

unlikely that they would be selected by most refiners for production as early as 2007. Finally, the use of conventional hydrotreating technology to meet a 500 ppm standard can readily be combined later with these alternative technologies to meet the subsequent 15 ppm standard in 2010. Thus, we expect that the vast majority of refiners would use conventional hydrotreating to meet the 500 ppm standard in 2007 applicable to NRLM diesel fuel.

Refiners would also likely need to install or modify several existing ancillary units related to sulfur removal (e.g., hydrogen production and purification, sulfur recovery, amine scrubbing and sour water scrubbing facilities). All of these units currently exist at the vast majority of refineries, but may have to be expanded or enlarged.

4. Has Technology to Meet a 500 ppm Cap Been Commercially Demonstrated?

Conventional diesel desulfurization technologies have been available and in use for many years. U.S. refiners have nearly ten years of experience with this technology in producing diesel fuel with less than 500 ppm sulfur for highway use. Thus, the technology to produce 500 ppm NRLM diesel fuel has clearly been demonstrated and optimized over the last decade.

5. Availability of Leadtime To Meet the 2007 500 ppm Sulfur Cap

About 105 refineries in the U.S. currently produce high sulfur distillate fuel. Under the fuel-related provisions of this proposal, we project that roughly 42 of these refineries would likely need to produce 500 ppm NRLM diesel fuel to satisfy the demand for this fuel. The remaining 63 or so refineries would continue to produce high sulfur distillate fuel, either as heating oil or as high sulfur NRLM diesel fuel.

If we promulgate this proposal one year from today, this would provide refiners and importers with approximately 38 months before they would have to begin complying with the 500 ppm cap for NRLM diesel fuel on June 1, 2007. Our leadtime analysis, which is presented in the draft RIA, projects that 27–39 months are typically needed to design and construct a diesel fuel hydrotreater.²⁵⁹ Thus, the leadtime available for the 500 ppm cap in mid-2007 should be sufficient.

Easing the task is the fact that we project that essentially all refiners would use conventional hydrotreating to comply with the 500 ppm NRLM

diesel fuel cap. This technology has been used extensively for more than 10 years and its capabilities to process a wide range of diesel fuel blendstocks are well understood. Thus, the time necessary to optimize this technology for a specific refiner's situation should be relatively short.

While conventional hydrotreating would likely be used to meet the 500 ppm cap in 2007, most refiners would have to plan to be able process this fuel further to meet the 15 ppm nonroad diesel fuel cap in 2010. Even those refiners planning on producing 500 ppm locomotive and marine diesel fuel starting in 2010 would likely have to plan for the potential that this fuel could be controlled to 15 ppm sulfur at some time in the future. Thus, the conventional hydrotreater built in 2007 would have to be able to be compatible with the technology eventually chosen to produce 15 ppm fuel in 2010 or later. This could affect the hydrotreater's design pressure, physical location and layout and peripherals, such as hydrogen supply and utilities. However, we project that 34 out of the 42 refineries which we project would produce this fuel also produce highway diesel fuel. Thus, over 80 percent of the refiners likely to produce 500 ppm NRLM fuel in 2007 are already well into their planning for meeting the 15 ppm highway diesel fuel standard, effective June 1, 2006. It is likely that these refiners have already chemically characterized their high sulfur diesel fuel blendstocks, as well as their highway diesel fuel, for potential desulfurization. They will also have already assessed the various technologies for producing 15 ppm diesel fuel and have a good idea of what technology they might use to meet the 15 ppm nonroad diesel fuel cap starting in 2010. Those refiners which only produce high sulfur distillate fuel today would still be able to take advantage of the significant experience that technology vendors have obtained in helping refiners of highway diesel fuel plan for producing 15 ppm diesel fuel in 2006.

Also, of the 34 refineries producing highway diesel fuel today, we project that three will likely build a new hydrotreater to produce 15 ppm highway diesel fuel in 2006. This would allow them to produce 500 ppm NRLM diesel fuel using their existing highway diesel fuel hydrotreater. Another 10 of these 34 refineries produce relatively small volumes of high sulfur distillate compared to highway diesel fuel today. Thus, we project that they should be able to produce 500 ppm NRLM fuel from their high sulfur distillate with

minor modification to their existing hydrotreater.

Refiners may also need some time to assess what diesel fuel and heating oil markets they plan on participating in starting 2010. While heating oil may not be widely distributed in PADDs 2, 3 and 4, refiners in PADDs 1 and 3 would still be able to produce heating oil for the Northeast fuel market. Likewise, heating oil may still be distributed in the Pacific Northwest. Under this proposal, locomotive and marine diesel fuel would remain at 500 ppm for some time. Thus, many refiners would require some time to decide what market to participate in after 2010. This strategic planning should be able to coincide with refiners' evaluation of 15 ppm technologies and not add to the overall lead time required.

In all, we project that the task of producing 500 ppm NRLM fuel in 2007 would be less difficult than the task refiners faced with the implementation of the 500 ppm highway diesel fuel cap in 1993. Refiners had just over three years of leadtime for the highway diesel fuel cap, as is the case here and this proved sufficient.

6. What Technology Would Refiners Use to Meet the Proposed 15 ppm Sulfur Cap for Nonroad Diesel Fuel?

We project that refiners would be able to use a variety of desulfurization technologies to meet the proposed 15 ppm sulfur cap for nonroad fuel. One approach would be to use an extension of conventional hydrotreating technology. We expect that refiners would utilize hydrotreating to meet the proposed 500 ppm standard. We expect that refiners would design this hydrotreater to facilitate the addition of a second reactor or hydrotreating stage to further desulfurize their distillate blendstocks from 500 ppm to 15 ppm. Refiners might also shift to the use of an improved catalyst even in the first reactor (i.e., that producing roughly 500 ppm sulfur product), as well as add equipment to further purify the hydrogen used.

This is the same technology which EPA projected would be used by most refiners to meet the 15 ppm sulfur cap for highway diesel fuel. EPA just recently reviewed the progress being made by refining technology vendors and refiners in meeting the 2006 highway diesel sulfur cap.²⁶⁰ All evidence available confirms EPA's projection that conventional hydrotreating will be capable of producing diesel fuel containing less

²⁵⁹ "Highway Diesel Progress Review," USEPA, EPA420-R-02-016, June 2002.

²⁶⁰ "Highway Diesel Progress Review," EPA, June 2002, EPA420-R-02-016.