

# Electrification of Heavy-Duty Vehicles



Science for a  
and healthy planet  
safer world.

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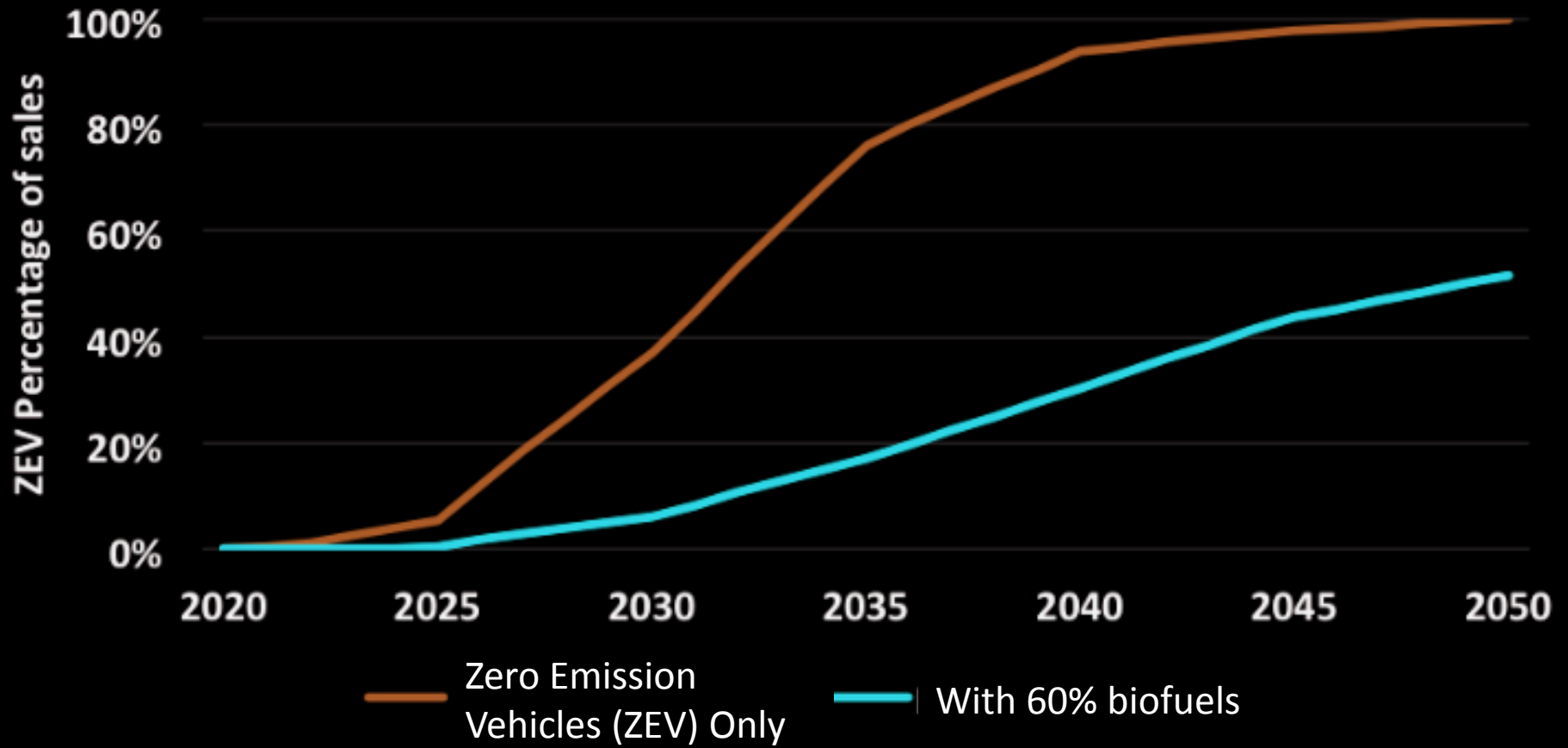






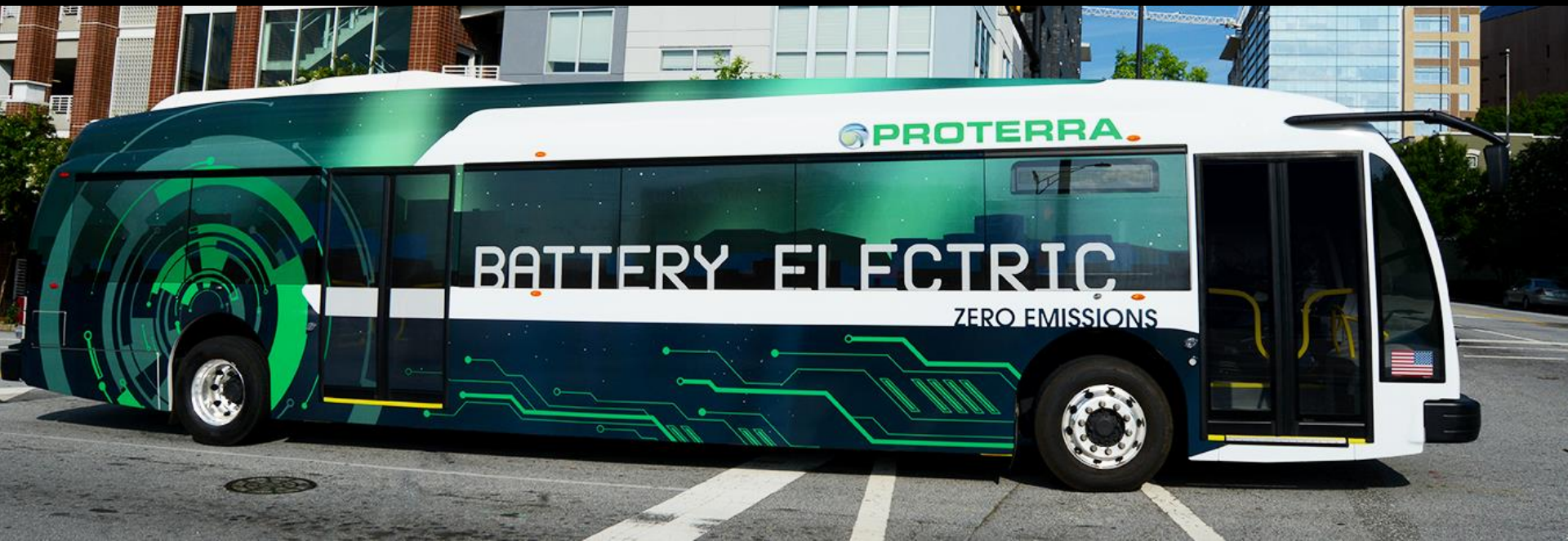


Even with aggressive growth in biofuel use and efficiency improvements, rapid uptake of electric technologies is needed to achieve deep carbon reductions in the truck sector.



# Transit Buses

- Battery Electric: > 40 in CA and >2000 worldwide
- Fuel Cells: >80 worldwide
- Fixed routes and central refueling
- Technology transferability to other heavy-duty applications



# Delivery Trucks



- Fixed routes operating less than 100 miles per day
- Central refueling
- Battery size similar to a Tesla Model S





# Medium Duty Applications



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Zenith



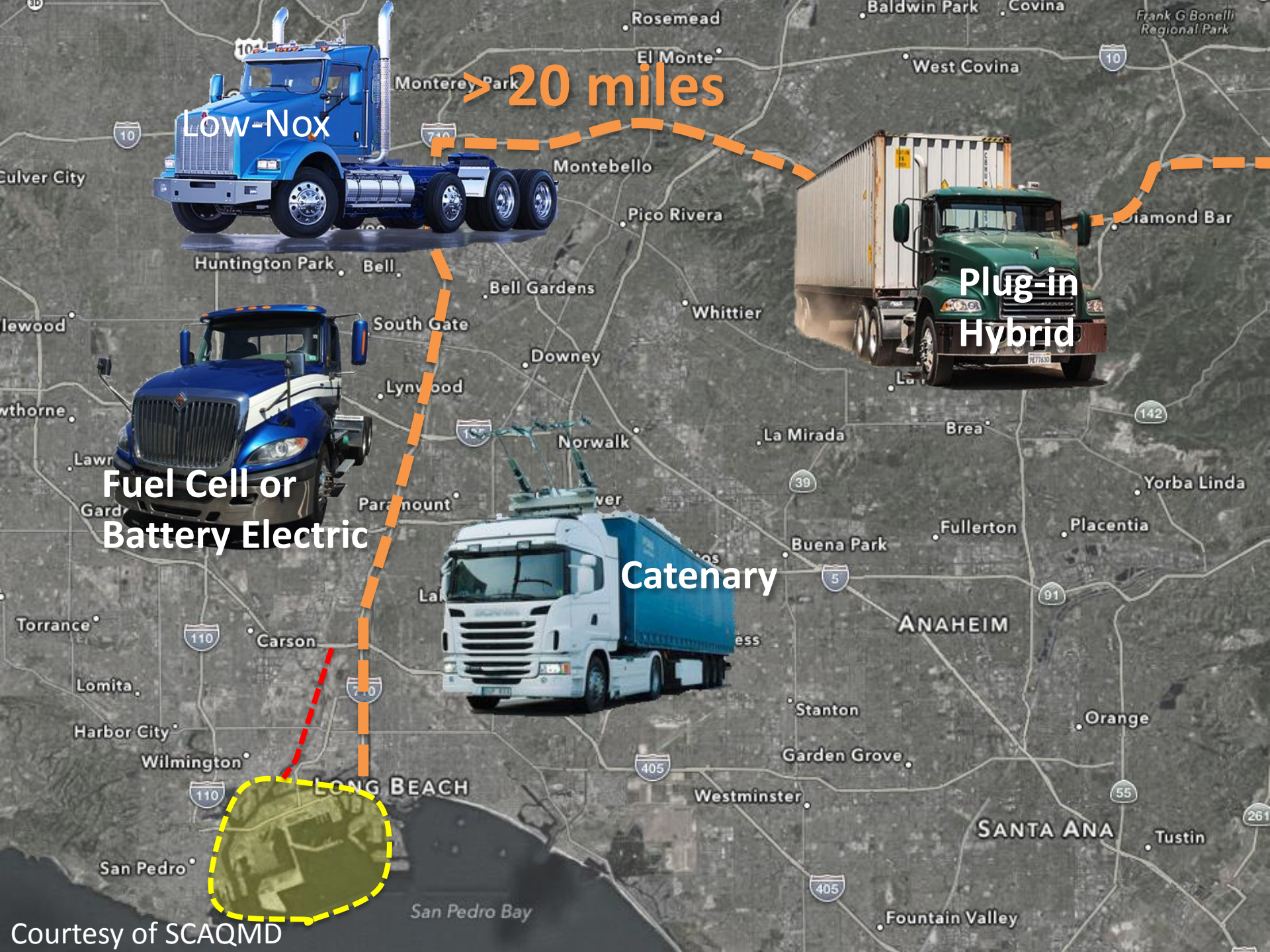
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## Battery Electric Yard Hostlers



## Battery Electric and Fuel Cell Forklifts





Low-Nox

> 20 miles

Plug-in Hybrid

Fuel Cell or Battery Electric

Catenary



# Electric Truck and Bus Manufacturers



Source: CALSTART, *Electric Truck and Bus Grid Integration: Opportunities, Challenges and Recommendations* September 2015

# Moving to Zero Emissions

- Growing number of options to help fleets, municipalities, and state government to meet sustainability goals
- Incentives are helping with demonstrations, initial deployment, and fueling infrastructure
- Sustainable Freight Action plan will identify additional measures to accelerate zero emissions deployment



For Recent Technical Assessments by ARB:

<http://www.arb.ca.gov/msprog/tech/report.htm>

OR Google

ARB Tech Assessments



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