NESCAUM
www.nescaum.org

Northeast States for Coordinated Air Use Management
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Dominic Sims
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2019 Group B Appeals Board
c/o Mike Pfeiffer
Senior Vice President of Technical Services
International Code Council
500 New Jersey Avenue, NW
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Re: Opposition to Appeal of EV-Ready Code Amendments CE217 – Parts I & II

Dear Messrs. Wheeler and Sims and Members of the Group B Appeals Board:

The Northeast States for Coordinated Air Use Management (NESCAUM) is writing to express its strong opposition to the appeals filed by the National Association of Home Builders (NAHB) and the Leading Builders of America (LBA) challenging the electric vehicle (EV)-ready code amendments to the 2021 International Energy Conservation Code (IECC) encompassed by CE217 – Parts I & II, which were approved by an overwhelming majority of voting code officials in the December 2019 Online Governmental Consensus Vote (OGCV).[1]

About NESCAUM

NESCAUM is a non-profit association of the state air pollution control agencies of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode

[1] The EV-ready commercial code amendments were approved by 82 percent of the 1,030 voting code officials. Similarly, 70 percent of 856 code officials voted to approve the residential EV-ready amendments.

Island, and Vermont. NESCAUM provides technical and policy advice to its members, and facilitates multi-state initiatives on a range of air quality, climate, and clean transportation issues. Transportation electrification is a top priority for NESCAUM's member states. Seven of the eight NESCAUM states have adopted California's zero emission vehicle (ZEV) regulation, which requires automakers to sell increasing numbers of electric vehicles in the ZEV states through 2025. NESCAUM leads the work of a Multi-State Zero-Emission Vehicle (ZEV) Task Force, which is comprised of a broader group of 10 ZEV states that are working collaboratively to accelerate consumer adoption of zero-emission passenger cars and trucks through implementation of a Multi-State ZEV Action Plan.

The Importance and Benefits of EV-Ready Building Code Requirements

State and municipal policy makers across the country are embracing the benefits of transportation electrification as an effective means to meet state science-based greenhouse gas emission reduction targets, improve air quality and public health, increase grid integration of renewable energy sources, and optimize the efficiency and operation of the grid. Today, eleven states have adopted California's ZEV regulation and four additional states have either commenced rulemaking to adopt the ZEV mandate, or publicly announced their intention to do so.

At the end of 2019, there were approximately 1.5 million electric vehicles on the road in the U.S.[2] A recent sales forecast developed by the Edison Electric Institute (EEI) and the Institute for Electric Innovation (IEI) estimates that by 2030, the number of EVs on U.S. roads will reach 18.7 million.[3] While EV sales continue to increase year-over-year, many consumers express interest in electric vehicles but cite the lack of convenient home, workplace and public charging options as a primary barrier to driving electric. A robust charging network is needed to stay ahead of market growth over the coming decade.

Adoption of EV-ready building code requirements for new residential and commercial buildings will help meet consumer expectations for convenient home, workplace and public charging and is a key *Multi-State ZEV Action Plan* recommendation to close the infrastructure gap:

> States should revise residential and commercial building codes to require supporting electric infrastructure for [electric vehicle supply equipment or "EVSE"] in new construction and major renovations, and

[2] https://www.eei.org/issuesandpolicy/electrictransportation/Pages/default.aspx.
[3] *Electric Vehicle Sales Forecast and the Charging Infrastructure Required Through 2030*, Edison Electric Institute and Institute for Electric Innovation, November 2018, accessible at http://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20EV%20Forecast%20Report_Nov2018.pdf.

> should encourage local governments to adopt ordinances requiring a minimum percentage of EVSE-parking spaces in new or re-constructed residential and commercial parking structures. . . [.] *Multi-State ZEV Action Plan, p. 18*.

State and local governments across the country that are working to electrify the transportation sector are increasingly adopting EV-ready building code requirements to meet consumer needs.[4] In the NESCAUM-member states, for example, legislation recently enacted by the Connecticut General Assembly requires state building code standards to include requirements for EV charging stations.[5] Massachusetts has adopted EV-ready building code requirements for commercial properties. Vermont has adopted mandatory and stretch code EV-ready parking space requirements for both residential and commercial construction.[6]

Requiring installation of electric vehicle charging infrastructure during initial construction delivers significant cost savings. It is well documented that retrofitting buildings with the electrical infrastructure necessary to deploy electric vehicle charging stations can cost up to three times more than installation during initial construction. A 2016 cost analysis prepared for the City and County of San Francisco found that installation of a complete electric circuit during construction can be as much as two-thirds less expensive compared to post-construction retrofits.[7] The San Francisco analysis is consistent with the results of other analyses on the cost differential between new construction and retrofits.[8]

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[4] https://www.swenergy.org/transportatoin/electric-vehicles/building-codes#who

[5] Public Act No. 19-35, Sec. 11, accessible at https://www.cga.ct.gov/2019/ACT/pa/pdf/2019PA-00035-R00HB-05002-PA.pdf.

[6] See *2019 Vermont Residential Building Energy Standards*, Section R404.3, accessible at https://publicservice.vermont.gov/sites/dps/files/documents/2020%20RBES%20CLEAN_Final%20Proposed-for%20LCAR_added%20language%20R402.1.5.pdf; *2020 Vermont Commercial Building Energy Standard Amendments*, Section C405.10, accessible at https://publicservice.vermont.gov/sites/dps/files/documents/2020%20VT%20Commercial%20Building%20Standard%20Amendments%20Rev%201.1.pdf.

[7] *Plug-In Electric Vehicle Infrastructure Cost-Effectiveness Report for San Francisco*, California State-Wide Investor-Owned Utilities Codes and Standards Program, November 17, 2016, accessible at http://evchargingpros.com/wp-content/uploads/2017/04/City-of-SF-PEV-Infrastructure-Cost-Effectiveness-Report-2016.pdf.

[8] *See, e.g.,* California Air Resources Board, *Electric Vehicle Charging Infrastructure, Green Building Standards Code Suggested Changes for Nonresidential Buildings: Technical and Cost Analysis*, July 9, 2015, available at: http://www.documents.dgs.ca.gov/bsc/2015TriCycle/CAC/GREEN/Exhibit-B-CARB-Cost-Analysis-and-Technical-Report.pdf.

CE217 Falls Squarely Within the Scope of the IECC

Contrary to Appellants' assertion, EV-ready building code requirements *do* contribute to the effective use and conservation of energy in buildings, and therefore, fall squarely within the scope of the IECC. In fact, the IECC is a vitally important tool for the implementation of a range of public energy efficiency policies that require modifications to building infrastructure or otherwise affect building construction. IECC sections R101.3 and C101.3 reflect this underlying purpose, stating in pertinent part:

> This code shall regulate the design and construction of buildings *for the effective use and conservation of energy over the useful life of each building*. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective (emphasis added).

It is an undisputed fact that electric vehicles are far more energy efficient than conventionally fueled vehicles. Between 64% and 75% of the energy generated by an internal combustion engine is lost through wasted heat due to various engine inefficiencies. In contrast, EVs lose only between 15% and 20% of the energy generated by the battery, and even less when the energy that is recaptured and reused from regenerative braking is accounted for.[9] In addition, a Level 2 charger is much more energy efficient than a Level 1 standard 120 volt outlet,[10] further adding to the overall energy savings associated with electric vehicles. In 2019 alone, the U.S. Department Energy estimated that plug-in electric vehicles saved 44.8 trillion Btu and 470 million gallons of gasoline.[11] Moreover, it is well documented that widespread electrification of the transportation sector will enable grid integration of renewable energy sources and lead to grid efficiencies that will lower electricity rates for all ratepayers.[12]

Cost-effective installation of EV charging infrastructure in new buildings promotes a much more energy efficient mode of personal transportation that leads to significant household energy savings and conservation over the useful life of the building. Changes to public policies and building codes, such as the IECC, are necessary to fully capture these benefits and to ensure that building code officials recognize and understand new technologies that are being adopted by state and local governments.

An EV tipping point is approaching, and it is imperative that we scale up deployment of charging infrastructure to keep pace with the growth of EV sales. Residential charging at

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[9] https://fueleconomy.gov/feg/atv-ev.shtml.
[10] https://avt.inl.gov/sites/default/files/pdf/fsev/SteadyStateLoadCharacterization2015Leaf.pdf
[11] https://www.energy.gov/eere/vehicles/articles/fotw-1144-july-27-2020-us-energy-savings-due-light-duty-plug-electric-vehicle.
[12] Michael J. Bradley and Associates, *Electric Vehicle Cost Benefit Analyses* https://mjbradley.com/sites/default/files/NE%20PEV%208%20state%20Summary%2009nov17.pdf.

single family homes and multi-unit dwellings is particularly important because charging at home provides unparalleled convenience for consumers, can be done during times of off-peak power demand, and costs less than paid public charging.[13] EEI and IEI estimate that of the total 9.6 million charging ports needed to support the expanded EV market in 2030, 7.5 million Level 2 home chargers will be needed.[14] The IECC can, and must, play an important role in ensuring that newly constructed residential and commercial buildings accommodate the nation's transition to an electrified energy saving transportation sector.

Sincerely,

Paul J. Miller
Executive Director

[13] For example, in March 2019, 66 percent of EV rebate recipients in Massachusetts reported that they have purchased, or will purchase, an EV charger.
[14] *Electric Vehicle Sales Forecast and the Charging Infrastructure Required Through 2030*, Edison Electric Institute and Institute for Electric Innovation, November 2018, accessible at http://www.edisonfoundation.net/iei/publications/Documents/IEI_EEI%20EV%20Forecast%20Report_Nov2018.pdf.