



Ethanol Infrastructure Investment Opportunities in the U.S.

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Ethanol Infrastructure Investment Opportunities in the U.S.

Capitalizing on a Convergence of Trends

INTRODUCTION

- An August 2005 U.S. law requires that, by the year 2012, 7.5 billion barrels of biofuel be used to supplement gasoline.
- Ethanol makes up the overwhelming majority of U.S. biofuel.
- In 2005, the U.S. produced over 4 billion gallons of ethanol. Most of this ethanol is produced in Middle USA.
- The bulk of ethanol demand is on the Eastern and Western coasts of the USA.
- Increased U.S. demand for ethanol is likely to stimulate Caribbean countries to produce ethanol and export to the USA.
- These exports are likely to enter the U.S. through the Gulf Coast.
- The U.S. has an under-developed ethanol transport infrastructure.
- Increased U.S. production and imports from the Caribbean put extreme pressure on the U.S. ethanol transport infrastructure.
- This creates opportunities for knowledgeable, well-capitalized market-players.

ENERGY POLICY ACT OF 2005

- On August 8, 2005, with the goal of furthering the energy independence of the U.S.A., the President of the United States signed into law the Energy Policy Act of 2005 (EPA2005).
- EPA2005 provides tax incentives, tax credits, subsidies, and grants for various alternative fuel industries, and requires that 7.5 billion gallons of biofuel (Ethanol) be used to supplement gasoline by 2012.

Saboor H. AbdulJaami

Attorney and Counselor at Law

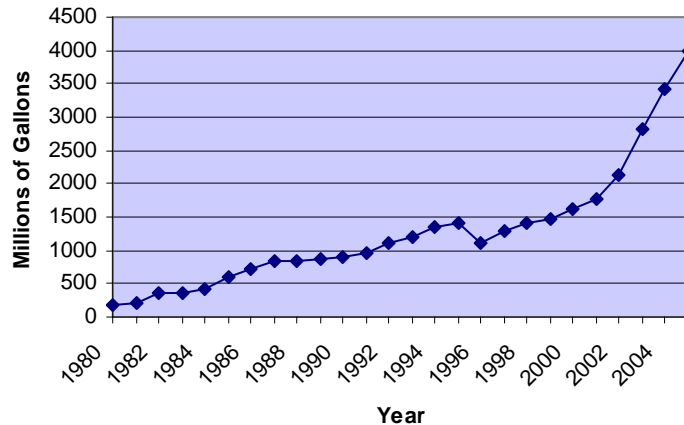
410 Park Avenue, Suite 1530
New York, NY 10022-4407

Tel: 1.646.435.0668
Fax: 1.646.435.0664
email: sabduljaami@shajlaw.com
web address: www.shajlaw.com



IMPACT OF EPA2005 AND RFS

Historic U.S. Fuel Ethanol Production



Source: U.S. Energy Information Administration

Ethanol Industry Expansion, January 2000 – January 2006

| | Jan. 2000 | Jan. 2001 | Jan. 2002 | Jan. 2003 | Jan. 2004 | Jan. 2005 | Jan. 2006 |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Total Ethanol Refineries | 54 | 56 | 61 | 68 | 72 | 81 | 95 |
| Ethanol Production Capacity | 1748.7 mg/y | 1921.9 mg/y | 2347.3 mg/y | 2706.8 mg/y | 3100.8 mg/y | 3643.7 mg/y | 4336.4 mg/y |

Source: Renewable Fuels Association

- In the year 2005, fourteen (14) new U.S. ethanol refineries began production.
- As of December 2005, twenty-nine (29) ethanol refineries were under construction and nine (9) refineries were undergoing expansion.
- When completed, those 29 refineries should add approximately 1.5 billion gallons of ethanol production capacity by early to mid 2007.

OVERVIEW OF U.S. ETHANOL INDUSTRY

U.S. Ethanol Production Capacity by State

| | Current (million gallons) | Expansion (million gallons) | Under Construction (million gallons) | Total (million gallons) |
|---------------------|-------------------------------------|---------------------------------------|--|-----------------------------------|
| Iowa | 1134.5 | 95 | 470 | 1699.5 |
| Nebraska | 543 | 14.5 | 491 | 1048.5 |
| Illinois | 780 | 57 | 50 | 887 |
| South Dakota | 475 | 18 | 110 | 603 |
| Minnesota | 495.6 | 8 | 90 | 593.6 |
| Indiana | 102 | | 180 | 282 |
| Wisconsin | 188 | | 40 | 228 |
| Kansas | 172.5 | | 40 | 212.5 |
| Mississippi | 50 | | 157 | 207 |
| Missouri | 110 | | 45 | 155 |
| Colorado | 43.5 | 1.5 | 40 | 85 |
| North Dakota | 33.5 | | 50 | 83.5 |
| California | 33 | | 35 | 68 |
| Tennessee | 67 | | | 67 |
| Kentucky | 26.4 | 9 | | 35.4 |
| New Mexico | 30 | | | 30 |
| Texas | | | 30 | 30 |
| Wyoming | 5 | | | 5 |
| Ohio | 3 | | | 3 |
| Georgia | 0.4 | | | 0.4 |
| Total | 4292.4 | 203 | 1828 | 6323.4 |

Source: Renewable Fuels Association

- The vast majority of U.S. ethanol is produced from corn.
- Refineries come in two types: dry mills and wet mills.
- In 2005, seventy-nine percent (79%) of U.S. ethanol was produced in dry mills; twenty-one percent (21%) from wet mills.

Saboor H. AbdulJaami

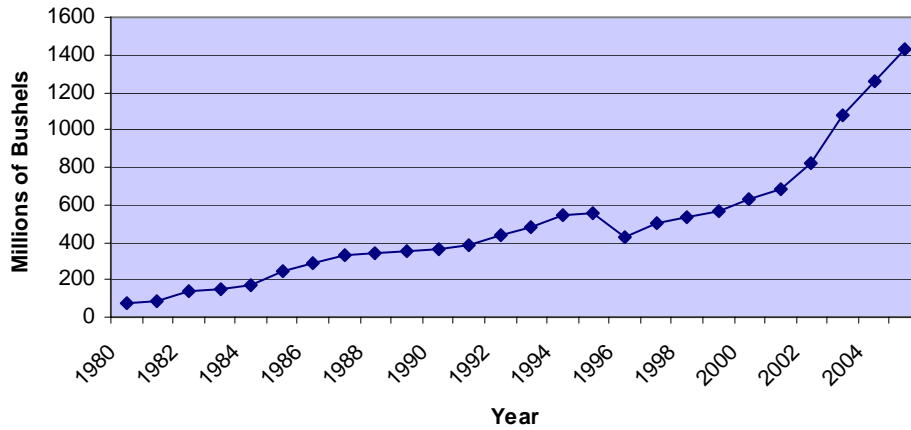
Attorney and Counselor at Law

410 Park Avenue, Suite 1530
New York, NY 10022-4407

Tel: 1.646.435.0668
Fax: 1.646.435.0664
email: sabduljaami@shajlaw.com
web address: www.shajlaw.com



Corn Utilized in Ethanol Production

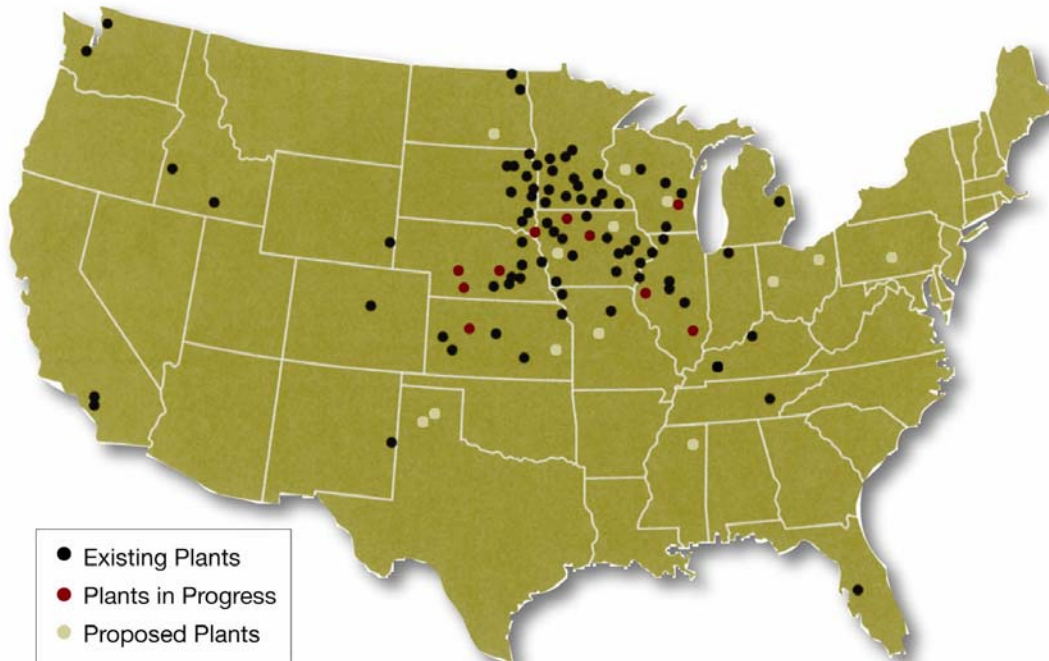


Source: Renewable Fuels Association

- In 2005, nearly 13% of the U.S. corn crop was used to produce ethanol.
- By 2010, it is estimated that 2.6 billion bushels of corn will be needed.
- Corn yields approximately 2.5-3 gallons of ethanol per bushel.
- It costs approximately US\$1.09 to produce one gallon of fuel ethanol from corn, compared to approximately US\$0.83 to produce one gallon of fuel ethanol from sugar in Brazil.

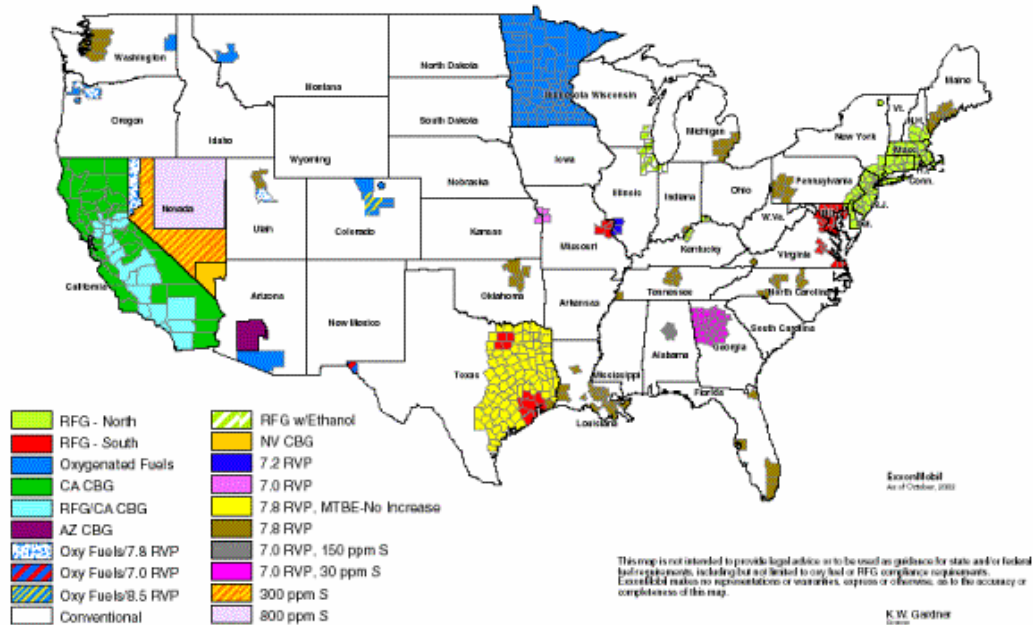
PROBLEM – MID-USA PRODUCTION; COASTAL DEMAND

Location of U.S. Ethanol Production Capacity





U.S. Gasoline Requirements, 2002



Estimated U.S. Consumption of Fuel Ethanol, MTBE, and Gasoline

| (amounts in thousands ('000)) | 1996 | 1998 | 2000 | 2002 |
|---------------------------------|-------------|-------------|-------------|-------------|
| E85 | 694 | 1727 | 7074 | 10,075 |
| E95 | 2699 | 59 | 13 | 0 |
| Ethanol in Gasohol (E10) | 660,200 | 889,500 | 1,106,300 | 1,118,900 |
| MTBE in Gasoline | 2,749,700 | 2,903,400 | 3,087,900 | 2,531,000 |
| Gasoline* | 117,783,000 | 122,849,000 | 125,720,000 | 130,730,000 |

Source: U.S. Department of Energy, Alternatives to Traditional Transport Fuels 1999

* Gasoline consumption includes ethanol in gasohol and MTBE in Gasoline

- The EPA2005 bans the use of MTBE as a gasoline additive and requires that beginning February 2006, all gasoline sold or introduced into the 48 contiguous United States instead contain a specified volume of ethanol (approximately 2.78% in 2006).
- Based on the estimated 2002 Gasoline consumption (see above chart), 3.6 billion barrels of ethanol would be needed to meet the EPA2005 requirements.
- Prior to the passing of EPA2005, consumption of fuel ethanol and use of fuel ethanol as an additive was concentrated where corn is grown – in the middle of the USA.

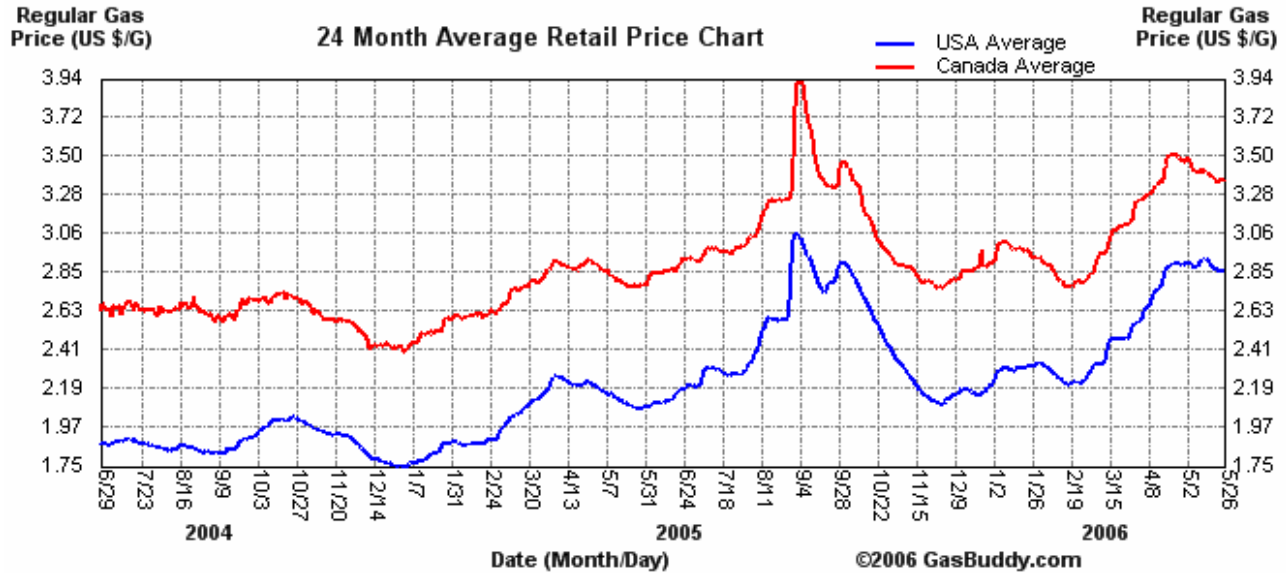
Saboer H. AbdulJaami
Attorney and Counselor at Law

410 Park Avenue, Suite 1530
New York, NY 10022-4407

Tel: 1.646.435.0668
Fax: 1.646.435.0664
email: sabduljaami@shajlaw.com
web address: www.shajlaw.com



- Since February 2006, coastal demand for fuel ethanol combined with the difficulty of shipping ethanol from rural mid-USA producers to coastal consumers has increased pressure on the price of gasoline.



Saboor H. AbdulJaami

Attorney and Counselor at Law

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New York, NY 10022-4407

Tel: 1.646.435.0668
Fax: 1.646.435.0664
email: sabduljaami@shajlaw.com
web address: www.shajlaw.com



OVERVIEW OF U.S. FUEL ETHANOL SHIPPING INFRASTRUCTURE

U.S. Fuel Ethanol Transportation: Mode, Percentages, Cost, and Considerations

| Mode | Percentage | Cost (US\$/gallon) | Considerations |
|----------------------------|------------|---|--|
| Barge or Barge+Ship | 30-35% | Barge: US\$0.12* Barge+Ship: US\$0.09* | <ul style="list-style-type: none"> ▪ River barge Volume: approximately 10,000 gallons ▪ Frozen rivers can prevent winter delivery ▪ Ocean shipping Volume: 1 million to 12 million gallons ▪ Barge+Ship can take up to 34 days from shipping to delivery ▪ Size of shipment dependent on Terminal storage facilities |
| Railroad | 30-35% | US\$0.09* | <ul style="list-style-type: none"> ▪ Volume: approximately 29,000 gallons per rail car ▪ Shipments could be up to 80 rail cars ▪ Unloading and inspection is labor intensive, and time consumptive ▪ Can reach land-locked refineries that need to ship medium to long-range (300-2,000 miles) ▪ Can take up to 20 days from shipping to delivery ▪ Size of shipment dependent on terminal storage facilities |
| Truck | 30-35% | US\$0.05* | <ul style="list-style-type: none"> ▪ Volume: approximately 7800 to 8200 gallons ▪ Cost effective and efficient for short distances (≤ 300 miles) ▪ Can pick-up directly from refinery and deliver directly to consumer |
| Pipeline | <1% | US\$0.01-0.03 | <ul style="list-style-type: none"> ▪ In the year 2000, volume was insufficient to justify infrastructure costs and O&M challenges ▪ Most pipelines originate in Southern USA; most ethanol plants are in Mid USA ▪ Segregated denatured fuel ethanol shipped via pipeline would incur additional monitoring costs ▪ Corrosion would have to be monitored ▪ Ethanol easily picks up pipeline impurities, contaminating the product ▪ Storage tanks and associated pipeline would have to be upgraded/installed – approximately US\$450,000 per new 25 million gallon tank ▪ Blended gasoline/ethanol – most economical because downstream terminal operating costs are minimized ▪ Blended gasoline/ethanol – not fungible ▪ Blended gasoline/ethanol – sensitive to moisture (the U.S. has a “wet” pipeline system) |

*Estimated based on the average per gallon cost of shipping fuel ethanol from Illinois to 49 different U.S. cities in 1999/2000.



IMPACT OF IMPORTS TO THE USA

2005 World Ethanol Production by Country (Top 10)

| Country | Ethanol Production (million gallons) |
|--------------|---|
| USA | 4264 |
| Brazil* | 4227 |
| China | 1004 |
| India | 449 |
| France | 240 |
| Russia | 198 |
| Germany | 114 |
| South Africa | 103 |
| Spain | 93 |
| UK | 92 |
| Thailand | 79 |

Source: F.O. Licht

* Brazil is currently the recognized leading ethanol producer

U.S. Ethanol Imports – Million Gallons

| | 2002 | 2003 | 2004 | 1/2005 | 2/05 | 3/05 | 4/05 | 5/05 | 6/05 | 7/05 | 8/05 | 9/05 | 10/05 | 11/05 | 12/05 | Total |
|--------------|-------------|-------------|--------------|-------------|----------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|--------------|
| Brazil | 0 | 0 | 90.3 | 1.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.7 | 5.2 | 10.7 | 0 | 19.8 |
| Costa Rica | 12 | 14.7 | 25.4 | 5.4 | 0 | 5.3 | 0 | 2.9 | 0 | 0 | 4.2 | 0 | 4.3 | 5.8 | 0 | 27.9 |
| El Salvador | 4.5 | 6.9 | 5.7 | 1.6 | 0 | 0 | 0 | 1.7 | 0 | 3.5 | 0 | 0 | 3.3 | 3.3 | 4.5 | 17.8 |
| Jamaica | 29 | 39.3 | 38.6 | 4.2 | 0 | 3.6 | 3.1 | 0 | 4.1 | 0 | 0 | 2.5 | 10.1 | 5.9 | 3.0 | 36.6 |
| Trinidad | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.0 | 3.0 | 10.0 |
| Total | 45.5 | 60.9 | 159.9 | 12.3 | 0 | 8.9 | 3.1 | 4.6 | 4.1 | 3.5 | 4.2 | 5.2 | 22.9 | 32.6 | 10.5 | 112.1 |

Source: Jim Jordan & Associates, January 2006

- Currently, Jamaica, Costa Rica and El Salvador operate dehydration plants and ethanol from Brazil and Europe passes through these countries into the U.S.
- The U.S. imposes an ad valorem tariff of 2.5% and an import duty of US\$0.54 per gallon of ethanol imported into the USA.
- *However*, under the Caribbean Basin Economic Recovery Act (CBERA), ethanol that is produced from at least 50% agricultural feedstock grown in a CBERA country can be imported duty free.
- Up to 60 million gallons (or 7% of the U.S. domestic ethanol market) of non-CBERA ethanol can be imported into the U.S.A. through CBERA countries each year.
- The Caribbean is a well-known sugar-producing region.
- It is likely that within the next 18-24 months, ethanol will be produced in CBERA countries for import to the U.S.A.

Saboore H. AbdulJaami

Attorney and Counselor at Law

410 Park Avenue, Suite 1530
New York, NY 10022-4407

Tel: 1.646.435.0668
Fax: 1.646.435.0664
email: sabduljaami@shajlaw.com
web address: www.shajlaw.com



- These imports are likely to enter the US from the Gulf Coast, most likely New Orleans, Louisiana, where they can be transshipped; South-North pipelines also exist.

OPPORTUNITIES

- Investment in ethanol transportation infrastructure, including barge, tanker, road and rail investments and possibly a “dry” pipe transportation system depending on the sustainability of long-term ethanol demand.
- Investment in ethanol storage infrastructure and fuel mixing infrastructure.

CONTACT ABDULJAAMI, PLLC

- We recommend that you contact AbdulJaami, PLLC to advise you on structuring, documenting and successfully closing your contemplated project.

ABOUT ABDULJAAMI, PLLC

AbdulJaami, PLLC focuses on advising businesses that have US\$1 million to US\$100 million in annual revenues on the successful completion of corporate finance, trade finance and project finance transactions in the Americas. Learn more about AbdulJaami, PLLC at www.shajlaw.com.

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Saboor H. AbdulJaami

Attorney and Counselor at Law

410 Park Avenue, Suite 1530
New York, NY 10022-4407

Tel: 1.646.435.0668
Fax: 1.646.435.0664
email: sabduljaami@shajlaw.com
web address: www.shajlaw.com