



E-85

STATE OF MINNESOTA
OFFICE OF THE
ATTORNEY GENERAL
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Introduction and Overview.

The Attorney General's Office ("AGO") began to review ethanol and E85 pricing in the fall of 2005, after consumers and small E85 wholesalers raised questions about why E85 prices had risen so sharply. Consumers noted that E85 prices were nearly the same as regular gas prices, and in some parts of the state, even exceeded the price of regular gas by \$.10 per gallon or more. Consumers questioned why the price of E85, which is typically 85% ethanol and 15% gas,¹ would increase similar to the price of regular gas. From these inquiries, it was apparent that there is a popular belief that the price of E85 should track the price of corn, since ethanol is made from corn.

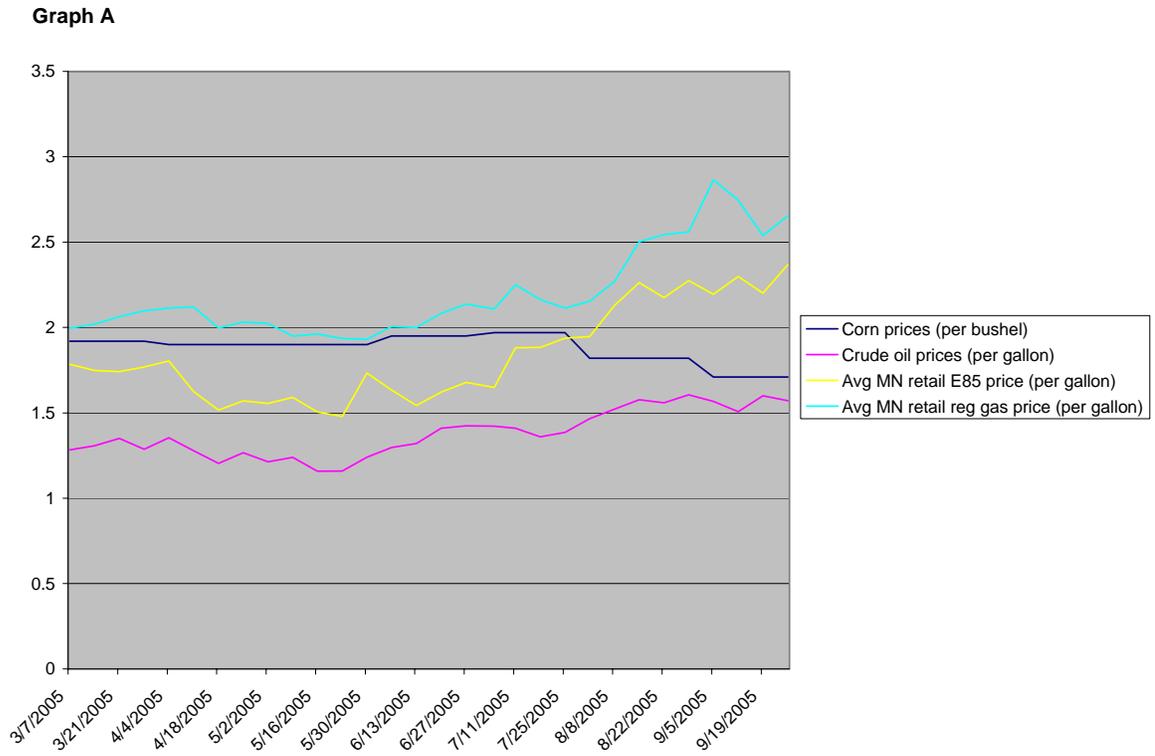
In response to these inquiries, the AGO issued Civil Investigative Demands ("CIDs") to over two dozen ethanol and E85 producers, marketers, wholesalers, retailers, and fuel terminals seeking information about how fuel ethanol and E85 were marketed, distributed, and priced during a six month period spanning from March to end of September 2005. These CIDs resulted in approximately ten thousand pages of documents being produced to and reviewed by the AGO, including invoices, contracts, and other pricing information.

Based on the data provided, it appears that the price of E85 and ethanol have little correlation with the price of corn.² See Graph A. Rather, it appears that ethanol and E85 prices tend to parallel changes in regular gas prices. See Graph B. E85 is a supplement or additive for regular gas, and for those who have flexible fuel vehicles, E85 competes with regular gasoline. As a competitor to gasoline, E85 prices are influenced by gasoline prices, and may even "consciously parallel" these prices, meaning that retailers may change E85 prices when regular gas prices change.

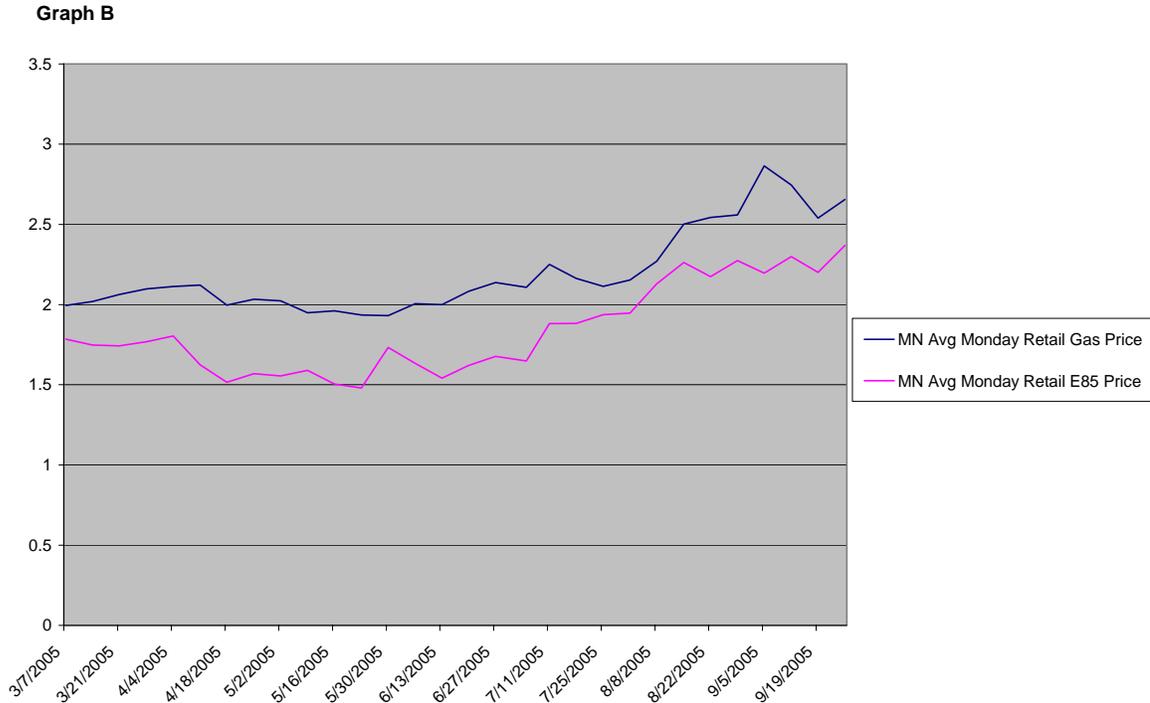
¹ What is commonly referred to as "E85" may actually contain only 70% to 80% ethanol, depending on the time of year and/or geographic region. The American Society for Testing and Materials (ASTM) and the American Automobile Manufacturers Association (AAMA) set specifications for fuels. These specifications are similar, and are relied upon in the oil and gas industry nationwide in buying and selling fuels. To minimize problems with "cold starts" -- starting a cold engine during colder weather -- the specifications for E85 call for E85 to have a higher gasoline content during colder seasons in certain geographic areas. See U.S. Department of Energy, *Handbook for Handling, Storing, and Dispensing E85*, at 9, 22-23 (October 2002). Thus in Minnesota, during the late winter and spring months, "E85" is actually only 75% ethanol, while in the late summer and fall months, it contains only 80% ethanol.

² Information about prices is competitive information that many companies consider to be highly sensitive, and which, if shared improperly by the companies themselves (with other competitors for the purpose of price-fixing, for example), could lead to antitrust violations or other anticompetitive conduct. Thus, in referring to pricing information below, this report will not identify specific companies or entities but will refer to pricing information in an aggregate or illustrative manner.

The following graph (Graph A) compares the prices of regular gas, crude oil, corn and E85 between March 2005 and September 2006:



The following graph (Graph B) compares the average retail prices of regular gas and E85 during the same period.



Finally, the data reflected that ethanol prices are affected by supply and demand factors. At least three states, including Minnesota, require all or most gasoline to include a certain minimum percentage of ethanol, spurring demand for the product.³ More important, there has been a recent rapid increase in the use of ethanol as an oxygenate on the East Coast and in Texas, causing ethanol supply to be pulled out of Minnesota and other Midwestern states. These factors are discussed more in-depth below. Because of

³ By law, all gas sold in Minnesota is required to be a least 10% ethanol (known as “E10”). Minn. Stat. § 239.791, subd. 1 (2005). Montana also just implemented an E10 requirement in 2005. *See* Mont. Code Ann. § 82-15-121 (2005). In the fall of 2004, Hawaii passed a law requiring a rule to be implemented that would require all gas sold in the state to contain at least ten percent ethanol. *See* Haw. Rev. Stat. § 486J-10. Bills have been proposed to amend this law to require a deadline of April 2, 2008, for the new rules to take effect. *See* Hawaii Legislature H.B. No. 2611 and 2246. Finally, the Wisconsin Legislature was considering a bill with an E10 requirement earlier this year. The bill proposed in the Wisconsin Legislature (Assembly Bill 15) can be found online at <http://www.legis.state.wi.us/2005/data/AB-15.pdf>. It was essentially tabled in early March 2006. *See* the legislative history for this bill, which is available online at <http://www.legis.state.wi.us/2005/data/AB15hst.html>.

anticipated ethanol shortages due to these supply and demand factors, many commentators predict that ethanol prices will continue to rise this summer.⁴

Ethanol Production and Distribution Process.

Ethanol is usually created by fermenting and distilling a plant, typically corn in the United States.⁵ On average, about 2.5 gallons of ethanol can be produced from one bushel of corn.⁶ Ethanol can be produced by either wet milling or dry milling. As noted below, nearly all of Minnesota's plants are dry mills.⁷

Corn (or other plant material) typically arrives at a plant by truck or rail car.⁸ The corn is then put through a fermentation process to create alcohol.⁹ The alcohol is distilled and dehydrated. If the dehydrated alcohol (or "anhydrous ethanol") is destined for fuel use, it is denatured to make it undrinkable, typically by adding 5% of a toxic substance like gasoline.¹⁰ Once it is denatured, it can be shipped to gasoline terminals or wholesalers, or to E85 wholesalers or retailers, who may mix it with gasoline.¹¹

Ethanol cannot be distributed through gasoline pipelines.¹² Thus, it must be shipped by truck, rail or barge, depending on how far it must travel, where the plant is located, and the availability of these modes of transport.¹³ Most ethanol is shipped by

⁴ James R. Healey, *Ethanol Shortage Could Up Gas Prices*, USA Today, March 30, 2006 (available online at http://www.usatoday.com/money/industries/energy/2006-03-30-ethanol-gas-prices_x.htm).

⁵ Minnesota Pollution Control Agency, *Ethanol Production in Minnesota*, at 1 (October 2002) [hereinafter *Ethanol Production in Minnesota*]. Ethanol (ethyl alcohol) can be made from a variety of materials, but currently, it is most commonly made from starchy crops, such as corn or sugar cane, or cellulosic biomass materials, such as wood chips.

⁶ *Id.*

⁷ *Id.* The main difference between the two milling processes is in how the grain is initially treated. Because most of the plants in Minnesota are dry mills, this report focuses on dry milling.

⁸ *Ethanol Production in Minnesota*, *supra* n. 5, at 2.

⁹ *Id.*

¹⁰ *Ethanol Production in Minnesota*, *supra* n. 5, at 2.

¹¹ *Id.*

¹² This is because water is used to transport fuel through pipelines. Ethanol has an affinity for water and thus can be pulled out of fuel by water, while petroleum does not mix with the water. Energy Information Administration, *Eliminating MTBE in Gasoline 2006*, at 1, fn. 3 (February 22, 2006) (available online at http://www.eia.doe.gov/pub/oil_gas/petroleum/feature_articles/2006/mtbe2006/mtbe2006.pdf) [hereinafter, *Eliminating MTBE*].

¹³ *Id.*

truck and rail.¹⁴ Trucks and barges are used to transport ethanol short distances, while rail is typically used for longer distances.¹⁵ In 2002, the average distance ethanol was shipped by rail was 1,163 miles; for trucks, it was 93 miles.¹⁶ In that same year, the average one-way distance to ship ethanol by truck ranged from 30 to 250 miles while it ranged 800 to 2,500 miles to ship ethanol by rail.¹⁷

Fuel Ethanol -- General Background.

Inventors began experimenting with ethanol as a fuel as early as 1826.¹⁸ Henry Ford designed his first car to run on pure ethanol, and the Model T was originally produced to run on ethanol, gasoline, or a combination of the two.¹⁹ In the 1920s, a large American oil company had begun adding ethanol to gasoline to increase octane levels and reduce engine knocking.²⁰ Ethanol continued to be used in fuel or as fuel until after World War II, when the price of gasoline became so low that demand for ethanol as a fuel virtually disappeared.²¹ Then, the oil embargo of 1973 and other events in the 1970s caused oil prices to surge, making ethanol attractive again as a gasoline extender and a way to increase the U.S. gasoline supply.²² Around this same time, the Environmental Protection Agency (EPA) passed regulations designed to phase out lead in gasoline, which was used as an octane booster.²³ Ethanol has a high octane content, and thus can be used as an octane booster.²⁴ Thus, ethanol as a fuel and a fuel additive began to gain in popularity.

Beginning in the late 1970s, Congress passed a number of laws that have promoted or subsidized the production and use of fuel ethanol. The Energy Tax of 1978 created a federal tax subsidy for “gasohol,” which was defined as a blend of gas that included at least 10 percent alcohol -- what is now commonly referred to as “E10”. This

¹⁴ Office of Energy Policy and New Uses, United States Dept. of Agriculture, *2002 Ethanol Cost of Production Survey*, at 16, (July 2005) [hereinafter *Ethanol Cost of Production Survey*]

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Ethanol Cost of Production Survey*, *supra* n. 14, at 17.

¹⁸ See Alternative Fuels Data Center, *What is Ethanol?*, (available online at: http://www.eere.energy.gov/afdc/altfuel/whatis_eth.html).

¹⁹ See Energy Information Administration, *Ethanol Timeline*, (available online at: <http://www.eia.doe.gov/kids/history/timelines/ethanol.html>) [hereinafter, *Ethanol Timeline*].

²⁰ *Id.*

²¹ *Id.*

²² Hosein Shapouri et al., *The Energy Balance of Corn Ethanol: An Update*, Agriculture Economic Report No. 814, at 1 (U.S. Department of Agriculture 2005) [hereinafter, *Energy Balance of Corn Ethanol Update*].

²³ *Id.*

²⁴ *Id.*

law excluded alcohol made from nonrenewable resources like petroleum, coal, or natural gas, with the result that all fuel ethanol produced in the United States is made from renewable biomass feedstocks (like corn).²⁵ In the early 1980s, Congress passed additional laws creating incentives for ethanol production, and granting tax benefits and subsidies to ethanol producers to help make ethanol production financially viable.²⁶ Gas prices continued to be low, however, resulting in ethanol prices being too low to keep many producers in business during the mid-1980s.²⁷

Federal laws enacted in the early 1990s further promoted ethanol use and production. The Energy Policy Act of 1992 (EPACT) defined “alternative transportation fuels” to include what is now known as E85 and required certain fleets to purchase alternative fuel vehicles capable of running on E85. Further, as explained in more detail below, the Clean Air Act amendments passed in the early 1990s boosted ethanol use because they mandated the use of oxygenates (and ethanol is an oxygenate) in fuel in certain areas that did not meet the National Air Ambient Quality Standards set by the EPA for carbon monoxide and ozone.

To burn E85, a car must be a “flexible fuel vehicle,” or FFV. An FFV can run on either regular gas or E85.²⁸ All of the “Big Three” U.S. auto manufacturers offer FFVs. The website for the Energy Efficiency and Renewable Energy division of the U.S. Department of Energy includes information about current models of FFVs.²⁹ According to the U.S. Department of Energy, vehicles running on E85 get about 30% less gas mileage than when running on regular gas.³⁰

Ethanol and MTBE.

The 1990 Clean Air Act amendments mandated the use of oxygenates in fuel in certain areas determined to have carbon monoxide (CO) or ozone levels that did not meet the National Air Ambient Quality Standards (NAAQS) for these substances set by the EPA (called “nonattainment areas”). An oxygenate is a substance added to gas to increase its oxygen levels so that the gas burns with fewer CO and other toxic emissions. Oxygenates are either ethers or ethanol. Until recently, the most widely-used oxygenate

²⁵ In Brazil, ethanol is made from sugarcane.

²⁶ See, e.g., the 1980 Energy Security Act (offering insured loans to small ethanol producers, and loan guarantees to cover the majority of construction costs, price guarantees, and purchase agreements to buy biomass energy for federal agencies); the 1980 Gasohol Competition Act; the 1980 Crude Windfall Tax Act; the 1983 Surface Transportation Assistance Act (extending the ethanol-gasoline blend tax credit); and the 1984 Tax Reform Act (increasing the ethanol subsidy to \$.60/gallon).

²⁷ *Ethanol Timeline*, *supra* n. 19, at 3.

²⁸ See <http://www.fueleconomy.gov/feg/flextech.shtml>.

²⁹ This information can be found at

http://www.eere.energy.gov/cleancities/vbg/progs/search_type.cgi?2.

³⁰ See <http://www.eere.energy.gov/cleancities/vbg/consumers/e85.shtml>

had been methyl tertiary butyl ether (MTBE). Besides ethanol (alcohol) and MTBE, other oxygenates are ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and tertiary butyl alcohol (TBA).³¹ As explained below, oxygenated gas (required during winter in CO nonattainment areas) or reformulated gasoline (which contains an oxygenate and is required to be used in ozone nonattainment areas) is used in at least 26 states and the District of Columbia. See Tables One and Two below.

Originally, the EPA designated 39 CO nonattainment areas, which included Duluth and the Twin Cities.³² The majority of these areas reached attainment in the mid to late 1990s, including Duluth and the Twin Cities.³³ At the time of this writing, there are 12 nonattainment areas, covering eight states. See Table One below.³⁴ According to the EPA, for all of these areas except Portland, Oregon, ethanol is the only oxygenate used to make the oxygenated gas.³⁵

³¹ California Energy Commission, *Supply and Cost of Alternatives to MTBE in Gasoline*, at 2 (February 1999).

³² Energy Information Administration, *Areas Participating in the Oxygenated Gasoline Program*, at 2, (July, 1, 1999), available online at <http://www.eia.doe.gov/emeu/steo/pub/special/oxy2.html> [hereinafter, “*Oxygenated Gasoline Program*”]. The Clean Air Act Amendments required that oxygenated gas (gas containing at least 2.7% oxygen by weight) be used during the winter in CO nonattainment areas. *Id.* The Amendments also permitted states to implement oxygenated gas programs that go beyond what was required by federal law, such as Minnesota’s 10% ethanol requirement passed in 1997. *Id.* at 8.

³³ *Id.* at 5-6.

³⁴ Taken from EPA bulletin EPA 420-B-05-013 (November 2005).

³⁵ *Id.* at 2.

TABLE ONE: Areas Requiring Winter Oxygenated Fuel Programs for Attainment or Maintenance of Carbon Monoxide NAAQS

City	State
El Paso	Texas
Denver/Boulder	Colorado
Longmont	Colorado
Missoula	Montana
Provo/Orem	Utah
Las Vegas	Nevada
Phoenix	Arizona
Los Angeles	California
Reno	Nevada
Albuquerque	New Mexico
Portland	Oregon
Tucson	Arizona

Beginning in 1995, the Clean Air Act also required that reformulated gasoline (RFG) be used in the worst areas for nonattainment of the EPA's NAAQS for ozone.³⁶ The EPA also established procedures for states to voluntarily opt-in to or request to opt out of the RFG program.³⁷ Further, a state may implement its own cleaner-burning gasoline program without opting into the federal RFG program.³⁸ RFG is gasoline that is formulated to burn in a way that reduces smog formation and toxic pollutants, and, until recently, was required to be two percent oxygen by weight.³⁹ To meet this two percent requirement, an oxygenate must be mixed with the gas.⁴⁰ According to the most recent information available on the EPA's website, RFG is used in 19 states and the District of

³⁶ Energy Information Administration, *Areas Participating in the Reformulated Gasoline Program*, at 1-3 (June 15, 1999) (available on the web at <http://www.eia.doe.gov/emeu/steo/pub/special/rfg2.html>).

³⁷ *Id.*, at 2-5.

³⁸ *Id.*, at 6.

³⁹ EPA, *Removal of Reformulated Gasoline Oxygen Content Requirement and Revision of Commingling Prohibition to Address Non-Oxygenated Reformulated Gasoline*, at 1 (February 14, 2006) (available on the web at <http://www.epa.gov/oms/rfg.htm>).

⁴⁰ *Id.*

Columbia, either in the entire state or in certain portions of the state. See Table Two below.⁴¹

TABLE TWO: States Where RFG Is Used

STATE	REQUIRED	OPT-IN
California	X (certain areas)	
Connecticut	X (certain areas)	X (entire state)
Delaware	X (certain areas)	X (entire state)
District of Columbia	X	
Georgia	X (certain areas)	
Illinois	X (certain areas)	
Indiana	X (certain areas)	
Kentucky		X (certain areas)
Louisiana	X (certain areas)	
Maryland	X (certain areas)	X (certain areas)
Massachusetts		X (certain areas)
Missouri		X (certain areas)
New Hampshire		X (certain areas)
New Jersey	X (certain areas)	X (certain areas)
New York	X (certain areas)	X (certain areas)
Pennsylvania	X (certain areas)	
Rhode Island		X (certain areas)
Texas	X (certain areas)	X (certain areas)
Virginia	X (certain areas)	X (certain areas)
Wisconsin	X (certain areas)	

Until several years ago, MTBE was the primary oxygenate mixed with gas in the U.S., particularly to make RFG used in Texas and states in the Northeast. During the past two years, about half of the states have banned or restricted the use of MTBE due to concerns about ground water contamination, including the two states (New York and

⁴¹ EPA, *Where You Live*, (last updated March 7, 2006) (list of areas where RFG is currently used) (available online at <http://www.epa.gov/oms/rfg/whereyoulive.htm>).

California) that most heavily used MTBEs.⁴² Minnesota banned the use of MTBE effective July 1, 2000. Minn. Stat. § 239.761 subd. 6 (2005).

Further, the federal Energy Policy Act of 2005, which was signed into law in August 2005, banned the use of MTBE effective December 31, 2014.⁴³ The 2005 Energy Policy Act also removed the oxygen content requirement for RFG as of May 8, 2006; according to the Energy Information Administration, however, most refiners are expected to continue to include oxygenates in RFG because oxygenates help boost octane and are clean-burning components.⁴⁴ These new federal law provisions, in conjunction with the lack of provisions to protect oil companies from legal liability for contamination by MTBE, have caused oil companies to announce that they will stop using MTBE almost immediately and switch to ethanol by the latter half of 2006.⁴⁵ Further, some states that have enacted MTBE bans with delayed effective dates have pushed up the effective dates.⁴⁶ The switch from MTBE to ethanol is predicted to result in shortages of ethanol, and higher ethanol prices.⁴⁷ President Bush recently announced that he was directing the EPA to grant waivers to states from Clean Air Act requirements that they use cleaner burning gas, to ease the surge in ethanol demand.⁴⁸

⁴² Further, some studies have indicated that ETBE, TBA, and TAME could affect drinking water in the same way as MTBE, leading to odor and taste problems. California Energy Commission, *supra* n. 31 at 9.

⁴³ Section 1504 of the Energy Policy Act of 2005.

⁴⁴ Energy Information Administration, *This Week in Petroleum*, at 1 (released May 10, 2006) (available on the web at <http://tonto.eia.doe.gov/oog/info/twip/twipprint.html>).

⁴⁵ *Eliminating MTBE*, *supra* n. 12, at 1. See also Tom Webb, *Tight Ethanol Supply May Yield Price Shock/Minnesota Mandate Faces Criticism*, St. Paul Pioneer Press at 1C (April 12, 2006) [hereinafter, Webb, *Tight Ethanol Supply*].

⁴⁶ Beverly Wang, *N.H. Switch to Ethanol Gas Sooner than 2007 MTBE Ban*, Associated Press (March 14, 2006) (available online at http://www.boston.com/news/local/maine/articles/2006/03/14/nh_switch_to_ethanol_gas_sooner_than_2007_mtbe_ban/).

⁴⁷ Healey, *supra* n. 4. See also *Eliminating MTBE*, *supra* n. 12, at 1; Webb, *Tight Ethanol Supply*, *supra* n. 45; and Brad Foss, *Ethanol Industry Braces for Growing Pains* (March 20, 2006) (available online at <http://abcnews.go.com/Business/print?id=1747163>).

⁴⁸ J.R. Pegg, *Bush Calls for Gas Price Investigation, Lifts Clean Gas Rules*, at 3, (Environmental News Service (April 25, 2006) (available online at <http://www.ens-newswire.com/ens/apr2006/2006-04-25-11.asp>).

Fuel Ethanol in Minnesota.

In General.

The Twin Cities are a national pilot market for large-scale promotion of E85, and consequently FFVs.⁴⁹ This pilot program is a joint public-private effort being carried out by the “Minnesota E85 Team,” which consists of industry representatives, associations, and state and federal governmental entities.⁵⁰ At this time, there are about 200 gas stations in Minnesota that sell E85.⁵¹ Minnesota has the largest number of E85 gas stations of any state in the nation.⁵² Further, Minnesota and the other Upper Midwestern states produce the majority of the nation’s ethanol, due to their high corn production.⁵³ Minnesota is the fifth largest ethanol producing state, behind Iowa, Illinois, Nebraska, and South Dakota, in that order.⁵⁴

In Minnesota, there are currently sixteen ethanol plants. As noted below, at least one additional plant is under construction, and plans to build another one were recently announced. Of the existing plants, twelve are dry mills⁵⁵ and were started as new generation co-ops.⁵⁶ See Table Three.

⁴⁹ Alternative Fuels Data Center, U.S. Department of Energy -- Energy Efficiency and Renewable Energy, *Minnesota Incentives and Laws*, at 1 (last updated July 2005) (available online at http://www.eere.energy.gov/afdc/progs/view_all.cgi?afdc/MN/1).

⁵⁰ These members include the Minnesota Corn Growers, Minnesota ethanol plants, Ford Motor Co., fuel retailers, the Minnesota Department of Commerce, the Minnesota Department of Agriculture, the U.S. Department of Energy’s Clean Cities Program, and the American Lung Association of Minnesota, to name several.

⁵¹ The American Lung Association of the Upper Midwest maintains a list of gas stations in Minnesota that sell E85. This list is available online through a link located at <http://www.cleanairchoice.org/outdoor/E85InCounty.asp?State=MN>.

⁵² Kory Wallen, *A Blender’s Market*, Ethanol Producer Magazine (January 2006) (available online at http://www.ethanolproducer.com/article.jsp?article_id=340&q=E85&page=all).

⁵³ See Energy Information Administration, *Renewable Motor Fuel Production Capacity Under H.R.4* (available online at: <http://www.eia.doe.gov/oiaf/servicerpt/fuel/rmf.html>).

⁵⁴ *ACE State by State Ethanol Handbook 2006*, at 14, 16, 24, 28, 42 (available online at http://www.ethanol.org/documents/EthanolHandbook2006_000.pdf) (published by the American Coalition for Ethanol).

⁵⁵ Ethanol can be produced through a “dry” or “wet” mill process. For dry milling, the corn is ground up into meal before being mixed with water; for wet milling, the corn is first steeped in a water and acid solution so that it will break down into its component parts. *Ethanol Production in Minnesota*, *supra* n. 5, at 1-3.

⁵⁶ *ACE State by State Ethanol Handbook 2006*, *supra* n. 54, at 24.

TABLE THREE: Minnesota Ethanol Plants & Capacities⁵⁷

City (plant name)	Capacity Million Gallons/year	Start-up year	<u>New Generation Co-op Members*</u>
Marshall (ADM)	40	1988	(Public Corp)
Morris (DENCO)	24	1991	Corporation
Winnebago (Corn Plus)	47	1994	750
Winthrop (Heartland)	37 ⁵⁸	1995	692
Benson (CVEC)	45	1996	850
Claremont (AI-Corn)	34	1996	354
Bingham Lake (Ethanol2000)	31	1997	241
Buffalo Lake (MN Energy)	19	1997	325
Melrose (Dairy Proteins)	3.0	1986	(Regional Coop)
Preston (Pro-Corn)	42	1998	159
Luverne (Corn-er Stone)	21	1998	197
Little Falls (CMEC)	22	1999	820
Albert Lea (Exol/Agri Resources)	41	1999	496
Lake Crystal (Northstar Ethanol)	50	2005	Private LLC
Granite Falls (Granite Falls Energy)	50	2005	LLC
Atwater (Bushmills Ethanol)	45	2005	LLC
TOTAL	551		4,880 members

Minnesota ethanol plants processed roughly 160 million bushels of corn into ethanol in 2004, the equivalent of one-sixth of Minnesota's total annual corn crop.⁵⁹ Minnesota's ethanol plants currently produce more than 550 million gallons each year.⁶⁰

⁵⁷ Minnesota Department of Agriculture, *Minnesota Ethanol Program*, at 2 (March 2006), (available online at <http://www.mda.state.mn.us/ethanol/about.htm>) [hereinafter *Minnesota Ethanol Program*].

⁵⁸ This plant is currently expanding its facility so as to be able to produce about 95 million gallons per year.

⁵⁹ Minnesota Department of Agriculture, *Ethanol Plants in Minnesota*, at 4 (January 2005) (available online at <http://www.mda.state.mn.us>).

⁶⁰ *Minnesota Ethanol Program*, *supra* n. 57, at 2.

The largest Minnesota plant currently produces about 40 million gallons a year, while the smallest mill produces 2.6 million gallons a year.⁶¹ By national standards, Minnesota's existing plants are considered to be small.⁶² This situation could be rapidly changing, however. A Minnesota Department of Agriculture official recently predicted that all of Minnesota's plants will be expanding their production in response to the surge in ethanol demand.⁶³ A farmer shareholder of the Winthrop plant informally told this Office that this plant is already in the process of expanding its facilities to add about 60 million gallons in annual production by the end of 2006, all of which it intends to transport by rail to the East Coast.

In addition, the surge in ethanol demand has prompted private companies to enter the industry at an increasing rate.⁶⁴ For example, US BioEnergy, an ethanol plant management company based in South Dakota, recently announced plans to build two large ethanol plants in Minnesota (one in Janesville and another near Springfield), both of which will produce about 100 million gallons of ethanol per year.⁶⁵ Because they will begin production after June 30, 2000, these new plants are not eligible for the state law production incentive credit available to most ethanol producers currently operating in Minnesota.⁶⁶

⁶¹ *Ethanol Production in Minnesota*, *supra* n. 5, at 1.

⁶² *2002 Ethanol Cost of Production Survey*, *supra* n. 14, at iii.

⁶³ Tom Webb, *Ethanol Demand Spurs Plant-Building Frenzy*, St. Paul Pioneer Press at 1C (April 14, 2006) [hereinafter, Webb, *Ethanol Demand*].

⁶⁴ *Id.*

⁶⁵ *Id.*, at 3C. See announcement regarding the Springfield plant on the US BioEnergy website (available online at http://www.usbioenergy.net/Springfield_press_release_4_10_06.htm); *Ethanol Plant Near Janesville Makes Further Commitment*, US BioEnergy press release (Dec. 19, 2005), (available online at <http://www.usbioenergy.net/12-19-05pressrelease.htm>). CHS, Inc. (formerly known as Cenex Harvest States Cooperatives) purchased a 28% share of US BioEnergy in November 2005, and announced in early April 2006 that it was entering into a renewable fuels marketing joint venture with US BioEnergy. *CHS Invests in US BioEnergy to Further Commitment to Renewable Fuels*, US BioEnergy press release (November 17, 2005) (available online at http://www.usbioenergy.net/CHS_PR.htm); and *CHS and US BioEnergy Form Renewable Fuels Marketing Joint Venture*, US BioEnergy press release (April 4, 2006) (available online at <http://www.usbioenergy.net/FuelsJVpressrelease4-4-06.htm>). US BioEnergy is also affiliated with Fagen, Inc., an ethanol plant building company which has built about two-thirds of the ethanol plants in the U.S.

⁶⁶ Webb, *Ethanol Demand*, *supra* n. 63, at C3.

Sales and Distribution.

Sixty-five percent of the ethanol produced in Minnesota is consumed in the state, while 35% is exported out-of-state.⁶⁷ Ethanol made in Minnesota has been exported to at least 18 states and Canada. See Table Four below. Further, as demand increases on the East Coast and in Texas, Minnesota plants and other ethanol suppliers are moving to meet such demand by selling their ethanol out of the state.⁶⁸

TABLE FOUR: States That Receive Minnesota Ethanol

Arizona
California
Colorado
Illinois
Indiana
Iowa
Kansas
Michigan
Nebraska
New Mexico
New York
North Dakota
Oklahoma
Oregon
South Dakota
Virginia
Washington
Wisconsin

The documents produced to this Office indicated that ethanol comes into Minnesota from surrounding states such as Iowa, Kansas, North Dakota, and Wisconsin. The documents produced to the AGO as part of its review of ethanol and E85 pricing

⁶⁷ *Ethanol Plants in Minnesota, supra n. 59, at 2.*

⁶⁸ *See Webb, Tight Ethanol Supply, supra n. 45, at 1C.*

indicate that ethanol can change hands many times between the plant and the E85 retailer as is shown by the attached flow chart. See Ethanol Distribution Flow Chart below. The majority of Minnesota plants sell their ethanol production through a marketing partnership with other ethanol plants or a marketing company. In some cases, the marketer buys the ethanol from the plant and resells it; in other cases, the marketer simply facilitates the sale and never takes title to the ethanol. These marketers charge the plants a small fee -- typically, \$.01 per gallon or less, for their services. The marketer in turn sets the resale or sale price for the ethanol. It may sell the ethanol to another wholesaler who may resell it or blend it with gas, to an oil company who buys it to blend with gas for resale to its branded retailers (if it is a vertically integrated company) or to other wholesalers, or to a farmer's co-op which blends it for sale to its farmer members, for example. Ethanol can pass through several wholesalers before reaching the consumer in the form of E85.

Currently, only one Minnesota ethanol plant offers blending of gas with fuel ethanol to make E85 on-site, though it was reported that more plants are interested in offering this service and have obtained or are trying to obtain a blender's license (which would be necessary to blend E85). Typically, ethanol is blended at a gasoline terminal or other location by a wholesaler, who then resells the E85 to retailers, or resells it to another wholesaler.

Nearly all of Minnesota's existing ethanol plants were organized as "new generation cooperatives" (NGCs). A traditional cooperative is one where the members pool raw goods or commodities (like their crops) and sell them to an intermediary for processing.⁶⁹ In contrast, members of a NGC also handle processing activities, shifting the focus away from selling a raw commodity to selling a value-added product, such as wine, baked goods, or ethanol.⁷⁰ NGCs may be combined with, converted to or organized as limited liability companies or other business structures. Agricultural producers enjoy a limited exemption from antitrust laws that allow them to form cooperative associations to jointly process and market their commodities. Without this limited exemption, these activities would likely be illegal agreements between competitors to fix prices, for example. Under the Clayton Act § 6 (15 U.S.C. § 17) and Capper Volstead Act (7 U.S.C. §§ 291-292), farmers ("agricultural producers") are allowed to engage in collective processing, preparing for market, handling, and marketing of agricultural commodities, whether by corporate or stock coops. To qualify for this limited exemption, the coop's members must be engaged in production, and not just the processing, of agricultural products, and all of the coop's members must be agricultural producers.⁷¹ Further, among other requirements, the coop may not deal with nonmembers' products in a greater amount than its members' products.⁷²

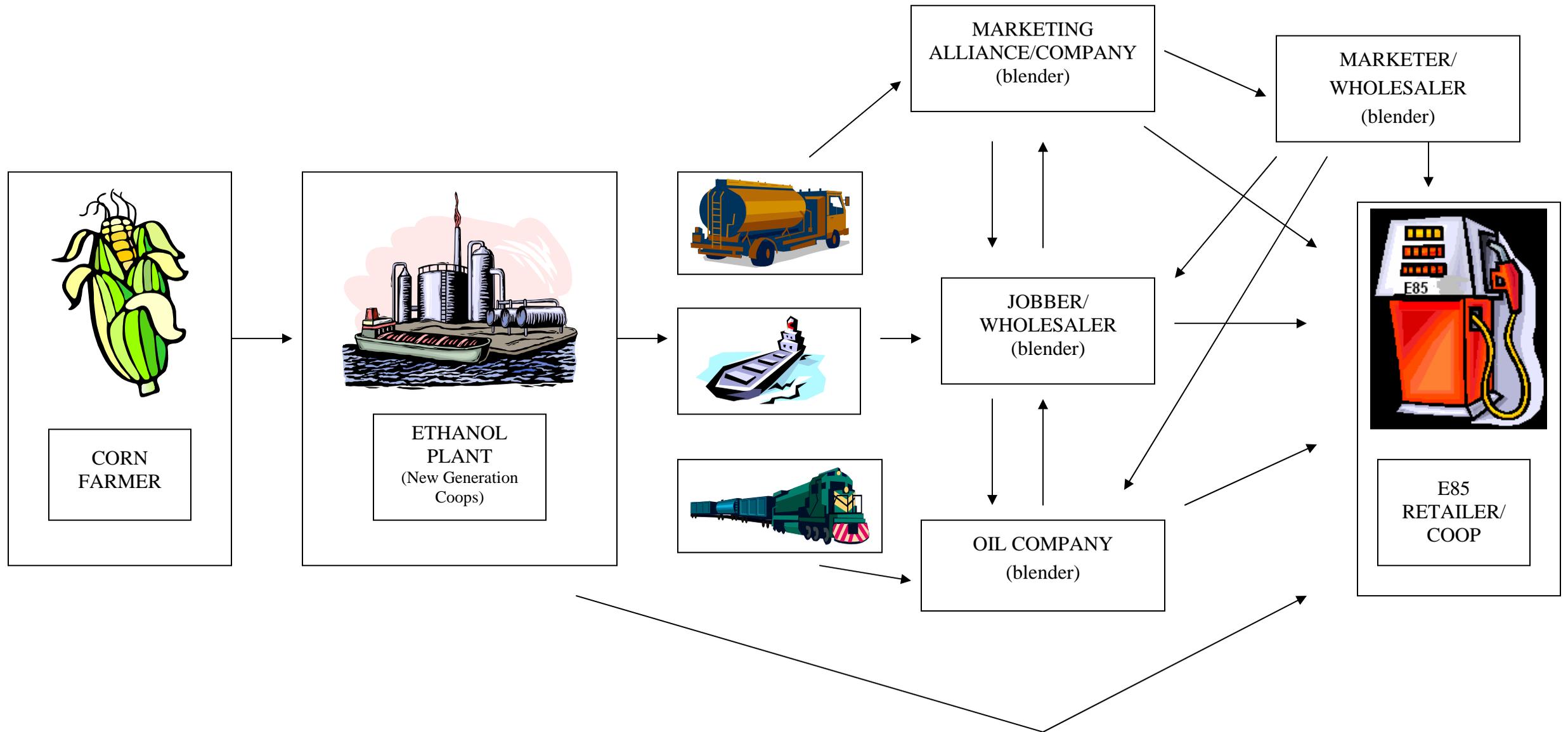
⁶⁹ Kathleen M. Kelley, *An Introduction to New Generation Cooperatives*, at 1 (November 2005) (available online at <http://farmbusiness.psu.edu/pubs/New%20Generation%20Cooperatives.pdf>).

⁷⁰ *Id.*

⁷¹ *Case-Swayne Co. v. Sunkist Growers, Inc.*, 389 U.S. 384, 386 (1967).

⁷² 7 U.S.C. 291 (2005).

ETHANOL DISTRIBUTION FLOW CHART



Tax Incentives and Subsidies for Ethanol Production and Consumption.

There are various state and federal law incentives and mandates for ethanol production and E85 consumption. For example, Minnesota has a mandate that all oxygenated gasoline sold in Minnesota must contain at least 10% ethanol (known as E10).⁷³ Minnesota law also requires that by August 30, 2013, all gasoline sold in the State must contain at least 20% ethanol (this requirement is subject to EPA approval).⁷⁴ This 20% mandate is predicted to result in 574 million gallons of ethanol being consumed in Minnesota (currently, Minnesota consumes about 260 million gallons per year).⁷⁵ Section 1501 of the Energy Policy Act of 2005 includes a mandate that by 2012, 7.5 billion gallons per year of renewable fuel must be mixed with gasoline that is sold in or brought into the U.S. Minnesota also imposes a lower fuel tax on E85 - it is \$.142 per gallon, compared to \$.20 per gallon for regular unleaded gasoline.⁷⁶ Further, “blenders” - those who hold a federal license permitting them to blend ethanol and gasoline - are eligible for a federal tax refund of \$.51 per gallon of ethanol blended with regular gas.⁷⁷

Both state and federal laws also provide grants to subsidize the building of ethanol plants and establishment of E85 retailers. For example, federal law provides for a tax credit for small ethanol producers of \$.10 per gallon.⁷⁸ Minnesota law provides for a \$.20 per gallon “production incentive” for every gallon of ethanol produced, up to three million dollars (or 15 million gallons) to any one producer, for ethanol plants that began production by June 30, 2000.⁷⁹ For E85 stations, the Energy Policy Act of 2005 created a new credit that permits taxpayers to claim a 30% credit, up to \$30,000, for the cost of installing an E85 station (or other “clean-fuel vehicle refueling property”). Further, the Minnesota Department of Agriculture is in the process of issuing \$500,000 in grants to gas retailers to pay 50% of the costs of adding E85 to their stations, up to \$15,000.⁸⁰ These funds were allocated to the Department of Agriculture by the Legislature in 2005. Finally, Minnesota law requires state agencies to purchase FFVs and other vehicles capable of running on alternative fuels whenever reasonably possible for motor pool or

⁷³ Minn. Stat. § 239.791 subd. 1 (2005).

⁷⁴ Minn. Stat. § 239.791 subd. 1a (2005).

⁷⁵ *Ethanol Plants in Minnesota*, *supra* n. 59, at 2.

⁷⁶ Minn. Stat. § 296A.07 subd. 3 (2005).

⁷⁷ The American Jobs Creation Act of 2004 (Public Law 108-357). Thus, for E85, this results in a \$.4335 per gallon tax credit for the blender.

⁷⁸ 26 U.S.C.A. § 40 (b) (4) (a) (2005). Section 1347 of the Energy Policy Act of 2005 modified the definition of a “small producer” to include plants with a capacity to produce up to 60 million gallons per year (as opposed to 30 million). 26 U.S.C.A. § 40 (g) (1) (2005).

⁷⁹ Minn. Stat. § 41A.09 (2005).

⁸⁰ See <http://www.state.mn.us/portal/mn/jsp/content.do?id=-536881350&subchannel=-536881511&sc2=null&sc3=null&contentid=536885915&contenttype=EDITORIAL&programid=536885394&agency=Commerce#Ethanol>.

agency use.⁸¹ For a summary of these various monetary incentives, see Table Five below.

TABLE FIVE: Summary of Monetary Incentives for Ethanol Production and Sale

Type of Incentive	State or Federal Law
Tax Credits/Reductions	<p>State: Alternative Fuel Tax of \$.142/gallon on E85 (compared with \$.20/gallon for regular gas)</p> <p>Federal: Tax refund of \$.51 per gallon of ethanol blended with regular gas (for blenders only)</p>
Producer Incentives	<p>State: Production incentive of \$.20 per gallon for every gallon of ethanol produced, up to three million dollars (or 15 million gallons) to any one producer, for ethanol plants that began production by June 30, 2000</p> <p>Federal: \$.10 per gallon of ethanol produced for “small ethanol producers” (those who produce up to 60 million gallons/year)</p>
Retailer Credits/Grants	<p>State: MN Dept. of Agriculture issuing \$500,000 in grants to gas retailers to pay 50% of the costs of adding E85 to their stations, up to \$15,000.</p> <p>Federal: taxpayers can claim a 30% credit, up to \$30,000, for the cost of installing an E85 station</p>

Ethanol and E85 Pricing.

According to a survey of 21 dry mill ethanol plants done by the USDA in 2002 and published last year, ethanol production has two main cost components -- capital costs

⁸¹ See Minn. Stat. § 16C.135 (2005).

and variable costs.⁸² Capital costs include costs for new construction or expansion; variable costs include net feedstock (corn) costs and cash operating expenses. The USDA survey found that for new plants, capital investment costs averaged \$1.57 per gallon, ranging from \$1.05 to \$3.00, while for expansion costs averaged \$.50 per gallon, ranging from \$.20 to \$1.00.⁸³

Variable costs make up an average of \$.96 per gallon. This average includes about \$.55 per gallon for net feedstock costs and \$.41 per gallon for operating expenses such as electricity, fuel, waste management, enzymes, labor, maintenance, and other costs. Due to recent increases in natural gas prices, fuel costs have been a significant component of plant operational costs. Net feedstock costs, however, make up the highest cost component of ethanol production.⁸⁴ Consistent with this survey, the documents produced to this Office anecdotally indicate that during the time period covered by the CIDs, the “break even” price of ethanol for ethanol producers ranged roughly from \$1.00 to \$1.20 per gallon depending on the price of corn and natural gas.

Ethanol and E85 prices do not appear to be based solely or even primarily on production costs. Rather, the documents reviewed by this Office anecdotally indicated that producers were reluctant to agree to prices below their “break even” price. Ethanol prices were typically based on gas prices or competitors’ ethanol prices published by OPIS (Oil Price Information Service) and AXXIS Petroleum, as well as perceived supply and demand issues.⁸⁵ OPIS and AXXIS collect and publish fuel prices, including daily and weekly average prices for ethanol in over one hundred “rack cities”,⁸⁶ including the Twin Cities. Subscribers pay a fee for this service, and can choose to receive different kinds of fuel pricing information.

Ethanol marketers and wholesalers use pricing trends reported by OPIS and AXXIS, and prices posted at terminals or from other trading markets (such as NYMEX), when they are contract bidding or setting spot prices. Ethanol contracts reviewed by the AGO had pricing terms that stated, by way of hypothetical example, that the price for weekly deliveries of 10 trucks (each truck containing about 8,000 gallons) over the next six months will be \$.10 per gallon less than the average ethanol rack price reported by AXXIS or OPIS in Minneapolis from the previous week, or the average rack price in Alexandria on the Wednesday of the previous week as reported by AXXIS, or the average price of gasoline from the previous week as reported by a trading market, plus

⁸² 2002 Ethanol Cost of Production Survey, *supra* n. 14, at iii.

⁸³ *Id.*, at 8.

⁸⁴ The average monthly corn prices that Minnesota purchasers paid in 2005 fluctuated between 1.97 and 1.63 dollars per bushel. *See* United States Department of Agriculture, National Agricultural Statistics Service (available online at <http://www.nass.usda.gov>).

⁸⁵ On August 12, 2005, OPIS acquired AXXIS Petroleum. *See* OPIS press release available online at <http://opisnet.com/images/axxispressrelease.pdf>.

⁸⁶ A rack city is a location where gasoline is picked up and delivered to retailers for sale to consumers. *See Minnesota’s Gasoline Market*, Minnesota AG’s Office, at 27 (July 2002).

\$.XX, or the ethanol price posted at a specific terminal, etc. Similarly, E85 wholesale prices may be set in reference to the price of unleaded gas, or a combination of the posted prices of ethanol and unleaded, at a rack or at some other location -- e.g., 15% less per gallon than regular gas sold at a designated rack.

Similar to the price of gasoline, ethanol prices can vary significantly even at the same terminal, vary from geographic area to geographic area, and fluctuate daily. Generally speaking, the closer to the supplier the purchase is made, the lower the price. This makes economic sense -- every time ethanol changes hands, a mark up may be added and storage and additional delivery fees may be incurred. Further, at least during the time period covered by the documents reviewed by this Office, it appears that retailers who are part of a vertically integrated company (i.e., who are owned by an oil company or its subsidiary) were able to obtain E85 at a lower price from their parent companies than many of their independent competitors were able to obtain from other wholesalers, particularly those who were buying on the "spot" market and not according to a contract.

During much of the time period covered by the CID production, beginning in June and going through the fall months of 2005, the ethanol market was considered to be in "backwardation," meaning that the ethanol market was perceived by buyers and sellers as being tight or undersupplied, creating a premium for "prompt" truckloads (or deliveries available in the current or nearest month). In a backwardated market, spot prices are typically higher than contract prices, which works to encourage liquidation of stored stock. The opposite of a backwardated market is one in "contango," which is a market considered to be in surplus, so that supplies that are available promptly sell for a discount. The contango market encourages sellers and resellers to build inventory and keep more product in storage, in hopes that supplies that have been bought cheaply (or have just been manufactured) can be sold high as the market changes; the backwardated market discourages storage for the same reason -- prompt prices are higher than predicted future prices, so there is less profit in waiting to sell. As a result of the confluence of the factors described above -- rising (and then skyrocketing) oil and gas prices, the gradual move away from MTBE use, and other supply and demand factors (such as increased use of ethanol for blending with gas where required or permitted by state law, as a cheaper substitute for "pure" gas), for much of the latter half of 2005, ethanol prices also rose significantly as they went into a backwardated period. Then, as ethanol prices began to drop in late September 2005, the oil industry's reaction to the Energy Policy Act of 2005 (which accelerated the move away from MTBE use) caused ethanol prices and E85 to start increasing again.

From the information received by the AGO, during this fall 2005 time period, at least one plant and one marketer were making efforts to try to keep the price of E85 down and even were willing to take losses to help keep prices down. For example, the Chippewa Valley Ethanol Company (CVEC) plant in Benson sells E85 directly from the plant. Beginning around September 1, 2005, the CVEC plant offered E85 for \$.70 per gallon less than the OPIS average price for E10 at the Alexandria terminal, and required

the retailer to sell the E85 for \$.70 per gallon less than the price for regular 87 octane gas at the retailer's station.

There is a popular belief that the price of E85 should track the price of corn, since ethanol is made from corn. Based on the data provided to the AGO, however, it appears that the price of E85 has little to do with the price of corn. See Graph A, *infra* p. 2. Rather, ethanol and E85 prices tend to track, or parallel, regular gas prices. See Graph B, *infra* p. 3.

In addition, as noted above, there are supply and demand dynamics unique to ethanol that may independently affect ethanol prices. For example, most ethanol plants are located in the Midwest. Unlike petroleum fuel, ethanol cannot be transported through pipelines, making distribution to other parts of the U.S. wholly reliant on truck, rail, or barge availability, resulting in non-Midwestern states being willing to pay more for ethanol to cover these transportation costs. Additionally, the nationwide move away from the use of MTBE is occurring faster than anticipated.⁸⁷ This has increased demand and is driving up ethanol prices on the East Coast and Texas (where there are almost no ethanol plants), causing ethanol suppliers who want to take advantage of these high prices to move their ethanol to these areas.⁸⁸ Further, as described above, other states, including Minnesota, have implemented or have considered legislation that requires all gasoline sold in the state to consist of at least 10% ethanol further increasing demand for the product.⁸⁹ All of these factors, in addition to crude oil prices and the price of regular gasoline appear to affect E85 prices as well.

Antitrust Law and Ethanol.

Under the antitrust laws, evidence of high prices or of simultaneous pricing is not enough to show illegal price-fixing conduct. State and federal antitrust laws generally apply to two categories of conduct. The first category prohibits agreements that unreasonably harm competition. Such “restraints of trade” require proof that two or more independent economic actors (i.e., gas retailers) agreed to engage in conduct such as price-fixing or bid-rigging. The second category prohibits monopolization or attempted monopolization, as in situations where one economic actor dominates a market and illegally abuses its market power to harm competition. Courts have repeatedly held that evidence of high prices or evidence that competitors change their prices in response to other competitors' prices (“conscious parallelism”), by itself is not sufficient proof of an antitrust violation; evidence of an actual *agreement* to fix prices, or a showing of abuse of monopoly power is needed.

⁸⁷ See Webb, *Tight Ethanol Supply*, *supra* n. 45; Foss, *supra* n. 47. See also, Wang, *supra* n. 46.

⁸⁸ Webb, *Tight Ethanol Supply*, *supra* n. 45.

⁸⁹ See state laws referred to, *supra*, n. 3.

The information produced to this Office pursuant to the CIDs did not substantiate evidence of an agreement among competitors to fix prices. Further, it does not appear that any single player has sufficient market dominance so as to have engaged in monopolistic behavior.

Conclusion.

Ethanol and E85 prices show little relationship to corn prices. Rather, E85 prices parallel regular gas prices, and are also being influenced by supply and demand factors, unique to ethanol, such as the MTBE ban and surge in the use of ethanol as an oxygenate on the East Coast and in Texas.

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