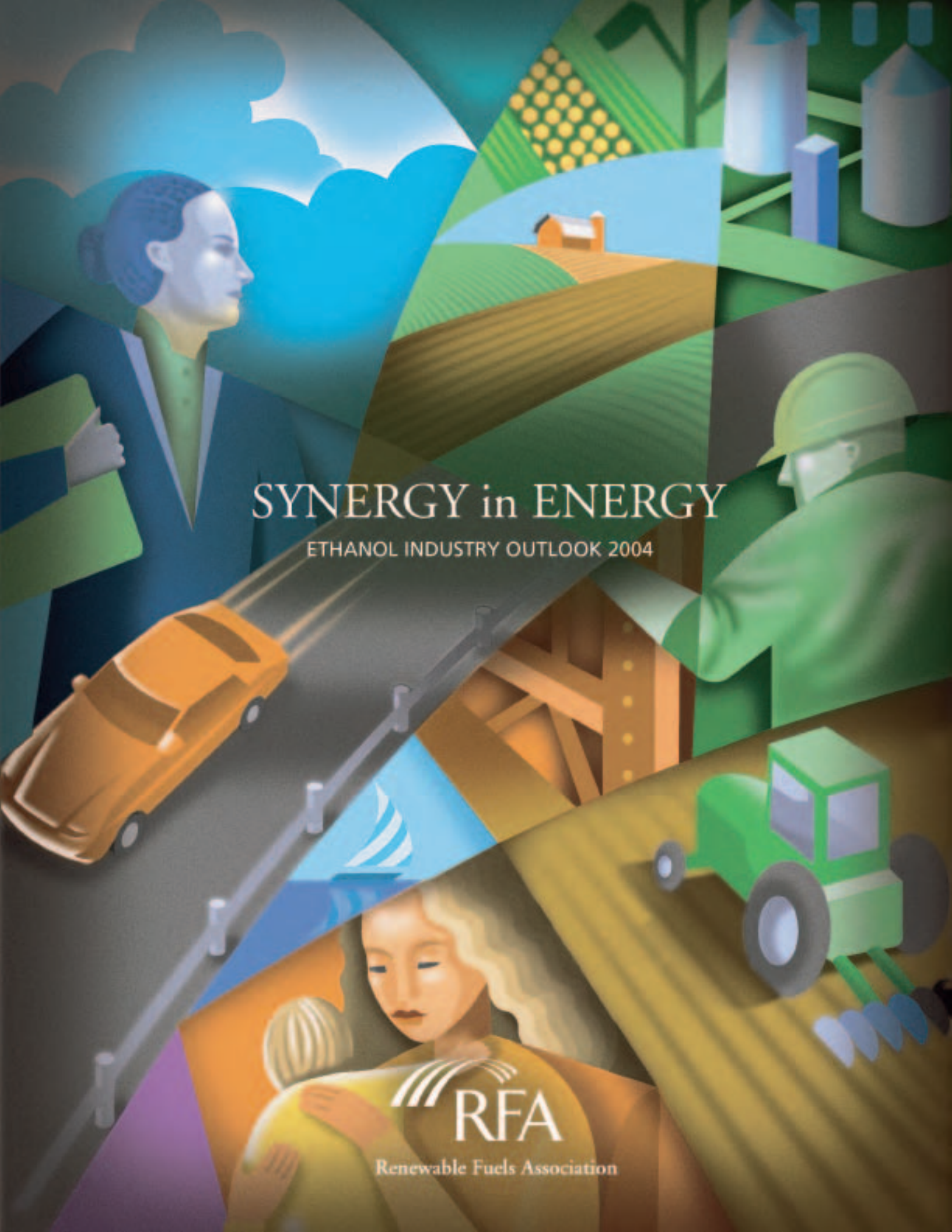
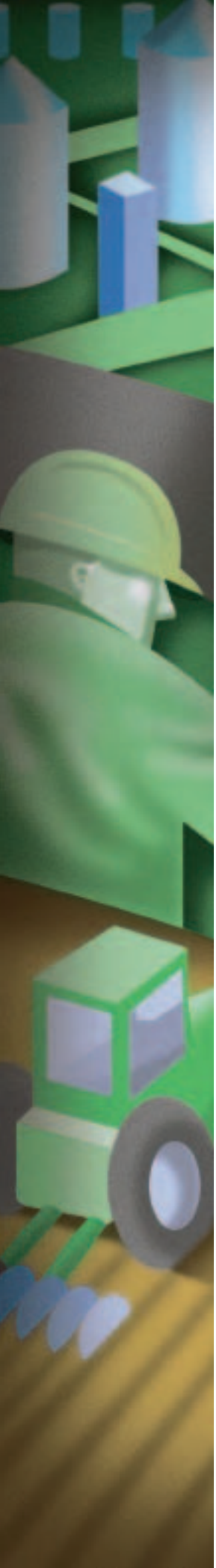


SYNERGY in ENERGY

ETHANOL INDUSTRY OUTLOOK 2004

RFA

Renewable Fuels Association



RFA
Renewable Fuels Association

February 2004

As the production and use of fuel ethanol continues to grow at a record pace, it is becoming an integral part of rural economic development, air quality improvement and gasoline marketing. Indeed, the U.S. ethanol industry of the 21st Century is one that is increasingly recognized as providing synergy in energy.

The 2004 Industry Outlook documents the unprecedented growth in U.S. ethanol production, as the industry has once again shattered all previous records for daily, monthly, and annual production. As a result of this growth, ethanol has become the single most important and fastest growing value added market for farmers, stimulating rural economic development, creating jobs and increasing farm income. The successful use of ethanol in our nation's most polluted cities has similarly made it a critical element of air quality standards and programs across the country. Moreover, ethanol remains the only near-term means of reducing greenhouse gas emissions from vehicles. Lastly, the increased demand for octane and clean blending components to replace MTBE in gasoline has made ethanol an inescapable constituent in motor fuels sold from coast to coast, a fact acknowledged by the refining industry, which we now count upon as allies rather than adversaries.

The road ahead promises many new legislative and marketplace challenges. But the numerous synergies between ethanol's public policy benefits and its commercial appeal make success ultimately inevitable. I look forward to 2004 and the opportunities that will arise, as the U.S. ethanol industry continues its march toward a more reliable energy future.

Bob Dinneen
President

The Secretary of Energy
Washington, DC 20585

President George W. Bush and I are committed to biofuels such as ethanol as a way to enhance our national security and to boost our economy, while at the same time protecting the environment. I am proud that since the beginning of the Bush Administration, the U.S. ethanol industry has expanded more rapidly than at any time in its history. In the last three years, 21 new ethanol plants have begun production, and the entire industry has added more than one billion gallons of annual production capacity.

Together, the Departments of Energy and Agriculture are working hard with many private sector partners to develop new bio-refineries for making a wide range of products from America's crops, trees and biomass-derived residues, including corn fiber. These new sources of transportation fuels, electricity, everyday consumer goods, plastics, paints and adhesives, will help reduce oil imports and create jobs in rural America.

Promoting the use of fuels made in America is good public policy. Their use reduces our dependence on oil imported from nations that are sometimes hostile toward our interests.

Moreover, one of the most important ways to make sure the rural economy is strong is to promote value-added processing, like ethanol production. As you know, the dramatic expansion in ethanol production has been spearheaded by farmer-owned ethanol plants. These plants create thousands of new jobs while raising profits for all farmers.

The Bush Administration strongly supports a Renewable Fuels Standard (RFS), as part of a national energy bill, to increase the use of clean, domestically produced renewable fuels like ethanol. The Bush Administration also supports extending the federal ethanol tax credit. Enacting these forward-looking policies will keep the ethanol expansion going strong. Ethanol today is produced in 20 states, and there are dozens of ethanol plants under construction and development. The RFS will lead to ethanol production from California to Texas to New York and everywhere in between.

By working together, we can create a stronger rural economy and reduce our country's dependence on imported energy supplies. I appreciate the ethanol industry's efforts to expand production of this valuable resource.

Sincerely,

Spencer Abraham

Synergy in Energy

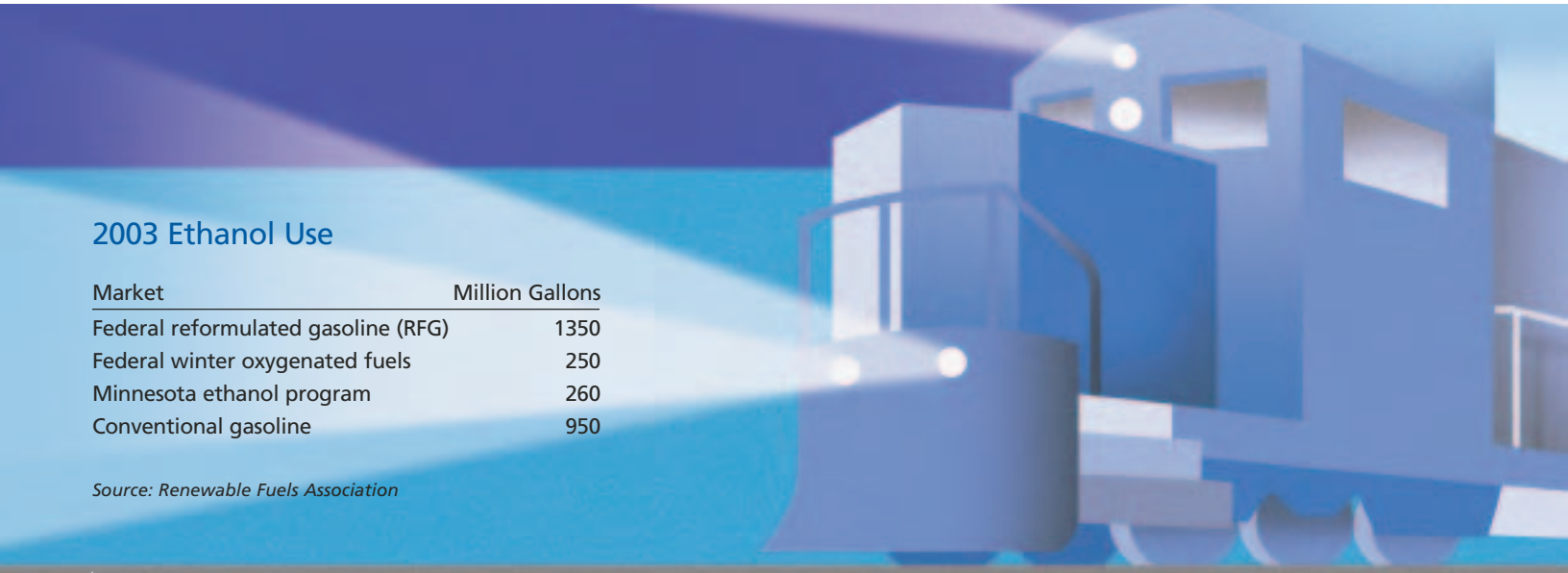
2003 saw the completion of ethanol's long transition from a niche fuel extender beginning in the 1970s to a ubiquitous gasoline component valued for its octane and oxygen content. The petroleum industry has recognized that ethanol is a reliable component in meeting growing consumer demand for clean, affordable fuel. With more than 2.81 billion gallons produced in 2003, ethanol is increasingly being utilized as a cost-effective octane enhancer and as a clean-burning replacement for MTBE.

Refiners have indicated they would likely replace MTBE with ethanol even without a federal oxygenate standard. "We'd do it anyway. We have to get the octane."

– Lynn Westfall, vice president of Tesoro Petroleum Corp.

The synergy derived from blending ethanol with gasoline goes far beyond expanding gasoline supplies. Ethanol use provides a major boost to rural economies and farm income. Ethanol use reduces America's dependence on foreign oil. And ethanol use reduces harmful vehicle emissions, ozone pollution, and greenhouse gas-forming emissions.

In short, ethanol use helps address all of these pressing challenges facing our country today. That's truly synergy in energy.



2003 Ethanol Use

Market	Million Gallons
Federal reformulated gasoline (RFG)	1350
Federal winter oxygenated fuels	250
Minnesota ethanol program	260
Conventional gasoline	950

Source: Renewable Fuels Association

Ethanol: From California to New York

Already extensively blended from the Rocky Mountains to the Midwest, ethanol added two important coastal markets in 2003. California began the shift to ethanol early in the year and was followed by New York and Connecticut at the end of the year. With the switch to ethanol now complete, these new markets account for more than 1.4 billion gallons of annual ethanol demand – equal to the industry's entire production in 1998.

After banning the gasoline oxygenate MTBE at the end of 2003 to curtail further water contamination, these three states needed to replace the lost volume, octane, and oxygen MTBE had provided. They turned to ethanol and the industry responded. By rapidly expanding production capacity, the ethanol industry successfully met the growing needs of these markets and ensured a smooth transition from MTBE to ethanol. Whether transported by 95-car unit train or ocean-going barge, ethanol is truly a coast-to-coast fuel component.

Transition in New York

"It's a nonevent. We don't have any supply disruption and we haven't seen any price increases."

– Empire State Petroleum Association, December 2003

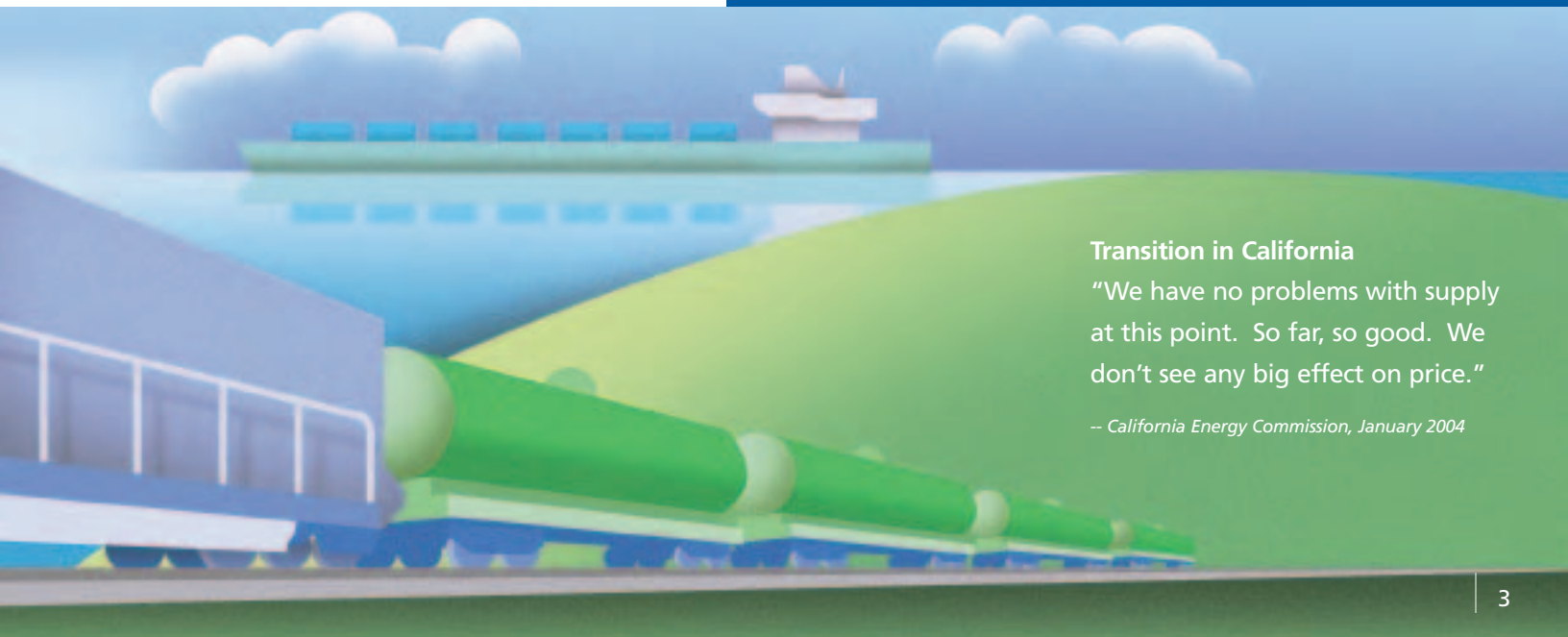
In 2004, ethanol use is expected to reach 950 million gallons in California and 450 million gallons in New York and Connecticut.

2002 Estimated Ethanol-Blended Fuel Use by State

(in thousands of gallons)

Alabama	101,810	Montana	16,414
Alaska	44,678	Nebraska	325,845
Arizona	149,796	Nevada	386,246
Arkansas	-	New Hampshire	-
California	1,773,616	New Jersey	11,987
Colorado	740,614	New Mexico	83,987
Connecticut	34,187	New York	42,159
Delaware	-	North Carolina	642,874
Florida	4,153	North Dakota	88,971
Georgia	303	Ohio	1,902,394
Hawaii	-	Oklahoma	-
Idaho	-	Oregon	386,287
Illinois	3,080,582	Pennsylvania	62,098
Indiana	1,220,289	Rhode Island	3,993
Iowa	934,265	South Carolina	-
Kansas	275,342	South Dakota	231,045
Kentucky	248,313	Tennessee	-
Louisiana	351,056	Texas	325,515
Maine	-	Utah	50,261
Maryland	382,055	Vermont	-
Massachusetts	9,942	Virginia	578,361
Michigan	1,153,880	Washington	659,244
Minnesota	2,587,209	West Virginia	122,042
Mississippi	-	Wisconsin	1,297,207
Missouri	687,048	Wyoming	-

Source: Federal Highway Administration



Transition in California

"We have no problems with supply at this point. So far, so good. We don't see any big effect on price."

-- California Energy Commission, January 2004

New Markets Equal Record Production

Responding to consumer demands for cleaner fuels and safer water, many California refiners began replacing MTBE with ethanol early in 2003. Therefore, it is no surprise that ethanol production in 2003 shattered the previous record – reaching **2.81 billion gallons**. This represents a 32 percent increase over 2002 production and a 91 percent increase from 1999 when California first announced its impending MTBE ban.

Approximately 30% of all gasoline in the United States will be blended with ethanol in 2004.

By the end of the year, New York and Connecticut joined California in completely switching from MTBE to ethanol. Production levels rose throughout the year to satisfy the new coastal markets. In fact, California and New York are now the two largest consumers of ethanol in the United States. With the demand for ethanol continuing to rise as MTBE use is reduced, 2004 promises to once again be a record year for ethanol production.

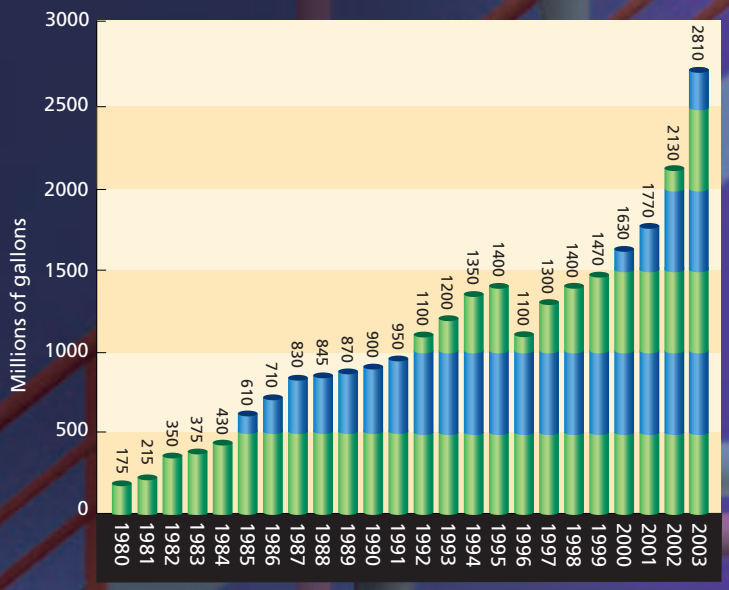
State Ethanol Production Capacity

State	Million gallons/year
Iowa	866.5
Illinois	796
Nebraska	537
South Dakota	422
Minnesota	398.1
Wisconsin	172
Kansas	109.5
Missouri	100
Indiana	95
Tennessee	65
Michigan	45
North Dakota	33.5
Kentucky	24
New Mexico	15
California	9
Wyoming	5
Idaho	4
Colorado	1.5
Washington	0.7
Total	**3698.8 mgy**

Includes gallons currently under construction.

Source: Renewable Fuels Association, February 2004

Historic U.S. Fuel Ethanol Production



Source: U.S. Energy Information Administration/Renewable Fuels Association

Building Rural Economies for the Future

Ethanol's status as a reliable oxygenate and octane enhancer from coast-to-coast would not have been possible without expanding production in a timely manner to meet the growing demand. Construction of **seven new ethanol plants** was completed in 2003. These new plants, along with expansions to existing plants, increased annual ethanol production capacity by more than 300 million gallons to over **3 billion gallons.**

Plant Construction Boon Continues

In early 2004, fifteen additional ethanol plants with more than 550 million gallons of annual production capacity are under construction. Many more plants are under development from New York to California. Although still centered in the Corn Belt, ethanol production is spreading across the country as ethanol use grows nationwide.

Rural Economic Engines

Each ethanol plant serves as a rural economic engine for the surrounding area – creating high-paying jobs, value-added markets for farmers and increased local tax revenue.

The U.S. ethanol industry is comprised of 72 production facilities in 19 states capable of producing more than 3 billion gallons of ethanol each year.

– February 2004

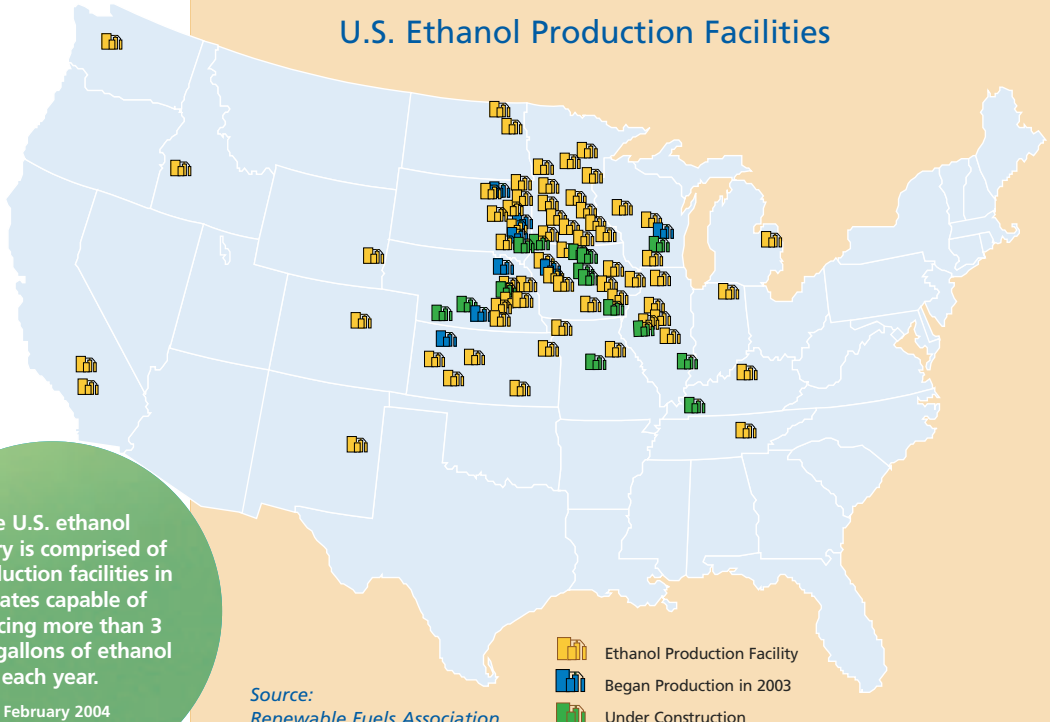
Ethanol and the Local Community

A recent study found that an average 40 million gallon per year ethanol plant will have the following positive economic impacts on a local community:

- Provide a one-time boost of $142 million to the local economy during construction.
- Expand the local economic base of the community by $110.2 million each year through the direct spending of $56 million.
- Create 41 full-time jobs at the plant and a total of 694 jobs throughout the entire economy.
- Increase the local price of corn by an average of 5-10 cents a bushel, adding significantly to farm income in the general area surrounding the plant.
- Increase household income for the community by $19.6 million annually.
- Boost state and local sales tax receipts by an average of $1.2 million (varies depending on local rates).
- Provide an average 13.3% annual return on investment over ten years to a farmer who invests $20,000 in an ethanol production facility.

Source: "Ethanol and the Local Community," John Urbanchuk, AUS Consultants and Jeff Kapell, SJH & Company, June 2002

U.S. Ethanol Production Facilities



Source: Renewable Fuels Association

Renewable Fuels Standard:
Good for Consumers, Agriculture and Energy Security

Renewable fuels can and should play a larger role in meeting our nation's energy needs. Creating a "Renewable Fuels Standard" (RFS), in which a small percentage of our nation's fuel supply is provided by renewable, domestic fuels such as ethanol and biodiesel provides a positive roadmap for reducing consumer fuel prices, increasing energy security and stimulating rural economies.

Recently an historic fuels agreement was forged between the ethanol and oil industries, agriculture, the environmental community, consumer groups and states. The agreement provides refiners with increased flexibility, provides agriculture and the renewable fuels industry with growth opportunities, and protects the environment. It is supported by a majority in Congress and the Administration.

Key provisions of the agreement:

- An RFS in which part of our nation's fuel supply, growing to 5 billion gallons by 2012, is provided by renewable fuels;
- Providing refiners with increased flexibility in meeting clean air standards;
- Phasing out the use of MTBE in the U.S. gasoline market; and
- Protecting the air quality gains of the RFG program.

Benefits to the economy and energy security

- Improves energy security by reducing crude oil imports 1.6 billon barrels through 2012.
- Grows the U.S. economy by cutting our trade deficit $34.1 billion through 2012.
- Enhances rural economic development by generating more than $5.3 billion in new investment opportunities.
- Boosts employment by creating more than 214,000 new jobs throughout the U.S. economy.

Source: AUS Consultants, February 2002

Benefits to American agriculture

- Increases farm income by $55.2 billion through 2012.
- Preserves family farms by increasing corn prices 6.6% above baseline projections.

Source: LECG, LLC, September 2002

Benefits to American consumers

- Saves taxpayer money by reducing direct government payments to farmers $10.6 billion through 2012.
- Protects consumers' pocketbooks by reducing gasoline prices 6.6 cents per gallon, an annual savings to consumers of $3.3 billion.

Source: LECG, LLC, May 2003

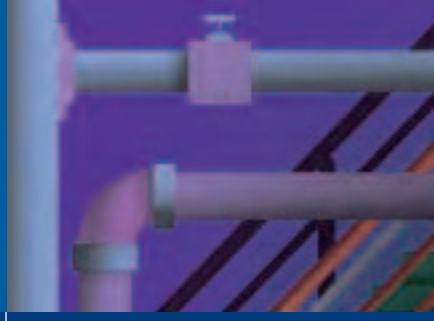
Groups that support the RFS Fuels Agreement

American Farm Bureau Federation ■ American Petroleum Institute ■ Renewable Fuels Association ■ National Corn Growers Association ■ National Farmers Union ■ Northeast States for Coordinated Air Use Management ■ U.S. Chamber of Commerce ■ National Biodiesel Board ■ American Coalition for Ethanol ■ American Corn Growers Association ■ American Lung Association ■ American Soybean Association ■ Bluewater Network ■ Clean Energy Now (Greenpeace) ■ Climate Solutions ■ Earth Island Journal ■ Environmental and Energy Study Institute ■ Ethanol Producers and Consumers ■ Governors' Ethanol Coalition ■ Institute for Local Self-Reliance ■ National Grain Sorghum Producers ■ National Grange ■ National Sunflower Association ■ New Uses Council ■ Renewable Energy Action Project ■ Union of Concerned Scientists ■ Women Involved in Farm Economics

U.S. Fuel Ethanol Production Capacity

Company	Location	Feedstock	Current Capacity (mmgy)	Under Construction/ Expansions (mmgy)
Abengoa Bioenergy Corp.	York, NE	Corn/milo	50	
	Colwich, KS		20	
	Portales, NM		15	
ACE Ethanol, LLC	Stanley, WI	Corn	15	15
Adkins Energy, LLC★	Lena, IL	Corn	40	
A.E. Staley	Loudon, TN	Corn	65	
AGP★	Hastings, NE	Corn	52	
Agra Resources Coop. d.b.a. EXOL★	Albert Lea, MN	Corn	38	
Agri-Energy, LLC★	Luverne, MN	Corn	21	
Alchem Ltd. LLLP	Grafton, ND	Corn	10.5	
Al-Corn Clean Fuel★	Claremont, MN	Corn	30	
Archer Daniels Midland	Decatur, IL	Corn	1070	
	Cedar Rapids, IA	Corn		
	Clinton, IA	Corn		
	Columbus, NE	Corn		
	Marshall, MN	Corn		
	Peoria, IL	Corn		
	Wallhalla, ND	Corn/barley		
Aventine Renewable Energy, Inc.	Pekin, IL	Corn	100	
	Aurora, NE	Corn	35	
Badger State Ethanol, LLC★	Monroe, WI	Corn	48	
Big River Resources, LLC★✦	West Burlington, IA	Corn		40
Broin Enterprises, Inc.	Scotland, SD	Corn	9	
Cargill, Inc.	Blair, NE	Corn	83	
	Eddyville, IA	Corn	35	
Central Illinois Energy Cooperative★✦	Canton, IL	Corn		30
Central MN Ethanol Coop★	Little Falls, MN	Corn	20	
Central Wisconsin Alcohol	Plover, WI	Seed corn	4	
Chief Ethanol	Hastings, NE	Corn	62	
Chippewa Valley Ethanol Co.★	Benson, MN	Corn	42	
Commonwealth Agri-Energy, LLC★✦	Hopkinsville, KY	Corn		20
Cornhusker Energy Lexington, LLC★✦	Lexington, NE	Corn		42
Corn Plus, LLP★	Winnebago, MN	Corn	44	
Dakota Ethanol, LLC★	Wentworth, SD	Corn	48	
DENCO, LLC★	Morris, MN	Corn	21.5	
ESE Alcohol Inc.	Leoti, KS	Seed corn	1.5	
Ethanol2000, LLP★	Bingham Lake, MN	Corn	30	
Glacial Lakes Energy, LLC★	Watertown, SD	Corn	48	
Golden Cheese Company of California★	Corona, CA	Cheese whey	5	
Golden Grain Energy, LLC★✦	Mason City, IA	Corn		40
Golden Triangle Energy, LLC★	Craig, MO	Corn	20	
Gopher State Ethanol	St. Paul, MN	Corn/Beverage Waste	15	
Grain Processing Corp.	Muscatine, IA	Corn	10	
Great Plains Ethanol, LLC★	Chancellor, SD	Corn	42	
Heartland Corn Products★	Winthrop, MN	Corn	36	

View an up-to-the-minute list of ethanol plants at:
www.ethanolRFA.org/eth_prod_fac.html



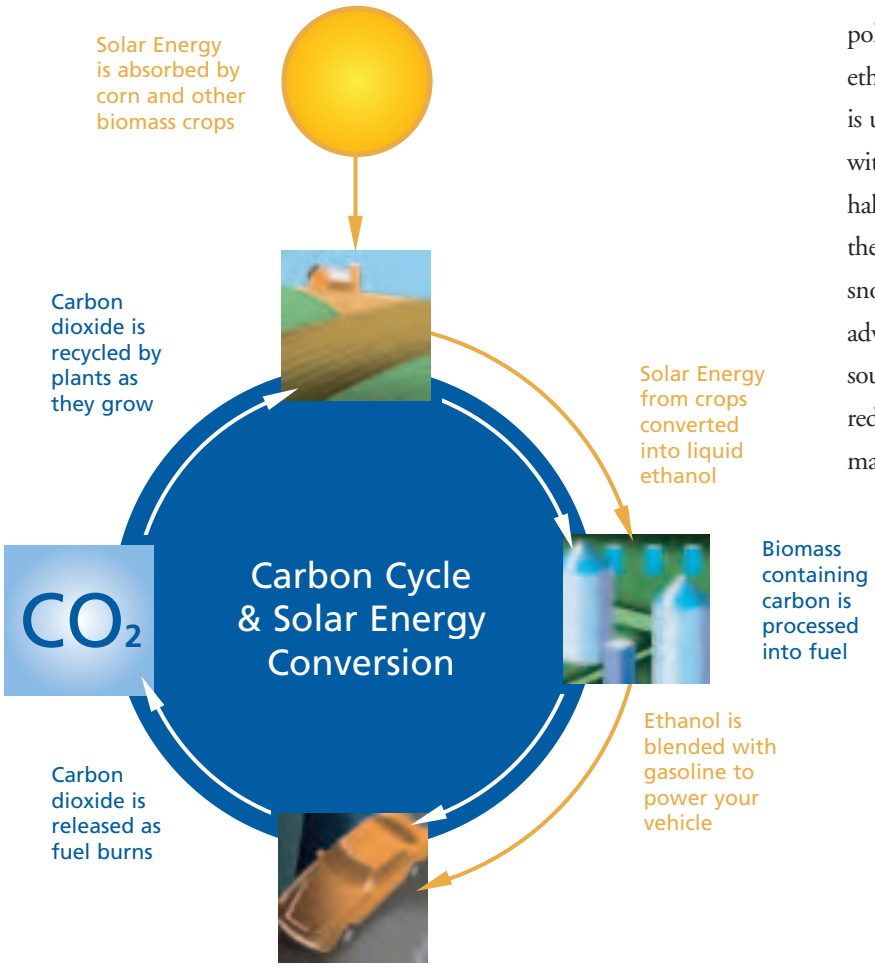
Company	Location	Feedstock	Current Capacity (mmgy)	Under Construction/ Expansions (mmgy)
Heartland Grain Fuels, LP*	Aberdeen, SD	Corn	8	
	Huron, SD	Corn	14	
Husker Ag, LLC*	Plainview, NE	Corn	23	
Iowa Ethanol, LLC*✦	Hanlontown, IA	Corn		45
James Valley Ethanol, LLC	Groton, SD	Corn	45	
J.R. Simplot	Caldwell, ID	Potato waste	4	
KAAPA Ethanol, LLC*	Minden, NE	Corn	40	
Land O' Lakes*	Melrose, MN	Cheese whey	2.6	
Lincolnland Agri-Energy, LLC*✦	Palestine, IL	Corn		40
Little Sioux Corn Processors, LP*	Marcus, IA	Corn	46	
Merrick/Coors	Golden, CO	Waste beer	1.5	
Michigan Ethanol, LLC	Caro, MI	Corn	45	
MGP Ingredients, Inc.	Pekin, IL	Corn/wheat starch	78	
	Atchison, KS			
Mid-Missouri Energy, Inc.*✦	Malta Bend, MO	Corn		40
Midwest Grain Processors*	Lakota, IA	Corn	45	
Midwest Renewables✦	Iowa Falls, IA	Corn		40
Miller Brewing Co.	Olympia, WA	Brewery waste	0.7	
Minnesota Energy*	Buffalo Lake, MN	Corn	18	
New Energy Corp.	South Bend, IN	Corn	95	
Northeast Missouri Grain, LLC*	Macon, MO	Corn	40	
Northern Lights Ethanol, LLC*	Big Stone City, SD	Corn	45	
Otter Creek Ethanol, LLC*✦	Ashton, IA	Corn		45
Parallel Products	Louisville, KY	Beverage waste	4	
	R. Cucamonga, CA		4	
Permeate Refining	Hopkinton, IA	Sugars & starches	1.5	
Pine Lake Corn Processors, LLC*✦	Steamboat Rock, IA	Corn		20
Platte Valley Fuel Ethanol, LLC✦	Central City, NE	Corn		40
Pro-Corn, LLC*	Preston, MN	Corn	40	
Quad-County Corn Processors*	Galva, IA	Corn	23	
Reeve Agri-Energy	Garden City, KS	Corn/milo	12	
Siouxland Energy & Livestock Coop*	Sioux Center, IA	Corn	18	
Sioux River Ethanol, LLC*✦	Hudson, SD	Corn		45
Tall Corn Ethanol, LLC*	Coon Rapids, IA	Corn	45	
Trenton Agri Products, LLC✦	Trenton, NE	Corn		30
Tri-State Ethanol Co., LLC*	Rosholt, SD	Corn	18	
United WI Grain Producers, LLC*✦	Friesland, WI	Corn		40
U.S. Energy Partners, LLC	Russell, KS	Milo/wheat starch	40	
Utica Energy, LLC	Oshkosh, WI	Corn	24	26
VeraSun Energy Corporation	Aurora, SD	Corn	100	
Western Plains Energy, LLC*	Campus, KS	Corn	30	
Wyoming Ethanol	Torrington, WY	Corn	5	
Total Existing Capacity			**3100.8**	
Total Under Construction/Expansions				**598.0**
Total Capacity			3698.8	

* farmer-owned ✦ under construction

Clean Air, Clean Water, Clean Fuel

Ethanol use protects the air we breathe and the water we drink. Containing 35% oxygen by weight, ethanol improves the combustion of petroleum fuels, thereby reducing harmful tailpipe emissions of carbon monoxide (CO), particulate matter (PM), oxides of nitrogen (NOx) and other ozone forming pollutants. At the same time, being highly biodegradable, ethanol does not pose a threat to water supplies as do some other gasoline additives.

Given its desirable environmental profile, ethanol has been utilized in the federal reformulated gasoline (RFG) program designed to reduce summertime smog and the federal winter oxygenated fuels program that combats harmful CO pollution. Ethanol is now the most widely used oxygenate in both of these clean air programs.



Even as recent tests conducted for the California Air Resources Board indicate ethanol blends help reduce pollution from the most sophisticated modern vehicles, ethanol's impact on "gross polluters" and off-road engines is unsurpassed. Gross polluters – older vehicles or cars with malfunctioning pollution control systems – emit over half of all vehicle emissions while comprising only 10% of the vehicle fleet. Off-road engines – motorcycles, ATVs, snowmobiles, watercraft and lawn mowers – lack advanced pollution control devices and are significant sources of pollution. Studies have shown ethanol blends reduce CO and hydrocarbons by 20% and fine particulate matter by 40% from gross polluters and off-road engines.

"Ethanol's role in combating Climate Change is one of the many reasons to implement an aggressive renewable fuels standard (RFS)."

—Will Coleman, Renewable Energy Action Project

Harnessing the Sun Reduces Greenhouse Gases

What makes ethanol a renewable fuel? Harvesting the power of the sun. Utilizing the solar energy stored in corn and other feedstocks, ethanol maintains a positive fossil energy balance.

In fact, a life cycle analysis of ethanol production – from the field to the car – by the U.S. Department of Agriculture found that ethanol has a large and growing positive energy balance. Ethanol yields 134% of the energy used to grow and harvest the corn and process it into ethanol. By comparison, gasoline yields only 80% of the energy used to produce it.

Energy Yield of Transportation Fuels for 1 Btu of Fossil Input

Ethanol	1.389 Btu
Gasoline	0.808 Btu
MTBE	0.675 Btu

Source: Argonne National Laboratory

Ethanol Is Best Near Term Option to Address Greenhouse Gases

While a 2003 study by the Pew Center on Global Climate Change outlined several ways to reduce greenhouse gas (GHG) emissions from the transportation sector, the renowned group found that "replacement fuels offer the greatest promise for reducing transportation sector GHG emissions" over the next 15 years. Replacement fuels – like ethanol – are alternative fuels that can be blended with petroleum fuels and, therefore, utilize the existing gasoline infrastructure. The Pew Center found "ethanol produced from corn in the United States reduces full cycle GHG emissions by 30 percent compared to gasoline…" Cellulosic ethanol could have an even larger impact.

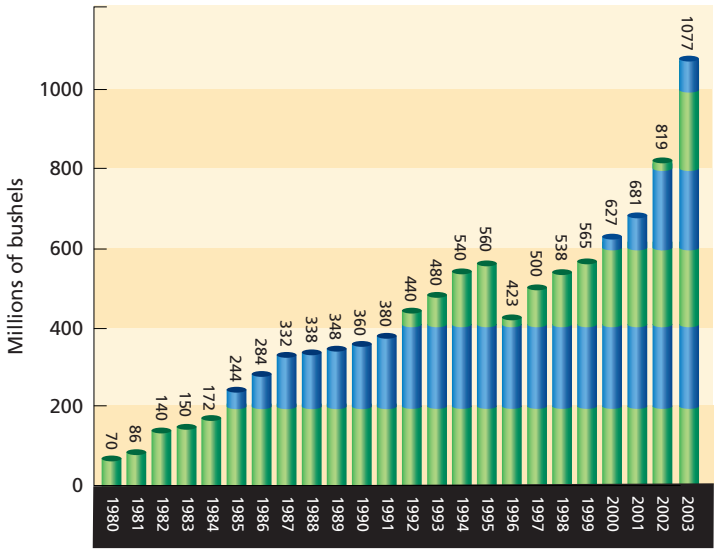
"In 2003, ethanol use in the U.S. reduced CO_2-equivalent greenhouse gas emissions by approximately 5.7 million tons, equal to removing the annual emissions of more than 853,000 cars from the road."

—Argonne National Laboratory, GREET 1.6 Model

Boosting the Agricultural Economy

As ethanol production in the U.S. continues to grow, so does ethanol's contribution to American agriculture through the increased consumption of grains such as corn and grain sorghum (milo). According to USDA, U.S. corn processed into ethanol in 2003 surpassed a record one billion bushels, or approximately 10% of the corn crop. Ethanol continues to be the third largest use of corn, behind only feed and exports. In fact, according to the USDA, ethanol production increases the price a farmer receives for corn by 20 to 40 cents per bushel. Ethanol is also an important and growing market for grain sorghum, accounting for 12% of the domestic sorghum market in 2003.

Corn Utilized in Ethanol Production

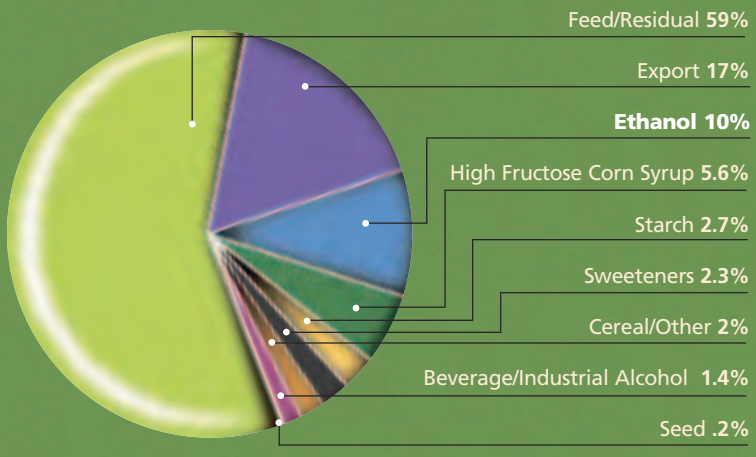


Source: National Corn Growers Association

Farmer Ownership of Ethanol Plants

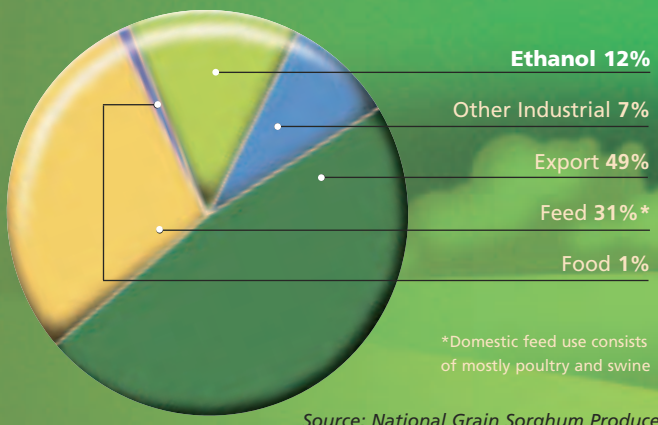
Recognizing the value-added benefits of ethanol production, thousands of farmers have invested in ethanol plants, thus capitalizing on profits from the plant's proceeds as well as ensuring a reliable market for their crop. By the end of 2003, 32 of the 72 ethanol plants across the U.S. were farmer-owned, and 12 of the 15 plants under construction are driven by farmer ownership. Therefore, taken as a whole, farmer-owned ethanol plants represent the single largest ethanol producer, comprising 40% of U.S. production capacity.

U.S. Corn Usage by Segment 2003



Source: USDA, ERS, Feed Outlook, Dec. '03

U.S. Grain Sorghum Usage by Segment 2003



*Domestic feed use consists of mostly poultry and swine

Source: National Grain Sorghum Producers

The Whole Kernel: Ethanol Coproducts

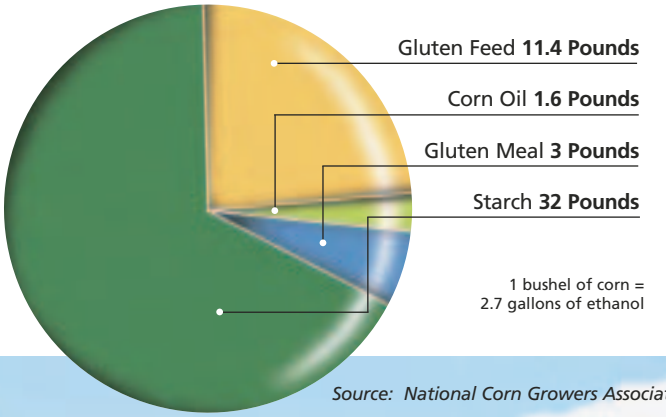
"The use of distillers grains has cut our feed costs considerably without reducing gains. Also, when receiving new cattle, we no longer have the problem of getting them to the bunk to eat. The aroma of distillers grains enables new cattle to go onto feed much quicker."

– John Radke, Radke Farms

In addition to ethanol, which is produced from the starch contained in grain, ethanol plants produce other coproducts including high-value livestock feed. The feed coproduct from dry mill ethanol production is referred to as distillers grains. Wet mills produce a range of coproducts, including gluten feed, germ meal and gluten meal.

In 2003, dry mill facilities accounted for 67% of U.S. ethanol production, and wet mills 33%. Ethanol dry mills produced approximately 6.4 million short tons of distillers grains. Ethanol wet mills produced approximately 470,000 short tons of corn gluten meal, 2.6 million short tons of corn gluten feed and germ meal, and 560 million pounds of corn oil.

Food and Fuel Products



Source: National Corn Growers Association

Feed Coproducts

By removing the starch from the grain, ethanol production concentrates the remaining fat, protein, fiber and minerals, thereby enhancing the nutrient viability and value of distillers grains. More space is left in the feed ration to meet the animal's nutritional requirements without exceeding recommended daily total dry matter intake.

With U.S. ethanol production growing, it is important to expand markets for coproducts. Today, distillers grains are primarily fed to dairy and beef cattle (ruminant animals). There may be opportunities in swine and poultry (nonruminant animals) feed markets as well. The RFA has recently partnered with the National Corn Growers Association and others to promote market development and research for distillers grains.

CO_2

Many plants also capture the carbon dioxide (CO_2) produced during the production process, and market it to dry ice manufacturers, carbonated beverage manufacturers and other food processors. In addition, there is a project underway in Kansas to inject the CO_2 into a marginal oil field for enhanced oil recovery.

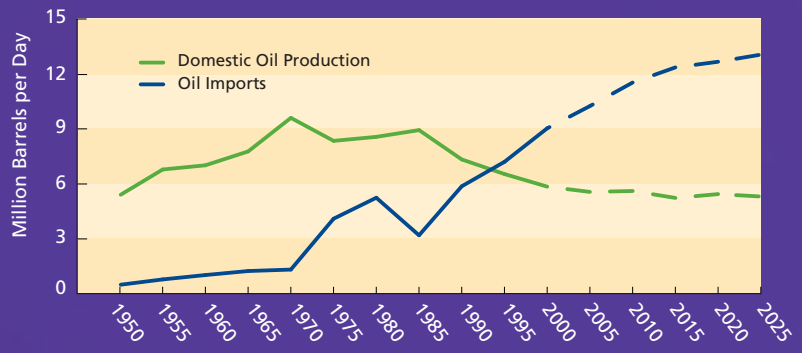
"As the availability of coproducts has increased, the usage of the coproducts has become more commonplace in feed yards. When used properly, wet feed coproducts have the potential to improve the cost of production for cattle producers."

– Bill Dicke, Cattlemen's Consulting LLC

Reducing Dependence on Foreign Oil

America's security and economic well-being are dependent upon foreign sources of crude oil. According to the U.S. Energy Information Administration, U.S. dependency on foreign oil is projected to grow from 62% in 2002 to more than 77% by 2025. Terrorist activity and political unrest in Saudi Arabia, Iraq, Venezuela, Nigeria and other major oil producing nations seriously jeopardizes the continuity and security of our oil supply.

U.S. Oil Production vs. Imports



Source: U.S. Energy Information Administration

The harsh security and economic impact of exporting hundreds of billions of U.S. dollars in return for oil has prompted Congress to consider the first major energy bill in more than a decade. While a multi-pronged approach is needed to combat our oil dependency, the increased use of domestic, renewable fuels like ethanol must play a large role. Increasing ethanol use, such as enacting a renewable fuels standard (RFS), will directly increase domestic fuel supplies and reduce our need for imported oil. Using home-grown ethanol keeps our energy dollars home, thereby stimulating the U.S. economy, creating jobs, and reducing the trade deficit.

"The flood of foreign crude imposes an economic penalty of enormous proportions that is not reflected in the price they pay at the gasoline pump. It is a penalty that costs jobs, drains investment capital and inflates the nation's defense burden... This translates into a pump price for gasoline of between $5.01 and $5.19."

- Milton Copulos, president, National Defense Council Foundation

Every 1 Btu of petroleum fuel used to produce ethanol yields a 6.34 Btu output, thereby greatly enhancing U.S. energy security. - USDA

From Fields to the Future

With ethanol production expanding at record pace, the industry continues to pursue new and expanded uses for ethanol. Opportunities exist in expanded E85 markets, as ethanol-blended diesel fuel, as a hydrogen source for fuel cells and as an aviation fuel. In addition, anticipated technological advances will make ethanol production from cellulose feedstocks - corn stover, rice straw, municipal solid waste, yard trimmings, grasses and trees - economical and attractive, dramatically increasing production possibilities.

E85

There are 3 million flexible fuel vehicles (FFVs) capable of operating on E85 (85 percent ethanol and 15 percent gasoline) or any blend in between, on the road today. Automakers will produce an estimated 2 million more each year. FFVs are available in most vehicle classes, including compacts, minivans, sedans, trucks and SUVs. There are more than 400 retail stations in the U.S. selling E85.

"The hydrogen can be produced from domestic sources – initially, natural gas; eventually, biomass, ethanol, clean coal, or nuclear energy. That's important. If you can produce something yourself, it means you're less dependent upon somebody else to produce it."

-- President George W. Bush, February 2003

For more information on ethanol and fuel cells, visit:

www.ethanolRFA.org/RFA_Fuel_Cell_White_Paper.pdf

E diesel

The E diesel Consortium is conducting research to determine the feasibility of blending ethanol with diesel fuel. Initially, E diesel may be used primarily in heavy-duty urban fleets. The E diesel Consortium is coordinating various technical efforts including all necessary testing and working with relevant organizations to set quality and performance standards.

Fuel Cells

President Bush's "Hydrogen Fuel Initiative" supports research and commercialization of fuel cells for automobiles and power generation. As a renewable fuel, ethanol is a very attractive fuel source for hydrogen production, reducing greenhouse gas emissions compared to fossil fuels. Tests have demonstrated that ethanol is more efficient and easier to reform into hydrogen than gasoline.

The first commercial demonstration of ethanol's potential to produce hydrogen to power a fuel cell is underway at Aventine Renewable Energy, Inc.'s Pekin, Illinois ethanol plant. The 13-kilowatt stationary fuel cell system is generating power for the plant's visitor center and additional energy for the plant. The project is a partnership with the U.S. Department of Energy, Caterpillar, Inc., Nuvera Fuel Cells, the State of Illinois, Renewable Fuels Association and Illinois Corn Growers Association.

Renewable Fuels Association

As the national trade association for the U.S. fuel ethanol industry, the Renewable Fuels Association (RFA) has been the "Voice of the Ethanol Industry" since 1981. The RFA serves as a vital link between the ethanol industry and the federal government, including the Congress and Administration, to promote increased production and use of ethanol through supportive policies, regulations, and research & development initiatives. The RFA also works with state governments, agriculture, petroleum, environment and public interest groups, and ethanol advocates across the country.

The RFA is recognized nationwide as a highly effective and professional organization dedicated to the continued vitality and growth of ethanol in the fuel marketplace. The RFA hosts the annual National Ethanol Conference: Policy & Marketing.

Objectives

- Promote federal, state and local government policies, programs and initiatives that encourage expanded ethanol use.
- Provide technically accurate and timely information to auto manufacturers and technicians, the media, policy makers, marketers and refiners, and the general public.
- Participate in educational activities to increase public awareness regarding renewable fuels and the positive contribution they make to American energy independence, the economy and the environment.
- Provide RFA members with the information necessary for informed business decisions.

Membership

RFA membership includes a broad cross-section of businesses, individuals and organizations dedicated to the expansion of the U.S. fuel ethanol industry. Membership includes Producer Members (public and private companies and farmer-owned cooperatives), Prospective Producer Members (plants under construction and development), Associate Members (organizations that provide products and services to the industry) and Supporting Members (non-profit organizations, academia and government entities).

The RFA is governed by a Board of Directors comprised of a representative from each producer member. The Board meets several times a year to set Association policy. RFA producer members represent 90% of U.S. fuel ethanol production.

RFA Committees

- Technical Committee
- Education & Promotion Committee
- Fuel Cell Task Force
- Founding Member, E diesel Consortium
- Founding Member, Feed Co-Products Working Group together with the National Corn Growers Association.

RFA Board of Directors

Bill Lee, Chippewa Valley Ethanol Co., Chairman

Ron Miller, Aventine Renewable Energy, Inc., Vice Chairman

Jeff Broin, Broin Companies, Secretary

Nathan Kimpel, New Energy Corp., Treasurer

Gary Smith, Abengoa Bioenergy Corp.
Terrance Kulesa, Ace Ethanol, LLC
Scott Trainum, Adkins Energy, LLC
Doug Mortensen, A.E. Staley
John Campbell, Ag Processing, Inc.
Jerry Janzig, Agra Resources Coop. d.b.a. EXOL
Norm Smeenk, Agri-Energy, LLC
Randall Doyal, Al-Corn Clean Fuel
Martin Andreas, Archer Daniels Midland Co.
Terry Jaffoni, Cargill, Inc.
Kerry Nixon, Central MN Ethanol Coop
Keith Kor, Corn Plus LLP
Dean Frederickson, Dakota Ethanol, LLC
Gerald Bachmeier, DENCO, LLC
Dave Easler, Ethanol2000, LLP
Tom Branhan, Glacial Lakes Energy, LLC
Dermot O'Brien, Golden Cheese Company of CA
James Freeman, Gopher State Ethanol
Rick Serie, Great Plains Ethanol, LLC
Ben Brown, Heartland Corn Products
Bill Paulsen, Heartland Grain Fuels, LP
Mark Dunn, J.R. Simplot
Steve Roe, Little Sioux Corn Processors, LP
Tony Simpson, Michigan Ethanol, LLC
Dave Nelson, Midwest Grain Processors
Fairman Thompson, Parallel Products
Owen Shunkwiler, Tall Corn Ethanol, LLC
Jeff Roskam, U.S. Energy Partners, LLC
Don Endres, VeraSun Energy Corp.
Dan Schwartzkopf, Wyoming Ethanol

RFA Staff

Bob Dinneen, President and CEO

Mary Giglio, Director, Congressional & Public Affairs

Larry Schafer, Legislative Counsel

Monte Shaw, Communications Director

Holly Newry, Office Manager

Kayt Wahlert, Administrative Assistant

RFA Associate & Prospective Producer Members

Alltech Biotechnology *Nicholasville, KY* www.alltech.com
Astle Corp. *Deer Creek, MN* www.astlecorp.com
Badger State Ethanol, LLC *Monroe, WI* www.badgerstateethanol.com
BBI International *Cotopaxi, CO* www.bbibiofuels.com
Bratney Companies *Des Moines, IA* www.bratney.com
Byrne & Company Limited *Preston, MN* www.byrneltd.com
California Renewable Fuels Council *Placentia, CA*
Christianson & Associates, PLLP *Willmar, MN* christiansoncpa.com
CoBank *Denver, CO* www.cobank.com
Dakota Renewable Fuels LLC *Fargo, ND* www.ndcorn.com
Delta-T Corporation *Williamsburg, VA* www.deltatcorp.com
Dorsey & Whitney, LLP *Washington, DC* www.dorsey.com
Eco-Energy, Inc. *Franklin, TN* www.eco-energyinc.com
Ethanol Products, LLC *Wichita, KS* www.ethanolproducts.com
Fagen, Inc. *Granite Falls, MN* www.fageninc.com
FCStone, LLC *West Des Moines, IA* www.fcstone.com
First Capitol Group, LLC *Platteville, WI* www.efutures.com
GATX Rail *Chicago, IL* www.gatx.com
Genencor International, Inc. *Rochester, NY* www.genencor.com
Grace Davison *Columbia, MD* www.gracedavison.com
GROWMARK, Inc. *Bloomington, IL* www.growmark.com
Hays Companies *Minneapolis, MN* www.hayscompanies.com
ICM, Inc. *Colwich, KS* www.icminc.com
Iogen Corp. *Ottawa, Ontario Canada* www.iogen.ca
KAAPA Ethanol, LLC *Minden, NE* www.kaapaethanol.com
Kinergy, LLC *Davis, CA*
Kleinfelder, Inc. *Parker, CO* www.kleinfelder.com
Land O'Lakes Farmland Feed, LLC *Shoreview, MN* www.landolakes.com
Lansing Grain Company, LLC *Overland Park, KS* www.lansinggrain.com
Lincolnland Agri-Energy, LLC *Palestine, IL* www.lincolnlandagrienergy.com
Lindquist & Vennum PLLP *Minneapolis, MN* www.lindquist.com
Lubrizol Corporation *Wickliffe, OH* www.lubrizol.com
Lurgi PSI Inc. *Memphis, TN* www.lurgipsi.com
Masada Oxynol, LLC *Birmingham, AL* www.masada.com
Mid-Missouri Energy *Carrollton, MO* www.midmissourienergy.com
Monsanto *St. Louis, MO* www.monsanto.com
National Corn Growers Association *Chesterfield, MO* www.ncga.com
National Grain Sorghum Producers *Lubbock, TX* sorghumgrowers.com
North America Bioproducts Corp. *Lawrenceville, GA* www.na-bio.com
Novozymes North America, Inc. *Franklinton, NC* www.novozymes.com
O2Diesel, Inc. *Newark, DE* www.o2diesel.net
Octel Starreon LLC *Littleton, CO* www.octelstarreon.com
Pioneer, A DuPont Company *Johnston, IA* www.pioneer.com
Quad County Corn Processors *Galva, IA* www.quad-county.com
Rocky Mountain Ethanol, LLC *Billings, MT*
The Rice Company - Krohn Division *Roseville, CA* www.riceco.com
The Scoular Company *Overland Park, KS* www.scoular.com
Tranter PHE, Inc. *Wichita Falls, TX* www.tranter.com
U.S. Development Group *Pasadena, TX* www.us-dev.com
U.S. Water Services *Cambridge, MN* www.uswaterservices.com
Wittig Energy Resources, LLC *McPherson, KS* www.wittigtransport.com

RFA

Renewable Fuels Association

One Massachusetts Avenue, NW
Suite 820
Washington, DC 20001
www.ethanolRFA.org
e-mail: info@ethanolRFA.org
(202) 289-3835
FAX (202) 289-7519