

^b Manufacturers may use banked Tier 2 NMHC+NO_x credits to demonstrate compliance with the proposed 75–175 hp engine NO_x standard in this model year. Alternatively, manufacturers may forego this special banked credit option and instead meet an alternative phase-in requirement in 2012, 2013, and part of 2014. See Section III.B.1.b.

The proposed long-term 0.01 and 0.02 g/bhp-hr Tier 4 PM standards for >75 hp and 25–75 hp engines, respectively, combined with the fuel change and proposed new requirements to ensure robust control in the field, represent a reduction of over 95% from in-use levels expected with Tier 2/Tier 3 engines.¹¹⁷ The proposed 0.30 g/bhp-hr Tier 4 NO_x standard for >75 hp engines represents a NO_x reduction of about 90% from in-use levels expected with Tier 3 engines. The basis for the proposed standard levels is presented in Section III.E.

a. Standards Timing

The timing of the Tier 4 NO_x, PM, and NMHC standards is closely tied to the proposed timing of fuel quality changes discussed in section IV, in keeping with the systems approach we are taking for this program. The earliest Tier 4 standards would take effect in model year 2008, in conjunction with the introduction of 500 ppm maximum sulfur nonroad diesel fuel in mid-2007. This fuel change serves a dual environmental purpose. First, it provides a large immediate reduction in PM emissions for the existing fleet of engines in the field. Second, its widespread availability by the end of 2007 aids engine designers in employing emission controls capable of achieving the proposed standards for model year 2008 and later engines; this is because the performance and durability of such technologies as exhaust gas recirculation (EGR) and diesel oxidation catalysts is improved by lower sulfur fuel.¹¹⁸ The reduction of sulfur in nonroad diesel fuel will also provide sizeable economic benefits to machine operators as it will extend oil change intervals and reduce wear and corrosion (see section V).

We are not, however, proposing new 2008 standards for engines at or above 100 hp because these engines are subject to existing Tier 3 NMHC+NO_x standards (Tier 2 for engines above 750 hp) in 2006 or 2007. Setting new 2008 standards would provide only one or two years before another round of design changes would have to be made

for Tier 4. Engines between 50–100 hp also have a Tier 3 NMHC+NO_x standard, but it takes effect in 2008, providing an opportunity to coordinate with Tier 4 to provide the desired pull-ahead of PM control. We believe that we can accomplish this PM pull-ahead without hampering manufacturers' Tier 3 compliance efforts by providing two Tier 4 compliance options for 50–75 hp engines. This reflects the splitting of the current 50–100 hp category of engines to match the new rated power¹¹⁹ categories shown in Figures III.B–1 and 2. We are proposing to provide manufacturers with the option to skip the Tier 4 2008 PM standard (see Figure III.B.1) and instead to focus design efforts on introducing PM filters for these engines one year earlier, in 2012. This option would ensure that a manufacturer's Tier 3 NMHC+NO_x compliance plans are not complicated by having to meet a new Tier 4 PM standard in the same timeframe, if that were to become a concern for a manufacturer.

We are concerned that this optional approach for 50–75 hp engines might be abused by equipment manufacturers whose engine suppliers opt not to meet the PM pull-ahead standard in 2008, but who then switch engine suppliers to avoid PM filter-equipped engines in 2012. We are therefore proposing that an equipment manufacturer making a product with engines not meeting the pull-ahead standard in any of the years 2008–2011, must use engines in that product in 2012 meeting the 0.02 g/bhp-hr PM standard; that is, from the same engine manufacturer or from another engine manufacturer choosing the same compliance option. This restriction would not apply if the 2008–2011 engines at issue are being produced under the equipment manufacturer flexibility provisions discussed in section VII.B. Also, we would not prohibit an equipment manufacturer who is using non-pull-ahead engines in 2008–2011 from making use of available equipment manufacturer flexibility provisions in 2012 or later. That is, they could continue to use Tier 3 engines in 2012 that are purchased under these provisions; they would, however, still be subject to the above-described restriction on switching manufacturers. We solicit comment on whether this

restriction should have a numerical basis (e.g., the “no switch” restriction in 2012 applies to the same percentage of 50–75 hp machines produced with non-pull-ahead engines in 2008–2011) to avoid further abuse by equipment manufacturers who redefine their product models to dodge the requirement, and on other suggestions for dealing with this concern.

Note that we are not proposing the optional 2008 PM standard for engines between 75 and 100 hp, even though they, like the 50–75 hp engines, are subject to a 2008 Tier 3 standard. This is because we believe that these larger engines, proposed to be grouped into a new 75–175 hp category, would be subject to stringent new PM and NO_x standards beginning in 2012, and adding a 2008 PM component to this program for a quarter of this 75–175 hp range would complicate manufacturers' efforts to comply in 2012 for the overall category.

We view the 2008 portion of the Tier 4 program as highly important because it provides substantial PM and NO_x emissions reductions during the several years prior to 2011. Initiating Tier 4 in 2008 also fits well with the lead time, stability, cost, and technology availability considerations of the overall program.¹²⁰ Initiating the Tier 4 standards in 2008 would provide three to four years of stability after the start of Tier 2 for engines under 50 hp. As mentioned above, it also coincides with the start date of Tier 3 NO_x+NMHC standards for engines between 50 and 75 hp and so introduces no stability issues for these engines. As the Agency expects to finalize this rule in early 2004, the 2008 start date provides almost 4 years of lead time to accomplish redesign and testing. The evolutionary character of the 2008 standards, based as they are on proven technologies, and the fact that some certified engines already meet these standards as discussed in Section

¹¹⁷ Note that we are grouping all standards proposed in this rule under the general designation of “Tier 4 standards”, including those proposed to take effect in 2008. As a result, there are no “Tier 3” standards in the multi-tier nonroad program for engines below 50 hp or above 750 hp.

¹¹⁸ “Nonroad Diesel Emissions Standards Staff Technical Paper”, EPA420-R-01-052, October 2001.

¹¹⁹ The term rated power is used in this document to mean the maximum power of an engine. See section VIII.L for more information about how the maximum power of an engine is determined.

¹²⁰ Section 213(b) of the Clean Air Act does not specify a minimum lead time period, nor does it mandate a set minimum period of stability for the standards (differing in these respects from the comparable provision section 202(a)(3)(C)) applicable to highway engines). However, in considering the amount of lead time and stability provided, EPA takes into consideration the need to avoid disruptions in the engine and equipment manufacturing industries caused by redesign mandates that are too frequent or too soon after a final rulemaking. These are appropriate factors to consider in determining “the lead time necessary to permit the development and application of the requisite technology”, and are part of taking cost into consideration, as required under section 213 (b).