Ian Finlayson
Department of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114

RE: Building Code Comments

Dear Mr. Finlayson,

Electrify America, LLC, appreciates the opportunity to provide comment on the recently-published Stretch Energy Code for the State of Massachusetts. Electrify America operates the nation's largest open network of ultra-fast chargers for electric vehicles (EVs), with nearly 3,400 chargers across 784 sites nationwide. Since opening our first site in the nation in Chicopee, Massachusetts, in May 2018, we have expanded to 60 chargers across 15 locations in the Commonwealth, with another 15 chargers across four sites now under construction.

EV-ready codes are critical to supporting the shift to electric transportation, and help to minimize costs associated with buildout of future EV charging infrastructure to serve the growing fleet. A study by the National Association of State Energy Officials (NASEO) found that EVSE installation costs can increase by two to six times if a parking space is made PEV-ready after instead of during construction.[1] Electrify America strongly supports the establishment of EV-ready codes to help minimize these soft costs and ensure that best practices and future-proofing are taken into account when developing commercial facilities to accommodate EV charging. We also support the inclusion of DC fast charging compliance alternatives in EV-ready codes, recognizing that Level 2 chargers do not meet drivers' charging needs in many commercial and retail use cases. However, we recommend that Massachusetts strengthen its proposed stretch code to require at least four 150 kW DC fast chargers in order to qualify for the DC fast charging alternative, to ensure that properties install a level of charging useful to modern EVs.

In order to be effective, EV-ready codes must take into account the types of vehicles coming to market now and in the future, and ensure that EV-ready requirements are aligned with the use case to which they apply, in terms of expected dwell-times and EV charging demand. Between model years 2016 and 2022, the average charging power of new EV models roughly quadrupled from 50 kW to 200 kW, and the average range of EV models increased from 84 miles to over 250 miles.[2] Today's EVs go further, charge faster, and require bigger batteries in order to meet customer demands. Larger capacity batteries take longer to charge, unless the

[1] National Association of State Energy Officials, 2021. "Supporting Material: Plug-In Electric Vehicle Policy Impact Rubric," p. 12. Available at: https://naseo.org/data/sites/1/documents/publications/Supporting%20Material_PEV%20Policy%20Impact%20Rubric_FINAL.pdf

[2] Excluding Tesla. Based on EV range data from FuelEconomy.gov and manufacturer public statements regarding vehicle charging power.

speed of charging also increases, which has significant implications for the role of Level 2 charging in commercial applications.

As vehicle ranges get longer, Level 2 charging no longer makes sense in the majority of use cases for short dwell-time retail, such as grocery stores, pharmacies, big box stores, neighborhood shopping centers, and other places where a driver will reasonably spend approximately an hour. DC fast charging is an ideal technology for serving these use cases, allowing drivers to conveniently obtain a full or nearly-full charge over the course of a typical shopping trip. Public DC fast charging is particularly important for residents of multi-unit dwellings, who according to recent research from UCLA's Luskin Center, rely on public DCFC as their primary means of charging at nearly three times the rate of non-MUD residents.[3] For drivers who cannot charge at home, a charging option that provides a full charge during a weekly shopping trip is much more convenient than finding time to leave their vehicle at a Level 2 charger over up to ten hours for the same result.

However, not all DC fast chargers are created equal, and power outputs range from 24 kW to 350 kW, more than an order of magnitude in charging power. The proposed DCFC compliance option in the Massachusetts stretch code allows any facility with at least two DC fast chargers to meet the code, without taking into account whether those chargers are of sufficient power level to provide a significant charge in a retail use case. A 24 kW DC fast charger is only about 2.5 times faster than a Level 2 charger, and only provides about 12% of the charging power demanded by the average model year 2022 EV. As written, the code presents a potential loophole where installing two very low-power DCFC units would qualify a developer for the DCFC compliance alternative, despite installing a technology not well-suited to serving modern EVs and not sufficient to meet the typical driver's charging needs. As such, we encourage Massachusetts to strengthen the requirement in the stretch code to require a minimum of 150 kW of charging power and a minimum of four chargers in order to qualify for the DCFC compliance alternative. This station configuration was recently adopted by U.S. DOT as the minimum configuration allowable under the NEVI program, and provides a level of charging consistent with driver expectations for ultra-fast charging.[4]

Several jurisdictions have adopted DC fast charging compliance alternatives, taking into account the greater power of these units relative to Level 2 charging. The City of San Francisco has adopted such a code, offering different requirements for commercial coverage depending on the mix of Level 2 and DCFC chargers used.[5] The City of Denver already allows limited trade-off between Level 2 and DC fast chargers at a 5:1 ratio, and would expand those trade-offs to allow significantly more DC fast charging under recently proposed

[3] University of California Los Angeles (UCLA) Luskin Center for Innovation, 2021. "Evaluating Multi-Unit Resident Charging Behavior at Direct Current Fast Chargers," p. 3. Available at: https://innovation.luskin.ucla.edu/wp-content/uploads/2021/03/Evaluating-Multi-Unit-Resident-Charging-Behavior-at-Direct-Charging-Behavior-at-Direct-Current-Fast-ChargersCurrent-Fast-Chargers.pdf

[4] U.S. Department of Transportation, 2022. "National Electric Vehicle Infrastructure Program: Program Guidance," p. 26. Available at: https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/nominations/90d_nevi_formula_program_guidance.pdf

[5] City and County of San Francisco Board of Supervisor, 2019. "Ordinance No. 244-19: Environment, Police Codes – Electric Vehicle Charging in Commercial Parking," p. 5. Available at: https://sfbos.org/sites/default/files/o0244-19.pdf

amendments to the Building and Fire Code. Finally, the State of California adopted flexibility to substitute DC fast charging for Level 2 make-ready spaces for the 2022 CalGreen building code, and is considering amendments to expand the provision to cover installed spaces at an August 18 workshop.[6] The proposed California requirements in particular take into account the total power provided by the chargers – whether DC fast or Level 2 – to ensure that regardless of which option is used, developers will install a meaningful degree of electric vehicle charging.

Electrify America strongly supports Massachusetts' development of the stretch code, and respectfully urges the state to strengthen the DCFC requirements to a minimum of four 150 kW units. We appreciate your consideration.

Best,

/s/

Andrew Dick
Business Development Manager, Incentives

[6] California Department of General Services, Building Standards Commission. "Draft item 5g, 5h, 5i, and 5j." Available at: https://www.dgs.ca.gov/-/media/Divisions/BSC/03-Rulemaking/2022-Intervening-Cycle/Pre-Cycle/CEVW-20220818/Draft-Item-5g-5h-5i--5j-Section-5106532.pdf?la=en&hash=23EF2F3C7528976A5FBDC3626213B651BA217AFB