



**EPRI**

ELECTRIC POWER  
RESEARCH INSTITUTE

# Plug-in Hybrid Electric Vehicle Status

March 7, 2007

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# EPRI Overview

Demonstration

Barrier Elimination

Infrastructure /  
Grid Integration

Proving the  
Benefits of Electric  
Transportation

## Ford Edge PFCV



## GM Volt

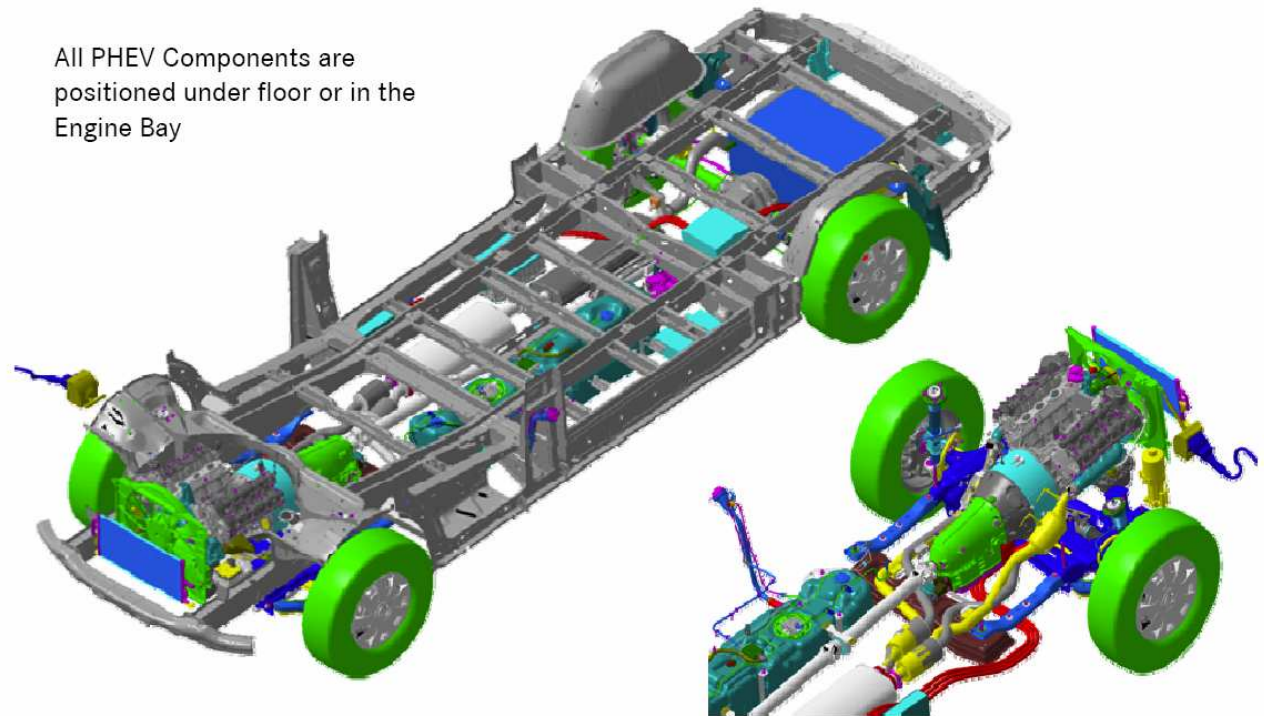


## DaimlerChrysler PHEV Sprinter



# PHEV Dodge Sprinter Program

- Plug-in hybrid commercial van
- 20 miles all-electric range (urban)
- Li Ion battery
- EPRI/DCX collaboration (Utility & public support)
- Extensive vehicle test, data collection and analysis program



Source: DaimlerChrysler

# Phase 1 – Fleet Feasibility Testing

## 3<sup>rd</sup> Vehicle

- Bus body with paratransit equip.
- Diesel
- Lithium Ion Battery



## 6<sup>th</sup> Vehicle

- Cargo Van
- Diesel
- Lithium Ion Battery



## 1<sup>st</sup> Vehicle

- Cargo Van
- Diesel
- NiMH Battery



Los Angeles

New York

Kansas City

Hannover

Schweinfurt (ZF Sachs)

## 5<sup>th</sup> Vehicle

- Utility Van
- Gasoline
- NiMH Battery



## 4<sup>th</sup> Vehicle

- Cargo Van
- Gasoline
- Li Ion Battery



## 2<sup>nd</sup> Vehicle

- Cargo Van
- Gasoline
- NiMH Battery



# Phase 2 – Fleet Demonstration and Field Testing

## California

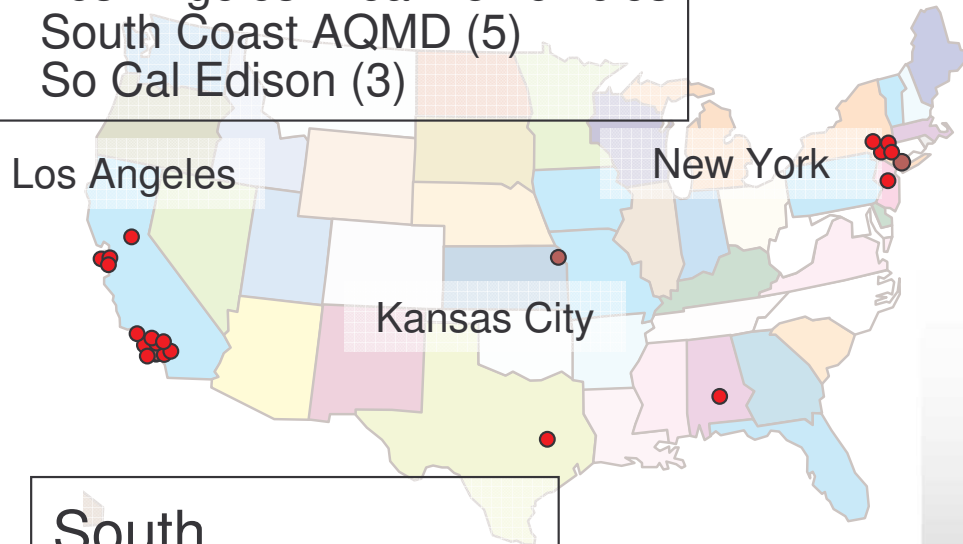
- San Francisco – 3 vehicles  
Pacific Gas & Electric
- Sacramento – 1 vehicle  
SMUD
- Los Angeles Area – 8 vehicles  
South Coast AQMD (5)  
So Cal Edison (3)

## New York Area

- New York – 4 vehicles  
NYPA
- New Jersey – 1 vehicle  
FirstEnergy

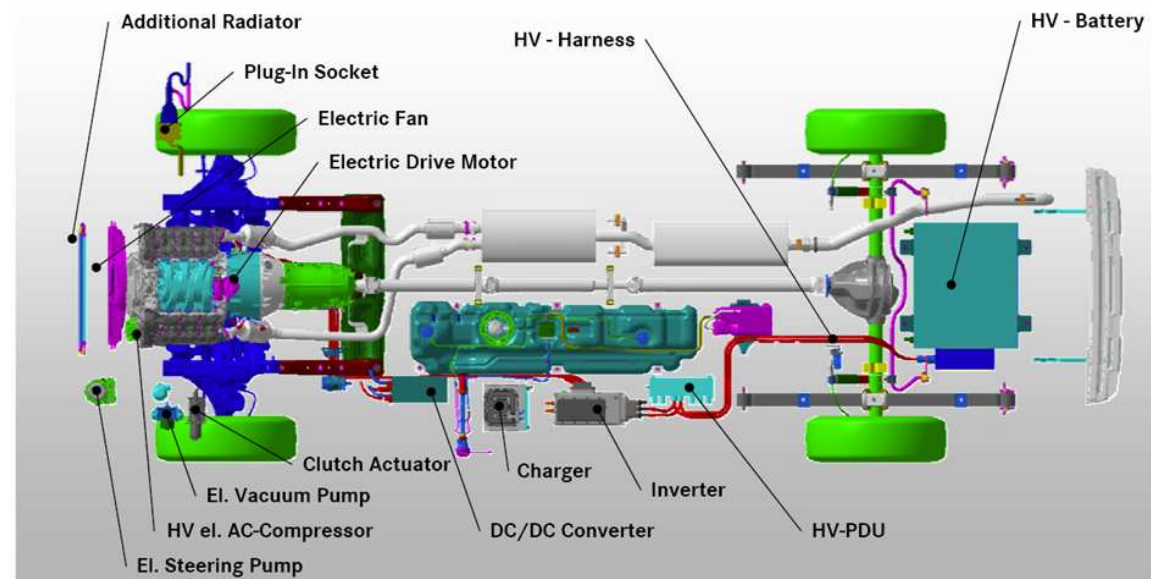
## Vehicle Specifications

- Mix of Cargo and Passenger Vans
- 8,550 lb. GVW
- V6 Gasoline Engine
- 50 kW Drive Motor
- 14 kWh JCS Li-Ion Battery
- Electric PS, PB, A/C, Heat
- Electric-only Mode
- 3 kW Charger (100-240 VAC)



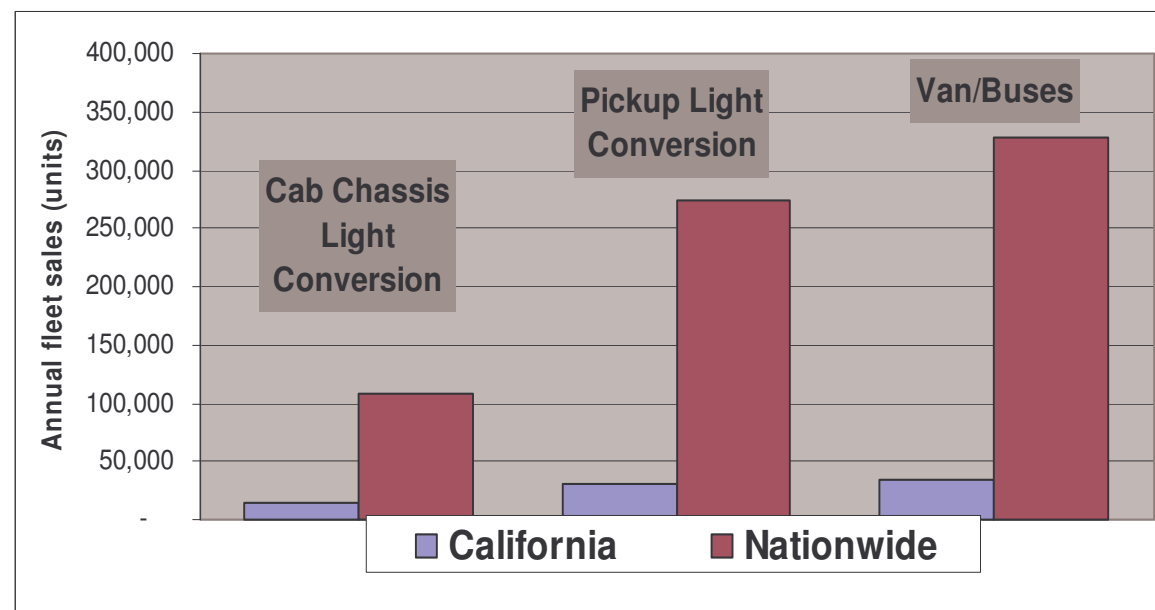
## South

- Alabama – 1 vehicle  
Southern Company
- Texas – 1 vehicle  
Austin Energy

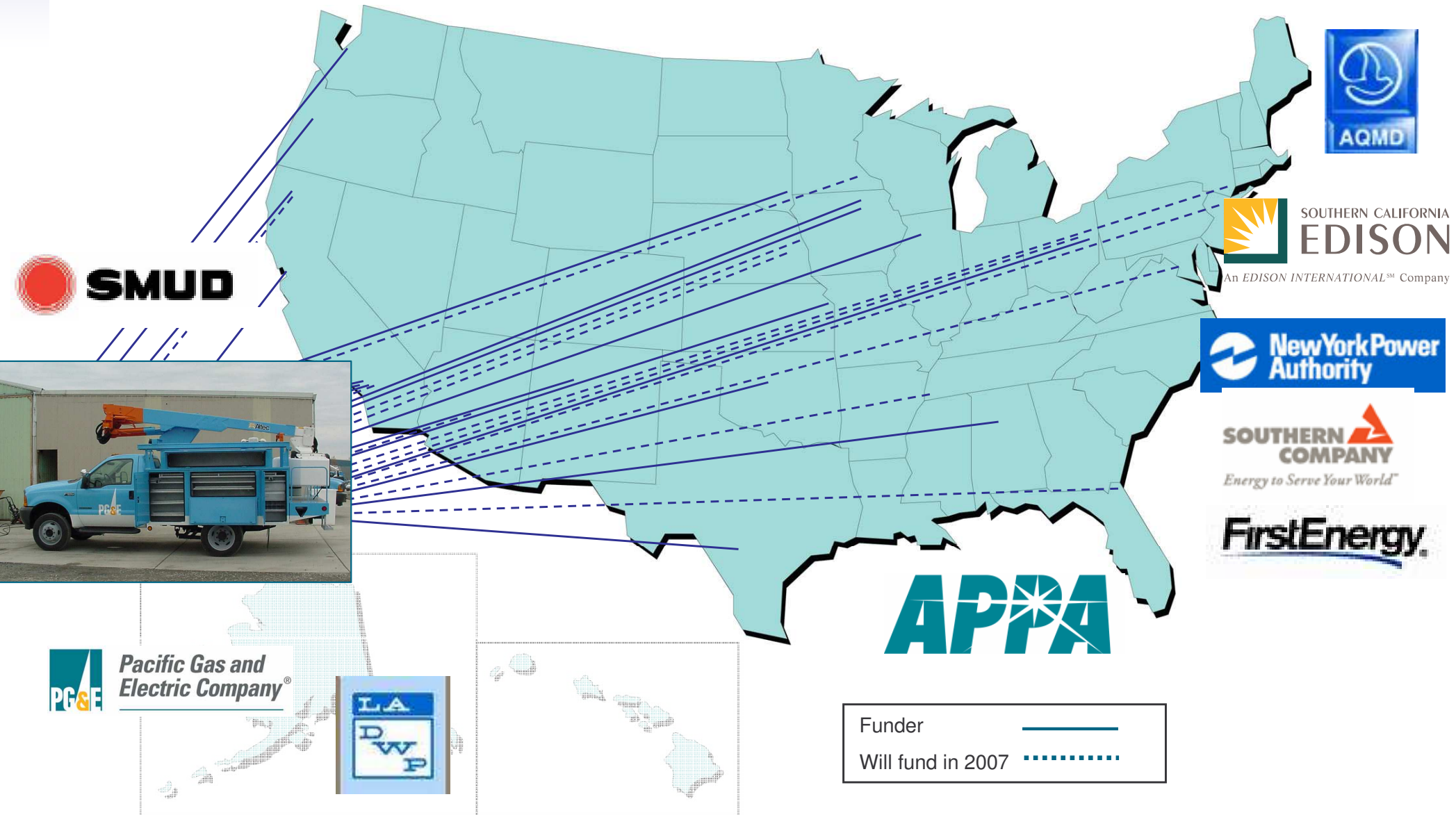


# PHEV Utility Trouble Truck Program

- Eaton, Ford, EPRI, Utilities, AQMD
- PHEV system for Class 3,4,5 commercial trucks and vans
- Phase 1 – 4 prototype vehicles demonstrated in utility fleets (2007)
- Phase 2 – 50 vehicles for utility, public fleets, F550 chassis + E450 van chassis



# Trouble Truck Support...Nationwide

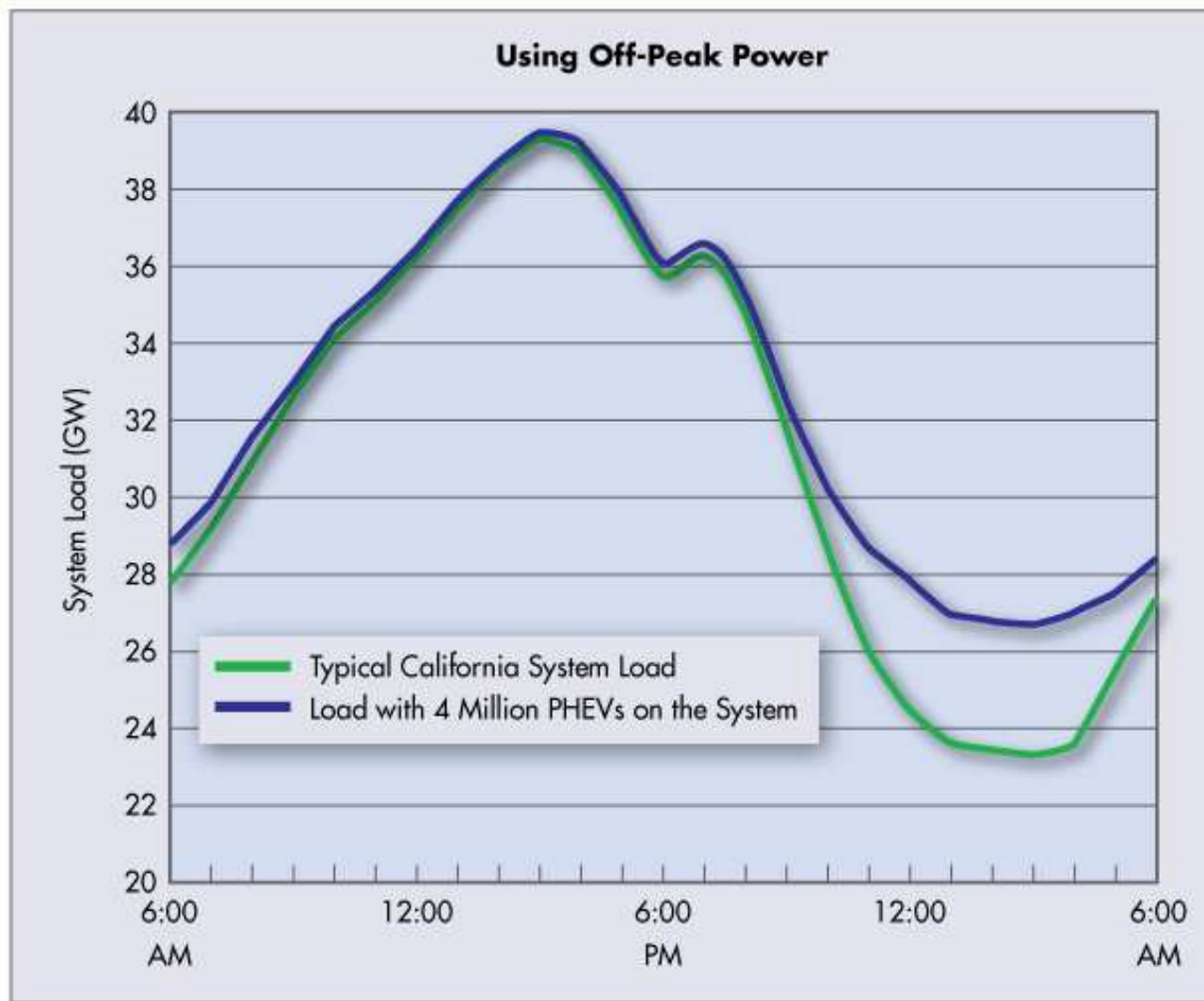


**PG&E** Pacific Gas and Electric Company®



# How Good is Electricity as an Alternative Fuel?

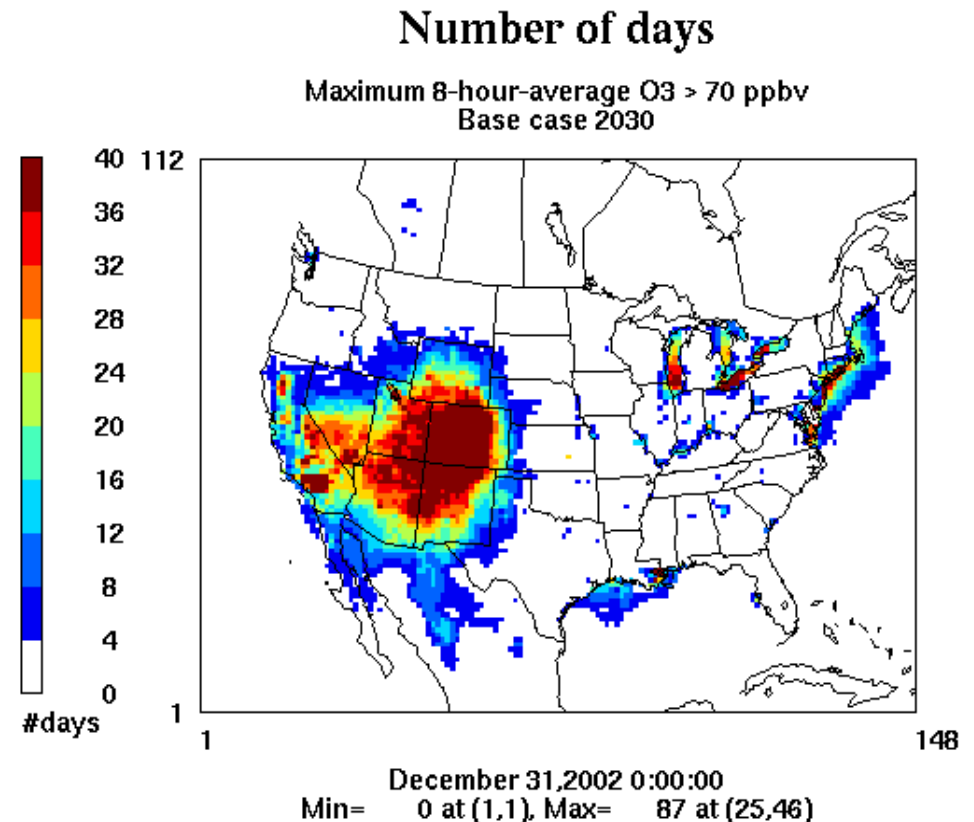
## Simulated Cal ISO System Load



Source: Cal ISO and EPRI

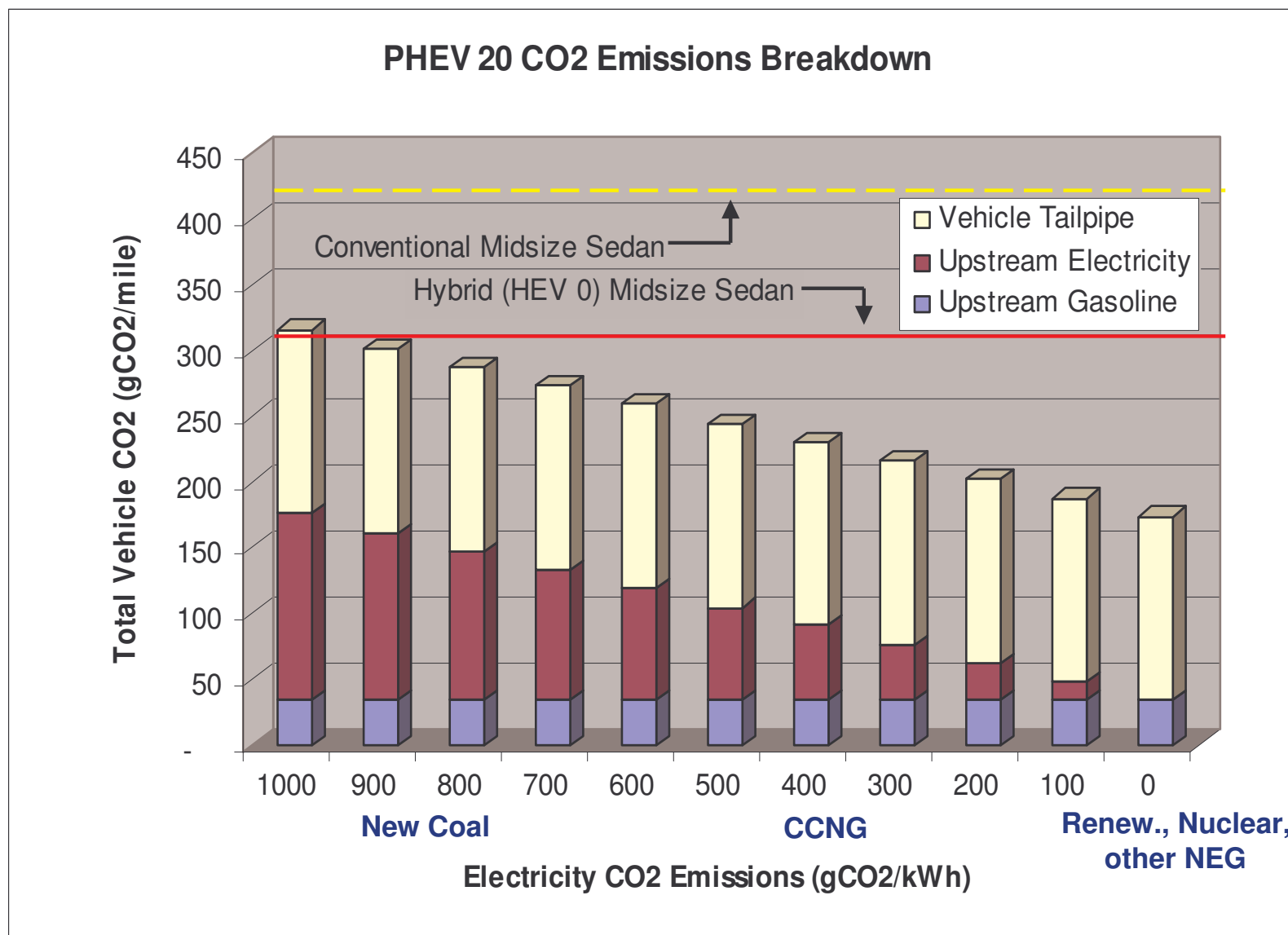
# Environmental Benefits

- Air Quality remains a concern
  - Population growth
  - Economic output
  - Increasing per capita VMT
  - Understanding future health concerns
- Global Climate Change
  - Increased probability of carbon-constrained future
- Petroleum Consumption
  - Some *marginal* new fuel sources have increased upstream emissions, environmental impacts



Number of Days Exceeding **Proposed**  
8-hour Ozone NAAQS of 70 ppbv in  
Base Case Simulation

# Electric Sector Carbon Intensity Influences Plug-In Hybrid Emissions



# Together...Shaping the Future of Electricity