ETHANOL Production
Level Measurement Solutions

Monitor Technologies, LLC.
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Overview

This white paper provides information regarding the process used to produce Ethanol and the location within this process where continuous level measurement and point level monitoring is typically required. In addition, a summary of the state of the Ethanol industry, as of this writing, is included. A summary of the key players in the engineering, design and construction of Ethanol facilities is also provided. The objective is to provide an initiation into this rapidly growing and important industry.

Why Ethanol

Ethanol is a clean-burning, high-octane fuel that is produced from renewable sources. The later fact is of great importance, especially during recent times of grossly rising oil prices and gasoline prices at the pump. Ethanol is produced from grain, which is renewed each and every year.

In the most basic sense, ethanol is grain alcohol, produced from crops such as corn. Because it is produced in the U.S., ethanol helps reduce this country's dependence upon foreign sources of energy like oil.

Pure, 100% ethanol is not generally used as a motor fuel; instead, a percentage of ethanol is combined with unleaded gasoline. Ethanol is beneficial as an additive for several reasons because it:

- decreases the overall cost of the fuel,
- increases the octane rating and
- decreases harmful emissions

The most common blends of ethanol and unleaded gasoline are called E10 and E85.

E10 - 10% ethanol and 90% unleaded gasoline - E10 is approved for use in any vehicle sold in the United States. Many automobile producers recommend its use because of its high performance (higher octane) and clean-burning characteristics.

In 2004, about one-third of America's gasoline was blended with ethanol, most in this 10% variety. This has been increasing steadily with mandates coming in the form of legislation at the state level. Some experts say that by the year 2012 farmers in the U.S. will produce enough corn to take care of food needs and to produce enough ethanol to have E-10 in every tank.

E85 - 85% ethanol and 15% unleaded gasoline - Vehicles classified as FFV's are "flexible fuel vehicles" and E85 is an alternative fuel for use in such vehicles. There are currently more than 4 million FFV's on roads today in the U.S. alone, and automobile manufacturers are making more each year. In conjunction with more flexible fuel

vehicles, more and more E85 is showing up at pumps in gas stations every year. FFV's also operate on straight gasoline so when E85 is not available that's what they run on.

It is important to remember that all gasoline vehicles can use E10 with no modifications to the engine. E85 is for use in a flexible fuel vehicle, so some people confuse "ethanol" with the blend of 85% ethanol and 15% gasoline. For a list of current vehicles classified as FFV's please refer to this website link, http://www.e85fuel.com/e85101/flexfuelvehicles.php for more information.

Other benefits exist - not from the use of the ethanol but from the existence of the industry itself and the impact on local, state and country economies. From the local communities where the crops are grown and processed to the metropolitan areas where drivers fill up with a domestically produced fuel, U.S. made ethanol propels the country's economy.

Worthwhile research and studies support the benefits of this fuel source and the industry that has formed. One such is a 1997 study called The Economic Impact of the Demand for Ethanol, performed and reported by Northwestern University's Kellogg School of Management. This research found that:

- approximately 370 local jobs are created during the construction of an ethanol production plant,
- up to 4,000 local jobs are created during the operation of an ethanol plant,
- ethanol plant construction creates $60 million to $130 million in additional income, and
- ethanol plant operation creates $47 million to $100 million in additional income.

Those are powerful numbers and justify the local and state interest in ethanol production plants. This is a driver to the new construction boom of these plants.

In addition, a 2002 study called Ethanol and the Local Community by AUS Consultants and SJH & Company found that:

- an ethanol plant expands the local economic base by $110 million each year, due to its approximate cost of $60 million for one year of construction,
- an additional $19.6 million in household income will be generated annually as a result of ethanol production,
- tax revenue for local and state governments will increase by at least $1.2 million a year, and
- nearly 700 permanent jobs will be created in the area near an ethanol plant.

For further information and reading refer to the article titled "Ethanol's Impact on the Local Community" in the June 2005 issue of Ethanol Today magazine.

Ethanol Industry

Today, as of the end of May 2006, the ethanol production industry in the U.S. includes 101 production plants operating and producing 4,817 million gallons of ethanol per year. In addition, there are 34 more plants under construction that will produce another 2,222.5 million gallons per year. Over 7 billion gallons of fuel produced and potentially produced each year as of now. Appendix A provides a list of current sites.

The worldwide ethanol industry produced over 12 billion gallons of ethanol in 2005, up about 13% over the previous year. The top ethanol producing countries are the U.S. and Brazil with virtually identical production in 2005, while Brazil produced about 13% more than the U.S. in 2004. Currently the U.S. imports only 4.5% of its ethanol need and this is expected to decline.

Driving forces include the RFS (Renewable Fuels Standard) that is a part of the comprehensive legislation enacted under President George W. Bush as the Energy Policy Act of 2005. The RFS calls for the production of 4 billion gallons of ethanol in 2006 and increases production capacity up to 7.5 billion gallons by 2012, an average annual growth rate of 11%. The U.S. ethanol and agriculture industries will exceed the goal by the end of 2006 and is poised to do the same by 2012. Additional ethanol plant and expansions will be required over the next six years.

In addition to the RFS, the use of ethanol to replace MTBE (methyl tertiary butyl ether) has grown. This is because MTBE has, over the years of use as a gasoline additive, shown up in drinking water and is considered a very hazardous pollutant. MTBE is an Oxygenate that increases air quality. Ethanol, as an additive to gasoline (E-10), is found to have the same air quality benefits without the negative side effects. Complete elimination of MTBE in the U.S. could boost demand for ethanol as a replacement to MTBE to over 4 billion gallons per year alone.

By-products of the ethanol production process have value and increase the viability of the industry. These by-products include distiller's grain (DDGS) and thin condensed distiller's solubles (CDS) or "syrup". How do these by-products occur?

Ethanol production consumes the grain's starch. However, the protein, minerals, fat and fiber remain as unused components of the grain. These are concentrated during the production process to produce a highly valued and nutritious livestock feed.

For "dry-mill" ethanol refineries, which make up the majority of ethanol refineries, most feed is dried and sold as Distillers Dried Grains with Solubles (DDGS). However, about 20-25% of the feed is shipped wet, reducing the energy for drying and reducing transportation costs. This also provides another market for producers.

Example: A modern dry-mill ethanol plant will produce about 2.8 gallons of ethanol and more than 17 pounds of distillers grains from a bushel of corn. In 2005, dry-mills

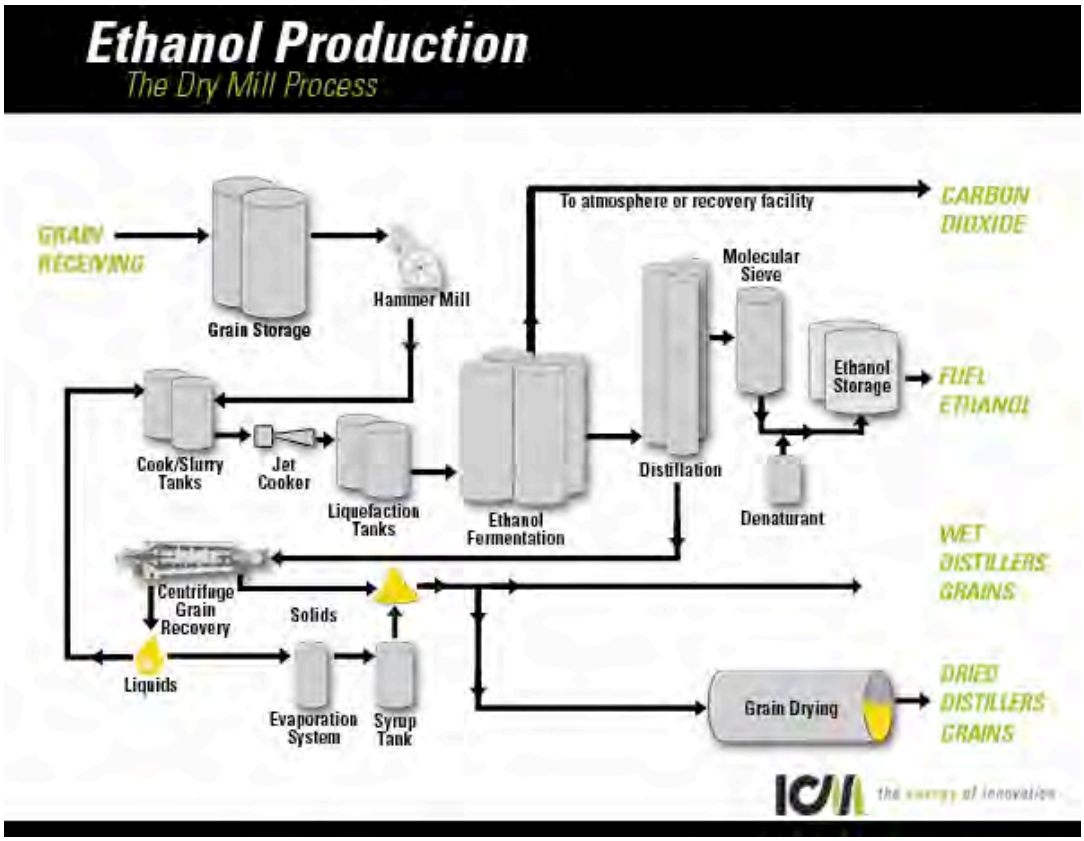
produced approximately 9 million metric tons of distillers grains. Wet-mill ethanol plants produced more than 430,000 metric tons of corn gluten meal, 2.4 million metric tons of corn gluten feed and germ meal, and 565 million pounds of corn oil during the same period.

Ethanol Production Process

There are two basic types of ethanol production plants already alluded to. One is the "wet mill" and the other is the "dry mill". The wet mill process will soak the grain (corn is the most common so we will use it in our discussion here) until the corn is able to be broken down into its components. The germ of the corn is used for the production of corn oil and the starch is used to produce the ethanol. There actually is a greater range of valuable products that can be produced by the wet mill process, however, the cost to build a wet mill facility is far greater than that of a dry mill plant.

The dry mill, most common type, grinds or mills the corn into flour using hammer mills. This flour then goes through the fermentation process where the starch is converted to ethanol and the remainder is dried and sold as DDGS (dried distillers grains with solubles).

Let's take a closer look at a basic dry mill process[1]:



[1] Courtesy of ICM, Inc. of Colwich, KS

Provided below is a brief description[2] of what takes place during each step of the dry mill process.

Grain receiving and storage: Corn (or milo) is delivered to the facility by truck or rail. The trucks or rail cars are unloaded and the grain is stored in storage bins designed to hold enough grain to operate the ethanol production plant for 7-10 days.

Screening and hammer mill: The corn is screened and cleared of debris, such as corn stalks, and then milled into a coarse flour using hammer mills.

Grain cooking: The coarse flour is mixed with process water (some of this as thin stillage coming from the spent grain recovery process) and the pH of this slurry is adjusted to about 5.8. An alpha-amylase enzyme is added. The slurry is cooked to 180-190° F for 30-35 minutes to reduce viscosity.

Pressurized jet cooker: The slurry is then pumped through a pressurized jet cooker that increases the temperature to about 221° F for about 5 minutes. The mixture is then cooled.

Liquefaction process: After cooling, the mixture is held at 180-190° F for 1-2 hours to give the alpha-amylase enzyme time to break down the starch into short chain dextrins. After adjusting the pH and temperature, a second enzyme, gluco-amylase, is added as the mixture is pumped into the fermentation tanks.

Fermentation: The mixture is now typically referred to as “mash”. The gluco-amylase, previously added, breaks down the dextrins into simple sugars. Yeast is added to convert the sugar to ethanol and carbon dioxide. The mash is allowed to ferment for 50-60 hours, resulting in a mixture that contains about 15% ethanol as well as the solids from the grain and added yeast.

Distillation: The mash is pumped into a distillation system. By the time the product is ready to leave the distillation columns it contains about 95% ethanol by volume (190 proof). The residue from the distillation process is called stillage and it is pumped from the bottom of the columns to the centrifuges.

Separation of ethanol from water (molecular sieve): The 190 proof ethanol contains about 5% water, which must be extracted before the final ethanol product is completed. The 190 proof ethanol is passed through a molecular sieve to completely separate the remaining water from the ethanol, based on the different sizes of the molecules of ethanol and water. This step in the process produces 200 proof anhydrous (waterless) ethanol.

[2] Information from ICM, Inc. website at http://www.icm.com

Denaturing the ethanol: Before the ethanol is sent to the final storage tanks it is denatured. A denaturant is added to make it unfit for human consumption.

Final ethanol storage: After the production process the final ethanol product is stored in storage vessels sized usually to hold from 7-10 days of product. Some facilities may be designed to hold more.

Recovery of grain by-products: The stillage from the bottom of the distillation columns contains solids from the grain and added yeast as well as liquid from the water added during the process. The stillage is sent to centrifuges from separation of the stillage into "thin stillage" (a liquid with about 5-10% solids) and wet distillers grain (WDG).

Evaporating the thin stillage: Some of the thin stillage is routed back to the grain cooking process. The thin stillage that is not routed back is sent through a multiple-effect evaporation system where it is concentrated into syrup containing 25-50% solids.

Syrup handling: This syrup that is a result of the evaporation of the thin stillage has a high protein and fat content. The syrup is mixed back with the wet distillers grain (WDG).

WDG: The wet distillers grain with added solubles from the syrup makes an excellent cattle ration for local feedlots and dairies. After the syrup is added it is then either conveyed to a wet cake pad to be loaded for transport or sent through a distillers grain dryer.

Grain drying: WDG is often sent through a drying system to remove moisture and extend shelf life. This dried distillers grain with solubles from the syrup (DDGS) is commonly used as a high protein ingredient in cattle, swine, poultry and fish diets. It is also currently being researched for human consumption.

Instrumentation Use In Ethanol Production

The typical dry mill ethanol production facility that produces 40 million gallons of ethanol per year can have dozens of level sensors and hundreds of individual pieces of process instrumentation to measure pressures, flows and temperatures as well. In addition, a variety of level sensor applications may exist with manufacturers that provide systems, subcomponents and equipment for an ethanol production plant.

Typical *CONTINUOUS* Level Applications	Monitor Technologies LLC Solutions
Corn storage silos	Flexar™ guided wave radar SiloPatrol® SE inventory Monitor
Corn grind silos	Flexar™ guided wave radar SiloPatrol® SE inventory Monitor

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Typical *CONTINUOUS* Level Applications	Monitor Technologies LLC Solutions
Syrup tanks	Flexar™ guided wave radar BulkSonics® ultrasonic transmitter
Thin stillage tanks	Flexar™ guided wave radar BulkSonics® ultrasonic transmitter
Ethanol day tanks	Flexar™ guided wave radar BulkSonics® ultrasonic transmitter
"Off Spec" ethanol tanks	Flexar™ guided wave radar BulkSonics® ultrasonic transmitter
Denaturant tanks	Flexar™ guided wave radar BulkSonics® ultrasonic transmitter
Ethanol storage tanks	Flexar™ guided wave radar BulkSonics® ultrasonic transmitter
Chemical storage tanks Caustic Sulfuric acid Ammonia Urea	Flexar™ guided wave radar BulkSonics® ultrasonic transmitter
Enzyme storage tanks Alpha amylase Gluco amylase	Flexar™ guided wave radar BulkSonics® ultrasonic transmitter

Typical *POINT* Level Applications	Monitor Technologies LLC Solutions
Corn storage silos (high/low level)	TrueCap® RF capacitance sensors Model PZP vibratory sensors VibraRod™ vibratory sensors
Corn grind silos (high/low level)	TrueCap® RF capacitance sensors Model PZP vibratory sensors VibraRod™ vibratory sensors
Slurry tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors

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Typical *POINT* Level Applications	Monitor Technologies LLC Solutions
Liquefaction tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Fermentation tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Yeast propagation tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
CO_2 scrubber (water tank) level (ethanol vapor is removed and recycled from the fermentation process)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Whole stillage tank (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Thin stillage tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Syrup tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Ethanol day tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
“Off spec” ethanol day tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Denaturant tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Ethanol storage tanks (high level)	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Chemical storage tanks (high level) Caustic Sulfuric acid Ammonia Urea	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors
Enzyme storage tanks (high level) Alpha amylase Gluco amylase	TrueCap® RF capacitance sensors VibraFork™ vibratory sensors

Design, engineering and construction

The following list of firms specialize in the design, engineering and/or construction of ethanol facilities:

Fagen, Inc. / Fagen Engineering LLC
P.O. Box 159
501 West Highway 212
Granite Falls, MN 56241
320-564-3324

Delta-T
323 Alexander Lee Parkway
Williamsburg, VA 23185
757-220-2955

BioFuel Industries
A Cogeneration Technologies Company
12615 Jones Road
Suite #209
Houston, Texas 77070
281-955-7343

ICM, Inc.
P.O. Box 397
310 N. First Street
Colwich, KS 67030-0397
316-796-0900
www.icm.com

Hogenson Construction, Inc.
206 12th Ave. NE
P.O. Box 777
West Fargo, ND 58078
701-281-1742
http://www.hogenson.com

McCormick Construction
7738 Commerce Circle
Rockford, MN 55373
763-477-4774
http://www.mccormickconstruction.com

KL Process Design Group
2693C Commerce Road
Rapid City, SD 57702
605-718-372
http://www.klprocess.com

Ambitech
1333 Butterfield Road, Suite 200
Downers Grove, IL 60515
630-963-5800
http://www.ambitech.com

Bio-Renewable Group
P.O. Box 2019
Fargo, ND 58107
701-282-6171
http://www.biorenewable.com

Broin & Associates
2209 East 57th Street N.
Sioux Falls, SD 57104
605-965-2200
http://www.broin.com

Lurgi PSI, Inc.
1790 Kirby Parkway, Suite 300
Memphis, TN 38138
901-756-8250
http://www.lurgipsi.com

STARCON International, Inc.
260 Market Place
Manhattan, IL 60442
815-478-4615
http://www.starcon.org

T.E. Ibberson Company
828 Fifth Street South
Hopkins, MN 55343
952-938-7007
http://www.ibberson.com

Interstates
1520 North Main
P.O. Box 260
Sioux Center, IA
712-722-1662 (Construction)
712-722-1663 (Engineering)
712-722-1664 (Controls)
http://www.interstates.com

Wanzek Construction, Inc.
Exit 342 on I-94
16553 37R Street S.E.
Fargo, ND 58103
701-282-6171
http://www.wanzek.com

Conclusion

Ethanol production has many benefits to the global economy and specifically to the U.S.. While ethanol production and use as a fuel has been around at least since the early 1970's, the recent increase in design and construction of new plants and expansion of existing plants is driven by the demand for ethanol we have seen in the past few years. The demand is a result of the RFS (renewable fuels standard) in the U.S., the use of ethanol as a replacement to MTBE, as well as the perceived need for independence from energy sources outside of the U.S. and the need for alternatives to higher crude oil and gasoline prices.

The U.S. is a leading producer of ethanol and it is in the best interest of the U.S. to continue to be so. Politicians, business leaders and even consumers recognize this. Ethanol demand will continue to grow in the U.S. and abroad. More grain will be used and more production capacity will be needed, probably well into the next decade.

Process instrumentation is an important component to the construction, operation and efficiency of the typical ethanol production facility. Solutions for the need to continuously measure material levels and monitor point level in various parts of the production process are required. Monitor Technologies is uniquely equipped with the range of technologies, expertise in both solids and liquid measurement and service that provides a customer experience second-to-none.

In addition, process instrumentation needs in an ethanol production facility include pressure, temperature and flow measurement as well as control systems. Monitor's level measurement and monitoring products are the perfect fit and compliment with the other process instrumentation requirements to meet the needs of the ethanol industry today and for decades to come.

APPENDIX A

Company	Location	Feedstock	Current Capacity (mmgy)	Under Construction/ Expansions (mmgy)
Abengoa Bioenergy	Corp. York, NE	Corn/Milo	55	
	Colwich, KS		25	
	Portales, NM		30	
	Ravenna, NE			88
ACE Ethanol	Stanley, WI	Corn	39	
Adkins Energy*	Lena, IL	Corn	40	
Advanced Bioenergy	Fairmont, NE	Corn		100
AGP*	Hastings, NE	Corn	52	
Agra Resources Coop d.b.a. EXOL*	Albert Lea, MN	Corn	40	8
Agri-Energy, LLC*	Luverne, MN	Corn	21	
Alchem Ltd. LLLP	Grafton, ND	Corn	10.5	
Al-Corn Clean Fuel*	Claremont, MN	Corn	35	
Amaizing Energy*	Denison, IA	Corn	40	
ADM	Decatur, IL	Corn	1,070	
	Cedar Rapids, IA	Corn		
	Clinton, IA	Corn		
	Columbus, NE	Corn		
	Marshall, MN	Corn		
	Peoria, IL	Corn		
	Wallhalla, ND	Corn/barley		
ASAlliances Biofuels, LLC	Albion, NE	Corn		100
	Linden, IN	Corn		100
	Bloomingburg, OH	Corn		100
Aventine	Pekin, IL	Corn	100	57
	Aurora, NE	Corn	50	
Badger State Ethanol, LLC*	Monroe, WI	Corn	48	
Big River Resources, LLC*	West Burlington, IA	Corn	40	
Blue Flint Ethanol	Underwood, ND	Corn		50
Broin	Scotland, SD	Corn	9	
Bushmills Ethanol*	Atwater, MN	Corn	40	
Cargill, Inc.	Blair, NE	Corn	85	
	Eddyville, IA	Corn	35	
Central Indiana Ethanol	Marion, IN	Corn		40
Central MN Ethanol Coop*	Little Falls, MN	Corn	21.5	
Central Wisconsin Alcohol	Plover, WI	Seed corn	4	
Chief Ethanol	Hastings, NE	Corn	62	
Chippewa Valley Ethanol*	Benson, MN	Corn	45	
Commonwealth Agri-Energy, LLC*	Hopkinsville, KY	Corn	33	
Conestoga Energy Partners	Garden City, KS	Corn/milo		55
Corn, LP*	Goldfield, IA	Corn	50	
Cornhusker Energy Lexington, LLC	Lexington, NE	Corn		40
Corn Plus, LLP*	Winnebago, MN	Corn	44	
Dakota Ethanol, LLC*	Wentworth, SD	Corn	50	
DENCO, LLC*	Morris, MN	Corn	21.5	
E3 Biofuels	Mead, NE	Corn		24
East Kansas Agri-Energy, LLC*	Garnett, KS	Corn	35	
ESE Alcohol Inc.	Leoti, KS	Seed corn	1.5	
Ethanol2000, LLP*	Bingham Lake, MN	Corn	32	
Frontier Ethanol, LLC	Gowrie, IA	Corn	60	
Front Range Energy, LLC	Windsor, CO	Corn	40	
Glacial Lakes Energy, LLC*	Watertown, SD	Corn	50	
Global Ethanol/Midwest	Lakota, IA	Corn	95	
Grain Processors	Riga, MI	Corn		57
Golden Cheese Company of California*	Corona, CA	Cheese whey	5	
Golden Grain Energy, LLC*	Mason City, IA	Corn	60	50
Golden Triangle Energy*	Craig, MO	Corn	20	

APPENDIX A Cont'd.

Company	Location	Feedstock	Current Capacity (mmgy)	Under Construction/ Expansions (mmgy)
Grain Processing Corp.	Muscatine, IA	Corn	20	
Granite Falls Energy, LLC	Granite Falls, MN	Corn	45	
Great Plains Ethanol, LLC*	Chancellor, SD	Corn	50	
Green Plains Renewable Energy	Shenandoah, IA	Corn		50
Hawkeye Renewables, LLC	Iowa Falls, IA	Corn	100	
	Fairbank, IA	Corn	100	
Heartland Corn Products*	Winthrop, MN	Corn	36	
Heartland Grain Fuels, LP*	Aberdeen, SD	Corn	9	
	Huron, SD	Corn	12	18
Heron Lake BioEnergy, LLC	Heron Lake, MN	Corn		50
Horizon Ethanol, LLC	Jewell, IA	Corn	60	
Husker Ag, LLC*	Plainview, NE	Corn	26.5	
Illinois River Energy, LLC	Rochelle, IL	Corn		50
Iowa Ethanol, LLC*	Hanlontown, IA	Corn	50	
Iroquois Bio-Energy Company, LLC	Rensselaer, IN	Corn		40
James Valley Ethanol, LLC	Groton, SD	Corn	50	
KAAPA Ethanol, LLC*	Minden, NE	Corn	40	
Land O' Lakes*	Melrose, MN	Cheese whey	2.6	
Lincolnland Agri-Energy, LLC*	Palestine, IL	Corn	48	
Lincolnway Energy, LLC*	Nevada, IA	Corn	50	
Liquid Resources of Ohio	Medina, OH	Waste Beverage	3	
Little Sioux Corn Processors, LP*	Marcus, IA	Corn	52	
Merrick/Coors	Golden, CO	Waste beer	1.5	1.5
MGP Ingredients, Inc.	Pekin, IL	Corn/wheat starch	78	
	Atchison, KS			
Michigan Ethanol, LLC	Caro, MI	Corn	50	
Mid America Agri Products	Madrid, NE	Corn		44
Mid-Missouri Energy, Inc.*	Malta Bend, MO	Corn	45	
Midwest Renewable Energy, LLC	Sutherland, NE	Corn	25	
Millennium Ethanol	Marion, SD	Corn		100
Minnesota Energy*	Buffalo Lake, MN	Corn	18	
Missouri Ethanol	Laddonia, MO	Corn		45
New Energy Corp.	South Bend, IN	Corn	102	
North Country Ethanol, LLC*	Rosholt, SD	Corn	20	
Northeast Missouri Grain, LLC*	Macon, MO	Corn	45	
Northern Lights Ethanol, LLC*	Big Stone City, SD	Corn	50	
Northstar Ethanol, LLC	Lake Crystal, MN	Corn	52	
Otter Creek Ethanol, LLC*	Ashton, IA	Corn	55	
Pacific Ethanol	Madera, CA	Corn		35
Panhandle Energies of Dumas, LP	Dumas, TX	Corn/Grain Sorghum		30
Parallel Products	Louisville, KY	Beverage waste	5.4	
	R. Cucamonga, CA			
Permeate Refining	Hopkinton, IA	Sugars & starches	1.5	
Phoenix Biofuels	Goshen, CA	Corn	25	
Pinal Energy, LLC	Maricopa, AZ	Corn		55
Pine Lake Corn Processors, LLC*	Steamboat Rock, IA	Corn	20	
Pinnacle Ethanol, LLC	Corning, IA	Corn		60
Platte Valley Fuel Ethanol, LLC	Central City, NE	Corn	40	
Prairie Ethanol, LLC	Loomis, SD	Corn		60
Prairie Horizon Agri-Energy, LLC	Phillipsburg, KS	Corn		40
Pro-Corn, LLC*	Preston, MN	Corn	42	

APPENDIX A Cont'd.

Company	Location	Feedstock	Current Capacity (mmgy)	Under Construction/ Expansions (mmgy)
Quad-County Corn Processors*	Galva, IA	Corn	27	
Red Trail Energy, LLC	Richardton, ND	Corn		50
Redfield Energy, LLC	Redfield, SD	Corn		50
Reeve Agri-Energy	Garden City, KS	Corn/milo	12	
Siouxland Energy & Livestock Coop*	Sioux Center, IA	Corn	25	10
Siouxland Ethanol, LLC	Jackson, NE	Corn		50
Sioux River Ethanol, LLC*	Hudson, SD	Corn	55	
Sterling Ethanol, LLC	Sterling, CO	Corn	42	
Tall Corn Ethanol, LLC*	Coon Rapids, IA	Corn	49	
Tate & Lyle Loudon, TN		Corn	67	
The Andersons Albion Ethanol LLC	Albion, MI	Corn		55
The Andersons Clymers Ethanol, LLC	Clymers, IN	Corn		110
Trenton Agri Products, LLC	Trenton, NE	Corn	35	10
United WI Grain Producers, LLC*	Friesland, WI	Corn	49	
US BioEnergy Corp.	Albert City, IA	Corn		100
	Lake Odessa, MI	Corn		45
U.S. Energy Partners, LLC	Russell, KS	Milo/wheat starch	48	
Utica Energy, LLC	Oshkosh, WI	Corn	48	
Val-E Ethanol, LLC	Ord, NE	Corn	45	
VeraSun Energy Corporation	Aurora, SD	Corn	230	110
	Ft. Dodge, IA	Corn		
	Charles City, IA	Corn		
Voyager Ethanol, LLC*	Emmetsburg, IA	Corn	52	
Western Plains Energy, LLC*	Campus, KS	Corn	45	
Western Wisconsin Renewable Energy, LLC*	Boyceville, WI	Corn		40
Wind Gap Farms	Baconton, GA	Brewery waste	0.4	
Wyoming Ethanol	Torrington, WY	Corn	5	
Xethanol BioFuels, LLC	Blairstown, IA	Corn	5	