



# **Additional Background Material**

# Common Abbreviations

## Regulatory Vehicle Types:

- **ZEV** – Zero Emission Vehicle
- **PZEV** – Partial Zero Emission Vehicle
- **AT PZEV**- Advanced Technology Partial Zero Emission Vehicle
- **SULEV** – Super Ultra Low Emission Vehicle
- **ULEV** – Ultra Low Emission Vehicle
- **LEV** – Low Emission Vehicle or Low Emission Vehicle Regulations
- **TLEV** – Transitional Low Emission Vehicle

## More Vehicle Terms:

- **LDV** – Light Duty Vehicle
- **HDV** – Heavy Duty Vehicle
- **PC** – Passenger Cars
- **LDT1** – Light Duty Truck 1  
(less than 3,750 lbs)
- **LDT2** – Light Duty Truck 2  
(less than 8,500 lbs)
- **SUV** – Sport Utility Vehicle
- **EV** – Electric Vehicle
- **HEV** – Hybrid Electric Vehicle
- **FCV** – Fuel Cell Vehicle
- **NGV** – Natural Gas Vehicle

# Common Abbreviations

## Pollutants:

- **NMOG** – Non Methane Organic Gas
- **ROG** – Reactive Organic Gas
- **HC** – Hydrocarbon
- **NO<sub>x</sub>** – Oxides of Nitrogen
- **Lbs. HC+NO<sub>x</sub>** – pounds of hydrocarbons and oxides of nitrogen
- **CO<sub>2</sub>** – Carbon Dioxide
- **CO** – Carbon Monoxide
- **PM** – Particulate Matter
- **G/mi** – gram per mile
- **PPM** – Parts Per Million

## Miscellaneous:

- **ICE** – Internal Combustion Engine
- **VMT** – Vehicle Miles Traveled
- **CBG** – Cleaner Burning Gasoline
- **LEV II** – 1998 amendments to LEV program
- **MOA** – Memorandum of Agreement
- **CNG** – Compressed Natural Gas
- **O<sub>2</sub>** – Oxygen
- **H<sub>2</sub>** – Hydrogen
- **CARB** or **ARB** – California Air Resources Board
- **EPA** – Environmental Protection Agency
- **Ca FCP** – California Fuel Cell Partnership



# Northeast Phase-In Multipliers

<b>Model Year</b>	<b>Requirement</b>	<b>PZEV Credit Multiplier</b>	<b>ZEV Credit Multiplier</b>
2002	Voluntary Early Introduction	1.5	3
2003	Voluntary Early Introduction	1.5	3
2004	Mandatory Compliance	1.5	3
2005	Mandatory Compliance	1.3	2
2006	Mandatory Compliance	1.15	1.5
2007	Equivalency with California program	1	1



# Northeast Percentage Requirements

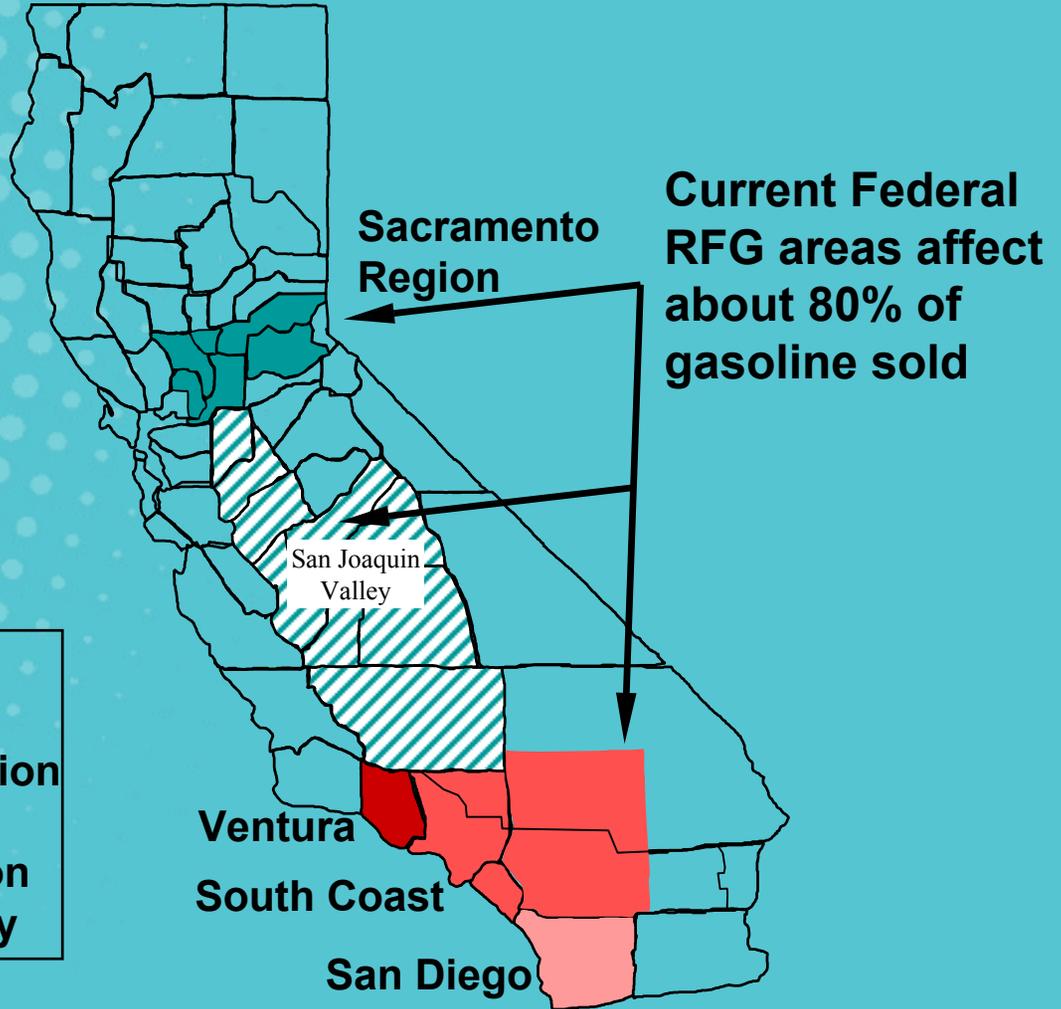
Model Year	Minimum Percent ZEV Credit	Minimum Percent AT PZEV Credit	Maximum Percent PZEV Credit
2004	0	0	10
2005	0	1	9
2006	1	2	7
2007	2	2	6

# Timeline of Fuels Programs

Year Adopted	Gasoline	Diesel	Alternative Fuels
1971	Reid Vapor Pressure Bromine Number	-----	-----
1975	Sulfur Manganese/Phosphorus	-----	-----
1976	Lead	-----	-----
1981	-----	Sulfur (SCAB)	-----
1982	Lead	-----	-----
1988	-----	Sulfur/Arom. HC	-----
1990	Phase 1 RFG -----	-----	Clean Fuels/LEV
1991	Phase 2 RFG Wintertime Oxygenates	-----	-----
1992	-----	-----	Commercial and Certification Specs
1994	Phase 2 RFG Predictive Model -----	-----	LPG (amended)
1998	Combustion Chamber Deposits (amended) Wintertime Oxygenates (amended) -----	-----	-----
1999	Wintertime Oxygenates (amended) -----	-----	LPG (amended)
2000	Phase 3 RFG(eliminates MTBE)	-----	Clean Fuels (amended)
2003	-----	Sulfur 15 ppm	-----

# Federal Minimum O<sub>2</sub> Requirement Affects Most of CA

**Federal RFG Areas**  
1991 - San Diego  
South Coast Region  
Ventura  
1995 - Sacramento Region  
2002 - San Joaquin Valley



# CaRFG3 Compared to CaRFG2

- **Generally gasoline will look the same except:**
  - **No MTBE**
  - **Increased use of ethanol**
  - **Less benzene**
  - **Lower sulfur content**

# Status of Refiners Switching to Ethanol by 2003

- Refiners that have already switched to ethanol:
  - BP
  - ChevronTexaco (Southern California)
  - ExxonMobil
  - Phillips
  - Shell
  - Kern
- Represent approximately 65% of state supply
- Other refineries expected to be fully compliant by December 31, 2003

# Alternative Fuels

- **CNG\*** - can reduce emissions of CO by about 70%, NMOG by 89%, and NO<sub>x</sub> by 87%, reduced CO<sub>2</sub>
- **Propane (LPG)\*** - can produce 30% to 90% less CO and about 50% fewer toxins and other smog-producing emissions
- **Electricity\*** - zero tailpipe and very low emissions from powerplants in CA
- **Ethanol\*** - lower CO and CO<sub>2</sub> emission and the same or lower levels of HC and NMOG. NO<sub>x</sub> emissions are about the same. E85 has fewer highly volatile components than gasoline and so has fewer evaporative emissions.
- **Hydrogen** - zero tailpipe emissions - possible emissions from H<sub>2</sub> production

\* From DOE Alternative Fuels Database

# EV Charging Connectors

- **Conductive**
  - Small and large paddle
- **Inductive**
- **ARB standardized charging system**
  - 2006+ model year (excluding NEVs) must be **conductive**
  - **Charger must be located on board the vehicle**

