

SOUTH COAST AQMD CLEAN TRANSPORTATION PROGRAMS

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August 24, 2003



“ All progress depends upon
the unreasonable man”

G.B. Shaw



Overview

- ❑ Air Quality Management Plan
- ❑ Fleet Rules
- ❑ Incentive Programs
- ❑ Clean Fuels Program (RD&D)

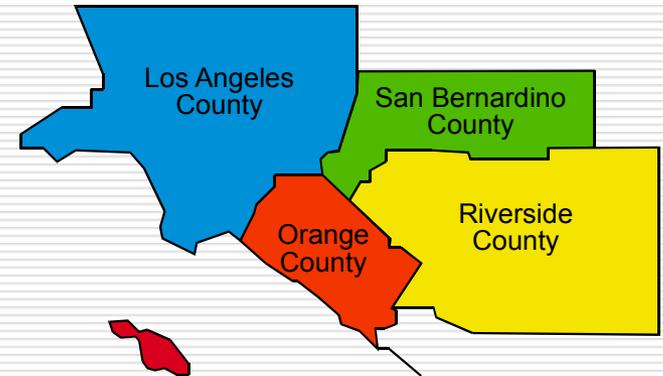


2003 AQMP Revisions

Background

□ South Coast Air Basin

- 4 county region
11,000 sq. mi.
- 16 million people
- 230 thousand diesel vehicles
- 8.5 million gasoline vehicles



□ Air Quality Challenges

- New AQMP identifies further NO_x and PM reductions needed



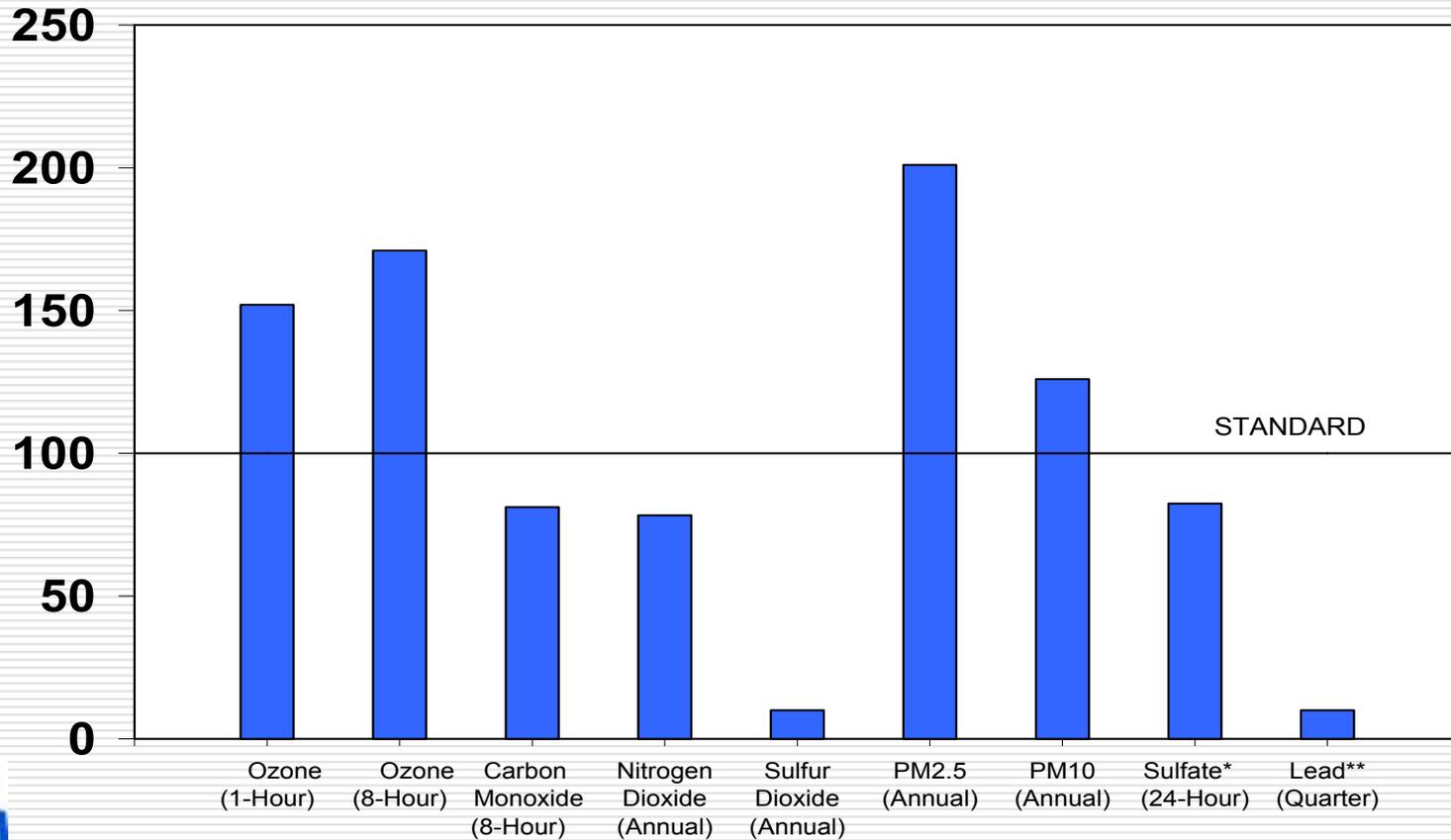
Purpose of 2003 AQMP

- ❑ State & Federal Clean Air Act Reqts
- ❑ Attainment Demonstration
 - Carbon Monoxide (met)
 - PM10 (2006)
 - One-Hour Ozone (2010)
- ❑ Transportation Budgets Based Upon Latest Planning Assumptions



Attainment Status

Percent of Standard

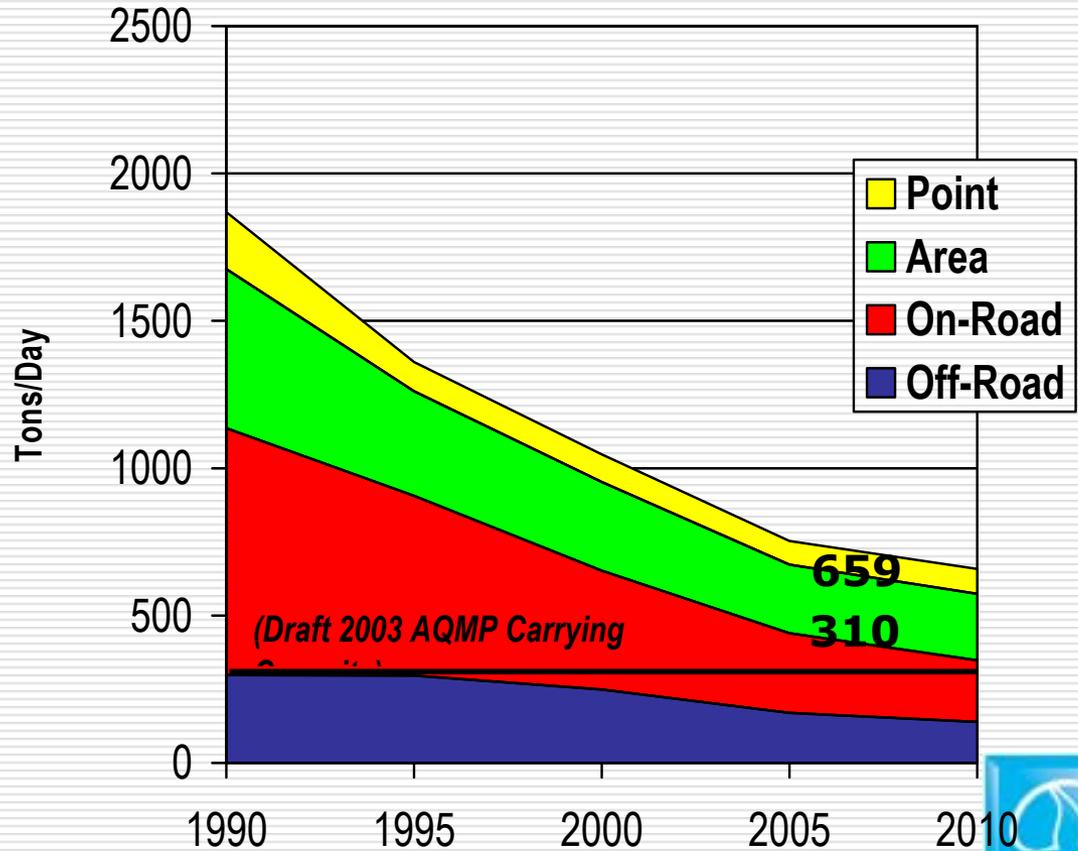


Key Findings

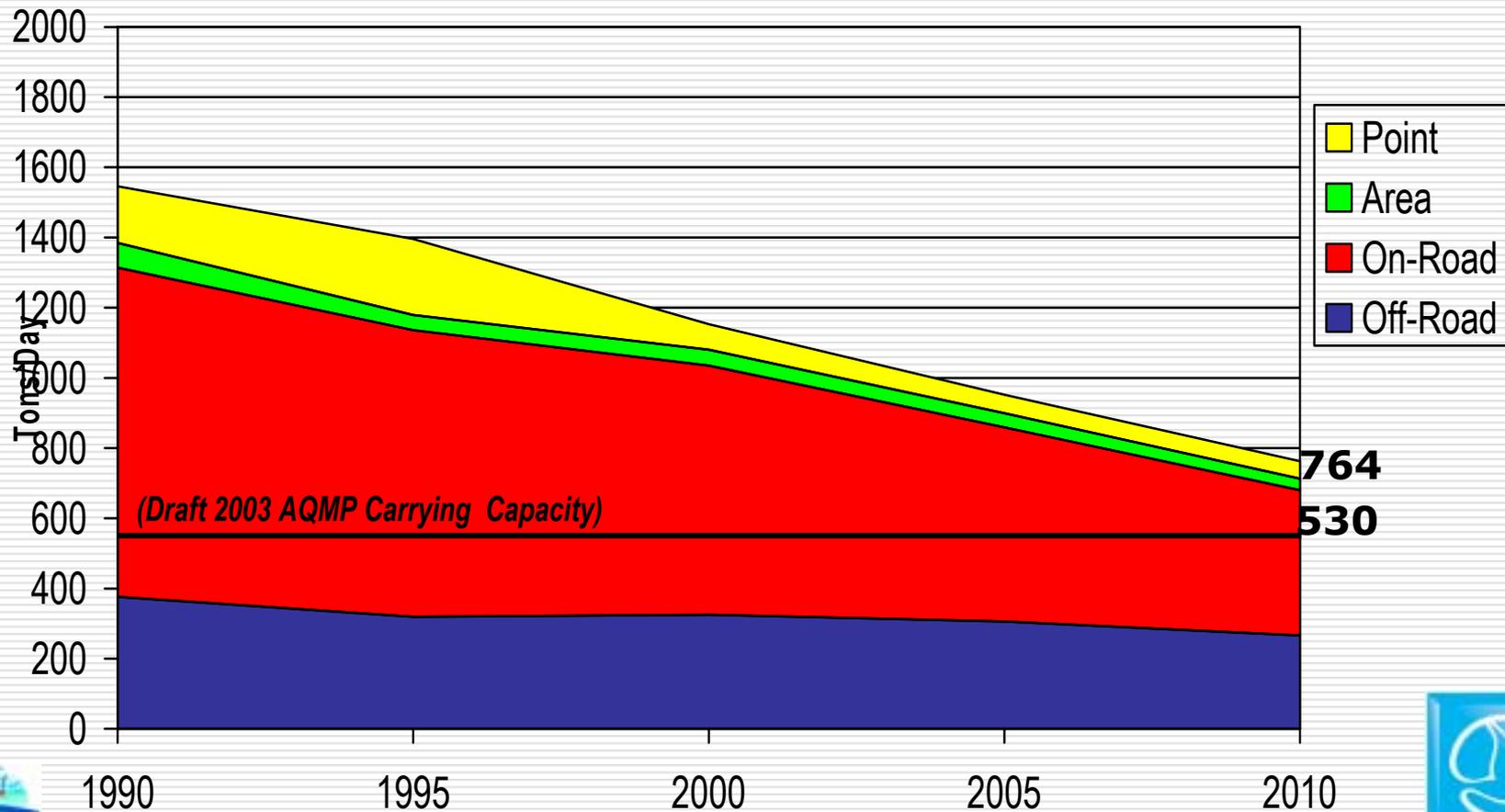
- ❑ Air Quality has Continued to Improve
- ❑ Increase in Estimated Emissions Inventory (mainly Mobile Sources)
- ❑ Significant Reductions Needed for Attainment Demonstration
- ❑ Fair Share of Reductions Required from State and Federal Agencies



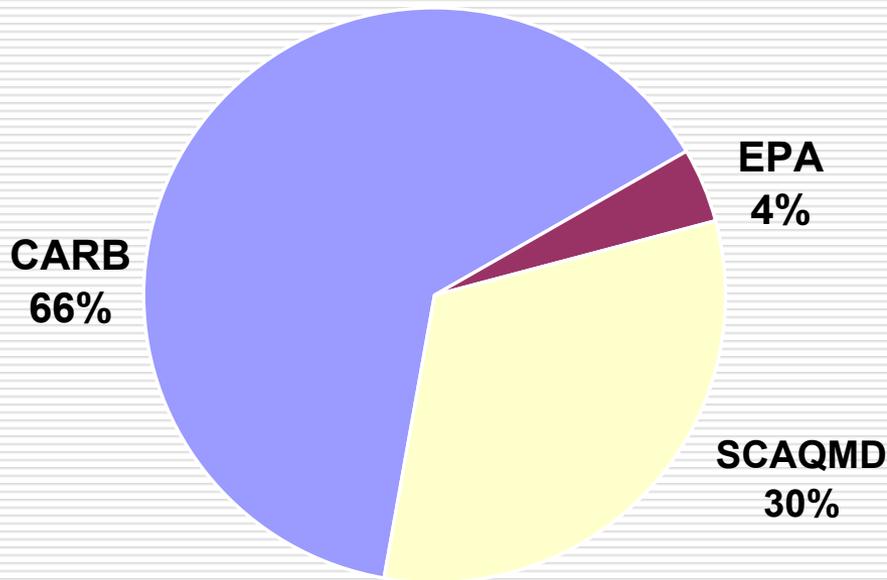
Emission Reduction Progress VOC by Source Category



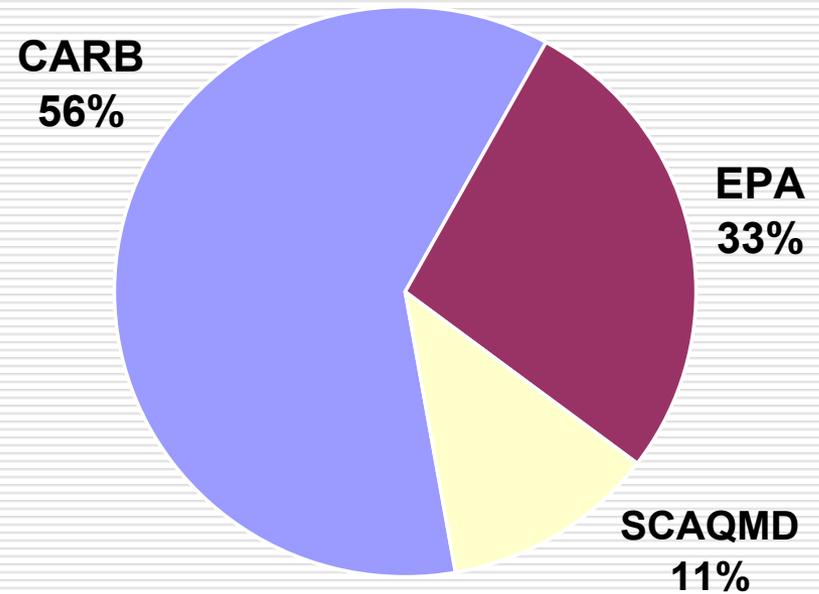
Emission Reduction Progress NO_x by Source Category



Relative Contribution by Agency to VOC and NO_x Inventories



2010 VOC Emissions = 659 Tons/Day



2010 NO_x Emissions = 764 Tons/Day



Control Strategy

- SCAQMD Stationary & Mobile
 - 26 Measures
- State & Federal Mobile
 - 22 Measures
- SCAG Regional Transportation
 - 1 Measure (3 components)



SCAQMD Strategy Highlights

- ❑ Short-Term (22 tpd VOC, 5 tpd NO_x)
- ❑ Long-Term (31 tpd VOC)
- ❑ Mobile Source Control Measures
 - Fee Programs for Federal Sources
Port-Related Activities
 - Off-Road Retrofit Program



Recommended Strategies for State & Federal

- Light- & Medium-Duty Vehicles
 - Replacement of Emission Controls
 - Enhance I/M with Remote Sensing
 - Accelerate Vehicle Retirement
 - New Reformulated Gasoline Standards
- Heavy-Duty Diesel Trucks/Buses
 - Retrofit with Lean-NOx Catalysts



Recommended Strategies for State & Federal (continued)

- Recreational Marine
 - Replace with 4-Stroke Engines
 - Retrofit 4-Stroke Engines w/Catalysts
- Construction/Industrial Equipment
 - Repower with New Engines
- Residential Lawn & Garden Equipment
 - Electrification



Recommended Strategies for State & Federal (continued)

- Consumer Products
 - Low & Ultra-Low VOC Products
- Ships
 - Cold Ironing
- Aircraft
 - More Stringent National Standards
- Trains
 - Low-Emission Locomotives



Recommended Strategies for State & Federal (continued)

TOTAL ESTIMATED REDUCTIONS

142-172 tpd VOC (need 349)

127 tpd NOx (need 234)



Additional Control Concepts for CARB Consideration

- Light- & Medium-Duty Vehicles
 - Enhanced I & M Program
 - Accelerate Fleet Turnover
 - Extend Emission Control Warranties
- Consumer Products
 - Demand-Side Strategies
 - Public Education



Additional Control Concepts for CARB Consideration (continued)

Heavy-Duty On-Road Vehicles

- Enhanced I & M Program
- Requirements or Incentives for Alternative Fuels (emulsified diesel)
- Incentives for Engine Repowers



Additional Control Concepts for CARB Consideration (continued)

- ❑ Off-Road Mobile Diesel Sources
 - Retrofit Controls
 - Airport GSE Electrification
 - Idle Control Devices for Locomotives
- ❑ Small Off-Road Gasoline Engines
 - Retrofit with Catalysts



FLEET RULES

- ❑ 1191 - Light- and Medium-Duty Public Fleets
- ❑ 1192 - Transit Buses
- ❑ 1193 - Refuse Collection Vehicles
- ❑ 1194 - Commercial Airport Ground Access
- ❑ 1195 - School Buses
- ❑ 1196 - Heavy-Duty Public Fleet Vehicles
- ❑ 1186.1 - Less-Polluting Sweepers



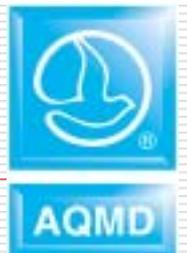
Rule 1191 - Clean On-Road Light- and Medium-Duty Vehicles

- ❑ Local, State, Federal Government Fleets (>15 vehicles)
- ❑ Purchase LEV or Cleaner July 1, 2001; ULEV or Cleaner 2004 (planned)
- ❑ Compliant Vehicles are Available - Gasoline or Alternative Fuel



Rule 1192 - Clean On-Road Transit Buses

- ❑ Purchase Alternative Fuel Transit Vehicles
- ❑ Operators with 100 + Vehicles, Immediate Implementation
- ❑ Operators With <100, Beginning July 1, 2001
- ❑ More than 60% of Urban Bus Fleet Alternative Fueled



Rule 1193 - Clean On-Road Residential & Commercial Refuse

- ❑ Purchase Alternative Fueled (or Dual-Fuel) Vehicles Beginning 7/01/01 or 7/01/02 Depending on Fleet Size and Type
- ❑ For FY 2000 to 2002, \$38M From Various Funding Programs -- 1,200 Alt. Fueled Refuse Trucks
- ❑ Investigating future diesel emission controls 9/03 RFP



Rule 1194 - Commercial Airport Ground Access

- ❑ Focus on Airport Fleet Vehicles
- ❑ New Procedures for Permitting Taxis at Airports
- ❑ For Taxicabs, Beginning January 1, 2002, ULEV or Cleaner Vehicles
- ❑ 318 NG Taxicabs ordered/purchased, 302 in CY 2002



Rule 1195 - Clean On-Road School Buses

- ❑ 57 School Districts, 9 Major Contractors (8,500 buses)
- ❑ Purchase Alt-Fueled HD School Buses; Purchase ULEV or Cleaner MD School Buses
- ❑ 141 NG School Buses ordered/purchased plus 65 anticipated (LESB Program) 2000-2003 FY
- ❑ 99 NG School Buses purchased from MSRC Program FY 2000-2002



Rule 1196 - Clean On-Road Heavy-Duty Public Fleet Vehicles

- ❑ Beginning July 1, 2002, Purchase Alt-Fuel Vehicle, Dual-Fuel Vehicle, or Gasoline-Powered Vehicle
- ❑ Denial of Tech. Infeasibility Certification – LADWP, Caltrans
- ❑ Staff Developing Implementation Guidance Document for Rule 1196
- ❑ 156 Alt-Fuel Vehicles Funded FY 2000-2002



Rule 1186.1 - Less Polluting Sweepers

- ❑ After July 2002, only Alt-Fuel Sweepers For New Purchases or Contracts
- ❑ 76 Alt-Fuel Sweepers Funded FY 2000-2002
- ❑ Scheduled Meetings with Cities/ Local Municipalities to discuss Cities Role in Rule 1186.1
- ❑ Implementation Issue – Maintenance Building Modifications Required



INCENTIVE PROGRAMS

- Carl Moyer <
- School Bus <
- ZEV Incentives
- Rule 2202 AQIP
- State Mitigation
- NO_x and PM Reduction



Approved Incentive Funding 2002

| | State \$M | EPA \$M | Clean Fuels \$M | AQMD \$M | Total \$M |
|-----------------------------------|---------------------|-------------------|-------------------------------|--------------------|---------------------|
| Carl Moyer | 9.3 | | | | 9.3 |
| School Bus | 18.6 | 5.0 | 0.53 | 1.5 | 25.7 |
| ZEV Incentive | 2.0 | | | | 2.0 |
| Rule 2202 AQIP | | | | 4.9 | 4.9 |
| State Mitigation | 7.0 | | | | 7.0 |
| NOx & PM Reduction | | | | 8.5 | 8.5 |
| TOTAL | | | | | \$57.4 |



Carl Moyer Funding 2002

| AQMD Funding Category | AQMD Funding Budget \$M | Total NO _x Reductions tons/year | Total PM Reductions tons/year | No. of Vehicles | Total Awards \$M |
|-----------------------|-------------------------|--|-------------------------------|-----------------|------------------|
| ON-ROAD | | | | | |
| Class 5/6 Private | no minimum | 9.61 | 0.22 | 30 | \$0.4 |
| Class 7/8 Private | \$2.0 | 126.36 | 2.74 | 147 | \$5.2 |
| Public Fleets | no minimum | 9.86 | 0.28 | 24 | \$0.5 |
| Transit Fleets | \$1.0 | 28.49 | 0.66 | 116 | \$1.3 |
| Sub Total | | 174.32 | 3.90 | 317 | \$7.4 |
| OFF-ROAD | | | | | |
| APU | no minimum | 3.37 | 0.48 | 38 | \$0.2 |
| Marine | no minimum | 30.37 | 1.73 | 6 | \$0.8 |
| Off-Road Private | \$2.0 | 40.61 | 3.23 | 15 | \$0.9 |
| Sub Total | | 74.36 | 5.45 | 59 | \$1.9 |
| GRAND TOTAL | | 248.68 | 9.35 | 376 | \$9.3 |



Carl Moyer Program

| | On-Road | | Off-Road | |
|-------------------|----------------|------------|-----------------|------------|
| | Trucks | Buses | Marine | Other |
| FY 1998-99 | 104 | 120 | 8 | 128 |
| FY 1999-00 | 58 | 143 | 26 | 67 |
| FY 2000-01 | 588 | 507 | | 222 |
| FY 2001-02 | 201 | 166 | 38 | 29 |
| TOTAL | 951 | 936 | 72 | 446 |



Carl Moyer Future Funding

Prop 40 Funding \$50 Million

- ❑ Over 2 years
- ❑ CARB Guidelines
- ❑ \$8.1 million - SCAQMD
- ❑ Summer 2003 Release RFP



School Bus Program

Since 2000, AQMD has awarded

- ❑ 206 Natural Gas School Buses
- ❑ 87 Clean Diesel Buses
- ❑ 1,505 PM Traps for Retrofits
- ❑ Total of \$43.71 million (state, AQMD, future EPA funds)
- ❑ Awards meet AB 1390 (Firebaugh) provisions that 50% of state funds go to schools in regions most affected by air pollution and have low income residents



CLEAN FUELS PROGRAM (RD&D)

- ❑ Started in 1988
- ❑ Funded by vehicle registration surcharge and fines
- ❑ Develop and demonstrate new clean-fuel & zero-emission technologies
- ❑ Cost share > 50%
- ❑ Contracts for \$100K-\$1M
- ❑ 80+ projects under contract



Major Areas of Interest

- Alternative Fuels → CNG, LNG, GTL
- Retrofit Technology → On-Road/Off-Road
- Hybrid Electric Vehicles → Buses, Trucks, Plug-in
- Fuel Cells → Stationary, Mobile
- Hydrogen → Production, Infrastructure



Next Generation Natural Gas Vehicles (NGNGV)

Teaming with DOE/NREL, CARB, CEC, and Industry

- Teleflex GFI
0.2 NO_x GM 6.0L
Engine
- Cummins Westport
0.5 NO_x B5.9 Engine
0.2 NO_x C8.3 Engine
- PACCAR / Cummins
Westport
HD NGV Vocational
Study
- Mack Truck
Integrate 12.0L
Engine in Refuse
Trucks



Gas To Liquid Projects

- Demonstration of Fischer Tropsch Fuel in Unmodified HD Trucks with Johnson Matthey PM Traps
 - Sponsors: AQMD, DOE/NREL, Shell, Yosemite Waters
- Development/Demonstration of Fischer-Tropsch Fueled HD Engines with PM/NO_x Aftertreatment
 - Sponsors: AQMD, CEC, DOE/NREL, Shell, Ralph's Grocery



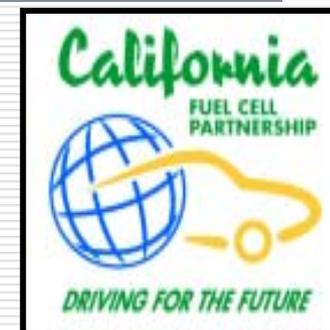
Hybrid Electric Vehicles (HEVs)

- ❑ Commercialization of Advanced HEVs (EPRI)
- ❑ Tri-Fuel, Plug-In HEV with Vehicle-to-Grid Power (AC Propulsion)
- ❑ Plug-In Hybrid SUV with Vehicle-to-Grid Power (UCD)
- ❑ Plug-In HE Utility Service Truck powered by Capstone MTG (Edison Intl)
- ❑ 2 HE Composite Body Buses powered by CNG-ICE (NABI)



Fuel Cells and Hydrogen

- ❑ Working with State organizations to expedite commercialization
- ❑ 2 residential projects to compare SOFC and PEM
- ❑ 2 industrial fuel cell projects MCFC and PEM
- ❑ 1 HD truck APU project to reduce idling emissions
- ❑ Hydrogen economy integrated demonstration project underway



Quotes

“Everything that can be invented
has been invented”

Charles H. Duell 1899
Patent Office Commissioner

“The best way to predict the future
is to invent it”

Alan Kay



Questions

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