

# Transportation Electrification: Reducing Emissions, Driving Innovation

August 2017



Energy for What's Ahead<sup>SM</sup>



# CA raising the bar in environmental policy and action



- Senate Bill 350 (DeLeon, 2015) established broad and ambitious clean energy policy goals for the electric sector. Specifically, SB 350:
  - Requires 50 percent of electricity to be generated from renewable resources by 2030
  - Requires a doubling of energy efficiency savings in existing buildings by 2030
- Senate Bill 32 (Pavley, 2016) requires California to reduce emissions to at least 40 percent below 1990 levels by 2030

SCE supports California's climate and clean energy goals and is working closely with state agencies to achieve them.

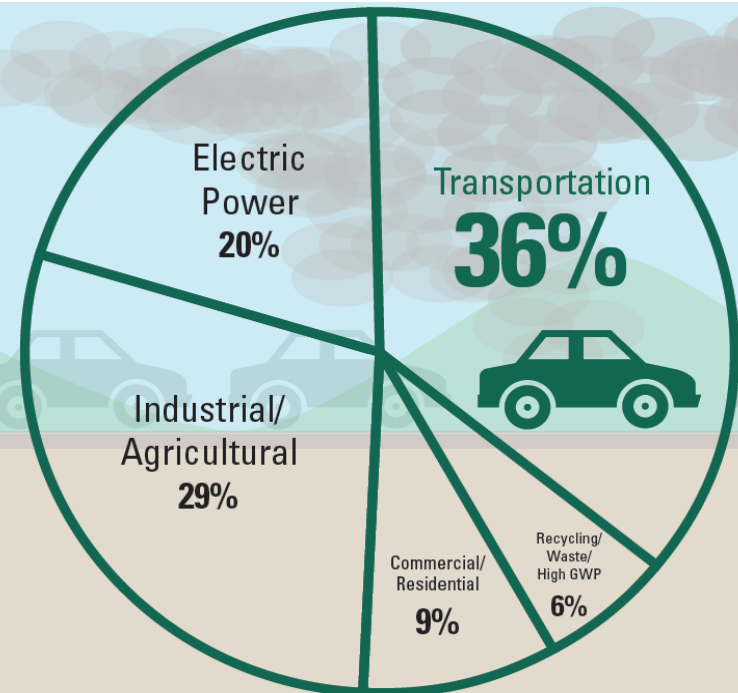
# Moving the needle on California's environmental goals requires significant investment in transportation electrification

- In California, transportation electrification represents the largest near-term opportunity to reduce greenhouse gas (GHG) emissions and air pollution
- By fueling a variety of vehicles with clean electric power instead of fossil fuels, we can help meet California's ambitious climate and clean air goals

## Transportation is a **BIG** Greenhouse Gas Problem

Did you know that 40% of the goods entering the nation are being moved through Southern California's ports and highways?

While the goods movement industry is crucially important to the state and local economy, the transportation sector is responsible for 36% of California's GHG emissions.

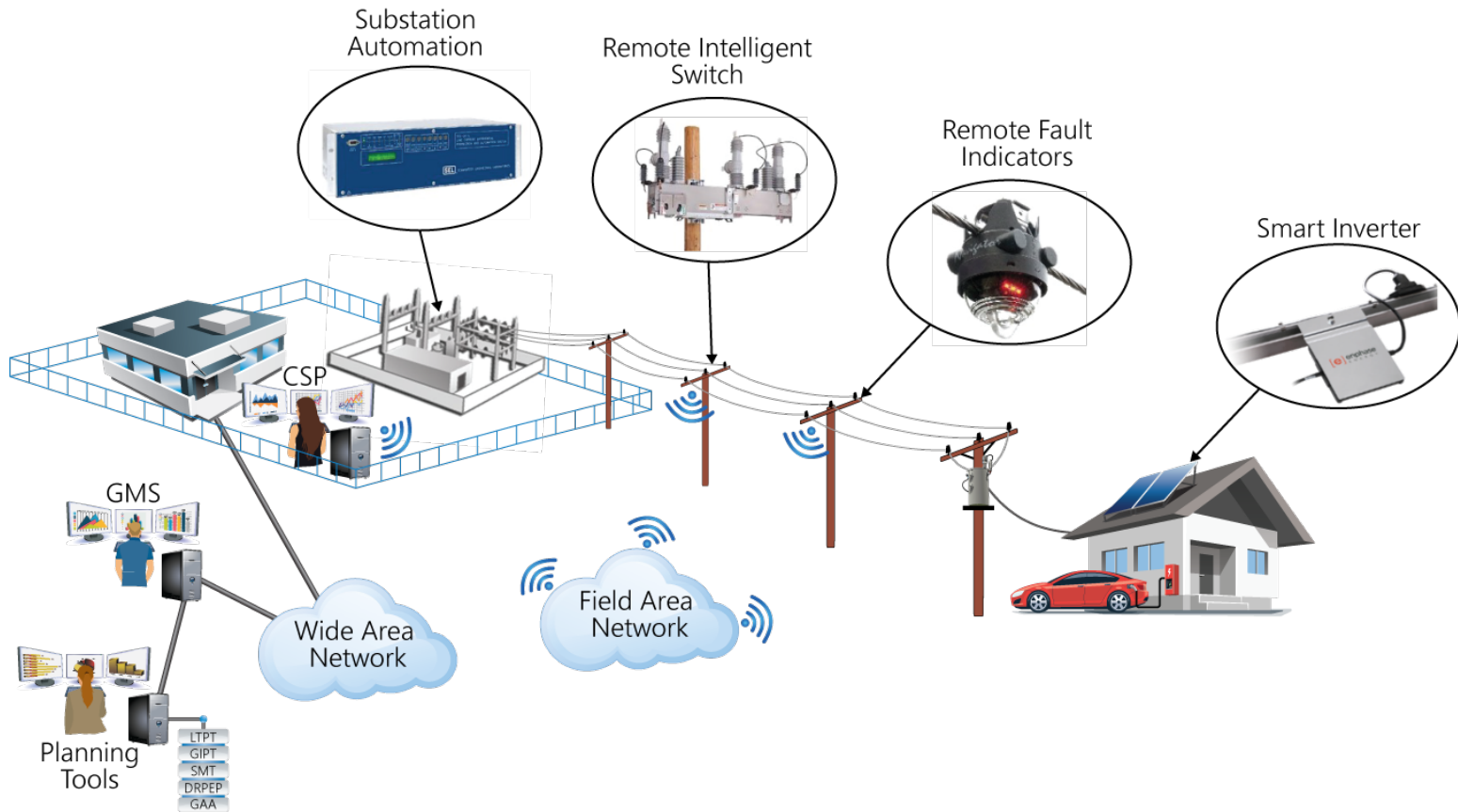


# Changing Energy Landscape



***A reliable, modern grid is essential for achieving a clean energy future***

# Evolving 21<sup>st</sup> Century Grid



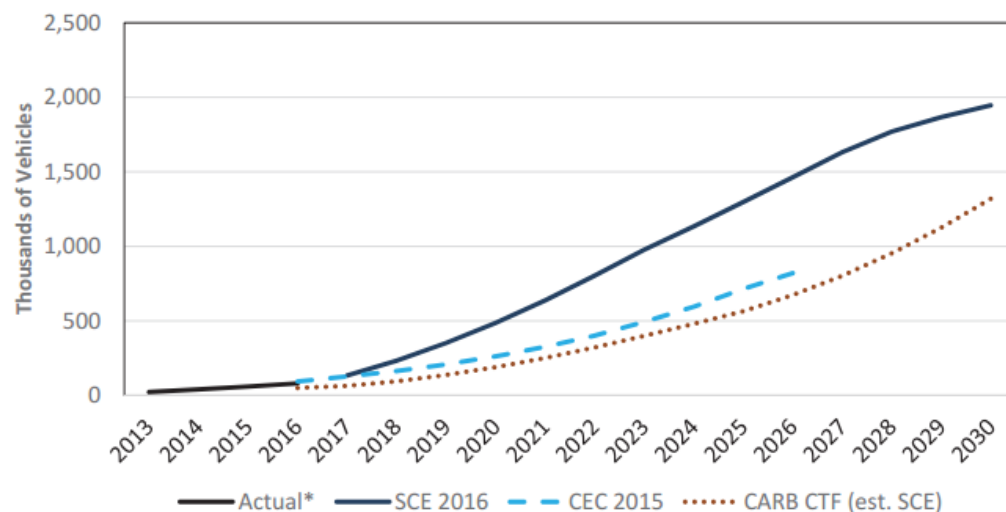
*The future grid will be increasingly sensor and data driven, further integrating grid and consumer devices*

# Transportation electrification is underway, but uptake is slow

After more than 5 years of commercial availability, passenger EVs represent only 3% of total annual vehicle sales in California. Despite the slow progress, some trends support growth potential:

- More models in more classes
- Increased electric range at a lower price
- Faster charging
- Ride-sharing/taxis and autonomous operations

### Comparison of Light-Duty EV Forecasts



## Electric Vehicles – By the Numbers

**\$1.3/gallon**

(EV gasoline equivalent)

VS.

**\$2.8/gallon**

(gasoline)

**20+**

models  
available

**12,000**

chargers in  
California today

**260,000+**

EVs in California today

**4,000,000+**

zero emission vehicles  
in California by 2030

SCE's TE vision is to provide environmental and economic benefits to all Californians

- **SCE is firmly committed to supporting California's goal** to reduce emissions by ~40% in 2030; to achieve this goal, significant carbon reductions are required in all transportation sectors
- The January 2017 TE application spans **all transportation sectors, with a particular focus on targeting pollution in disadvantaged communities** that are most impacted by medium-duty, heavy-duty and non-road transportation
- Listening to feedback from customers and stakeholders, SCE developed transportation strategies that center around **acceptance, availability and affordability of fueling**
- The proposed portfolio leverages the utility's natural role as an infrastructure provider to **specifically target the most critical barriers** to EV adoption in each segment's stage of development



# Pilots and Programs in the Application

Customer rebate for residential charging station installation



Building vehicle charging infrastructure for electric transit buses



Two Port of Long Beach electrification projects



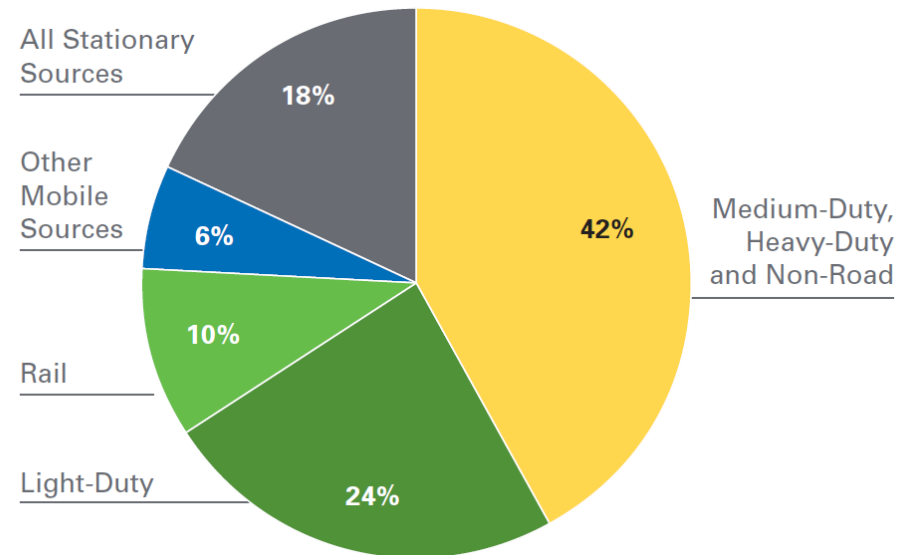
Funding for medium- and heavy-duty vehicle charging infrastructure



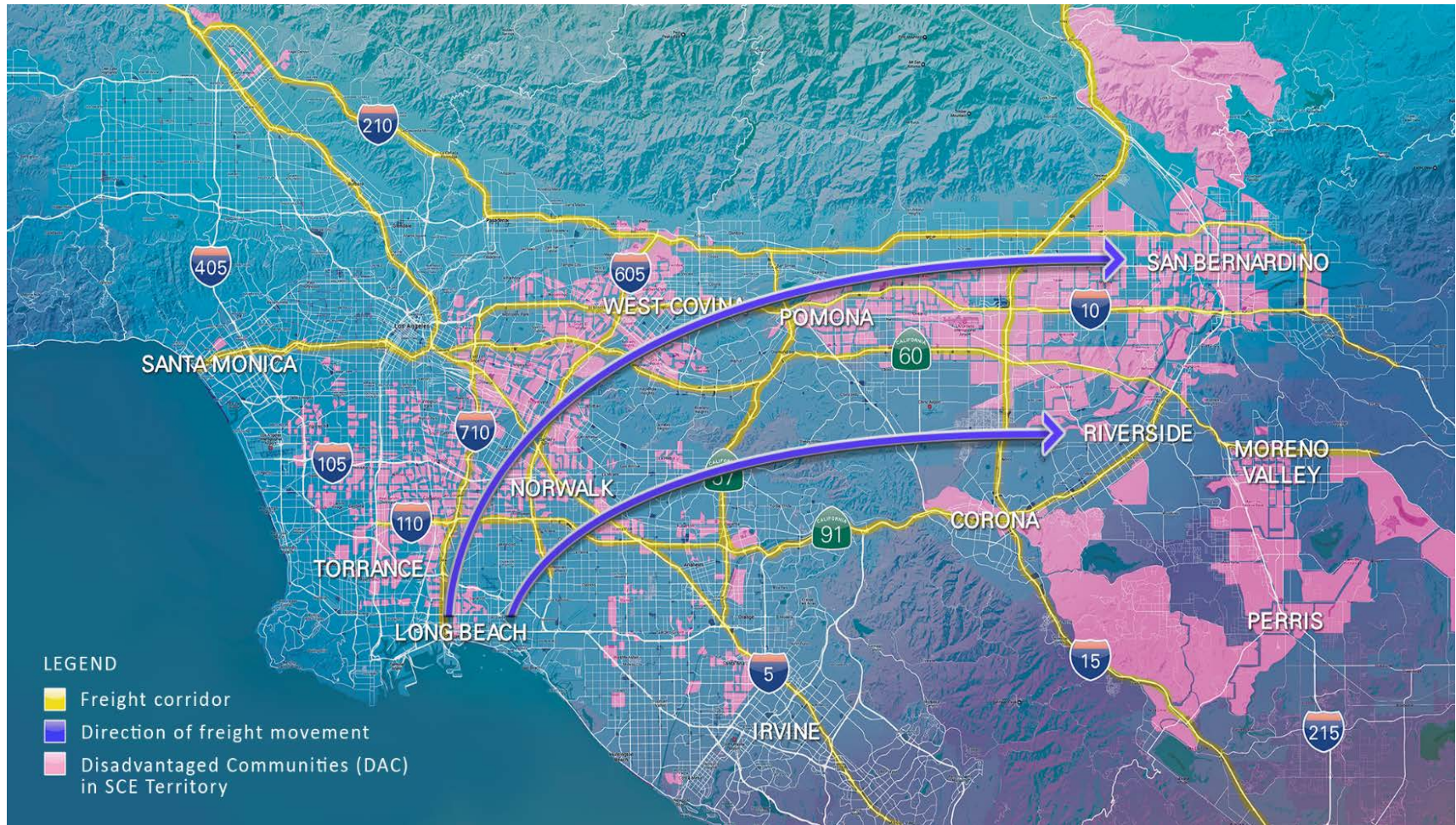
# SCE serves the only two basins in the nation in extreme non-attainment for ozone: San Joaquin and South Coast

- Transportation has an even greater impact on air quality than on GHG emissions in California – accounts for 80 percent of NOx and 95 percent of particulate emissions in the state
- Meeting 2032 attainment deadlines is more difficult than meeting the state's 2050 GHG goal as far as pace of commercialization of TE and other technologies according to CARB
- Heavy-duty EVs reduce NOx up to 60 times more per kWh than renewables or energy efficiency
- Light-duty EVs reduce NOx about 8 times more per kWh

## Medium-Duty, Heavy-Duty and Non-Road Vehicles Contribute Significantly to NOx Emissions in Los Angeles County



Disadvantaged communities are heavily impacted by air pollution from freight corridors – SCE has 45% of CA's DACs



Note: Communities are considered DACs if they are in the worst quartile of environmental & economic burden, as evaluated by the California EPA using CES 3.0. Freight corridors are consistent with those identified by the Southern California Association of Governments in its 2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy. A map of freight corridors, warehouses, and rail lines is available in the RTP/SCS Goods Movement appendix, available at [http://scagrtpscscs.net/Documents/2016/final/f2016RTPSCS\\_GoodsMovement.pdf](http://scagrtpscscs.net/Documents/2016/final/f2016RTPSCS_GoodsMovement.pdf).

# IOU January TE Application Comparison



## Priority review

- Dealership incentives to increase EV adoption (\$1.8M). \$250 goes to dealership, \$250 to salesperson
- DCFC & L2 for Caltrans park-n-rides (\$4M) in four locations
- DCFC installations, rate and rebate to enable electric taxis ride-share, and shuttles (\$3.5) would include solar and storage at 1 facility
- Port of San Diego Electrification (\$2.4M)
- Fleet delivery hub electrification (\$3.7M)
- Airport ground service equipment electrification (\$2.8M)

- Home charger information resource (\$1.8M). Information available on website
- Medium-duty customer demonstration (\$3.4M)
- Idle-reduction customer demonstration (\$3.4M)
- School bus excess supply price signal (\$3.4M)
- Open RFP to consider additional TE projects (\$8.2M)

- Residential make-ready installations (\$4M) rebate to customer
- EV ride-share driver reward (\$4M), \$ to ride-share and taxi drivers after a certain number of drives
- DC Fast Charger cluster make-readies in urban areas (\$4M), targeted towards non corridors
- Transit bus make-ready installations (\$4M)
- Port of Long Beach rubber tired gantry/tractor electrification (\$3.5)

## Standard review

- SDG&E owned residential charging installations with VGI rate (\$226M) 90K charging stations

- FleetReady Program : Make-ready for non-light-duty (\$211M)
- DC Fast Charger make-ready program (\$22.4M)

- Medium and heavy-duty make-ready infrastructure (\$554)
- Commercial EV Rate without demand chargers

**\$244M**

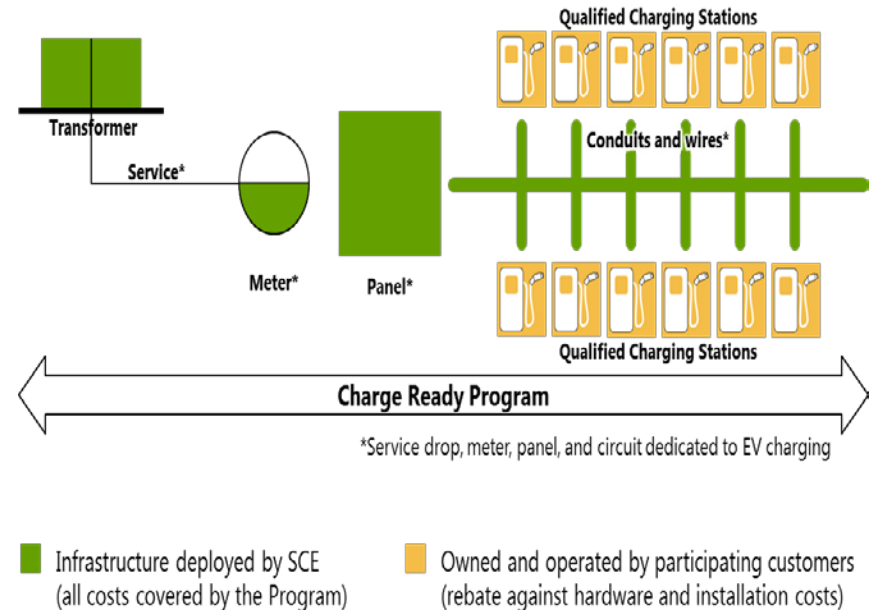
**\$253M**

**\$573M**



# SCE Charge Ready Program - Status

- Electric vehicle Charge Ready Program Phase 1 pilot approved by CPUC January 2016
  - Authorizes spend of \$22 million on pilot implementation for charger installations and Market Education Programs
- New application for Phase 2 to be filed with CPUC after completion of Phase 1 milestones in 2018
- Pilot Activities as of July 28, 2017
  - Program officially launched on May 27, 2016
  - SCE received customer commitments to install 1,087 charge ports at their sites
  - SCE completed infrastructure construction to support 219 charge ports at customer sites



SCE's Charge Ready Program supports Governor Brown's 2012 zero-emission vehicle Executive Order – 1.5 million EVs statewide by 2025

# Thank You

## **Mike Backstrom**

Managing Director, Energy & Environmental Policy

Southern California Edison

[Michael.Backstrom@sce.com](mailto:Michael.Backstrom@sce.com)



Energy for What's Ahead<sup>SM</sup>

