California-Mexico Medium- and Heavy-Duty Zero-Emission Vehicles (MHD ZEV) Transition

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Ongoing and Future ZEV Work

- Developing a blueprint for MD & HD ZEV infrastructure for Southern California Air Basin - CEC
- RHETTA - Research Hub from Electric Technologies in Truck Applications
- Fuel cell truck testing and evaluation – Cummins, Nikola
- Develop microgrids with hydrogen production/storage capabilities – proposed to DOE and NSF
- Effects of hydrogen injection on natural pipeline infrastructure – CPUC, Hydrogen Hub
- Evaluation of BEV sweepers – Caltrans
- Hydrogen production from biomass – CEC, Taylor Energy
- California Statewide ZEV deployment Tool - Caltrans
• Meet State and Federal regulatory requirements to deploy Zero Emission Vehicles (ZEVs)

• Comply with State mandates for state agencies to transition to ZEVs

• Diverse statewide fleet of roughly 12,000 vehicles

• Highly varied vehicle activity

• ZEV deployments require supporting refueling infrastructure

• Determination if vehicle range capabilities match vehicle usage patterns

• Determination if vehicle refueling needs can be met by existing and/or proposed charging or refueling infrastructure
Caltrans ZEV Tool

- ZEV compatibility
- Trip analysis
- Charging activity
- H2 refueling activity
- Vehicle range
- Charger type
- Opportunity charging
- Overnight charging
- LD/MD/HD
- BEV vs. H2
- Vehicle activity based
Refueling Preferences

- Select type of refueling infrastructure
- H2, Fast DC, L2, Caltrans
- Opportunity refueling preferences
- Analysis results with varied refueling preference
Caltrans ZEV Sweeper Deployment

- UC Riverside independent evaluation
- Hydrogen Fuel Cell sweeper deployment
- Vehicle activity based performance evaluation
- Energy/emissions dyno evaluation
- Future evaluation of 18 BEV sweepers
MHD ZEV Blueprint Resource Analysis

- Geospatial assessment of the electric grid infrastructure, including transmission, distribution, and substations information
- Geospatial assessment of existing electric power plants’ generation capacity
- Geospatial assessment of new load integration capacity at the distribution level, within Sothen California Edison (SCE) service territory
MD/HD Transportation Network Analysis:

- Utilizing Southern California Association of Government (SCAG) truck model for SCAQMD region
- Developing an inventory of major driving routes, average traffic volumes, trips, current refueling locations, and other points of interest
NCST: Electric Fleet Adoption Strategies – Addressing Storage and Infrastructure Needs
Resolve Modeling Results

- 50% RPS by 2030

Total CAISO installed generating capacity
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Total CAISO new build
MHD ZEV Transition Challenges

• MHD compatible battery electric and hydrogen fueling infrastructure
• Availability of MHD vehicle quantities and configurations
• Technology limitations: vehicles, batteries, H2 fuel cells, H2 storage, H2 handling, refueling/recharging
• Electrical grid capacities (T&D) and hydrogen gas supplies
• Economics of vehicle replacements, refueling stations, and infrastructure upgrades
• Workforce training
• Community engagement and environmental justice
• Regional, state, national, and international coordination