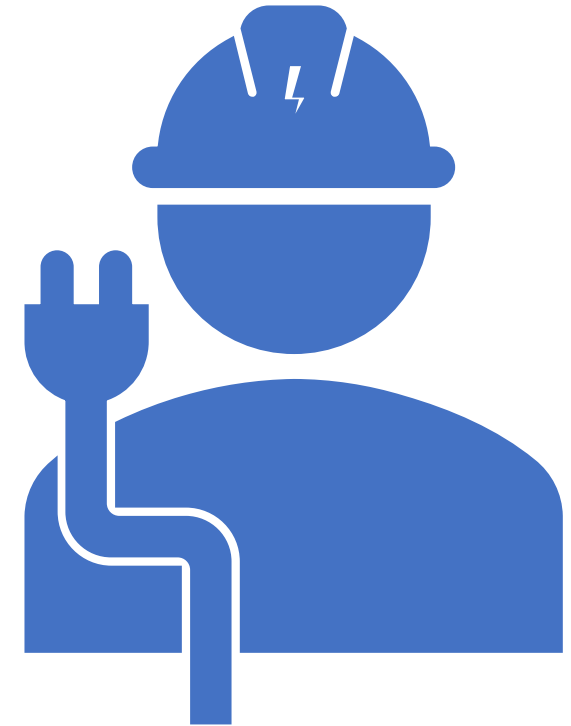


Zero Emission Vehicles and Grid Resilience

Yuliya Shmidt, Advisor to
Commissioner Rechtschaffen

California Public Utilities
Commission

04-08-21

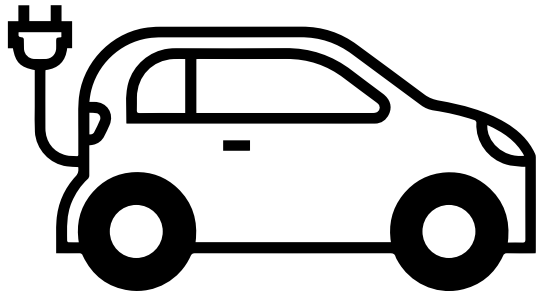


Outline

Role of the CPUC and
Electric Utilities

Electric charging and
grid resilience

Vehicle-Grid Integration
(VGI)



Zero Emissions Vehicles (ZEVs) will grow quickly as percentage of all vehicles

2029: CA Air Resources Board requires that all new transit buses be ZEV

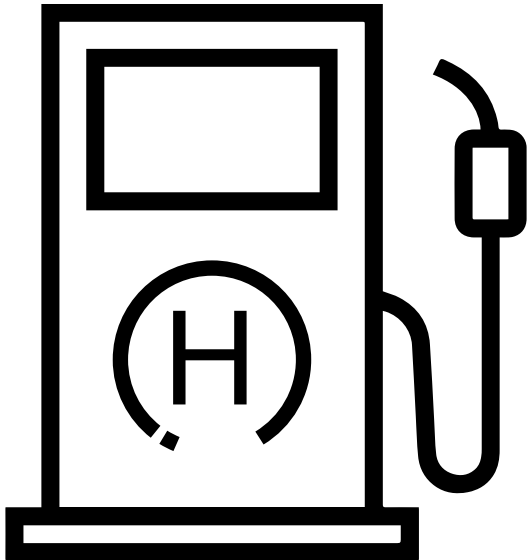
2030: CA Energy Commission's (CEC) assessment projects 8 million light-duty cars on the road

2030: CEC projects 180,000 medium/heavy duty vehicles on the road

2035: Governor Newsom's Executive Order mandates that all new light-duty cars be ZEV

2035: Executive Order mandates that all off-road vehicles and drayage trucks be ZEV, where feasible

2045: Executive Order mandates all new MD/HD vehicles be ZEV, where feasible



Role of the CPUC and Utilities

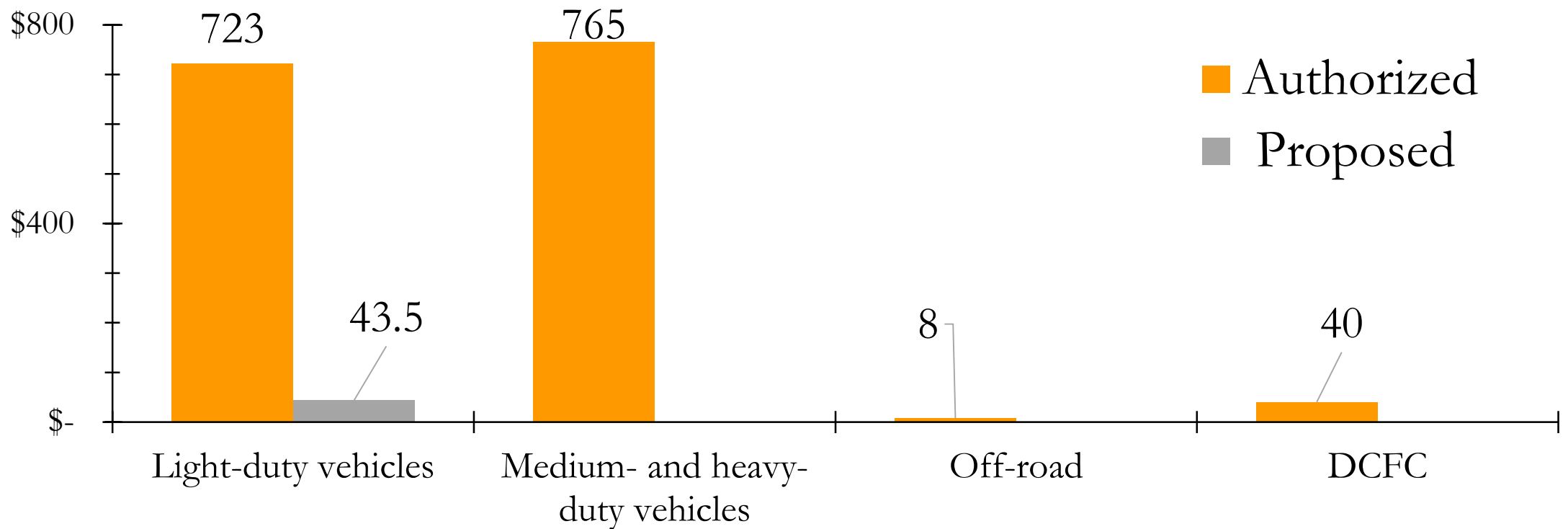
Infrastructure Investment

- Distribution grid that can support EV charging
- Make-ready infrastructure for EV chargers
 - Utility side of the meter: wiring and conduit
 - Customer side of the meter: panel upgrades, additional wiring and conduit

Minimizing Impacts on Grid

- Rate Design
- VGI

CPUC has authorized over \$1.5B in utility investment across dozens of programs



Transportation Electrification Framework (TEF)

Overarching Commission policy for Transportation Electrification

- Draft proposal issued in February 2020 (available at www.cpuc.ca.gov/zev)
- Robust stakeholder participation
- Initial policy decision expected Q2 2021

TEF identifies the IOUs' role in ensuring availability of charging during outages as:

- Customer communication
- Backup power resources
- Availability of public charging, including in rural areas
- Repairing damage to utility TE infrastructure



Public Safety Power Shutoffs (PSPS)

- Definition: PSPS events are temporary power shut-offs to areas that contain infrastructure that could cause a wildfire
- CPUC has issued several decision with detailed guidance on how utilities can call PSPS events
 - Utilities are required to develop detailed communication plans for PSPS events
 - Utilities are required to provide 48-72 hours notice
 - Utilities must complete a Transportation Resilience Needs Assessment prior to the 2021 fire season
 - Study transportation infrastructure that is affected by power outages such as bridges, tunnels, traffic lights, and EV charging

Public Safety Power Shutoffs (PSPS)

- By the 2021 wildfire season, utilities must execute plans to ensure that mobile EV fast charging is available and priority access is granted to customers impacted by de-energization events, especially along major transportation corridors
- Utilities' public websites and mobile apps must communicate the location, number, and accessibility of all Level 3 charging stations and publicly available Level 2 charging stations in proximity to areas impacted by PSPS
- Utilities must coordinate with charging providers to reinforce networks and key charging locations with backup generation

Vehicle Grid Integration: crucial next step in TE development

VGI is an umbrella term for a host of measures and behaviors that better integrate EV charging with the electric grid

- VGI: smart charging (i.e. charging that is responsive to TOU or dynamic price signals)
- Vehicle-to-Grid (V2G): vehicle batteries feeding power back to the grid
- Vehicle-to-Home (V2H) or Vehicle-to-Load (V2L): vehicle batteries providing power to home or other customer electric load for example during power outages



Benefits of VGI

Reduce grid impact or even create grid benefit from additional electric load.

Deliver grid services by providing power back to the grid during needed times

Reduce customer cost of charging by allowing drivers to employ managed charging

Reduce customer cost of ownership by allowing drivers to earn revenue from their cars.



California Public Utilities Commission

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