[13], Washington[14], and Texas[15], have adopted or are considering requirements around metrology for EVSE.[16]

In Canada, Measurement Canada, the federal agency responsible for ensuring accuracy in the selling of measured goods and developing and enforcing laws related to measurement accuracy, has been working for some time to develop metrology requirements for EV charging stations that would apply across the country. In 2022, Measurement Canada enacted a temporary dispensation program for commercial or public Level 1 and 2 devices, which would permit already deployed EVSE to be used for kWh billing without verification or sealing, assuming they meet the program requirements that include a +/- 3% accuracy requirement.[17] It also released specifications and test procedures for the type approval of Level 1 and Level 2 EV charging devices.[18] These specifications are largely drawn from requirements developed by the International Organization of Legal Metrology OIML for EVSE, and notably include greater testing requirements than those included in NIST Handbook 44 as well as greater flexibility for temperature variations. One significant difference is that kWh billing remains optional in Canada whereas it is mandatory for commercial devices in California unless they are outside the jurisdiction of California's Division of Measurement Standards, for example because they are owned by a municipality. In 2023 Measurement Canada is expected to release specifications, test procedures and temporary dispensation for L3+ EVSE as well as temporary dispensation for non-commercial EVSE.[19]

2.1.2 Billing and price display

While billing for liquid fuels tends to follow a standard volumetric model, billing for EV charging services is an area of innovation, with networks and charging site hosts experimenting with a range of pricing models including those based on energy, time, hybrid energy and time, flat per charging or monthly fees and rates that change depending on electricity costs. Regulators have typically refrained from mandating a specific pricing model, preferring instead to encourage competition and experimentation to drive lower prices and provide more flexibility for consumers, while also recognizing the unique situations of some charging stations. For example, some stations in high demand are programmed to increase time-based fees to encourage drivers to move their vehicles once a charge is complete to avoid delaying other drivers. In other

[12] Division of Measurement Standards. Notice of Regulatory Approval for Electric Vehicle Fueling Systems. Government Code 11349.3. December 2019. The DMS Regulation includes an additional accuracy class "5.0" applicable to DC EVSE installed prior to Jan 1, 2033. Further information is available on the DMS website: CDFA - DMS - Zero Emission Vehicle Projects (ca.gov).
[13] SB 1059 (2022, Daley).
[14] SB 5192 (2021, Das).
[15] The Texas Department of Agriculture is proposing to add a new Subchapter to the Texas *Administrative Code* regarding Electric Vehicle Charging Stations.
[16] Note that the US tends to refer to DC EVSE and AC EVSE whereas Canada refers to L3+ and Level 1 and 2. To ensure precision the authors have used the term referred to in the relevant specification and so there are some differences in terminology.
[17] Information on Measurement Canada's temporary dispensation program for EVSE can be found here: Temporary dispensation program for electric vehicle supply equipment - Measurement Canada
[18] Measurement Canada. S-E-EVSE-01—Specifications for approval of type of electric vehicle supply equipment; available here: S-E-EVSE-01—Specifications for approval of type of electric vehicle supply equipment - Measurement Canada
[19] Information on forthcoming EVSE specifications or programs from Measurement Canada are available here: Electric vehicle charging stations - Measurement Canada

cases, cities offering curbside charging (on street), will offer flat rates for overnight charging, recognizing that most users are unlikely to want to move their vehicles in the middle of the night for convenience and safety reasons.

While regulators do not typically require specific billing models, they are showing interest in requiring charging station owners and networks to display prices in a clear and accurate fashion, so that users can understand and predict charges. California, for example, requires commercial EVSE to be able to display the unit price at which the EVSE is set to dispense at any point during a transaction.[20] The same requirement exists in Canada for Level 2 EVSE.[21]

2.1.3 Payment

For those who have access, the vast majority of light duty vehicle EV charging occurs at home via residential charging, meaning payment is made directly to utilities for electricity delivered via a meter. Public charging in North America is typically paid for via network accounts accessible via mobile app, RFID cards or direct credit card processing. To avoid EV drivers needing multiple accounts, many leading networks in Canada and the United States have developed roaming agreements that allow users with an account on one charging network to pay for charging time on another network. These relationships have developed on a largely commercial basis, although California has mandated that all electric vehicle service providers operating one or more networked EVSE installed in California meet and maintain specific communication protocols (specifically Open Charge Point Interface (OCPI)) to facilitate roaming.[22] Washington state has also recently adopted a requirement that EV service providers use OCPI.[23]

Perhaps the most controversial area of EV charging regulation has related to the issue of direct payment by credit card. California Senate Bill 454 created the Electric Vehicle Charging Stations Open Access *Act*[24], which was interpreted by the state's Air Resources Board to include a mandate that all publicly available EVSE installed in California have a credit card reader device that accept EMV chip and at least one other major credit card, as well as a mobile (contactless) payment device physically located on either the EVSE or kiosk used to service the EVSE.[25] This applies to DCFC installed on or after January 1, 2022 and to Level 2 stations installed on or after July 1, 2023. EVSE installed prior to those dates have until July 1, 2033 to comply. Washington state has recently enacted a similar credit card reader requirement that applies to any publicly available EVSE installed on or after January 1, 2024; EVSE installed before January 1, 2024, have 10 years to comply.[26]

The Air Resources Board's rationale for mandating credit card readers on EV charging stations was to ensure more universal charging access and chip-enabled credit cards were selected based on the assumption that these cards were, at the time, the most ubiquitous form of credit card payment.[27] While many charging networks support the use of credit card payment as an option for consumers, numerous networks raised

[20] Division of Measurement Standards. Notice of Regulatory Approval for Electric Vehicle Fueling Systems. Government Code 11349.3. December 2019. S.2.4.1. Unit Price. – An EVSE shall be able to indicate on each face the unit price at which the EVSE is set to compute or to dispense at any point in time during a transaction. A computing EVSE shall display the unit price in whole cents (e.g., $0.12) or tenths of one cent (e.g., $0.119) on the basis of price per megajoule (MJ) or kilowatt-hour (kWh). In cases where the electrical energy is unlimited or free of charge, this fact shall be clearly indicated in place of the unit price.

[21] S-E-EVSE-01—Specifications for approval of type of electric vehicle supply equipment - Measurement Canada; 6.4.2.1 Unit price. An EVSE must be capable of indicating on each face the tariff at which the EVSE is set to compute or to dispense at any point in time during a transaction.

[22] California Code of Regulations. Chapter 8.3 Electric Vehicle Supply Equipment Standards. (2020). Available here: EVSE Att A - Final Reg. Order (ca.gov)

[23] SB 5192 (2021, Das). Available here: Washington State Legislature.

[24] SB 454 (2013, Corbett). Available here: Bill Text – SB-454 Public resources: electric vehicle charging stations. (ca.gov).

[25] California Code of Regulations. Chapter 8.3 Electric Vehicle Supply Equipment Standards. (2020). Available here: EVSE Att A - Final Reg. Order (ca.gov).

[26] SB 5192 (2021, Das).

[27] California Air Resources Board, "Electric Vehicle Supply Equipment Standards Regulation Background and FAQS, available here: Electric Vehicle Supply Equipment Standards Regulation Background and FAQs | California Air Resources Board.

concerns about the chip-enabled credit card specification, primarily because this form of payment is more costly, being phased out by major credit card companies, is susceptible to fraudulent transactions and can impact station payment reliability if broken.

2.1.4 Reliability

The reliability or "uptime" of a charging station, meaning the time that the charging station is in use or available for use, has recently become another important area of regulation. Regulators have recognized that in addition to deploying more charging infrastructure to encourage EV adoption, it is equally important for the charging stations that are deployed to work when drivers need them. This issue became particularly prominent following several high-profile studies and media reports of widespread station reliability problems in markets such as California and Ontario.[28] In 2022 California enacted the *EV Charging Reliability Transparency Act,* a bill that requires the Energy Commission to develop uptime recordkeeping and reporting standards by January 1, 2024, for EV chargers that received incentives and grants from state agencies.[29] Starting January 1, 2025, the Commission will assess the uptime of charging infrastructure, with an emphasis on equitable access to reliable chargers. The legislation aims to develop tools to measure and monitor the reliability of publicly funded chargers with the goal of addressing any issues that may emerge. New York state introduced similar legislation in 2022[30] and, while it did not pass, lawmakers are expected to introduce a new version in 2023 similar to the one adopted in California.

2.1.5 Installation and maintenance

In addition to protecting consumers by regulating what features ought to be included on charging stations and how they ought to operate, lawmakers have also begun to regulate by whom charging stations ought to be installed and maintained. This requirement – for any charging infrastructure located on the customer side of the electrical meter to be installed by an electrician holding a special certification (Electrical Vehicle Infrastructure Training Program (EVITP) certification) – originated in California and only applied to state funded charging stations.[31] This requirement is now being considered in Oregon[32], and, if adopted, would apply to both the installation *and maintenance* of any state-funded charging infrastructure. Washington considered similar legislation in 2022 that would have required EVITP certification regardless of whether public funds were used to the deploy the chargers, but the bill was defeated.[33]

3 Promoting accessibility

3.1.1 Physical charger access

Ensuring that charging stations can be physically accessed by individuals with disabilities such as mobility issues is another area where regulation has begun to emerge. In the US, California was the first jurisdiction to develop and implement accessibility requirements specifically related to EV charging stations in the *California Building Code*.[34] Some of these requirements mirror in large part requirements set out in the *Americans with Disabilities Act* ("ADA") related to reach ranges and operable parts; however, the *California Building Code* goes further in specifying, among other things, parking requirements for EVSE, including

[28] In California, see: Rempel, David and Cullen, Carleen and Bryan, Mary Matteson and Cezar, Gustavo Vianna, Reliability of Open Public Electric Vehicle Direct Current Fast Chargers. Available at SSRN: https://ssrn.com/abstract=4077554 or http://dx.doi.org/10.2139/ssrn.4077554. An Ontario-based study on reliability of chargers is expected to be forthcoming in 2023: see *Electric Autonomy*, "As EV charger reliability lags, Canadian drivers ask: who is responsible" (October 3, 2022), available here: https://electricautonomy.ca/2022/10/03/ev-charger-reliability-responsibility-canada/.
[29] AB 2061 (2022, Ting). Available here: Bill Text - AB-2061 Transportation electrification: electric vehicle charging infrastructure.
[30] A10688 (2022, Cunningham). Available here: NY A10688 | 2021-2022 | General Assembly | LegiScan.
[31] AB 841 (2020, Ting). Available here: Bill Text - AB-841 Energy: transportation electrification: energy efficiency programs: School Energy Efficiency Stimulus Program.
[32] SB 582 (2023, Wagner). Available here: SB0582 (oregonlegislature.gov).
[33] HB 1831 (2022, Bronoske). Available here: Washington State Legislature.
[34] Section 11-B.

minimum numbers of accessible parking spaces in certain types of parking deployments – see table below for further information.[35]

Table 1: Number of required EVCS

Total EV charging stations (EVCS)	Van accessible EVCS	Standard accessible EVCS	Ambulatory EVCS
1 to 4	1	0	0
5 to 25	1	1	0
26 to 50	1	1	1
51 to 75	1	2	2
76 to 100	1	3	3
101 and over	1, plus 1 for each 300, or fraction thereof, over 100	3, plus 1 for each 60, or fraction thereof, over 100	3, plus 1 for each 50, or fraction thereof, over 100

Recently, the US Access Board has released *Design Recommendations for Accessible Electric Vehicle Charging Stations* (the "Recommendations").[36] These Recommendations provide the most comprehensive guide to date on designing and installing accessible EV charging stations for different use cases like existing parking lots, residential facilities, public rights-of way and so on.

In Canada, while there is some legislation that may apply to EV charging stations, like the *Ontarians with Disability Act*[37] and the forthcoming *Regulations* under the *Accessible Canada Act*[38], the authors are not aware of specific legislation governing the accessibility of EV charging stations.

3.1.2 Language

Finally, the requirement to provide a charging session in a language other than English has emerged as a new regulatory requirement in Washington state.[39] In determining what alternative languages to offer, the electric vehicle service provider must consider the demographics in the area in which the charging station will be installed, and the languages most commonly spoken. At a minimum, the electric vehicle service provider must consult data published by the American Community Survey (ACS).

Conclusion

This paper focuses on novel regulatory trends impacting EV charging. Readers have likely noticed several recurring national and subnational jurisdictions pioneering the bulk of featured regulatory innovations. By and large, these regions, particularly Canada, California, BC and Quebec have achieved impressive levels of EV sales, and have had important regulatory influence beyond their borders. It is expected that more states and provinces will expand their interest in this space as EV sales increase. The EV charging market is interesting, because, like other emerging markets, regulators are focused on standard concerns regarding economic competitiveness, administrative fairness and consumer protection, but unlike some emerging

[35] US Department of Energy Alternative Fuels Data Center, "Mandatory Electric Vehicle (EV) Charging Station Building Standards, available at: Alternative Fuels Data Center: Mandatory Electric Vehicle (EV) Charging Station Building Standards (energy.gov).
[36] U.S. Access Board, "Design recommendations for Accessible Electric Vehicle Charging Station" (2022), available here: Electric Vehicle Charging Stations (access-board.gov).
[37] S.O. 2001, c. 32.
[38] S.C. 2019, c. 10.
[39] SB 5192 (2021, Das).

industries, regulators or the broader governments to which they belong, often also have a strong interest in the rapid and widespread, equitable and reliable deployment of EV charging stations to support broader decarbonization goals, meaning there is substantial opportunity for industry and government to work collaboratively to achieve a workable and consistent regulatory environment. Whether this is achieved will be determined in the coming years.

Presenter Biography

Elizabeth France is the Legal and Public Affairs Senior Director at FLO (EV Charging) and has a particular focus on regulatory compliance. Prior to joining FLO, Elizabeth worked as a lawyer in private practice and clerked at the Supreme Court of Canada. She is a graduate of the University of British Columbia (B.A.) and McGill University (B.C.L./LL.B.).