Welcome!

CPUC En Banc on Transportation Electrification in California Investor-Owned Utility Territory

Topic	Presenter	Time
Introductory Remarks	Commissioner Rechtschaffen	5 min
State TE Goals, Progress, and Gaps	Energy Division, CPUC	25 min
Statewide TE Infrastructure Deployment and Vision	Hannon Rasool, Deputy Director of Fuels and Transportation Division, CEC	30 min
Commissioner Discussion on Optimizing Ratepayer Funding of TE Market Acceleration	CPUC Commissioners	1 hour 15 min
Public Comment Period	3 minutes per commenter	15-30 min

To sign up for public comment, email Nicole.Cropper [at] cpuc.ca.gov

California Public Utilities Commission

Transportation Electrification in California Investor-Owned Utility Territory:

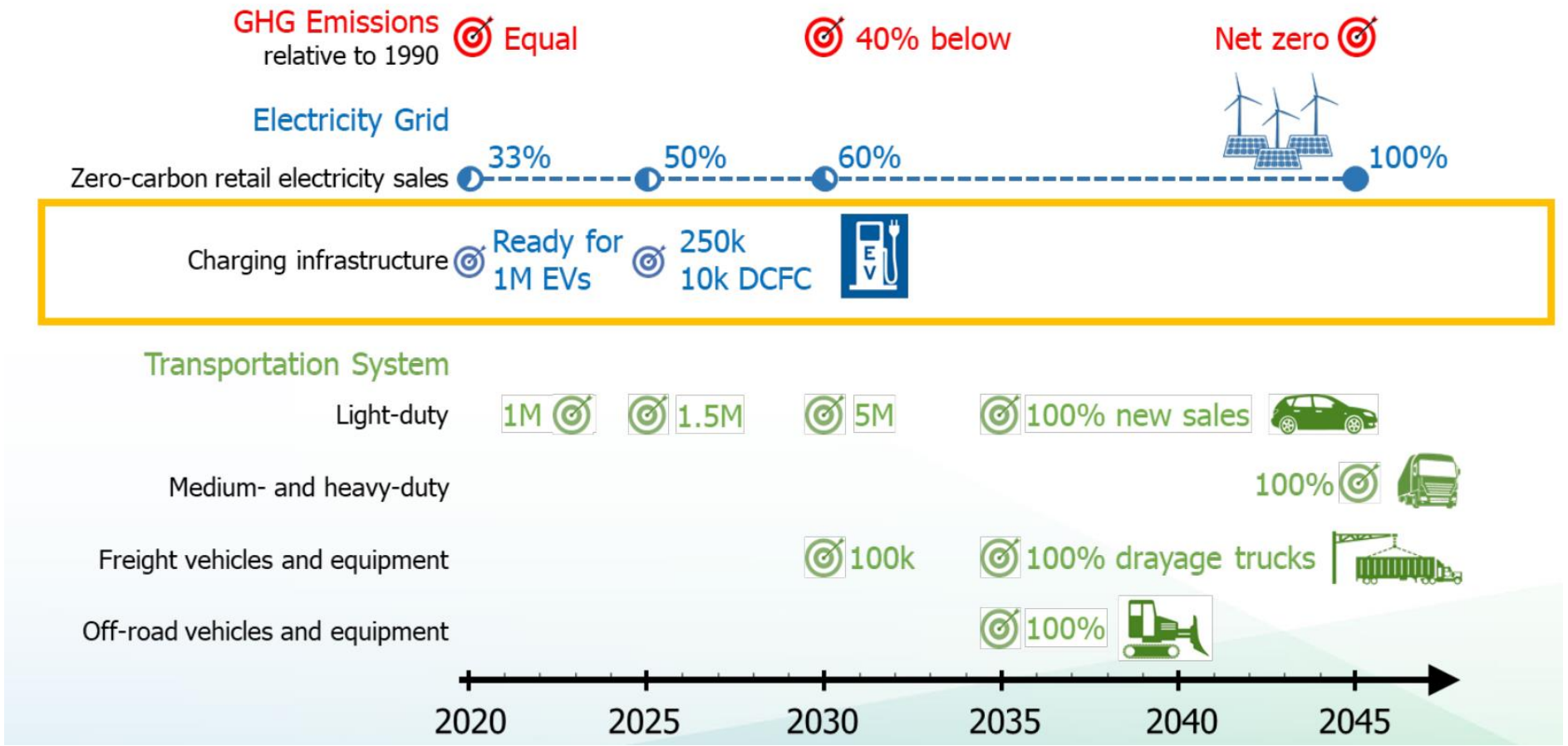
Goals, Progress, and Gaps

Presented by CPUC Energy Division Staff

Transportation Electrification En Banc | October 13, 2021

California Public Utilities Commission

California climate and EV targets require rapid buildout of charging infrastructure



Source: CEC

California has nearly 1 million EVs on the road

924,822
CA EV Sales

2,084,118
U.S. EV Sales

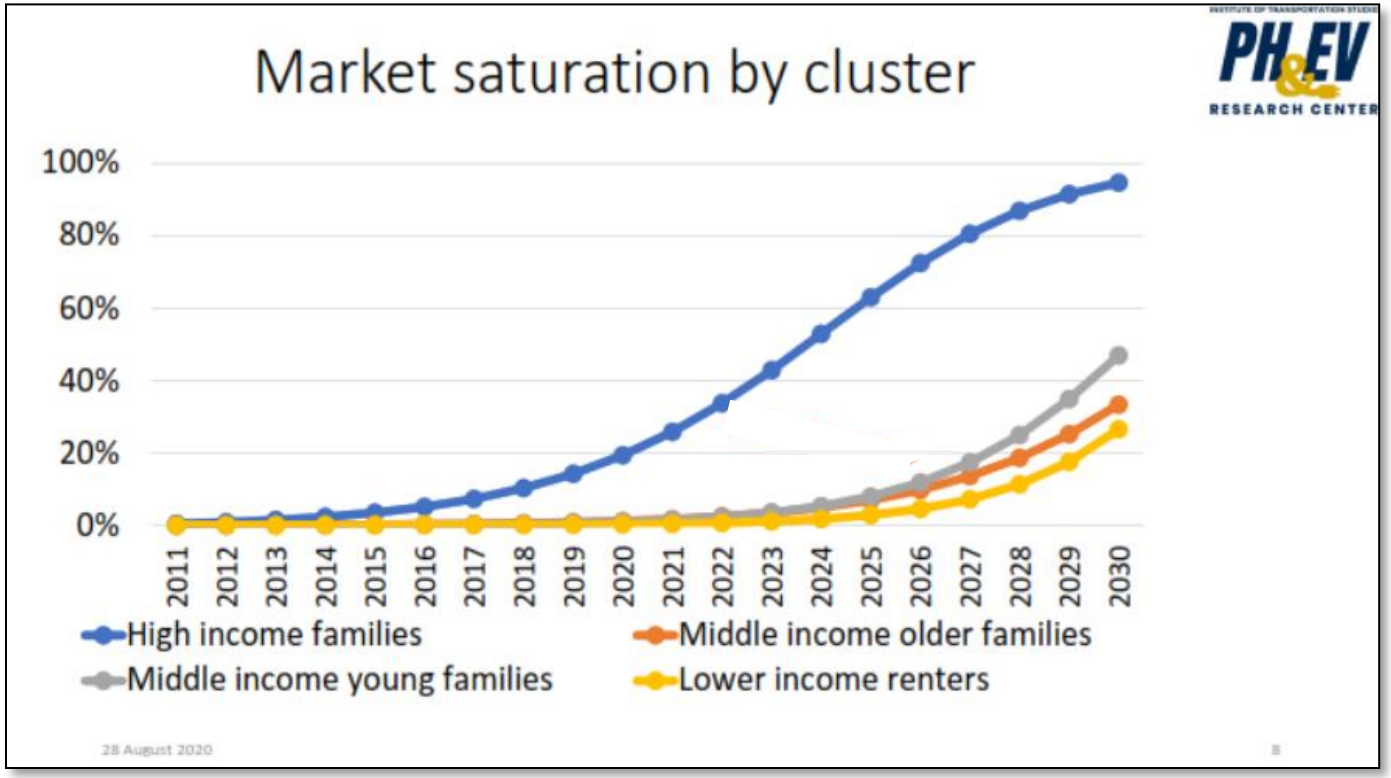
70
CA Models Available

74,459
CA EV Chargers

52
CA Hydrogen Stations

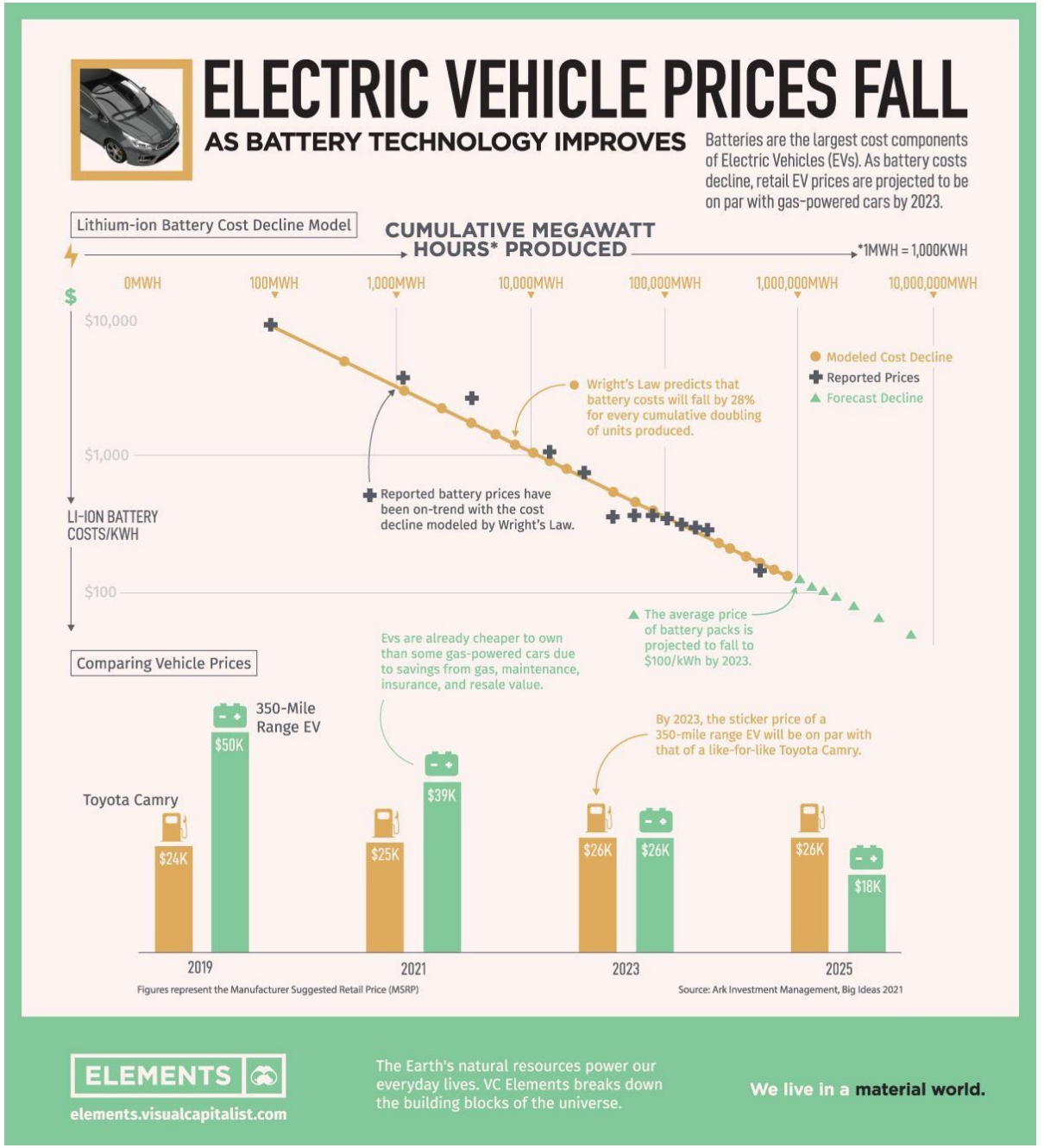
Q2 2021 Data Update. Posted Aug 5, 2021
Data Source: California Energy Commission (2021).
California Energy Commission Zero Emission Vehicle and Charger Statistics.
Retrieved from http://www.energy.ca.gov/zevstats

EV Adoption is not equal among Californians



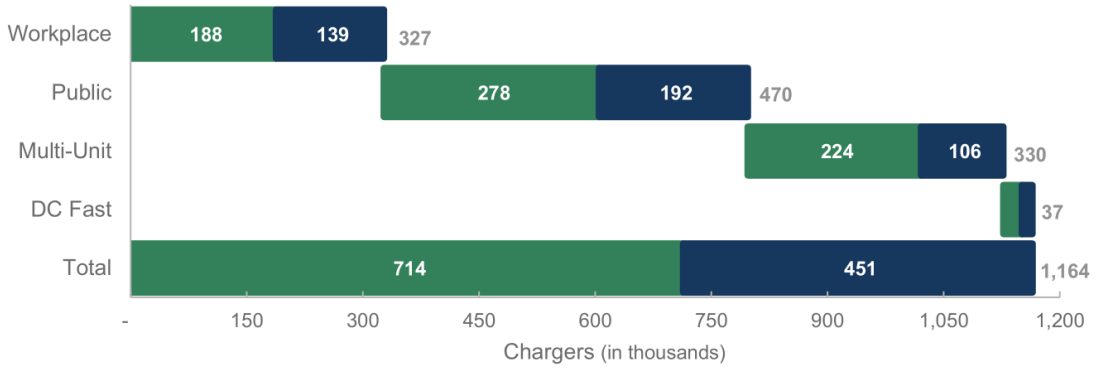
- Currently, EV adoption is higher among higher income drivers
- California must ensure that TE benefits are received by all

However, battery prices are falling fast – EV retail prices could reach cost parity with gas cars in 2023, leading to more rapid and equitable adoption



CEC estimates need for 1.2 million public/shared chargers by 2030 to support light-duty EVs

Forecasted CA Charger Need = 1,164,000



Green = 5M EVs Blue = 8M EVs
Source: Assembly Bill (AB) 2127 Electric Vehicle Charging Infrastructure Assessment (California Energy Commission, 2021)

Current Installed CA Chargers = 74,456

	Public	Shared Private	Grand Total
Level 1	301	350	651
Level 2	27,392	40,050	67,442
DC Fast	5,742	624	6,366
Number of Chargers	33,435	41,024	74,459

Source: California Energy Commission Zero Emission Vehicle and Charger Statistics. Retrieved from http://www.energy.ca.gov/zevstats

CEC estimates need for 157,000 chargers to support medium- and heavy-duty EVs in 2030

- To support CARB's estimate of 180,000 battery-electric MDHD vehicles by 2030, the CEC estimates need for:
  - 141,000 50 kW chargers
  - 16,000 350 kW DC fast chargers

- CPUC has authorized $729 million in funding to support 11,500 MDHD vehicles (<10% of CARB estimate)

- In addition, for TNCs (e.g., Uber and Lyft), CEC estimates a need for 2,000 DCFC in Greater LA, SF, and San Diego

Image: Shutterstock

Collaborative problem solving is critical

+

- **Local and Regional Government**
  - Air Districts
  - City/County Government
  - Metropolitan Planning Organizations
  - Regional Transportation Planning Agencies
- **Federal and Tribal Governments**
  - Federal Government Agencies and National Labs
  - Tribal Governments
- **Vehicle Manufacturers and Supply Chain**
  - Dealerships (and dealership groups; direct sales)
  - Light-Duty Manufacturers
  - Medium- and Heavy-Duty Manufacturers
  - New Market Entrants
  - Off-Road Vehicles and Equipment Manufacturers
  - Suppliers
- **Grid Operators, Electricity, and Hydrogen Providers**
  - Balancing Authorities
  - Community Choice Aggregators
  - Electric Utilities, Load-Serving Entities
  - Electric Vehicle Charging Station Providers and Installers
  - Gas Utilities
  - Hydrogen Producers
  - Hydrogen Station Developers and Operators
  - Registered Service Agencies
- **Fleets (public and private)**
- **Non-Governmental Organizations**
  - Codes and Standards Bodies
  - Collaboratives
  - Community-Based NGOs
  - Environmental NGOs
  - Equity NGOs
  - Trade Associations
- **Investors/Financing Institutions**
- **Organized Labor**
- **Academia**
  - Community Colleges
  - Universities
- **International Relationships**

Source: ZEV Market Development Strategy, GO-Biz, Feb 2020

CPUC and IOUs are accelerating the transition to electrified transportation

- Deploying electric vehicle charging infrastructure to meet customer demand
- Planning and building an electric grid and interconnection process that can safely and efficiently accommodate EVs
- Designing electricity rates that allow for affordable charging while facilitating grid-beneficial vehicle-to-grid integration
- Conducting program evaluation and interagency coordination to ensure ratepayer investments to support zero emission vehicles are strategically coordinated

CPUC has authorized ~$1.85 billion in TE investments

Year	Program Description	Funding
2016	SCE's Charge Ready Pilot	$22M
	SDG&E's Power Your Drive	$45M
	PG&E's EV Charge Network	$130M
2018	SCE's Charge Ready Bridge	$22M
	SB 350 Small IOU Programs	$7.6M
	SB 350 Priority Review Pilots	$42.8M
	SB 350 Standard Review Projects	$650.5M
2019	PG&E's EV Empower	$4M
	SDG&E's Power Your Drive Fleets Program and V2G School Bus Pilot	$113.5M
	AB 1082/1083 Schools, Parks & Beaches	$54.5M
2020	SCE's Charge Ready 2	$436M
	SB 676 VGI Pilots	$38.7M*
2021	SDG&E's Power Your Drive Extension	$43.5M
	TEF Near-Term Priorities	$240M*

* Funds authorized for IOU proposals, but no programs/pilots yet approved

IOU TE Programs advance equity through DAC and multi-unit dwelling targets, and focus funding on MDHD

- Light-duty programs require multi-unit dwelling deployments, which is aimed at increasing charging access for low- and middle-income customers
- MD/HD sector programs are critical to improving air quality for DAC residents. Each of the large IOU TE programs require:
  - at least 15% of budgets to serve transit agencies
  - rebates of up to 50% of the EVSE cost for sites in DACs and sites supporting school buses and transit focus on shuttle, delivery, or transit routes that go through DACs
  - at least 25% (PG&E), 40% (SCE), and 30% (SDG&E) of the MDHD infrastructure budget committed to DACs
- AB 841 now requires CPUC programs to commit a minimum of 30% of program budgets to "underserved communities"

Recent TE Authorizations	DAC / Underserved Community Targets
SCE Charge Ready 2	50% of ports (15% in MUDs)
SDG&E Power Your Drive 2	50% of funds
Near-Term Priorities PD	50% of funds

CPUC also helps vehicle ownership become more affordable through EV charging rate design

For drivers charging off-peak, charging an EV is on average ~1/3 the cost of fueling a gasoline-powered car

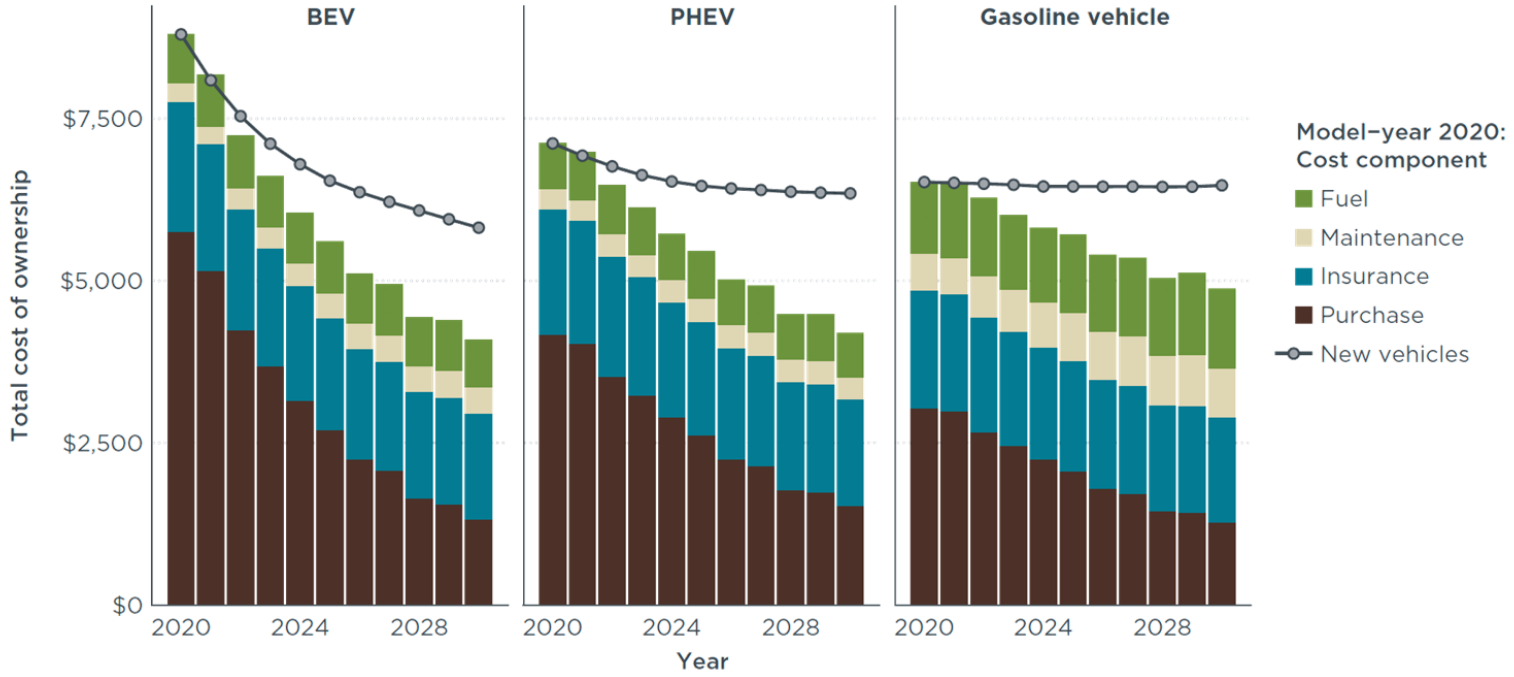


Figure 6. Average amortized total cost of ownership for model-year 2020 vehicles by year of purchase between 2020 and 2030, broken down by cost component and by fuel type. Black lines show total cost of ownership for new vehicles purchased in each year.

Source: International Council on Clean Transportation Working Paper, 2021
https://theicct.org/publications/EV-equity-feb2021

Questions?

California Energy Commission

Hannon Rasool, Deputy Director of the Fuels and Transportation Division

Policy Priorities for Optimizing TE Infrastructure Buildout

Presented by CPUC Energy Division Staff

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Are the IOUs and ratepayers responsible for further TE market acceleration?

Yes…

- SB 350 (De León, 2015) requires CPUC to approve programs that "accelerate widespread transportation electrification", if they're consistent with requirements
- AB 841 (Ting, 2020) authorizes distribution-side upgrades without the need for a specific application

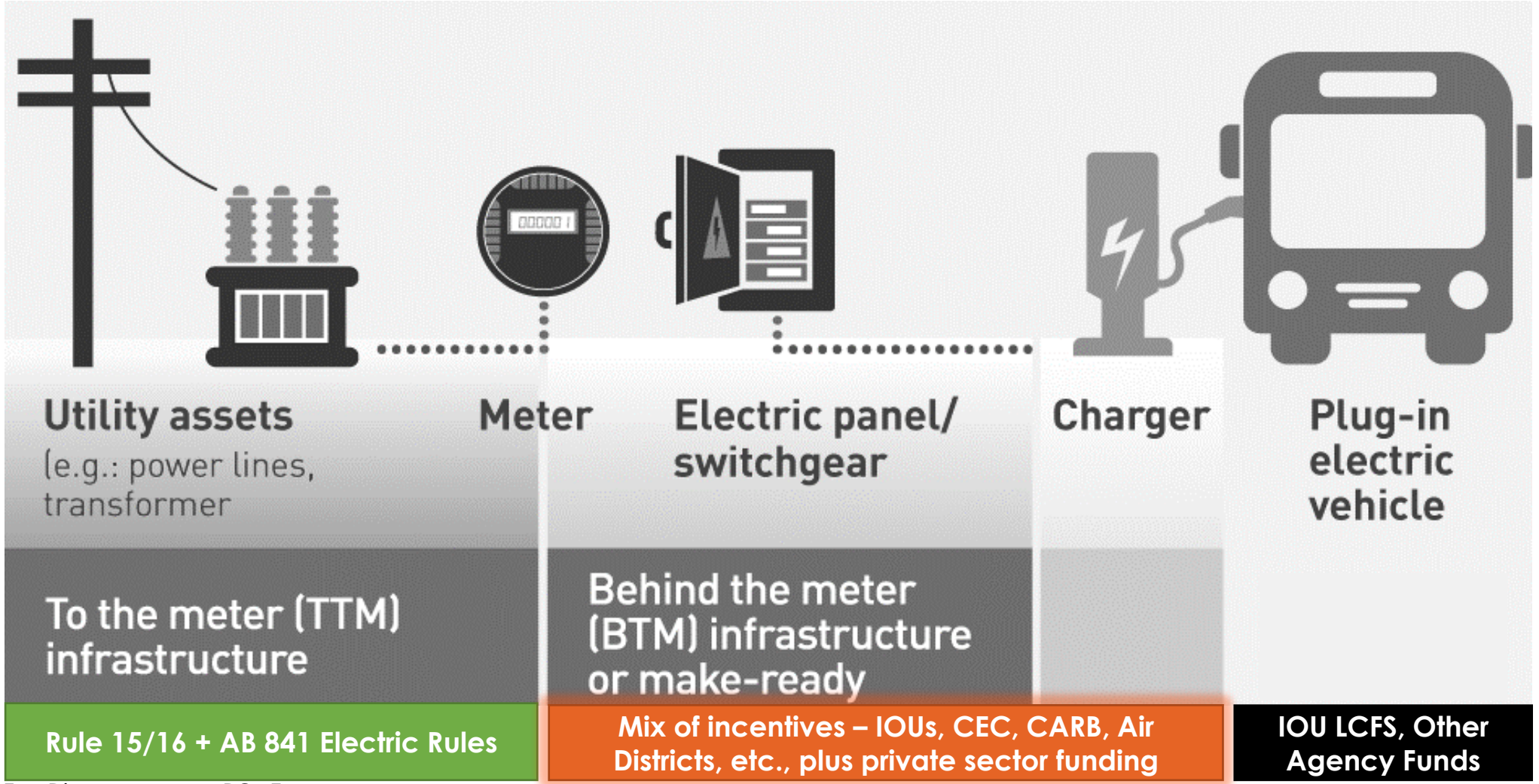
But to what extent?

- We must "accelerate" progress, but the extent of acceleration is not defined
- How do you define and demonstrate "market acceleration"? How do you demonstrate market acceleration?

And what responsibility do other state agencies have for market acceleration?

- CEC and CARB have market acceleration directives as well, often specified by Executive Order or Legislation

The role of the IOU in TE market acceleration is evolving, but policy questions remain



Top Diagram source: PG&E

Energy Division's Transportation Electrification Framework (TEF) proposed a strategic approach to TE planning and procurement; however, many issues are unresolved:

- How to align and time IOU TE targets with state TE targets / modeling
- Coordinating ratepayer TE investments with other state, regional, and local government investments
- Extent of *IOU* ownership of charging infrastructure on the customer's property (vs *customer* ownership)
- Overall levels of ratepayer funding to authorize
- Mechanism from procuring charging infrastructure
  - Durable rebate programs (e.g., California Solar Initiative)?
  - RFPs or Reverse Actions?
  - One-off IOU TE applications (i.e., business as usual)?

Resolving those issues requires policy prioritization and potential tradeoffs

- Deploying chargers as rapidly as possible to meet state goals?
- Equitable distribution of and access to charging infrastructure?
- Filling gaps left by the market/private sector?
- Reducing cost of IOU distribution system infrastructure upgrades and equipment?
- Accelerating specific sectors or use cases (e.g., transit, long-distance drivers)?
- Maximizing GHG reductions / air quality benefits?

Commissioner Roundtable Discussion Topics

1. Coordinating ratepayer TE investments with other state, regional, and local government TE investments
2. Timing of Investments: From here to 2030 and beyond
3. Optimizing TE programs for critical policy objectives
4. IOU Ownership of TE Charging Infrastructure
5. Optimal mechanisms for distributing ratepayer funding

Public Comment Period

Thank you