

within 10 percent of the PM_{2.5} standard in 2030, and 44 million people are projected to live in counties within 10 percent of the level of the 8-hour standard in 2030. Thus, our analyses show that these counties face a significant risk of exceeding or failing to maintain the PM_{2.5} and the 8-hour ozone NAAQS without significant additional controls between 2007 and 2030.

Federal, State and local governments are working to bring ozone and particulate levels into compliance with the NAAQS through State Implementation Plan (SIP) attainment and maintenance plans, and to ensure that future air quality reaches and continues to achieve these health- and welfare-based standards. The reductions in this proposed rulemaking will play a critical part in these important efforts to attain and maintain the NAAQS. In addition, reductions from this action will also reduce public health and welfare effects associated with maintenance of the 1-hour ozone and PM₁₀ NAAQS.

Emissions from nonroad, locomotive, and marine diesel engines account for substantial portions of the country's ambient PM and NO_x levels. NO_x is a key precursor to ozone and PM formation. We estimate that these engines account for about ten percent of total NO_x emissions and about ten percent of total PM emissions. These proportions are even higher in some urban areas, where these engines contribute up to 19 percent of the total NO_x emissions and up to 18 percent of the total PM emissions inventory. Over time, the relative contribution of these diesel engines to air quality problems will go even higher unless EPA takes action to further reduce pollution levels. For example, EPA has already taken steps to bring emissions levels from light-duty and heavy-duty vehicles and engines to near-zero levels by the end of this decade. The PM and NO_x standards for nonroad, locomotive, and marine diesel engines in this proposal would have a substantial impact on emissions. By 2030, NO_x emissions from these diesel engines under today's standards will be reduced by 827,000 tons, and PM emissions will decline by about 127,000 tons, dramatically reducing this source of NO_x and PM emissions. Urban areas, which include many poorer neighborhoods, can be disproportionately impacted by such diesel emissions, and these neighborhoods will thus receive a relatively larger portion of the benefits expected from proposed emissions controls. Diesel exhaust is of special concern because it is associated with increased risk of lung cancer and

respiratory disease. EPA recently issued its Health Assessment Document for Diesel Exhaust.⁶ The Agency has classified diesel exhaust as likely to be carcinogenic to humans by inhalation at environmental exposures. State and local governments, in their efforts to protect the health of their citizens and comply with requirements of the Clean Air Act (CAA or "the Act"), have recognized the need to achieve major reductions in diesel PM emissions, and have been seeking Agency action in setting stringent new standards to bring this about.⁷

2. Technology and Fuel Based Solutions

Although the air pollution from nonroad diesel exhaust is challenging, we believe they can be addressed through the application of high-efficiency emissions control technologies. As discussed in much greater detail in section III, the development of diesel emissions control technology has advanced in recent years so that very large emission reductions (in excess of 90 percent) are possible, especially through the use of catalytic emission control devices installed in the nonroad equipment's exhaust system and integrated with the engine controls. These devices are often referred to as "exhaust emission control" or "aftertreatment" devices. Exhaust emission control devices, in the form of the well-known catalytic converter, have been used in gasoline-fueled automobiles for 28 years.

Based on the Clean Air Act requirements in section 213, we are proposing stringent new emission standards that will result in the use of these diesel exhaust emission control devices. We are also proposing changes to nonroad diesel fuel quality standards, under section 211(c) of the Act, in order to enable these high-efficiency technologies.

To meet the proposed new standards, application of high-efficiency exhaust emission controls for both PM and NO_x will be needed for most engines. High-efficiency PM exhaust emission control

technology has been available for several years. This technology has continued to improve over the years, especially with respect to durability and robust operation in use. It has also proved extremely effective in reducing exhaust hydrocarbon emissions. Thousands of such systems are now in use, especially in Europe. It is the same technology we expect to be applied to meet the PM standards in the 2007 heavy-duty highway diesel engine rule. However, as discussed in detail in section III, these systems are very sensitive to sulfur in the fuel. For the technology to be viable and capable of meeting the standards, we believe it will require diesel fuel with sulfur content capped at the 15 ppm level.

Similarly, high-efficiency NO_x exhaust emission control technology will be needed if nonroad diesel engines are to attain the proposed standards. This is the same technology that we anticipate will be applied to heavy-duty highway diesel engines to meet the NO_x standards included in the 2007 highway diesel program. This technology, like the PM technology, is dependant on the 15 ppm maximum nonroad diesel fuel levels being proposed in this action in order to be feasible and capable of achieving the standards. Similar high-efficiency NO_x exhaust emission control technology has been quite successful in gasoline direct injection engines that operate with an exhaust composition fairly similar to diesel exhaust and is expected to be used to meet the 2007 and later heavy-duty highway diesel standards. As discussed in section III, application of this technology to nonroad diesels has some additional engineering challenges. In that section, we discuss the current status of this technology as well as the major development issues still to be addressed and the development steps that can be taken. With the lead-time available and the introduction of ultra low sulfur nonroad diesel fuel, we are confident the proposed application of this technology to nonroad diesels would proceed at a reasonable rate of progress and will result in systems capable of achieving the standards.

This view is further supported by the fact that manufacturers are already working on developing high-efficiency aftertreatment devices in order to have them available for introduction on highway diesel engines by 2007. EPA issued a progress report in June 2002 which discussed our findings that industry was making substantial progress in developing these devices. Additionally, the Clean Diesel Independent Review Panel issued a report in October 2002 on similar

⁶ U.S. EPA (2002) Health Assessment Document for Diesel Engine Exhaust. EPA/600/8-90/057F Office of Research and Development, Washington DC. This document is available electronically at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=29060>.

⁷ For example, see letters dated April 9, 2002, from Agency Secretary of California EPA, Commissioner of NY State DEC, and Commissioner of Texas NRCC to Governor Whitman; dated January 28, 2003 from Western Regional Air Partnership to Governor Whitman, and dated December 17, 2002, from State and Territorial Air Pollution Program Administrators and Association of Local Air Pollution Control Officials and Northeast States for Coordinated Air Use Management (and other organizations).