REGULATORY IMPACT ANALYSIS

NATIONAL LOW-EMISSION VEHICLE PROGRAM

DECEMBER 2, 1997

Regulatory Impact Analysis

NATIONAL LOW EMISSION VEHICLE PROGRAM

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1. Introduction

This Regulatory Impact Analysis (RIA) has been prepared in accordance with Executive Order 12866, which requires an RIA when a regulatory action is "significant." As will be described in detail below, the subject National Low Emission Vehicle Program (National LEV) is a program, which if voluntarily agreed to by the motor vehicle industry, will result in the nationwide sale of vehicles which are cleaner than those designed to meet the present federal Tier I standards. This program is designed to apply in all states except California. This RIA addresses the costs and emission reduction benefits associated with the National LEV program. The Final Framework Rule, which established most of the requirements of the National LEV program, was a significant regulatory action. The Final Rule, which finalizes the remaining elements of the National LEV program, is not a “significant” regulatory action. However, because this rule does modify some of the costs and benefits of the National LEV program as compared to the Final Framework Rule, EPA is modifying the RIA accordingly.

2. Summary of Proposed Requirements

2.1 Background

The Clean Air Act as amended in 1990 (Act) established, under section 184, the Ozone Transport Region (OTR) made up of the states of Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, the District of Columbia, and the portion of Virginia within the Consolidated Metropolitan Statistical Area that includes the District of Columbia. Congress established the OTR in recognition of the fact that the transport of ozone and ozone precursors throughout the region may render the Northeast states' attainment strategies interdependent.

As part of the statutory requirements in section 184, the Administrator established the Northeast Ozone Transport Commission (OTC) for the OTR. The OTC consists of the Governor of each state or their designees, the Administrator or the Administrator's designee, the Regional Administrator for the EPA regional offices affected or the Administrator's designee, and an air pollution control official representing each state. The OTC can develop recommendations for additional control measures to be applied within all or part of the OTR if the OTC determines that such measures are necessary to bring any area in the OTR into attainment for ozone by the applicable dates in the Act.

The OTC, under authority granted by section 184(c)(1) of the Act and after notice and opportunity for public comment, developed a recommendation that EPA mandate a low emission vehicle program,

based on the California Low Emission Vehicle program (Cal LEV), throughout the OTR. The OTC voted 9-4 in favor of this recommendation with New Hampshire, Virginia, Delaware, and New Jersey dissenting. On February 10, 1994, this recommendation was submitted to the EPA for consideration.

On December 19, 1994, EPA approved the recommendation of the OTC and promulgated a rule under sections 184 and 110 of the Act which required emission reductions from new motor vehicles in the OTR equivalent to the reductions that would be achieved by the OTC Low Emission Vehicle (OTC LEV) program.

Concurrently with the analysis of the OTC recommendation, EPA explored the possibility of a nationwide LEV-equivalent program. As EPA has stated in numerous public meetings and in the decision approving the OTC's recommendation, it is EPA's belief that a LEV-equivalent program could provide greater environmental and public health benefits to the OTR and the nation and do so more efficiently than would the OTC LEV program. Under the Clean Air Act, however, such a program can only be achieved by agreement of the relevant parties -- it cannot be imposed unilaterally. In an effort to develop a LEV-equivalent program, EPA and the affected parties participated in intensive and open discussions of available options, particularly under the Mobile Source Emissions and Air Quality in the Northeastern States Subcommittee of the Clean Air Act Advisory Committee that EPA established in August, 1994. EPA issued a Notice of Proposed Rulemaking on October 10, 1995 that set

out requirements for this program. The Final Framework Rule, which set out the structure and details of the program, was issued by EPA on June 6, 1997. A Supplemental Notice of Proposed Rulemaking, which took comment on issues unresolved in the Framework Rule, was issued on August 22, 1997. EPA is now issuing a rule finalizing the regulatory elements of the National LEV program. These activities have resulted in the National LEV program which is described below.

On March 11, 1997, the United States Court of Appeals for the District of Columbia vacated EPA's OTC LEV rulemaking, stating that while section 184 of the Clean Air Act allowed EPA to require states to adopt specific measures, other provisions in the Act (section 177 and 202) precluded EPA from requiring states to adopt a LEV program. This decision did not refute EPA's findings that reduction of ozone precursors in the OTR is necessary and that OTC States contribute to nonattainment of other OTC States nor did it undercut EPA's legal authority for National LEV. It did remove equivalency of emission reductions between OTC LEV and National LEV as a legal requirement in the National LEV rule, though the program will still need enforceable state commitments in order to give states State Implementation Plan (SIP) credit.

2.2 Elements of the National LEV Program

Under the program, auto manufacturers would have the option of

agreeing to comply with tighter tailpipe emission standards -- standards that EPA does not have authority to impose now. Once manufacturers committed to the program, the standards would be enforceable -- just as all other federal motor vehicle standards are enforceable. Manufacturers have indicated that they are willing to volunteer to meet these tighter standards because EPA and the states in the northeastern part of the country (the OTR States) have indicated that they are willing to agree to a program that provides manufacturers with regulatory stability and reduces regulatory burden by harmonizing federal and California motor vehicle standards. EPA believes that National LEV is an enforceable program that will achieve reductions in new motor vehicle emissions that are at least equivalent to the reductions that would be achieved through OTC state-by-state adoption of a LEV program.

Section 202 of the Act establishes the standards which apply to motor vehicles sold in the 49 states. The 1990 amendments to the Act established more stringent tailpipe emission standards, referred to as the Tier I standards, which apply to light duty vehicles and light-duty trucks. The implementation of those standards was in phases and was completed with the 1996 model year. The discussions regarding a LEV equivalent program which, through opt-in by the affected parties, would establish standards more stringent than Tier 1 standards, have focused on the development of an approach based on the nationwide sale of vehicles identical to

vehicles certified under CAL LEV standards as LEV category vehicles.

The CAL LEV program established five categories of vehicles: California "Tier 1" vehicles, transitional low emission vehicles (TLEVs), low emission vehicles (LEVs), ultra-low emission vehicles (ULEVs), and zero-emission vehicles (ZEVs), each category having increasingly stringent hydrocarbon emission standards. The CAL LEV standards for LEV category vehicles are .075 grams per mile (gpm) NMOG, 3.4 gpm carbon monoxide (CO), and 0.2 gpm oxides of nitrogen (NOx). Beginning in the year 2001, the National LEV program will require on average all new cars and light-duty trucks sold outside California to meet the California Low Emission Vehicle (LEV) standard. Prior to the nationwide introduction of this vehicle, auto manufacturers will phase in cleaner cars and light-duty trucks in the OTR according to a schedule that would accomplish emission reductions in the OTR basically equivalent to the following schedule:

40% TLEVS for model years 1999-2000
30% LEVs for model year 1999
60% LEVs for model year 2000

ie. 1999: 40% TLEV, 30% LEV, 30% TIER I
2000: 40% TLEV, 60% LEV

For the purposes of this RIA analysis, it will be assumed that

the National LEV program will continue through MY2005, at which time it will be replaced by Tier 2 standards equivalent to the National LEV standards. This assumption provides the opportunity to evaluate the future effects of both full fleet turnover and VMT growth and is consistent with the presumption that it is unlikely that vehicle standards will revert to Tier 1 after the full implementation of National LEV.

3. Technological Feasibility

3.1 Introduction

The technological feasibility of the vehicles which meet the CAL LEV standards, including the LEV category vehicles which will make up the National LEV program, is an area which has received extensive analysis. As stated earlier, California may adopt its own motor vehicle standards by Section 209(b)(1) of the Act, which requires the Administrator, after notice and an opportunity for public hearing, to waive application of the prohibitions of section 209(a) for standards adopted by the State of California if the State determines that the standards will be, in the aggregate, at least as protective of public health and welfare as applicable Federal standards. The Administrator must grant a waiver unless the Administrator finds that: (A) the determination of the State is arbitrary and capricious; (B) the State does not need such State standards to meet compelling and extraordinary conditions; or (C) such State standards and accompanying enforcement procedures are

not consistent with section 202(a) of the Act. State standards and enforcement procedures are inconsistent with section 202(a) if there is inadequate lead time to permit development of the necessary technology, given the cost of compliance within that time period, or if the Federal and State test procedures impose inconsistent certification requirements.

In its January, 1993 decision document granting California a waiver for its LEV program, EPA determined that CAL LEV was technologically feasible in the applicable time frame. This determination was based on information pertaining to estimates of the relative technological feasibility of LEV technologies provided to EPA by automobile manufacturers, CARB (including extensive comments received by CARB during its rulemaking process), manufacturers of emission control equipment, and other concerned parties.

In addition CARB, as part of its regulatory process, continues to review the technologies expected to be used to meet the CAL LEV standards and the ZEV sales mandate. This review was summarized most recently in a November, 1996 CARB staff report 1996 Low-Emission and Zero-Emission Program Review (hereafter referred to as CARB Staff Report). In its update, CARB noted that its projection that “emerging new technologies such as electrically-heated catalysts (EHCs) and heated fuel preparation systems” would be required in order to meet the LEV and ULEV standards was “overly

conservative".[1] CARB found that introduction of low-emission vehicles can be generally achieved with refinements to existing technology, such as adapative fuel control systems, close-coupled catalysts, leak-free exhaust systems, and engine designs which reduce oil consumption.

EPA addressed the issue of the feasibility of the technology required to meet CAL LEV standards during its consideration of the OTC recommendation regarding the adoption of a CAL LEV based program in the OTR. The analysis of the technology required for the vehicles which constitute the OTC LEV program described earlier, being identical to the vehicles which constitute the CAL LEV program, benefited from the great amount of research, product development, and scrutiny which had occurred in regards to CAL LEV. Since section 177 prohibits the requirement of "third cars" by the States, the feasibility of the OTC LEV recommendation approved by EPA is linked to the feasibility of the CAL LEV program, which EPA evaluated during its consideration of California's request for a waiver. The feasibility of the CAL LEV technology was, therefore, again addressed during EPA's consideration of the OTC-LEV recommendation and that analysis found no reason to believe that the LEV-category vehicles which will make up the National LEV program are not feasible.

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[1] Staff Report: Low-Emission Vehicle and Zero-Emission Vehicle Program Review, California Air Resources Board, November, 1996, P. 5. (EPA Docket No. A-95-26, IV-J-01).

3.2 Technologies and Feasibility of National LEV Vehicles

While the more stringently controlled vehicle categories in the CAL LEV and OTC LEV programs, including the LEV category vehicles which will constitute the National LEV program, may be technology forcing, these programs are not technology mandating. Vehicle manufacturers may design their products to meet the applicable standards, including the National LEV standard, using any technologies they deem appropriate to provide sufficient emission control levels, vehicle performance, and fuel economy while minimizing cost. In many instances, the expected technologies represent minor improvements in existing technologies or equipment that will be utilized on vehicles in order to meet other requirements unrelated to the programs, such as on-board diagnostics and the improvement of fuel economy.

The two main categories of emission control technologies are fuel control measures and aftertreatment controls. These characterizations turn on the methods of emission control associated with each. Fuel control measures are designed to optimize the air/fuel ratio in the engine, leading to the most efficient fuel combustion possible and thereby reducing the emissions generated by the engine. Aftertreatment measures involve the reduction of emissions after they have been generated in the engine.

The technologies that are currently expected to be used on the various categories of vehicles are discussed in detail in Chapter

III of the contractor report Analysis of Costs, Benefits, and Feasibility Regarding Implementation of OTC Petition on California Low Emission Vehicles, E.H. Pechan & Associates, December 5, 1994. This report was done in support of EPA's OTC LEV petition decision and can be found in Air Docket A-94-11. The report noted that for LEVs, the expected technologies include close coupled catalysts, air injection, and heat conservation measures such as double-walled exhaust pipes. While these measures are still feasible control strategies, it is expected that as manufacturers continue to develop low emission technologies, new technologies or different combinations of existing known technologies will be used. The updated CARB Staff Report demonstrates this by showing that electrically-heated catalysts are now not expected to be widely needed as a control strategy, representing a change from earlier projections.

EPA received extensive comments from the automobile manufacturers, CARB, emission control equipment manufacturers, and others regarding the feasibility of the technologies required for TLEV, LEV, and ULEV vehicles as part of EPA's evaluation of California's request for a waiver of its CAL LEV program. California's input to that process relied on extensive comments received by California during its rulemaking process and California's own analysis. In addition, California continues to review the status of the CAL LEV technology. EPA found in its approval of California's waiver request, and California continues

to find in its periodic reviews, that the technology expected to be required for these vehicles is feasible and, in fact, as described in the California Staff Report "many of these technologies are already in production in some vehicle models, and the remaining technologies are now developed to near commercial levels of readiness."

No comments challenging the feasibility of LEV category vehicles were received during EPA's subsequent consideration of the OTC LEV recommendation. While comments were received from the automobile industry which stated that the non-ZEV CAL LEV standards present a "major challenge" and which stated that EPA should consider feasibility in the context of the fuels and conditions prevalent in the OTR, no comments were received which stated that meeting these standards in the time allowed was not feasible. On the contrary, numerous comments were received which supported the position that the standards are technologically feasible and that the cost and complexity of the required technology will be reduced from current estimates. The Manufacturers of Emission Controls Association provided comments which stated its belief that the standards were feasible and that conventional technology will be adequate to achieve the standards in a greater percentage of the [CAL LEV] fleet than originally anticipated. MECA's comments on the National LEV NPRM were similar, stating that the "LEV standards are not only technologically feasible, but can be achieved at a compliance cost which is both reasonable and well below estimates

made by many parties in the past." Based on the progress being reported in refining the technology which will be used on these vehicles, EPA has no reason to believe that the technology required by the National LEV program is not feasible within the proposed time frame.

4. Emission Reductions

The national motor vehicle emissions control program promulgated today represents a significant step towards the goal of reducing smog in heavily populated urban areas, both in the northeastern United States and in the rest of the country. The National LEV program would also achieve reductions in emissions of other pollutants, including CO, PM, and formaldehyde.

4.1 Urban Air Pollution and Ozone Nonattainment

Automobiles are a major source of ozone precursor and carbon monoxide emissions. While significant progress has been made over the past two decades in controlling automobile emissions, many air quality control regions still fail to meet the national ambient air quality standard for ozone and carbon monoxide.

Ozone is a powerful oxidant which affects humans by irritating the respiratory system and reducing lung function. Ozone has been shown to cause symptoms such as cough, headache, chest pains, sore throat, and nausea, which may restrict normal daily activities. A wide array of health effects has been attributed to short-term (1-3

hours), prolonged (608 hours) and long-term (months to years) exposure to elevated ozone levels. Acute health effects induced by short-term exposures to ozone levels as low as 120 parts per billion (ppb), generally while engaged in heavy exercise, include transient pulmonary function responses, transient respiratory symptoms and effects on exercise performance, increased airway responsiveness, transient pulmonary inflammation, increased susceptibility to respiratory infection, and increased hospital admissions and emergency room visits. Similar health effects have been observed following prolonged exposures at lower ozone levels and at lower levels of exercise.

Ozone also affects plants and materials. Oxidation by ozone can impair plant tissue and function and reduce the yield of most crops. Some tree species suffer injury to needles or leaves, lowered productivity, and in severe cases, individual trees can die. Tropospheric ozone also contributes to the greenhouse effect. Studies also indicate that ozone can cause damage to terrestrial and aquatic ecosystems, including acidification of surface waters, reduction in fish populations, damage to forests and wildlife, soil degradation, and reduced visibility.

4.2 Sources of Ozone

Ozone is produced in the troposphere by photochemical reactions of non-methane volatile organic compounds (VOCs) and oxides of nitrogen (NOx). Both VOC and NOx controls must be

considered in providing for attainment of the ozone national ambient air quality standard. NOx emissions are a concern from both a regional and local perspective. This is based in part upon available modeling results which indicate that regional NOx-oriented control strategies coupled with local VOC controls may be needed to attain the standard. Preliminary analyses conducted by the EPA for the new 8-hour ozone standard indicate that decreases in regional NOx emissions would be effective in helping many areas attain the standard, which suggests that decreasing NOx emissions on a regional basis is effective in decreasing ozone over large geographic areas. Also, decreasing emission of VOCs will lead to lower levels of ambient ozone under conditions experienced in most urban areas. Thus, this discussion will focus on the impact of the National LEV on both NOx and VOC emissions.

VOCs in motor vehicle exhaust are the result of the incomplete combustion of hydrocarbon fuels in the vehicle engine. VOC emissions are reduced, as described in section 3.1, through measures to more accurately control fuel distribution, to ensure more complete ignition of fuel/air mixture, and to reduce the levels of hydrocarbons in the exhaust stream (catalytic after-treatment).

Oxides of nitrogen are formed in the combustion chamber when oxygen and atmospheric nitrogen combine at high temperatures. NOx emissions are reduced by lowering peak combustion temperatures through small amounts of exhaust gas recirculation or through other

measures, and by catalytic exhaust after-treatment.

4.3 Ozone Nonattainment

As of October 30, 1997 there are 59 ozone nonattainment areas in the nation. Of these, 22 are designated as marginal ozone nonattainment areas, 16 as moderate, 11 as serious, nine as severe, and one as extreme. In addition, as of October 1997, 41 ozone nonattainment areas have been redesignated to attainment. These areas have established maintenance plans to demonstrate how they will continue to meet standards over the next ten years. Section 181 of the Act requires that marginal nonattainment areas demonstrate compliance by 1993, moderate areas by 1996, serious areas by 1999, and severe areas by 2005 or 2007.

The national ambient air quality standards (NAAQS) for various pollutants, including ozone, are set by EPA at a level that the Agency determines is necessary to protect public health. EPA concluded, based on its analysis in the context of the OTC LEV decision in 1994, that NOx reductions of 50 to 75% from 1990 levels from every portion of the OTR lying to the south, southwest, west, and northwest of each serious or severe OTR nonattainment area, and VOC reductions of 50 to 75% from the portion of the OTR in or near (and upwind of) each serious and severe OTR nonattainment area, were necessary to bring each such nonattainment area into attainment by the applicable date. The ozone NAAQS were recently

changed to base attaintment on eight hour averages of zone, not one hour averages, to lower the acceptable ozone concentration from 120 to 80 ppb, and to set the final standard at the average fourth highest concentration instead of the third. These new standards result in more and larger areas, including some outside the OTR, with monitoring data indicating nonattainment.

4.4 Particulate Matter

The National LEV program will also require light-duty diesel motor vehicles and light-duty diesel trucks to meet standards for emissions of particulate matter that are more stringent than the comparable Tier 1 standards. Particulate matter (PM) is the generic term for a broad class of chemically and physically diverse substances that exist as discrete particles over a wide range of sizes. The populations that appear to be at greatest risk from exposure to PM are individuals with respiratory and cardiovascular diseases, individuals with infectious respiratory disease, elderly individuals, asthmatic individuals, and children. PM emissions have been associated with numerous serious health effects, including upper and lower respiratory illnesses such as pneumonia, chronic obstructive pulmonary disease, chronic bronchitis, aggravation of the respiratory system in children with preexisting illnesses, and premature mortality in sensitive individuals (such as those with cardiovascular diseases). PM emissions also contribute to impairment of visibility, acidic deposition, and

materials damage.

EPA recently modified the PM NAAQS by adding two new primary $PM_{2.5}$ standards. The revisions will provide increased protection against a wide range of PM-related health effects given the physical and chemical differences between subclasses of PM_{10} which will be addressed by the new standards. The $PM_{2.5}$ standards are designed to limit the fine fraction of PM, which appears to contain more of the reactive substances potentially linked to detrimental health effects and is potentially more easily absorbed into the thoracic region than does the coarse fraction of PM_{10}.

4.5 Air Toxics

The National LEV program also includes standards for formaldehyde emissions from motor vehicles, unlike the current federal Tier 1 standards, which do not regulate emissions of formaldehyde. In April 1993, EPA released its assessment of the need for controlling emissions of toxic air pollutants from motor vehicles and motor vehicle fuels (EPA Motor Vehicle-Related Air Toxics Study). This study focused on the carcinogenic risk associated with such emissions, and discussed the health effects of the following specific toxic air pollutants: benzene, formaldehyde, 1,3-butadiene, acetaldehyde, and selected metals and motor vehicle-related pollutants identified as hazardous air pollutants in § 112(b) of the Clean Air Act. Interested readers should refer to this EPA study for more information regarding the health effects of

toxic motor-vehicle-related air pollutants.

EPA has classified benzene as a Group A known human carcinogen, based on studies on workers showing that long-term exposure to high levels of benzene causes cancer. Exposure to benzene emissions has also been associated with non-cancer health effects, including blood disorders, adverse effects on the immune system, and damage to reproductive organs. EPA has classified formaldehyde as a probable human carcinogen, based on animal studies showing that long-term exposure to and inhalation of formaldehyde is associated with certain types of tumors. In addition, exposure to formaldehyde is associated with non-cancer health effects, including irritation of the eyes, nose, throat, and lower airway at low levels of exposure, and adverse effects on the liver and kidneys.

4.6 Emissions Reductions Associated with National LEV

EPA believes that the NLEV program will provide greater reductions in VOC and NOx emissions in the OTR than would OTC state-by-state adoption of a LEV program, and do so in a more efficient and cost-effective manner. A primary reason for the greater emissions benefits is that, since the NLEV program will apply nationwide (except for California) in 2001, vehicles purchased outside the OTR that drive into or are relocated to the region will be up to 70% cleaner than incoming vehicles (i.e., Tier 1 vehicles) would be under the OTC LEV program.

The NLEV program will also result in significant environmental and public health benefits in the rest of the country. There are 19 ozone nonattainment areas in the U.S. outside the OTR and California, including several areas classified as "serious" or "severe" for ozone.

Chapter II of the Pechan Analysis summarizes the emission reductions which will be obtained if the National LEV program is implemented. As the impact of the program will increase as fleet turnover replaces Tier I vehicles with cleaner National LEV vehicles, the analysis calculated emission reductions for the years 2005, 2007, and 2015. This analysis, summarized below, is discussed in detail in the preamble of the final rule and the Pechan analysis.

Highway Vehicle Emissions Summary

(based on start date of MY1999 in OTR, MY2001 nationwide)

2005

	NMOG	NOx	CO
BASE CASE	12,339	15,319	93,702
NATIONAL LEV	12,046	14,863	89,807

2007

	NMOG	NOx	CO
BASE CASE	12,167	15,150	93,343
NATIONAL LEV	11,856	14,654	89,495

2015

	NMOG	NOx	CO
BASE CASE	12,274	15,389	96,387
NATIONAL LEV	12,100	15,084	94,460

Note: 1) Emission estimates are in tons per ozone season weekday.
2) BASE CASE assumes California LEV in N.Y., Mass., Conn., R.I., N.J., Vt., and Maine, with program start dates as described in Chapter II of the Pechan report. All other states have Tier I vehicles until model year 2005, when a Tier 2 program equivalent to National LEV is assumed to start.
National LEV case assumes National LEV vehicles in all 49 states in model year 1999 (including N.Y., Mass. and Conn.). The seven states listed in (1) above are assumed to have a California LEV program in model year 2006. In MY2006 and later, the states without state-adopted LEV programs are assumed to have Tier 2 standards equivalent to National LEV.
Analyses include study year registration distribution and permanent migration effects.

The Pechan Analysis (Chapter II, Section E) also estimated the air toxic compound emissions (a fraction of the total NMOG emissions) for the year 2005 for each of the studied cases. The emission reductions of Benzene, 1-3, Butadiene, Formaldehyde, and Acetaldehyde obtained through the implementation of the National LEV program are shown in Table II-11 in the Pechan analysis.

Finally, in Chapter II, Section G of the Pechan analysis

considered the secondary particulate reductions which would occur as a result of the implementation of the National LEV program. Given that secondary particulate formation is a function of the level of NOx and volatile organic compounds (VOC) in automotive exhaust, these reductions are a function of the NOx and NMOG reductions achieved by the National LEV program. It is estimated that in 2005, the National LEV program will result in approximately 32 tons per day effective particulate benefit when compared to the base case.

5. Costs of the Action

The primary cost impact (incremental increase in costs over Tier I motor vehicle standards) associated with the adoption of the National LEV program will be the costs associated with the additional emission control hardware which will be required to meet the more stringent standards. The current estimates of the emission control technology which will be used with the LEV category California vehicles, which will be the basis of the National LEV program, were discussed in Section 3.1.

The evaluation of costs included in this analysis and discussed in detail in the Pechan analysis focuses on the cost estimates made by CARB in connection with their periodic review of the CAL LEV program. These costs were adjusted to reflect the economies of scale which will be associated with a nation-wide

program.[2]

A description of the assumptions and procedures used in making the cost estimates which are used in this analysis, as well as a discussion of the assumptions and inputs used by CARB, may be found in Chapter III of the Pechan analysis. The analysis estimates the annual costs of the National LEV program to be approximately $970 million relative to those costs attributed to the alternative OTC State Section 177 Programs. The estimated incremental per-vehicle costs of the technology which will be required in the National LEV program (as compared to Tier I vehicles), derived by the Pechan analysis from the California estimates, are summarized in Table III-1 of the Pechan analysis. These estimates are conservative. It is generally thought that costs will decrease as vehicle and component manufacturers continue to refine their estimates of the technology which will be required on the various vehicle types and as optimization of the required components lower manufacturing costs.

There have been a number of estimates of the cost associated with California LEV program technology, a 1994 analysis performed

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[2] The November, 1996 CARB Staff Report modified CARB's vehicle incremental cost estimates to approximately $120 for LEVs. EPA's cost analysis for the National LEV program, which has included the data in CARB's staff reports on the CAL LEV program, looks at costs of vehicles in California and then estimates National LEV program costs based on nationwide sales volumes. Two principal reasons for vehicle price differentials between California and National LEV vehicles are economy of scale in production volumes and allocation of costs among the number of vehicles being produced, with such costs distributed over an appropriate number of years.

for the auto industry by Sierra Research, Inc. being primary among them. EPA has chosen to utilize the CARB estimates as the basis for this RIA, rather than the significantly higher Sierra estimates, due to the fact that other information suggests that the required technology will continue to become less complex and less expensive as development continues. CARB has noted that in the early years of its LEV program, manufacturers have generally not marked up their TLEVs to account for the additional control technology. Introduction of California TLEVs into the New York market has also not resulted in price mark-ups. In comments provided in response during EPA's consideration of the OTC petition regarding the adoption of a CAL LEV based program in the OTR, the Manufacturers of Emission Control Association (MECA) commented that conventional technology will be adequate to achieve the standards in a greater percentage of the [California] fleet than originally anticipated. Additionally, MECA commented that the complexity of advanced systems such as EHC's and hydrocarbon traps are being reduced and that the cost of the required systems are likely to decrease in the future due to competition among suppliers. MECA noted that historically in the automotive industry, costs for system additions have shown a rapid decrease in successive model years after their introduction.

EPA estimates that the adoption of additional Supplemental Federal Test Procedure (SFTP) requirements applicable to TLEV, LEV, and ULEVs will not result in any cost increases to the

manufacturer. The costs associated with SFTP compliance in the National LEV program are substitutes for and not additive to the costs EPA estimated manufacturers would incur in meeting the SFTP requirements for a fleet made up entirely of Federal Tier 1 vehicles since National LEV vehicles will replace Tier 1 vehicles in manufacturers' fleets starting in model year 2001. Federal Tier 1 SFTP requirements were estimated to increase annual variable costs by approximately $6.18 per vehicle while California estimates its SFTP requirements, which EPA is adopting as part of the National LEV program, will increase annual variable costs by $6.00 per vehicle.[3] EPA believes that applying the California SFTP requirements over the nationwide vehicle fleet associated with National LEV will lead to economies of scale and thus decrease the per vehicle costs of this requirement.

In addition to the costs associated with the design and production of vehicles, auto manufacturers also incur costs associated with testing used to determine compliance with the applicable standards. These costs are increased in cases where differences between Federal and California test procedures necessitated conducting separate tests to satisfy the requirements of the two procedures. Concurrently with the negotiations which

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[3] The apparently different total annual costs between the programs is a result of California's analysis that necessarily reflects issues unique to California and the application of LEV-stringency SFTP standards only in California. In fact, California states agreement with -- and makes use of -- EPA's annual fixed costs, calculated on a per engine family basis.

led to the National LEV program, EPA worked with California, the auto industry, and other affected parties to harmonize, to the greatest possible extent, Federal and California test procedures. The harmonization which has occurred will result in a cost savings to manufacturers since, in many cases, a single test procedure may be used to satisfy both California and Federal requirements.

6. Impact on Small Entities

The Regulatory Flexibility Act, 5 U.S.C. 601(a), provides that, an agency is required to prepare and make available a regulatory flexibility analysis (RFA) for certain rules. EPA has determined that it is not required to prepare an RFA for this rule. This rule will not have a significant economic impact on a substantial number of small entities. A RFA is required only for small entities which are directly regulated by the rule. See Mid-Tex Electric Cooperative, Inc. v. FERC, 773 F.2d 327 (D.C. Cir. 1985) (agency's certification need only consider the rule's impact on regulated entities and not indirect impact on small entities not regulated). The National LEV program will directly regulate only those auto manufacturers that opt into the National LEV. These auto manufacturers generally do not qualify as small businesses within the meaning of the Regulatory Flexibility Act.

Nevertheless, the Agency has considered the effect of a National LEV program on new and used car dealerships as part of its regulatory impact analysis, even though such analysis is not

required because these businesses would not be directly regulated under the rule. EPA received comments on this specific issue during the OTC LEV rulemaking process and believes it is useful to continue to include this analysis in the National LEV rulemaking for illustrative purposes. The results of this analysis, set forth in Chapter IV of the Pechan analysis, indicate that the National LEV program would not have a significant economic impact on automobile dealerships.

The analysis evaluated the potential effect of vehicle price increases associated with the National LEV program on vehicle sales. The analysis concludes that the impact on dealerships will not be significant. It estimates an impact, in terms of cost as a percentage of sales, ranging from approximately 0.2 percent to 0.8 percent for small dealerships and from approximately 0.1 percent to 0.3 percent for large dealerships. It should also be noted that because the Pechan analysis made the "worst case" assumption that all cost increases are borne by the dealerships, these compliance cost-to-sales ratios are clearly overstated as dealerships are not likely to have to absorb most, if any, of the cost increase per vehicle.