2006 Report on Ethanol Market Concentration

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Federal Trade Commission

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Under Section 1501(a)(2) of the Energy Policy Act of 2005, as codified at 42 U.S.C. § 7545(o), the Federal Trade Commission ("Commission" or "FTC") must annually "perform a market concentration analysis of the ethanol production industry using the Herfindahl-Hirschman

a small group of firms, could wield sufficient market power to set prices or coordinate on prices or output.

I. Background

This analysis builds upon the factual background contained in the Commission's 2005

Report on Ethanol Market Concentration, which detailed important characteristics of domestic fuel ethanol production and marketing.¹

The growth in domestic ethanol production over recent years has been well-documented. In 2005, U.S. ethanol plants produced 3.9 billion gallons of ethanol, up 15 percent from 3.4 billion gallons in 2004.² It is estimated that in 2006 U.S. ethanol production will exceed 4.6 billion gallons, at least 18 percent greater than 2005 production, and at least 188 percent greater than the 1.6 billion gallons produced in 2000.³

Increases in ethanol production reflected comparable growth in U.S. ethanol production capacity. By the end of 2005, there were 95 facilities with a total of over 4.3 billion gallons per year of ethanol production capacity.

market participants. The Horizontal Merger Guidelines categorize three levels of market concentration: markets may be "unconcentrated" (HHI below 1000), "moderately concentrated" (HHI between 1000 and 1800), or "highly concentrated" (HHI over 1800). The HHI provides a snapshot of market concentration and, in the context of merger review, the post-merger change in the HHI suggests the merger's likely effect on market concentration. It must be emphasized, however, that the HHI is only the starting point for competitive analysis, and the Commission does not make enforcement decisions based solely on market shares or HHIs. The analytical significance of the HHI depends on other market factors (such as ease of entry and likely competitive effects) that require further investigation and market analysis.

For purposes of calculating the HHIs required by Section 1501(a)(2), we must assume that U.S. fuel ethanol production is a relevant antitrust market. This assumption precludes consideration of potentially relevant product and geographic characteristics that would bear on a complete competitive analysis of the ethanol industry. Indeed, provided that fuel ethanol production remains above minimum production levels mandated by the Energy Policy Act of 2005, ethanol itself may not be a proper antitrust product market. At levels above the mandatory minimum, ethanol likely competes with other blending components (alkylate, iso-octane, or other clean, high-octane blending components) that can be used in gasoline, and refiners and

 $^{^9}$ For example, a four-firm market with market shares of 30 percent, 30 percent, 20 percent, and 20 percent has an HHI of 2600 [(30 * 30) + (30 * 30) + (20 * 20) + (20 * 20) = 2600]. The HHI ranges from 10,000 (pure monopoly) to a number approaching 0.

¹⁰ See Horizontal Merger Guidelines § 1.5.

¹¹ A relevant antitrust market has both product and geographic aspects. A product market is a product or group of products such that a hypothetical firm that was the only seller of those products would find it profitable to impose at least a small but significant and nontransitory price increase above the competitive level. If such a price increase would not be profitable because of the loss of sales to other products, the product or group of products would not be a relevant product market. Similarly, a geographic market is a region such that a hypothetical firm that was the only

blenders may choose to use other blending components in their gasoline as ethanol prices increase. In regions or states that sell E-85 (a blend of gasoline that is 85 percent ethanol), owners of flexible-fuel vehicles will choose regularly between purchasing E-85 or purchasing gasoline with no more than 10 percent ethanol. If ethanol is part of an overall gasoline market, or even a smaller market consisting of other clean-burning blendstocks, the HHIs in this analysis could overstate concentration in the product market and suggest an exaggerated likelihood of the potential for ethanol producers to engage profitably in anticompetitive behavior.

Although this analysis is limited to U.S. ethanol production, imported ethanol also may be analytically significant. The RFA reports that over 136 million gallons of ethanol were imported into the U.S. in 2005, down from 149 million gallons in 2004. Yet imports increased significantly from January through July 2006, totaling 309 million gallons in that period alone and increasing domestic ethanol supplies by 12 percent. Of course, the annual variation in ethanol imports is related to changes in the relative prices of ethanol in the U.S. and other countries. As relative U.S. ethanol prices increase (as they did in 2006), selling ethanol into the U.S. becomes more attractive to foreign producers, despite federal tariffs. Although imports remain a small share of U.S. consumption, their presence suggests that HHIs for domestic ethanol production tend to overstate concentration in the ethanol industry.

Staff used three different methods of calculating HHIs in ethanol production and marketing. As described below, staff first calculated HHIs based on the ethanol production capacity of each individual producer. Staff then calculated HHIs that attributed each producer's

 $^{^{\}rm 12}$ See From Niche to Nation at 17.

 $^{^{13}}$ See EIA,2 Tc 0.252 0 Tdbd389 0 T p.ow
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capacity to the firm responsible for marketing the producer's ethanol. Finally, by way of confirming these calculations, staff determined the HHIs on the basis of actual production, rather than capacity.

A. Producer-Based Allocation, Using Capacity

Staff first calculated market shares of producers based on their fuel ethanol production capacity. Although market shares may be measured in other ways, such as by total dollar sales, production capacity provides a useful and easily confirmable indicator of a producer's competitive significance.¹⁴

To determine the production capacity of each ethanol plant, staff relied on publicly available information supplemented by interviews with industry participants. RFA publishes and frequently updates data regarding ethanol capacity and announced capacity additions. Many producers publicly disclose existing plant capacity or future construction plans. Marketers also may announce new agreements with producers. Staff interviewed producers, marketers, and other industry participants to confirm public data.

In attributing capacities to individual producers, staff included additional capacity from new plant construction or expansion, provided that the construction or expansion had sufficiently progressed such that the extra capacity could yield marketable volumes within one year. This is consistent with the approach adopted in the Horizontal Merger Guidelines. Staff attributed additional capacity to the firm only if the firm had finished its expansion plans, received necessary financing for the construction, and begun physical construction or expansion.

Although a producer may plan on expanding capacity substantially over the next few years, staff

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¹⁴ See HORIZONTAL MERGER GUIDELINES § 1.41. A firm's capacity likely is the best measure of its competitiveness, because ethanol is an undifferentiated product (*i.e.*, producers manufacture chemically identical ethanol).

¹⁵ See id. § 1.32.

deemed these plans to be too speculative for this analysis until the producer has secured financing and begun actual construction. ¹⁶

Using this approach, if each U.S. ethanol-producing firm is allocated market share based on its capacity, staff determined that the HHI would be 326, which is deemed an unconcentrated market under the Horizontal Merger Guidelines. Staff's similar calculation of this figure in last year's report yielded an HHI of 499. Thus, there has been a reduction in concentration in ethanol production since 2005.

B. Marketer-Based Allocation, Using Capacity

Marketing agreements add complexity to a competitive analysis of the ethanol industry. Producers must reach oil companies and others that ultimately blend ethanol with gasoline for sale to consumers. Some producers market their own ethanol by entering into sale agreements with oil companies, blenders, or brokers, and by arranging for truck or rail transportation to

There is no standard marketing agreement in the industry, and marketing agreements vary in length. Some marketers maintain an equity ownership interest in their producers' facilities. In virtually all instances, however, the ethanol producer determines its own output level.

To analyze market concentration in light of these marketing relationships, staff evaluated whether the capacities used to produce the ethanol marketed by one company should be attributed to that single ethanol marketer rather than to the individual ethanol producers represented by the marketer. A producer's ability to adjust its own output in response to changing prices suggests that staff should treat each producer individually. Marketing "pools," however, may warrant a different approach. In a pooling arrangement, the marketer treats all of its producers' volumes in common, makes sales to accounts, and decides which plant is best situated to service the account. Each producer is allocated a prorated share from the common revenue pool, based on the volume it contributes. ¹⁹

Given the fact-specific nature of market analysis, staff cannot determine with certainty the effect of each marketing agreement on the industry. Staff therefore calculated HHIs by attributing all producers' shares to their marketers, regardless of whether the marketing agreement involves pooling volumes. This approach yields an HHI of 995. This figure falls within the range for unconcentrated markets under the Horizontal Merger Guidelines and is down from last year's HHI of 1259 using the same allocation method.²¹

Staff alternatively calculated an HHI that attributed shares to marketers only when they had pooling arrangements with their producers. For producers that did not market through a pooling arrangement, staff attributed the market shares to the producers themselves. This approach yields an HHI of 635 – also an unconcentrated market, and down from last year's HHI of 813 using the same methodology.²²

C. EIA Production Data

Although capacity-based data provide a good indication of ethanol industry concentration, calculation of HHIs on this basis is limited by difficulties in measuring ethanol production capacity with precision. Most industry participants report capacity based on "guaranteed" or "name-plate" capacity. Typically, builders and designers guarantee that a newly constructed plant (or expansion) will produce a certain volume of ethanol. In this industry, the plant often can produce more than the guaranteed capacity. Moreover, a plant will tend to exceed its rated capacity as the producer improves the production process and gains expertise in the plant's operation. It is not uncommon for ethanol plants to run 10 to 15 percent higher than their stated capacities.²³

²¹ See FTC, REPORT ON ETHANOL MARKET CONCENTRATION 11 (2005).

²² See id.

²³ In addition, some industries demonstrate significant differences among competitors' capacity utilization rates.

To address the measurement issues in the capacity-based HHI calculations, staff performed a parallel analysis using ethanol production data. Every month, EIA collects confidential information on the production of oxygenates such as ethanol and methyl tertiary-butyl ether. Firms that produce over 8 million gallons of oxygenates per year must report to EIA their monthly production volumes by product. EIA agreed to calculate the HHI data based on annual production from July 2005 through June 2006, following the same attribution methods outlined in the previous sections. To maintain its confidentiality obligations, EIA reported only the final HHI numbers and did not disclose to us the volumes of ethanol attributed to each producer or marketer.

The two right-hand columns of Figure 1 show HHIs using EIA production data. If all shares are attributed to the individual producers, the HHI is 683, which is unconcentrated under the Horizontal Merger Guidelines and shows deconcentration in the market when compared to the HHI of 929 from the 2005 report.²⁴ If we allocate producers' shares to their marketers, the HHI is 1345. This would be moderately concentrated under the definitions in the Horizontal Merger Guidelines, although it represents deconcentration when compared to the HHI of 1613 from 2005. If we allocate producers' shares to their marketers for pooling agreements only, the production-based HHI is 981, down from the HHI of 1221 from the 2005 report.²⁵

Figure 1: Domestic Fuel Ethanol Concentration

| | HHI Based on Capacity | | HHI Based on Production | |
|---|--------------------------|---------|----------------------------|------|
| Treatment of Marketing Agreements | 2006(P) | 2007(P) | 2005 | 2006 |
| Attribute shares to each producer | 499 | 326 | 929 | 683 |
| Attribute shares to marketer only for pool marketing agreements | 813 | 635 | 1221 | 982 |
| Attribute shares to marketer for all marketing agreements | 1259 | 995 | 1613 | 1345 |

Source: RFA, EIA

III. Conclusion

Our HHI analysis of market concentration shows that U.S. ethanol production is unconcentrated or, at most (using actual production data), only moderately concentrated under the Horizontal Merger Guidelines, revealing little incentive or ability for one or more firms to act anticompetitively. New entry and other market factors reduce the significance of these figures, and, as shown in Figure 2, concentration has fallen as production capacity has increased.

Nevertheless, given the highly fact-intensive nature of antitrust analysis, staff cannot exclude the abstract possibility that future mergers may potentially create anticompetitive effects in a given segment of the industry, or that industry participants may engage in anticompetitive conduct.

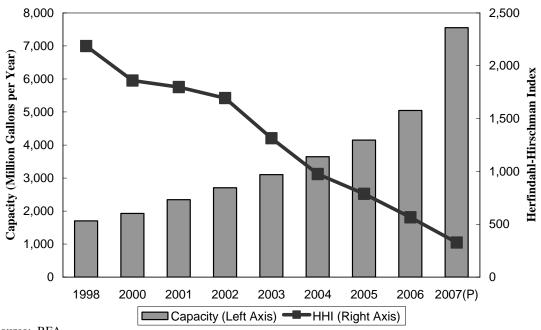


Figure 2: Historical Fuel Ethanol Capacity and HHIs

Source: RFA

Note: Annual figures are for year-end for 1998 to 2004, and October for 2005 to 2006. 2007(P) is projected capacity for late 2007, which adds construction of new plants and expansions as of July 2006.