

**DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
COMPETITION COMMITTEE**

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ROUNDTABLE ON ENVIRONMENTAL REGULATION AND COMPETITION

-- Note by the US FTC and the US DOJ --

This note has been submitted by the Delegation of the US Federal Trade Commission and the Antitrust Division of the US Department of Justice to the Competition Committee FOR DISCUSSION at its meeting held on 8-9 June 2006.

JT03211274

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1. In keeping with the focus of this OECD roundtable, our submission addresses how environmental regulation may affect (and has affected) competition. As such, this paper does not examine the significant benefits that environmental regulation has provided and continues to provide, *e.g.*, through improved air, land and water quality. Antitrust enforcers and advocates can play an important role in identifying the competitive effects of regulation, so that legislators and regulatory agencies can do the best job of balancing potentially competing policy considerations and can make fully informed decisions. Antitrust agencies are well suited to this competition-specific analysis, and we appreciate the opportunity to focus attention on the competitive effects of environmental regulation.

2. This submission focuses on the competitive effects of environmental legislation in the gasoline sector, in which the Federal Trade Commission (“FTC” or “Commission”) has extensive competition policy and enforcement expertise. In examining the competitive effects of environmental regulations applied in the last decade to gasoline markets in the United States, this submission examines the extent to which environmental regulations – particularly those intended to encourage cleaner-burning formulations of gasoline – may have worked to change the contours of relevant markets or may have contributed to highly visible market phenomena such as price volatility.

1. Environmental Regulations Applied in Gasoline Markets

1.1 Background

3. In the United States, the refining, terminaling, wholesaling, and marketing of gasoline are subject to numerous environmental regulations enforced at the federal level by the U.S. Environmental Protection Agency (“EPA”) and by state environmental agencies. In particular, regulations to reduce air pollution have required refiners to change gasoline formulations to produce cleaner burning fuels. The original step in this direction, taken pursuant to the Clean Air Act, prohibited lead additives in gasoline. Similar regulations followed, *inter alia*, requiring the use of oxygenates that would make gasoline burn more cleanly and limiting emissions of several harmful pollutants, including nitrogen oxide, sulfur dioxide, and volatile organic compounds.

4. Under amendments to the Clean Air Act, the EPA was authorised to identify “pollution non attainment areas,” defined as metropolitan areas in which air pollution was particularly high. In such areas, the EPA could require remedial measures, including the use of special formulations of gasoline – so-called “reformulated gasoline” (“RFG”). By 1995, the EPA identified 19 non attainment areas in which RFG and its successors, RFG II and RFG III, would be required. It was illegal for retailers to sell gasoline in these areas that did not burn at least as cleanly as RFGs.¹ At present, RFGs are required in portions of 17 states and the District of Columbia, and they account for 30% of the gasoline sold in the United States. Each individual refiner decides whether and how to blend RFGs.

5. At roughly the same time, the State of California enacted similar environmental regulations, requiring gasoline sold anywhere within the state to meet minimum quality standards set by the California Air Resources Board (“CARB” or “Board”). CARB formulations pollute less than do RFGs. Thus, although CARB formulations satisfy federal environmental standards for gasoline sold in non attainment areas, RFGs do not necessarily satisfy California's environmental standards.

¹ The non attainment areas were Covington, Kentucky (near Cincinnati, Ohio); Louisville, Kentucky; St. Louis; Dallas-Ft. Worth; Houston; the Chicago-Milwaukee area; the Los Angeles-San Diego area; the Sacramento, California, area; the area in Virginia between Richmond and Norfolk; and the heavily populated area between Washington, D.C., and Boston.

1.2 *The Possible Effect of Gasoline Formulation Regulation on Competition*

6. This submission assesses whether such environmental regulations applied in the gasoline sector may affect the intensity of competition and the likelihood of anticompetitive conduct, rather than other price effects (such as those attributable to a change in costs).² In particular, we describe how environmental legislation may have affected the contours of the relevant markets in which firms compete or may have contributed to price spikes or price volatility. These rules also have been subject to manipulation by market participants, and, in the case of CARB regulation, also have raised concerns over the potential for anticompetitive unilateral conduct in the form of “cheap exclusion.”

1.2.1 *Market Fragmentation*

7. The Commission has examined the gasoline industry in numerous investigations. Most of these investigations have involved petroleum industry mergers, with others addressing conduct prompted by temporary price spikes. Relevant gasoline markets are usually regional or metropolitan in scope.³ Similarly, environmental regulations on gasoline formulations usually are applied over a specific region or metropolitan area. Thus, environmental regulations can result in requirements to use different gasoline formulations in nearby or adjacent geographic areas.

8. FTC merger investigations,⁴ for example, have shown that environmental regulations may affect competition and the competitive analysis of mergers in several ways. First, in some cases, environmental regulations may make it appropriate to assess the possible competitive effects of mergers in relatively narrow relevant markets or in multiple product and geographic markets. For example, when Chevron proposed to acquire Texaco in 2001, the Commission alleged a relevant market in RFG II gasoline confined to just the greater St. Louis metropolitan area.⁵ The Commission also examined the competitive effects of West Coast refinery consolidation in its investigation of the Shell/Texaco joint venture in the late 1990s, separately alleging markets for conventional gasoline in the Pacific Northwest and for CARB gasoline in California. The Commission resolved the competitive concerns in these two markets with the divestiture of one refinery in the Pacific Northwest that produced both conventional and CARB gasoline.⁶

² Both RFGs and CARB formulations are more expensive to refine and blend than conventional gasoline, and the price premiums for those specialized formulations do not necessarily indicate a change in the competitive dynamics of the market.

³ In the refining/bulk supply markets, this is due to transportation infrastructure, whereas terminal markets are limited by transportation costs. The staff of the FTC has noted that “[a]lthough crude oil is, for the most part, a commodity traded on world markets, our experience shows that economically relevant gasoline markets are regional for refining and transportation, and local when considering gasoline distribution or retail sales.” Comments of the staff of the FTC before the EPA at 4 (Jan. 30, 2002).

⁴ The FTC has released data in the last two years that show that the agency has brought merger cases in the petroleum industry – and has required relief in such cases – at lower levels of concentration than in other industries. Unlike in other industries, the Commission has obtained merger relief in moderately concentrated petroleum markets. Moreover, our vigorous merger enforcement has preserved competition and thereby kept gasoline prices at a competitive level. *See, e.g.*, Federal Trade Commission Horizontal Merger Investigation Data, Fiscal Years 1996-2003 (Feb. 2, 2004), Table 3.1, et seq.; FTC Horizontal Merger Investigations Post-Merger HHI and Change in HHI for Oil Markets, FY 1996 through FY 2003 (May 27, 2004), available at <http://www.ftc.gov/opa/2004/05/040527petrolactionsHHIdeltachart.pdf>.

⁵ Chevron Corp., FTC Dkt. No. C-4023 (Jan. 4, 2002).

⁶ Federal Trade Commission, Bureau of Economics, *The Petroleum Industry: Mergers, Structural Change, and Antitrust Enforcement* (“Petroleum Report”) at 51 (2004).

9. Second, the limited volume of some special environmentally-mandated fuel specifications may limit the number of refineries that produce the fuel, at least in the short run. In addition to the costs and timing of changing product specification line ups, the ability of refineries that currently do not produce a special formulation to respond to a price increase in such a fuel may be further impeded, in some cases, by other factors, such as the time and expense of transporting product into the high price area, capacity limitations in the high-priced area's terminal storage or a relative lack of independent distribution outlets in the area. Moreover, as discussed further below, environmental regulations for certain fuel specifications in some cases may require such significant investment costs that some refineries may choose to exit the market permanently.

10. By the same token, sometimes regulatory action can expand the contours of these markets when circumstances dictate. For example, following Hurricanes Katrina and Rita, various temporary environmental waivers allowed the sale of many fuel specifications into geographic areas where such sales would not normally be permissible, thereby enabling the refiners to respond more quickly and effectively to the price spikes resulting from the storms.⁷

Economies of Scale and Scope for Larger Refineries

11. In the United States, environmental regulations require that specific gasoline formulations be sold in specific geographic areas. With each new formulation, a potential supplier must decide whether to make a costly investment in any refinery that might provide the new formulation to a market. This investment imposes both a fixed cost and a variable cost on the refinery.⁸ For some formulations, the fixed cost is sufficient to discourage the refinery from making the investment, and thus impedes the refinery from supplying the new formulation in the geographic area in which it is required. In this way, the formulation regulations can fragment markets for the bulk supply of refined products.

12. Because the fixed component of the investment can be high, the disincentive to supply a new formulation of gasoline falls disproportionately upon small refiners, for which average costs increase more sharply than for refiners with the capacity to produce at higher output levels. Thus, the new formulation regulations may accelerate the ongoing trend of market exit by small refineries, with a concomitant shift toward larger refineries.⁹ As a corollary, formulation regulations also confer a cost advantage on operators of multiple refineries. In addition, multi-refinery operators usually can supply the new formulation at lower cost than the single refinery operator, irrespective of the scale of individual refineries.¹⁰ Broadly

⁷ See, e.g., Prepared Statement of the Federal Trade Commission, "Market Forces, Competitive Dynamics, and Gasoline Prices: FTC Initiatives to Protect Competitive Markets," Presented by Deborah Platt Majoras, Chairman, Before the Committee on Commerce, Science, and Transportation and the Committee on Energy and Natural Resources, United States Senate, at 24 (Nov. 9, 2005).

⁸ A refinery can be viewed as a collection of assets, each providing the ability to implement specific chemical reactions in very large volume. Refinery capacity is usually expressed in terms of atmospheric distillation capacity – the most basic step in refining crude oil into gasoline. But this oversimplifies matters, since refineries usually become large by adding "downstream" assets (*i.e.*, other chemical processes) that enable the refinery to produce a greater variety of products. Each of these assets has its own capacity for the specific intermediate or final products that it supplies. Petroleum Report at 176, 178-180.

⁹ There are economies of scale to refineries. Engineering studies estimate that the minimum efficient scale falls between 115 MBD (thousands of barrels per day) and 183 MBD. Yet even for refineries of similar size, costs vary greatly, in part due to the influence of location, access to waterway transport, proximity to large markets, and access to low-cost crude oil. To some degree, the exit of small refineries has resulted from the decline of domestic crude oil reserves. Petroleum Report at 179.

¹⁰ Petroleum Report at 180-181.

speaking, these advantages (induced by environmental legislation) amount to economies of scale and scope for larger refiners, and contribute to concentration in the supply of gasoline at the refinery level.¹¹

13. Notwithstanding the reduction in the overall number of petroleum refineries in the United States – a trend that has been constant over the last 50 years, with the exception of the late 1970s and early 1980s – the U.S. has experienced an expansion of refinery capacity as the remaining refineries have expanded and grown more efficient. Just since 1995, the expansions to existing refineries have added the equivalent of approximately 15 new average-sized refineries to the nation’s refining capacity. The older, less efficient refineries that were taken out of service – many of them so small and inefficient that they were dubbed “tea kettle” refineries – faced a number of difficulties and increased costs in producing gasoline formulations that would satisfy increasingly stringent and complex environmental specifications. These cost penalties have reinforced other factors encouraging small refineries either to exit or to become larger.¹²

14. More generally, to the extent environmental regulations increase the investment requirements and the fixed costs of operations, these regulations may increase scale economies and efficient operating size throughout the supply chain, from the refinery to the wholesale terminal to the retail gas station.

1.2.2 *Price Spikes and Price Volatility*

15. In the past, federal, state, and local environmental regulations have interacted with pipeline repair problems to produce price spikes and (in some cases) increased price volatility. For example, in 2000, supply interruptions on the Explorer pipeline (serving St. Louis and Chicago) and the Wolverine pipeline (serving Detroit and northern Ohio) contributed to supply problems causing price spikes in these areas. Supply interruptions were exacerbated by local government decisions mandating that particular oxygenates – methyl tertiary-butyl ether (“MTBE”) or ethanol – be used in RFG.¹³ By 2000, St. Louis had chosen to encourage the use of MTBE-based RFG, whereas Chicago and Milwaukee required the exclusive use of ethanol. Generally, MTBE is less costly for refiners to use than ethanol. MTBE is produced at the refinery and can be shipped via pipeline. Ethanol is a solvent that threatens product quality in batch operations in pipelines,¹⁴ and therefore it must be shipped – at greater cost and hazard – via barge, rail, or truck before it is mixed with gasoline at the terminal. In addition, the intermediate feedstocks for gasolines using MTBE and ethanol are different and incompatible. Refiners found it very difficult to produce gasoline using ethanol. In addition, there were refinery product problems, extended shutdowns of refineries for maintenance, refining disruptions, major pipeline disruptions, and low inventories from a tight market beginning in the spring of 2000.¹⁵ All of these actions weakened or undermined the incentives of refiners

¹¹ Although the cost disadvantages of smaller refineries in some instances may be offset by other factors such as transportation costs advantages due to proximity to crude producing areas or product consuming areas, increasing scale economies owing to environmental regulations and technological change generally appear to be favouring larger scale refineries and refinery systems in the long run. Petroleum Report at 179-180.

¹² To the extent that technological advances or regulatory requirements require large capital investments, bigger, higher capacity refineries will be increasingly competitively advantaged compared to smaller refineries due to economies of scale. See Petroleum Report at 7.

¹³ The Clean Air Act originally required the use of oxygenates in gasoline in order to encourage more complete combustion, thereby reducing airborne pollution. Refiners have relied largely upon MTBE and ethanol to fulfil this oxygenate requirement.

¹⁴ Final Report of the Federal Trade Commission, “Midwest Gasoline Price Investigation,” at 127 (Mar. 29, 2001).

¹⁵ *Id.* at 18-20.

and pipelines to provide the feedstocks for the ethanol gasoline required by Chicago and Milwaukee, and contributed to extended price spikes in this region.¹⁶

16. A number of states have recently limited or banned the use of MTBE, and the Energy Policy Act of 2005 contained numerous provisions encouraging the use of ethanol and discouraging the use of MTBE. MTBE has virtually been eliminated from the market, and prices for RFG with ethanol are significantly higher than conventional gasoline. Many observers expect the increased reliance on ethanol to result again in price spikes. After the problems that Chicago and Milwaukee encountered in blending ethanol into gasoline, some observers believe it likely that states in the Northeast will encounter similar problems. In April 2006, President Bush announced that he would ask the EPA to weaken or suspend environmental regulations that apparently have caused gasoline shortages in some portions of the Northeast.¹⁷

17. Upon examining price volatility for different regions of the country and comparing these results to gasoline formulation restrictions, FTC staff found that the regulation of gasoline formulation, in and of itself, did not cause greater price volatility, but that environmental legislation may exacerbate volatility in areas with limited alternative sources of supply because potential substitutes are more difficult to obtain in the event of a supply shortage.¹⁸

18. As an initial test, a comparison of the standard deviation of the prices of reformulated versus conventional gasoline in the Gulf Coast area showed no significant difference in the variation of the prices.¹⁹ This demonstrates that, at least within the important refining region of the Gulf Coast area, the prices of RFG are not more volatile than those of conventional gasoline. This result suggests that the RFG formulation, in and of itself, adds no significant volatility to the price.

19. This test was then applied to a defined area encompassing the East Coast of the U.S., which is served by the Colonial and Plantation pipelines that supply gasoline from the Gulf Coast. Comparing conventional gasoline across these two regions, we found no significant difference in the volatility of prices near these pipelines.²⁰

20. The Commission found a different result for RFG. Price volatility for RFG sold in Maryland and Virginia near the Colonial pipeline, which brings Gulf-refined product into the area, is higher than the price volatility for RFG sold on the Gulf Coast. The most reasonable explanation for this phenomenon is that the only locations along the Colonial pipeline that use RFG are in Virginia and Maryland (at the northern end of the pipeline), while the broad areas to the south supplied by Colonial require only

¹⁶ *Id.*, Executive Summary at 3 -5. Shortages of ethanol-based RFG spilled over to other types of gasoline. St. Louis was granted a waiver from federal regulation, which allowed it to substitute conventional gasoline for RFG, and this diverted conventional gasoline shipments that could have gone to the Chicago region. In addition, the waiver immediately froze a stock of MTBE gasoline intended for sale in St. Louis; this gasoline occupied scarce storage capacity. Moreover, the EPA waiver raised uncertainty, further weakening incentives for suppliers to supply Chicago and Milwaukee with the feedstock necessary for ethanol-based RFG. See Jeremy Bulow, (former) Director, Bureau of Economics, Federal Trade Commission, "The Midwest Gasoline Investigation" at 3 (Apr. 17, 2001). The Commission's 2001 report predicted that price spikes in gasoline would recur absent a change in the underlying regulatory environment.

¹⁷ See <http://www.cnn.com/2006/POLITICS/04/25/bush.energy/>.

¹⁸ Federal Trade Commission, *Gasoline Price Changes: The Dynamic of Supply, Demand, and Competition* ("Gasoline Price Changes"), Ch. 4 (2005).

¹⁹ RFG's higher price was expectedly attributable to higher refining costs.

²⁰ Gasoline Price Changes at 95.

conventional gasoline. Moreover, these areas in Maryland and Virginia tend to rely on the pipeline for their RFG supply, with few or no supply alternatives. Thus, in the event of a shortage, other shipments of RFG would not be diverted quickly to Maryland and Virginia from relatively nearby locations. As shortages develop and prices rise, then, there is no mechanism – other than time-consuming additional shipments from the distant Gulf Coast – to drive the price back down toward the pre-shortage level. For these reasons, shortages tend to result in larger and more persistent price increases – that is, in the higher price volatility that we observe in some areas.²¹

1.2.3 Concerns over Regulatory Failure and “Cheap Exclusion”

21. In theory, environmental regulations might encourage collusion by leading to narrower relevant markets characterised by significantly higher concentration levels. The FTC, however, has not found evidence of collusion in the petroleum markets despite several extensive investigations over the past decade.²² With regard to unilateral conduct, there are numerous instances in antitrust history in which firms have endeavoured to misuse the regulatory process to create or maintain market power. The FTC’s *Unocal* case, concerning the misuse of the regulatory process with respect to gasoline formulation rules, provides a striking example of this form of anticompetitive unilateral conduct.

22. In 1988, the California Legislature enacted the legislation that laid the foundation for the eventual creation of CARB gasolines. The Legislature intended that these gasolines would use the latest relevant science and technology. In implementation of this legislation, the Board relied on industry experts and the large petroleum refiners for information on available technologies and the costs of using such technologies. With its mission to promulgate product standards for gasoline, the Board wanted to avoid the use of proprietary standards that might have enabled one or more firms to exercise market power or otherwise harmed competition.²³

23. In an administrative complaint issued in 2003, the FTC alleged that Unocal, in its participation in proceedings before the Board, deceived the Board and other participants regarding a process for developing clean-burning gasolines appropriate for use in California. Unocal allegedly encouraged the Board to rely on several of Unocal’s studies to develop product standards for gasolines, and the Board did so in part because Unocal represented that these studies were nonproprietary and available to the public at

²¹ See generally Gasoline Price Changes at 69-97. In Gasoline Price Changes, the Commission examined a variety of factors and found that prices depended on, *inter alia*, access to refineries as well as access to refined products pipelines. Areas were vulnerable to price spikes, and subject to highly volatile prices, only when they depended heavily on one or a few supply sources. Areas with access to more numerous, diversified suppliers did not experience price spikes even when an important source of supply was interrupted. Some of the observed price spikes were related to environmental regulations. Shortages developed in Detroit when a blackout followed a transition to a specially formulated gasoline. *Id.* at 74-75. By contrast, in 2004, price spikes were predicted when New York and Connecticut banned MTBE in favour of ethanol; but this transition proceeded smoothly, with no price effects, due to supply from European and South American refiners. *Id.* at 75-76.

²² See, e.g., *The Federal Trade Commission Investigation of Gasoline Price Manipulation and Post-Katrina Gasoline Price Increases: A Commission Report to Congress* (Spring 2006) at 12 (Commission investigation did not find evidence of collusion involving special fuel formulations).

²³ See *Union Oil Co. of California*, FTC Dkt. No. 9305 (Mar. 4, 2003) (Complaint), at ¶¶ 16-27, at <http://www.ftc.gov/os/2003/03/unocalcmp.htm>.

no charge.²⁴ Concurrently, the Commission alleged, Unocal was pursuing patents that would enable it to charge substantial royalties once the Board incorporated the research into its RFG regulations.²⁵

24. Over time, refiners invested so as to comply with Board regulations, based on the Unocal standards. In so doing, the refiners implicitly committed themselves to relying on Unocal's then-patented studies. Early in 1995, Unocal issued a press release announcing that its patented technology covered many of the fuel compositions compliant with the CARB requirements. Shortly thereafter, the major California refiners – Exxon, Mobil, ARCO, Chevron, Texaco, and Shell – filed suit to have the Unocal patents invalidated. Unocal countersued for patent infringement and ultimately prevailed, obtaining an initial award of \$91 million from the refiners.²⁶ In other lawsuits, Unocal sought damages for infringement (by the six named refiners) and also sued Valero (another refiner).

25. Under the terms of FTC consent orders issued in 2005, which resolved this administrative case as well as the Commission's challenge to Chevron Corporation's acquisition of Unocal,²⁷ Chevron and Unocal agreed to stop enforcing the patents in question and to release them to the public by the merger's effective date.²⁸

26. The regulatory process in California addressed in the Unocal case provides a clear lesson on regulatory issues. The legislation at issue prescribed design standards for gasoline. Design standards, however, can have unintended side effects. In particular, they can create or enhance the incentives of suppliers and other participants to use the regulations as a means of enhancing or creating market power.²⁹ In the case of Unocal and California's standards, this resulted in what some FTC antitrust enforcers have referred to as "cheap exclusion" – the obtaining of monopoly power through processes that are relatively inexpensive and that have no plausible efficiency justifications.³⁰ Exclusionary conduct featuring the misuse of governmental rules is relatively cheap, since it does not require investment in business capability. Moreover, this technique may be particularly pernicious, both because presumably there is no efficiency benefit from misusing government authority and because the presence of government authority may prevent market forces from eroding market power as quickly as they otherwise would.³¹ The Unocal case exemplifies how firms can attempt to misuse regulation (in this case environmental regulation) as a form of cheap exclusion.

²⁴ Complaint at ¶¶ 33-49.

²⁵ *Id.*

²⁶ *Id.* at ¶¶ 60-72.

²⁷ See *Union Oil Company of California*, FTC Dkt. No. 9305, Agreement Containing Consent Order (June 10, 2005), available at <http://www.ftc.gov/os/adjpro/d9305/050610agreement9305.pdf>.

²⁸ See Oil Daily, *FTC Deal Frees Refiners from Unocal Patents* (June 13, 2005). The Commission estimated that the savings to California motorists resulting from the settlement would be approximately \$500 million per year.

²⁹ This is why some standards-setting bodies, including the larger organizations in North America, try to avoid design standards and instead rely on performance standards as much as possible.

³⁰ In recent years the FTC has pursued a number of investigations of anticompetitive unilateral as well as joint conduct that might be characterized as "cheap exclusion." See Susan A. Creighton, "Cheap Exclusion," remarks before Charles River Associates 9th Annual Conference on Current Topics in Antitrust Economics and Competition Policy (Feb. 8, 2005), available at <http://www.ftc.gov/speeches/creighton/050425cheapexclusion.pdf>; Susan A. Creighton, "Ranking Exclusionary Conduct," remarks before the 2005 ABA Fall Forum (Nov. 15, 2005), available at <http://www.ftc.gov/speeches/creighton/051115conduct.pdf>.

³¹ See generally Robert A. Bork, *The Antitrust Paradox* 159 (2^d ed. 1993).

27. As our examination of the U.S. gasoline sector demonstrates, environmental legislation has important competitive implications. With increasing reliance on environmental regulation worldwide, there is a real need for a better understanding and identification of the hidden competitive costs of such legislation. This roundtable offers an initial step toward prompting this analysis.