

## **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.”<sup>1</sup> The statute also requires the FTC to consider all marketing arrangements among industry participants in preparing its analysis.<sup>2</sup> The FTC must report its findings to Congress and to the Administrator of the Environmental Protection Agency (“EPA”) by December 1.<sup>3</sup> This report presents the FTC’s concentration analysis of the ethanol production industry for 2011. It builds upon Commission reports from previous years, which contain relevant background information that this report does not repeat.<sup>4</sup>

For purposes of this analysis, FTC staff (“staff”) reviewed and analyzed publicly available data and conducted interviews with ethanol producers, marketers, and other industry

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<sup>1</sup> Energy Policy Act of 2005 § 1501(a)(2), 42 U.S.C. § 7545(o)(10) (2009). For purposes of this report, we presume that Congress used the term “price-setting” to mean “price fixing.”

<sup>2</sup> *Id.* at § 7545(o)(10)(A)(ii).

<sup>3</sup> *Id.* at § 7545(o)(10)(B).

<sup>4</sup> See FTC, Report on Ethanol Market Concentration (2005) (“2005 Ethanol Report”), available at <http://www.ftc.gov/reports/ethanol05/20051202ethanolmarket.pdf>; 2006 Report on Ethanol Market Concentration (2006) (“2006 Ethanol Report”), available at [http://www.ftc.gov/reports/ethanol/Ethanol\\_Report\\_2006.pdf](http://www.ftc.gov/reports/ethanol/Ethanol_Report_2006.pdf); 2007 Report on Ethanol Market Concentration (2007) (“2007 Ethanol Report”), available at <http://www.ftc.gov/reports/ethanol/2007ethanol.pdf>; 2008 Report on Ethanol Market Concentration (2008) (“2008 Ethanol Report”), available at <http://www.ftc.gov/os/2008/11/081117ethanolreport.pdf>; 2009 Report on Ethanol Market Concentration (2009) (“2009 Ethanol Report”), available at <http://www.ftc.gov/os/2009/12/091201ethanolreport.pdf>; 2010 Report on Ethanol Market Concentration (2010) (“2010 Ethanol Report”), available at <http://www.ftc.gov/os/2010/12/101203ethanolreport.pdf>.

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 production<sup>5</sup> – allocated under three different approaches, for a total of six HHI calculations.<sup>6</sup> 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 ethanol<sup>7</sup> production industry is unconcentrated,<sup>8</sup> assuming domestic fuel ethanol production is a relevant market for competition analysis. This

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<sup>5</sup> 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 shares and the production-based HHIs presented in this report. EIA provided only the aggregated HHI figures to FTC staff and did not disclose the underlying confidential data or market shares. *See* Section IV.B, *infra*.

<sup>6</sup> *See* Section IV, *infra*.

<sup>7</sup> This report analyzes fuel ethanol market concentration, rather than market concentration of all ethanol. Fuel ethanol and beverage-grade alcohol are not substitute products in consumption; fuel ethanol contains about five percent denaturant (for example, natural gasoline), rendering it undrinkable and exempt from the beverage alcohol tax. *See* Renewable Fuels Association (“RFA”), How Ethanol is Made, <http://www.ethanolrfa.org/pages/how-ethanol-is-made> (last visited Sept. 23, 2011).

<sup>8</sup> The Commission and the U.S. Department of Justice characterize markets in which the HHI is below 1500 as unconcentrated. HHIs between 1500 and 2500 indicate moderately concentrated markets, which may or may not raise competitive concerns. Markets with HHIs over 2500 are highly concentrated and are more likely to pose competitive concerns. U.S. Department of Justice and Federal Trade Commission Horizontal Merger Guidelines (2010) (“Horizontal

assumption precludes consideration of (1) a broader relevant product market that includes other gasoline additives and (2) a relevant geographic market broader or narrower than the United States. Nonetheless, the level of concentration in the U.S. ethanol industry does not justify a presumption that a single ethanol producer or marketer or a group of such firms could exercise market power to set prices or coordinate on price or output levels.

## **II. Recent Industry Developments**

Since 2005, Congress has required the domestic consumption of a minimum annual volume of renewable fuels, including ethanol blended into motor fuels. The Energy Policy Act of 2005 originally established this minimum, the Renewable Fuel Standard (“RFS”), and set out escalating annual requirements for 2006 through 2012. The 2005 RFS required the use of 6.8 billion gallons of renewable fuels in 2010, rising to 7.5 billion gallons in 2012.<sup>9</sup> In the Energy Independence and Security Act of 2007, Congress amended the RFS, significantly increasing the volume minimums – including a revised 2011 requirement of 13.95 billion gallons – and extending the annual mandate to a peak requirement of 36 billion gallons in 2022.<sup>10</sup>

Ethanol demand has increased steadily year-over-year since the FTC’s first Report on Ethanol Market Concentration in 2005.<sup>11</sup> This trend has held over the past year: for each month

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Merger Guidelines” or “Guidelines”) § 5.3, available at <http://ftc.gov/os/2010/08/100819hmg.pdf>.

<sup>9</sup> Energy Policy Act of 2005, Pub. L. No. 109-58, § 1501(a)(2), 119 Stat. 594, 1067 (amended 2007).

<sup>10</sup> See Energy Independence and Security Act of 2007 § 202(a)(2), 42 U.S.C. § 7545(o)(2)(B)(i)(I) (2009).

<sup>11</sup> See EIA, Annual U.S. Refinery and Blender Net Input of Fuel Ethanol (last modified July 28, 2011), available at <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MFERIUS1&f=A>; see also prior Ethanol Reports, *supra* note 4.

from July 2010 to June 2011, the industry blended more ethanol than in the same month of the prior year,<sup>12</sup> blending a total of 12.3 billion gallons.<sup>13</sup> 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.<sup>14</sup> 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.

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<sup>12</sup> 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>.

<sup>13</sup> 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>.

<sup>14</sup> 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 that beyond 2011, fuel ethanol consumption may reach 10 percent of total motor gasoline demand, the maximum level permissible under current regulation.<sup>15</sup> EIA notes that ethanol blending neared this saturation point, known as the “blend wall,” as use of 10 percent ethanol-gasoline blends increased over the past year.<sup>16</sup> Since last year’s Ethanol Report, EPA has granted waivers to permit the use of gasoline blends of up to 15 percent ethanol, or E15, in light-duty motor vehicles of model year 2001 and later.<sup>17</sup> However, the industry must overcome several significant hurdles before E15 can reach the market. These outstanding requirements include registration of E15 with EPA, securing coverage under car

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<sup>15</sup> The Clean Air Act prohibits fuel manufacturers from increasing the concentration of any fuel additive sold for general use in light-duty motor vehicles, but provides that EPA may waive this prohibition upon a determination that the new concentration will not cause vehicles to fail to comply with emissions rules. Clean Air Act § 211, 42 U.S.C. § 7545(f) (2009). In 1979, EPA granted a waiver permitting “gasohol” blends of up to 10 percent ethanol. *See* Fuels and Fuel Additives: Gasohol, 44 Fed. Reg. 20777 (Apr. 6, 1979). This 10 percent blend, E10, is now prevalent in the marketplace. Blends with higher ethanol concentration are not yet legal for sale. *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); *see also infra* note 18.

<sup>16</sup> *See* EIA, This Week In Petroleum: The United States, from Ethanol Importer to Ethanol Exporter (Aug. 24, 2011), available at <http://www.eia.gov/oog/info/twip/twiparch/110824/twipprint.html>; *see also* EIA, This Week In Petroleum: The Ethanol Blend Wall (July 8, 2010), available at <http://www.eia.gov/oog/info/twip/twiparch/100708/twipprint.html>.

<sup>17</sup> Partial Grant of Waiver Application to Increase the Allowable Ethanol Content of Gasoline to 15 Percent, 75 Fed. Reg. 68094 (Nov. 4, 2010) (granting Clean Air Act waiver to allow sales of E15 for use in model year 2007 and newer light-duty motor vehicles); Partial Grant of Waiver Application to Increase the Allowable Ethanol Content of Gasoline to 15 Percent, 76 Fed. Reg. 4662 (Jan. 26, 2011) (granting Clean Air Act waiver to allow sales of E15 for use in model year 2001 through 2006 light-duty motor vehicles).

manufacturers' warranties for E15 usage, and establishment of E15 distribution infrastructure.<sup>18</sup> 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.<sup>19</sup> As a result, those less efficient producers ramped up production to meet increased driving and export demand.<sup>20</sup> 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

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<sup>18</sup> 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.

<sup>19</sup> 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).

<sup>20</sup> U.S. ethanol exports for the first six months of 2011 have already surpassed total exports for 2010. See EIA, Monthly U.S. Exports of Fuel Ethanol (last modified Sept. 29, 2011), available at [http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=M\\_EPOOXE\\_EEX\\_NUS-Z00\\_MBBL&f=M](http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=M_EPOOXE_EEX_NUS-Z00_MBBL&f=M). Increased demand in Brazil – one of the world's largest ethanol producers – drove up prices for sugar cane-based Brazilian ethanol. These higher ethanol prices helped continue the upward trend in U.S. ethanol exports.

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).<sup>21</sup> 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.<sup>22</sup>

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<sup>21</sup> 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).

<sup>22</sup> 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&parentnav=LATEST\\_RELEASES&edeployment\\_action=retrievecontent](http://usda.gov/wps/portal/usda/usdahome?contentid=2011/01/0020.xml&navid=NEWS_RELEASE&navtype=RT&parentnav=LATEST_RELEASES&edeployment_action=retrievecontent) (identifying cellulosic ethanol plant projects in Alabama, Mississippi, and Florida selected to receive a total of \$405 million in

### III. Summary of Market Concentration Trends

Actual ethanol production has increased this year even as production capacity has remained the same, reflecting greater utilization and more efficient use of existing capacity. Domestic ethanol production increased approximately 11 percent between 2010 and 2011, from 12.3 billion gallons to 13.7 billion gallons.<sup>23</sup> Production has increased over 850 percent since 2000, when domestic ethanol production was 1.6 billion gallons.<sup>24</sup> Domestic ethanol production capacity, including capacity under construction, remained steady<sup>25</sup> at about 15.2 billion annualized gallons as of September 2011, after increasing to that level from 14.5 billion annualized gallons as of October 2009.<sup>26</sup>

The number of firms producing ethanol has increased since last year's report. As of September 2011, 164 firms currently produce ethanol or likely will begin producing ethanol within the next 12 to 18 months, as compared to 160 firms in 2010.<sup>27</sup> The largest ethanol producer's share of domestic capacity is 11.5 percent, a slight decrease from its 12 percent share

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loan guarantees through the Biorefinery Assistance Program, Section 9003 of the 2008 Farm Bill).

<sup>23</sup> Production figures for 2011 cited in this report reflect production from July 2010 to June 2011; 2010 figures reflect production from July 2009 to June 2010. See EIA, Monthly U.S. Oxygenate Plant Production of Fuel Ethanol (last modified Sept. 29, 2011), available at [http://www.eia.doe.gov/dnav/pet/hist/LeafHandler.ashx?n=p&s=m\\_epooxe\\_yop\\_nus\\_1&f=m](http://www.eia.doe.gov/dnav/pet/hist/LeafHandler.ashx?n=p&s=m_epooxe_yop_nus_1&f=m).

<sup>24</sup> See RFA, Building Bridges to a More Sustainable Future: 2011 Ethanol Industry Outlook 3 (Feb. 2011), available at <http://www.ethanolrfa.org/page/-/2011%20RFA%20Ethanol%20Industry%20Outlook.pdf>.

<sup>25</sup> See 2010 Ethanol Report at 6.

<sup>26</sup> See *id.* Unless indicated otherwise, measures of capacity in this report represent both current capacity and capacity under construction.

<sup>27</sup> *Id.*



in 2010.<sup>28</sup> 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.<sup>29</sup>

#### **IV. Analysis<sup>30</sup>**

Section 1501(a)(2) of the Energy Policy Act of 2005 instructs the Commission to measure concentration in U.S. ethanol production using HHIs.<sup>31</sup> HHIs can provide a snapshot of market concentration<sup>32</sup> 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.<sup>33</sup>

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<sup>28</sup> *Id.*

<sup>29</sup> *See id.*

<sup>30</sup> 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.

<sup>31</sup> 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.

<sup>32</sup> *See supra* note 8 (discussing the HHI threshold levels for characterizing a market as unconcentrated, moderately concentrated, or highly concentrated under the Horizontal Merger Guidelines). *See also* Horizontal Merger Guidelines § 5.3.

<sup>33</sup> In the context of merger review, the difference between the pre-merger HHI and the post-merger HHI is one factor that may affect how the agency might view the competitive significance of the merger, all other circumstances remaining equal. *See* Horizontal Merger Guidelines § 5.3.

To calculate the HHIs that Section 1501(a)(2) requires, we must assume that U.S. fuel ethanol production is a relevant antitrust market.<sup>34</sup> 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

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<sup>34</sup> 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.<sup>35</sup>

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**

For each of the HHI calculations described below, staff first calculated producers' market shares based on their fuel ethanol production capacity. Production capacity provides a useful and easily confirmable indicator of a producer's competitive significance.<sup>36</sup>

Staff relied on publicly available information and interviews with producers, marketers, and other industry participants to determine the production capacity of each ethanol plant (and to obtain other information presented in this report). The Renewable Fuels Association provides frequently updated data on ethanol plant capacity and capacity expansion plans on its website. Capacity information is also available on many individual producers' websites, some of which also provide details of construction and expansion plans. Some marketers publicly announce new agreements with producers, providing staff with the information necessary to attribute a producer's market share to the correct marketing firm when appropriate.

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<sup>35</sup> FTC staff provided EIA staff with the information necessary to attribute market shares to marketers where appropriate. EIA staff provided only the aggregated HHI figures to FTC staff and did not disclose the underlying confidential data or market shares.

<sup>36</sup> See Horizontal Merger Guidelines § 5.2. In markets for homogeneous products (such as ethanol), a firm may derive its competitive significance primarily from its ability and incentive to increase production in the event of a competitor's price increase or output reduction, *i.e.*, its available capacity. *Id.*

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.<sup>37</sup>

### **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.<sup>38</sup> This HHI represents a negligible increase from last year's HHI of 288.<sup>39</sup>

### **2. *Attributing Market Shares to Marketers***

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<sup>37</sup> 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.*

<sup>38</sup> 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.

<sup>39</sup> 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.<sup>40</sup>

An ethanol marketer may represent and make limited decisions for multiple individual producers, essentially aggregating these producers' capacities under a single entity. For purposes of competitive analysis, attributing production capacity to marketers rather than to the actual producers provides a measure of industry concentration that captures this aggregation.

This approach yields an HHI of 585, unconcentrated under the Horizontal Merger Guidelines. This HHI is lower than the corresponding HHI of 606 in 2010.<sup>41</sup>

### **3. *Attributing Market Shares to Marketers with Pooling Agreements***

Staff's final approach to concentration calculation attributes a producer's market share to its third-party marketer only when the marketer sells the producer's output under the terms of a pooling agreement. Under a pooling agreement, the marketing firm sells its client producers' volumes in common rather than individually, which allows the marketing firm to make more significant decisions for its client producers than a traditional marketing agreement. Although the specific terms of pool marketing agreements vary, pool marketers generally sell ethanol to customers, and assign a client plant or plants to fulfill each sale obligation. Each producer receives a prorated share from the common revenue pool based on the volume it contributes.

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<sup>40</sup> In some instances, staff was unable to determine whether a producer marketed for itself or used an outside marketing firm. In these instances, staff attributed market shares to the producers.

<sup>41</sup> 2010 Ethanol Report at 12.

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 agreement receives purchase offers only from its marketer, which also represents other producers. By contrast, under a non-pooling marketing arrangement, the marketer sells its producers' volumes on a plant-specific basis and can present each producer with offers from multiple buyers.

Because individual producers within a pooling arrangement do not participate directly in negotiating the sale of their output, competition among the members of a given pool is limited if present at all. Buyers deal only with the single marketer, which then allocates the production capacity within its client portfolio to fulfill its output obligations. Therefore, attributing production capacity to marketers only for those producers in pooling arrangements may capture more accurately the competitive significance of firms in the ethanol industry. Under this allocation approach, production volumes sold under non-pooling marketing arrangements contribute to the producer's market share rather than to the non-pool marketer's share. Measured in this way, the HHI is 342, unconcentrated under the Horizontal Merger Guidelines and essentially unchanged from last year's HHI of 343.<sup>42</sup>

**B. Concentration with Market Shares Based on Actual Production**

At FTC staff's request, EIA staff calculated industry concentration using market shares based on market participants' actual production volumes over the past year. Using production data is instructive because capacity data have certain limitations, particularly insofar as stated capacity does not necessarily represent actual production capabilities. Ethanol plants often can

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<sup>42</sup> *Id.* at 13.

produce as much as 10 to 15 percent more than their stated design capacities<sup>43</sup> and tend to operate at increasing rates as their owners and operators improve the production process and gain expertise in operating their plants. In this respect, actual production may reflect a market participant's competitive significance more accurately than would its plants' capacities.

There are some limitations to the accuracy of HHIs based on actual production, just as there are limitations to HHIs based on production capacity. HHIs based on production over a given period may overstate or understate actual concentration due to entry and exit of firms, construction of new capacity, and variations in capacity utilization rates during the relevant time frame. Specifically, the production-based HHIs provided below do not fully reflect the deconcentrating impact of new facilities that began production during the last 12 months and plant improvements that increased capacity during the last 12 months, nor do they fully reflect the concentrating impact of plant closures and idlings during the period. In both cases, these facilities will have produced only a fraction of what they otherwise would produce in a full year, leading to an understatement (in the case of new facilities) or an overstatement (in the case of idled facilities) of their competitive significance in the market. Similarly, the HHIs below do not account for the effects on concentration of plant expansion, construction, and capacity-enhancing improvement projects that are not yet in operation.<sup>44</sup>

EIA provided FTC staff with the final production-based HHIs contained in this report. Firms that produce over eight million gallons of oxygenates (such as ethanol) per year must report to EIA their monthly production volumes by product. These production data are

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<sup>43</sup> *See id.*; 2009 Ethanol Report at 12; 2008 Ethanol Report at 11; 2007 Ethanol Report at 12; 2006 Ethanol Report at 9; 2005 Ethanol Report at 12.

<sup>44</sup> *See* 2010 Ethanol Report at 14; 2009 Ethanol Report at 13; 2008 Ethanol Report at 12-13; 2007 Ethanol Report at 13; 2006 Ethanol Report at 11; 2005 Ethanol Report at 13.

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.<sup>45</sup> These production-based HHIs reflect actual production volumes from July 2010 through June 2011.

Where EIA attributed the actual production market share directly to individual producers, the resulting HHI is 284, slightly higher than the 2010 HHI of 244.<sup>46</sup> By contrast, the production-based HHI calculated by attributing the market share of each producer to the firm that markets for that producer results in an HHI of 601, below the 2010 HHI of 671.<sup>47</sup> Attributing a producer's market shares to its marketing firm only when the marketing is pursuant to a pooling agreement yields an HHI of 328. This HHI is slightly higher than the comparable figure of 304 in last year's report.<sup>48</sup>

### **C. Ease of Entry and Imports**

Today, the U.S. ethanol industry is unconcentrated, suggesting that an attempt to exercise market power is unlikely. Should the industry become more concentrated in the future, an increase in the price of ethanol resulting from anticompetitive conduct would likely remain unsustainable due to both (1) the ease of entry into the ethanol industry and (2) the responsiveness of imports to fluctuations in the U.S. ethanol price relative to foreign prices.

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<sup>45</sup> For producers for which EIA maintains production data, FTC staff provided EIA with the identity of those producers' marketers and whether those producers entered into pooling agreements with their marketers. EIA used this information, in conjunction with its own data on ethanol production, to calculate the HHIs that attribute market share to marketers.

<sup>46</sup> 2010 Ethanol Report at 15.

<sup>47</sup> *Id.*

<sup>48</sup> *Id.*



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,<sup>49</sup> 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.

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<sup>49</sup> 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 have persisted. Although some of the 2011 HHIs reflect a modest increase in concentration from 2010, the industry remains less concentrated than it was at the time of the first Report on Ethanol Market Concentration in 2005. While few firms initiated construction projects in 2011, existing plants increased their production capacity, and currently idled plants are likely to begin operation in the next 12 to 18 months. Furthermore, potential entry by new firms and the possibility of ethanol imports provide additional constraints on the exercise of market power by current industry participants. These dynamics make it extremely unlikely that a single ethanol producer or marketer or a group of such firms could exercise market power to set prices or coordinate on price or output levels.

**Figure 1: Domestic Fuel Ethanol Concentration<sup>50</sup>**

<b>Concentration Based on Capacity</b>	<b>2010 HHI</b>	<b>2011 HHI</b>
Shares attributed to each producer	288	291
Shares attributed to marketers for all marketing agreements	606	585
Shares attributed to marketers only for pooling agreements	343	342
<b>Concentration Based on Production</b>	<b>2010 HHI</b>	<b>2011 HHI</b>
Shares attributed to each producer	244	284
Shares attributed to marketers for all marketing agreements	671	601
Shares attributed to marketers only for pooling agreements	304	328

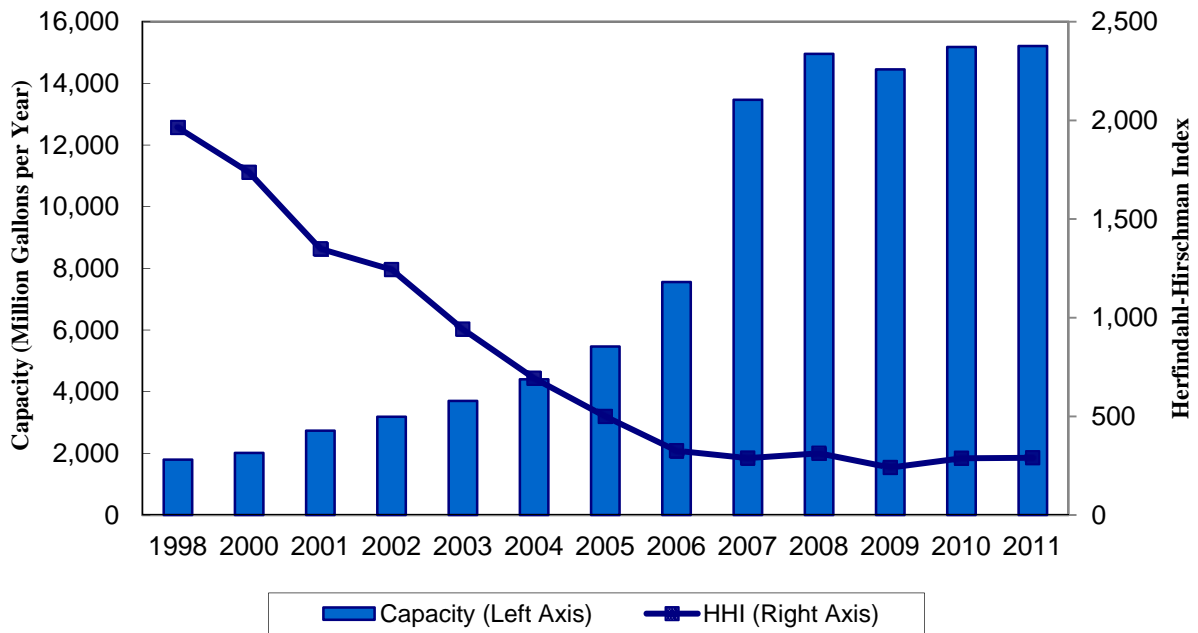
Source: Production HHIs from EIA

Note: Capacity for 2010 includes the capacity as of September of 2010 and the capacity additions under construction and expected to be completed within 12 to 18 months after September 2010. Capacity for 2011 includes the current capacity as of September 2011 and the capacity additions under construction and expected to be completed within 12 to 18 months after September 2011. Production data for 2010 are from July 2009 through June 2010, and production data for 2011 are from July 2010 through June 2011.

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<sup>50</sup> As discussed in note 8, *supra*, the Commission and the Department of Justice characterize markets with HHIs below 1500 as unconcentrated. HHIs between 1500 and 2500 indicate moderately concentrated markets, and HHIs over 2500 indicate highly concentrated markets that are more likely to pose competitive concerns. Horizontal Merger Guidelines § 5.3.

**Figure 2: Historical Fuel Ethanol Capacity and HHIs**



Note: Annual figures are for operating capacity and capacity under construction at year-end for 1998 to 2004, and as of October for 2005 to 2011. The HHI figures shown are capacity-based, with market share attributed to the producer.