

2007 AQMP Summit Panel 4 – On-Road Heavy-Duty Vehicle Strategies Notes

Unless otherwise noted, the following recommendations and comments reflect the views of panel members and other attendees at the 2007 Air Quality Management Plan (AQMP) Summit.

Proposed Control Strategies:

Ultra Low Sulfur Diesel

- 95% utilization of diesel, provide incentive to add capacity for ultra low sulfur diesel (ULSD)
- 15 ppm sulfur diesel is integral strategy to emission reductions
- Need vehicles to take full advantage of ULSD

Policy

- Resist incentives and mandates, but need to address entry barriers
- Need Moyer incentives to get further reductions
- Allow cleaner vehicles to be heavier
- Need Zero Emission Vehicle (ZEV) program for heavy-duty (HD) vehicles
- Continue current strategies
- Combination of technologies is a step in the right direction
- Tie registration to vehicle emissions and fuel efficiency
- Increase use of public transit
- Apply light duty strategy to identify high emitters on heavy duty too
- Transit buses need to get beyond demonstration to build volume
- Need regulation & incentives to build volume & reduce cost
- Maintain leadership in South Coast Air Quality Management District (SCAQMD)
- Don't pick winners & losers, let economy decide on merit
- Monitor in-use emissions and new technology emissions

Fleet Retrofits and Turnover

- Need fleet turnover and retrofits
- Focus on retrofit and particulate matter (PM) controls
- Accelerate turnover in existing fleet by oxides of nitrogen (NOx) & PM fleet rules, i.e. more Gateway projects, scrapping, Moyer

- Repower after 12 years, no room on old vehicles for new technology
- Replace worst offenders
- Fleet turnover needs to accelerate
- Lease cleaner Class A trucks to owners serving ports
- Need practical retrofit to focus on high emitters

Fuels

- Optimize alternative fuel stations that are doing well, need more alternate fuel vehicles
- Trucks running on liquefied natural gas (LNG), compressed natural gas (CNG), now California Air Resources Board (CARB) certified
- Goal to always be cleaner than comparable diesel
- Use hydrogen for hybrid and fuel cell technology
- Electric cleaner than 2007 and 2010 standards
- Truck electrification – several technologies reduce idling
- Department of Defense truck idling reduction using hybrid electric
- Continue to use cleaner existing alternate fuels

Technology

- Improve lean NOx technology and urea injection for SCR
- Encourage plug-in electric PM filters to regenerate filters while parked
- Encourage NOx and PM retrofit in combination with additional NOx controls
- Onboard diagnostics with NOx sensors, vehicles keep track
- In use fleet rules combining NOx and PM like selective catalytic reduction (SCR) and diesel particulate filters (DPFs)
- HCNG engine sensor detects fuel blend – need snappy marketing name
- Encourage use of cylinder deactivation technology in vehicles
- Power train packaging on new hybrids much better than old integrations

Barriers to the Introduction of Clean Air Technologies

Economic

- Convincing fleet operators that alternatives are cost-effective

- Cost and resources to support new technology
- Not enough incentives
- Compete against existing technology, fuel price volatility
- Getting research and development for new technology, need certainty to invest
- Cost, durability issues, training for alternative fuels
- Need incentives for private fleets, missing out on diesel hybrids

Policy

- Need more resources at CARB for heavy-duty vehicle retrofit verification
- Need certainty to sustain business, implementation delays difficult
- Jurisdiction for a heavy-duty vehicle ZEV program

Technology

- Old models need to be updated for ultra low sulfur fuels

Recommended Research Priorities for the Next 5 to 10 Years

- Research needed on compression and storage technology, likely metal hydrides
- Improve lean NOx technology and urea injection for SCR
- Need research and development funds for next generation 2010 products
- Need better understanding of transients effects
- Heavy-duty vehicle research for on-board diagnostics – soot filters and NOx sensors
- Focus on zero emission batteries for plug-in and electric vehicles and for other fuel cells
- Focus on energy efficiency multiple technologies

Question and Answer Period

- Any reformulation of fuel to lower NOx?
 - Just implementing ultra low sulfur diesel for heavy-duty vehicles, hard to predict, unlikely for light-duty vehicles

- The Environmental Protection Agency's (EPA's) low sulfur diesel fuel is different from California's.
- Intrigued by combined PM and NOx fleet rules
- Reduce sulfur in bunker fuel for marine?
 - Marine will need to meet the same specifications in 2007; refiners would coke rather than clean up bunker fuel
- Pre-1994 model year trucks lack of NOx retrofit?
 - The percent verification test cycle is well covered in CARB's certification program, high efficiency filter can help
 - Engine calibrations involve tradeoffs, but could be improved
- Surprised that UTC Power is not advocating more fuel cell bus demonstrations
 - Demonstrations don't build the market. Fleet orders are needed.
- Verification SCR working in Europe and proven, but can't bring it here, verification cost too high for small volume
 - Agree need balance, working with CARB
- Fuel neutrality is no longer a choice, can't just compete on emissions performance, but need to use all alternatives to petroleum due to energy limits.
 - Cleaner diesel reduces refinery capacity unfortunately.
- Fuel neutrality allows fuels to be developed, debate still open on fuel supply subject to improved technology, Canadian tar sands can now be developed
- Retrofit NOx no CARB verification, just NOx in addition to PM, can't make flexible claim for multiple filters