

2011 Report on Ethanol Market Concentration

I. Introduction

Section 1501(a)(2) of the Energy Policy Act of 2005, as codified at 42 U.S.C. § 7545(o), requires the Federal Trade Commission (“Commission” or “FTC”) each year to “perform a market concentration analysis of the ethanol production industry using the Herfindahl-Hirschman Index [“HHI”] to determine whether there is sufficient competition among industry participants to avoid price-setting and other anticompetitive behavior.”¹ The statute also requires the FTC to consider all marketing arrangements among industry participants in preparing its analysis.² The FTC must report its findings to Congress and to the Administration.

participants. As in previous reports, staff calculated HHIs for the ethanol production industry based on two different measures of market share – production capacity and actual production⁵ – allocated under three different approaches, for a total of six HHI calculations.⁶ Based on production capacity, the HHIs for the domestic ethanol production industry range from 291 to 585, depending on the method of market share allocation. Based on actual production, the HHIs range from 284 to 601. Three of the six resulting HHIs for 2011 are slightly higher than those calculated for the 2010 Ethanol Report, indicating increased concentration. The other three HHIs for 2011 are slightly lower than those calculated for the 2010 Ethanol Report, indicating decreased concentration. All of the 2011 HHIs, however, reflect that the domestic ethanol industry remains unconcentrated, as it has been in each year during the life of the Commission’s reporting obligations under the statute.

These figures indicate that the U.S. fuel ethanol⁷ production industry is unconcentrated,⁸ assuming domestic fuel ethanol production is a relevant market for competition analysis. This

⁵ Due to the confidential nature of the ethanol production data the Department of Energy’s Energy Information Administration (“EIA”) collects, EIA staff – at FTC staff’s request – calculated both the actual production market share and capacity market share. These figures are based on data from EIA’s Annual Energy Review, Table A-1.1, “Production of Ethanol by State, 2000-2010.”

from July 2010 to June 2011, the industry blended more ethanol than in the same month of the prior year,¹² blending a total of 12.3 billion gallons.¹³ Consistent with the upward trend in blending volumes, industry participants believe that overall ethanol demand will meet or exceed the 2011 RFS minimum.

In recent years, domestic ethanol blending volumes have exceeded the RFS requirements. According to industry participants, favorable blending economics (i.e., low ethanol prices relative to gasoline blendstock prices) have historically provided the primary incentive for refiners and blenders to blend ethanol volumes above the RFS minimum, and these favorable blending economics have largely persisted in 2011. Many industry participants believe that ethanol blending will continue to be economically advantageous in the coming year, despite the imminent expiration of the Volumetric Ethanol Excise Tax Credit (“VEETC”) on December 31, 2011.¹⁴ VEETC provides a \$0.45 tax credit to refiners for every gallon of ethanol they blend with gasoline, enhancing ethanol’s cost advantage and encouraging greater levels of blending.

¹² See EIA, Monthly U.S. Refinery and Blender Net Input of Fuel Ethanol (last modified Sept. 29, 2011), available at <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mferius1&f=m>.

¹³ See *id.* For perspective, this represents about nine percent of total U.S. gasoline consumption over the same 12-month period, which totaled approximately 136.5 billion gallons. See EIA, Monthly U.S. Product Supplied of Finished Motor Gasoline (last modified Sept. 29, 2011), available at <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MGFUPUS1&f=M>.

¹⁴ VEETC originated in the American Jobs Creation Act of 2004. Pub. L. No. 108-357, § 301, 118 Stat. 1418, 1459 (2004) (amended 2010). In 2010, Congress extended the tax credit through December 31, 2011, as part of a larger tax policy package. Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 § 708, 26 U.S.C. § 6426 (2010). Congress continues to debate whether to continue and/or modify VEETC. See, e.g. Ethanol Reform and Deficit Reduction Act, S. 1185, 112th Cong. (2011) (proposing to extend VEETC through 2014 at a variable rate based on quarterly average crude oil prices); Volumetric Ethanol Excise Tax Credit Repeal Act, H.R. 1075, 112th Cong. (2011) (proposing an early repeal of VEETC).

Industry participants have indicated th

manufacturers' warranties for E15 usage, and establishment of E15 distribution infrastructure.¹⁸ According to industry participants, these issues limit E15's ability to forestall the approaching blend wall.

As in prior years, fuel ethanol prices have been volatile in 2011, leading to wide variations in margins. Margins were strong through the second half of 2010. In early 2011, increasing ethanol supply due to plant process improvements coincided with decreased overall gasoline demand, resulting in lower ethanol margins. According to industry participants, this low margin environment continued for most of the first half of 2011, prompting some less efficient producers to reduce operating rates. Crude oil prices then rose in May and June and ethanol prices followed suit, improving ethanol margins.¹⁹ As a result, those less efficient producers ramped up production to meet increased driving and export demand.²⁰ Despite unusually high corn prices (i.e., higher ethanol input costs) over the last year, the high price of crude oil relative to ethanol has helped maintain overall industry profitability. If margins stay at

¹⁸ See EPA, E15 (a blend of gasoline and ethanol), <http://www.epa.gov/otaq/regs/fuels/additive/e15/index.htm> (last modified Sept. 16, 2011) ("As of August 11, 2011, E15 is not registered with EPA and is therefore not legal for distribution or sale as a transportation fuel ... There are a number of additional factors including requirements under other federal, state, and local laws that may also affect the distribution of E15."). According to industry participants, the model year restriction on EPA's E15 waiver means that retailers need separate tanks for E10 and E15 because they must continue to offer E10 for vehicles older than model year 2001.

¹⁹ See generally Tracking Ethanol Profitability, Agricultural Marketing Resource Center, Iowa State University, <http://www.extension.iastate.edu/agdm/energy/xls/d1-10ethanolprofitability.xls> (last modified Sept. 12, 2011).

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current levels, industry participants believe that plant construction and improvement projects currently underway will begin operations later this year.

Although sufficient ethanol production capacity exists to meet the 2011 RFS requirements, additional capacity will be necessary to fulfill future RFS mandates set out in the Energy Independence and Security Act of 2007, including volume requirements for advanced biofuels (defined as cellulosic ethanol and other biofuels derived from feedstocks other than corn starch).²¹ Although there are no commercial-scale cellulosic ethanol production plants in operation today, investment continues in the research and development of such facilities. The U.S. Department of Agriculture (“USDA”) and the Department of Energy (“DOE”) recently offered loan guarantees to support the construction of five commercial-scale cellulosic ethanol projects, representing a combined capacity of 121 million gallons per year.²²

²¹ See Energy Independence and Security Act of 2007 § 202(a)(2), 42 U.S.C. § 7545(o)(2)(B)(i)(II)-(IV) (2009) (providing specific volume requirements for advanced biofuels, including biodiesel and cellulosic biofuel). The advanced biofuels minimums apply from 2009 to 2022. The biodiesel requirement started in 2009 with volume minimums specified through 2012. The cellulosic requirement took effect in 2010 and extends until 2022. *Id.* However, EPA reduced the cellulosic biofuel standard for 2011, as it did in 2010, because the projected volume of cellulosic biofuel production was less than the minimum volume set out by statute. See 2011 Renewable Fuel Standards, 75 Fed. Reg. 76790, 76791 (Dec. 9, 2010) (to be codified at 40 C.F.R. pt. 80); Changes to Renewable Fuel Standard Program, 75 Fed. Reg. 14670, 14675 (Mar. 26, 2010) (to be codified at 40 C.F.R. pt. 80).

²² See Press Release, DOE, DOE Offers Abengoa Bioenergy a Conditional Commitment for a \$133.9 Million Loan Guarantee (Aug. 19, 2011), available at <https://lpo.energy.gov/?p=5121> (describing Loan Programs Office loan guarantee offer for development of a commercial-scale cellulosic ethanol plant in Kansas); Press Release, DOE, DOE Offers Conditional Commitment for a \$105 Million Loan Guarantee For First-of-its-Kind Cellulosic Bio-Refinery (July 7, 2011), available at <https://lpo.energy.gov/?p=4913> (describing Loan Programs Office loan guarantee offer for development of commercial-scale cellulosic ethanol plant in Iowa); Press Release, USDA, Agriculture Secretary Vilsack Outlines Progress on Effort to Advance Renewable Energy Production in America (Jan. 20, 2011), available at http://usda.gov/wps/portal/usda/usdahome?contentid=2011/01/0020.xml&navid=NEWS_RELEASE&navtype=RT&parent_nav=LATEST_RELEASES&edeployment_action=retrievecontent (identifying cellulosic ethanol plant projects in Alabama, Mississippi, and Florida selected to receive a total of \$405 million in

in 2010.²⁸ Although this figure is slightly higher than the largest producer's capacity share of 11 percent in 2008 and 2009, it remains below the largest producer's capacity shares of 16 percent in 2007, 21 percent in 2006, and 26 percent in 2005.²⁹

IV. Analysis³⁰

Section 1501(a)(2) of the Energy Policy Act of 2005 instructs the Commission to measure concentration in U.S. ethanol production using HHIs.³¹ HHIs can provide a snapshot of market concentration³² based upon the number of market participants and their respective sales, production, or capacity. The Commission and the U.S. Department of Justice regularly use HHIs to measure concentration in a relevant antitrust market as part of their analysis of the likely effects of a merger or acquisition on competition in that market.³³

²⁸ *Id.*

²⁹ *See id.*

³⁰ The background information in this section regarding HHI calculations and their relevance is consistent with the background information presented in last year's Report on Ethanol Market Concentration. *See id.* at 7.

³¹ Energy Policy Act of 2005 § 1501(a)(2), *supra*note 1. A given market's HHI is the sum of the squares of the individual market shares of all market participants. 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]. HHIs range from 10,000 in a one-firm (pure monopoly) market to a number close to zero in a highly unconcentrated market.

³² *See supra*note 8 (discussing the HHI threshold levels for characterizing a market as unconcentrated, moderate^{3.9} f

To calculate the HHIs that Section 1501(a)(2) requires, we must assume that U.S. fuel ethanol production is a relevant antitrust market.³⁴ This assumption precludes consideration of a broader or narrower relevant geographic market than the United States that could provide further insight into how ethanol producers compete. This assumption also precludes consideration of a broader relevant product market that includes other gasoline blending components that might be economically viable and environmentally acceptable substitutes for ethanol. In the event that ethanol competes with other blending components, HHIs based on a fuel ethanol market would understate the amount of competition in the industry.

As in previous years, this report presents six HHIs for the ethanol industry, calculated using two different measures of market share and three different methods of allocating those market shares. First, FTC staff calculated each producer's market share based on the producer's domestic ethanol production capacity. FTC staff then performed three separate HHI calculations, attributing the producer's market share: (1) to the producer itself; (2) to the producer or to the third-party firm that actually marketed the producer's ethanol output; and (3) to the third-party marketing firm only if that firm marketed the producer's volumes pursuant to a pooling agreement (and, absent such a pooling agreement, to the producer). Second, EIA staff calculated market shares derived from its confidential ethanol production data. Using the

³⁴ A relevant antitrust market has both product and geographic aspects. A relevant product market is a product or group of products such that a hypothetical profit-maximizing firm that was the only seller of those products likely would impose at least a small but significant and nontransitory increase in price ("SSNIP"). 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 relevant geographic market is a region such that a hypothetical profit-maximizing firm that was the only seller of the relevant product in that region likely would impose at least a SSNIP above the competitive level. If such a price increase would not be profitable because of the loss of sales to sellers outside the region, the region would be too narrow to be a relevant geographic market. See Horizontal Merger Guidelines §§ 4.1-4.2.

market share allocation methods described above, EIA staff then performed each of the HHI calculations and provided the resulting production-based HHIs to FTC staff.³⁵

Three of the six HHIs calculated for this report are slightly higher than those calculated in 2010, reflecting a minor increase in concentration. The other three calculations yielded HHIs just below those calculated for the 2010 Ethanol Report, indicating a decrease in concentration. In all cases, the 2011 HHIs, like the 2010 HHIs, indicate that the domestic ethanol production industry remains unconcentrated.

A. Concentration with Market Shares Based on Production Capacity

In determining the aggregate capacity of each producer, staff included the capacity of existing plants as well as the projected capacity of plants currently under construction and plants currently undergoing expansion. Staff included the capacity of these plant construction and expansion projects only where the producer had finalized construction plans, received the necessary financing for construction, and begun physical construction. According to industry participants, once a new plant or expansion project has reached this stage, completion is likely within 12 to 18 months. Incorporating capacity from such projects into current market share calculations is consistent with the approach set forth in the Horizontal Merger Guidelines.³⁷

1. *Attributing Market Shares to Producers*

Under the simplest approach to market concentration, staff allocated market share to each producer based on the producer's percentage of total production capacity. This method of calculation yielded an HHI of 291, unconcentrated under the Horizontal Merger Guidelines.³⁸ This HHI represents a negligible increase from last year's HHI of 288.³⁹

2. *Attributing Market Shares to Marketers*

³⁷ See Horizontal Merger Guidelines § 5.1. The Guidelines include as market participants "rapid entrants" – firms that are not current producers but likely would respond rapidly in the event of a SSNIP, with a direct competitive impact and without incurring significant sunk costs. Such firms have competitive significance even though they do not currently supply the relevant market. Rapid entrants can also include firms that produce the relevant product but refrain from selling it in the relevant geographic market, as well as firms that clearly possess the necessary capacity to supply the relevant market rapidly. This is particularly likely in markets for homogeneous goods when that capacity is efficient and available (as is the case with many ethanol plants under construction or undergoing expansion). *Id.*

³⁸ The market shares implicit in these HHI calculations may suggest an analytic precision that does not reflect the rate of change in this industry, particularly as producers frequently announce capacity additions, new plants, plant sales, and cancellations of plans to build new capacity. Staff's HHI calculations represent staff's best estimate of the industry's concentration as of September 2011, the cut-off date for our analysis unless otherwise indicated. This approach therefore excludes any more recent publicly available information.

³⁹ 2010 Ethanol Report at 11.

Staff's second method of calculating market concentration is also capacity-based but attributes each producer's capacity to the firm marketing its ethanol. Many producers enter into marketing agreements with third parties to market their ethanol to blenders and end users, while other producers sell their output directly. For those producers that engage in direct sales, staff attributed the market shares to the producers themselves.⁴⁰

An ethanol marketer may represent and make limited decisions for multiple individual

The output from each plant generally earns an identical return, sometimes adjusted to reflect the cost of transportation from a plant to its output's destination. Each producer under a pooling

produce as much as 10 to 15 percent more than their stated design capacities⁴³ and tend to

confidential. Therefore, EIA provided only the aggregated HHIs to FTC staff and did not disclose the volumes of ethanol attributable to any individual producer or the market shares based on those volumes.⁴⁵ These production-based HHIs reflect actual production volumes from

The U.S. ethanol production industry currently lacks significant barriers to entry. Potential entrants can purchase and re-start existing production facilities that are currently idle as a result of recent economic conditions such as insufficient operating capital due to high input costs. In addition, construction and expansion projects – including the development of cellulosic ethanol plants – continue in the industry today, albeit at a reduced rate. This suggests that entry into the ethanol marketplace by means of building new capacity is not currently cost-prohibitive, although market participants have indicated that buying existing facilities is less expensive than new construction. An increase in supply resulting from new entry likely would make any exercise of market power unsustainable.

The probable influx of ethanol imports also would likely restrain any potential exercise of market power by a domestic firm. Ethanol import levels are responsive to fluctuations in the price of U.S. ethanol relative to foreign ethanol prices, particularly prices for sugar cane-based ethanol from Brazil. Consistent with this relationship, ethanol exports have continued to increase over the past year and import volumes have decreased due to the low price of U.S. ethanol relative to prices in other countries. If U.S. ethanol prices were to increase due to the exercise of market power by a domestic firm or group of firms,⁴⁹ currently exported ethanol could remain in the domestic market, and imports would likely increase. The likely response of ethanol imports to an anticompetitive increase in domestic prices relative to foreign prices would render that increase unsustainable.

⁴⁹ The level of concentration and the large number of market participants in the U.S. ethanol production industry suggest that collusion is unlikely among a sufficient number of firms to exercise market power. In the event of such collusion (in the form of an export cartel or otherwise), imports likely would continue to act as a constraint on the cartel's exercise of market power.

Even if domestic ethanol production were more concentrated than it is, the ease with which new firms can enter the domestic market and the responsiveness of ethanol imports to relative price changes likely would constrain anticompetitive behavior by domestic firms.

V. Conclusion

Ethanol production has remained unconcentrated over the last year. Regardless of the particular measure of market share or the market share allocation method used to calculate concentration, the low concentration levels that characterize the U.S. ethanol production industry

Figure 1: Domestic Fuel Ethanol Concentration⁵⁰

| Concentration Based on Capacity | 2010 HHI | 2011 HHI |
|---|-----------------|-----------------|
| Shares attributed to each producer | 288 | 291 |
| Shares attributed to marketers for all marketing agreements | 606 | 585 |

Shares attributed to marketers

