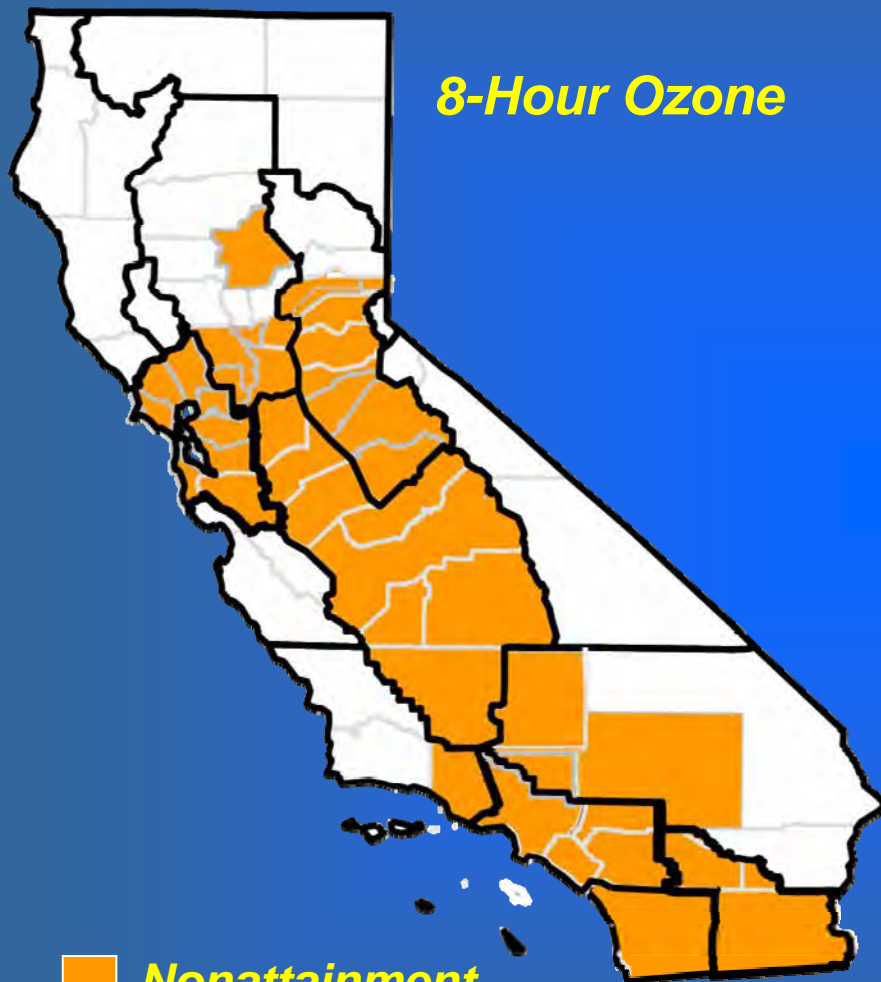


# California's Heavy Duty Diesel Vehicle Idling Regulations

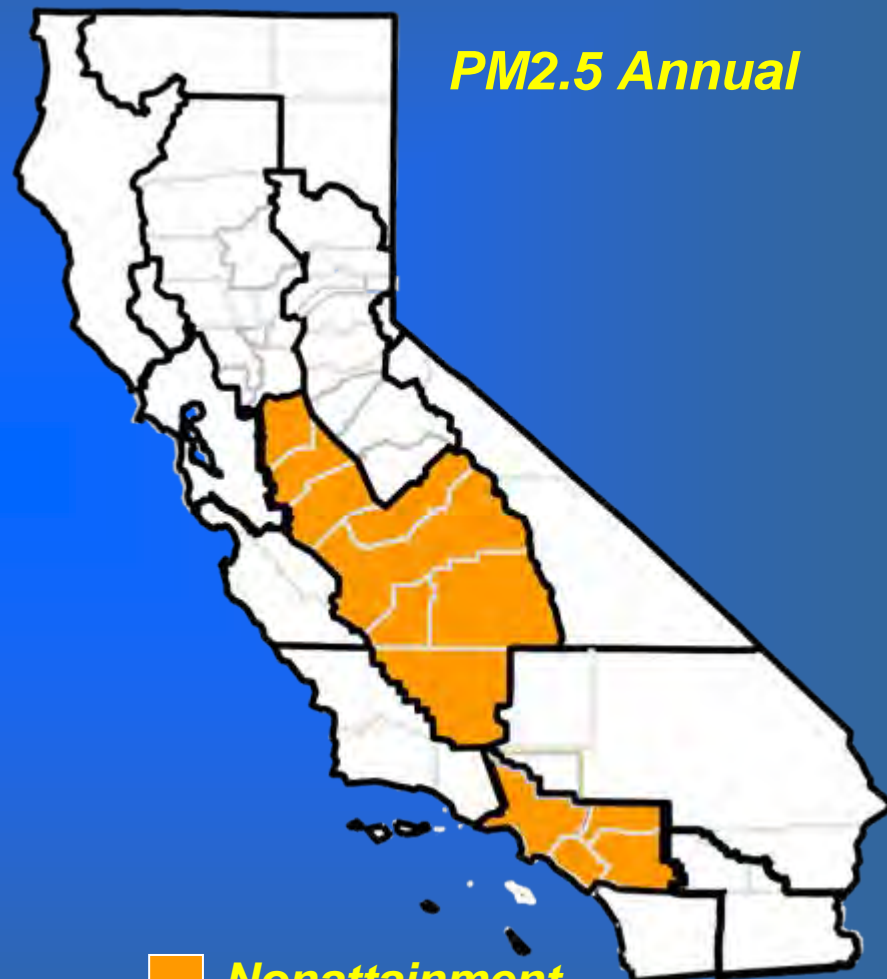
David Chen



# Area Designations for National Ambient Air Quality Standards for Ozone and PM2.5



**Nonattainment**  
**Unclassified/Attainment**



**Nonattainment**  
**Unclassifiable/Attainment**

# Overall Health Impacts of Diesels in California

- Annual health impacts
  - 2,900 premature deaths
  - 3,600 hospital admissions (1,700 asthma-related)
  - 240,000 asthma attacks/respiratory symptoms
  - 600,000 lost days of work
- Most impacted: children, elderly, people with pre-existing health problems.

# Emission From Idling Sleeper Trucks Are Significant

## ■ Smog emissions

2010 Statewide (tons per day)		
NOx	HC	PM
53	4.6	0.73

## ■ Greenhouse gas emissions (CO<sub>2</sub>)

- 2010 GHG emissions = 1.1 megatons per year

## ■ Fuel consumption

- Typically 1 gallon per hour
- 2100 gallons per year per truck

# Reasons for Truck Idling

- Stopped in traffic
- Operating power takeoff devices  
e.g. cement mixers, trash trucks, etc.
- Warming up engine in cold weather
- Cab climate control while waiting or resting
- Powering cabin appliances such as  
televisions, microwaves, etc.
- Habit



# Idling Regulations for Heavy Duty Diesel Trucks

## Title 13, California Code of Regulations

- § 1956.8: Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Year Heavy-Duty Engines and Vehicle
- § 2480: Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools (applies to all trucks).
- § 2485: Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling (currently excludes sleepers).



# Applicability: Who's Affected

Drivers of diesel-fueled commercial vehicles:

- Gross Vehicle Weight Rating >10,000 lbs
- Operating in California
- California-Based Vehicles

AND

Non-California-Based Vehicles



# Current Idling Requirements

- 5 minute idling limit at any location  
(sleeper berth vehicles currently exempt when beyond 100 ft of a residence/school)
- 5 minute limit on the operation of diesel-fueled auxiliary power systems (APS) when operated within 100 ft of a residence
- At school,
  - Must shut down engine upon stopping
  - Must not turn on engine more than 30 seconds before departure





# New Requirements

## Effective January 1, 2008

- Sleeper trucks lose exemption
- Additional requirements for cab comfort devices on trucks with 2007+ engines
- Automatic shutdown device for trucks with 2008+ CA-certified engines
- Optional NOx idling emission standard
- Vehicle labeling requirements
- Provision for novel/future idle reduction technologies

# Additional Device Requirements for Trucks with 2007+ Engines

- Diesel-fueled Auxiliary Power Systems (APS)
  - must have verified level 3 PM trap, or
  - exhaust must be routed to the vehicle's exhaust pipe
- Fuel-Fired Heaters: Must meet ULEV standards in LEV II program
- "Clean APS" hood label required for Internal Combustion Engine APSs

# New Requirements for 2008+ CA-Certified Engines

- Automatic engine shutdown system
  - Shuts down engine after 5 minutes
  - Non-adjustable and tamper-resistant
  - Installed by engine manufacturer
- Shutdown system bypasses
  - Operating PTO device
  - Engine <60 degrees F
  - Catalyst regeneration
  - Service and maintenance

# Optional NOx Idling Emission Standard

- 30 g/hour
- If engine is certified to this standard:
  - Allowed to idle beyond 100 ft of a residence or school
  - Automatic shutdown system not required
- "Clean Idle" hood label required

# Breakdown by Engine Model Year: 2006 and Older

- Subject to 5 minute idling limit
- APS Engine must be CA or Fed certified
- No additional APS PM emission control required.
- Fuel-fired heaters are not required to meet LEV II standards.

# Breakdown by Engine Model Year: 2007+ Certified Engines

- Subject to 5 minute idling limit.
- APS engine must be CA or Fed certified.
- If operating a diesel-fueled APS in CA:
  - APS equipped with verified level 3 PM control
  - or exhaust rerouted to vehicle's PM emission control system.
- If operating fuel-fired heaters in CA:
  - certified to LEV II standards.
- Label for internal combustion engine APS

# Breakdown by Model Year: 2008+ CA-Certified Engines

- All previous requirements, plus
- Automatic engine shutdown system  
(GVWR > 14,000 lbs)

UNLESS

- Manufacturer certifies engine to optional  
NOx idling emission standard  
(Label Required)

# When Is Idling Allowed?

- Stopped in traffic
- Operating power take-off devices
- Service and maintenance
- Queuing when beyond 100 feet of a school or residence.
- Stopped because of bad weather conditions or mechanical difficulty
- Beyond 100 ft of a residence if engine meets optional NOx idling emission standard
- Until January 1, 2008, idling of sleeper trucks when beyond 100 feet of a school or residence



# Alternative Technologies That Provide Cabin Comfort

- Diesel-Fueled APS
- Battery-Electric APS
- Vehicle-Battery-Powered Systems
- Fuel-Fired Heater
- Thermal Storage Device
- Electrified Parking Space
- Off-Board Power Infrastructure

# Alternative Technologies: Diesel-Fueled APS

- Heating, Cooling, Electrical Power
- Fuel use: ~0.2 gallon/hour
  - Main engine ~1 gallon/hour
- Cost including installation :  
~\$6,000 - \$8,500
- Cost with verified Level 3 PM  
control device: ~\$8,000 - \$10,500



# Alternative Technologies: Battery-Electric APS

- Heating, Cooling, Electrical Power
- Battery recharged while driving, 4-6 hours
- Operating Time: up to 10 hours
- Cost: ~\$4,000 - \$10,000



Power Pack



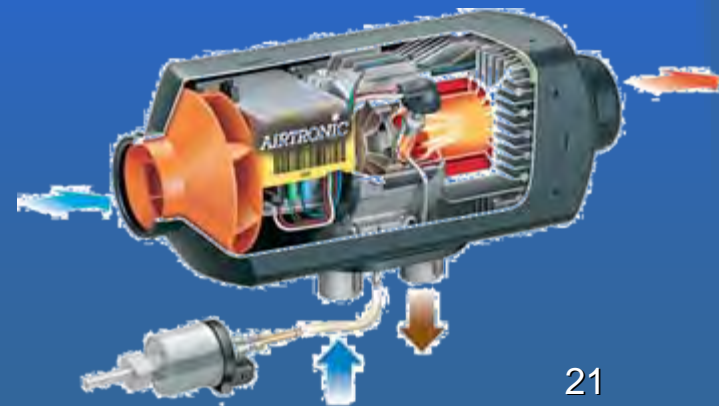
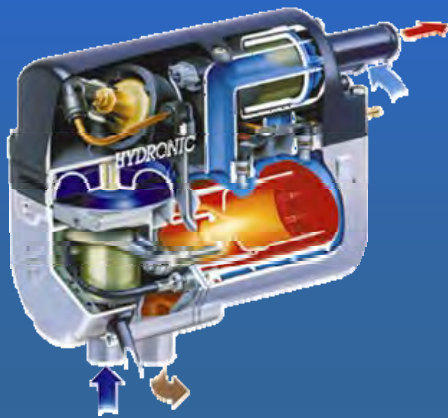
# Alternative Technologies: Vehicle-Battery-Powered Systems

- Powered by vehicle's existing battery
- Heating or Cooling only
- No electrical power
- Operating Time: up to 8 hours
- Cost: ~\$550 - \$1,600



# Alternative Technologies: Fuel-Fired Heater

- Engine and/or cab heating only
- Fuel use: 0.02-0.16 gal/hour
- Cost: ~\$1,000 - \$3,000



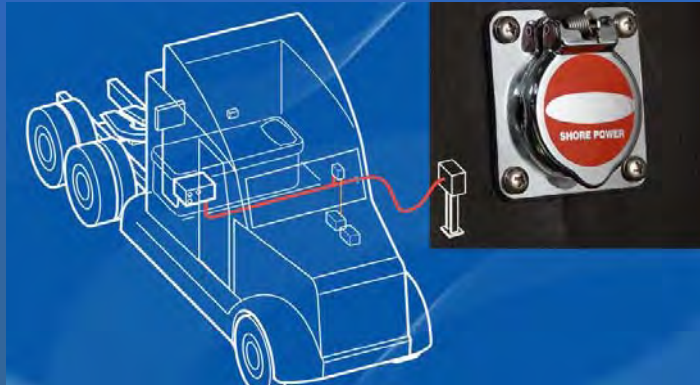
# Alternative Technologies: Thermal Energy Storage

- Cooling energy stored while driving, 4-6 Hours
- Cab cooling only, up to 10 hours
- Cost: ~\$3,600
- Can be integrated with fuel-fired heater for heating (Cost for cooling and heating: ~\$4,600 )



# Alternative Technologies: Shore Power

- “Plug in” to electrical grid
- Heating and Cooling
- Electrical Power for cab appliances
- Requires On-Board Equipment: AC unit, inverter/charger, electrical connections  
~ \$4,000 per truck



# Alternative Technologies: Off-Board Power Infrastructure

- Heating, Cooling, Electrical Power, Internet, Telephone, Television
- Cost to truck operator \$1.60 - \$1.88 per hour, for basic services (climate control)
- Cost ~\$10 (window adapter)





# Payback Time With Fuel Savings

Manufacturer	Technology	Cost (\$)	Payback (years)
Thermoking	Diesel APS	8500	1.7
	(APS+PM trap)	(10500)	(2.1)
Pony Pack	Diesel APS	7000	1.4
	(APS+PM Trap)	(9000)	(1.8)
Idling Solutions	Battery Electric	10000	1.6
Bergstrom (NITE System)	Battery Electric for AC + Fuel Fired Heater	4200	0.7
Webasto (BlueCool Truck + Air Top 2000)	Cold Storage for AC + Fuel Fired Heater	4600	0.7
Xantrex/Dometic	Inverter/charger + Electric AC and Heat	4000	0.6

Idle Hours/year = 2100; Fuel Use = 1 gal/hour; Fuel Cost: = \$3.05/gal

What Happens After Payback?

**POCKET THE MONEY  
SAVED!**

**\$\$\$**

# Financial Assistance Programs

- Carl Moyer Program:
  - Funding for technologies that go beyond the proposed requirements
  - Based on percent of operation in California and cost-effectiveness of reductions
- Federal Small Business Administration Loans
- Cascade Sierra Solutions:
  - Outreach/Assistance
  - Financial Programs
  - [www.cascadesierrasolutions.org](http://www.cascadesierrasolutions.org)

# Emission Reductions

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## 2010 Statewide Emission Reductions\*

	<b>NOx</b>	<b>HC</b>	<b>PM</b>	<b>CO2</b>
<b>Reductions (tons per day)</b>	<b>46</b>	<b>4.2</b>	<b>0.42</b>	<b>1930</b>

\*Sleeper truck population = 75,000

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# Big Benefits

- Reduce Smog Emissions
- Reduce Greenhouse Gas Emissions (CO<sub>2</sub>)
- Reduce Fuel Consumption and Foreign Oil Dependency
- And, Save Money!

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