



**Before the Joint Economic Committee  
United States Senate**

***Gas Prices in the Northeast: Potential Impact on the American Consumer  
Due to Loss of Refining Capacity***

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**April 26, 2012, 2:15 pm  
Room G-50, Dirksen Senate Office Building**

**I. Introduction**

I would like to thank Chairman Robert Casey and the members of the Joint Economic Committee for holding this hearing on the loss of refining capacity in the Northeast and its potential impact on the prices of refined petroleum products (RPPs). I appreciate the opportunity to appear here today.<sup>1</sup> The American Antitrust Institute is a non-profit education, research, and advocacy organization. Our mission is to increase the role of competition in the economy, assure that competition works in the interests of consumers, and sustain the vitality of the antitrust laws. The AAI has long been involved in analyzing the competitive implications of issues in the energy industries, including electricity, natural gas, petroleum, and renewables.

Much of the analysis available to date on refinery closures in the Northeastern U.S. focuses on the relatively straightforward economics of their potential impact on RPP prices such as gasoline, heating oil, and ultra low sulfur diesel (ULSD). Perhaps the most pressing question for policymakers is whether the current downturn in the refining sector in the Northeast is part of a cyclical trend – and will rebound at some point in the future – or if it represents a structural shift that could reflect a permanent change in refining fundamentals. The answer is that it is too soon to tell. Nevertheless, the industry may be at a critical juncture where policy responses are particularly important.

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<sup>1</sup> Diana Moss is Vice President and Senior Fellow, American Antitrust Institute (AAI) ([www.antitrustinstitute.org](http://www.antitrustinstitute.org)). This testimony has been approved by the AAI Board of Directors.

<sup>2</sup> Federal Trade Commission, *Gasoline Prices and the Petroleum Industry: An Update* Figure 3, 7 (September 2011), available at <http://www.ftc.gov/os/2011/09/110901gasolinepricereport.pdf>.

<sup>3</sup> FTC, *supra* note 2 at Table 10 (p. 59).

My testimony today acknowledges the importance of underlying economics as integral to the larger picture surrounding refinery closures. However, I will focus primarily on perhaps a less obvious aspect of the problem, namely the importance of the competitive landscape in downstream petroleum markets in analyzing the implications of refinery closures and crafting appropriate policy responses. This is not to say that there is a competitive problem, only that refinery closures fundamentally alter the structure of markets in ways that potentially change competitive incentives facing suppliers.

## **II. Background**

Refined petroleum product price dynamics in the U.S. and the Northeast, in particular, are affected by a complicated and changing landscape. This backdrop is influenced, as always, by the world crude oil market, changes in petroleum resource exploitation in the U.S. and Canada, and shifts in how the U.S. utilizes its complex networks of downstream assets, including refineries, product pipelines, and terminaling and storage facilities. Price dynamics are also affected by changes in domestic consumption driven by economic recession beginning in 2008, the effects of which are still lingering but may reverse in time. A host of other factors, however, may signal a more permanent downturn in oil consumption, including: increases in fuel economy standards, the ethanol content of fuels, and the use of pure bio-fuels. Finally, fundamental changes in the U.S. refining industry, particularly in the Northeast, are an integral part of the picture.

The pattern of crude oil consumption has changed in ways that are important for an analysis of refining in the Northeast. For example, between 2004 and 2010, oil consumption in the U.S. and Europe fell by almost six percent. Consumption in China, the Middle East, Latin America, and other Asian countries, however, increased by about eight percent.<sup>2</sup> In the early 2000s, Saudi Arabia was the largest exporter of crude oil to the U.S. Between 2004 and 2010, however, those export levels fell by 27 percent. Exports to the U.S. from Venezuela and Mexico also fell off and Canada, which is now the leading exporter to the U.S., increased exports by 18 percent.<sup>3</sup>

In approaching the problem of refinery closures in the Northeast U.S. it is, as a preliminary matter, important to point out that U.S. gasoline prices are heavily influenced by the dynamics of cartelized world crude oil markets. The U.S. has little control over OPEC. Currently, crude prices make up about 72 percent of retail gasoline prices in the U.S.<sup>4</sup> While membership in OPEC has changed somewhat, and there is some ongoing debate as to how effective the cartel is in setting and maintaining crude prices, it is widely held that higher prices contribute in substantial part to higher prices of gasoline than what would emerge without the cartel.

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<sup>2</sup> Federal Trade Commission, *Gasoline Prices and the Petroleum Industry: An Update* Figure 3, 7 (September 2011), available at <http://www.ftc.gov/os/2011/09/110901gasolinepricereport.pdf>.

<sup>3</sup> FTC, *supra* note 2 at Table 10 (p. 59).

<sup>4</sup> Energy Information Administration, *Gasoline and Diesel Fuel Update* (April 16, 2012), available at <http://www.eia.gov/petroleum/gasdiesel/>.

When the spotlight falls on actual or projected increases in RPP prices in the U.S., there is sometimes a tendency to overplay the role of OPEC in price determination. To be sure, crude oil prices factor significantly into downstream prices. However, domestic downstream activities – including refining, distribution of refined products to storage terminals, and wholesale and retail marketing – also play an important role. These activities make up a not insignificant 17 percent of the final retail price of gasoline.<sup>5</sup>

The impact of downstream activities on RPP prices is amplified by what we see happening in the Northeastern U.S. refining markets. Relative to other PADDs, PADD 1 has special features that are potentially relevant to competition. For example, PADD 1 has the: (1) fewest number of refineries; (2) largest number of refinery idlings and closures; (3) highest levels of market concentration and increases in concentration over time; (4) highest levels of wholesale market concentration; (5) lowest refining capacity utilization rates; and (6) greatest dependency on imports of petroleum products from other PADDs and abroad. My testimony touches on each of these factors, which collectively draw attention to the competitive landscape.

### **III. Refinery Closures in PADD 1**

#### **A. Market Concentration**

Refining market developments in PADD 1 stand in stark contrast to those in other PADDs, where concentration has remained relatively stable over the last several years. Refinery idlings and closures in PADD 1 are attributed to poor economics such as low refining margins. Many refiners are devoting resources to more profitable upstream activities such as exploration and production. Sunoco has publically stated that it is leaving the refining business and has (or plans to) idled or closed three refineries in the last three years totaling 658,000 barrels per day of crude distillation capacity.<sup>6</sup>

The number of refineries in the U.S. continues to decline. Between 1985 and 2011, there was a 31 percent decrease in the number of refineries in the U.S. and a 52 percent decrease in PADD 1.<sup>7</sup> While there are fewer refineries in the U.S., their average capacity has increased over time, due to the development of higher capacity, technologically advanced facilities, and the networking of refineries. These fewer, larger refineries account in large part for the fact that of 45 total refiners, the top 10 account for 75 percent of total U.S. refining capacity.<sup>8</sup> In PADD 1, there were 14 operating refineries in 2004.

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<sup>5</sup> EIA, *supra* note 4.

<sup>6</sup> *Sunoco is Leaving the Refining Business*, energyandcapital.com, September 6, 2011, <http://www.energyandcapital.com/articles/sunoco-is-leaving-the-refining-business/1750>.

<sup>7</sup> Energy Information Administration, “Number of Capacity of Petroleum Refineries,” (number of operating refineries), *available at* [http://www.eia.gov/dnav/pet/pet\\_pnp\\_cap1\\_a\\_\(na\)\\_800\\_Count\\_a.htm](http://www.eia.gov/dnav/pet/pet_pnp_cap1_a_(na)_800_Count_a.htm).

<sup>8</sup> Anthony Andrews, Robert Pirog, and Molly F. Sherlock, Congressional Research Service, *The U.S. Oil Refining Industry: Background in Changing Markets and Fuel Policies* 17 (November 22, 2010), *available at* <http://digital.library.unt.edu/ark:/67531/metadc29627/>.

By the beginning of 2011, that number had fallen to 10.<sup>9</sup> By mid-2012, after the closure of Sunoco's Marcus Hook and Philadelphia refineries and ConocoPhillips' Trainer refinery, and assuming no idled facilities come back on line, there will be 7 operating refineries. These closures represent a 43 percent loss in capacity from 2011 through 2012.<sup>10</sup>

The PADD system, developed during World War II to allocate fuels from petroleum products, does not accurately capture the concept of a market, either from an economic or antitrust perspective. PADD boundaries encompass far broader areas than what consumers would consider in searching out lower-priced supplies, or suppliers that could undercut prices increases elsewhere in the market. Such markets – determined by transportation constraints and production cost differentials – are likely to be much smaller and more concentrated than PADD-based markets.<sup>11</sup> Nonetheless, PADD-based statistics do give us some sense of changes in market structure that are relevant to today's inquiry into refinery closures.

Refinery idlings and closures are reflected directly in changes in market concentration in PADD 1. In 2004, for example, concentration in PADD 1 was about 2,700. But by the end of 2010, concentration reached 3,300 HHI.<sup>12</sup> The Federal Trade Commission (FTC) notes that these changes are due largely to the Valero-Premcor merger. However, increases in concentration also reflect changes in the distribution of ownership associated with refinery closures. For example, the year-end 2010 statistics reflect the idling of Chevron's Perth Amboy refinery, PBF's Delaware City refinery, Nustar's Savannah refinery, and Western's Yorktown refinery. These closures drove up the market shares of Sunoco and ConocoPhillips significantly, increasing market concentration.

Closure of ConocoPhillips' Trainer refinery and Sunoco's Marcus Hook refinery in late 2011, coupled with the restart of PBF Energy's Delaware City refinery slightly lowered market concentration. However, three major players (ConocoPhillips, Sunoco, and PBF Energy) continued to account for about 93 percent of refinery capacity. With the planned closure of Sunoco's Philadelphia refinery in mid-2012 (if a buyer cannot be found), market concentration will increase to almost 4,000 HHI. This will leave only *two* firms (PBF Energy and ConocoPhillips) that account for 86 percent of refinery capacity.<sup>13</sup> This will cause a significant change in the structure of the PADD 1 market.

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<sup>9</sup> EIA, *supra* note 7.

<sup>10</sup> PBF Energy's Delaware City Refinery came back on line in October of 2011.

<sup>11</sup> The FTC's analysis of relevant markets in petroleum merger cases is a good illustration of this concept, whereby concentration is significantly higher than on a PADD-basis.

<sup>12</sup> FTC, *supra* note 2 at Table 13 (p. 62).

<sup>13</sup> Energy Information Administration, *Refinery Capacity Data by Individual Refinery as of January 1, 2011*, available at <http://www.eia.gov/petroleum/refinerycapacity/>.

## B. Competitive Issues

The refining industry is a “bottleneck,” or a segment through which all inputs must pass to ultimately reach the consumer. Bottlenecks are a common feature of most networked industries and often involve highly concentrated markets and high sunk and environmental compliance costs that discourage new entry. Control of bottleneck facilities potentially raises concerns over the exercise of market power. For example, in the majority of merger enforcement actions involving downstream petroleum markets, the FTC’s concern centered on the increased likelihood that the merged firm could unilaterally – or in coordination with other rivals – withhold capacity to drive up price.

Much like in electricity markets where firms are differentiated by capacity, as opposed to by product, strategic withholding of refining capacity could result in anticompetitive increases in RPP prices. It is therefore important to consider scenarios involving refiners that control large shares of capacity, marginal capacity that sets the market price, or facilities located strategically near transportation and terminal networks. In highly concentrated markets that are less conducive to competitive outcomes, such as PADD 1, the possibility of refiners coordinating short-term outages and longer-term idlings or closures are also greater.

It is clear from the analysis above that market shares and concentration are directly affected by refinery idlings and closings. However, PADD 1 is currently in the grip of two potentially opposing forces -- high concentration and low capacity utilization rates. The likelihood of price increases is generally higher when capacity is tight relative to demand, as opposed to at low utilization rates. In other words, incentives to exercise market power by withholding output can be defeated by the presence of excess capacity in the market, as currently exists in PADD 1. Capacity utilization rates in other PADDs are currently above 90 percent, whereas in PADD 1, they are at about 68 percent, down from 93 percent in 2005.<sup>14</sup>

However, one effect of refinery closures in PADD 1 might be to increase utilization rates. Indeed, between December 2011 and January 2012, capacity utilization in PADD 1 jumped from 56 to 72 percent – about a 30 percent increase.<sup>15</sup> It is too early to determine whether the uptick signals a longer-term trend. However, it is possible that with the closures of Sunoco’s Marcus Hook and Conoco-Phillips Trainer refineries in late 2011, other refineries have taken up the slack. Regardless of the cause, if utilization continues to increase, it will be important for policymakers to monitor for price spikes and their potential causes, including strategic competitive behavior.

While the foregoing competitive concerns focus largely on short-run output restrictions, it is also possible that long-term, high levels of market concentration increase the risk that

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<sup>14</sup> Energy Information Administration, *Refinery Utilization Rates React to Economics in 2011* (March 20, 2012), available at <http://www.eia.gov/todayinenergy/detail.cfm?id=5470>.

<sup>15</sup> Energy Information Administration, *East Coast Refining District Percent Utilization of Refinery Operable Capacity*, available at <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MOPUEEC2&f=M>.

suppliers can coordinate on capacity investment decisions.<sup>16</sup> Slower investment keeps capacity tight and increases the probability that anticompetitive withholding will produce significant and sustained price increases. Indeed, capital expenditures in refining capacity declined, on average, by 3 percent annually over the period 2005 to 2010. While this is likely to reflect a reticence by U.S. refiners to expand their presence in markets with unfavorable economics, ongoing decreases in investment, particularly in concentrated markets, should be monitored.<sup>17</sup>

#### **IV. Wholesale Markets and Gasoline Prices in PADD 1**

National gasoline prices have continued their steady march upward since the mid-2000s, marked by periodic exogenous shocks. The hurricanes in 2005 caused spikes associated with temporary refinery disruptions, as did the phase out of MTBE in the summers of 2006 and 2007. Likewise, the impact of the global recession beginning in 2008 caused gasoline prices to plunge as demand fell off. But since the beginning of 2009, prices have resumed their upward trend.

A number of factors can influence gasoline price behavior. For example, if upstream (e.g., wholesale RPP) prices continue to increase, accompanying downstream (e.g., retail RPP) price increases can be reinforced by what economists term “asymmetry” or the “rockets and feathers” effect. This is the tendency for downstream petroleum prices to increase faster than upstream prices when upstream prices are on the rise, but to fall more slowly when upstream prices are on the decline.<sup>18</sup> There are various theories that could explain asymmetry, including oligopolistic coordination, consumer search costs, and inventory adjustment costs.<sup>19</sup>

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<sup>16</sup> For almost 60 years, economists have probed into competitive issues in the domestic petroleum industry, include concerns over potentially exclusionary conduct in gasoline marketing beginning in the 1950s, the concept of “conscious parallelism,” or that anticompetitive coordination does not necessarily take the form of a conspiracy, refusals to deal and the potential incentives to foreclose rivals associated with integrated refining-marketing, and entry barriers at the refining level. See, e.g., for discussion of various competitive issues: J. B. Dirlam and A. E. Kahn, *Leadership and Conflict in the Pricing of Gasoline*, 61 YALE L. J. 818 (1952); B. Turner, *Conscious Parallelism in the Pricing of Gasoline*, 32 ROCKY MNTN. L. REV. 206 (1959-1960); W. Adams, *Vertical Divestiture of the Petroleum Majors: An Affirmative Case*, 30 VAND. L. REV. 1115 (1977); J. W. Markham and A. Hourihan, *Horizontal Divestiture in the Petroleum Industry*, 31 VAND. L. REV. 237 (1978); W. L. Novotny, *The Gasoline Marketing Structure and Refusals to Deal with Independent Dealers: A Sherman Act Approach*, 16 ARIZ. L. REV. 465 (1974); and E. V. Rostow and A. S. Sachs, *Entry into the Oil Refining Business: Vertical Integration Re-examined*, 61 YALE L. J. 756 (1952).

<sup>17</sup> CRS, *supra* note 8 at 19.

<sup>18</sup> Asymmetry is observed between a number of upstream-downstream price combinations. The most common is wholesale gasoline-retail gasoline prices, followed by crude oil-retail gasoline prices.

<sup>19</sup> Theories of coordination could include signaling adherence to a collusive agreement at the refining or retail levels. For more detail see, e.g., Diana L. Moss, *The Petroleum Industry, Merger Enforcement, and the Federal Trade Commission*, 53 THE ANTITRUST BULLETIN 203 (Spring 2008).

Gasoline prices are also potentially influenced by the effects of increased market concentration resulting from the last wave of mergers in the late 1990s and early 2000s. When upstream and downstream markets are concentrated in vertically integrated industries, competitive concerns can arise. For example, vertical integrated firms may possess the ability and incentive to foreclose rivals from the market by limiting their access to customers or inputs, or raising rivals' costs by forcing them to operate at inefficient scale.<sup>20</sup> Successful foreclosure of rival gasoline retailers by vertically integrated refiner-marketers could increase prices in retail markets.

Refining concentration in PADD 1 is already high and, as noted, might be driven higher by additional refinery closures. But it is also clear that between 2004 and 2010, wholesale concentration increased by between about 300 and 700 HHI points in some PADD 1 states – particularly Pennsylvania where there is a geographic concentration of refining capacity – but also Maine and Rhode Island.<sup>21</sup> Similar to refining markets, however, state-level measures of wholesale concentration are likely understate market concentration since terminal networks are typically defined around smaller, metropolitan areas.<sup>22</sup>

Higher levels of refining and wholesale market concentration should be considered in light of the mitigating fact that refiner integration into gasoline marketing has declined since the early 2000s. For example, rack sales of gasoline in PADD 1 increased from 68 percent to 75 percent in 2010, while sales to co-ops and dealer-tank-wagon declined from 17 percent to 14 percent.<sup>23</sup> Indeed, there is evidence that integrated petroleum companies and refiners are spinning off downstream assets to concentrate on more profitable upstream activities. Moreover, large independent gasoline retailers can play a role in disciplining retail gasoline prices.

At first blush, these observations might support the notion that integrated refiners potentially have less ability to affect gasoline prices through vertical foreclosure than in the past. However, this must be viewed against the looming prospect of two firms in PADD 1 accounting for almost 90 percent of refinery capacity. Under those circumstances, jobbers and other distributors that purchase at the rack and independent gasoline retailers potentially face the prospect of dealing with fewer firms, one of which (ConocoPhillips) is vertically integrated into wholesale and retail marketing. Much like concentration in refining markets, this situation should be carefully monitored.

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<sup>20</sup> Some economic research appears to support the notion that merger involving refiner-marketer combinations activity in the U.S. since the mid-1990s increased wholesale and, sometimes, retail prices. Moss, *supra* note 19.

<sup>21</sup> FTC, *supra* note 2 at Table 14, at 63.

<sup>22</sup> Data from FTC merger investigations shows that terminaling and marketing markets are much smaller and more concentrated than state-based markets.

<sup>23</sup> FTC, *supra* note 2 at Table 15 (p. 65).

## V. Changing Use of the Transportation Network

Changes in the pattern of imports into PADD 1 and network usage also have competitive implications. Pipeline networks in the U.S. were largely designed and constructed to accommodate long-established trading patterns between supply and demand centers, within the U.S. and abroad. When those patterns change – as they are in light of the Northeast refinery closures – new constraints can emerge. For example, increased product flows and capacity constraints, reversals of product flows, shifting shares of pipeline versus ocean-borne (i.e., tanker and barge) transportation, and new pipeline transportation all affect usage of downstream networks, with associated effects on costs, prices, and disposition of supplies. A good analogy is the changed use of the U.S. high voltage transmission grid following regulatory reforms in the mid-1990s. Expansion of wholesale power markets, accompanied by higher volume, longer distance transfers of electricity and new trading patterns exposed limitations on the grid. Today, the industry faces similar issues, as renewables such as wind generators are located on remote parts of the grid.

PADD 1 is unusual in that it is a net importer of petroleum products. In 2010, 72 percent of total product supply in PADD 1 was met by “imports.” Just over one half of supply came from other PADDs (primarily PADD 3) and 20 percent from foreign imports. PADD 1 therefore supplied only about 21 percent of its own needs in 2011.<sup>24</sup> The economics of this situation are straightforward. Additional supplies must be procured from non-PADD 1 sources to make up for refining capacity shortfalls, particularly for ULSD and gasoline. Those supplies can come from a variety of sources – PADD 3, PADD 2, Canada, and foreign sources.<sup>25</sup>

Regardless of how shortfalls resulting from refinery closures are met, RPP prices in PADD 1 will likely increase relative to other PADDs, for a number reasons. First, scarce supplies must be bid away from other, more lucrative markets, potentially raising prices.<sup>26</sup> Second, capacity constraints on the Colonial pipeline that moves product from the Gulf Coast and up the eastern seaboard will potentially drive up transportation costs and therefore prices. Constraints on existing terminal and storage capacity and configurations might likewise adversely affect prices. Third, the costs of altering or building new infrastructure to accommodate the PADD 1 refining situation (should it become permanent) are potentially high and could increase prices.

Finally, if products are imported to PADD 1 from atypical or more remote sources, supply chains will probably become longer and more complex, potentially driving up

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<sup>24</sup> FTC, *supra* note 2, Table 11 (p. 60).

<sup>25</sup> Energy Information Administration, *Potential Impacts of Reductions in Refinery Activity on Northeast Petroleum Product Markets*, (February 27, 2012), available at <http://www.eia.gov/analysis/petroleum/nerefining/update/>.

<sup>26</sup> Supplies that come from abroad should, in any robust economic analysis, account for the indirect costs associated with dependency on foreign fuel sources.



costs and prices.<sup>27</sup> Under these circumstances, supply chains become more “fragile” and prone to disruption from events such as input market shocks, weather, or political events. This fragility could be exacerbated by the presence of concentrated markets at critical, constrained junctures in the supply chain. Such circumstances can create incentives for firms to exercise market power through unilateral or coordinated conduct, and are therefore important to monitor.

## **VI. Conclusion**

It is as yet unclear how refinery closures in the Northeast will affect RPP prices, particularly gasoline. Should prices rise, proposals for addressing them will highlight the tension between competition policy and broader-based public policy. Competition policy views domestic petroleum refining and marketing much like any other commodity market, using methodologies and economic tools to evaluate whether mergers or strategic firm conduct are likely to harm competition and/or consumers. Public policy, on the other hand, is apt to treat high gasoline prices as a societal problem. In addition to traditional consumer welfare and economic efficiency concerns, public policy would potentially consider equity, economic growth, and national security as key factors in crafting approaches.

Given these concerns, public policy could view petroleum markets as candidates for special rules or treatment that would not be considered in the realm of competition policy. It is thus important that approaches separate the underlying market dynamics (e.g., scarcity) associated with refinery closures in the Northeast from outcomes that are related to strategic competitive behavior. If the latter appears to be a factor in the evolving Northeast refinery situation, then it would be prudent for policymakers, including antitrust enforcers, to consider several important questions.

One question is whether past mergers have had an effect in creating the market structures and incentives that facilitate anticompetitive outcomes. In making budgetary decisions, Congress might also consider that the FTC will need resources to monitor for and investigate potential competitive concerns. Finally, antitrust may not be able to address some competitive issues. Much like the California electricity crisis of the early 2000s when generators engaged in unilateral withholding strategies to drive up wholesale electricity prices, withholding of refinery output or restraining growth in capacity likewise does not constitute a violation of U.S. antitrust laws.<sup>28</sup> In such circumstances, public policy would play a larger role in ensure that competition and consumers are not harmed.

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<sup>27</sup> EIA, *supra* note 25, at 23.

<sup>28</sup> Withholding output or capacity as part of a collusive strategy would be reachable under Section 1 of the Sherman Act. Likewise, exclusionary conduct by a single firm could be a violation of Section 2 of the Sherman Act. If a withholding strategy was likely in a post-merger context, it could be a cognizable anticompetitive effect under Section 7 of the Clayton Act.