NLEV Nationwide Benefits

Emissions

- National LEV cars much cleaner than today’s new (Tier 1) vehicles (based on NMOG standards)
  - TLEVs 50% cleaner than Tier 1
  - LEVs 70% cleaner
  - ULEVs 84% cleaner

- For model years after 2000, annual emissions benefits from National LEV approximate the removal of almost 10.5 million Tier 1 vehicles from the road.

- NLEV and Base Case (OTC LEV) comparison - for years 2005, 2007, 2015 - tons per day - emissions (ozone season weekday) totals for NMOG, NOx - nationwide (estimate based on MY 97 start date in Northeast, MY 2001 start date nationwide):
  NOx emissions reductions in year 2005 - 400 tons/day
  NOx emissions reductions in year 2007 - 600 tons/day
  NOx emissions reductions in year 2015 - 1249 tons/day

  NMOG emissions reductions in year 2005 - 279 tons/day
  NMOG emissions reductions in year 2007 - 399 tons/day
  NMOG emissions reductions in year 2015 - 778 tons/day

- NLEV and Base Case comparison - for year 2005 - tons per day - toxic emissions for benzene, 1,3-butadiene, formaldehyde, acetaldehyde:

<table>
<thead>
<tr>
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<th>Benzene</th>
<th>1,3-Butadiene</th>
<th>Formaldehyde</th>
<th>Acetaldehyde</th>
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<td>Reduction</td>
<td>7</td>
<td>1.1</td>
<td>4</td>
<td>1.2</td>
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- For year 2005 - tons per day - Particulate Matter (NMOG plus NOx) benefit associated with NLEV as compared to Base Case:

  28.6 ton/day effective PM-10 emissions reduction (mostly NOx)
Cost

- Incremental estimated cost per car for LEVs in CA - $96
  (CARB has modified their estimates slightly upward
  and EPA will address this change in the SNPRM).

- Incremental estimated cost per car for nationally available LEVs - $76
  -equal to less than 0.5% of new car price
  -less than ½ cost of pinstriping; about the price of a basic hubcap

- EPA expects cost to be even less than $76 due to the following factors:
  - automotive pollution control technology continues to advance, leading to improved designs at lower costs.
    - for example, Honda has announced the introduction of new LEV technology that will add little or no cost to vehicles
  - significant economies of scale for the manufacturers
  - CARB’s own cost estimates have generally been shown to be higher than actual price differences
  - auto industry experience has consistently demonstrated rapid price decreases in successive model years for newly-introduced technology
  - National LEV program includes numerous provisions to harmonize federal and California motor vehicle requirements, providing manufacturers with additional savings

- Annualized estimated cost of NLEV Program - $950 million

Ozone Nonattainment Areas/Population

- There are 111 million people living in classified ozone nonattainment areas today.
  - 50 million in the OTR
  - 22 million in CA
  - 39 million in areas outside CA, OTR

- There are approximately 26 million people living in areas that have been redesignated.

- Total current number of nonattainment areas in U.S. - 66
  - Number in OTR - 33
  - Number outside OTR & CA - 25
  - Number in CA - 8
- Number designated as marginal - 26
- Number designated as moderate - 19
- Number designated as serious - 11
- Number designated as severe - 9
- Number designated as extreme - 1
- Number of former nonattainment areas redesignated to attainment - 33

- Vehicles in non-attainment areas

Ozone:

-approximately 15 million light-duty cars and trucks are sold in the US each year
-approximately 11 million are sold in states with some region in ozone nonattainment
  -approximately 5 million are sold in CA, OTC states
  -approximately 6 million are sold in other states

NLEV Benefits to Non-OTR States

Toxics, Visibility Benefits

- National LEVs would result in a VOC reduction of as much as 185 lb/vehicle over the lifetime of the passenger car.

- National LEVs would result in a NOx reduction of as much as 186 lb/vehicle over the lifetime of the passenger car.

Depending on the quality of a state’s I/M program, National LEVs will result in a 15 - 78% reduction in toxic emissions over the lifetime of the vehicle, or 1.4 - 7.6 lbs reduction per vehicle.

Because these vehicles will typically operate for over a decade, pollution in non-OTR states will decline by 700,000 tons for every year that NLEVs are substituted for current use cars.

- Provides margin for growth in attainment states

- Provides additional reductions to help redesignated areas stay in attainment
Greenhouse Gases/Global Warming/Other Effects

- NOx:
  - Of the six criteria pollutants monitored nationally over the last 25 years, NOx is the only pollutant for which emissions have increased
  - Emissions of nitrogen oxides include nitrous oxide, which itself is a greenhouse gas
  - Nitrous oxide emissions contribute about 6% of the greenhouse effect
  - In addition, emissions of nitrogen oxides lead to the formation of tropospheric ozone, which is another greenhouse gas.
  - Excessive nitrogen from air pollution can result in the acidification of lakes, streams, and soils.
  - Air pollution contributes to increased nitrogen loadings in water bodies, which in turn accelerates eutrophication - an over-enrichment of eco-system which results in significant oxygen depletion, dieback of underwater plants, and reduced populations of fish and shellfish
  - NOx emissions can interfere with the transmission of light, limiting visual range and color discrimination. Nitrogen dioxide is a reddish brown gas that can impair visibility.