

Ethanol Plant Valuation

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For Educational Purposes Only

- **The opinions set forth herein reflect the viewpoints of the author. While a great deal of care has been taken to provide accurate and current information, no responsibility is assumed for the accuracy of the data contained herein. This document was created for educational purposes with the understanding that the author is not engaged in rendering legal, accounting, or other professional advice.**

Outline

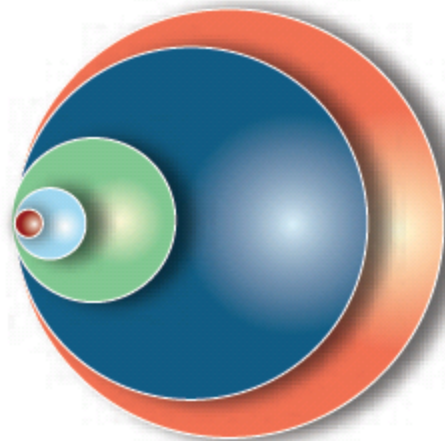
- Ethanol Facts and Figures
- Supply and Demand
- Approaches to Value
 1. Cost Approach
 2. Sales
 3. Operational Income Approach

Ethanol Facts and Figures

2009	2010
Each gallon of ethanol delivers as much as 130% more energy	Each gallon of ethanol delivers as much as 260% more energy
In 2009 production of 10.75 billion gallons	In 2010 production of 13 billion gallons
78% of all gas sold is blended with ethanol	90% of all gas sold is blended with ethanol

Facts and Figures (cont'd)

2009	2010
There are more than 8 million FFV on the road	There are more than 8.5 million FFV's



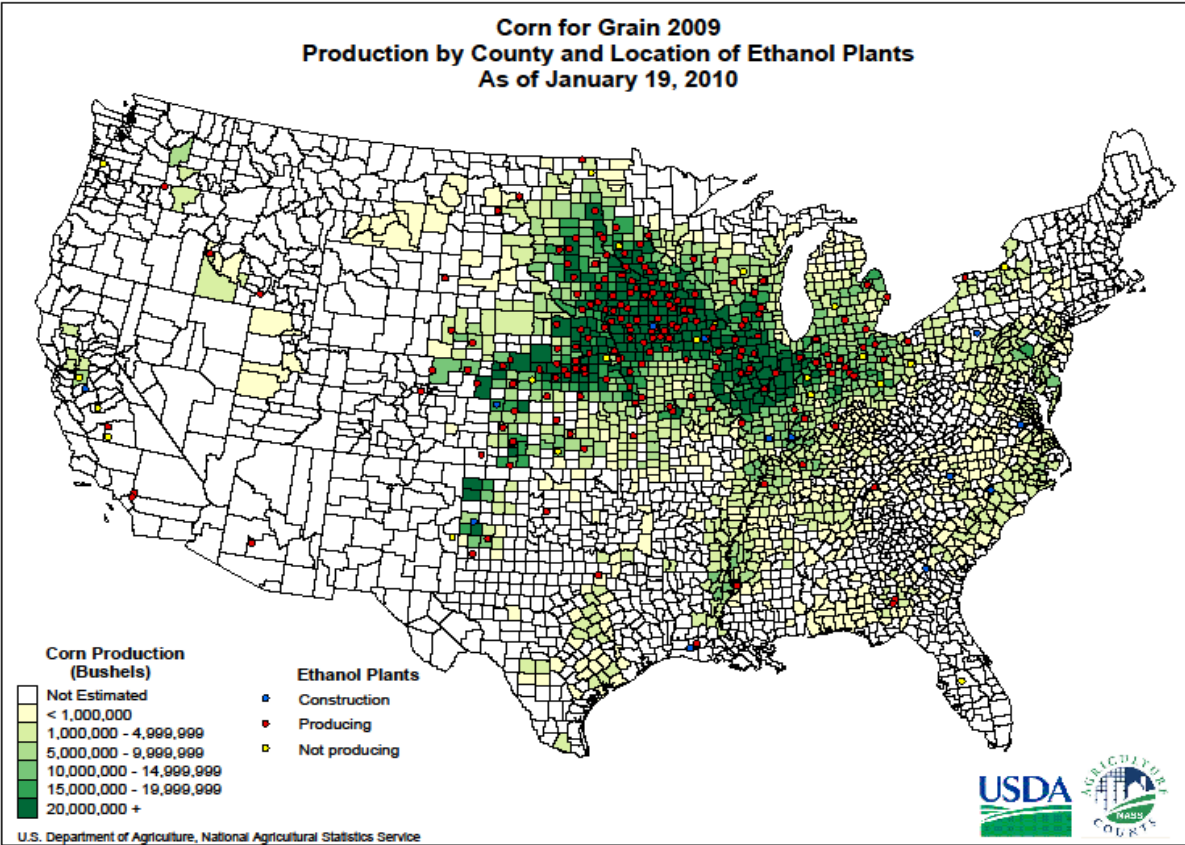
2009 U.S. ETHANOL PRODUCTION REQUIRED LESS THAN 1% OF GLOBAL CROPLAND (Million Acres)

- Global Arable Land and Permanent Crop Area (3,840 acres)
- Global Major Crop Area (2,145 acres)
- U.S. Major Crop Area (358 acres)
- U.S. Corn Area (86 acres)
- U.S. Corn Ethanol Area (Net Distillers Grains) (18 acres)

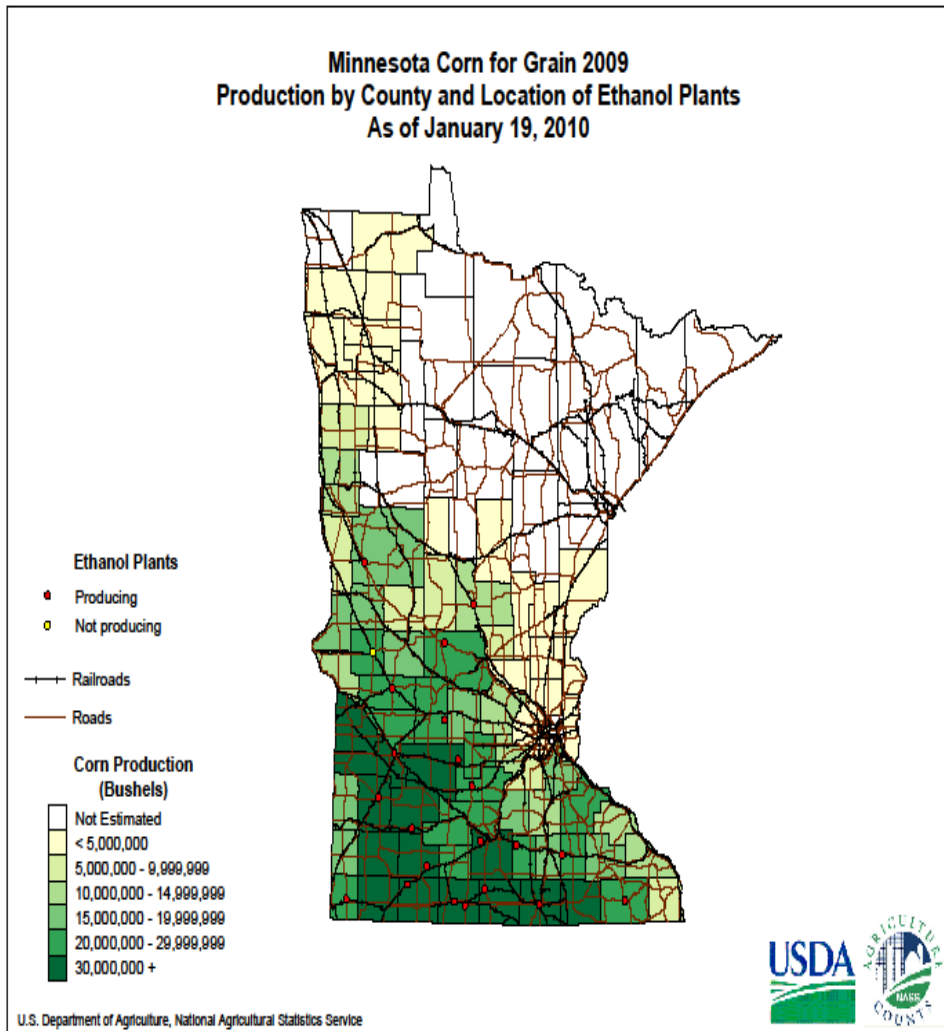
Sources: U.N. FAO, USDA



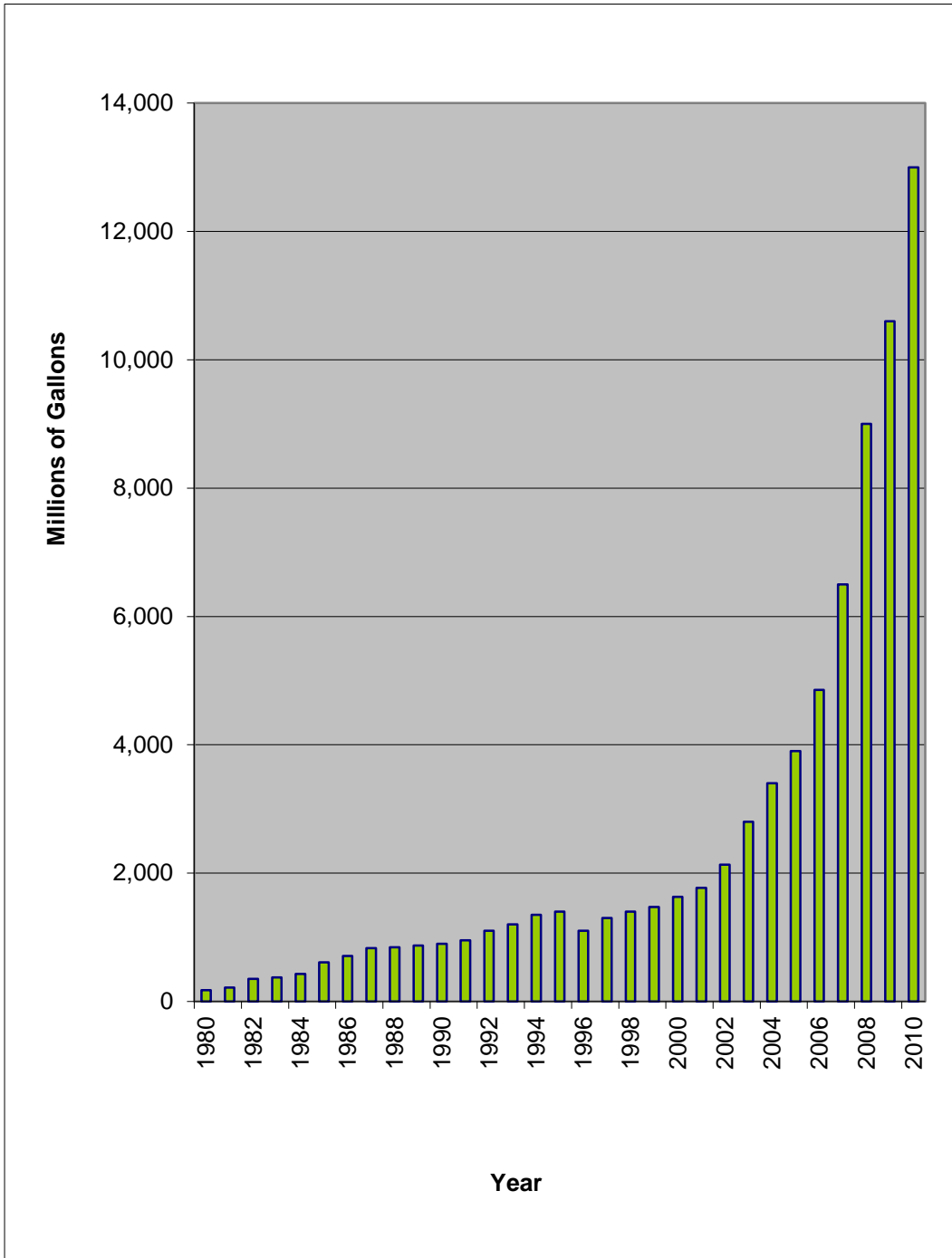
US Ethanol Plant Map



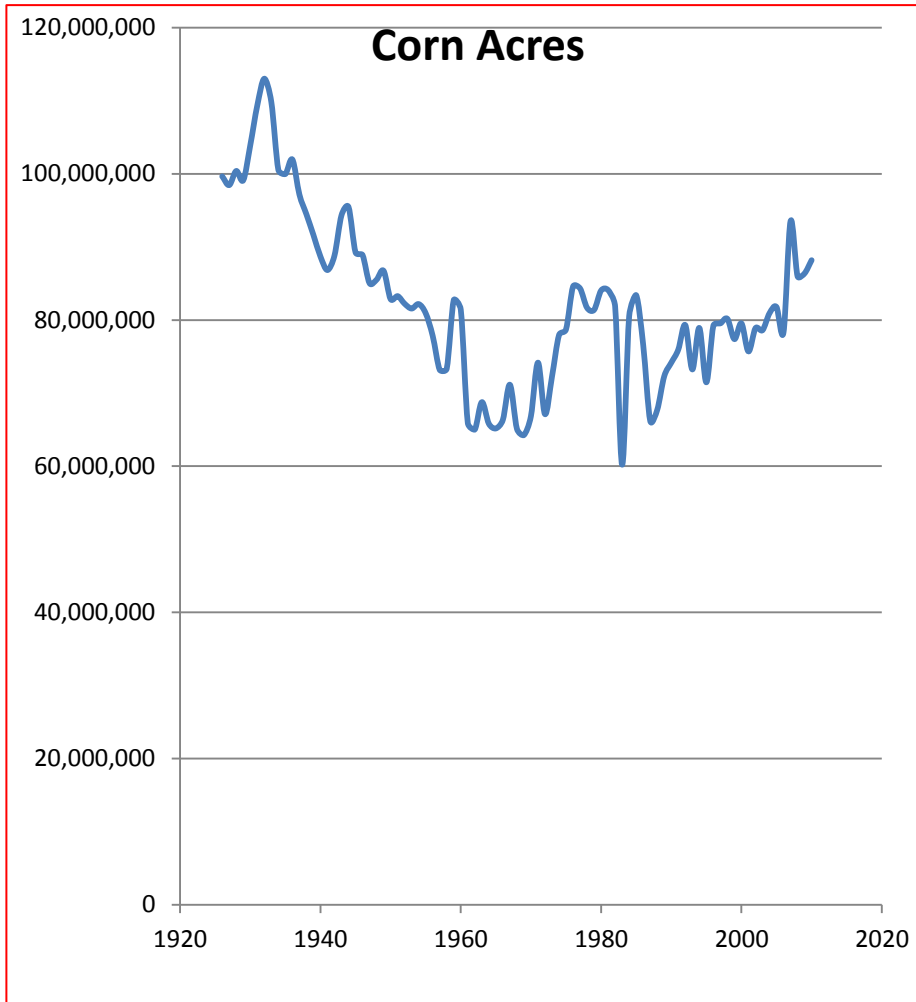
Ethanol Plant Locations in Minnesota



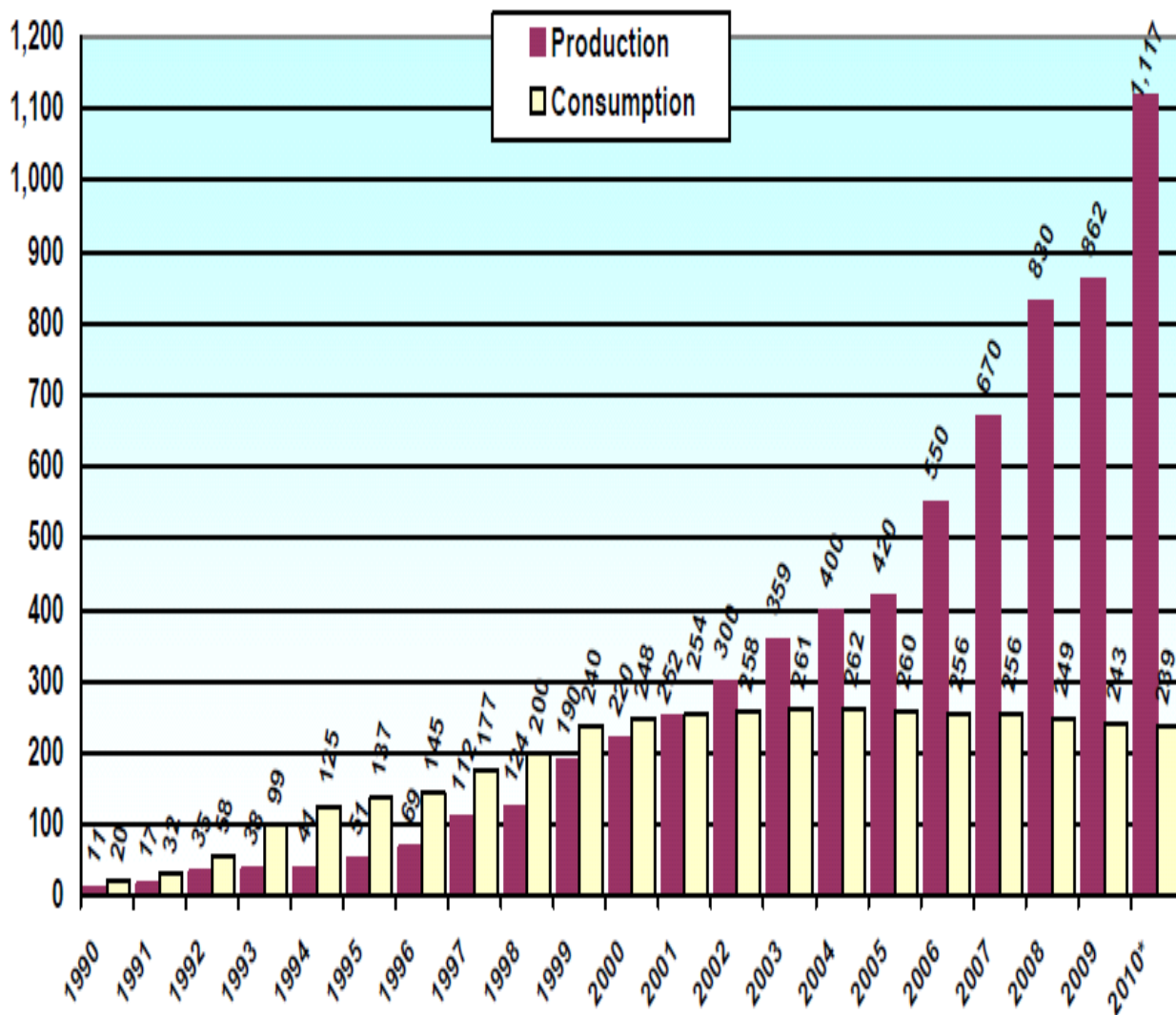
Ethanol Production in the U.S.



U.S. Corn Acres Planted



Minnesota Ethanol Production and Consumption (Million Gallons)



*Projected. Source: MDA, AMS

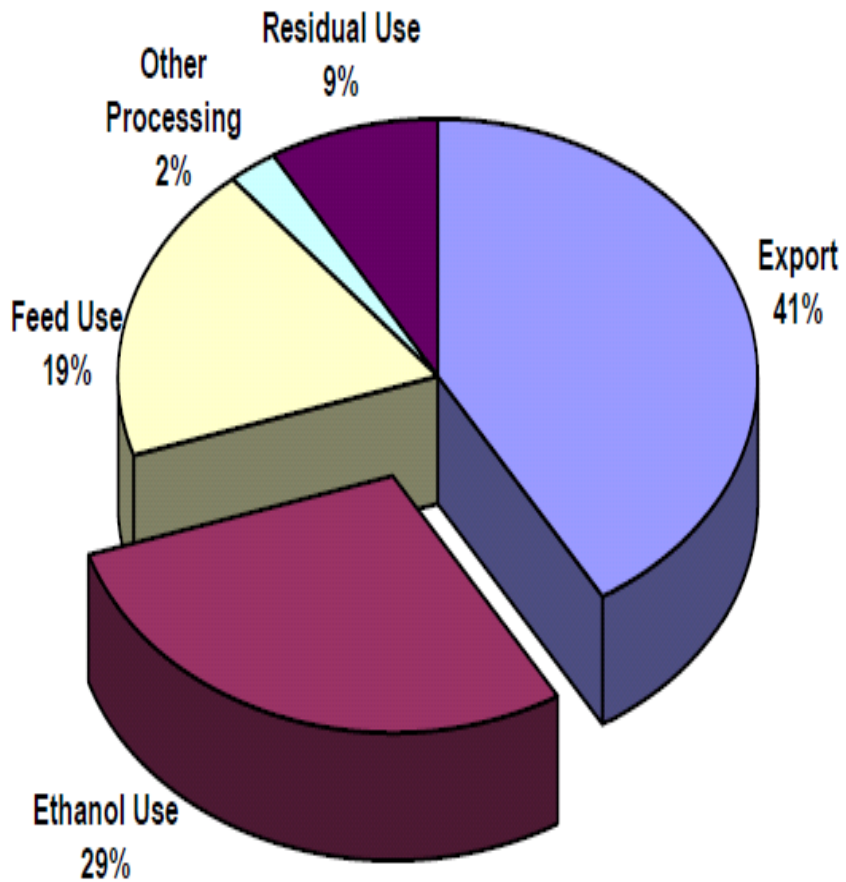
Minnesota Ethanol Production and Economic Impact

Year	Production (Million Gallons)	Output Impact (\$ million)	Employment Impact (# of Jobs)
2000	220	\$486.12	1,330
2001	252	\$600.32	1,642
2002	300	\$566.17	1,549
2003	359	\$807.73	2,209
2004	400	\$1,109.76	3,035
2005	420	\$1,175.73	3,214
2006	550	\$2,069.29	5,660
2007	670	\$2,217.84	6,066
2008	830	\$3,146.78	8,607
2009	862	\$2,506.11	6,854
2010*	1,117	\$3,069.53	8,395

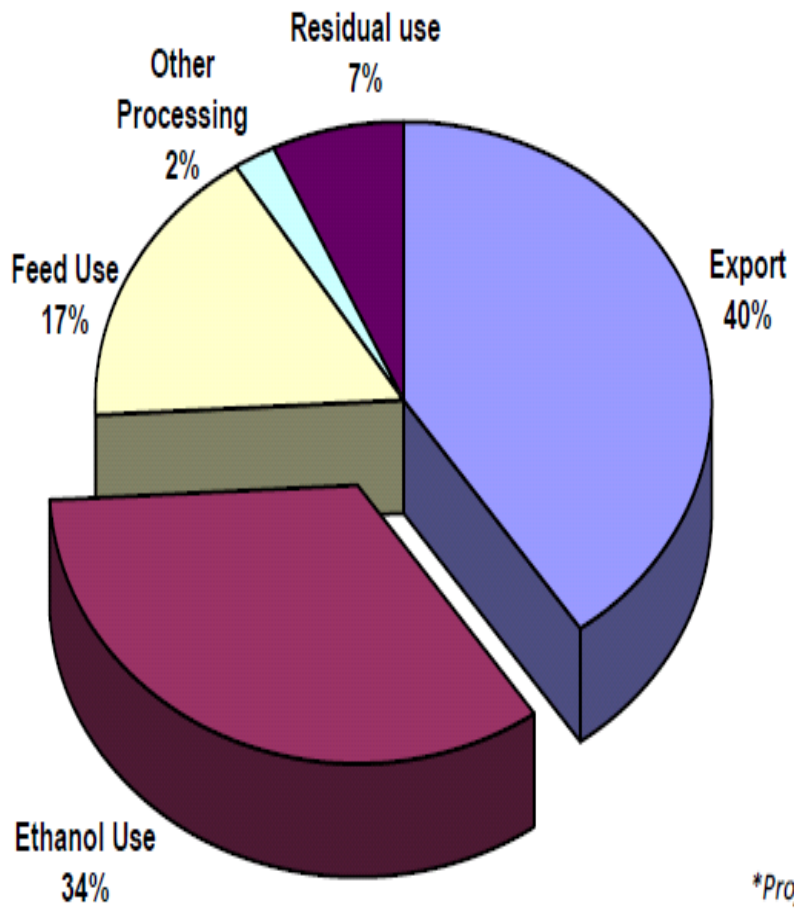
*Projected

Source: MDA, AMS

MN Corn Utilization (2009)



MN Corn Utilization (2010*)



Source: PRX and MDA

The Energy Policy Act of 2005

- - was responsible for regulations that ensured gasoline sold in the U.S. contained a minimum volume of renewable fuel, called the *Renewable Fuels Standard*. The regulations aimed to double , by 2012, the use of renewable fuel, mainly ethanol made from corn.

The Energy Independence and Security Act of 2007

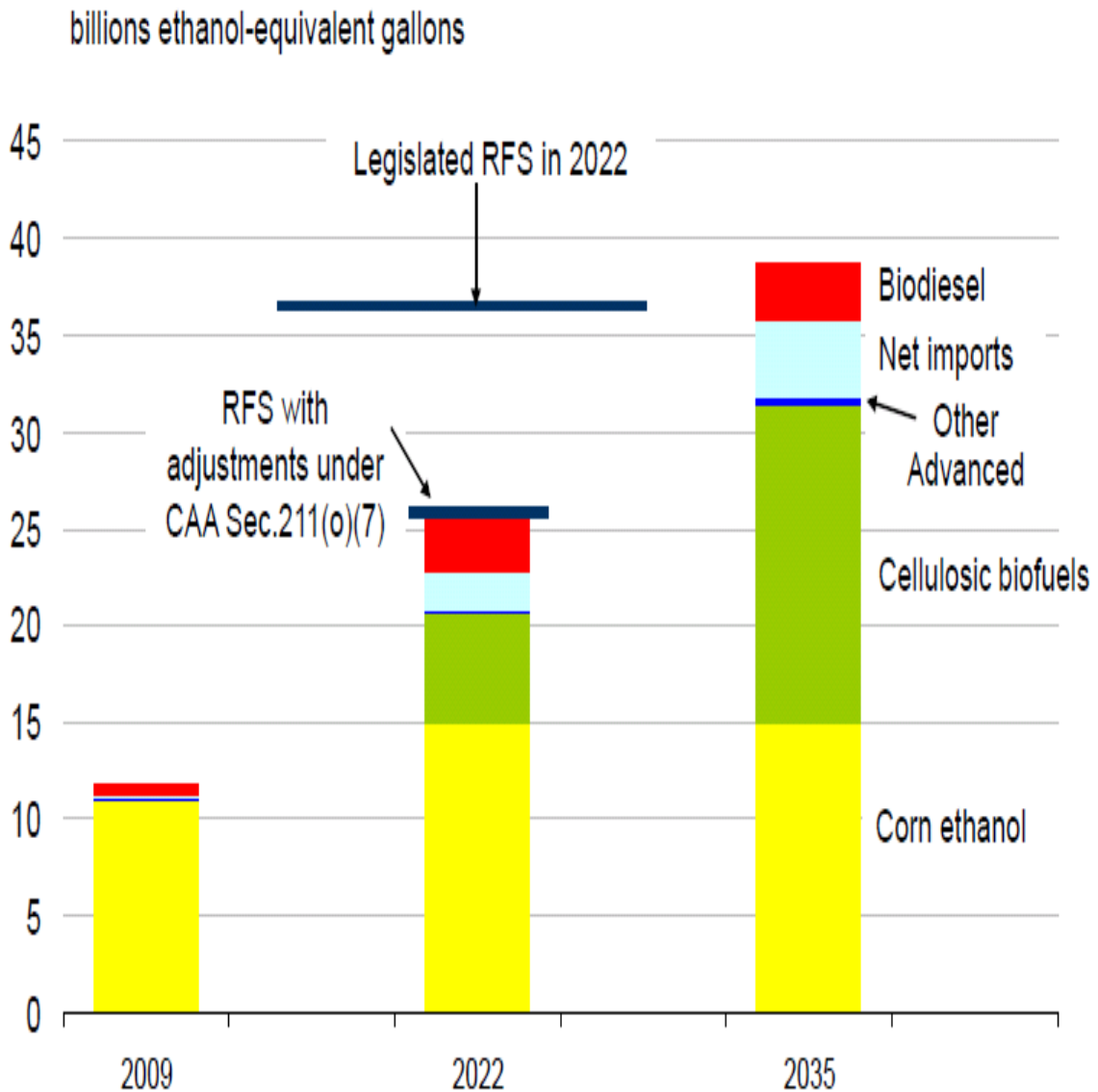
- - expanded the Renewable Fuels Standard to require that 36 billion gallons of ethanol and other fuels be blended into gasoline, diesel, and jet fuel by 2022.

Production of Ethanol at its Maximum

- 13 billion gallons maximum output at 10% blend
- Recently expanded to 15% blend, production will equal demand again in 4 years
- Lack of flex-fuel vehicles that use 85% ethanol blend (approx 8MM of the 240MM vehicles)
- Of the 170,000 gas stations, only about 2,300 have ethanol. The cost of retrofitting gas pump for ethanol is between \$22,000 and \$80,000.

- Corn production has steadily increased while using fewer acres
- Farmers grow 5 times as much corn as they did in the 1930' – on 20% less land. That's still 13 million acres, or 20,000 square miles, twice the size of Massachusetts.
- The yield per acre has increased from 24 bushels in 1931 to 154 now, a six-fold increase

Biofuels fall short of the goal in 2022, but exceed the 36 billion gallon RFS target by 2030



Richard Newell, December 16, 2010

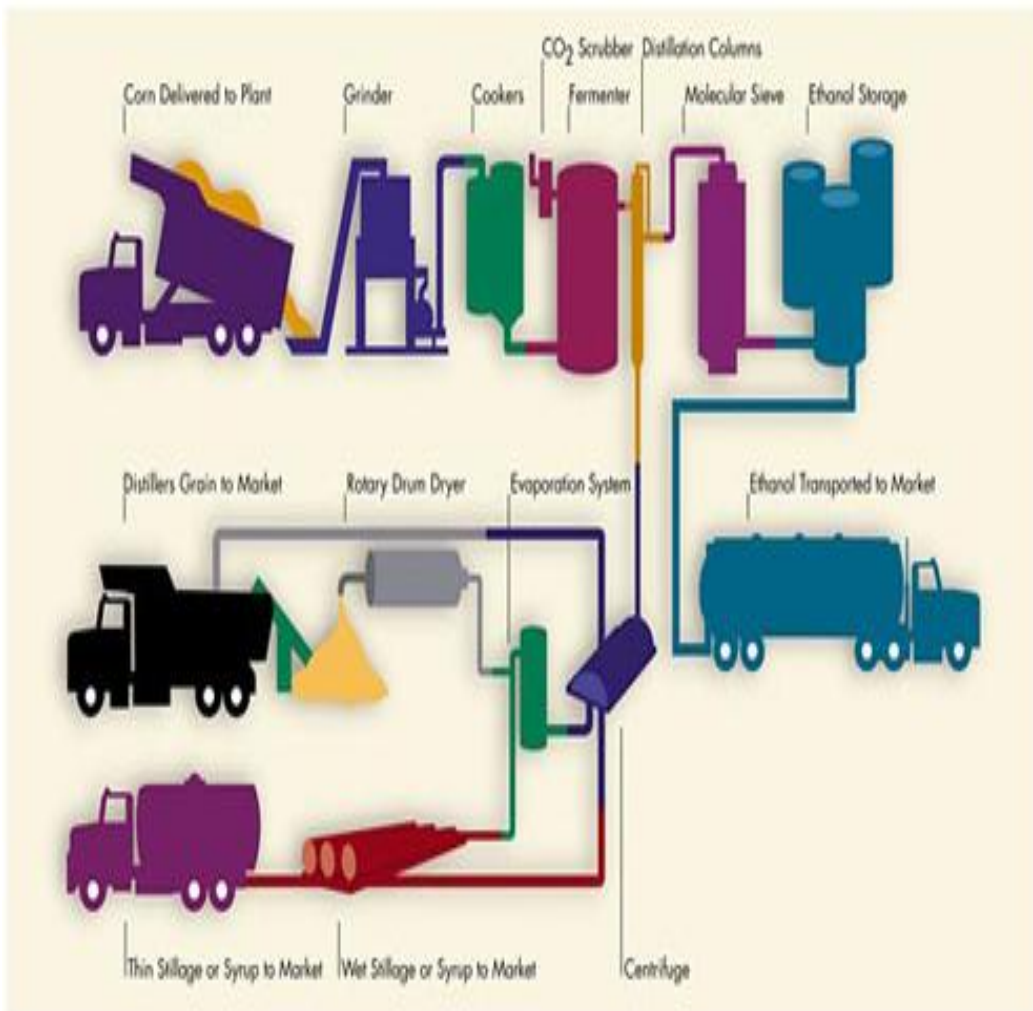
Source: EIA, *Annual Energy Outlook 2011* 33

Alternative Fuel Sources

- - biodiesel
- - electric
- -hydrogen
- -methanol
- -propane
- -bio-butanol
- -bio-gas
- -Fischer-Tropsch Diesel
- -Hydrogenation Derived Diesel
- -P Series Ultra Low Sulfur Diesel
- Technology to convert nat'l gas, coal, biomass to liquid

Ethanol Process

The Ethanol Production Process - Dry Milling



Ethanol Production Methods

Wet vs. Dry Milling

The principle difference between the two methods is the initial treatment of the grain and resulting co-products. The increased production of higher margin co-products in the wet-mill process results in lower ethanol yield, approximately 2.5 gallons of ethanol per bushel of corn whereas a typical dry mill yields 2.7 gallons per bushel of corn.

Co-Products of the Ethanol Process

- 1. Ethanol - 85%
- 2. Distillers Grains - 15%
- 3. Carbon Dioxide
- Distillers Grains are marketed at \$150/ton dry as compared to \$50/ton wet.

Cost Approach

55 MG/Yr

SE Minnesota
Construction has not started

Description	Amount	% of Total		
PROPOSED PLANT				
<i>Direct Costs</i>				
Ethanol Plant	83,400,000	63.41%		
Mat'l Escalation	4,170,000	3.17%		
CCI contingency	1,668,000	1.27%		
Construction Contingency	1,305,000	0.99%		
Construction Performance Bond	500,000	0.38%		
Administration Building	400,000	0.30%		
Fire protection and water supply	<u>5,300,000</u>	<u>4.03%</u>		
Subtotal	96,743,000	73.55%		
<i>Indirect Costs</i>				
Construction Insurance Cost	300,000	0.23%		
Construction Manager Fee	162,000	0.12%		
Organization costs	1,375,000	1.05%		
Pre-production period costs	800,000	0.61%		
Subtotal	2,637,000	2.00%		
SITE IMPROVEMENTS				
Site Development Cost	2,682,000	2.04%		
Natural Gas Pipeline	8,000,000	6.08%		
Electrical Svc Extension	1,163,000	0.88%		
Railroad	6,000,000	4.56%		
Construction/Paving of turning lane	0	0.00%		
Site Engineering Cost	0	0.00%		
Soil Stabilizatin (Pilings)	<u>0</u>	<u>0.00%</u>		
Subtotal	17,845,000	13.57%		
SITE VALUE				
Land Cost	175	12,571	2,200,000	1.67%
START UP COSTS				
Financing	700,000	0.53%		
Capitalized Interest	3,000,000	2.28%		
Debt Svc Reserve	0	0.00%		
Inventory-working capital	3,750,000	2.85%		
Inventory-corn	1,100,000	0.84%		
corn hedging costs	250,000	0.19%		
Rolling Stock	400,000	0.30%		
inventory-ethanol	1,250,000	0.95%		
inventory-chemicals & ingredients	400,000	0.30%		
Inventory-DDGS	500,000	0.38%		
Spare Parts-process equipment	500,000	0.38%		
Office Equipment	75,000	0.06%		
Computers, Software, network	<u>175,000</u>	<u>0.13%</u>		
Subtotal	12,100,000	9.20%		
Total		131,525,000	100%	
	Per Gallon	\$	2.39	

100 MG/Yr

**Lawler, Iowa - Actual Cost
Construction began November 2007**

Description	Amount	% of Total
ETHANOL PLANT - 2007		
<i>Direct Costs</i>		
Ethanol Plant	120,587,000	69.07%
Mat'l Escalation	0	0.00%
CCI contingency	0	0.00%
Construction Contingency	1,912,000	1.10%
Construction Performance Bond	0	0.00%
Administration Building	350,000	0.20%
Fire protection and water supply	<u>4,000,000</u>	<u>2.29%</u>
Subtotal	126,849,000	72.66%
<i>Indirect Costs</i>		
Construction Insurance Cost	225,000	0.13%
Construction Manager Fee	210,000	0.12%
Organization costs	1,400,000	0.80%
Pre-production period costs	<u>950,000</u>	<u>0.54%</u>
Subtotal	2,785,000	1.60%
SITE IMPROVEMENTS		
Site Development Cost	5,670,000	3.25%
Natural Gas Pipeline	3,800,000	2.18%
Electrical Svc Extension	1,300,000	0.74%
Rail Infrastructure	8,700,000	4.98%
Construction/Paving of turning lane	1,600,000	0.92%
Site Engineering Cost	900,000	0.52%
Soil Stabilizatin (Pilings)	<u>930,000</u>	<u>0.53%</u>
Subtotal	22,900,000	13.12%
SITE VALUE		
Land Cost	3,500,000	2.00%
START UP COSTS		
Financing	1600000	0.92%
Capitalized Interest	4000000	2.29%
Debt Svc Reserve	0	0.00%
Inventory-working capital	7,000,000	4.01%
Inventory-corn	2,000,000	1.15%
corn hedging costs	0	0.00%
Rolling Stock	445,000	0.25%
inventory-ethanol	1,500,000	0.86%
inventory-chemicals & ingredients	500,000	0.29%
Inventory-DDGS	500,000	0.29%
Spare Parts-process equipment	750,000	0.43%
Office Equipment	85,000	0.05%
Computers, Software, network	<u>175,000</u>	<u>0.10%</u>
Sub-Total	18,555,000	10.63%
Total	174,589,000	100%
Per Gallon	\$ 1.75	

	50 MG/Yr		
Lamberton, MN			
Construction began in 2008			

Description	Amount	% of Total
ETHANOL PLANT 2008		
<i>Direct Costs</i>		
Ethanol Plant	66,026,000	58.10%
Mat'l Escalation	0	0.00%
CCI contingency	3,741,000	3.29%
Construction Contingency	1,924,700	1.69%
Construction Performance Bond	350,000	0.31%
Administration Building	350,000	0.31%
Fire protection and water supply	<u>5,495,000</u>	<u>4.84%</u>
Subtotal	77,886,700	68.54%

<i>Indirect Costs</i>		
Construction Insurance Cost	164,000	0.14%
Construction Manager Fee	100,000	0.09%
Organization costs	1,414,500	1.24%
Pre-production period costs	<u>750,000</u>	<u>0.66%</u>
Subtotal	2,428,500	2.14%

SITE IMPROVEMENTS		
Site Development Cost	14,850,000	13.07%
Natural Gas Pipeline	0	0.00%
Electrical Svc Extension	0	0.00%
Rail Infrastructure	4,900,000	4.31%
Construction/Paving of turning lane	0	0.00%
Site Engineering Cost	0	0.00%
Soil Stabilizatin (Pilings)	0	0.00%
Subtotal	19,750,000	17.38%

SITE VALUE				
Land Cost	125	7,118	889,800	0.78%

START UP COSTS		
Financing	1,589,000	1.40%
Capitalized Interest	2,578,000	2.27%
Debt Svc Reserve	1,888,000	1.66%
Inventory-working capital	2,000,000	1.76%
Inventory-corn	1,100,000	0.97%
corn hedging costs	0	0.00%
Rolling Stock	400,000	0.35%
inventory-ethanol	1,500,000	1.32%
inventory-chemicals & ingredients	400,000	0.35%
Inventory-DDGS	500,000	0.44%
Spare Parts-process equipment	500,000	0.44%
Office Equipment	80,000	0.07%
Computers, Software, network	<u>150,000</u>	<u>0.13%</u>
Sub-Total	12,685,000	11.16%

Total		113,640,000	100%
	Per Gallon	\$ 2.27	

55 MG/Yr		
SE Minnesota		
Construction has not started		

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Inventory-working capital	3,750,000	2.85%
Inventory-corn	1,100,000	0.84%
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inventory-chemicals & ingredients	400,000	0.30%
Inventory-DDGS	500,000	0.38%
Spare Parts-process equipment	500,000	0.38%
Office Equipment	75,000	0.06%
Computers, Software, network	<u>175,000</u>	<u>0.13%</u>
Subtotal	12,100,000	9.20%

Total		131,525,000	100%
	Per Gallon	\$ 2.39	

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Construction Manager Fee	210,000	0.12%
Organization costs	1,400,000	0.80%
Pre-production period costs	<u>950,000</u>	<u>0.54%</u>
Subtotal	2,785,000	1.60%

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Natural Gas Pipeline	3,800,000	2.18%
Electrical Svc Extension	1,300,000	0.74%
Rail Infrastructure	8,700,000	4.98%
Construction/Paving of turning lane	1,600,000	0.92%
Site Engineering Cost	900,000	0.52%
Soil Stabilizatin (Pilings)	<u>930,000</u>	<u>0.53%</u>
Subtotal	22,900,000	13.12%

SITE VALUE			
Land Cost		3,500,000	2.00%

START UP COSTS		
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Debt Svc Reserve	0	0.00%
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	Per Gallon	\$ 1.75	

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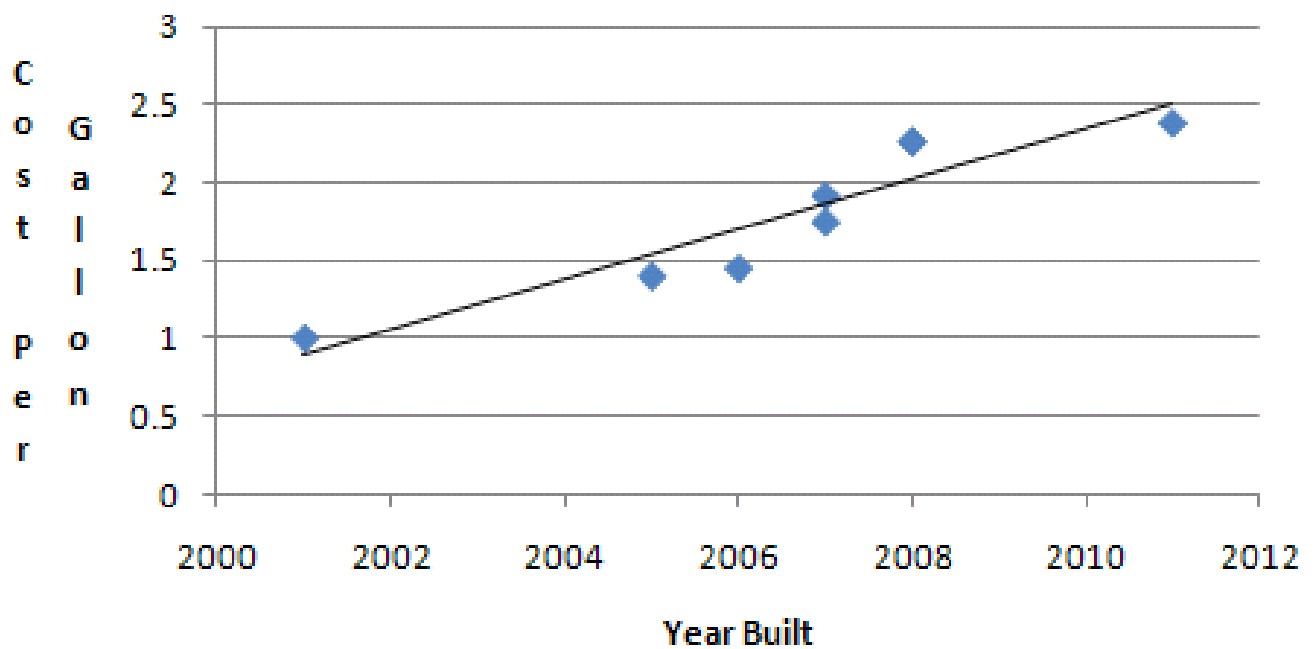
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	Per Gallon	\$ 2.27	

Plant Cost Per Gallon



50 MGY Ethanol Production Facility

Asset Category Summary

DESCRIPTION	DEPRECIABLE COST BASIS
DESIGN / BUILD CONTRACT	
SITWORK	\$ 430,395.43
CONCRETE	6,267,641.27
MASONRY/ARCHITECTURE	466,261.72
STRUCTURAL STEEL / MISCELLANEOUS METALS	4,642,152.07
TOWER WALKWAY	379,127.95
PRE-ENGINEERED BUILDINGS	427,060.48
DDG STORAGE FACILITY	538,878.85
MAINTENANCE OFFICE	110,049.24
GRAIN HANDLING SYSTEM	
Concrete Storage	2,310,000.00
Mechanical	9,525,874.32
MCCORMICK EARTHWORK FOR GRAIN SILOS	614,597.50
PROCESS TANKS AND VESSELS	4,984,986.53
DENATURANT TANKS	1,226,318.81
TANKS - FIELD CONTAINMENT LINERS	323,199.09
AMYLAZE TANKS	208,357.30
FIELD ERECTED TANKS	
Denatured Ethanol Tanks	1,335,000.00
Beerwell vessel	826,650.00
Fermentation vessel	2,598,800.00
Piping and mechanical	1,695,481.45

HEAT EXCHANGERS	1,793,314.29
PROCESS EQUIPMENT	201,420.83
LOUVERS, FANS	106,424.82
PUMPS	1,759,821.64
DISTILLATION INTERNALS	419,104.01
ACID CURTAIN/TRAC	2,372.84
VACCUUM PUMP	61,433.91
BASKETS	23,752.09
ETHANOL VAPOR SERVICE	17,149.09
RO SYSTEM	39,379.06
AGITATORS	655,728.96
SULPHURIC PUMPS	15,281.91
SCRUBBER UNITS	54,797.23
DEAERATOR	10,581.99
PUMPS	93,639.70
CENTRIFUGES	2,151,977.15
CHILLER	358,662.86
TRUCK SCALES & PROBE	272,583.77
ETHANOL LOADOUT	358,662.86
COOLING TOWER	624,073.37
DUAL DRYER SYSTEM	4,979,502.97
THERMAL OXIDIZER	4,562,191.56
METHANATOR	746,018.75
PROCESS PIPING AND VALVES	3,732,852.20
GASKETS	11,820.51
ADAPTERS/COUPLERS	3,529.97
PIPE CLAMPS	49,656.87
FLANGES	10,059.66
PROCESS PUMPS	28,426.33
PIPE & VALVES	2,619,585.90

PAINTING	717,325.72
INSULATION	1,405,958.40
PLUMBING & HVAC	94,987.61
FILTRATION	26,448.75
VENTS, TUBING, FILTERS	33,508.87
HEATING/AIR	454,781.64
ELECTRICAL & INSTRUMENTATION	1,734,181.33
LABORATORY EQUIPMENT	101,287.07
MECHANICAL INSTRUMENT	95,145.38
WIRE	974,837.07
HYDROSTATIC SCREEN	72,287.78
CALIBRATED VALVE	13,749.61
BLOWERS	7,986.36
MECHANICAL INSTRUMENT	15,434.70
YEAST TANK AERATER	5,266.18
ANGLE IRON	2,895.38
METERING PUMPS	4,504.81
DCS SYSTEM	434,099.81
WIRE/CABLE	488,007.13
LEVEL GAUGES	17,839.62
MECHANICAL INSTRUMENT	22,610.91
INSTRUMENTS	46,858.61
SULFURIC ACID EDUCTOR	6,938.98
SPEED SWITCHES	33,872.32
ELECTRICAL MATERIAL	1,171,353.14
ELECTRICAL MATERIAL	265,835.36
FLASHDEK MATERIAL	7,064.31
GAUGES, THERMOMETERS	106,403.23
MECHANICAL INSTRUMENT	111,741.84

FLOW METERS	9,980.93
BEARINGS	5,011.24
LEG MONITORING EQUIPMENT	7,933.62
ELECTRICAL MATERIAL	118,944.15
MOLECULAR SIEVE	287,647.61
BILLABLE REPLACEMENT WIRE	73,864.19

73,651,232.77

ADMINISTRATIVE BUILDING - LAMBERTON CONSTRUCTION

	DEPRECIABLE
<u>DESCRIPTION</u>	<u>COST BASIS</u>
	\$ 296,036.52

WATER TREATMENT CLS BUILDING - RICE LAKE

	DEPRECIABLE
<u>DESCRIPTION</u>	<u>COST BASIS</u>
EXCAVATION, UTILITIES, AND RESTORATION	\$ -
PIPING	2,384,721.03
EARTHWORK AND RESTORATION	350,175.96
REINFORCING STEEL, CONCRETE WORK, PRECAST	2,119,587.81
MASONRY	52,299.01
STRUCTURAL & MISC. METAL	257,629.46
RO ADDITION	371,537.48
ROUGH & FINISH CARPENTRY	2,273.87
EPDM ROOFING, INSULATION, CAULKING	145,641.37
H.M. DOORS, OVERHEAD DOORS	21,994.01
INTERIOR FINISHES, PAINTING	287,644.54

PROCESS EQUIPMENT

FIRE/STORAGE TANK	426,032.26
VESSCO EQUIPMENT	3,260,046.11
SIEMENS EQUIPMENT	1,942,462.44
PUMPS	101,759.09
SLUDGE STORAGE MIXER	68,843.68
ADDITIONAL MISC EQUIPMENT AND PIPING	217,042.02
INSTALLATION	373,985.65

MECHANICAL 1,575,791.83

ELECTRICAL AND CONTROLS 1,307,537.71

WATER BOOSTER SYSTEM 16,521.32

WELL HOUSE CONSTRUCTION Offsite 44,419.75

LIFT STATION & FORCEMAN PIPING 116,530.10

C02 LINE 30,482.76

PIPE ON RACK TO ETHANOL FACILITY 105,798.94

15,580,758.19

SITWORK

DEPRECIABLE

DESCRIPTION

COST BASIS

1,569,756.19

SITE FENCING

DESCRIPTION	DEPRECIABLE COST BASIS
FURNISH AND INSTALL CHAIN LINK FENCE	\$ 81,169.44

LAND IMPROVEMENTS SURFACING OF ROADS

DESCRIPTION	DEPRECIABLE COST BASIS
BUILD AND PAVE ROADS	\$ 855,327.03

MAINTENANCE EQUIPMENT

DESCRIPTION	DEPRECIABLE COST BASIS
PLANT TOOLS AND EQUIPMENT	\$ 78,973.18

LAND IMPROVEMENTS

DEPRECIABLE

DESCRIPTION	COST BASIS
SURVEYING, CULVERT STAKING, DIRT WORK	\$ 49,681.25
FIBER OPTIC CABLE AND TELEPHONE EQUIPMENT	24,573.84
SAND, GRAVEL & FILL MATERIALS	124,977.80
PE PIPING TO ELECTRICAL SOURCE	91,180.38
PUMPS, METERS, AND VALVES	114,712.55
POTABLE WATER SANITARY SEWER	105,024.17
	510,149.98

RAIL SPUR CONSTRUCTION

DEPRECIABLE

DESCRIPTION	COST BASIS
	7,034,023.07

FIRE PROTECTION LOOP

DEPRECIABLE

DESCRIPTION	COST BASIS
	673,635.99

WELLS OR WATER SYSTEM

	DEPRECIABLE
DESCRIPTION	COST BASIS
	1,477,947.18

OTHER MISCELLANEOUS PLANT EQUIPMENT (Misc Process Equipment, Pumps, Lab Equipment & Air Stack Monitor)

	DEPRECIABLE
DESCRIPTION	COST BASIS
	370,268.30

LAND / NON-DEPRECIABLE

	DEPRECIABLE
DESCRIPTION	COST BASIS
LAND	\$ 1,120,279.16

Vehicles **\$ 41,994.00**

Other Equipment (Motorized) **\$ 1,077,595.90**

Additions (non real) **\$ 709,038.09**

CIP (non real) **\$ 14,644.00**

\$105,142,828.98

What's Taxable Real Property
and what is non-taxable
machinery and equipment?

2010 Minnesota Statutes

272.03 DEFINITIONS.

Subdivision 1. **Real property.** (a) For the purposes of taxation, "real property" includes the land itself, rails, ties, and other track materials annexed to the land, and all buildings, structures, and improvements or other fixtures on it, bridges of bridge companies, and all rights and privileges belonging or appertaining to the land, and all mines, iron ore and taconite minerals not otherwise exempt, quarries, fossils, and trees on or under it.

(b) A building or structure shall include the building or structure itself, together with all improvements or fixtures annexed to the building or structure, which are integrated with and of permanent benefit to the building or structure, regardless of the present use of the building, and which cannot be removed without substantial damage to itself or to the building or structure.

Properties Subject to Taxation

Personal Property can be defined by exception: anything that is not real property is personal property. The main characteristic of personal property is that it is moveable. If it is moveable without causing damage to itself or the real estate, it is considered to be personal property. For example, hot tubs located on a slab outside of a house or small metal sheds that are easily dismantled and moved are considered personal property.

Not Taxable

(c)(i) Real property does not include tools, implements, machinery, and equipment attached to or installed in real property for use in the business or production activity conducted thereon, regardless of size, weight or method of attachment, and mine shafts, tunnels, and other underground openings used to extract ores and minerals taxed under chapter 298 together with steel, concrete, and other materials used to support such openings.

Real Estate is Taxable

- The Property Tax Administrators Manual defines Real Estate as:

Real Estate includes the land and any appurtenances (e.g. structures) attached to the land.

It is

immobile and tangible. It includes all things that are a natural part of the land such as trees, minerals, etc. as well as things that are attached to it by people such as buildings and site improvements.

(ii) The exclusion provided in clause (i) shall not apply to machinery and equipment includable as real estate by paragraphs (a) and (b) even though such machinery and equipment is used in the business or production activity conducted on the real property if and to the extent such business or production activity consists of furnishing services or products to other buildings or structures which are subject to taxation under this chapter.

Taxable - (ii) The exclusion provided in clause (i) does not apply to the exterior shell of a structure which constitutes walls, ceilings, roofs, or floors if the shell of the structure has structural, insulation, or temperature control functions or provides protection from the elements. Such an exterior shell is included in the definition of real property even if it also has special functions distinct from that of a building.

Taxable vs. Non-Taxable

- In *Busch v. County of Hennepin*, 380 NW 2d 813,816 (Minn. 1986) (“Busch”), the Minnesota Supreme Court held that personal and real property should be distinguished by applying the “Shelter” test...

Cont'd

- ..in *Barton Enter., Inc. v. County of Ramsey*, 390 N.W. 2d 776 (Minn 1986) the Minnesota Supreme Court held that...”the tanks themselves were taxable real property because they provided shelter to their contents and protected their contents from contaminants and from the elements.

What is the Shelter Test?

- 3-step process whereby:
- 1. If the property falls within the broad definition of real property, (step 2)
- 2. Is tools, implements, machinery and equipment
- Step 3: If a structure has walls, ceilings, roofs or floors, *and* provides building like functionality, i.e., structural, insulation, or temperature control functions; or provides protections from the elements, that exterior structure is taxable.

Ethanol Facility, Anywhere, MN





Reverse Osmosis lined Pond



400,000 gallon water tank. – Tiltup water treatment building to the right of the water tank.



Water Clarifier – Part of water treatment facility that recycles water for use in the ethanol process



Water Press located I the Water Treatment Building



Sludge Tank



Water Treatment Piping in Water Treatment Building



Dryer.



Cooling Tower



Energy Center Building



Boiler System – Thermal Oxidizer located in the Energy Center.



Process Building



Chemical Storage Tanks located in the Process. These tanks are within the building.



Personal Property – Evaporators located in the Process Building



Chiller located in the Process Building. Note fermentation tank in the background.



Fermentation Vessel. This is one of 4 fermentation tanks that are used in the process. Liquid only remains in this tank for 55 hours.



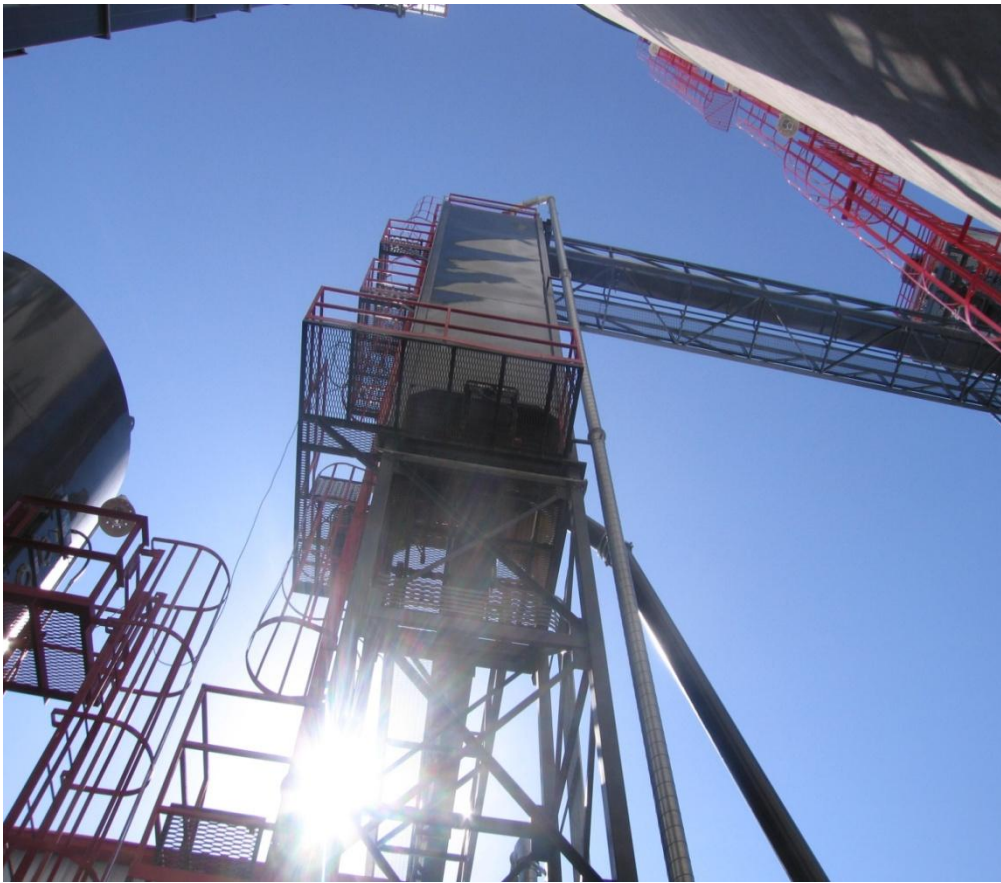
Fermentation Tanks and Beer Well.



Methanators and Thermal Oxidizer Stack



Centrifuge



Distiller



Poured concrete Silos (2+)



Hammer Mill



Hoppers/conveyor below Hammer Mill



1st Floor Electric Control Panel below conveyor system



Dust Collector



Grain Receiving Bldg w/rail spur



Rail Spur



Receiving Building – Corn in, Distillers Grains - Out




Tank Farm- #1-Denaturant Process Tank; #2- 200 Proof Tank ; #3- 190 Proof Tank; #4&5 Finished Ethanol Tanks in the background. The conveyor system is in the foreground.



Administration Building

50 MGY Ethanol Production Facility

Reconstructed Cost

DESCRIPTION	DEPRECIABLE COST BASIS
PLANT REPRODUCTION COST	
 CONCRETE	6,267,641.27
MASONRY/ARCHITECTURE	466,261.72
STRUCTURAL STEEL / MISCELLANEOUS METALS	4,642,152.07
TOWER WALKWAY	379,127.95
PRE-ENGINEERED BUILDINGS	427,060.48
DDG STORAGE FACILITY	538,878.85
MAINTENANCE OFFICE	110,049.24
GRAIN HANDLING SYSTEM	
Concrete Storage	2,310,000.00
Mechanical	9,525,874.32

MCCORMICK EARTHWORK FOR GRAIN SILOS	614,597.50
HEAT EXCHANGERS	1,793,314.29
PROCESS EQUIPMENT	201,420.83
LOUVERS, FANS	106,424.82
PUMPS	1,759,821.64
DISTILLATION INTERNALS	419,104.01
ACID CURTAIN/TRAC	2,372.84
VACCUUM PUMP	61,433.91
BASKETS	23,752.09
ETHANOL VAPOR SERVICE	17,149.09
RO SYSTEM	39,379.06
AGITATORS	655,728.96
SULPHURIC PUMPS	15,281.91
SCRUBBER UNITS	54,797.23
DEAERATOR	10,581.99
PUMPS	93,639.70

CENTRIFUGES	2,151,977.15
CHILLER	358,662.86
COOLING TOWER	624,073.37
DUAL DRYER SYSTEM	4,979,502.97
THERMAL OXIDIZER	4,562,191.56
METHANATOR	746,018.75
PROCESS PIPING AND VALVES	3,732,852.20
GASKETS	11,820.51
ADAPTERS/COUPLERS	3,529.97
PIPE CLAMPS	49,656.87
FLANGES	10,059.66
PROCESS PUMPS	28,426.33
PIPE & VALVES	2,619,585.90
PAINTING	717,325.72
INSULATION	1,405,958.40
PLUMBING & HVAC	94,987.61

FILTRATION	26,448.75
VENTS, TUBING, FILTERS	33,508.87
HEATING/AIR	454,781.64
ELECTRICAL & INSTRUMENTATION	1,734,181.33
LABORATORY EQUIPMENT	101,287.07
MECHANICAL INSTRUMENT	95,145.38
WIRE	974,837.07
HYDROSTATIC SCREEN	72,287.78
CALIBRATED VALVE	13,749.61
BLOWERS	7,986.36
MECHANICAL INSTRUMENT	15,434.70
YEAST TANK AERATER	5,266.18
ANGLE IRON	2,895.38
METERING PUMPS	4,504.81
DCS SYSTEM	434,099.81
WIRE/CABLE	488,007.13
LEVEL GAUGES	17,839.62
MECHANICAL INSTRUMENT	22,610.91
INSTRUMENTS	46,858.61
SULFURIC ACID EDUCTOR	6,938.98

ELECTRICAL MATERIAL	1,171,353.14
ELECTRICAL MATERIAL	265,835.36
FLASHDEK MATERIAL	7,064.31
GAUGES, THERMOMETERS	106,403.23
MECHANICAL INSTRUMENT	111,741.84
FLOW METERS	9,980.93
BEARINGS	5,011.24
LEG MONITORING EQUIPMENT	7,933.62
ELECTRICAL MATERIAL	118,944.15
MOLECULAR SIEVE	287,647.61
BILLABLE REPLACEMENT WIRE	<u>73,864.19</u>
SUB-TOTAL	\$ 59,390,797.52

WATER TREATMENT CLS BUILDING

DESCRIPTION

EXCAVATION, UTILITIES, AND RESTORATION	\$ -
PIPING	2,384,721.03
REINFORCING STEEL, CONCRETE WORK, PRECAST	2,119,587.81
MASONRY	52,299.01

STRUCTURAL & MISC. METAL	257,629.46
RO ADDITION	371,537.48
ROUGH & FINISH CARPENTRY	2,273.87
EPDM ROOFING, INSULATION, CAULKING	145,641.37
H.M. DOORS, OVERHEAD DOORS	21,994.01
INTERIOR FINISHES, PAINTING	287,644.54
PROCESS EQUIPMENT	-
VESSCO EQUIPMENT	3,260,046.11
SIEMENS EQUIPMENT	1,942,462.44
PUMPS	101,759.09
SLUDGE STORAGE MIXER	68,843.68
ADDITIONAL MISC EQUIPMENT AND PIPING	217,042.02
INSTALLATION	373,985.65
MECHANICAL	1,575,791.83
ELECTRICAL AND CONTROLS	1,307,537.71
WATER BOOSTER SYSTEM	16,521.32
WELL HOUSE CONSTRUCTION Offsite	44,419.75
LIFT STATION & FORCEMAN PIPING	116,530.10
C02 LINE	30,482.76
PIPE ON RACK TO ETHANOL FACILITY	105,798.94
SUB-TOTAL	\$ 14,804,549.97

ADMINISTRATIVE BUILDING \$ 296,036.52

SUB-TOTAL BUILDINGS/PLANT \$ 74,491,384.00

TANKS-STORAGE

DESCRIPTION

PROCESS TANKS AND VESSELS 4,984,986.53

DENATURANT TANKS 1,226,318.81

TANKS - FIELD CONTAINMENT LINERS 323,199.09

AMYLAZE TANKS 208,357.30

FIELD ERECTED TANKS

Denatured Ethanol Tanks 1,335,000.00

Beerwell vessel 826,650.00

Fermentation vessel 2,598,800.00

Piping and mechanical 1,695,481.45

Water Storage Tank 426,032.26

SUB-TOTAL TANKS 13,624,825.45

SITE IMPROVEMENTS

DESCRIPTION

DESCRIPTION - SITEWORK	\$ 1,569,756.19
SITEWORK	\$ 430,395.43
EARTHWORK AND RESTORATION-Water Plant	350,175.96
SURVEYING, CULVERT STAKING, DIRT WORK	\$ 49,681.25
SAND, GRAVEL & FILL MATERIALS	124,977.80
RAIL SPUR CONSTRUCTION	\$ 7,034,023.07
FIRE PROTECTION LOOP	\$ 673,635.99
FIBER OPTIC CABLE AND TELEPHONE EQUIPMENT	24,573.84
FURNISH AND INSTALL CHAIN LINK FENCE	\$ 81,169.44
BUILD AND PAVE ROADS	\$ 855,327.03
PE PIPING TO ELECTRICAL SOURCE	91,180.38
PUMPS, METERS, AND VALVES	114,712.55
WELLS OR WATER SYSTEM	\$ 1,477,947.18
POTABLE WATER SANITARY SEWER	<u>105,024.17</u>
	<u>12,982,580.28</u>

Misc Equip/Pumps/Start-up Costs	DEPRECIABLE
DESCRIPTION	COST BASIS
TRUCK SCALES & PROBE	272,583.77
ETHANOL LOADOUT	358,662.86
PLANT TOOLS AND EQUIPMENT(Maint.)	78,973.18
Misc Equip/Pumps/Lab Equip/Air Stack Monitor	\$ 370,268.30
Vehicles	\$ 41,994.00
Other Equipment (Motorized)	\$ 1,077,595.90
Additions (non real)	\$ 709,038.09
CIP (non real)	\$ 14,644.00
Start-up Costs / Inventory	\$ <u>7,857,171.02</u>
SUB-TOTAL	\$ 10,780,931.12
LAND / NON-DEPRECIABLE	\$ 1,120,279.16
TOTAL COST INCLUDING START-UP/INVENTORY	\$ 113,000,000.00
LESS MISC/START-UP/INVENTORY COSTS	\$ <u>10,780,931.12</u>
EQUALS COST LESS START-UP/INVENTORY	\$ 102,219,068.89

COST SUMMARY			
MN Ethanol Plant Going Green Drive Anywhere, MN	County:		
	Property Type:	Ethanol Plant	
	Building Type:	Heavy Ind	
	Building Quality:	Average	Value/Gallon
	Production MMG/Yr	50	0.33
	Year Built	2008	
BUILDING IMPROVEMENTS			
Total Replacement Cost New of Building Improvements			74,491,384
DEPRECIATION			
Year of Construction		2008	
Actual Age		3	
Effective Age		3	
Economic Life Expectancy		40	
Remaining Economic Life		37	
Physical Depreciation		7.5%	
Functional Obsolescence		0%	
Economic Obsolescence		45%	
Total Accrued Depreciation (%)		52.5%	
Less: Depreciation		\$39,107,977	
DEPRECIATED VALUE			\$35,383,407
STORAGE TANKS			
Total Replacement Cost New Tanks			13,624,825
DEPRECIATION			
Year of Construction		2008	
Actual Age		3	
Effective Age		3	
Economic Life Expectancy		30	
Remaining Economic Life		27	
Physical Depreciation		10.0%	
Functional Obsolescence		0%	
Economic Obsolescence		45%	
Total Accrued Depreciation (%)		55.0%	
Less: Depreciation		\$7,493,654	
DEPRECIATED VALUE			\$6,131,171
SITE IMPROVEMENTS			
Total Replacement Cost New of Site Improvements			12,982,580
DEPRECIATION			
Effective Age		3	
Economic Life Expectancy		20	
Remaining Economic Life		17	
Physical Depreciation		15%	
Functional Obsolescence		0%	
Economic Obsolescence		45%	
Total Accrued Depreciation (%)		60.0%	
Less: Depreciation		\$7,789,548	
DEPRECIATED VALUE SITE IMPROVEMENTS			\$5,193,032
TOTAL PROJECT COST			101,098,790
TOTAL ACCRUED DEPRECIATION (\$)		53.80%	54,391,179
DEPRECIATED VALUE OF IMPROVEMENTS			46,707,611
ADD: SITE VALUE			1,120,279
TOTAL INDICATED VALUE BY THE COST APPROACH			47,827,890
MULTIPLIED BY THE PERCENT OF TOTAL THAT IS TAXABLE			34%
EQUALS TAXABLE VALUE OF REAL PROPERTY			16,261,483

Contributors to Economic Obsolescence

- 1. Changes in the availability and price of corn and natural gas
- 2. Volatile commodity and financial markets
- 3. Changes in environmental regulations
- 4. Lack of transportation, storage and blending infrastructure
- 5. Changes in Federal/State laws or policies/tax incentives
- 6. Changes in ethanol production technology

External Obsolescence by Market Extraction

- Total Cost \$2.00 100%
- Sale Price \$1.00 50%
- Total Deprec. \$1.00 50%

- Physical \$0.20 10%

- Allocation to
- External \$0.80 40%

- *Sale Price should exclude land value

INDICATED ECONOMIC OBSOLESCENCE TAKEN FROM THE MARKET

Buyer	Seller	Location	Sale Date	Sale Price	Capacity MGPY	SP/G	RCN/\$	RCN/ Gallon	less Phy.	Phy. \$	RCN less	Econ. \$	Econ. %	Total \$ Dep	Total Depr. %
Green Plains Renewable Energy	Otter Tail Ag	Fergus Falls, MN	3/5/2011	\$ 55,000,000	55	\$ 1.00	110,000,000	\$2.00	10%	\$0.20	\$ 1.80	\$0.80	40%	\$1.00	50%
Valero	VeraSun/ASA Ethanol Holdings	Linden, IN	1/18/2010	\$100,000,000	110	\$ 0.91	220,000,000	\$2.00	10%	\$0.20	\$ 1.80	\$0.89	45%	\$1.09	55%
Valero	VeraSun/ASA Ethanol Holdings	Bloomington, OH	1/19/2010	\$100,000,000	110	\$ 0.91	220,000,000	\$2.00	10%	\$0.20	\$ 1.80	\$0.89	45%	\$1.09	55%
Renewable Energy Group	Central Iowa Energy	Newton IA	3/8/2010	\$ 32,153,000	30	\$ 1.07	60,000,000	\$2.00	10%	\$0.20	\$ 1.80	\$0.73	36%	\$0.93	46%
Gevo	Agri-Energy	Luverne, MN	9/24/2010	\$ 20,700,000	22	\$ 0.94	44,000,000	\$2.00	10%	\$0.20	\$ 1.80	\$0.86	43%	\$1.06	53%
Average													42%	52%	

Cost Approach Value

- \$0.33 per gallon

Income Approach

- Agri-business appraisers typically include an Income Approach to value when appraising a Industrial process facility such as an ethanol plant.
- A minimum of 3, with preferably 5 years of historical financial data is required.
- Short-comings of applying an operational income approach are due to the recent construction and volatility in the grain/ethanol commodity market.
- High corn prices are eating up profit margins placing financial strain on many plants.

Ethanol Plant Sales

Market Value Indicators by importance

- 1. Certificate of Real Estate Value (Real Property)
- 2. Certificate of Real Estate Value (Sale of a Business)
 - how the portion of the sale allocated to R.E. was determined
 - was the allocation appraisal based
 - who did the appraisal and what was the basis for the appraisal.
 - Note: Use of allocations as evidence of market value is on a case-by-case basis.

Ethanol Plant Sales

Buyer	Seller	Location	Date	Sale Price	GPY(M)	\$/Gallon	
Green Plains Renewable Energy	Otter Tail Ag	Fergus Falls, MN	03/05/11	55,000,000	55	1.00	Bankruptcy Sale
Valero	VeraSun/ASA Ethanol Holdings	Linden, IN	01/18/10	101,000,000	110	0.92	Multi Plant Sale Allocated
Valero	VeraSun/ASA Ethanol Holdings	Bloomington, OH	01/19/10	101,000,000	110	0.92	Multi Plant Sale Allocated
Renewable Energy Group	Central Iowa Energy	Newton IA	03/08/10	32,153,000	30	1.07	Buyer Allocated Sale
Gevo	Agri-Energy	MN	09/24/10	20,700,000	22	0.94	
Green Plains Renewable Energy	Global Ethanol	Lakota, IA Riga, MI	10/22/10	147,600,000	157	0.94	Buyer Allocated Sale

Sales Approach

- Sale 1 \$1.00
- Sale 2 \$0.92
- Sale 3 \$0.92
- Sale 4 \$1.07
- Sale 5 \$0.94
- Sale 6 \$0.94
- Total $\$5.79 / 6 = \0.965
- Median Sale Price \$0.94

- $\$0.94 \times 34\% = \0.32 per gallon

OTHER NOTABLE TRANSACTIONS

Buyer	Seller	Location	Date	Price	GPY(M)	\$/Gallon
NuGen	Dougherty Funding to	Marion, SD	Aug-09	\$100,334,582	100	\$1.00 Deed Recorded w/mortgage rec @ \$87,874,547
Green Plains Renewable Energy	Ag Star	Ord, NE Central City, NE	May-09	\$123,500,000	150	\$0.82 Ag Star bought at VeraSun bankruptcy auction 3/2009
Murphy Oil	Ag Star	Hankinson, ND	Oct-09	\$89,531,000	100	\$0.90 Ag Star bought at VeraSun bankruptcy auction 3/2009
Guardian Energy	Ag Star	Janesville, MN	Aug-09	\$106,000,000	110	\$0.96 Note: Mortgage of \$106,000,000 recorded
Carbon Green BioEnergy	Ag Star	Woodbury, MI	Jun-09	\$46,000,000	50	\$0.92 Note: Mortgage of \$46,000,000 recorded. Ag Star bought at VeraSun bankruptcy auction 3/2009
River Valley	Ag Star	Dyersville, IA	Aug-09	\$108,000,000	110	\$0.98 Note: Mortgage of \$108,000,000 recorded. Ag Star bought at VeraSun bankruptcy auction 3/2009

Value Per Gallon from Approaches

- Cost \$0.33
- Sales \$0.32

Reconciliation

- Explain the strengths and weaknesses of each approach to value, recognizing that MN Courts have relied principally on the Cost Approach to Value Special Purpose Properties, and that the cost approach is an imprecise measure which tends to inflate the value of a property because of the difficulty in determining total accrued depreciation. At the same time, the sales and income approaches tend to artificially lower the assessment.

Thank You