

EV Roadmap – “Cliff’s Notes” Version

The EV Roadmap prepared by the CT Department of Energy and Environmental Protection is a dense, 104-page document. We recommend reading it if you have the time. But for those who want to cut to the chase, below is the cut/pasted recommendations from each section. Following the recommendations is the glossary from the report, which is nothing if not laden with jargon.

Policy Recommendations

Public and Private Fleets

1. DAS should develop a detailed light-duty fleet transition plan that outlines annual EV procurement targets for the state fleet, beginning with a 5 percent target of eligible state vehicles in 2020, in order to meet ZEV procurement requirements in accordance with Public Act 19-117.
2. Public and private fleet managers should utilize vehicle telematics systems, as DAS is currently piloting, to establish fleet benchmark data on the day-to-day operations of both EVs and comparable ICE vehicles, in order to inform future vehicle purchasing and infrastructure deployment decisions.
3. Public and private fleet managers should align the useful life cycle of EVs with manufacturer battery/mileage warranties and consider total cost of vehicle ownership when making procurement decisions.
4. DEEP will look to partner with other interested state agencies to create a web-based resource center dedicated to fleet electrification with helpful resources for public and private fleet managers, including case

studies, best practices, and vehicle benchmarking tools.

Medium and Heavy-Duty Electrification

1. DEEP will continue to evaluate the benefits of adopting California's ACT regulations. A CARB staff report summarizing the initial statement of reasons for adopting the rule was proposed in October 2019.
2. DEEP will continue to monitor the effectiveness of freight truck voucher incentive programs in accelerating the adoption of freight trucks.
3. DEEP will continue to engage in outreach with Connecticut municipalities through the Municipal Collaborative on Fleet Electrification regarding electric school bus and other medium and heavy-duty fleet deployment opportunities available through the VW Grant.

Residential Charging

1. A residential Level 2 EVSE incentive program tied to participation in TOU rates or a managed charging pilot program should be implemented in the near-term so that it can be scaled up to meet market growth while minimizing grid impacts.
2. DEEP will explore pilot programs for EVSE deployment at MUDs.
3. Connecticut should enact right-to-charge legislation that prohibits condominium associations and landlords from restricting condominium owners or lessees with designated parking spaces from installing EV charging equipment and associated metering equipment.

Workplace Charging

1. DEEP encourages employers considering workplace charging

solutions to distribute a survey to gauge employee interest and determine charging infrastructure needs.

2. DEEP recommends that employers considering workplace charging solutions contact their EDC as early as possible in the planning process to assist with site evaluation, equipment selection, cost estimates, and possibly even financial incentives for EVSE.
3. DEEP encourages employers to equip at least 10 percent of their total parking spaces with Level 1 charging plugs and evaluate opportunities for installing networked Level 2 EVSE with co-located DERs to meet the refueling needs of employees.
4. Connecticut should support legislation that more broadly enables EVSE at commercial properties to qualify for C-PACE funding.

Fleet Charging

1. DEEP suggests that fleet operators and managers work with their EDC to identify solutions that will minimize distribution system impacts and help realize greater cost savings, including managed charging specific to fleet use case, deployment of DERs, and optimizing infrastructure buildout for their use case.

Consistency of Consumer Experience

Interoperability

1. All publicly-accessible Level 2 and DCFC station sites, installed or operated with the use of public funding, should be required to have both CHAdeMO and CCS connections available on site.

Future-Proofing

2. The make-ready portion of electrical infrastructure

installed at publicly-funded, publicly-accessible locations should be capable of supporting chargers with a minimum 150 kW capacity.

3. Charging station developers should be encouraged to evaluate the potential to pair charging stations with on-site DERs when assessing and selecting a charging station location.
4. The potential future need for additional charging stations should be considered when installing make-ready electrical infrastructure and selecting the placement of charging stations at specific locations.

Minimizing Grid Impacts and Maximizing Benefits through demand-reduction measures

Active and Passive Managed Charging

1. DEEP will explore the potential for an active managed charging program that incents EV drivers to charge during off-peak periods.
2. The EDCs' current TOU rate tariffs should be optimized, and EV-specific TOU rates and dynamic pricing should be evaluated as additional options, to shift charging behavior to off-peak periods.
3. DEEP will continue to monitor the effectiveness of innovative programs in other jurisdictions, unrelated to rate design, to incent off-peak charging.

Fleet Charging

4. DEEP will explore options to examine distributed and grid-side technologies and services that could help to more cost-effectively integrate charging for the Hamden Bus Pilot and other fleet electrification initiatives through its Public Act 15-5 proceeding.

5. The potential should be explored for establishing a commercial EV fleet rate that incents off-peak charging and minimizes adverse impacts to the electric grid.

Demand Charges

1. DEEP recommends exploration of a sliding scale tariff approach for both Eversource and UI that is responsive to DCFC station utilization and EV market penetration.
2. DEEP recommends exploration of the costs and benefits of a commercial EV fleet rate that incents off-peak charging and minimizes adverse impacts while maximizing benefits to the electric distribution system and its customers.

Building Codes and Permitting Requirements

1. DEEP recommends that the State Building Code standards be updated to: (1) require that all new MUDs and commercial construction be pre-wired to accommodate Level 2 EV charging equipment; (2) require that 10 percent of parking spaces be pre-wired to accommodate Level 2 EV charging equipment and outfitted with a 120-volt power outlet for Level 1 EV charging; and (3) establish ADA compliance requirements for EV charging stations.
2. DEEP recommends that the state adopt a voluntary municipal stretch building code and that municipalities adopt zoning ordinances with more stringent EV pre-wiring requirements.
3. DEEP recommends that the Codes and Standards Committee and the Office of the State Building Inspector adopt best practices for DCFC permitting and deployment. Consolidate and streamline the permitting and inspection process for Level 2 EVSE and DCFC installations.
4. DEEP will update and publish guidelines for the

installation of EVSE at state-owned facilities and public and private EV charging stations.

Innovation

1. DEEP recommends that the EDCs and charging station developers partner on a pilot program to identify existing locations with excess load capacity that can support the deployment of publicly accessible curbside EV charging.
2. DEEP will explore the potential for V2G/V2B pilots.
3. DEEP will monitor potential opportunities for developing a transactive energy marketplace that rewards optimal EV charging behaviors and expands the public charging network.

Purchase Incentives

1. Continue to collect and analyze CHEAPR purchase survey data to implement changes that improve overall program effectiveness.
2. Move expeditiously to implement the revised CHEAPR program per Public Act 19-117, including:
 - o Establish rebate parameters, including rebate levels, bins, LMI components, MSRP, eligibility criteria, and strategy to communicate program adjustments.
 - o Consider implementation options with and without auto dealer incentive.
 - o Maintain and expand education, marketing and outreach.
 - o Develop strategies to manage exhaustion of funding each year.
 - o Retain a program administrator familiar with used electric vehicle rebates.

o Establish metrics necessary to maintain program health and funding.

3. Support expansion and extension of the Federal EV Tax Credit.
4. Work to develop market-based incentives to support EV adoption through TCI, the EDCs, and the OEMs.
5. Maintain FCEV rebates at current levels through the next five years of the program along with the development of infrastructure to incent the deployment of FCEVs.

Education, Marketing, Outreach

1. Connecticut should continue to leverage opportunities to support and participate in the regional DCDE campaign and the Destination Electric Program to build upon and increase consumer awareness in the state and the region.
2. DEEP will work with OEMs to explore additional marketing opportunities for the EVs available for sale in Connecticut and the region.
3. As part of PURA's ZEV Docket, utility investment in marketing and education should be considered to support full utilization of any utility investment in EV charging infrastructure.
4. The EDCs should provide data associated with charging use to help municipalities and private industries deploy infrastructure in priority areas.

Volkswagen EVSE

These recommendations are framed based on the ongoing and significant investments by Electrify America and the potential for PURA to develop a regulatory framework that could impact EVSE deployment, and may require adjustment as the regulatory process advances. Connecticut's VW Mitigation Trust EVSE funds

(\$8.4 million) could be allocated in the following ways to support widespread electrification, including:

1. Direct funding of state and municipal EVSE to support light duty government EV deployment targets specified in Public Act 19-117;
2. Grants for Level 2 workplace charging; next to home charging, which will account for 60-80 percent of all charging, the second most prevalent charging location will be at the workplace and will reassure early EV adopters;
3. Grants for publicly-accessible Level 2 charging to provide reasonably cost-effective and highly visible charging infrastructure that supports use patterns of current EV drivers, while also strengthening the perception that the state's charging network is sufficiently robust to eliminate range concerns;
4. Grants for MUDs, which could also include innovative solutions for MUDs such as charging hubs, community-based EV sharing, valet, or mobile charging. As part of a make-ready program, the utilities are well-positioned to also offer energy efficiency measures to MUDs that could reduce the cost associated with electric system upgrades necessary to support EVSE;
5. Grants for hydrogen fueling infrastructure and regional corridor development; and

Reserving a residual amount of funding to address gaps in the EV fast-charging network not filled through a utility program, Electrify America build-out, or other EVSE provider efforts.

Abbreviations:

AC – alternating current

ACT – Advanced Clean Trucks Regulations

ADA – Americans with Disabilities Act

AFLEET – Alternative Fuel Life-Cycle Environmental and
Economic Transportation

ATV – alternative technology vehicle

BAU – business as usual

BESH – Basic Electric Service Hourly

BEV – battery electric vehicle

BNEF – Bloomberg New Energy Finance

CAA – Clean Air Act

CAFE – Corporate Average Fuel Economy

CALGreen – California Green Building Standards Code CARA –
Connecticut Automotive Retailers Association CARB – California
Air Resources Board

CHEAPR – Connecticut Hydrogen and Electric Automobile

Purchase Rebate

CO2 – carbon dioxide

C-PACE – Commercial Property Assessed Clean Energy CSE –
Center for Sustainable Energy

CT – Connecticut

CVRP – California Clean Vehicle Rebate Project

DAS – Connecticut Department of Administrative
Services

DCDE – Drive Change. Drive Electric.

DCFC – direct current fast charger/charging

DEEP – Connecticut Department of Energy and
Environmental Protection

DER – distributed energy resource

DMV – Connecticut Department of Motor Vehicles

DOE – U.S. Department of Energy

DOT – Connecticut Department of Transportation

EDC – electric distribution company

EPA – U.S. Environmental Protection Agency

EV – electric vehicle

EVSE – electric vehicle supply equipment

FCEV – fuel cell electric vehicle

FHWA – Federal Highway Administration

FTA – Federal Transit Administration

GBTA – Greater Bridgeport Transit Authority

GC3 – Governor's Council on Climate Change

GHG – greenhouse gas

GIS – geographic information system

GMP – Green Mountain Power

GPS – global positioning system

REET – Greenhouse gases, Regulation Emissions, and
Energy use in Transportation

GWSA – Global Warming Solutions Act

HOV – high occupancy vehicle

ICC – International Code Council

ICE – internal combustion engine

IECC – International Energy Conservation Code

kWh – kilowatt hour

LED – light-emitting diode

LMI – low- and moderate-income

Low-No – Low- or No-Emission Grant program

MOR-EV – Massachusetts Offers Rebates for EVs MSRP – manufacturer suggested retail price

MUD – multi-unit dwelling

MY – model year

NAAQS – National Ambient Air Quality Standards NDEW – National Drive Electric Week

NESCAUM – Northeast States for Coordinated Air Use

Management

NHEC – New Hampshire Electric Co-op

NHTSA – National Highway Traffic Safety Administration NOx – nitrogen oxides

NREL – National Renewable Energy Laboratory NYSERDA – New York State Energy Research and

Development Authority

O&M – operation and maintenance

OCPI – Open Charge Point Interface

OCPP – Open Charge Point Protocol

OEM – original equipment manufacturer

OpenADR – Open Automated Demand Response

OSCP – Open Smart Charge Protocol

PG&E – Pacific Gas and Electric Company

PHEV – plug-in hybrid electric vehicle

PM-2.5 – particulate matter 2.5

PUC – public utility commission

PURA – Public Utilities Regulatory Authority

RMI – Rocky Mountain Institute

SDG&E – San Diego Gas and Electric Company

SIR – Savings-to-investment ratio

S02 – sulfur dioxide

SUV – sport utility vehicle

TOD – transit-oriented development

TCI – Transportation and Climate Initiative

TOU – time-of-use

UC Davis – University of California Davis

V2B – vehicle-to-building

V2G – vehicle-to-grid

VIN – vehicle identification number

VOC – volatile organic compound

VMT – vehicle miles traveled

VW – Volkswagen

ZEV – zero emission vehicle

ZEV MOU – Zero-Emission Vehicle Memorandum of Understanding