

Tier 3 Gasoline Sulfur Standard's Impact on Gasoline Refining

The U.S. Environmental Protection Agency (EPA) is finalizing a rule designed to reduce air pollution from passenger cars and trucks. Starting in 2017, Tier 3 sets new vehicle emissions standards and lowers the sulfur content of gasoline, considering the vehicle and its fuel as an integrated system. The vehicle standards reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard will make emission control systems more effective for both existing and new vehicles, and will enable more stringent vehicle emissions standards since removing sulfur allows the vehicle's catalyst to work more efficiently. EPA is setting these Tier 3 standards to address public health issues that exist currently and are projected to continue in the future. EPA's action was requested in a May 2010 Presidential memorandum.

Overview

The Tier 3 program's gasoline sulfur reductions are critical to enabling manufacturers to comply across the fleet with the stringent vehicle standards. The gasoline sulfur standards will also achieve significant immediate benefits by reducing emissions from existing vehicles. Under the final Tier 3 program, federal gasoline will be required to meet an annual average standard of 10 parts per million (ppm) of sulfur by January 1, 2017. EPA is also finalizing standards that maintain the current 80 ppm refinery gate and 95 ppm downstream cap. The Tier 3 fuel program includes a number of flexibilities such as a credit averaging, banking and trading (ABT) program that will allow refiners to spread out their investments over a 6 year period and provide for a seamless transition from the Tier 2 to the Tier 3 ABT program. EPA is also finalizing a three-year delay for small refiners and small volume refineries as well as other flexibilities for refiners such as deficit carry-forward and hardship provisions for extenuating circumstances.

Impacts On Fuel Price and Refiners Will Be Minimal

EPA estimates the costs of sulfur control would be less than a penny per gallon. Consequently, consumers are unlikely to notice a difference in fuel prices at the pump due to Tier 3, as its impact will be overwhelmed by other variability in the marketplace.

To comply with the Tier 3 sulfur standards, refiners will take a range of actions depending on the current configuration of their refineries and their other market investment plans. Based on EPA's peer-reviewed refinery-by-refinery analysis, of the 108 gasoline refineries impacted by Tier 3, 40 are either already meeting the 10 ppm standard, or are expected to purchase credits to show compliance. Another 67 are able to comply with modifications to their existing equipment which can occur in 2 years' time. Only 1 is projected to require the installation of a new gasoline hydrotreater which can be installed in 3 years. We anticipate that even those refineries that comply through the use of credits will make a variety of operating changes and/or low capital cost changes to lower their sulfur levels below their current Tier 2 levels to minimize their need for credits.

Many variables determine the retail price of fuel. The primary factor is the price of crude oil on the global market, and other factors include weather, transportation, supply and demand, distribution and marketing costs. The prices paid by consumers at the pump reflect these costs, as well as profits or losses by the company. In recent years, due to lower crude oil and natural gas prices, U.S. refineries have been and continue to be experiencing very healthy margins on the fuels they produce. U.S. refineries are exporting greater quantities of diesel fuel and have started to export gasoline meaning that foreign markets may also be affecting domestic fuel prices.

Table 1 illustrates the Energy Information Administration's four main components of the retail price of a gallon of gasoline in terms of share of total price for December 2013. Gasoline sulfur control for Tier 3 would add just 0.2 percentage points to the refining component shown in Table 1.

Table 1
Regular Gas Cost by Percentage

Cost Components	Percent of Cost
Crude Oil Price	68%
Taxes	13%
Distribution and Marketing Costs	10%
Refining Costs	9%

* Percentages are based on the price of regular gasoline in December 2013 (\$3.28 per gallon)

The Agency's evaluation of gasoline sulfur control costs has undergone independent peer review and is corroborated by two independent studies: a 2011 study conducted by Mathpro for the International Council on Clean Transportation and a 2012 study conducted by Navigant for the Emissions Control Technology Association.

EPA is Providing Flexibilities to Reduce Cost and Ease Compliance for Refineries

EPA is finalizing the proposed start date of January 1, 2017 for the fuel sulfur control program with a number of flexibilities that will, in effect, provide nearly 6 years of lead time for those refineries that may need it. These flexibilities include:

- A credit averaging, banking and trading (ABT) program that will allow refiners to spread out their investments from 2014 through 2019 and provide for a seamless transition from the Tier 2 ABT program to the Tier 3 ABT program, including the ability to carry over “banked” credits from Tier 2.
- A delay in the start date for approximately 30 small refiners and small volume refineries until 2020.
- A 1-year deficit carryforward provision that allows an individual refinery that does not meet the 10 ppm standard in a given year to carry a deficit forward for 1 year if necessary, as long as they make up the deficit the following year.
- Hardship provisions that allow refiners to petition for compliance assistance on the basis of extreme hardship or extreme unforeseen circumstances.

Benefits of the Tier 3 Program Far Outweigh the Costs

EPA estimates that in 2030, the annual monetized health benefits of the Tier 3 standards will be between **\$6.7 and \$19 billion**.

By 2030, the Tier 3 standards will annually prevent:

- Between 770 and 2,000 premature deaths
- 2,200 hospital admissions and asthma-related emergency room visits
- 19,000 asthma exacerbations
- 30,000 upper and lower respiratory symptoms in children
- 1.4 million lost school days, work days and minor-restricted activities

Reductions in gasoline sulfur will achieve immediate emissions reductions and health benefits from the existing fleet, and in time to support states' efforts to attain and maintain the existing health-based National Ambient Air Quality Standards (NAAQS).

The gasoline sulfur standards, which take effect in 2017, will provide large immediate reductions in NO_x emissions from existing gasoline vehicles and engines on the road today, and significantly reduce ambient concentrations of ozone. NO_x emissions will be reduced by about 260,000 tons, or about 10% of emissions from on-highway vehicles, in 2018 alone.

EPA very carefully considered comments from stakeholders and the public regarding program lead time, and we believe that the final program addresses these concerns.

- EPA received many comments from the states, NGOs, and private citizens expressing their desire that the Tier 3 vehicle and fuel standards begin in 2017 so the benefits can be realized as soon as possible.

Regulatory Announcement

- In addition, auto manufacturers have stressed the importance for the Tier 3 program to be closely aligned with the California LEV III program, including the timing of implementation, to avoid unnecessary burdens on their industry and to ensure certainty. Beginning the program in 2017 ensures a harmonized, 50-state vehicle program that is coordinated with the implementation of the California LEV III emission standards and the national GHG standards.
- While most oil industry commenters requested 5 years of lead time, EPA is finalizing a number of flexibilities as part of Tier 3 that will, in effect, provide nearly 6 years of lead time for those refineries that may need it.

For More Information

You can access the final rule, regulations and related documents on EPA's Office of Transportation and Air Quality (OTAQ) Web site at:

www.epa.gov/otaq/tier3.htm

For more information on this rule, please contact the U.S. Environmental Protection Agency, Office of Transportation and Air Quality at:

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