# 13

# THE PAPER STUDIES

## 13.1 $Tens of millions in paper studies went into defining Tier 3

Section 4.2 refers to paper studies done between 2004 and 2014 by EPA, API, AFPM, MathPro, Baker & O'Brien, Turner Mason, Navigant Economics, and other government and industry resources, to define the Tier 3 standard and estimate refining requirements and costs. Process licensors were also asked to provide input, and they did, to varying degrees.

The EPA's draft regulatory impact analysis (RIA), issued in March 2013, gives a detailed account of this work.

## 13.2 The biggest unknown in cost analysis was octane destruction

Chapters 4 and 5 of the RIA are of special interest to refiners, covering the feasibility of the program and its cost.

Chapter 4 of the RIA contains review and analysis of the existing US refining infrastructure and its suitability for making 10 ppm sulfur gasoline. It describes the available gasoline desulfurization technologies, the downstream implications of sulfur reduction, and estimated lead time requirements.

Chapter 5 of the RIA provides the cost analysis which used actual refinery-by-refinery infrastructure, capacity, and gasoline stream volume data.

The biggest uncertainty in these paper studies, and the biggest cost sensitivity, was the amount of octane that would be lost in gasoline desulfurizers.

## 13.3 EPA accommodated industry requests to ease compliance

During the rule-making process, comments from refiners emphasized the need to allow enough lead time to choose hydrotreating technologies and licensors, secure permits and engineering resources, procure and install equipment, and make tie-ins during scheduled FCC turnarounds. Uncertainty about the sulfur credit system was also a concern, especially among small refiners.

When it finally appeared in the Federal Register in 2014, The Tier 3 Rule gave nearly six years lead time for the industry to prepare for Tier 3 and included the following provisions:

- 3-year extra lead time for small refiners
- Five-year life on use of Tier 2 credits
- Opportunity for early Tier 3 credit generation
- Exemption on gasoline that is exported
- 80 ppm refinery gate sulfur cap
- 95 ppm downstream sulfur cap

These provisions were intended to address the industry's concerns by reducing the need for new build units, allowing time for refiners to access capital and engineering resources, creating incentives for early compliance, opening outlets for noncompliant gasoline, and easing compliance by small refiners.