

THE CLEAN AIR ACT'S CLEAN-FUEL VEHICLE PROGRAMS

I. Executive Summary

Motor vehicle emissions reduction plays a critical role in improving national air quality. Emission reductions are being implemented through federal and state regulatory frameworks stressing technology-forcing requirements and allowing relative flexibility in achieving those requirements. Attaining emission reduction targets requires stringent regulations that force industry to develop new vehicle technology. Flexibility within the regulatory framework allows industry to develop the means to focus on cleaner air as an end result. However, conflict between these two principles will arise if the emphasis on technology-forcing requirements overwhelms the choices between competing technologies. From the perspective of renewable fuels such as ethanol and biodiesel this is the problem with the both of the clean-fuel vehicle programs established under the 1990 Clean Air Act Amendments.

The 1990 Amendments established two Clean Fuel Vehicle programs: a Clean-Fuel Fleet Program (CFF) and a California Pilot Test Program. The CFF program will be run by the individual states that have not opted out of this program under their State Implementation Plan, while the Pilot Test Program is a federal program administered in California only. The vehicle emission requirements under these programs favor a level of emission reductions that can best be achieved through the use of dedicated-technology vehicles, notably natural gas and electric. Diesel vehicles might qualify as Low Emission Vehicles (LEV), as long as they meet that emission standard when running on both petroleum-based diesel and/or a renewable-based fuel, and thus be eligible for inclusion. However, as of this date, no such vehicles have yet to be certified by EPA as meeting LEV emission standards. Until this happens, there is no viable role for biodiesel within these two Federal programs. Furthermore, assuming a manufacturer is willing to certify a diesel engine family as meeting LEV standards on both biodiesel and petroleum diesel for use in the CFF programs, the issue of whether or not biodiesel can be considered a clean alternative fuel under the Clean Air Act will remain.

II. Motor Vehicles and Air Pollution

Motor vehicles cause more air pollution than any other human activity.¹ The motor vehicle is the single greatest source of U.S. air pollution.² Motor vehicle exhaust emits harmful chemicals such as nitrogen oxides (NOx),³ hydrocarbons (HCs),⁴ carbon monoxide (CO), particulate matter (PM), carbon dioxide (CO₂), and sulfur dioxide (SO₂).⁵ The United States' most pervasive air pollution problem however, is ozone. Ozone poses very serious health concerns.⁶ When the 1990 Clean Air Act Amendments were enacted, nearly 100 areas in the United States

¹ U.S. Gen. Accounting Office, *Electric Vehicles: Likely Consequences of U.S. and Other Nations' Programs and Policies*, 93 (No. GAO/PEMD-95-7) (1994) [hereinafter GAO Report].

² Henry A. Waxman et al., *Cars, Fuels, and Clean Air: A Review of Title II of the Clean Air Act Amendments of 1990*, 21 *Environmental Law* 1947, at 1949 (1991).

³ Some NOx emissions come from fuel, but most NOx comes from elemental nitrogen in the air combining with oxygen at high temperatures to create NOx. Arnold W. Reitze, Jr., *Air Pollution Control Law* 7 (1995).

⁴ Hydrocarbons are organic gases from which volatile organic compounds (VOCs) are formed. Non-methane hydrocarbons (NMHCs) are the gases regulated in the Tier I and Tier II standards for conventional vehicles.

⁵ GAO Report, *supra* note 1, at 93-94, table 4.6.

⁶ 136 Cong. Rec. H2515 (daily ed. May 21, 1990) (statement of Rep. Waxman); see also Office of Technology Assessment,

exceeded the federal ambient air quality standard for ozone.⁷ Motor vehicles contribute the largest amount of ozone precursors, such as HCs and NOx, which react to form photochemical oxidants in the atmosphere. Ozone is a highly reactive gas and, even at low concentrations, it attacks cells and breaks down body tissue. Ozone exposure can also aggravate chronic heart disease, asthma, bronchitis, and emphysema.⁸ Motor vehicles also produce nearly two-thirds of all CO emissions. CO is commonly associated with respiratory irritation and illness.⁹ CO interferes with oxygen absorption by the blood, which can cause impaired perception and thinking, delayed reflexes, drowsiness, and death.¹⁰ Finally, motor vehicles emit known and potentially toxic air contaminants such as aldehydes, benzene, toluene, xylene, ethylene dibromide, butadiene, asbestos, and lead. These toxic pollutants may cause cancer, reproductive problems, and birth defects. As it accumulates in bone and other tissue, lead affects the circulatory, reproductive, nervous, and kidney systems. Scientists also suspect that lead causes hyperactivity and decreased learning ability in children. Benzene also causes severe health problems, and is a known carcinogen.¹¹

The health effects related to motor vehicle emissions calls for programs and policies that reduce the amount of harmful airborne chemicals emitted by mobile sources. Yet, motor vehicle emissions are especially difficult to control. Although motor vehicle pollution control technology improved after regulation during the 1960s, targeted emissions continued to increase because of increases in population and vehicle miles traveled.¹² Furthermore, the growth in vehicle ownership indicates a substantial increase in the vehicle population. In 1990, 58% of American households owned two or more vehicles, whereas in 1969, only 31% owned more than one vehicle. Finally, the average automobile occupancy declined from 1.9 in 1977, to 1.5 in 1990. Vehicle occupancy was even lower for work-related trips, dropping to 1.1 persons per vehicle in 1990.¹³ This phenomenon demonstrates that increased motor vehicle emissions result from an entrenched American lifestyle of heavy automobile dependency. Thus, decreasing harmful motor vehicle emissions ultimately requires either changes in the American lifestyle or changes in vehicle technology.

III. California's Special Role

In 1970, Congress passed the Clean Air Act (CAA),¹⁴ introducing two important structures regarding vehicle emission controls. First, the CAA introduced the concept of technology-forcing: that is, requiring industry to develop innovative technology to meet increasingly stringent air quality requirements. Under this concept, the government set national standards for emission limitations, and the automakers and petroleum industry must develop the vehicle and/or fuel technology to meet these requirements. The EPA specified that by 1975,

Urban Ozone and the Clean Air Act: Problems and Proposals for Change, 7-23 (1988).

⁷ Reitze, *supra* note 3, at 159.

⁸ GAO Report, *supra* note 1, at 93-94, table 4.6.

⁹ *Id.* at 93-94.

¹⁰ GAO Report, *supra* note 1, at 93-94, table 4.6.

¹¹ *Id.*

¹² California Air Resources Bd., *Staff Report: 1994 Low-Emission Vehicle and Zero-Emission Vehicle Program Review 2* (Apr. 1994) [hereinafter 1994 CARB Staff Report].

¹³ *Id.*

¹⁴ 42 U.S.C. 1857-1858a (1970).

automakers must reduce HCs and CO motor vehicle emissions by 90% and reduce 90% of NOx emissions by 1976.¹⁵ Examples of technology developed to meet exhaust emission requirements include: (1) air injection systems that pump air into engine exhaust to oxidize HCs and CO into H2O and CO2; (2) exhaust gas recirculation (EGR) valves that dilute the air/fuel mixture and reduce the heat of combustion, thus reducing NOx emissions; and (3) oxidation catalysts (catalytic converters) that convert HCs and CO to H2O and CO2 in the exhaust. Second, the 1970 CAA re-authorized the waiver of federal preemption provisions, wherein States could waive the federal preemption of State emission controls. This was allowed in order “to foster California’s role as a laboratory for motor vehicle emission control, in order to continue the national benefits that might flow from allowing California to continue to act as a pioneer in this field.”¹⁶

Under the 1977 amendments to the CAA, the government “intended to ratify and strengthen the California waiver provision and to affirm the underlying intent of that provision, i.e., to afford the broadest discretion [to California] in selecting the best means to protect the health of its citizens and the public welfare.”¹⁷ More recently, the EPA granted a federal preemption waiver for the California LEV Program, enabling California to “continue to carry out strong emission-control programs necessary to protect the health of its citizens.”¹⁸ Furthermore, the 1977 Amendments also added Section 177, which allowed nonattainment areas in other states to adopt California standards with EPA approval.¹⁹ This laid the legal groundwork for allowing other states to adopt what was then only California’s stringent emission control standards. The Clean Fuel Vehicle (CFV) Program of the 1990 Clean Air Act Amendments further exemplifies the relationship between the federal government and the State of California in this area. California’s Low-Emission Vehicle (LEV) Program served as a model for EPA’s CFV Program.

IV. Clean Fuel Vehicles and Clean Alternative Fuels

In 1990, the second major set of CAA Amendments tripled the size of the mobile source control statute with stringent technological limits on conventional vehicle emissions, new controls on gasoline and diesel fuels, and requirements for other mobile sources such as non-road vehicles, trains, ships, and construction equipment.²⁰ The 1990 Amendments also introduced a new approach, at least on the federal level, towards emission controls - the designation of a clean fuel vehicle. Here, federal lawmakers once again looked to California for guidance.²¹ In large part, the federal government modeled the two CFV Programs after California’s earlier LEV Program.

The 1990 CFV Programs required the development of both cleaner burning cars (clean fuel vehicles) and clean alternative fuels.²² The CFV Programs focused on clean fuel vehicles that can meet either the applicable federal standards set out in CAA sections 242 through 245, or California emission standards made applicable by waiver of

¹⁵ Reitze, *supra* note 3, at 17.

¹⁶ See, *Waiver of Federal Preemption: California Low-Emission Vehicle Standards*, 58 Fed. Reg. 4166 (1993) [hereinafter *Waiver Hearings*].

¹⁷ See, *Waiver Hearings*, *supra* note 20.

¹⁸ *EPA's Reilly Clears Way for California to Adopt Tough Vehicle Emission Program*, *The Oil Daily*, Jan. 8, 1993, at 5.

¹⁹ See Pub. L. 95-95, Title I, Section 129(b) (1977).

²⁰ 42 U.S.C. 7521-7590 (1988 & Supp. V 1993).

²¹ See, *Air Quality Standards in Southern California: Hearings Before the Subcommittee on Health & the Environment of the House Comm. on Energy & Commerce*, 100th Cong., 1st Sess. 13 (1987) (testimony of Dr. James M. Lents).

²² See, 1990 Clean Air Act Amendments, 42 U.S.C. 7581, 7581-7590 (1988 & Supp. V 1993).

federal preemption.²³ The new emission standards required an 80% reduction in current levels of organic gas and NOx auto emissions.²⁴ CFVs may meet these requirements on conventional fuel or meet these requirements when running on a “clean alternative fuel.” The definition of clean alternative fuels included compressed natural gas (CNG), methanol, ethanol, liquefied petroleum gas (LPG), electricity, reformulated gasoline and even diesel.²⁵ It does not, however, include biodiesel. While lawmakers recognized that regulating motor vehicle fuels was important to achieving necessary emission reductions under the CFV programs, they left no provision for the inclusion of fuels not already designated by name.

V. The Clean-Fuel Fleet (CFF) Program

In the 1990 Clean Air Act Amendments, Congress created a centrally-fueled clean-fuel fleet program for certain ozone and CO nonattainment areas which required owners or operators of centrally-fueled fleets to ensure that a certain percentage of their fleet comprised clean fuel vehicles and vehicles using clean alternative fuels.²⁶ A centrally fueled fleet consists of ten or more motor vehicles owned or operated by a single person and include public and private fleets such as delivery vans, taxicabs, or school buses that regularly refuel at a common location.²⁷ Credits toward fulfilling statutory requirements are available to fleet operators who purchase more clean fuel vehicles than required, purchase clean fuel vehicles meeting ULEV or ZEV standards, or purchase vehicles in categories that are not covered by the Clean-Fuel Fleet Program but meet ULEV and ZEV standards.²⁸ Early credits are also available for fleet operators who purchase clean fuel vehicles prior to 1998.²⁹ These credits are not tradable outside a State’s State Implementation Plan (SIP) but can be traded between affected fleets in the same State or used towards future purchase requirements. (The CAA created the SIP, a requirement for States to submit to EPA a plan for improving overall air quality within the State regardless of source.)

While prohibiting the EPA from requiring vehicle manufacturers to produce clean fuel fleet vehicles, the 1990 Amendments allowed an opt-out opportunity for those areas wishing to use other methods to meet their air quality objectives. Of the original twenty-two areas covered by the CAA, only six areas have not opted-out. They are Atlanta, Metropolitan Washington D.C. (including Virginia and Maryland), Chicago-Gary-Lake County, Milwaukee-Racine, Denver-Boulder and Baton Rouge, LA. The CFF Program, administered by the affected states, was to begin implementing purchase requirements with model year 1998 EPA-certified clean fuel vehicles.³⁰ However, due to a lack of availability of such vehicles EPA has pushed back the start date to model year 1999 vehicles.³¹ Both light-duty LEVs running on California reformulated gasoline and CFVs certified by EPA are

²³ 42 U.S.C. 7581(7), 7583(e).

²⁴ Waxman et al., *supra* note 2, at 1993.

²⁵ See, 42 U.S.C. 7581(2).

²⁶ See, 1990 Clean Air Act Amendments, 42 U.S.C. 7586(a)-(b). Thirty percent of LDV and LDT fleets must be clean-fuel vehicles in 1998, increasing to 70% in 2000. Fifty percent of HDT fleets must be clean fuel vehicles from 1998 through 2000. *Id.*

²⁷ 42 U.S.C. 7581(5).

²⁸ 42 U.S.C. 7586(f)(1)-(2) & (4).

²⁹ 42 U.S.C. 7586(f)(5).

³⁰ 42 U.S.C. 7586(f)(5).

³¹ See, Margo Oge, EPA Memorandum on Clean Fuel Fleet Implementation, May 22, 1997 (available on EPA web site, on file at EPA and on file with author).

qualified vehicles. However, it is important to note that dual-fueled or flexible-fueled vehicles must meet LEV emission levels on both the petroleum-based fuel and the clean alternative fuel the vehicle can be run on³² and, as mentioned above, biodiesel is not a designated clean alternative fuel. Further, the only heavy-duty CFVs certified by EPA to date are dedicated natural gas vehicles.³³ Should a diesel engine manufacturer be willing to certify an engine as meeting LEV emission standards on both petroleum diesel and biodiesel, the issue of whether or not biodiesel can be considered “a clean alternative fuel” will remain.

VI. The California Pilot Test Program

The California Pilot Program was modeled, in large part, after California’s own LEV Program, which mandates LEV production in California. The two programs share similar exhaust emission standards, credit systems, clean alternative fuel provisions, reporting requirements, and small-volume manufacturer exemptions. However, there are significant discrepancies between the two programs. The Pilot program is a federally administered program. Rather than being demand-driven like the CFF Program, the Pilot Program is supply-driven and simply requires manufacturers to sell a specific number of CFVs in California. Under the Pilot Program, clean fuel vehicles “shall be produced, sold, and distributed (in accordance with normal business practices and applicable franchise agreements) to ultimate purchasers in California including owners of covered fleets... in numbers that meet or exceed” 150,000 vehicles in model years 1996 through 1998, and 300,000 in model year 1999 and thereafter.³⁴ “Sales” are defined in the Pilot Program to mean “the first point of sale from the manufacturer to the dealer or ultimate owner.”³⁵ Automakers are required to calculate their own clean fuel vehicle sales requirements. Their portion of the 150,000 or 300,000 clean fuel vehicle sales quota is based on the manufacturing share of California vehicle sales during the model year two years earlier.³⁶ Additionally, manufacturers cannot use sales of converted vehicles to meet Pilot Program sales requirements.³⁷ Converted vehicles include gasoline- or diesel-burning vehicles that have been modified to meet clean fuel vehicle requirements.³⁸

The Pilot Program, like California’s Clean Fuels Program, also recognizes that clean fuels must be available to consumers in order to attain necessary emission reductions. Both programs require the fuel industry to develop new fuels that better control harmful emissions. The Pilot Program includes a fuel production mandate similar to its vehicle production mandate.³⁹ The program requires California to submit a SIP revision that guarantees “sufficient clean alternative fuels shall be produced, distributed and made available to assure that all clean fuel vehicles required under [the Pilot Program] can operate, to the maximum extent practicable, exclusively on such fuels in California.”⁴⁰ After consultations with vehicle manufacturers, local governments, and fuel suppliers, California must determine the fuels to be produced and distributed.⁴¹ After assessing the necessary the clean fuel

³² 42 U.S.C. 7587(j).

³³ See, EPA’s Office of Mobile Sources Web site at: <http://www.epa.gov/OMSWWW/>

³⁴ 42 U.S.C. 7589(c)(1).

³⁵ 59 Fed. Reg. 50,042, at 50,066.

³⁶ *Id.* at 50,067.

³⁷ 42 U.S.C. 7589.

³⁸ 42 U.S.C. 7587 (regarding the definition of a "person who converts" under 7587 (c)).

³⁹ 42 U.S.C. 7589(c)(2)(A).

⁴⁰ See *id.* See also Waxman et al., *supra* note 2, at 2005.

⁴¹ 42 U.S.C. 7589(c)(2)(A).

quantities and types, California must hold fuel suppliers responsible for producing and distributing these fuels.⁴²

Because of the Pilot Program's forced production and distribution requirements, fuel suppliers will need to develop sales strategies to avoid losses from unsold supplies. California law, however, simply forces fuel suppliers to make clean fuel available; it does not require the production of clean fuel. California's "fuel availability" approach may be considered as weaker than the Pilot Program's "fuel production" approach because it does not provide an incentive for fuel suppliers to sell their fuels.⁴³ And, whenever clean fuels cost more than conventional gasoline, consumers will opt for fueling their clean fuel vehicles with the cheaper conventional gasoline instead of clean fuel. From a societal standpoint the Federal Pilot Program clean fuel production mandate is more efficacious in creating marketing and emplacement strategies for the sale of cleaner fuels. However, the fuel producers themselves may see the California Clean Fuels Program as the more attractive program.

Both the Pilot Program and California Clean Fuels Program provide fuel producers with some flexibility to meet production requirements. Under the Pilot Program, transferable credits are granted to fuel suppliers who exceed their production and distribution requirements. The holder may use the credits to demonstrate compliance with the alternative fuel production requirements. The Pilot Program's credits will allow producers to bank credits in order to offset excess supply in the future, or trade credits to other fuel producers who would rather fulfill the production mandate by purchasing credits rather than producing the clean fuels. California's Clean Fuel Program, on the other hand, does not establish a credit system. Its flexibility lies in a provision that allows any person to petition CARB to substitute a certain fuel for the designated clean fuel.⁴⁴ If the substitute clean fuel does not increase NMOG, NO_x or CO emissions, increase the health risks from toxic emission exposure, or increase deterioration of the emission control system,⁴⁵ fuel producers may provide a potentially cheaper substitute clean fuel under the California Clean Fuel Program. For biodiesel producers, it may be easier to get biodiesel included under California's Clean Fuel Program than under the Federal Pilot Program.

VII. The NLEV or 49 State Rule

While not one of Clean Air Acts' clean fuel fleet programs, the National Low Emission Vehicle (NLEV) standard is a significant enough example of the reliance placed on California by EPA that it merits coverage here. More importantly, it is probably the only EPA enforced standard that any future biodiesel vehicle must meet. The NLEV standard, also based on California's current LEV standard, started as a recommendation of the Ozone Transport Commission (OTC), a group comprised of air quality regulators representing the twelve northeastern states from Maine to Northern Virginia, as well as the District of Columbia. The OTC's recommendation of adopting the California LEV standard throughout its region as one method of bringing those State's SIPs into compliance was quickly accepted by EPA. The OTC LEV Program aimed to reduce smog by requiring that all new passenger cars and light-duty trucks sold in the Northeast after 1999 meet the exhaust emission standards and fleet-average emission requirements established by California. The OTC specifically recommended that the EPA require officials in these states to adopt California's approach to motor vehicle emission control as part of the federal CAA requirements.⁴⁶ In its ruling, the EPA found that each of the SIPs in the northeastern states contained inadequate measures for achieving emission reductions. Therefore, in order to cure these inadequacies, the EPA then required the Ozone Transport Region (OTR) States to adopt the California LEV Program or CAL LEV.⁴⁷ However, this

⁴² Waxman et al., *supra* note 2, at 2005.

⁴³ See. Waxman et al., *supra* note 2, at 2005-6.

⁴⁴ 42 U.S.C. 2317 (1988 & Supp. V 1993).

⁴⁵ *Id.* 2317(a)(1-3).

⁴⁶ 60 Fed. Reg. 4712, at 4718 (1995).

⁴⁷ *Id.*, at 4712.

requirement was later overturned.⁴⁸ EPA was found not to have the authority to require the auto manufacturers to meet the National Low Emission Vehicle (NLEV) standards because Section 202(b)(1)(C) of the Clean Air Act prevents EPA from mandating new exhaust standards applicable before model year 2004. Therefore, NLEV could only come into effect if all of the OTC States and all of the auto manufacturers agreed to it.

Once a voluntary agreement between all affected parties was reached the NLEV Program's emission controls would be legally enforceable.⁴⁹ EPA could not itself negotiate for or with the various parties. However within a year of being set back, EPA was able to promote an accommodation through a proposed rulemaking which outlined their vision of what the NLEV program would look like.⁵⁰ After receiving commentary on the proposed rulemaking EPA published a Final NLEV Program Rule effective January 1998.⁵¹ By March 1998 all affected parties had agreed to opt-in and one enforceable NLEV standard was adopted which would apply to automobiles sold in the northeastern states as of model year 1999 and nationally by model year 2001, three years in advance of EPA's statutory authority.

VIII. Conclusion

Motor vehicle emissions control is critical to improving national air quality. Within this context, the clean fuel vehicle has emerged as a step toward harmful emission reduction. It may be perceived as the newest frontier for clean air advocates. However, the need for further flexibility in setting targets and certifying vehicles should serve as a caveat to the success of technology-forcing requirements. This requires a focus on the end result - cleaner air - and not the means of getting there. From the perspective of renewable fuels, it can be argued that neither the federal CFV Program, CAL LEV nor NLEV Programs provide for sufficient flexibility for renewable fuels to have a real role in these programs despite the implementation of their internal credit exchange system or fleet-average emission targets.

The structure of both the Clean-Fuel Fleet Program (CFF) and the California Pilot Test Program impede biodiesel's potential role within these programs. Flexible-fueled vehicles, such as ethanol or biodiesel vehicles, have to meet LEV standards on both petroleum and renewable fuels in order to qualify as CFVs under these programs. To date, no diesel vehicle has been designated as a CFV by EPA. For biodiesel to have a role in either of these programs, a manufacturer of diesel engines will need to certify an engine family as meeting LEV standards on both petroleum diesel and biodiesel. And, that assumes that EPA will consider biodiesel as a clean alternative fuel under its two CFV programs. Additionally, the incentive for an engine manufacturer to undertake such testing may further be weakened because EPA is currently proposing to allow dedicated CFVs to carry on-board petroleum fuel reserves for emergencies.⁵² In combination with the above issues, as well as existing ULEV and ZEV incentives that favor dedicated vehicles, the EPA proposal would further restrict the perceived value of flexible-fueled vehicles for fleet owners and operators within both CFV programs.

⁴⁸ *Commonwealth of Virginia vs. EPA*, 108 F. 3d 1397 (D.C. Cir. 1997)

⁴⁹ 60 Fed. Reg. 31201 (1997).

⁵⁰ 62 Fed. Reg. 44754 (1997).

⁵¹ 63 Fed. Reg. 926 (1998).

⁵² Draft working document of proposed Direct Final Rule (October 31, 1997) on file with author and EPA Office of Mobile Sources.