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July 1, 2013

Air and Radiation Docket and Information Center
U.S. Environmental Protection Agency
Mail Code 2822T
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Attention: Docket I.D. # **EPA–HQ–OAR–2011–0135**

Re: *Proposed Rule – Tier 3 Motor Vehicle Emission and Fuel Standards*

Dear Docket Administrator:

The Northeast States for Coordinated Air Use Management (NESCAUM) offers the following comments on the U.S. Environmental Protection Agency's (EPA's) proposal, published on May 21, 2013 in the Federal Register, entitled *Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards* (78 FR 29816-30191). NESCAUM is the regional association of air pollution control agencies in Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

NESCAUM strongly supports lowering the average sulfur content of gasoline and further reducing emissions from motor vehicles. The proposed standards are achievable using commercially available technologies, and the cost would be recovered many times over through reductions in morbidity and mortality throughout the nation. In the absence of Tier 3, similar levels of emission reductions would have to be accomplished by further controlling local sources, an unfair economic burden on local businesses when more cost-effective national programs are available.

Overview

NESCAUM and our member states are committed to clean vehicles, as evidenced by the adoption of the California Low-Emission Vehicle (LEV) program in seven of our member states. While the Tier 3 vehicle emission standards would not directly affect emissions from new vehicles sold in these states, they would reduce pollution transport from neighboring regions and ensure that out-of-state vehicles operating within our region have comparably low emission characteristics. More importantly, the Tier 3 fuel standards would improve air quality in the Northeast by significantly reducing emissions from the existing fleet. By harmonizing vehicle emission standards with those in the California program, Tier 3 would facilitate compliance by automobile manufacturers, enabling them to harness economies of scale by deploying advanced emission control technologies in all new vehicles sold nationwide.

While Tier 2 vehicles are significantly cleaner than their predecessors, motor vehicles remain the largest source of ozone-forming pollutants in the region. As early as 2007, EPA recognized the importance of Tier 3 standards to help states meet the national ambient air quality standard (NAAQS) for ozone, and it is late in delivering the much needed reductions from the light-duty vehicle sector. It is both feasible and appropriate to set new federal exhaust and evaporative emission standards and clean gasoline requirements comparable to those already in place in California.

The low sulfur gasoline provisions in the proposed Tier 3 rule would provide critical air quality, public health and environmental benefits in the Northeast. Cleaner gasoline allows pollution control equipment on cars and trucks to operate more effectively and can significantly reduce oxides of nitrogen (NOx) and other vehicle emissions. The introduction of 10 parts per million (ppm) sulfur gasoline would result in a large and nearly immediate reduction in NOx emissions from the existing fleet of gasoline vehicles. Lower sulfur gasoline also facilitates the deployment of advanced technologies to improve fuel economy and reduce greenhouse gas emissions, which would help mitigate the impacts of climate change, reduce gasoline consumption, and save consumers money. For example, one of the most promising near-term technologies for reducing fuel consumption, lean-burn gasoline direct injection (GDI), is impractical without lower sulfur gasoline.[1] In addition, the rule as proposed would lead to lower emissions of the greenhouse gases nitrous oxide (N_2O) and methane (CH_4), more than offsetting any GHG increase at refineries associated with fuel desulfurization.[2]

Motor vehicles are the Northeast's largest source of NOx, which is the most important contributor to elevated regional ozone concentrations and an important precursor to fine particulate matter (PM2.5) formation. These pollutants are responsible for tens of thousands of premature deaths, hospital admissions, and lost work and school days in the U.S. annually. Reductions in NOx associated with the Tier 3 rule would also help states meet the new nitrogen dioxide NAAQS and reduce the environmental impacts of acid rain, coastal marine eutrophication, and regional haze.

National and regional NOx controls, including those for motor vehicles, have proven to be extremely effective in lowering ambient levels of ozone in the eastern U.S. NESCAUM estimates that the Tier 3 low sulfur gasoline provisions alone would reduce NOx emissions in the eastern U.S. by more than 175,000 tons per year.[3] These NOx reductions would benefit air quality and public health in the Northeast by: (1) lowering the "ozone reservoir" that forms in

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[1] U.S. EPA and NHTSA. 2010. *Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards: Joint Technical Support Document.* (EPA-420-R-10-901) sec 3.4.2.5, p3-79.

[2] U.S. EPA. 2013. *Draft Regulatory Impact Analysis, Tier 3 Motor Vehicle Emission and Fuel Standards.* 2013, pp. 7-123; and *Proposed Rule: Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards*, pp. 74-75.

[3] NESCAUM. 2011. "Assessment of Clean Gasoline in the Northeast and Mid-Atlantic States." Available online at http://www.nescaum.org/topics/fuels.

the eastern U.S., and (2) reducing the amount of low-level NOx emissions and pollutants derived from NOx that are transported into the Northeast/Mid-Atlantic region.

Even with the projected benefits associated with programs currently in effect, many of our most populous areas are predicted to be nonattainment for the current 0.075 ppm ozone NAAQS in 2015. Current nonattainment designations of the ozone NAAQS fail to capture the extent of the ozone pollution problem in the eastern United States. When EPA determined the attainment status of areas in the U.S., it based its determinations on ozone monitoring data collected during either 2008-2010 or 2009-2011. In the eastern states (Texas to North Dakota and to the east), there were 99 monitors measuring ozone levels in violation of the 0.075 ppm NAAQS during these years. This, however, presents a misleading picture of the extent of the air pollution problem facing the states. In contrast to the time periods used by EPA to designate ozone nonattainment areas, during 2010-2012 there were 252 monitors measuring violations of the ozone NAAQS in these same states, an increase of over 150% in the number of violating monitors.[4] Many of these monitors are in cities, towns, and counties that EPA did not originally identify as having ozone pollution problems.

Attaining the standard in these areas will require additional NOx reductions within our region as well as in upwind areas that contribute to the region's pollution burden. Tier 3 is the most significant strategy that the federal government could implement to help states attain and maintain the NAAQS for ozone. The combined near-term benefits of the low sulfur gasoline provisions and the increasing benefits of the tailpipe standards would help areas that need additional reductions to attain, and assist other areas to stay in attainment.

According to the petroleum industry's own estimates, the proposed Tier 3 program would reduce peak monthly 8-hour ozone by up to 1.2 parts per billion (ppb) in 2022.[5] Although opponents of the proposed rule characterize this reduction as insignificant, in fact it is very substantial, and greater than could be achieved by any other known, practical measure in the same timeframe. Further, the benefits of the new emission standards would increase over time with fleet "turnover." Reductions not achieved through the Tier 3 program and other federal measures would have to come from additional controls on local sources.

The revised evaporative emissions standards in the proposed rule would contribute to improved air quality and reduce public exposure to toxic contaminants in gasoline. Tier 3 would reduce total evaporative emissions to near-zero levels from all affected vehicles. Hundreds of thousands of California-certified vehicles currently on the road in our region already meet this standard.

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[4] Based on AIRS monitoring data (exceptional events excluded) obtained from EPA AirData, Monitor Values Report, http://www.epa.gov/airdata/ad_rep_mon.html (downloaded May 1, 2013).

[5] ENVIRON International Corporation. 2013. *Effects of Light-duty Vehicle Emissions Standards and Gasoline Sulfur Level on Ambient Ozone*. Available online at http://www.api.org/~/media/Files/News/2013/13-April/ENVIRON-Sep2012-Effects-of-LDV-Emiss-Stds-Gasoline-Sulfur-level-on-Ozone.pdf.

Emissions standards have been shown to be very cost effective in terms of public health outcomes. A recent EPA study found that the health benefits resulting from implementation of the 1990 Clean Air Act Amendments exceed costs by a factor of three to one under the most conservative assumptions; under assumptions considered most likely, benefits exceed costs by a factor of 30 to 1.[6] In addition to critical air quality, public health, and environmental benefits, Tier 3 would promote economic growth and create jobs throughout the U.S. According to the Manufacturers of Emission Controls Association, the emission control technology industry provides 65,000 domestic jobs and accounted for $12 billion in economic activity in the U.S. in 2010.[7]

Recommendations

Reducing Sulfur in Gasoline

It is not appropriate to allow ethanol producers or blenders to generate sulfur credits under the proposed gasoline sulfur program. This would require expansion of the program's sampling, testing, recordkeeping, and reporting requirements and require ethanol producers and blenders to be treated as refiners. This expansion of the program to include non-obligated parties would unnecessarily complicate the program with no corresponding benefit.

Early credits generated under the averaging, banking, and trading (ABT) program should expire after three years. The three-year early credit life provision offers sufficient flexibility to refiners and still provides a date certain by when automobile manufacturers can be assured that introduction of their technology designs correspond with the availability of 10 ppm average sulfur gasoline.

The current Tier 2 refinery gate and downstream caps of 80 and 95 ppm should be lowered to 50 and 65 ppm, respectively. Given the stringency of the 10 ppm average standard, these lower caps will provide sufficient flexibility for refiners, pipelines, terminals, transmix processors, and gasoline additive manufacturers as achieved under the Tier 2 program, while ensuring maximum reduction in downstream sulfur levels.

Long-term cap relief should not be made available in conjunction with lowering the sulfur caps below the current 80/95 ppm level. The other shorter term hardship relief options should be sufficient for all circumstances. Having noted that, it is important that refineries be given sufficient time so as not to be faced with the need to undergo two turnarounds (shutdowns and

[6] U.S. EPA. 2011. *The Benefits and Costs of the Clean Air Act from 1990 to 2020*. Available online at http://www.epa.gov/cleanairactbenefits/prospective2.html.

[7] Manufacturers of Emission Controls Association. 2011. Press release: *MECA Highlights Economic Benefits of Mobile Source Emissions Control Industry*. Available online at http://www.meca.org/galleries/default-file/MECA%20economic%20benefits%20press%20release%20031111.pdf.

startups for major maintenance or equipment installation) in a relatively short time period. To the extent reasonable, the equipment installation for low sulfur fuel equipment should be accommodated during a normally scheduled maintenance turnaround. This avoids the excess emissions that occur during multiple shutdowns and startups of a refinery.

Use of Ethanol in Certification Fuel

EPA should ensure that certification fuels accurately represent fuels used in the real world. In our view, the proposed requirement that certification fuel contain 15% ethanol by volume (E15) is inappropriate at this time. Given that this fuel represents a tiny fraction of the present-day fuels market in the U.S., that its future prospects as a mainstream automotive fuel are highly uncertain, and that its use in the existing fleet of vehicles will have non-trivial effects on vehicle emissions, we urge EPA to refrain from specifying E15 as a test fuel at this time. We suggest that EPA continue to monitor the use of ethanol as a blended transportation fuel. If and when E15 comes to represent a significant share of the national market, EPA should reassess its implications and the potential benefits and drawbacks to revising the test fuel specifications.

Stringency of PM Standard

NESCAUM strongly supports the proposed PM standard of 3 mg/mi for all light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles for all model years through 2024. However, we feel that the standard should be phased down to 1 mg/mi from 2025 to 2028, consistent with the requirements of the California LEV III program. We note that encouraging progress is being made with respect to reliability of advanced PM measurement techniques,[8] and we share CARB's view that lead time for the 1 mg/mi phase-in is sufficient for appropriate measurement techniques to be perfected and validated. We urge EPA to fully harmonize its PM standards with CARB's and to work with CARB to monitor and support continued progress in the development of PM measurement techniques.

Adverse Impacts of NOx Emissions in the Northeast

The NESCAUM region, home to over 42 million people, is subject to episodes of poor air quality resulting from ground-level ozone and fine particle pollution. During severe events, the scale of the problem can extend beyond NESCAUM's borders and include over 200,000 square miles across the eastern United States. Local and regional sources as well as air pollution transported hundreds of miles from distant sources outside the region contribute to elevated ozone and fine particle concentrations in the region.

NOx emissions contribute to a number of adverse public health and environmental outcomes. NOx is the most important contributor to regional ozone concentrations and an important precursor to fine particulate matter formation. These two pollutants are responsible for tens of

[8] Watson, J., *et al*. 2013. *An Analysis of Sub 1 mg/mi PM Mass for Light-Duty Vehicles*. Presentation to Manufacturers of Emission Controls Association Conference, Sacramento, CA, May 22, 2013.

thousands of premature deaths, hospital admissions, and lost work and school days in the U.S. annually. NOx is also a key factor in a number of environmental problems that affect the Northeast. Table 1 summarizes the major adverse impacts of NOx emissions in the NESCAUM region.

Table 1. Adverse Public Health and Environmental Impacts of NOx in the Northeast

Ozone and PM2.5	• Reduces lung function, aggravates asthma and other chronic lung diseases • Can cause permanent lung damage from repeated exposures • Contributes to premature death
Acid Deposition	• Damages forests • Damages aquatic ecosystems, e.g., Adirondacks and Great Northern Woods • Erodes manmade structures
Coastal Marine Eutrophication	• Depletes oxygen in the water, which suffocates fish and other aquatic life in bays and estuaries, e.g., Chesapeake Bay and Long Island Sound
Visibility Impairment	• Contributes to regional haze that mars vistas and views in urban and wilderness areas

Ozone

Ozone remains a persistent pollution problem in parts of the NESCAUM region during warm weather months. The evolution of severe ozone episodes often begins with the passage of a large high pressure area from the Midwest to the middle or southern Atlantic states. Three primary pollution transport pathways affect air quality in the region: long-range, mid-level, and near-surface. During severe ozone episodes associated with high-pressure systems, these pathways converge on the Mid-Atlantic area, where sea and bay breezes act as a barrier and funnel ozone and other air pollutants up the Northeast Corridor.

Collectively, NOx emissions and ambient ozone concentrations in the region have dropped significantly since 1997, along with the frequency and magnitude of exceedances of the health-based ozone NAAQS.[9] Despite this demonstrated progress, many of the most populous areas of the region continue to violate the current 0.075 ppm ozone NAAQS. Attaining the standard in these areas will require significant additional NOx reductions within the Northeast and in upwind areas. Federal measures such as the Tier 3/low sulfur gasoline program will significantly reduce NOx emissions and help states achieve the requisite reductions.

Looking toward the future, additional NOx reductions will be critical to ozone attainment in a broader swath of the region if EPA were to adopt a more health protective ozone NAAQS in the

[9] NESCAUM. 2010. *The Nature of the Ozone Air Quality Problem in the Ozone Transport Region: A Conceptual Description*, prepared for the Ozone Transport Commission by NESCAUM, Boston, MA (August 2010). Available at http://www.nescaum.org/documents/2010_o3_conceptual_model_final_revised_20100810.pdf/.

range of 0.060 – 0.070 ppm as recommended by EPA's Clean Air Scientific Advisory Committee (CASAC).

Particulate Matter

Scientific evidence has established a solid link between cardiac and respiratory health risks and transient exposure to ambient fine particle pollution that is capable of penetrating deep into the lungs.[10] Exceedances of the fine particle NAAQS can occur at any time of the year, with some of the highest levels often reached in the winter. There are important differences in the chemical species responsible for high fine particle levels during summer and winter in the Northeast. Regional fine particle formation in the eastern United States is primarily due to SO_2, but NOx is also important because of its influence on the chemical equilibrium between sulfate and nitrate pollution during winter when nitrates can be a relatively greater contributor to urban PM2.5 levels.

Acid Deposition

Atmospheric sources of nitrogen are a primary contributor to acidification of forest soils and fresh water ecosystems in the Northeast. Nitrogen saturation results in a number of important changes in forest ecosystem functions, including: (1) increased acidification of soils and surface waters; (2) depletion of soil nutrients and the development of plant nutrient imbalances; and (3) forest decline and changes in species composition. More than 30 percent of the lakes in the Adirondacks and at least 10 percent of the lakes in New England are susceptible to the effects of acidic episodes that include long-term increases in mortality, emigration, and reproductive failure of fish, as well as short-term acute effects. Acidic episodes can occur at any time of the year but typically are most severe during spring snowmelt, when biological demand for nitrogen is low and saturated soils exhibit lower nitrogen retention.[11]

Marine Eutrophication

Airborne nitrogen is an important contributor to eutrophication, the process by which a body of water acquires a high concentration of nutrients that promote excessive growth of algae. As the algae die and decompose, high levels of organic matter and decomposing organisms deplete the water of available oxygen, causing the death of other organisms, such as fish. Atmospheric nitrogen is a major contributor to eutrophication of key coastal resources in the Northeast, including Barnegat Bay in New Jersey and Long Island Sound.[12] The Chesapeake Bay is the largest estuary in the U.S. and its watershed stretches across more than 64,000 square miles, encompassing parts of six states, including New York. Since the 1950s, the bay has experienced

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[10] U.S. EPA. 2005. *Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information*, USEPA OAQPS Staff Paper, EPA-452/R-05-005a, (December 2005).

[11] Driscoll, C.T., G.B. Lawrence, A.J. Bulger, T.J. Butler, C.S. Cronan, C. Eagar, K.F. Lambert, G.E. Likens, J.L. Stoddard, and K.C. Weathers. 2001. *Acidic deposition in the northeastern United States: Sources and inputs, ecosystem effects, and management strategies*, BioScience 51, 180–198.

[12] Bricker, S.B., C.G. Clement, D.E. Pirhalla, S.P. Orlando, and D.R.G. Farrow. 1999. *National Estuarine Eutrophication Assessment: Effects of Nutrient Enrichment in the Nation's Estuaries*, NOAA, National Ocean Service, Special Projects Office and the National Centers for Coastal Ocean Science. Silver Spring, MD: 71 pp.

a decline in water quality due to over-enrichment of unwanted nutrients such as phosphorus and nitrogen. The major contributors to nutrient discharge in the bay are wastewater effluent, urban and agricultural runoff, and air deposition.[13]

Visibility Impairment

Regional haze is a form of air pollution that obscures the views of city skylines (Figure 1) as well as "pristine" scenic vistas (Figure 2). It is caused by fine particle air pollution and can cover hundreds of square miles in the East. Natural visibility conditions in the East are estimated at 60 to 80 miles in most locations. Under current polluted conditions, average visibility ranges from 20 to 40 miles. On the worst days, regional haze can reduce visibility to just a few miles. Outdoor recreation is a multi-billion dollar industry in the U.S. and is of particular economic importance to communities near protected federal lands. Surveys indicate visitors have rated "clean, clear air" as among the most important features of national parks and have overwhelmingly ranked scenic views and clean air as "extremely" or "very" important. Studies have yielded estimates in the billions of dollars for the visibility benefits associated with substantial national pollution reductions.[14] While sulfate, formed from SO_2 emissions, is the most important particle constituent of regional haze, reductions in other local and distant pollutant emissions, including NOx, will be necessary to achieve the nation's long-term goal of restoring pristine visibility conditions year-round in national parks and wilderness areas.[15]

Refining Industry Impacts

To put the Tier 3 low sulfur impacts on the petroleum refining industry into perspective, it is instructive to summarize what has been previously required in other fuel programs. Over the past 13 years, EPA undertook three rulemakings, requiring significant reductions in the sulfur content of petroleum fuels. The Tier 2 regulation, promulgated in 2000, reduced the sulfur

[13] Maryland Department of the Environment, *Chesapeake Bay Restoration*, http://www.mde.state.md.us/programs/Water/Pages/water/bayrestoration.aspx (accessed September 1, 2011).
[14] NESCAUM. 2001. *Regional Haze and Visibility in the Northeast and Mid-Atlantic States*, NESCAUM, Boston, MA (January 31, 2001). Available at http://www.nescaum.org/documents/regional-haze-andvisibility-in-the-northeast-and-mid-atlantic-states/.
[15] In 1999, EPA promulgated the Regional Haze Rule in pursuit of the national visibility goal created by Congress in the Clean Air Act to ultimately restore natural visibility conditions in 156 national parks and wilderness areas across the country (called "Class I" areas).

Figure 1. Winter Pollution Haze Layer over Boston, MA on January 14, 2010
(Source: CAMNET Realtime Air Pollution and Visibility Monitoring Network. www.hazecam.net)

Figure 2. Comparison of a clear day on February 22, 2008 (left) and a hazy polluted day on August 17, 2009 (right) in Acadia National Park, ME
(Source: CAMNET Realtime Air Pollution and Visibility Monitoring Network. www.hazecam.net)

content of gasoline from a pre-regulation average of about 330 ppm down to 30 ppm and included an interim 120 ppm step. The highway diesel regulation, promulgated in 2001, reduced the sulfur content of diesel from 500 ppm down to 15 ppm. The non-road diesel regulation, promulgated in 2004, reduced the sulfur content of non-road fuel from a pre-regulation average of 3000 ppm down to 15 ppm, with an interim 500 ppm step. Compared to what is now proposed

under Tier 3, these previous initiatives required very ambitious reductions. The refining industry met these challenges, supplying the market with compliant fuel while continuing to prosper economically. EPA's structuring of these regulations played a critical role in facilitating the transition from high to low sulfur fuels in each case.

Specifically, EPA built several very important regulatory flexibilities for refiners into the gasoline and diesel fuel sulfur standards, including 1) providing several years of lead time for all refiners to add and/or enhance desulfurization capabilities, 2) ABT programs to encourage early compliance where possible and provide means for extending compliance dates where needed, 3) provisions for smaller refiners to further extend compliance deadlines and credit generation opportunities, 4) opportunities for refiners to integrate their desulfurization infrastructure planning processes across all three fuels programs, 5) interim sulfur limits to allow refiners to phase their operations into compliance with the final standards, and 6) various hardship waiver provisions to provide a means to address unexpected circumstances. Most of these same flexibilities are built into the proposed Tier 3 program structure and in conjunction with comparatively modest requirements for reduction in sulfur will make for a relatively smooth transition from a 30 ppm average down to a 10 ppm average sulfur content.

Some in the refining sector have made projections that the Tier 3 sulfur standards will force a number of refineries to close because the costs of compliance will be too high and/or the deadlines are too soon to make the necessary equipment and operational changes at the refinery. Consequently, the U.S. fuel markets allegedly will become increasingly more dependent on competitive foreign imports of products. Similar projections were made during promulgation of the previous rulemakings for low sulfur fuels. It is instructive to briefly review what actually occurred in the U.S. refining sector over the phase-in period of these regulations in order to gain a sense of what the likely outcomes will be under this more modest Tier 3 scenario.

Refining activity in the U.S. increased over the same period as indicated in Table 2. Particularly noteworthy is the fact that desulfurization capacity increased by 40 percent from 2000 to 2010, indicating that the domestic refining industry responded positively to the regulatory challenge and succeeded in dramatically reducing the sulfur content of fuels.

Table 2. Operable Capacities of U.S. Refineries – Selected Years (Barrels per Stream Day)

Year	Atmospheric Distillation	Catalytic Cracking	Hydrocracking	Desulfurization Including Hydrotreating
2000	17,393,070	5,948,938	1,575,800	11,439,704
2004	17,815,034	6,097,894	1,602,100	13,500,799
2006	18,307,502	6,187,883	1,637,200	14,807,986
2010	18,581,089	6,140,121	1,819,700	16,023,206

Source: U.S. Energy Information Administration

Refiners' original projections of very high compliance costs were principally based on the assumption that conventional energy-intensive hydrotreating technology would have to be deployed almost exclusively to achieve the low sulfur levels in the final products. In actual practice, refiners opted for a combination of technologies and facility efficiency improvements to cost-effectively remove fuel sulfur. At around the time of the first of the three rulemakings (Tier 2 gasoline), the National Petroleum Council issued a report[16] identifying several more cost-effective desulfurization technology improvements, classified either as "demonstrated" or "near commercial status." By the time refiners had to select equipment for meeting Tier 2 gasoline standards, there were several additional, less energy-intensive technology choices available to them.[17] Despite industry predictions of insufficient lead time and manufacturing resources for timely compliance with the standards for all three rulemakings, early compliance was widespread, as evidenced by the surplus of credits under the ABT programs.[18,19]

Refiners made a number of process improvements, some directly involving desulfurization technology and others affecting other processes within the refinery. These process improvements helped offset the cost of investment in new desulfurization equipment and reduced ongoing operating costs. In addition, many of these improvements also reduced facility-wide emissions, creating opportunities for refineries to net out of major new source review stationary source permitting that otherwise may have been required for process modifications:

- Heat recovery and recycling processes aimed at reducing refinery fuel consumption,
- Purification of hydrogen streams to reduce hydrogen production demand and impurities affecting catalysts,
- Improved catalyst substrates and catalyst design,
- Improved heat exchanger design to enhance heat recovery and debottleneck processes,
- More extensive use of pre-treatment of FCCU feed streams with mild hydrotreating,
- Optimization of temperature and pressure in vessels to enhance reactor efficiencies, and
- Optimization of excess air in combustion systems.

These same principles will apply to implementation of the low sulfur fuel standards in the Tier 3 regulation. The discussion that accompanies the proposed rule notes:

> [T]here are strong economic incentives for refiners to design and purchase the most energy-efficient process equipment to minimize the cost of production. For

[16] U.S. DOE. 2000. *U.S. Petroleum Refining: Assuring the Adequacy and Affordability of Cleaner Fuels,* June 2000.
[17] MathPro Inc. 2003. *Evolution of Process Technology for FCC Naphtha Desulfurization: 1997-2003; An Example of Technical Progress Induced by Environmental Regulation,* March 2003.
[18] U.S. EPA, *Summary and Analysis of the 2005 Highway and Nonroad Diesel Fuel Pre-Compliance Reports,* EPA 420-R-06-012, June 2006.
[19] U.S. EPA. 2010. *Summary and Analysis of the 2010 Nonroad Diesel Fuel Pre-Compliance Reports,* EPA 420-R-10-028, December 2010.

> example, most of the new or modified units expected to be involved in refinery projects designed to meet the proposed Tier 3 standards are fuel combustion units (e.g., process heaters). Because fuel cost (direct cost in the case of purchased natural gas and opportunity cost in the case of refinery-generated fuel gas) represents a significant component of total operating cost for such units, refineries will strive to maximize energy efficiency based on available technologies as part of their project design.[20]

Regarding the issue of foreign imports of fuels, the discussion in the proposed rule points out that "despite refining industry projections that previously imposed diesel rules would lead to greater U.S. reliance on imports through major negative impacts on domestic refining, the reverse has actually occurred. Over the last 8 years, imports of gasoline and diesel fuel have continued to be the marginal supply, and have even dropped precipitously so that the U.S. is now a net exporter of diesel fuel and is importing half the gasoline that it did at its peak in 2006. With the projected decline in future gasoline demand in the U.S. as vehicle fuel efficiency improves, gasoline imports are expected to continue to decline."[21] According to the U.S. Energy Information Administration's 2013 Annual Energy Outlook, the U.S. is projected to be a net exporter of petroleum products at least through 2040.

In response to favorable long-term economic outlooks, the North American refining industry is taking the initiative to make significant new investments in its capacity to increase the supply of petroleum products, including low sulfur products. Several refineries in the Northeast that recently were in danger of permanently closing have reopened or remained in business due to ownership changes and favorable developments related to petroleum and product supply. In 2010, PBF Energy purchased the Valero refinery in Delaware City, DE. In conjunction with the purchase of the Delaware City facility, PBF Energy announced plans to invest $500 million to enhance its desulfurization capacity.[22] In 2011, PBF Energy announced plans to invest $1 billion at the Delaware City refinery to boost distillate output and heavy crude capacity.

In 2010, Marathon Petroleum completed a $3.9 billion expansion, nearly doubling the capacity of its Garyville, LA refinery.[23] This refinery is now the fourth largest in the U.S. and increases the ability of Gulf Coast refiners to augment the petroleum product needs in the Northeast. In 2009, Irving Oil Refinery (Saint John, New Brunswick) completed a $220 million upgrade. The majority of the work focused on improving its yield of ultra-low sulfur products. The Saint John Refinery is Canada's largest and exports more than 80 percent of its products to the U.S.[24]

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[20] 78 FR 29934, May 21, 2013
[21] 78 FR 29992, May 21, 2013.
[22] heatingoil.com. *Delaware Refinery to Reopen with Plans to Produce Low-Sulfur Heating Oil and Biofuels*, Posted June 2, 2010.
[23] The Times-Picayune, *Marathon Completes $3.9 Billion Expansion in Garyville*, March 25, 2010.
[24] Irving Oil Company. 2009. Press Release: *Irving Oil Refinery Completes $220 Million Investment Project*, November 17, 2009.

Conclusion

In conclusion, we thank and commend EPA for its diligence and hard work in developing this proposed rulemaking. If the rule is promulgated as proposed, the resulting air quality and public health benefits will be substantial not just in the Northeast, but across the country. The standards are achievable in the proposed timeframe and can be met using commercially available technologies. The cost will be recovered many times over through reductions in morbidity and mortality throughout the nation. Importantly, emission reductions not achieved through Tier 3 would have to be accomplished by further controlling local sources, an unfair economic burden on local businesses when more cost-effective national programs are available.

If you have any questions regarding the issues raised in these comments, please contact Matt Solomon at NESCAUM (ph: 617-259-2029).

Sincerely,

Arthur N. Marin
Executive Director

cc: NESCAUM Directors