

## Chapter I: Introduction

We prepared this Draft Regulatory Impact Analysis (RIA) for our notice of proposed rulemaking (NPRM) on Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements. The purpose of this document is to present our estimates of the likely costs, benefits and industry impacts associated with the implementation of the proposed heavy-duty engine and vehicle standards and the diesel sulfur requirements. Following our review of public comments on the proposal, we will update this Draft RIA and issue a final RIA as part of the Final Rulemaking.

This chapter provides an overview of the proposal. Subsequent chapters present the following information:

- **Chapter II** presents the health and welfare concerns associated with heavy-duty vehicle emissions, and the expected emissions reductions resulting from the proposed standards.
- **Chapter III** examines the engine and vehicle changes needed to meet the proposed heavy-duty emission standards and the feasibility of these changes under the proposed implementation schedule. It also presents the basis for the need for diesel fuel sulfur levels of 15 ppm or less.
- **Chapter IV** examines the refinery and fuel distribution system changes needed to meet the proposed low sulfur highway diesel fuel requirement and the feasibility of these changes under the proposed implementation schedule.
- **Chapter V** estimates the economic impact of the engine/vehicle and fuels standards in per-vehicle and per-gallon terms, and in the aggregate.
- **Chapter VI** discusses the cost-effectiveness of the proposed program.
- **Chapter VII** presents the Initial Regulatory Flexibility Analysis (RFA) for this NPRM. This analysis evaluates the impacts of the heavy-duty engine and vehicle standards and the diesel sulfur requirements on small businesses.
- **Chapter VIII** analyzes the issues surrounding possible exemptions for Alaska and U.S. territories.
- **Chapter IX** analyzes relevant diesel fuel program alternatives.
- **Appendix A** describes current regulatory requirements that affect diesel sulfur content and explains our bases for controlling diesel sulfur under Section 211(c) of the Clean Air Act.

## **Heavy-Duty Standards / Diesel Fuel Draft RIA - May 2000**

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The proposal covers the second of two phases in a comprehensive nationwide program for controlling emissions from heavy-duty engines (HDEs) and vehicles. It builds upon the phase 1 program we proposed last October (64 FR 58472, October 29, 1999). That action reviewed and proposed to confirm the 2004 model year emission standards set in 1997 (62 FR 54693, October 21, 1997), proposed stringent new emission standards for gasoline-fueled heavy-duty vehicles (HDVs), and proposed other changes to the heavy-duty program, including provisions to ensure in-use emissions control.

This second phase of the program looks beyond 2004, based on the use of high-efficiency exhaust emission control devices and the consideration of the vehicle and its fuel as a single system. In developing the proposal, we took into consideration comments received in response to an advance notice of proposed rulemaking (ANPRM) published in May of last year (64 FR 26142, May 13, 1999), and by comments we received in response to our discussion of future standards in the heavy-duty 2004 standards proposal last October.

There are two basic parts to the proposal: (1) new exhaust emission standards for heavy-duty highway engines and vehicles, and (2) new quality standards for highway diesel fuel. The systems approach of combining the engine and fuel standards into a single program is critical to the success of our overall efforts to reduce emissions, because the emission standards would not be feasible without the fuel change. This is because the emission standards, if promulgated, are expected to result in the use of high-efficiency exhaust emission control devices that would be damaged by sulfur in the fuel. This proposal, by providing extremely low sulfur diesel fuel, would also enable cleaner diesel passenger vehicles and light-duty trucks. This is because the same pool of highway diesel fuel also services these light-duty diesel vehicles, and these vehicles can employ technologies similar to the high-efficiency heavy-duty exhaust emission control technologies that would be enabled by the fuel change. We believe these technologies are needed for diesel vehicles to comply with our recently adopted Tier 2 emissions standards for light-duty highway vehicles (65 FR 6698, February 10, 2000).

We believe that this systems approach is a comprehensive way to enable promising new technologies for clean diesel affecting all sizes of highway diesel engines and, eventually, diesel engines used in nonroad applications too. The fuel change, in addition to enabling new technologies, would also produce emissions and maintenance benefits in the existing fleet of highway diesel vehicles. These benefits would include reduced sulfate and sulfur oxides emissions, reduced engine wear and less frequent oil changes, and longer-lasting exhaust gas recirculation (EGR) components on engines equipped with EGR. Heavy-duty gasoline vehicles would also be expected to reach cleaner levels due to the transfer of recent technology developments for light-duty applications, and the recent action taken to reduce sulfur in gasoline as part of the Tier 2 rule.

The basic elements of the proposal are outlined below. We are proposing a 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 HDE model year. We are also proposing standards for NO<sub>x</sub> and 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, gasoline engines would be fully subject to these standards in the 2007 model year, although we request comment on phasing these standards in as well. A potential delay in the implementation date of the gasoline engine and vehicle standards to the 2008 model year arising from issues connected with the 2004 model year standards is discussed in section III.D.2. In addition, we are proposing a formaldehyde (HCHO) emissions standard of 0.016 g/bhp-hr for all heavy-duty engines, to be phased in with the NO<sub>x</sub> and NMHC standards, and the inclusion of turbocharged diesels in the existing crankcase emissions prohibition, effective in 2007.

Proposed standards for complete 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, 0.195 g/mi for NMHC, and 0.016 g/mi for formaldehyde. 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, 0.230 g/mi for NMHC, and 0.021 g/mi for formaldehyde. 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.

We are proposing to revise the evaporative emissions standards for heavy-duty engines and vehicles, effective on the same schedule as the gasoline engine and vehicle exhaust emission standards. 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.

Finally, we are proposing that diesel fuel sold to consumers for use in highway vehicles be limited in sulfur content to a level of 15 parts per million (ppm), beginning June 1, 2006. This proposed sulfur standard is based on our assessment of how sulfur-intolerant advanced exhaust emission control 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.

With minor exceptions, existing compliance provisions for ensuring diesel fuel quality that have been in effect since 1993 would remain unchanged (55 FR 34120, August 21, 1990).

