

Barriers and Solutions for Plug-In Electric Vehicle Charging Infrastructure

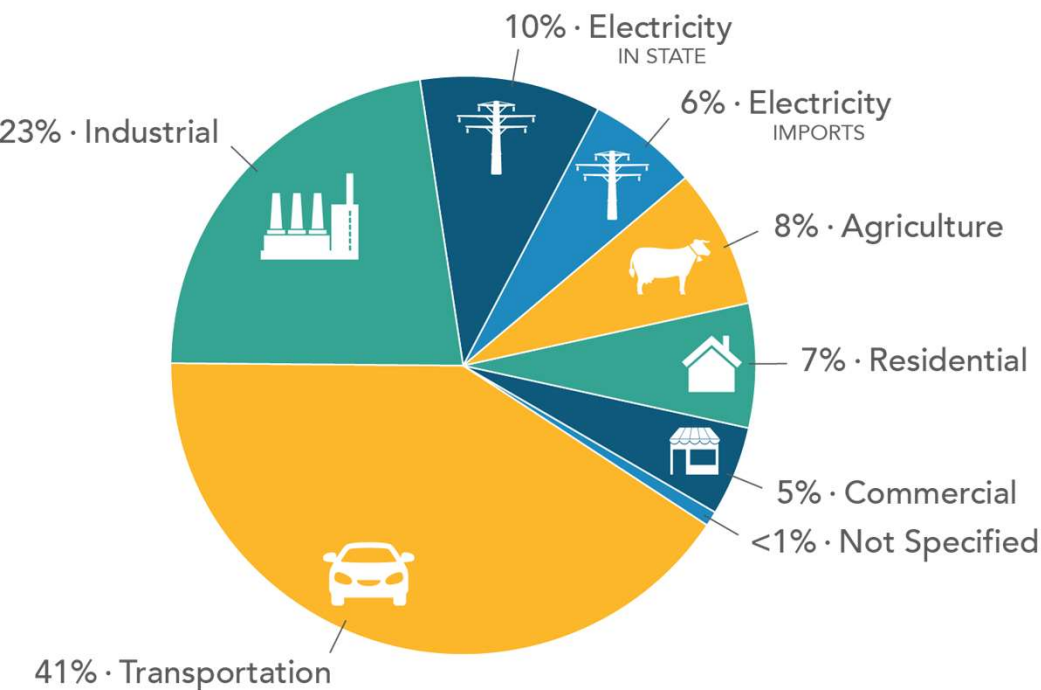
Toward 250,000 Chargers by 2025

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Office of Governor Gavin Newsom

California must electrify transportation to meet its climate and air quality goals

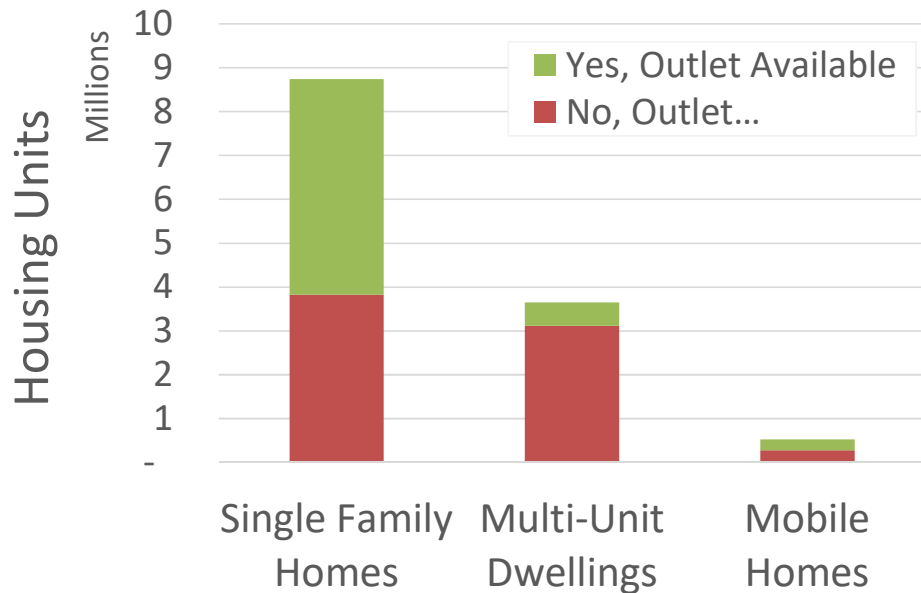


429.4 MMTCO₂e
2016 TOTAL CA EMISSIONS

- Economy-wide carbon neutrality by 2045
- 5 million zero-emission vehicles by 2030
- 250,000 EV chargers by 2025
- Half of in-state GHG emissions come from vehicles, oil extraction, and oil refining
- 25% of emissions come from Light Duty Vehicles
- Trucks, buses, & off-road vehicles produce 68% of NO_x

Challenge: A majority of drivers may not have power where they park

120 V outlet located within 20 feet of residential parking space in California



- Of the residents in the state's 14 M housing units, over 90% own or use a car.
- Half of housing units do not have electrical outlets near where cars are parked.
- The majority of apartment units also do not have available electric outlets where cars are parked.

Electrification requires new equipment and costly grid upgrades (if needed)

Commercial Level 2

Up to 19kW

\$1k to \$3k per EVSE

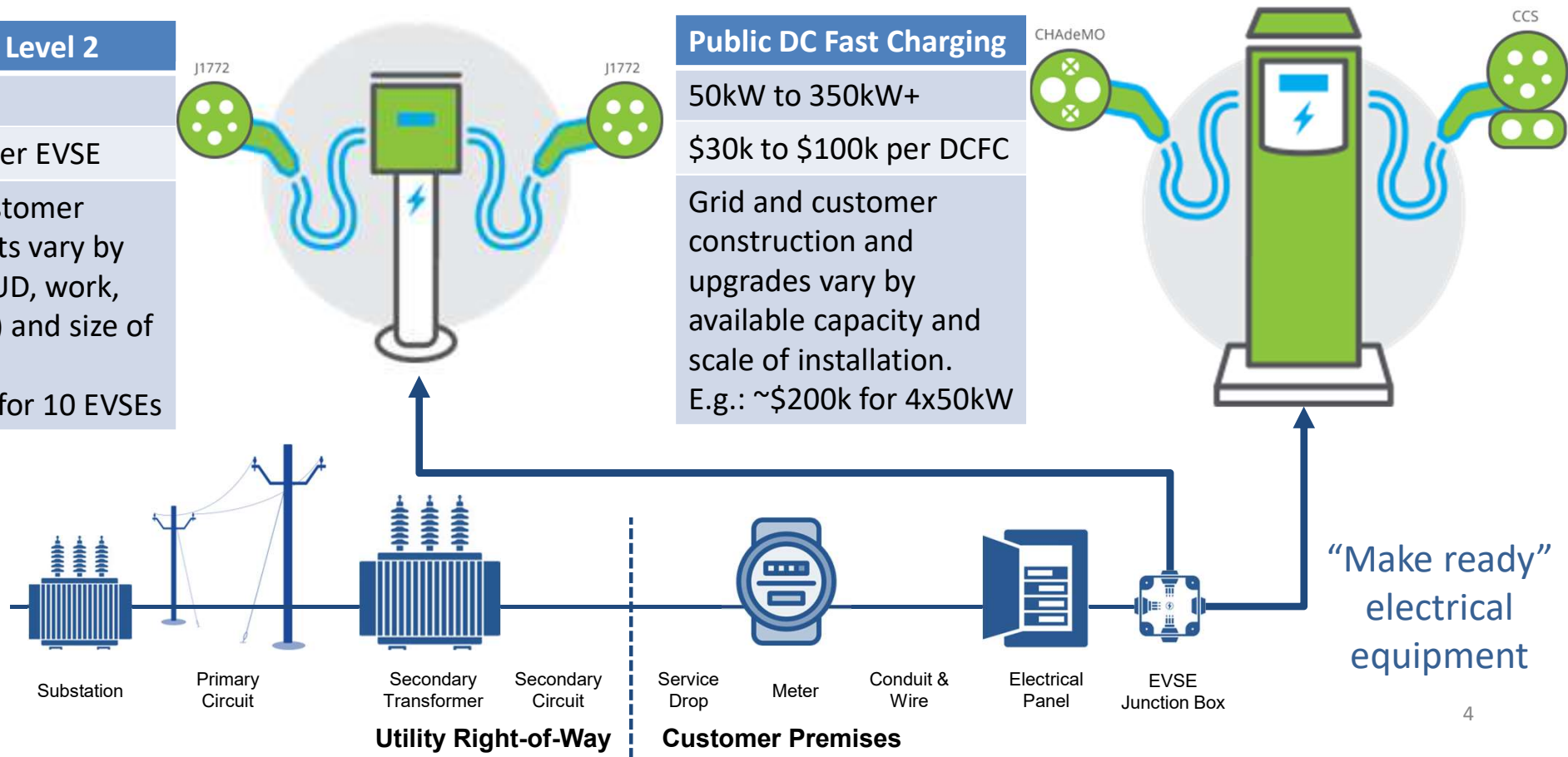
Grid and customer upgrade costs vary by location (MUD, work, public, fleet) and size of installation.
E.g. ~\$100k for 10 EVSEs

Public DC Fast Charging

50kW to 350kW+

\$30k to \$100k per DCFC

Grid and customer construction and upgrades vary by available capacity and scale of installation.
E.g.: ~\$200k for 4x50kW



Acquiring sites and receiving necessary permits pose challenges

- Parking spaces dedicated to an individual resident complicate tenant and owner decisions.
- Installation costs may be high, and building owners may not be willing to dedicate a sufficient number of parking spaces to offset these costs.
- Building permit processes may delay installations (e.g., ADA interpretation, safety, traffic studies, and fees).

Planning activities to support EV infrastructure, including at multi-family buildings

- Statewide analysis of EV charging needs and locations
- Regional EV Infrastructure Planning Grants
- Clean Energy in Multifamily Buildings (CLIMB) Plan



Incentives are available from state and local government, and from utilities

- Energy Commission's CalEVIP
- IOU Pilot Programs: \$200M Approved by CPUC
- Air districts, publicly-owned utilities, and cities also are providing funding for EV charging at multi-unit dwellings



Updates to building codes and permitting will help clear paths forward

- 2019 CALGreen Code was amended to increase the number of buildings and the percentage of parking spaces that must be ready for chargers in new multi-family housing.
- The 2019 Energy Efficiency Building Standards will require solar be installed on new residential buildings. An alternative compliance option is to install a demand-responsive thermostat and a 40 A Level 2 EV charger.
- *To be published:* A guidebook on charger planning, permitting, accessibility, and grid connection will provide best practice checklists and a ZEV Readiness Scorecard for cities (GoBIZ).

Innovative charging solutions can increase deployment and accessibility



Off-Grid Solar + Storage



Mobile Storage



DC Fast Charge Plazas



Street-Side Lamp / Power Pole



Shared Mobility Fleets



Modular, Automated Parking Garages