

In-Use Off-road Diesel Vehicle Proposed Regulation



**Public Hearing
July 26, 2007**

California Environmental Protection Agency



Air Resources Board

Outline

- Review of proposed regulation
- Recent staff efforts
- Response to issues
- CIAQC and South Coast proposals
- Changes to staff proposal
- Recommendation

Review of Proposed Regulation



Regulation Overview

- Applies to off-road vehicle engines 25 hp and up
- Beginning in 2009
 - Labeling and annual reporting
 - Idling limits
 - Limits on adding dirty vehicles to fleets
- Fleet average or BACT requirements begin
 - 2010 for large fleets
 - 2013 for medium fleets
 - 2015 for small fleets

General Approach

- NOx requirements, lesser of
 - Turn over engines (8%/10% of hp per year) or
 - Meet NOx average
- PM requirements, lesser of
 - Install PM retrofits (20% of hp per year) or
 - Meet PM fleet average
- Compliance options:
 - NOx or PM exhaust retrofits (VDECS)
 - Buy new or used vehicles
 - Install engine repowers
 - Retire or designate as low-use

Special Provisions

- Exemptions or compliance extensions
 - Low-use vehicles
 - Vehicles in attainment areas
 - Manufacturer delays
- No retrofit requirements
 - Engines in vehicles less than 5 years old
 - No retrofit available
 - Retrofit not safe
- No turnover requirements
 - Small fleet
 - Certain specialty vehicles
 - Less than 10 years old
 - Retrofit in past 6 years



Benefits of Regulation

- 4,000 fewer premature deaths
- Meets 2020 Diesel Risk Reduction Plan goal
- \$18 - \$26 billion in avoided costs

NOx Emissions	2010	2015	2020
Without Reg (tpd)	311	228	151
Benefits (tpd)	13	30	48
% Reduction	4%	13%	32%

PM Emissions	2010	2015	2020
Without Reg (tpd)	16.7	11.5	7.0
Benefits (tpd)	2.3	6.9	5.2
% Reduction	14%	60%	74%

Costs

- Total cost of \$3.0 - \$3.4 billion
 - Increase of 0.3% per year in statewide construction costs
- Cost-effectiveness
 - \$37 - \$43/lb PM
 - \$2.1 - \$2.5/lb NO_x

Recent Staff Efforts



Staff Findings: Statewide Costs

- Industry estimate of \$13 billion too high
- Most of difference (\$8B) now understood
 - Normal turnover rate too low (\$2.3B diff)
 - Assumed no fleets would meet the fleet averages (\$1.5B diff)
 - New vehicle prices too high (\$4.3B diff)
- Original staff estimate of \$3-3.4 billion still best estimate
- Public workgroup meeting in June

Staff Findings: Fleet Impacts

- Costs in first few years can be significant
- Early action lowers and spreads out these costs
- Many fleets will need to pass on costs
- Newer vehicles help pay for themselves
 - Lower repair costs
 - Increased productivity
 - Tax advantages
- Public Workgroup meeting in July

Fleets Evaluated

- Fleets evaluated
 - 9 Fleets
 - Includes rental, construction and mining
 - Fleet locations throughout state
 - 6 of the 9 fleets had early credit
 - 4 provided financial information

Issues Raised by Fleets

- Capital requirements in early years
- Ability to pass on costs
- Concerns with PM retrofit technology
 - Costs of existing systems
 - Early market availability
 - Concerns with technology

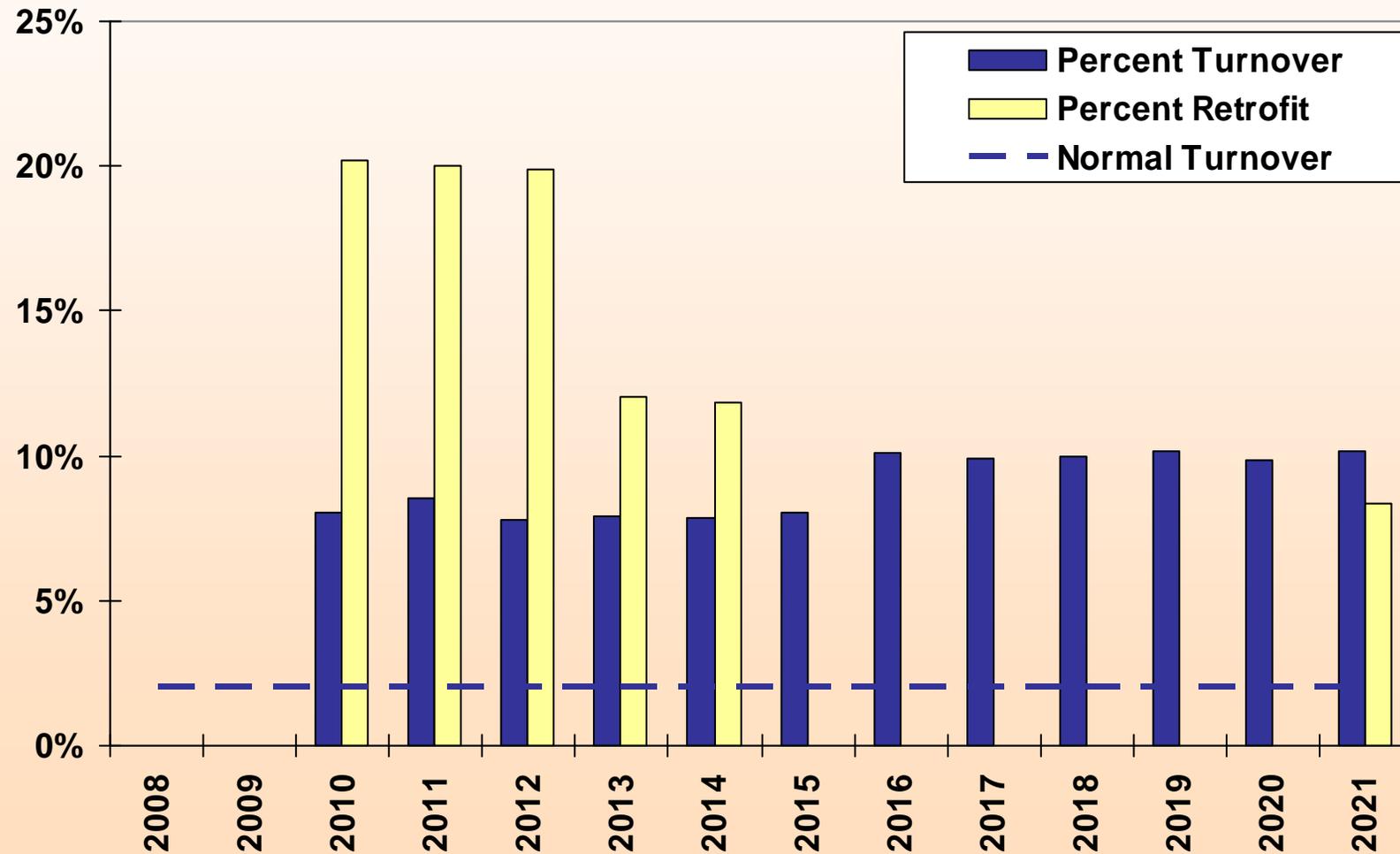
Summary of Cash Flow Results

- 4 fleets evaluated
- Price increases necessary
 - Increase of 1% would cover costs for all 4 fleets
- If no price increase, costs more significant
 - Represent up to 20% of after-tax income on average

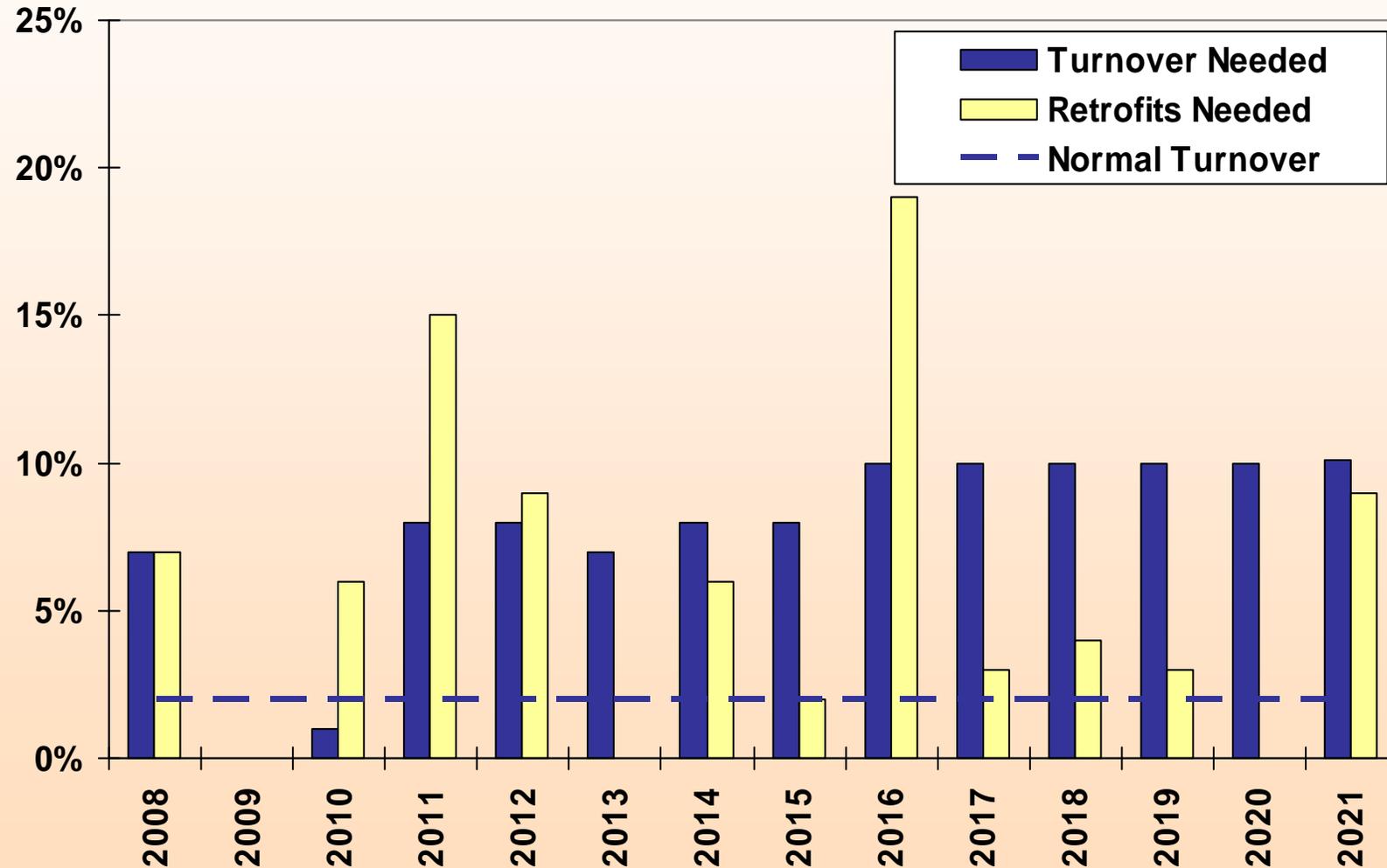
Fleet Analysis: Downs Equipment Rentals

- Testified projected costs of \$2 million/year
 - \$1 million annual profits
 - \$400,000/year costs would be “manageable”
 - Newer vehicles bring higher rental rates
- Staff evaluated potential compliance alternatives
 - Early action
 - Financing
 - Higher rental rates

Higher Cost Approach



Lower Cost Alternatives



Economic Conclusions

- With the use of alternatives:
 - Company remains profitable every year
 - Net loss in profits is less than 5%, and includes increases in equity
 - In the worst year, costs approach \$300,000, but are still less than what company indicated it could pay

Fleet A – Grading Contractor

- Fleet Profile
 - Average Vehicle Age = 13 yrs
 - 51% Tier 0 in 2007
 - 12,000 hp
 - Early Action: Repowered ~10% of hp
- Financials
 - Revenue: \$15 million/yr
 - After Tax Income: \$500,000/yr
- Impact on Profits
 - 11% decrease if no costs passed on
 - 5% decrease with a 1% revenue increase

Fleet B – Grading Contractor

- **Fleet Profile**
 - Average Vehicle Age = 9.5 yrs
 - 28% Tier 0 in 2007
 - 31,000 hp
 - Early Action: Repowered ~30% of hp
- **Financials**
 - Revenue: \$40 million/yr
 - After Tax Income: \$900,000/yr
- **Impact on Profits**
 - 13% decrease if no costs passed on
 - 8% decrease with a 1% revenue increase

Fleet C – Excavating Contractor

- Fleet Profile
 - Average Vehicle Age = 10 yrs
 - 29% Tier 0 in 2007
 - 19,500 hp
 - Early Action: None
- Financials
 - Revenue: \$64 million/yr
 - After Tax Income: \$1.1 million/yr
- Impact on Profits
 - 8% decrease if no costs passed on
 - No impact with a 1% revenue increase

Fleet Analysis: Red Mountain Machinery

- Indicated need \$23 million over 4 years
 - Assumed no normal turnover
- Company was looking at national fleet
 - Only 30% of fleet in California
- Could comply by operating cleanest vehicles in California
- Would need to either
 - Do normal turnover and install retrofits, or
 - Accelerate turnover to minimize use of PM exhaust retrofits

Estimate of Jobs Lost

- Staff reevaluated employment impacts
- About 1,400 in average year
- If costs accrue in more sensitive sectors, job loss could be as high as 3,400 in worst year

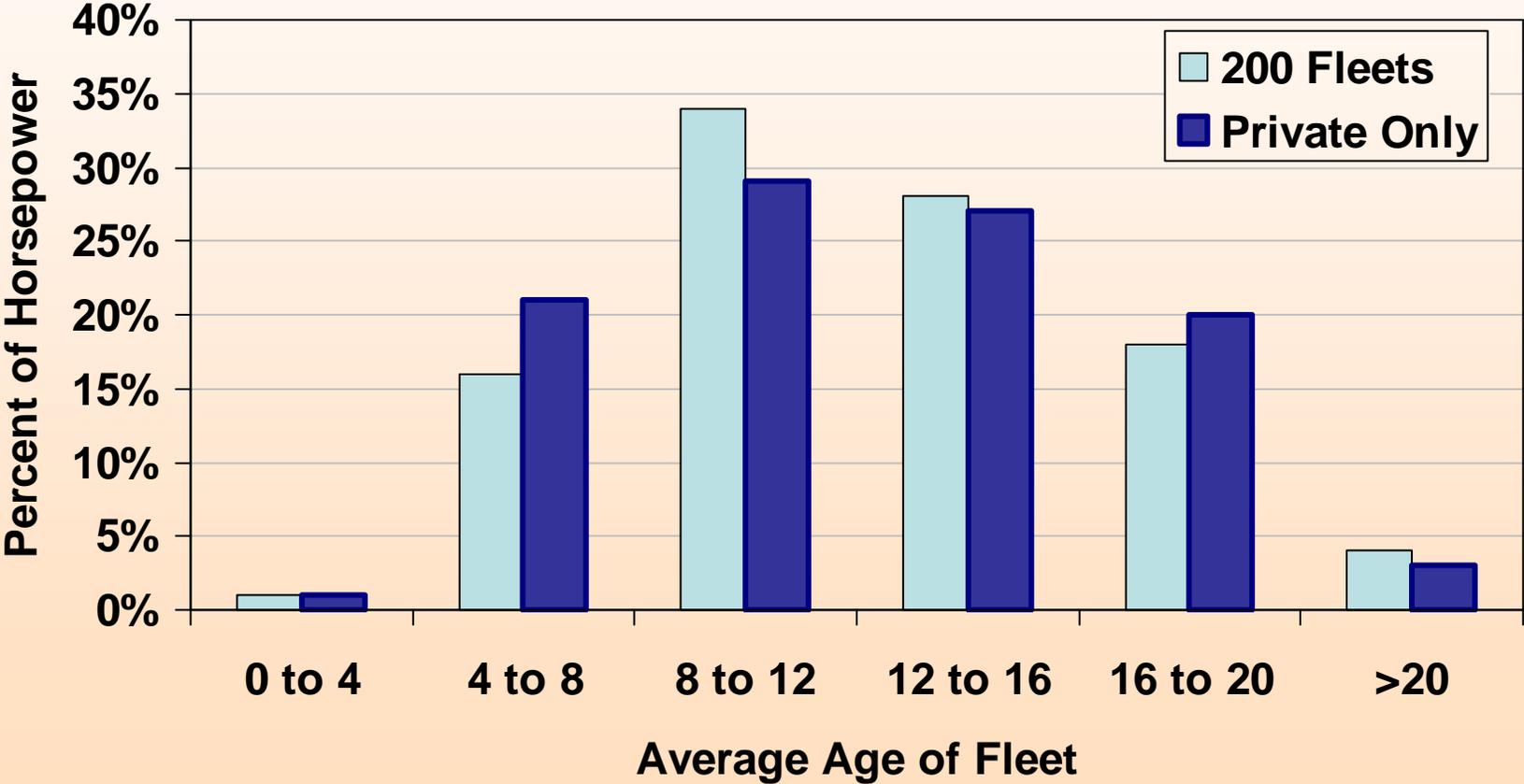
Response to Issues



Catalyst based NOx and PM exhaust retrofit systems

Public Fleets Did Not Skew Inventory

(77% of horsepower from private fleets)



Navy Labeling Issue

- Navy asked that we look at alternative labeling provisions
 - Concerned on damaged or lost labels
- Staff met with Navy
- Changing rule could create unintended loophole for intentional failure to label

Low-Use Exemption

- Concern that low-use vehicles will represent significant emissions in 2020
 - In 2020, less than 3% of PM emissions
- Controlling such vehicles not cost-effective
- Staff recommends adding new reporting requirements beyond 2020
 - Staff does not recommend sunset

PM Retrofit System Concerns

- Availability
 - Only three Level 3 off-road systems verified
- Cost
 - Only active systems available
- Durability
 - May not hold up in construction environment

PM Retrofit Facts

- Every new on-road engine sold in US has particulate filter
- Over 2,000 solid waste collection vehicle filters installed
- Numerous installations worldwide
 - New York
 - LAX
 - Croton water project (NY)

Passive Diesel Particulate Filter that Achieves 25% NOx Reduction



Wheel loader



Scraper

Active Diesel Particulate Filter



Off-Road Truck



Excavator with
Hammer Attachment
(significant vibration)

Off-Road Showcase Demonstration

- Joint ARB, SCAQMD, and MSRC program
- \$1 million in MSRC funding
 - SCAQMD funding also committed
- 28 devices submitted
 - 17 manufacturers
 - All Level 3 for PM
 - 8 reduce NO_x as well as PM
 - 17 passive, 11 active
- 18 fleets with 245 vehicles
 - 5 public, 13 private
- ARB will coordinate verification

CIAQC and SCAQMD Proposals



CIAQC July Proposal

- Seeks major revisions to regulation
 - Each fleet achieves a percent reduction in emissions from certain baseline years
 - No enforceable target until 2015
 - Medium fleets defined up to 10,000 hp
 - Delay compliance
 - Small fleets defined up to 2,500

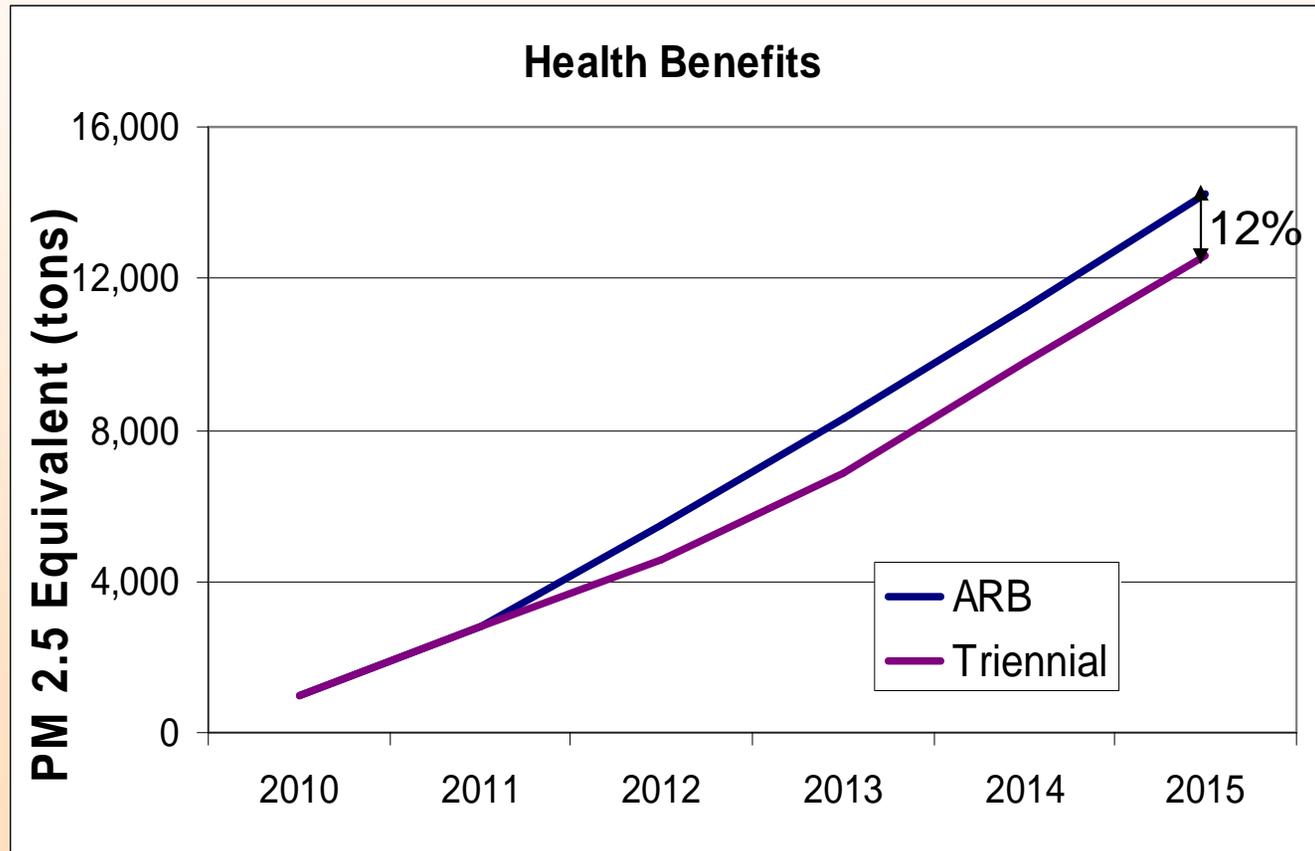
Staff Response

- Proposal falls short on emission benefits
- Would provide additional flexibility
 - But no guarantee actions will be taken
- Other structural problems

CIAQC Proposal for Triennial Compliance Dates

- More widely spaced compliance dates
 - 2010, 2011, 2014, 2017, 2020
 - During triennial periods, no requirement in year 1, 40% in year 2
- 12% loss in cumulative benefit in 2015

Impact on Health Benefits of Triennial Compliance



South Coast July Proposal

- District provides incentive money for NOx
 - Surplus to statewide provisions
 - \$120M (Moyer) over 4 years
- As of 2008, would apply to fleets:
 - Operate vehicles in district
 - Greater than 40% T0/T1 in 2008
- GPS monitoring required

South Coast/San Joaquin Valley Off-road Opt-in for NOx (SOON)

- Developed with CIAQC and Districts
- Applicability:
 - Limited to SCAQMD and SJV
 - District Governing Boards must opt-in
 - Fleets must meet stringent fleet average
 - Or apply for incentive \$
 - No requirements on fleets if projects not funded
 - Reductions must be surplus to those required by rule

SOON Emission Reductions

- New reductions to the SCAQMD PM2.5 attainment demonstration
- Estimate 5-12 tpd in 2014 benefits
- Reductions dependent on
 - Funding levels
 - Project cost-effectiveness
 - Interaction with statewide regulation

Changes to Staff Proposal



Staff's Proposed Changes

- Raise small fleet definition to $\leq 2,500$ hp
 - ~1-3% less NOx benefits but little PM impact
- No grace period for out-of-state vehicles
- Refine safety exemption language
- Classify union training facilities as small fleets
- Other clarifying changes

Recommendation



Staff Recommendation

- Approve staff proposal with proposed changes