



# Regulatory Announcement

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## Proposed Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements

*The U.S. Environmental Protection Agency (EPA) is proposing a major program to significantly reduce emissions from heavy-duty engines and vehicles. This comprehensive national control program regulates the heavy-duty vehicle and its fuel as a single system. We are proposing new emission standards that will begin to take effect in 2007 and corresponding diesel fuel requirements that take effect in 2006. If fully implemented as proposed, this program will reduce emissions of oxides of nitrogen (NO<sub>x</sub>) and nonmethane hydrocarbons (NMHC), key ingredients in ozone, by 2.8 million and 305,000 tons per year in 2030, respectively. Particulate emissions from these vehicles would be reduced by 110,000 tons per year in 2030.*

### Overview

These proposed standards are based on the use of high-efficiency catalytic aftertreatment devices or comparably effective advanced technologies. Because these devices are damaged by sulfur, we are also proposing new fuel quality requirements to remove most of the sulfur from highway diesel fuel by the middle of 2006. These changes form the second phase of a two-phase Agency initiative, beginning with the previously set 2004 heavy-duty engine standards, to reconcile the heavy-duty highway engine with the environment.

This second phase will achieve emission reductions of upwards of 90 percent or more over levels achieved by the phase 1 reductions, and will provide a clean diesel fuel in time for implementation of the light-duty Tier 2 standards. As a result, diesel vehicles of all sizes will achieve gasoline-like exhaust emission levels, in addition to their inherent advantages over gasoline vehicles with respect to fuel economy, lower greenhouse gas emissions, and lower evaporative hydrocarbon emissions.

## **Background**

Diesel engines overwhelmingly dominate the bus and large truck markets and have been capturing a growing share of the light heavy-duty vehicle market over the last decade. The impact of diesel engines on air quality may grow even larger if automobile manufacturers carry out stated plans to increase sales of diesel-powered light-duty trucks and cars over the next few years. In light of the air quality concerns, we published an Advance Notice of Proposed Rulemaking (ANPRM) in May 1999 to investigate the possibility of bringing about dramatic improvements in diesel emissions control through a combination of fuel and vehicle changes. The fuel changes would enable not just heavy-duty diesel emissions control, but would also help to enable light-duty diesels to meet our recently adopted Tier 2 standards. Based on the air quality concerns and the comments we received on the ANPRM, we are now proposing a comprehensive national control program that covers heavy-duty vehicles operated on any fuel.

## **Proposed Standards for Heavy-Duty Highway Engines and Vehicles**

### **Heavy-Duty Engines**

We are proposing a particulate matter (PM) emissions standard for new heavy-duty engines of 0.01 grams per brake-horsepower-hour (g/bhp-hr), to take full effect in the 2007 heavy-duty engine (HDE) model year. We are also proposing standards for oxides of nitrogen (NO<sub>x</sub>) and nonmethane hydrocarbons (NMHC) of 0.20 g/bhp-hr and 0.14 g/bhp-hr, respectively. These NO<sub>x</sub> and NMHC standards would be phased in together between 2007 and 2010, for diesel engines. The phase-in would be on a percent-of-sales basis: 25 percent in 2007, 50 percent in 2008, 75 percent in 2009, and 100 percent in 2010. Because of the more advanced state of gasoline engine emissions control technology, these engines would be fully subject to these standards in the 2007 model year, although we request comment on phasing in these standards as well. In addition, we are proposing formaldehyde emission standards and new requirements for crankcase emissions control on turbocharged diesel engines.

Proposed Standards for HDEs	
PM	0.01 g/bhp-hr
NO <sub>x</sub>	0.20 g/bhp-hr
NMHC	0.14 g/bhp-hr

### Heavy-Duty Vehicles

Proposed standards for complete heavy-duty vehicles (HDVs) would be implemented on the same schedule as for engine standards. For certification of complete vehicles between 8500 and 10,000 pounds gross vehicle weight rating (GVWR), the proposed standards are 0.2 grams per mile (g/mi) for NO<sub>x</sub>, 0.02 g/mi for PM, and 0.195 g/mi for NMHC. For vehicles between 10,000 and 14,000 pounds, the proposed standards are 0.4 g/mi for NO<sub>x</sub>, 0.02 g/mi for PM, and 0.230 g/mi for NMHC. These standards levels are roughly comparable to the proposed engine-based standards in these size ranges. Note that these standards would not apply to vehicles above 8500 pounds that we classify as medium-duty passenger vehicles as part of our Tier 2 program because of their primary use as passenger vehicles (the final standards for these vehicles are in 65 FR 6698, February 10, 2000).

Proposed Standards for HDVs			
GVWR	PM	NO <sub>x</sub>	NMHC
8,500-10,000	0.02 g/mi	0.2 g/mi	0.195 g/mi
10,000-14,000	0.02 g/mi	0.4 g/mi	0.230 g/mi

### Evaporative Emissions

We are proposing to revise the evaporative emissions standards for heavy-duty engines and vehicles, effective in the 2007 model year. The proposed standards for 8500 to 14,000 pound vehicles are 1.4 and 1.75 grams per test for the 3-day diurnal and supplemental 2-day diurnal tests, respectively. Slightly higher standards levels of 1.9 and 2.3 grams per test would apply for vehicles over 14,000 pounds. These proposed standards represent more than a 50 percent reduction in the numerical standards as they exist today.

<b>Proposed Evaporative Emission Standards</b>		
<b>GVWR</b>	<b>3-Day Diurnal Test</b>	<b>Supplemental 2-Day Diurnal Test</b>
8,500-14,000	1.4 g/test	1.75 g/test
>14,000	1.9 g/test	2.3 g/test

### **Proposed Standards for Diesel Fuel**

We are proposing that diesel fuel sold to consumers for use in highway vehicles have a sulfur content no greater than 15 parts per million (ppm), beginning June 1, 2006. This proposed sulfur cap is based on our assessment of how sulfur-intolerant advanced aftertreatment technologies will be, and a corresponding assessment of the feasibility of low-sulfur fuel production and distribution. We are seeking comment on voluntary options for providing refiners with flexibility in complying with the low sulfur highway diesel fuel program. In addition, we request comment on some potential flexibility provisions to assist small refiners in complying with the program.

### **Health and Environmental Benefits**

Without significant new controls on motor vehicle emissions, millions of Americans will continue to breathe unhealthy air. The standards proposed would result in substantial benefits to the public health and welfare through significant annual reductions in emissions of NO<sub>x</sub>, PM, NMHC, carbon monoxide, sulfur dioxide, and air toxics. If fully implemented as proposed, this program will reduce emissions of NO<sub>x</sub> and NMHC, key ingredients in ozone, by 2.8 million and 305,000 tons per year in 2030, respectively. Particulate emissions from these vehicles would be reduced by 110,000 tons per year in 2030.

Ozone causes a range of health problems related to breathing, including chest pain, coughing, and shortness of breath. PM is deposited deep in the lungs and causes premature death, increased emergency room visits, and increased respiratory symptoms and disease. With both ozone and PM, children and the elderly are most at risk. In addition, ozone, NO<sub>x</sub>, and PM adversely affect the environment in various ways, including crop damage, acid rain, and visibility impairment. Numerous studies also link diesel exhaust to increased incidence of lung cancer.

## **Cost of the Proposed Program**

The significant environmental benefits of this program would come at an average cost increase of about \$1000 to \$1600 per new vehicle, depending on the vehicle size. We estimate that the overall cost associated with lowering the sulfur cap from the current level of 500 ppm to the 15 ppm level proposed today will be approximately 3-4 cents per gallon, comprised of an approximately 4 cents per gallon increased cost to produce and distribute the fuel, and a cost offset of about 1 cent per gallon or more from the vehicle maintenance savings that result from the use of the cleaner fuel.

## **Public Participation Opportunities**

We welcome your comments on this proposal. For instructions on submitting written comments, please see the *Federal Register* notice. You may submit written comments to EPA up to 90 days after the proposed rule is signed by the EPA Administrator. It is available from the EPA Air Docket by calling 202-260-7548; please refer to Docket No. A-99-06. In addition, you can access the proposed rule and related documents electronically on the Office of Transportation and Air Quality Web site at:

<http://www.epa.gov/otaq/diesel.htm>

The address for submitting written comments is:

Margaret Borushko (Docket No. A-99-06)  
U. S. Environmental Protection Agency  
Office of Transportation and Air Quality  
2000 Traverwood Drive  
Ann Arbor, MI 48105

You may also submit comments by email to [diesel@epa.gov](mailto:diesel@epa.gov).

In addition, public hearings will be held in Los Angeles, Denver, New York City, Chicago, and Atlanta approximately three weeks after publication of the proposed rule in the *Federal Register*. Additional information about the hearings will be published in a supplemental notice in the *Federal Register* in the near future.

## **For More Information**

You can access documents related to the proposed rule and the ANPRM electronically at the Internet site listed above, or by contacting Margaret Borushko at the address given above.