

# Zero/Near-Zero Emissions Technology Advancement Efforts in the San Joaquin Valley

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2012 West Coast Collaborative Partners Meeting



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# San Joaquin Valley

## Air Pollution Control District



- Made up of eight counties in California's Central Valley:
  - San Joaquin
  - Stanislaus
  - Merced
  - Madera
  - Fresno
  - Kings
  - Tulare
  - San Joaquin Valley Air Basin portion of Kern.



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# Air Quality Challenge

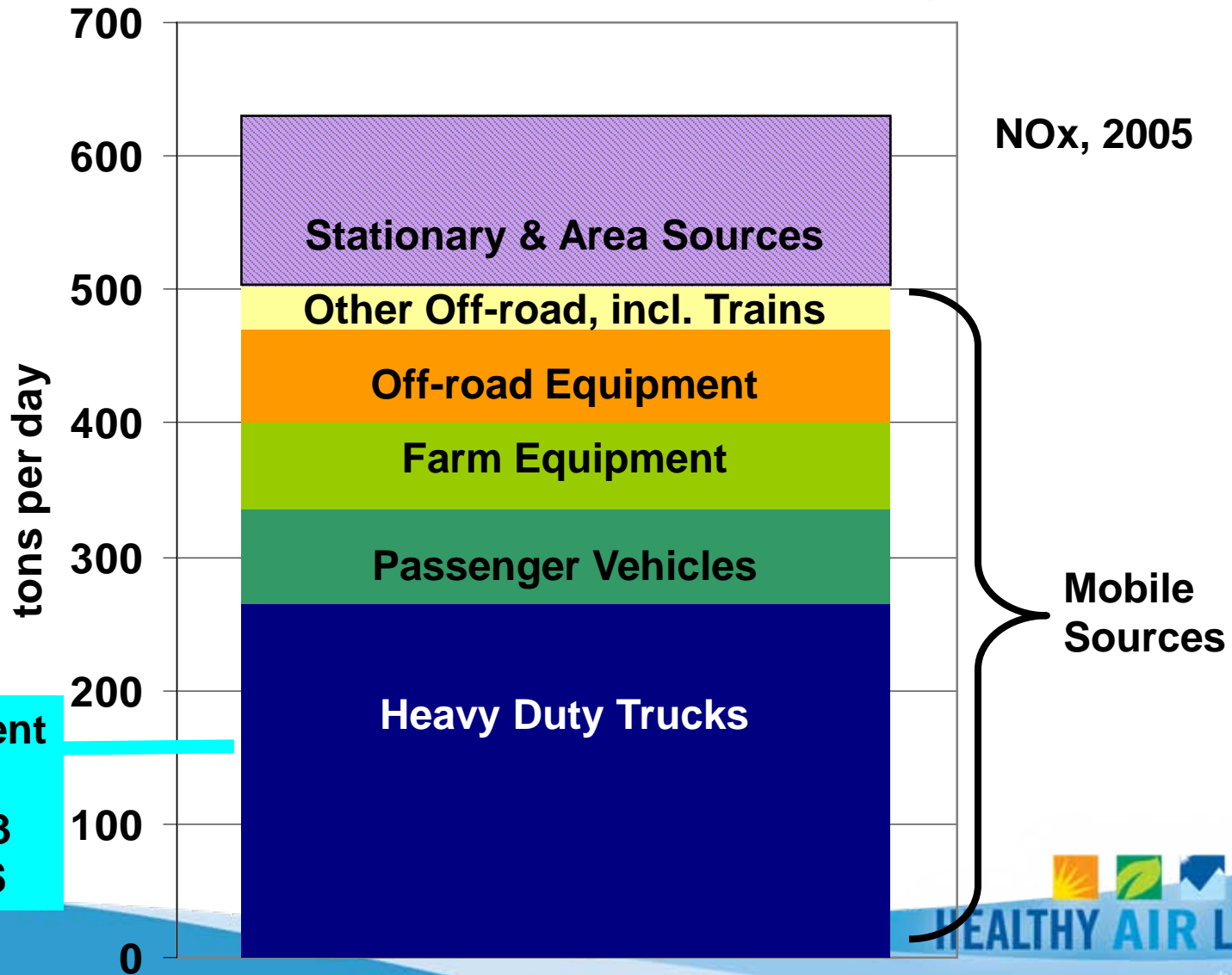
- The Valley experiences unique and significant difficulties in achieving EPA's increasingly stringent standards
- Not many available or foreseeable opportunities remaining for new control measure commitments
- Existing standards already require long-term, "black box" (unknown) measures
- Technology advancement will be necessary to achieve necessary reductions
  - Meeting the current standard requires 75% reduction in emissions
  - New standards will require another 80–90%
  - Transformative measures require significant investment in new technology and time



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# Sources of Air Pollution San Joaquin Valley Air Basin



# Zero Emissions Technology

The San Joaquin Valley's Unique Needs

## Goods Movement

- Heavy duty trucks
  - Major N/S corridors: Interstate 5 & Highway 99
  - 45% of truck traffic in major CA trade corridors in SJV
  - Lower density population for urban delivery
  - Sig. Impact to environmental justice communities
- Technology challenges and options
  - Zero/Near-zero emissions long-haul truck technologies
  - Alternative systems and fuels



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# Zero Emissions Technology

## The San Joaquin Valley's Unique Needs

### People Movement

- San Joaquin Valley Challenges
  - Lower density population
    - Increases VMT
    - Challenges for transit
  - Low income/high unemployment
  - Older and heavier vehicle fleet
- Technology challenges and options
  - Advanced light-duty vehicles
  - Advanced transit options



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# Technology Advancement

- The District adopted the Technology Advancement Program March 18, 2010
- The program focused on three areas critical to moving advanced technologies to market:
  - Renewable Energy
  - Waste Solutions
  - Mobile Sources
- Also promote deployment of advanced technology through variety of incentive programs
  - Heavy-Duty Voucher Incentive Program “Plus”
  - Drive Clean! Program
  - Advanced transit and infrastructure funding



# Funding of Technology Demonstration Projects

- First RFP opened June 03, 2010
  - Selected 6 projects
  - \$1.2 million in funding
- Second RFP opened July 05, 2011
  - Selected 12 projects
  - \$3 million in funding
- Identified \$8 million for FY 2012-13.
  - Two rounds of funding





# Technology Demonstration

Solar Powered Agricultural Pump with Energy Storage

**Solar trough installation**

**Trough truss detail (with power block shed in background)**



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# Technology Demonstration

Series Hydraulic Hybrid Refuse Truck

**Series Hydraulic Hybrid  
Refuse Truck**

**Series Hydraulic Hybrid Refuse  
Base truck without body**



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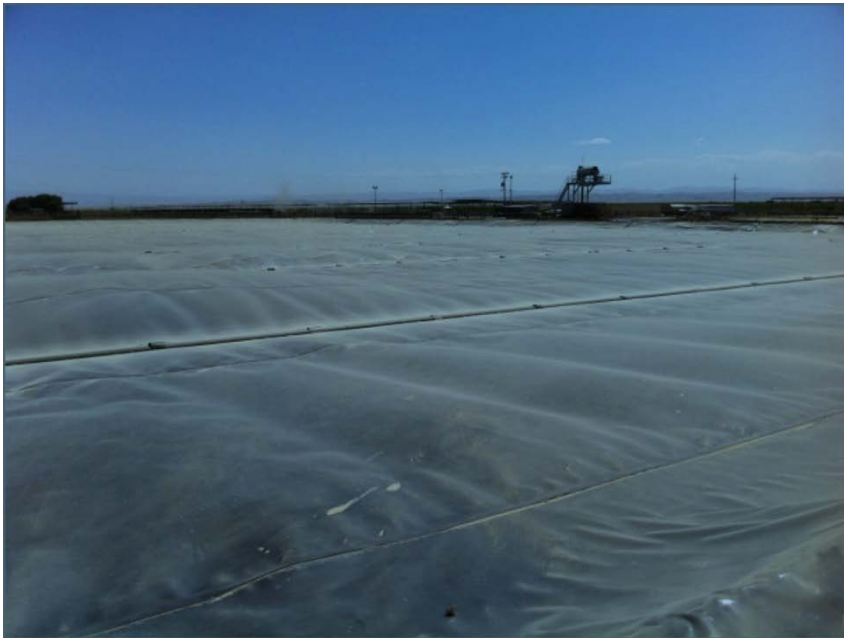
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# Technology Demonstration

Two Stage Aftertreatment System for Zero-Emission Biogas Utilization

**Bidart Stockdale Digester**  
Beginning to inflate with biogas

**Engine and EGR System**  
Control systems pending install



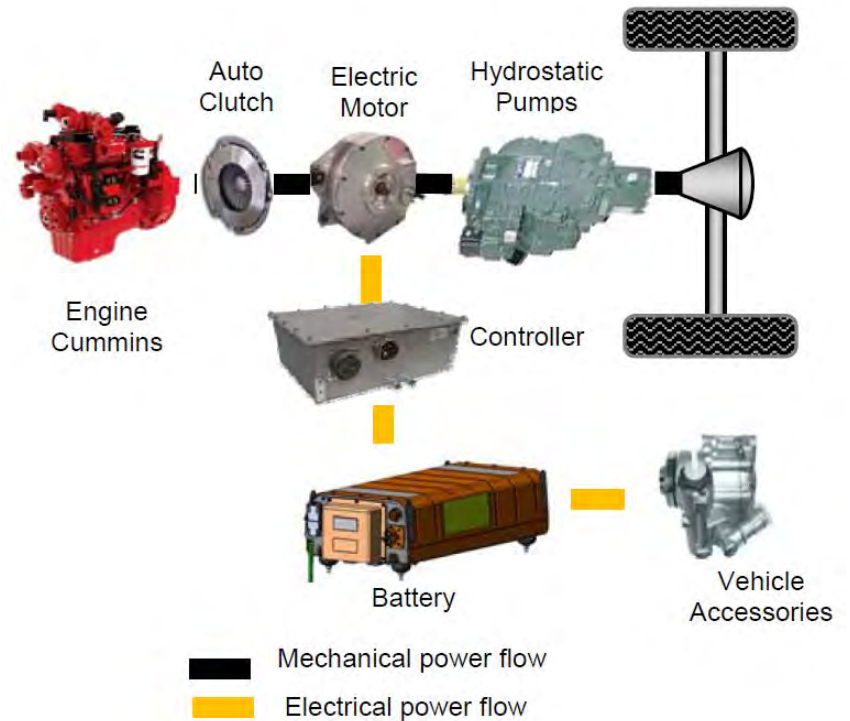
# Technology Demonstration

## Plug-in Hybrid Electric Wheel Loader

### Wheel Loader In Agricultural Application



### Hybrid Drivetrain Power Flow Diagram



# Technology Demonstration

Extended Range Electric Vehicle (EREV) Bucket Truck  
with Electric Worksite Idle Management (eWIM)

**VIA Motors EREV Drivetrain on  
PACCAR Chassis**

**eWIM system reduces idling at  
the worksite**



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