

MINUTES OF THE HOUSE COMMITTEE ON AGRICULTURE.

The meeting was called to order by Chairman Dan Johnson at 3:30 p.m. on February 7, 2001, in Room 423-S of the Capitol.

All members were present except: Representative Flora - excused  
Representative Light - absent

Committee staff present: Raney Gilliland, Legislative Research Department  
Gordon Self, Revisor of Statutes Office  
Kay Scarlett, Committee Secretary

Conferees appearing before the committee:

E. Dean Carlson, Secretary, Kansas Department of Transportation  
Jere White, Ex. Director, Kansas Corn Growers Assn./Kansas Grain Sorghum Producers Assn.  
Representative Rocky Nichols  
Jill Zimmerman, Anderson County Extension Agent  
Dale Ladd, McPherson County Extension Agent  
Gary Hobbie, Russell City Manager  
Dave VanderGriend, President and CEO, ICM, Colwich  
Bill Pracht, Eastern Kansas Agri Energy, Westphalia  
Jeff Torluemke, Senior VP, State Bank of Hoxie, Heartland Energy, Hoxie  
Scott Whitefoot, NESIKA Energy, Republic County  
Dave Dykstra, Vice President, Marketing, High Plains Corporation  
Greg Krissek, Director of Operations, Kansas Corn Growers Association  
Bill Fuller, Associate Director, Public Policy Division, Kansas Farm Bureau  
Doug Wareham, Vice President, Government Affairs, Kansas Grain and Feed Assn. (Written only)  
Kerri Ebert, President, Kansas Agricultural Alliance (Written only)

Others attending: See attached list

**Hearing on HB 2011 - Incentives for production of ethanol from agricultural products; amounts; removal of cap; expiration date.**

Chairman Johnson opened the hearing on **HB 2011**. Raney Gilliland, Legislative Research Department, explained that this bill would extend the Kansas Qualified Agricultural Ethyl Alcohol Producers Incentive Fund for agricultural ethyl alcohol production until July 1, 2011. In addition, the bill proposes to remove the cap on production and provide added incentives for increased or new agricultural ethyl alcohol production in Kansas.

E. Dean Carlson, Secretary, Kansas Department of Transportation, expressed concern about the potential impact on revenues available for the Comprehensive Transportation Program if the cap was eliminated and the incentive for new or expanded agricultural ethyl alcohol production as proposed in **HB 2011** was to pass. He encouraged the committee to not expand the incentive program beyond extending the sunset provision. (Attachment 1)

Jere White, Executive Director, Kansas Corn Growers Association and Kansas Grain Sorghum Producers Association, appeared in support of **HB 2011**. He discussed the Kansas Ethanol Plant Feasibility Study funded by the Kansas Corn Commission, Kansas Grain Sorghum Commission, and Kansas Department of Commerce & Housing and the potential for ethanol production in Kansas and its impact on the state's economy. He provided a copy of the report, "How Much Energy Does It Take to Make a Gallon of Ethanol," by David Lorenz and David Morris and a copy of a letter from Jim Wells, United States General Accounting Office, concerning federal tax incentives that benefit the petroleum and ethanol industries. (Attachment 2)

## CONTINUATION SHEET

Representative Rocky Nichols testified in support of **HB 2011** and outlined seven reasons he believes ethanol production and promotion makes sense for Kansas: adding value to Kansas grains; job creation and economic development; diversification of our motor fuels portfolio; reducing our State's and Nation's reliance on foreign oil; lower petroleum gas prices; positive trade benefits; and positive environmental and health benefits. (Attachment 3)

Jill Zimmerman, Anderson County Extension Agent, discussed her involvement with the Anderson County Economic Development Committee and creation of the 47-member producer alliance known as Eastern Kansas Agri Energy and their interest in pursuing an ethanol production facility in eastern Kansas. (Attachment 4)

Dale Ladd, McPherson County Extension Agent, reported that the McPherson Chamber of Commerce, several area cooperatives, and a group of central Kansas feedlots have been working together intensively for the past five months to study the economic feasibility of converting grain sorghum into a renewable fuel, at the same time providing a very high quality concentrate product to cattle feeders. (Attachment 5)

Gary Hobbie, Russell City Manager, testified in support of **HB 2011**. He discussed the City of Russell's partnership with private industry for the city to produce electricity with their new generation units, to be used by the citizens of Russell; then to reuse the waste heat to fire steam boilers to be used in the ethanol distillation process; then to reuse the waste heat again in the drying of the distillers grains to be shipped to area feedlots to be used as supplemental feed grains. He also reported on a pilot project to capture the CO-2 from the ethanol plant to be used in an oil susquestrian project to increase the amount of oil produced by wells located south of Russell. (Attachment 6)

Dave VanderGriend, President and CEO of ICM, Colwich, the company designing and building the new ethanol plant in Russell, appeared in support of **HB 2011** and discussed the technical aspects of building new ethanol production facilities.

Bill Pracht, Eastern Kansas Agri Energy, Westphalia, reported on the 47-member producer alliance known as Eastern Kansas Agri Energy and their efforts in investigating the feasibility of building an ethanol plant in Anderson County. He noted that an ethanol plant would add about 30 new jobs, provide a source of livestock feed to area producers, and if successful, provide a better return than investing in farm land. (Attachment 7)

Jeff Torluecke, Senior Vice President, State Bank of Hoxie, and Heartland Energy, Hoxie, appeared in support of **HB 2011** to extend and expand the ethanol production incentive.

Scott Whitefoot, NESIKA Energy, Republic County, testified in support of **HB 2011** for added incentives to operate and build new ethanol plants in Kansas.

Dave Dykstra, Vice President, Marketing, High Plains Corporation, discussed the impact the Agricultural Ethyl Alcohol Producers Incentive has had on their operations and the economic benefits ethanol production has had on the state. He reported that with this incentive, their company has grown considerably over the past 21 years and is now the nation's seventh largest producer of fuel ethanol. (Attachment 8)

Greg Krissek, Director of Operations, Kansas Corn Growers Association, testified in support of **HB 2011**. He said the economic benefits for employment, suppliers, agriculture, and associated industries that accrue to communities goes far beyond the level of the incentive payments received. (Attachment 9)

Bill Fuller, Associate Director, Public Policy Division, Kansas Farm Bureau, appeared in support of **HB 2011**. He reported that Kansas Farm Bureau believes promoting ethanol production and use in Kansas will have positive impacts on agriculture producers, the economy, and the environment. (Attachment 10)

Doug Wareham, Vice President, Government Affairs, Kansas Grain and Feed Association, provided written testimony in support of **HB 2011**. (Attachment 11)

Kerri Ebert, President of the Kansas Agricultural Alliance, representing 21 agricultural associations, submitted written testimony in support of **HB 2011**. (Attachment 12)



CONTINUATION SHEET

Copies of the 2000 Fact Book on the *United States of America Fuel Ethanol Program* published by the Clean Fuels Development Coalition were distributed compliments of the Kansas Ethanol Producers. (Attachment13)

There being no other conferees, the Chairman closed the hearing on **HB 2011**.

Representative Joann Freeborn moved to withdraw her request for a committee bill to establish an AgrAbility Program. There being no objections, the motion carried.

**Action on HB 2101 - Creating the plant pest emergency response fund.**

Representative Dahl moved to pass **HB 2101** favorably. The motion was seconded by Representative Hayzlett. Committee discussion ensued. Representative Schwartz offered a substitute motion to amend **HB 2101** by placing a \$15,000 cap on the fund, to trigger back in at \$5,000. Seconded by Representative Freeborn, the motion carried. **HB 2101** passed as amended.

The meeting adjourned at 5:15 p.m. The next meeting is scheduled for February 12, 2001.

# HOUSE AGRICULTURE COMMITTEE GUEST LIST

DATE: FEBRUARY 7, 2001

NAME	REPRESENTING
Scott Whitfoot	Republic County
Thayne Larson	Republic County
Dave Dykstra	High Plains
Jere White	KCGA - KGSFA
Sill Zimmerman	Anderson Co Ag Agent
Bill Pracht	Eastern Ks Agri - Energy
Dale Ladd	McPherson Co. Extension Ag Agent
Paul Johnson	PAK
Bill Bauman	Menlo, Ks
Keri Ebert	Kansas Dairy Association
Rebecca Reed	KDA
Robert Haley	KDOT
Jay Zimmerman	Sumner Co.
JEFF TORLUEMKE	Sheridan County
DAVE VANDER GRIEND	ICM Wichita Ks
Tom Bruno	FARM CREDIT
Bill Watts	KDOT
Nancy Bogina	KDOT
E. Dean Carlson	KDOT



**KANSAS DEPARTMENT OF TRANSPORTATION  
OFFICE OF THE SECRETARY OF TRANSPORTATION**

**Docking State Office Building  
915 SW Harrison Street, Rm. 730**

**Topeka, Kansas 66612-1568**

**Ph. (785) 296-3461 FAX (785) 296-1095**

**TTY (785) 296-3585**

**TESTIMONY BEFORE**

**HOUSE AGRICULTURE COMMITTEE**

**REGARDING HOUSE BILL 2011**

**CHANGES TO THE KANSAS QUALIFIED ETHYL ALCOHOL PRODUCERS INCENTIVE  
PROGRAM**

**February 7, 2001**

E. Dean Carlson  
Secretary of Transportation

Bill Graves  
Governor

Mr. Chairman and Committee Members:

I am Dean Carlson, Secretary of the Kansas Department of Transportation. On behalf of the Department, I am here today to testify on House Bill 2011 regarding the changes to the Kansas Qualified Ethyl Alcohol Producers Incentive Program. We feel obligated to point out bills, which have the potential to impact the revenues available for the Comprehensive Transportation Program.

The current Kansas Qualified Ethyl Alcohol Producers Incentive Program is scheduled to sunset on July 1, 2001. The Governor and the Department are supportive of the development in Kansas of the production of renewable ethanol and support the extension of the current program. KDOT's projections for the Comprehensive Transportation Program assumed that the current incentive program would not sunset during the life of the Comprehensive Transportation Program.

House Bill 2011 would amend the Kansas Qualified Ethyl Alcohol Producers Incentive Program by modifying the current incentive payment program and extending the program to July 1, 2011.

The current incentive program provides \$2.5 million per year from the motor fuel tax receipts. This amount is divided among the Kansas qualified ethyl alcohol producers on the basis of qualified production, limited to a maximum of \$0.20 per gallon. House Bill 2011 would eliminate the cap. The bill would change the incentive to fixed \$0.05 per gallon for production up to the amount of production in calendar year 2000 and \$0.075 per gallon for five years for new or expanded production after which the incentive would be \$0.05 per gallon.

Although it is difficult to predict the impact of the incentive program, if current production were to double from the calendar year 2000, production of 36 million gallons, the amount required to support the proposed changes, would be an additional \$2 million per year for 5 years and \$1.1 million thereafter. A \$2 million and \$1.1 million annual increase in the incentive would reduce the annual revenues to the State Highway Fund by \$1.25 million and \$0.69 million and to the Special City and County Highway Fund by \$0.75 million and \$0.41 million respectively. The unanticipated impact to the Comprehensive Transportation Program through FY 2009, excluding the loss to the Special City and County Highway Fund, is estimated to be a reduction of \$10.9 million including \$2.5 million loss in interest revenue.

Successful completion of the Comprehensive Transportation Program is predicated on a given revenue stream. HB 2011 goes beyond the projected current incentive program causing a potential reduction of the anticipated revenue stream. We therefore encourage the committee to not expand the incentive program beyond extending the sunset provisions.

House Agriculture Committee  
February 7, 2001  
Attachment 1





## A look at the potential for ethanol production in Kansas

*Jere White, Executive Director*

*Kansas Corn Growers Association*

*Kansas Grain Sorghum Producers Association*

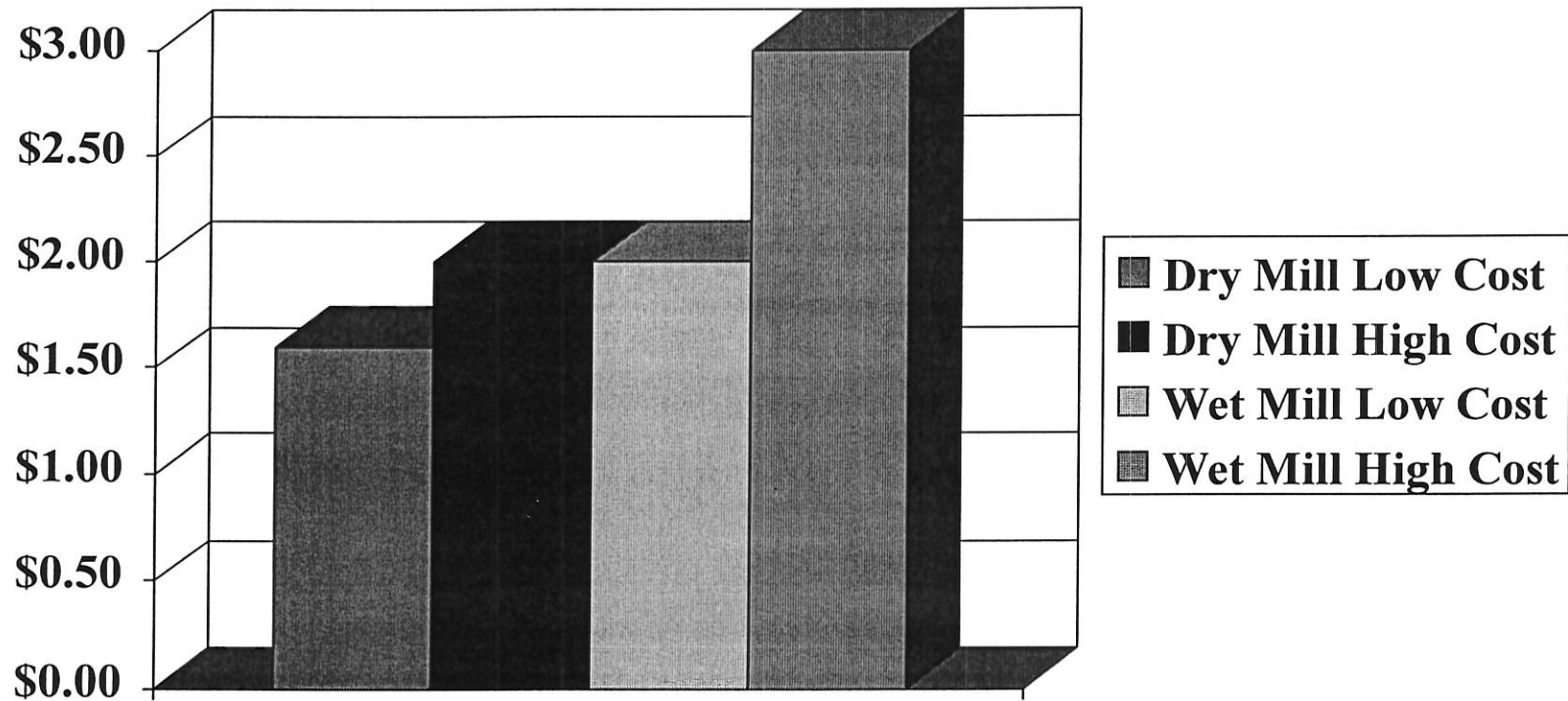




# **ECONOMIC IMPACT OF ETHANOL PRODUCTION**

- **High Capital Investment and Construction Cost**
- **High Dollar Volume Sales**
- **Agricultural Impact**
- **Creation of Jobs with Higher than Average Wage Scale**
- **High Percentage of Revenue Remains in State**
- **Multiple Plant Opportunities**
- **State and Local Taxes Paid**
- **Energy Consumption**

# Average Cost of Construction



# Considerations in Location

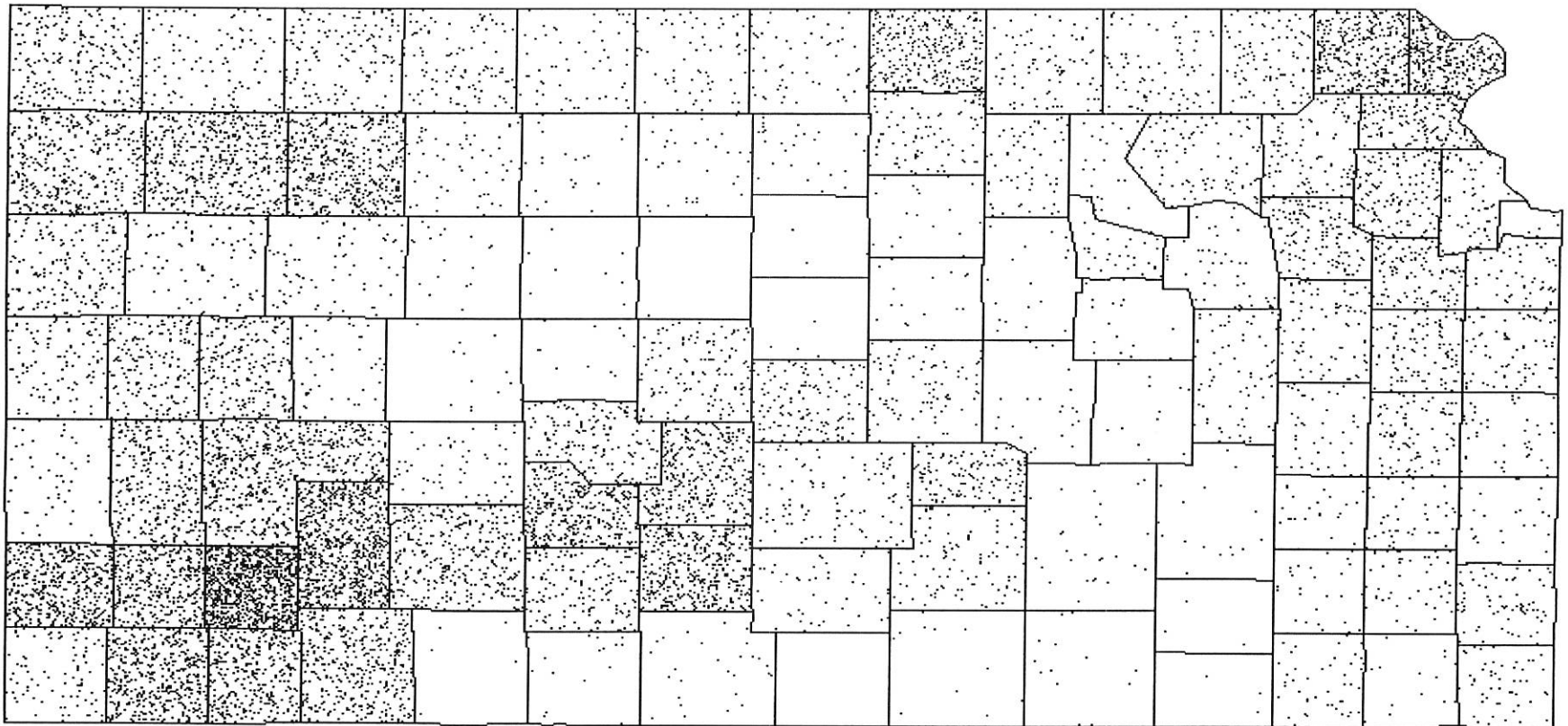
- **Close proximity to plant feedstocks.**
- **Rail access.**
- **Road access.**
- **Availability of utilities; electricity, natural gas, and water.**
- **Availability of a wastewater treatment plant.**
- **Close proximity to dried distillers grains markets.**
- **Access to labor.**
- **Access to ethanol markets.**



# NAS Production Data

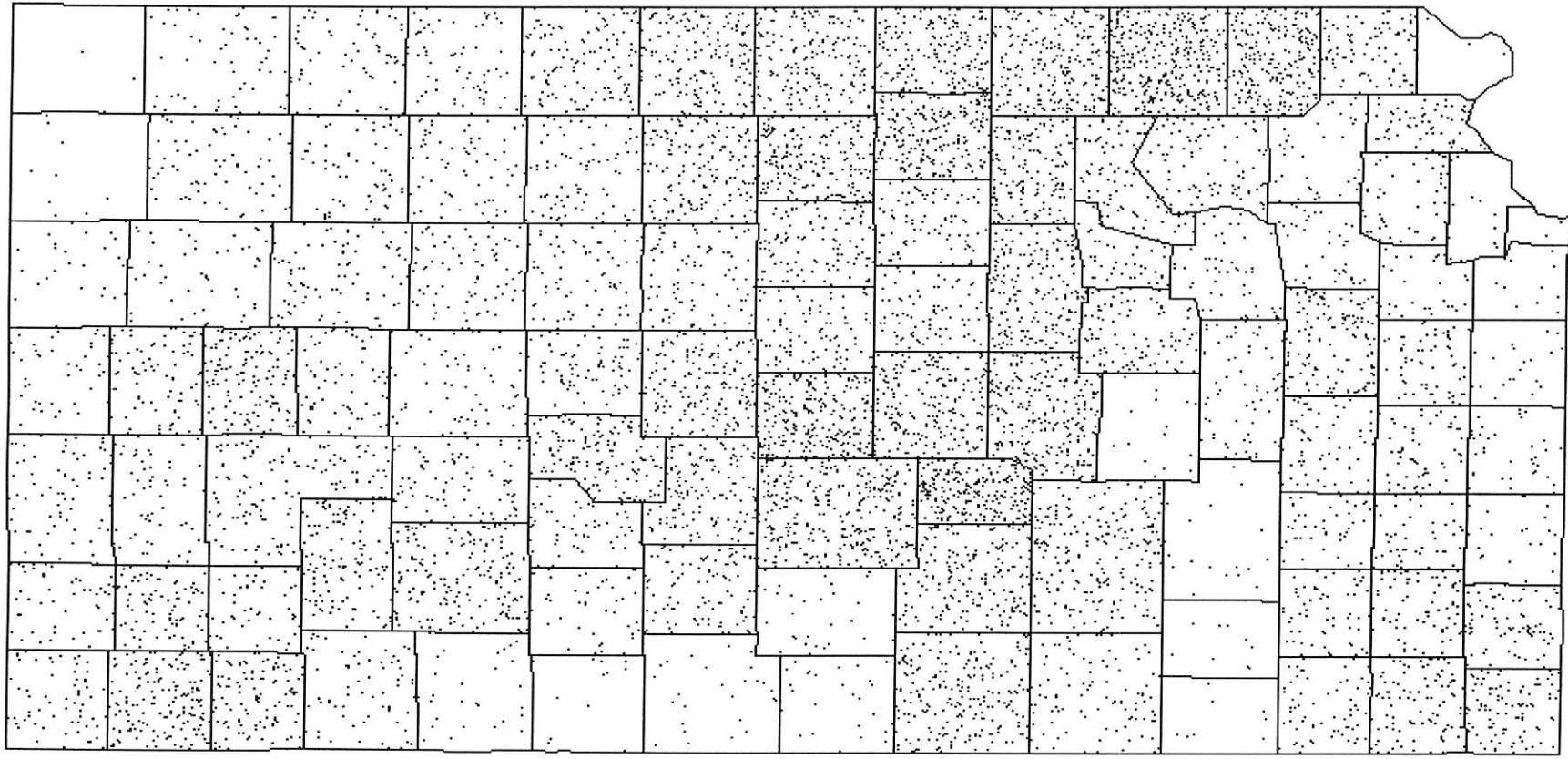
<b>District</b>	<b>Corn</b> (bushels)	<b>Sorghum</b> (bushels)	<b>Cattle On Feed</b> (head)	<b>Hogs</b> (head)
NW	74,890,000	16,253,000	145,000	146,000
WC	34,090,000	28,042,000	430,000	99,000
SW	153,260,000	36,842,000	1,165,000	1,453,000
NC	25,545,000	52,577,000	60,000	577,000
C	10,025,000	41,651,000	115,000	162,000
SC	44,395,000	31,307,000	160,000	187,000
NE	46,490,000	23,856,000	15,000	404,000
EC	22,035,000	13,122,000	30,000	199,000
SE	7,860,000	20,350,000	40,000	226,000
<b>STATE TOTAL</b>	418,950 (000)	264,000 (000)	2,160 (000)	3,453 (000)

# Corn



**1 Dot = 15,000 Bushels**

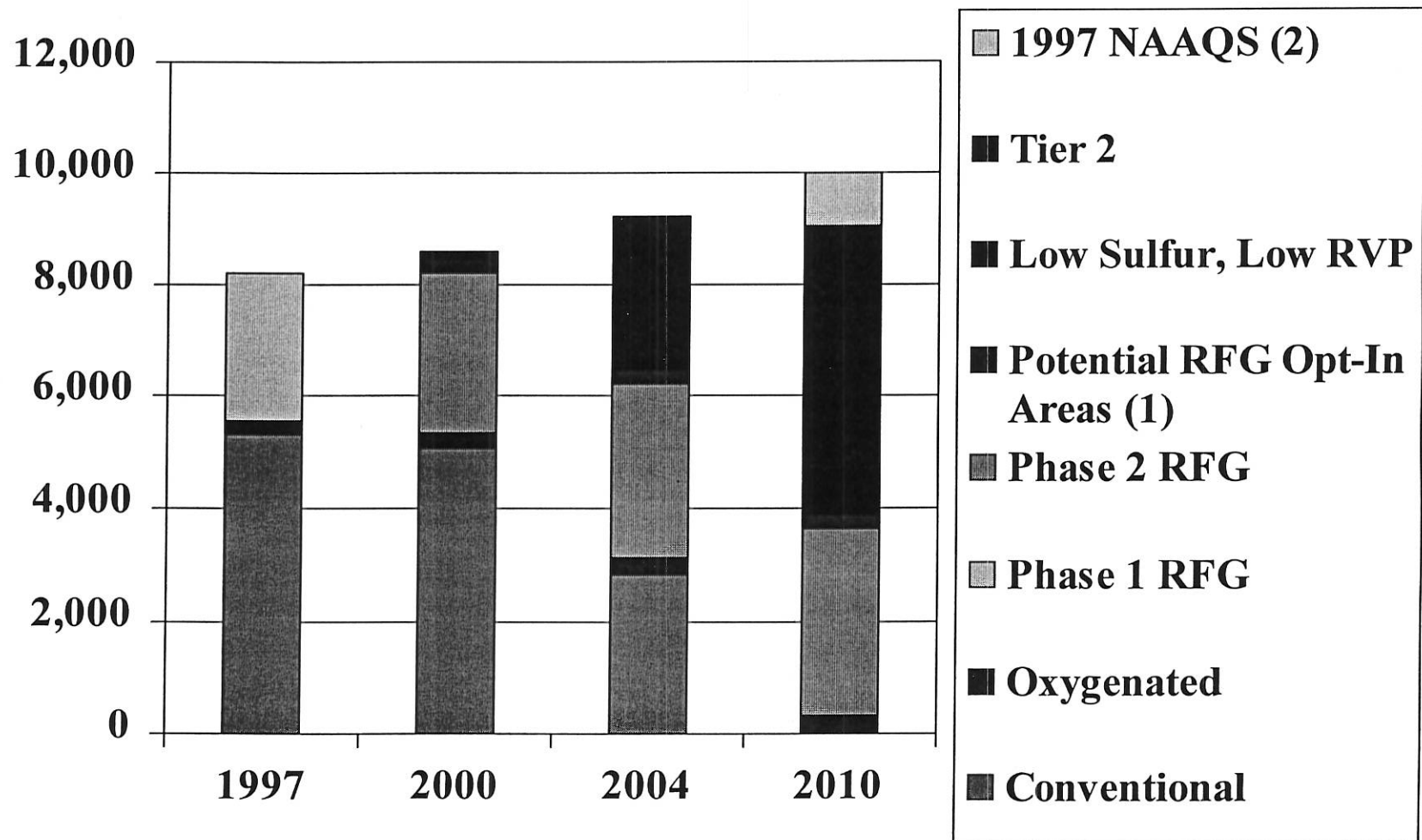
# Sorghum



**1 Dot = 15,000 Bushels**

# Projected US Gasoline Usage

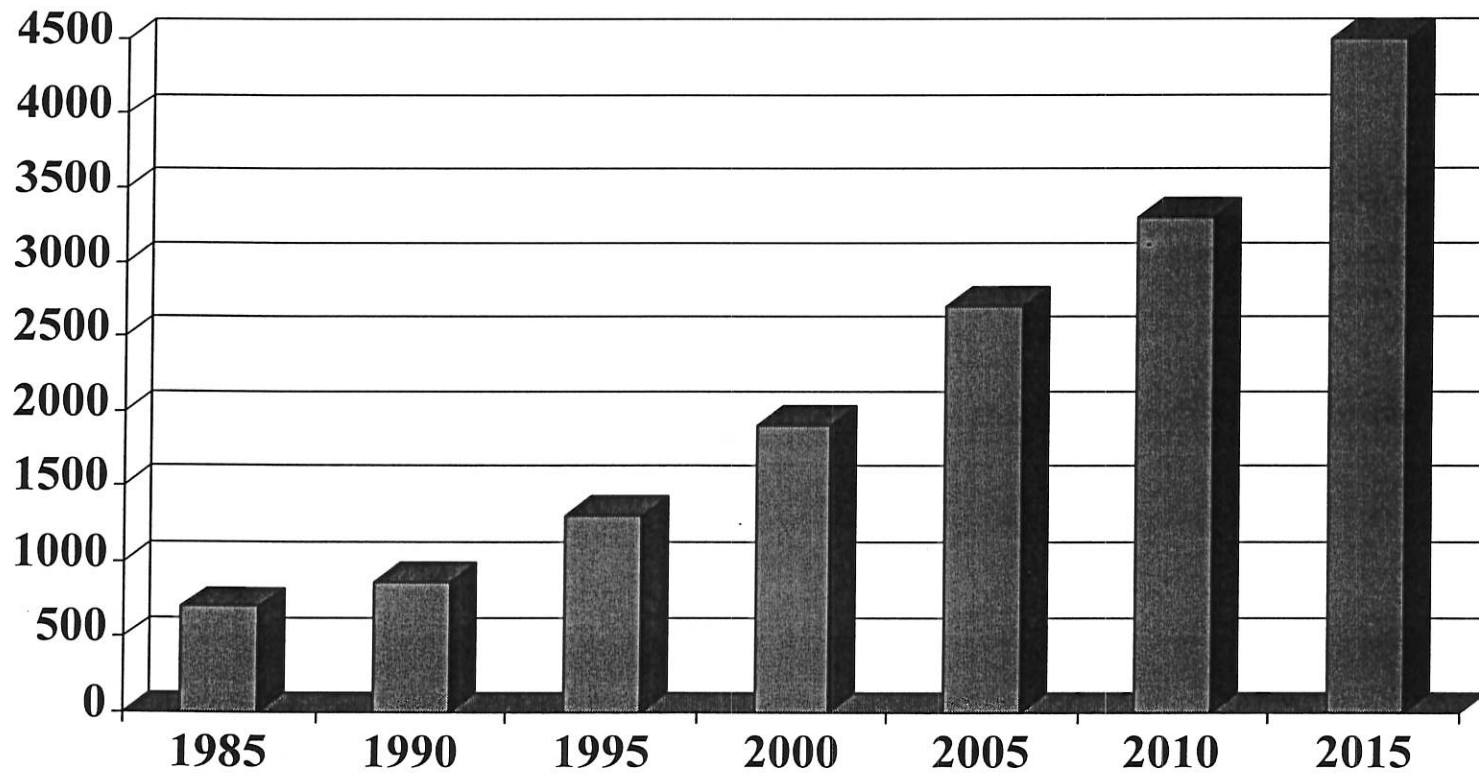
in thousands of barrels per day





# US Ethanol Demand

*in thousands of gallons*



Source: Energy Information Administration

2-11

**ASSUMPTION TEMPLATE FOR  
AN ETHANOL PLANT  
(PER MILLION GALLONS OF PRODUCTION)**

## **Inputs**

- 1,875,000 gallons of fresh water
- 374,532 bushels of corn/sorghum  
(based on a 2.67 conversion factor)
- 1,162,500 Kwh of electricity
- 44,875 MCF of natural gas

ASSUMPTION TEMPLATE FOR  
AN ETHANOL PLANT  
(PER MILLION GALLONS OF PRODUCTION)

2-12

## Outputs

- 1,050,000 gallons of 198+ proof denatured ethanol
- 3,090 tons of Distillers Dried Grains with Solubles (DDGS)

**ASSUMPTION TEMPLATE FOR  
AN ETHANOL PLANT  
(PER MILLION GALLONS OF PRODUCTION)**

## **Transportation Statistics**

- **Incoming**
  - 468 truckloads of corn/sorghum
- **Outgoing**
  - 125 truckloads of ethanol or 33 railcars
  - 103 truckloads of DDGS or 39 railcars



# How Much Energy Does It Take to Make a Gallon of Ethanol?

David Lorenz and David Morris

August 1995

©1995 Institute for Local-Self Reliance (ILSR)  
Reproduction permitted with attribution to ILSR

One of the most controversial issues relating to ethanol is the question of what environmentalists call the "net energy" of ethanol production. Simply put, is more energy used to grow and process the raw material into ethanol than is contained in the ethanol itself?

In 1992, ILSR addressed this question. Our report, based on actual energy consumption data from farmers and ethanol plant operators, was widely disseminated and its methodology has been imitated by a number of other researchers. This paper updates the data in that original report and addresses some of the concerns that some reviewers of the original report expressed.

Our analysis again concludes that the production of ethanol from corn is a positive net energy generator. Indeed, the numbers look even more attractive now than they did in 1992. More energy is contained in the ethanol and the other by-products of corn processing than is used to grow the corn and convert it into ethanol and by-products. If corn farmers use state-of-the-art, energy efficient farming techniques and ethanol plants integrate state-of-the-art production processes, then the amount of energy contained in a gallon of ethanol and the other by-products is more than twice the energy used to grow the corn and convert it into ethanol.

As the ethanol industry expands, it may increasingly rely on more abundant and potentially lower-cost cellulosic crops (i.e. fast growing trees, grasses, etc.). When that occurs, the net energy of producing ethanol will become even more attractive.

Three subordinate questions must be addressed to estimate the energy inputs and outputs involved in making ethanol.

1. How much energy is used to grow the raw material?
2. How much energy is used to manufacture the ethanol?
3. How do we allocate the energy used in steps one and two between ethanol and the other co-products produced from the raw material?

Answers to these three questions are presented in Table 1, which is divided into three sections that parallel the three questions: feedstock energy; processing energy; co-product energy credits. All energy inputs and outputs in this report are on a high heat value basis.<sup>1</sup>

**Table 1: Energy Used to Make Ethanol From Corn and Cellulose (Btus per Gallon of Ethanol)**

	Corn Ethanol (Industry Average)	Corn Ethanol (Industry Best)	Corn Ethanol (State-of-the- Art)	Cellulosic Crop- Based Ethanol
Fertilizer	12,981	7,542	3,869	3,549
Pesticide	1,060	643	406	437
Fuel	2,651	1,565	1,321	8,120
Irrigation	7,046	6,624	6,046	--
Other (Feedstock)	3,395	3,248	3,122	2,558
<i>Total (feedstock)</i>	<i>27,134</i>	<i>19,622</i>	<i>14,765</i>	<i>14,663</i>
Process Steam	36,732	28,201	26,185	49,075
Electricity	14,444	7,300	5,148	8,925
Bulk Transport	1,330	1,100	800	1,330
Other (process)	1,450	1,282	1,050	2,100
<i>Total (processing)</i>	<i>53,956</i>	<i>37,883</i>	<i>33,183</i>	<i>61,430</i>
<b>TOTAL ENERGY INPUT</b>	<b>81,090</b>	<b>57,504</b>	<b>47,948</b>	<b>76,093</b>
Energy in Ethanol	84,100	84,100	84,100	84,100
Co-product Credits	27,579	36,261	36,261	115,400
<b>TOTAL ENERGY OUTPUT</b>	<b>111,679</b>	<b>120,361</b>	<b>120,361</b>	<b>199,500</b>
Net Energy Gain	30,589	62,857	72,413	123,407
<b>Percent Gain</b>	<b>38%</b>	<b>109%</b>	<b>151%</b>	<b>162%</b>

We focus on corn because corn accounts for over 90 percent of the current feedstock for ethanol production in the U.S. and because corn-derived ethanol has been at the center of the controversy about the energetics of ethanol.

The data in Table 1 are presented from four different perspectives:

The first column presents the energetics of ethanol based on the current energy efficiency of corn farming and ethanol production. Assuming the national average for energy used in growing corn and for energy used in the manufacture of ethanol, about 36,732 more BTUs, or 38 percent more energy is contained in the ethanol and other products produced in the corn processing facility than is used to grow the corn and make the products. In other words, the net energy ratio is 1.38:1.

The second column presents the energetics of ethanol based on the assumption that the corn is grown in the state with the most efficient corn farmers and the ethanol is made in the most energy efficient existing ethanol production facility. In this case, over two BTUs of energy are produced for every one BTU of energy used. The net energy ratio is 2.09:1.

The third column presents the energetics of ethanol based on the assumption that corn farmers and ethanol facilities use state-of-the-art practices. This is a best-case and hypothetical scenario. If farmers and industry were to use all the best technologies and practices the net energy ratio would be 2.51:1.

The data for the first three columns has been gathered from actual farming and ethanol production facilities. The data in the fourth column on the energetics of cellulosic crop-derived ethanol is more hypothetical since as yet no ethanol produced on a commercial scale is from cellulose. Feedstock production data assumes that a short rotation woody crop, such as a hybrid poplar, is used and processing energy data is taken from biomass-based ethanol facilities in the planning stages. The net energy ratio is 2.62:1.<sup>2</sup>

The reader can "mix and match" components from Table 1. For example, if an average efficiency corn farm provided the feedstock for the most efficient ethanol plant, the entire process would use 27,134 BTUs in the growing of corn plus 37,883 BTUs for the processing into various products for a total of 65,017 BTUs. With the lower co-product credits of 27,579 BTUs in column one, the total energy output would be 111,679 BTUs and the net energy increase is thus 46,662 BTUs. In this case the energy output/input ratio comes to 1.72.

---

## 1. How much energy is used to grow the corn?

This is a complicated question because of the wide variations in farming practices and farming conditions. Corn is grown in a variety of ways and in a variety of climatic and soil conditions. All of these affect the amounts and kinds of energy used.

For example, the single largest component of on-farm use is for nitrogen fertilizer, representing about 40 percent of all energy used in corn planting, cultivation and harvesting. The use of nitrogen fertilizer varies dramatically. Corn planted in rotation with soybeans or other legumes uses much less fertilizer than corn grown continuously.<sup>3</sup>

Corn farmers nationwide make 1.3-2.2 applications of nitrogen per year. Those who monitor the existing nitrogen in the soil before additional applications are able to reduce nitrogen fertilizer rates by up to 25 percent without affecting yields.<sup>4</sup>

The National Research Council notes, "Within a given region for a specific crop, average production cost per unit of output on the most efficient farms are typically 25 percent less, and often more than 50 percent less, than the average cost on less efficient farms." The study concluded that in 1987 the most efficient Minnesota corn farms used about 40 percent less fertilizer and pesticide per bushel than the least efficient farm.<sup>5</sup>

A Missouri study of 1,000 farms concluded that a 40 percent reduction in nitrogen applications is possible even among farmers using corn/soybean rotation systems if they adopt alternative growing techniques.<sup>6</sup>

Large farms tend to use continuous corn planting and higher nitrogen fertilizer applications. Smaller farm operations tend to rotate corn and soybeans or other legumes, lowering nitrogen fertilizer applications. From year to year large variations might occur even on the same farm due to weather conditions. Pennsylvania nitrogen fertilizer use, for example, ranged from 113 pounds per acre in 1988 to over 140 pounds in 1989 and 1990 to 76 pounds in 1993.

Our conclusions related to on-farm energy use are contained in Table 2, Agricultural Energy Use for Corn Production in the United States. This Table is the basis for the Feedstock Production data in Table 1.

**Table 2: Agricultural Energy Use for Corn Production in the United States**

		Average(National)			Best Existing(State)			State of the Art (Farmer)
	lbs/acre (corn)	BTU/acre (corn)	BTU/gal (ethanol)	lbs/acre (corn)	BTU/acre (corn)	BTU/gal (ethanol)	lbs/acre (corn)	BTU/acre (corn)
Nitrogen	123	3,395,415	11,096	73	2,015,165	6,459	38	1,048,990
Phosphorus	47	289,990	948	37	228,290	732	15	92,550
Potash	55	286,825	937	21	109,515	351	17	88,655
Pesticide	3	324,512	1,060	1.92	200,668	643	1.2	129,246
Fuel	5.85 (gal.)	811,337	2,651	3.52 (gal.)	488,189	1,565	3.03 (gal.)	420,231
Irrigation	-	2,156,200	7,046	-	2,026,828	6,624	-	1,850,020
Other	-	1,038,790	3,395	-	1,013,527	3,248	-	992,947
Total Energy	-	8,303,069	27,134	-	6,082,182	19,622	-	4,622,638

The national average for nitrogen fertilizer application for corn production from 1991-1993 was on average 123 pounds per acre<sup>7</sup>. South Dakota farmers used the least amount. South Dakota is the ninth largest producer of corn in the United States with a 1991

production of 240.5 million bushels. The state has approximately 20,000 mostly small farms that primarily rely on corn/soybean rotations. South Dakota has traditionally been below the national average in nitrogen fertilizer application. In 1989 it used 131 pounds per acre, dropping to 71 pounds in 1991 and 70 pounds in 1993.

Aside from fertilizers, energy is used for farm vehicles and for crop drying, seed corn production, on-farm electricity, bulk crop transportation and for crop irrigation. The use of irrigation, in particular, makes a significant difference in the energetics of corn. Only 16 percent of all corn grown in the U.S. comes from irrigated farms. Thus, in the first column of Table 1 under "Irrigation" we have assigned a weighted average of 16 percent in our calculations.<sup>8</sup> The average farm uses about 5.85 gallons of diesel fuel per acre. Estimates for best-existing fuel consumption are based on no-till cultivation techniques.

The state-of-the-art column assumes that farmers use low input agricultural practices and new hybrid varieties, like Pioneer Hi-Bred International's new tropical corn.

Although the state of the art column is intended to represent a hypothetical best-case, we have identified at least one farmer who has already achieved similar results. Since 1987, the Thompson farm located in Central Iowa, has been using 35 percent less energy than the national average, while achieving yields 30 percent above the national average. Its total energy input is about 5 million BTUs per acre of corn compared to our state-of-the-art estimate of 4.6 million BTUs and the national average of 8.4 million BTUs.

Translated into energy input per gallon of ethanol, the Thompson farm contributes about 16,800 BTUs per gallon of ethanol produced compared to our State-of-the-Art figures of 14,800 BTUs per gallon.<sup>9</sup>

Our conclusion is that, for corn production, farmers use 27,134 BTUs per gallon of ethanol. The most energy-efficient farms use 19,622 BTUs while the state-of-the-art is 14,764 BTUs per gallon. For comparative purposes, we also include the energy used to raise hybrid poplar, 14,663 BTUs per gallon of ethanol produced.

---

## 2. How much energy is used to make the ethanol?

The data in Table 1 for ethanol production are contained in the section titled Processing Energy Input. They are based on the weighted average of both wet and dry milling operations that produce at least 10 million gallons per year.<sup>10</sup> Table 3 presents these energy requirements for both wet and dry mills. The data is taken from actual plant operations as of early 1995.

**Table 3: Ethanol Processing Energy Use for Wet and Dry Mills**

	Average(National)	Best	State of te
--	-------------------	------	-------------



			Existing(State)		Art (Farmer)	
	Wet Mill (BTU/gal)	Dry Mill (BTU/gal)	Wet Mill (BTU/gal)	Dry Mill (BTU/gal)	Wet Mill (BTU/gal)	Dry Mill (BTU/gal)
Process Steam	35,400	39,000	29,200	26,500	26,000	26,500
Electricity	17,103 (2.07 kWh)	9,915 (1.2 kWh)	8,676 (1.05 kWh)	4,957 (0.6 kWh)	5,872 (0.9 kWh)	3,915 (0.6 kWh)
Bulk Transport	1,330	1,330	1,100	1,100	800	800
Other (process)	1,450	1,450	1,282	1,282	1,050	1,050
Processing Total	55,283	51,695	40,258	33,839	33,722	32,265

The modern motor fuel grade ethanol industry is only 18 years old. Early plants were very inefficient. Indeed, in 1980 a typical ethanol plant all by itself consumed more energy than was contained in a gallon of ethanol. Some plants used as much as 120,000 BTUs to produce a gallon of ethanol that contained only 84,100 BTUs of energy.

In the last decade many ethanol plants have become much more energy efficient. In 1980, for example, ethanol plants used 2.5 to 4.0 kWh of electricity per gallon of ethanol produced. Today they use as little as 0.6 kWh. The majority of ethanol producers still purchase electricity from outside sources, but newer facilities generate electricity from process steam within the plant.

In the late 1970s, ethanol plants did not recover waste heat. Today they do. Old energy intensive rectification and solvent extraction systems required 12,000 BTUs per gallon of ethanol produced. Newer molecular sieves need only 500 BTUs.<sup>11</sup> Larger producers have been using molecular sieves for several years. Now smaller plants (20 million gallons per year and less) are starting to incorporate them.

Best-existing and state-of-the-art ethanol plants can achieve energy reductions through a combination of these technological innovations. Molecular sieves reduce distillation energy significantly; low cost cogeneration facilities produce process steam and electricity; and semi-permeable membranes efficiently remove co-products from the process water to reduce the energy requirements of drying.

Wet mills, which account for 63 percent of all ethanol currently produced, extract higher value co-products than dry mills. Co-products from wet mills include corn oil, 21 percent protein feed, 60 percent gluten meal, germ, and several grades of refined starches and corn sweeteners. In dry milling, co-products can include corn oil and distillers dry grain with solubles (DDGS), which is used as animal feed. Carbon dioxide is a fermentation by-product of both milling processes.

Dry mills derive the DDGS co-product from the process water after fermentation occurs. It then requires a significant amount of energy to dry this co-product into a saleable form. Wet mills derive the majority of the co-products before fermentation through mechanical separators, centrifuges, and screens. All told, wet mills require 60 percent more electrical energy than dry mills on average, while requiring 10 percent less thermal energy. These differences are related specifically to the processing of the co-products, and are illustrated in the "Average" column in Table 3.

An integrated, relatively small-scale dry mill could avoid drying energy requirements for co-products. Reeve Agri-Energy in Garden City, Kansas, operates a 10 million gallon per year plant that feeds wet DDGS to its cattle. This operation uses only about 33,000 BTUs to produce a gallon of ethanol. However, a limited number of locations exist with a sufficient number of nearby livestock to justify such an operation, and it would probably not be economical for larger dry milling operations to adopt such practices.

A wider number of wet mills, on the other hand, may be able to achieve the energy use levels noted in the best existing wet mill category in Table 3.

We conclude that the ethanol industry, on average, uses 53,956 BTUs per gallon to manufacture ethanol. The best existing plants use 37,883 BTUs per gallon. Next generation plants will require only 33,183 BTUs per gallon of ethanol produced.

---

### **3. How do we divide the energy used among the products produced?**

If we add the amount of energy currently used in growing corn on the average farm to the amount of energy used to make ethanol in the average processing plant today, the total is 81,090 BTUs per gallon (Table 1, Column 1). Under the best-existing practices, the amount of energy used to grow the corn and convert it into ethanol is 57,504 BTUs per gallon. Ethanol itself contains 84,100 BTUs per gallon. Thus even without taking into account the energy used to make co-products, ethanol is a net energy generator.

But an analysis that excludes co-product energy credits is inappropriate. The same energy used to grow the corn and much of the energy used to process the corn into ethanol is used to make other products as well. Consequently, we need to allocate the energy used in the cultivation and production process over a variety of products. This can be done in several ways.

One is by taking the actual energy content of the co-products to estimate the energy credit. For example, 21 percent protein feed has a calorie content of 16,388 BTUs per pound. The problem with this method is that it puts a fuel value on what is a food and thus undermines the true value of the product.

Another way to assign an energy value to co-products is based on their market value. This is done by adding up the market value, in dollars, of all the products from corn



processing, including ethanol, and then allocating energy credits based on each product's proportion of the total market value. For example, Table 4 shows the material balance and energy allocation based on market value for a typical wet milling process. Here the various co-products account for 43 percent of the total value derived from a bushel of corn, and thus are given an energy credit of 36,261 BTUs per gallon of ethanol.

**Table 4: Market Value Method for Allocating Energy for Corn Wet Milling (1 bushel=52 pounds)**

Products	Amount Produced (pounds)	Market Value (dollars per pound)	Total Value(dollars)	Energy Allocation (BTUs per gallon ethanol)
Corn Oil	1.6	\$0.35	\$0.58	9,010
21% Gluten Feed	13.5	\$0.05	\$0.68	10,563
60% Gluten Meal	2.6	\$0.12	\$0.31	4,816
Carbon dioxide	17	\$0.04	\$0.68	10,563
Total Co-Products	34.7	-	\$2.25	34,953
Ethanol	16.5	\$0.18	\$2.97	46,137
Total Products	51.2	-	\$5.22	81,090

The replacement value method is a third way to determine co-product energy credits. Using this approach, we determine the nearest competitor to corn products and calculate how much energy it would require to raise the feedstock and process it into that product. For example, it requires 1.6 pounds of soybean oil to replace 1.6 pounds of corn oil. The energy required to raise the soybeans and extract the oil comes to 13,105 BTUs. The nearest feeding equivalent to the 13.5 pounds of 21 percent corn protein feed is 13.45 pounds of barley. The energy required for growing the barley and drying it is 1,816 BTUs per pound, which translates into 7,188 BTUs per gallon of ethanol equivalent. The carbon dioxide replacement value is based on the energy intensity of other fermentation processes that produce it as a by-product. Carbon dioxide has no actual energy value because it is not classified as a food (caloric value) or a fuel (combustion value). However, the majority of the carbon dioxide produced in ethanol fermentation is captured and sold, and it is therefore necessary to include this co-product energy credit.

Table 5 provides a comparative overview of all three methodologies. The first two rows are based on corn products. The third row is based on non-corn equivalents. The last column in Table 5 shows the variation depending on which methodology is used. For Table 1 we chose to use the replacement value energy estimates, which come to 27,579 BTUs per gallon.

**Table 5: Co-Product Energy Credit Methodologies for Corn Wet Milling**

Method	Corn Oil	60% Gluten Meal	21% Protein Feed	Carbon Dioxide	Total Co-Products
Actual Energy Value	9,960	3,404	16,388	-	29,752
Market Energy Value	9,347	4,996	10,959	10,959	36,261
Replacement Value	13,105	2,827	7,187	4,460	27,579

We have chosen a higher value of 36,261 BTUs per gallon for the best-existing and state-of-the-art cases. Each of the co-products produced with ethanol competes with and replaces a variety of alternate products. For example, 21 percent corn protein meal competes with conventional feed products like hay, grain straw, soybean protein, barley, etc, many of which are not clearly defined in terms of energy value. Currently 21 percent corn protein competes with all of these and partially replaces all of them. If it were to completely replace barley alone, it would have a higher energy credit. The higher energy credits in the second and third columns of Table 1 are based on analyses of potential products that have a higher energy replacement value and that are currently only partially replaced by corn-ethanol co-products.

---

#### 4. Conclusion

Assuming an average efficiency corn farm and an average efficiency ethanol plant, the total energy used in growing the corn and processing it into ethanol and other products is 81,090 BTUs. Ethanol contains 84,100 BTUs per gallon and the replacement energy value for the other co-products is 27,579 BTUs. Thus, the total energy output is 111,679 BTUs and the net energy gain is 30,589 BTUs for an energy output-input ratio of 1.38:1.

In best-existing operations, assuming the corn is grown on the most energy efficient farms and the ethanol is produced in the most energy efficient plants, the net energy gain would be almost 58,000 BTUs for a net energy ratio of 2.09:1. Assuming state-of-the-art practices, the net energy ratio could be as much as 2.51:1. Cellulosic crops, based on current data, would have a net energy ratio of 2.62:1.

There are circumstances where ethanol production would not generate a positive energy balance. For example, one could assume corn raised by the least energy efficient farmers, those who use continuous corn planting and irrigation, being processed by ethanol plants that do not use cogeneration and other energy efficient processes. In this case ethanol production could have a negative energy balance of about 0.7:1. However, a relatively small amount of ethanol is produced in this manner, possibly less than 5 percent. We

think it reasonable to look at least to columns one and two for the answer to our initial question. Based on industry averages, far less energy is used to grow corn and make ethanol than is contained in the ethanol. Moreover, we think it is a safe assumption that as the ethanol market expands, new facilities will tend to incorporate state-of-the-art processing technologies and techniques so that each new plant is more energy efficient than the one before. It is less certain that farmers will continue to become more energy efficient in their operations because of the many variables involved. Nevertheless, it does appear that growing numbers of farmers are reducing their farm inputs and that this trend will continue.

A final word about cellulose. If annual ethanol sales expand beyond 2 billion gallons, cellulosic crops, not starch, will probably become the feedstock of choice. The data in the last column suggest a very large energy gain from converting cellulosic crops into ethanol. Cellulosic crops, like fast growing tree plantations, use relatively little fertilizer and use less energy in harvesting than annual row crops. The crop itself is burned to provide energy for the manufacture of ethanol and other co-products. A major co-product of cellulosic crops is lignin, which currently is used only for fuel but which potentially has a high chemical value. Were it to be processed for chemical markets, the net energy gain would be even greater.

Our conclusion is that under the vast majority of conditions, the amount of energy contained in ethanol is significantly greater than the amount of energy used to make ethanol, even if the raw material used is corn.

---

## NOTES

1 The difference between high and low heat values represents the heat contribution of the condensation of water during combustion. When ethanol is burned, for example, it produces heat and water vapor. As the water vapor condenses it gives off additional heat. Ethanol has a low heat value(LHV) of 76,000 BTUs/gallon, an estimate which more accurately represents the heat content of the fuel in conventional combustion engines. Ethanol has a high heat value of 84,000 BTUs/gallon. In the United States the energy content of fuels conventionally is expressed on a high heat value(HHV) basis. Interestingly, in Europe LHVs are used. The use of either basis does not affect the conclusions of our analysis such as long as the same heat values are used for all inputs and outputs.

2 The estimate of the net energy gain from cellulosic crop-based ethanol is considered conservative. We believe that as this industry develops, the same learning curve that occurred in the starch based ethanol industry will occur in the cellulosic based ethanol industry, fostering a much more positive net energy gain for ethanol production from cellulose.

3 Agriculture Chemical Usage: Field Crops Summary. U.S. Department of Agriculture. Economic Research Service. Washington, D.C. 1992-1994.

4 Bosch, D. J., K. O. Fuglie, and R. W. Keim, Economic and Environmental Effects of Nitrogen Testing for Fertilizer Management, U.S. Department of Agriculture, Economic Research Service, 1994.

5 Alternative Agriculture. Committee on the Role of Alternative Farming Methods in Modern Production Agriculture. Board on Agriculture. National Research Council. National Academy Press. Washington, D.C. 1989.

6 Research conducted by the Department of Agricultural Economics. University of Missouri-Columbia, Columbia, Missouri.

7 Testing indicates that one acre of corn absorbs approximately 90 lbs of nitrogen fertilizer in one growing season. All of the estimates for fertilizer usage in this report assume synthetic fertilizer inputs. The difference between corn's nitrogen requirements and the fertilizer requirements indicated represent the reductions possible via the alternative growing strategies mentioned specifically in the text. These include rotations with leguminous crops, and the use of naturally occurring forms of nitrogen, such as animal waste.

8 Previous studies have included other components in the on-farm analysis. One included the amount of solar energy used in photosynthesis. Another included the embodied energy of farm machinery, that is, the energy used to make the machinery. We have decided not to include energy inputs which are acquired at no cost, like sunlight. Also we have not included embodied energy because the estimates are subject to a very high degree of uncertainty.

9 Personal conversation with Richard Thompson, November, 1992.

10 About 95 percent of the motor fuel grade ethanol in the United States is produced from 10 million gallon per year facilities or larger. Although there are a number of facilities of smaller scale, the vast majority of those will quickly expand production, if commercially successful.

11 DeSplegelaere, T.J. "Energy Consumption in Fuel Ethanol Production for a Corn Wet-Milling Process", paper presented at IBIS 1992 Fuel Ethanol Workshop. Wichita, Kansas. June 9-11, 1992.

---

How Much Energy Does It Take to Make a Gallon of Ethanol? can be ordered from ILSR's Washington, DC office. Cost of the hard copy is \$8.75 including shipping and handling.

**Institute for Local Self-Reliance, National Office**  
2425 18th Street, NW  
Washington, DC 20009-2096



United States General Accounting Office  
Washington, DC 20548

Resources, Community, and  
Economic Development Division

B-286311

September 25, 2000

The Honorable Tom Harkin  
Ranking Minority Member  
Committee on Agriculture,  
Nutrition, and Forestry  
United States Senate

Subject: Petroleum and Ethanol Fuels: Tax Incentives and Related GAO Work

Dear Senator Harkin:

Over the years, the federal government has granted tax incentives, direct subsidies, and other support to the petroleum industry, as well as some tax and other benefits to the ethanol industry, in an effort to enhance U.S. energy supplies. The tax incentives generally decrease revenues accruing to the U.S. Treasury. In earlier reports, we addressed various issues related to these incentives, including their impact on federal revenues and effectiveness in accomplishing their objectives.

You requested that we provide you with information on the tax incentives<sup>1</sup> that benefit the petroleum and ethanol<sup>2</sup> industries. Accordingly, we are providing revenue loss estimates for tax incentives designed to encourage the exploration and production of petroleum and the production of ethanol (see enc. I). In addition to this specific information, we are providing a summary of key findings from our earlier reports on these and related issues (see enc. II). We used the enclosed material to brief your staff on June 30, 2000. A summary of the tax incentive information follows.

---

<sup>1</sup>Tax incentives are federal tax provisions that grant special tax relief designed to encourage certain kinds of behavior by taxpayers or to aid taxpayers in special circumstances. The revenue losses that result from these provisions—called tax expenditures—may, in effect, be viewed as spending channeled through the tax system. The Congressional Budget and Impoundment Control Act of 1974 requires that a list of tax expenditures be included in the budget. The act defines “tax expenditures” as “revenue losses attributable to provisions of Federal tax laws which allow a special exclusion, exemption, or deduction from gross income or which provide a special credit, a preferential rate of tax, or a deferral of tax liability.” Each year, estimates of tax expenditure revenue losses are prepared by the Department of the Treasury and by the staff of the Joint Committee on Taxation. According to the Committee, these special income tax provisions are referred to as tax expenditures because they may be considered as analogous to direct outlay programs, and the provisions and programs can be considered as alternative means of accomplishing similar budget policy objectives.

<sup>2</sup>Under the Internal Revenue Code, a tax exemption and/or tax credits are available for any biomass-derived alcohol fuel, including ethanol and methanol. However, alcohol fuel derived from petroleum or natural gas does not qualify for the exemption or the credits.



Table 1 shows inflation-adjusted summations of estimated revenue losses for petroleum and ethanol fuel tax incentives from 1968 to 2000. We developed these data from unadjusted annual revenue loss estimates made by the Department of the Treasury and the staff of the Joint Committee on Taxation (JCT).<sup>3</sup> Specific petroleum tax incentives range from about \$330 million for the expensing of tertiary injectants<sup>4</sup> (1980-2000) to about \$82 billion for certain cost depletion deductions (1968-2000). Some of the tax incentives for the petroleum industry have been in place for many decades, but over the past 25 years, these incentives have generally been scaled back.

**Table 1: Tax Incentives for Petroleum and Ethanol Fuels: Estimates of Revenue Losses Over Time**

Dollars in millions

Tax incentive	Summed over years	Adjusted to year 2000 dollars
<b>Petroleum industry</b>		
Excess of percentage over cost depletion <sup>a</sup>	1968-2000	\$81,679-\$82,085
Expensing of exploration and development costs <sup>a</sup>	1968-2000	42,855-54,580
Alternative (nonconventional) fuel production credit	1980-2000	8,411-10,542
Oil and gas exception from passive loss limitation	1988-2000	1,065 <sup>b</sup>
Credit for enhanced oil recovery costs	1994-2000	482-1,002
Expensing of tertiary injectants	1980-2000	330 <sup>c</sup>
<b>Ethanol industry</b>		
Partial exemption from the excise tax for alcohol fuels	1979-2000	7,523-11,183
Income tax credits for alcohol fuels	1980-2000	198-478

Note: When two figures are provided for an incentive, they represent the estimates developed from Treasury's and JCT's data. The lower figure is presented first, regardless of which agency's data it is based on. Some of the estimated revenue losses for the tax incentives have a considerable range because of, among other things, (1) differences between Treasury's and JCT's estimates of individual and corporate gross income, deductions and expenditures, and (2) differences in the lower bound for the annual revenue loss estimates they present. See enclosure I for details.

<sup>a</sup>In some years, revenue losses associated with other fuels and nonfuel minerals were included with revenue losses from oil and gas. See enclosure I for details.

<sup>b</sup>There is no JCT revenue estimate because only Treasury recognizes this tax code provision as a separate tax incentive. See enclosure I for details.

<sup>c</sup>There is no Treasury revenue estimate because only JCT recognizes this tax code provision as a separate tax incentive. See enclosure I for details.

Source: GAO's compilations based on annual estimates of tax expenditures published by Treasury and JCT.

Ethanol fuel tax incentives ranged from \$198 million for alcohol fuel tax credits (1980-2000) to about \$11 billion for the excise tax exemption for alcohol fuels (1979-2000). These tax incentives were instituted in 1979-80. In the past decade, these incentives have been extended, but the rates of exemption and credit have been reduced somewhat.

<sup>3</sup>For each tax incentive, the years over which we report annual revenue loss estimates are limited to the years for which both Treasury and JCT made estimates. Thus, the first year is the first period for which revenue loss estimates are available from both Treasury and JCT; it may not be the year when the incentive was first implemented. Estimates include both corporate and individual income tax revenue losses except for the partial exemption from the excise tax for alcohol fuels, which represents revenue losses from the federal excise tax on gasoline.

<sup>4</sup>Tertiary injectants are fluids, gases, and other chemicals that are pumped into oil and gas reservoirs to extract reserves that cannot be extracted by conventional primary or secondary recovery techniques.

The estimated revenue losses for these tax incentives should not be added together. The estimate for each tax incentive is made independently of any other tax incentive, and the effect of making more than one change might be greater than or less than the sum of the changes. Enclosure I contains more detailed information on these estimates of revenue losses from the petroleum and ethanol tax incentives (see tables 2-9), as well as descriptions of the incentives and summaries of their legislative histories.

### Scope and Methodology

To prepare the information for this report, we compiled Treasury's and JCT's yearly revenue loss estimates for tax incentives received by the petroleum and ethanol industries. Treasury's estimates are from annual editions of the *Budget of the United States Government*, Analytical Perspectives volume, Tax Expenditures section. JCT's estimates are from annual editions of the *Estimates of Federal Tax Expenditures*. To put the dollar amounts for different years on a comparable basis, we adjusted these estimates for inflation, using a fiscal year gross domestic product (GDP) deflator.<sup>1</sup> Descriptions of the tax incentives and their legislative histories are from JCT's *Present-Law Tax Rules Relating to Domestic Oil and Gas Exploration and Production and Description of H.R. 53 and H.R. 423* (JCX-8-99, Feb. 23, 1999) and the Senate Committee on the Budget's *Tax Expenditures: Compendium of Background Material on Individual Provisions* (Dec. 1996). Additionally, we reviewed and summarized previous GAO studies related to petroleum and ethanol tax incentives and other subsidy programs. We conducted our work from July through September 2000 in accordance with generally accepted government auditing standards.

-----

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 14 days after the date of this letter. At that time, we will send copies to interested Members of Congress and make copies available to others on request.

If you have any questions about this report or need additional information, please call Daniel Haas or Godwin Agbara at (202) 512-3841.

Sincerely yours,



Jim Wells  
Director, Energy, Resources,  
and Science Issues

Enclosures - 2

---

<sup>1</sup>The deflator was obtained from the *Budget of the United States Government, Fiscal Year 2001*, Historical Tables volume, table 10.1.

**ROCKY NICHOLS**  
STATE REPRESENTATIVE  
58TH DISTRICT  
SHAWNEE COUNTY

HOME  
2329 S.E. VIRGINIA  
TOPEKA, KANSAS 66605  
(785) 357-6262  
E-MAIL—[r.nichols@cjnetworks.com](mailto:r.nichols@cjnetworks.com)  
Internet Homepage—  
<http://www.cjnetworks.com/~r.nichols>



TOPEKA  
HOUSE OF  
REPRESENTATIVES

## COMMITTEE ASSIGNMENTS

MEMBER APPROPRIATIONS COMMITTEE  
TAX, JUDICIAL AND TRANSPORTATION  
BUDGET COMMITTEE  
KANSAS FILM COMMISSION

OFFICE  
STATEHOUSE—284 WEST  
TOPEKA, KANSAS 66612-1504  
(785) 296-7651

Mr. Chairman and members of the Committee:

I want to thank this committee for taking the time to examine the very important issue of what incentives are needed to attract new ethanol production to Kansas.

I had originally requested that the Legislative Coordinating Council assign the ethanol issue for interim study to the Interim Utilities Committee because I saw a great opportunity to set in place the policies that are needed to make Kansas a nationwide and worldwide leader in the area of ethanol production and promotion. This opportunity was created by the fact that the current Ethanol Production Incentive sunsets on June 30, 2001. The fact that this important production incentive comes up for renewal this year gives us as policy makers an incredible opportunity to discuss and debate what mix of incentives and policies are needed to make Kansas a leader in this area. The last time the Kansas ethanol program came up for renewal, the Kansas Legislature renewed the program with little debate on what, if any, enhancements or changes to the program were necessary to attract even more ethanol production to Kansas. I am glad that the Interim Utilities Committee used the June 30, 2001, sunset as motivation to truly think outside the box and to give serious consideration to what policies are needed to make Kansas a nationwide and, hopefully one day, a worldwide leader in ethanol production and promotion. In that regard, I am testifying in support of HB 2011, which was recommended by the Interim Utilities Committee.

**Seven Reasons Why Increasing Ethanol Production and Promotion Makes Sense for Kansas:**

- 1. Adding Value to Kansas Grains** – By attracting new ethanol production facilities, Kansas has the ability to add value to our grains right here in our home state. From 1994 to 1996, fuel ethanol producers consumed nearly 35 million bushels of Kansas grains (An Economic Impact Analysis of Fuel Ethanol Production in Kansas: 1996, Peeples Consulting Associates, Inc.). That was under the old ethanol capped program that is set to expire on June 30, 2001
- 2. Job Creation & Economic Development** –On a local level up to 4,000 local jobs are created for each new ethanol production plant in Kansas (“The Economic Impact of the Demand for Ethanol,” Michael K. Evans, Professor of Economics, Kellogg School of Management, Northwestern University, 1997). The top ten corn and grain growing states in the U.S. reported in 1997 a combined \$464.8 million increase in sales and corporate income tax receipts from ethanol producers alone (U.S. Department of Agriculture Monthly Report, May 1998).

House Agriculture Committee  
February 7, 2001  
Attachment 3



3. **Diversification of our motor fuels portfolio** – Much like a diversified investment portfolio, a diversified and balanced motor fuels portfolio is needed to prevent the sudden price shocks or spikes in gas prices, like what was experienced last summer in Kansas and other Midwest states. Excluding big-rig diesel trucks, crude-oil/petroleum gasoline accounts for over 91% of current motor vehicle sales in Kansas, ethanol holds around 8% and natural gas barely registers on the scale at a fraction of a percent (US Department of Transportation/Federal Highway Administration; Kansas Department of Revenue, 1996). Also, the US Department of Energy estimated that the cost to consumers of a single “price shock” in the year 2005 would amount to over one half of one trillion dollars. You would probably fire your stockbroker if your investment portfolio was as un-diversified as Kansas’ motor fuels portfolio.
4. **Reducing our State’s and Nation’s Reliance on Foreign Oil** – Since ethanol’s inception in 1978, it is estimated that it has replaced over 14 billion gallons of imported gasoline (estimate performed by the consulting group Information Resources, Inc., Washington, DC, June, 1998).
5. **Lower Petroleum Gas Prices** – According to the U.S. Department of Energy, the American Petroleum Institute has even admitted “the presence of ethanol causes conventional gasoline prices to be .27 percent lower than would have occurred without ethanol. The total cost savings to the consumer is approximately \$270 million per year” (U.S. Department of Energy Report, interagency review of GAO Report, 1996; Fuel Ethanol Fact Book, US Fuel Ethanol Program, 1997).
6. **Positive Trade Benefits** – It is estimated that in 1997 alone ethanol production improved the U.S. trade balance by approximately \$2 billion (Kellogg School of Management, Northwestern University, 1997-98).
7. **Positive Environmental and Health Benefits** – The EPA has stated that ethanol blended gasoline will reduce carbon monoxide emissions in motor vehicles by 10% - 30%, which the EPA and U.S. Department of Agriculture deemed “significant” (Report, “Ethanol: Economic and Policy Tradeoffs,” January 1988).

Given these and other positive benefits of ethanol production in Kansas, I would offer my support to HB 2011, which lifts the cap on the current ethanol production credit and extends this new program until the year 2011. Extending this program until 2011 is important because the Federal Government incentives for ethanol will sunset sometime around 2008. Extending the Kansas ethanol production incentive program until beyond the next Federal reauthorization will give ethanol producers some stability because they will know that the Kansas program will be around for the next 10 years (they can incorporate both the state and federal incentives into their short and long-term business and reinvestment plans, etc.). Additionally, I am supportive of the tiered incentives of .05 and .025, and in particular the lifting of the \$625,000 cap on the ethanol producer incentive fund, to help encourage new ethanol production in Kansas.

Thank you again for the courtesy you have extended to me today. I will stand for your questions.



Statement of Jill A. Zimmerman  
K-State Research and Extension  
Anderson County Extension Agent,  
Agriculture

**Cooperative Extension Service**  
K-State Research and Extension  
Anderson County  
411 South Oak  
P.O. Box 423  
Garnett, KS 66032 -0423  
785-448-6826

February 7, 2001

### House Agriculture Committee

County Extension Agents throughout the state of Kansas are viewed as leaders and role models of their community. It is extremely important, as agents, that we are cognizant of issues affecting agriculture. Especially, in a rural community such as ours, where our livelihood depends upon production agriculture.

Often times we are a source of research based information for our clientele. This requires us to not only source the information but have the ability to facilitate this information to producers in a variety of ways. Whether it be hosting in-depth schools, offering producer programs, or various one-on-one consultations.

The agriculture industry is changing at a rapid pace and the importance of knowing what producers “needs” and “wants” are to help them remain competitive in the agriculture industry has never been as important as it is today.

My involvement began over a year ago when I was asked to serve on the Anderson County Economic Development(ACED) Committee. As chairperson of the agriculture sub-committee, it became our objective to look at opportunities to provide added value to agriculture in Anderson County. In ACED’s process, we used the template provided by the two grain commissions and the Department of Commerce and Housing to complete our own pre-feasibility work before hiring Bryan and Bryan, Inc. of Cotopaxi, Co to complete a more in-depth pre-feasibility analysis.

Producers are also constantly seeking new ways to provide added value to the raw commodities that they produce. As is the case with formation of a 47 member producer alliance known as East Kansas Agri Energy (EKAE). Of which 34 producers are from Anderson County, and they have strongly demonstrated their interest in pursuing an ethanol production facility in eastern Kansas.

Through this process I have served as a source of information and facilitated opportunities for those individuals in our community to learn more about ethanol production and how an ethanol plant would affect our community. We have toured two new generation ethanol cooperatives in Missouri that have come on line within the last year.

It has become apparent through this process that there is a true need for a source of reliable, non-biased information and guidance regarding ethanol production in our state. Other states have that type of support base for individuals to draw upon. I feel that K-State Research and Extension is working to develop that knowledge base which can be utilized by those parties interested in pursuing ethanol production in their own communities.

**Anderson County  
Kansas State University  
Agricultural Experiment  
Station and Cooperative  
Extension Service**

K-State, County Extension  
Councils, Extension Districts,  
and U.S. Department of  
Agriculture Cooperating.

All educational programs  
and materials available  
without discrimination on  
the basis of race, color,  
religion, national origin,  
sex, age, or disability.

*“Knowledge*

House Agriculture Committee  
February 7, 2001  
Attachment 4



## Ethanol Production Facility Report McPherson-Rice County Area

An interesting blend of a large grain sorghum production area adjacent to a relatively large feedlot area gave encouragement to a group of farmers, feeders, and agri-businessmen to explore the feasibility of an ethanol plant in the McPherson-Rice county area. A six county area surrounding the Lyons or McPherson site annually produces about 32,000,000 bushels of grain sorghum which is largely exported out of the area. In addition, the presence of between 100-150,000 head of feedlot cattle creates an attractive target for utilization of the by-product, distillers grains.

The McPherson Chamber of Commerce agriculture committee, several area cooperatives, and a group of central Kansas feedlots have been working together intensively for five months now to study the economic feasibility of converting grain sorghum into a renewable fuel at the same time providing a very high quality concentrate product to cattle feeders.

The group has been working very closely with Kansas Department of Commerce and Housing, Kansas Cooperative Development Center, Kansas Grain Sorghum Commission, Kansas State University, and local K-State Research and Extension agents to gather as much information as possible to guide the decision making process.

Preliminary feasibility studies prepared in cooperation with David Coltrain, Extension ag economist, showed an ethanol production facility in this central Kansas area carried significant potential for being profitable largely due to two competitive advantages: (1) a nearby source of abundant grain sorghum which is priced discount to corn, and (2) nearby feedlots which could utilize the by-product on a 'wet' basis to avoid expensive natural gas drying costs. Other advantages for the area include shorter freight routes to certain metro markets, the possibility of establishing a 'co-generation' relationship with nearby industry, and adequate commercial grain storage already in place.

The exploration group recently took a tour of two ethanol plants near Hastings, Nebraska to get a better feel what all is involved in the establishment and management of an ethanol facility. Host plants were very cooperative and informative, giving our group even more encouragement to proceed. Consultations have also been held with several ethanol industry experts.

The next step will be to contract with a professional ethanol industry consultant to complete an in-depth feasibility study and business plan. Funds have been raised for this analysis through a combination of grants and local producer support. If this feasibility study proves positive, a more formal organizational structure will be set up to carry the project forward. The major hurdle will obviously be raising the capital it requires to construct and start-up any major agriculture value-added industry. Potential investors at this point would include area grain producers, feedlots, cooperatives, and, to an unknown extent, other outside investors.

The economic impact of an ethanol plant will reach not only grain farmers and feedlots, who will feel direct monetary benefits, but also the local communities where skilled jobs will be created and services and utilities purchased.

*Prepared by Dale Ladd,* House Agriculture Committee  
February 7, 2001  
Attachment 5

CITY OF

**Russell**

House Agriculture Committee  
February 7, 2001  
Attachment 6

***Partnerships In Action***  
***Making Rural Kansas Stronger***



SHAFFER, KLINE & WARREN, INC.

**Solar<sup>®</sup> Turbines**

***A Caterpillar Company***



**310 N. First Street**  
**P.O. Box 397**  
**Colwich, KS 67030**  
**PHONE: (316) 796-0900**  
**FAX: (316) 796-0944**

**To the Special Committee on Utilities; Honorable Representatives and Senators;**

On behalf of the City of Russell I thank you for the opportunity to speak to you concerning House Bill 2010 as amended.

Our community has been hit extremely hard this past year with the explosion and fire at our electric power generation facility along with the closing of the Chief Industries King of the Road RV Manufacturing facility, in which we lost approximately 150 jobs. These two incidences have left major scars in our community and we all look forward to a prosperous 2001 and beyond as we work to replace those lost jobs and businesses.

We are pleased to be able to inform you that we are replacing our electric generation facility with two natural gas & diesel, duel fueled turbine engines, which will replace the lost generating capabilities, through our insurance proceeds. We are presently in the demolition process as we speak of the five lost engines, with reconstruction and new construction of the Russell Energy Center to begin in March and completion in October of this year. The city has also decided to purchase the former King of the Road manufacturing facility in order to expedite the replacement of the lost manufacturing jobs and in hopes of keeping our present citizens in Russell, Kansas. I also am glad to tell you we have a prospect that is interested in occupying that facility so things are looking up in Russell, Kansas.

Our community of Russell placed itself in an excellent position by deciding to place the new natural gas turbines in our Industrial Park area, in hopes of attracting a new business that will require us to operate the turbines at peak capacity and their optimum efficiency. As plans were being discussed and approved by our city council and the citizens in Russell, concerning the location and size of the replacement generation units, an engineering firm was in negotiations with the local wheat gluten plant, owned by Farmland Industries, to place an ethanol plant nearby.

We met several times to discuss the possibility of a 'Partnership' where the City of Russell would produce electric generation for the new facility. Further discussion included the potential use of waste heat in a cogeneration facility, producing the steam needed for the distillation process in the ethanol plant. This partnership expanded into more and more options each time we met. Today we plan to produce electricity with our new generation units to be used by the citizens of Russell; then reuse the waste heat to fire steam boilers to be used in the distillation process; then reuse the waste heat again in the drying of the distillers grains to be shipped to area feedlots to be added as supplemental feed grains. These three uses alone made a great partnership, and in further discussion we added the reuse of the wastewater from the present gluten plant, capturing the 'B Starch' left in the waste product, eliminating a suspended solid problem in our wastewater lagoons which will shorten the life of our facility

These co-products work well together and made a great partnership until the Kansas Geological Society discovered the ethanol plant potential construction. Discussions concerning the capturing of the C0-2 from the ethanol plant played an important role in a pilot project being planned in South Russell County. If captured this C0-2 could be used in an oil susquestrian project to increase the amount of oil produced by wells located south of Russell. Estimates include capturing ½ of the oil remaining in the veins below the earth's surface, of which only ½ has been captured to date, this partnership will create another oil boom for Kansas. If the C0-2 project works, an underground pipeline will be built to tie the Russell Ethanol plant to the Oklahoma C0-2 pipeline opening up the balance of Kansas's oil fields for further oil recapturing.

During the process of creating these partnerships, as usual, financial discussions occurred. Through a joint decision, we decided to use the Tax Increment Financing opportunities made available to us and future projects in the Industrial Park through the Enterprise Zone options previously set up by former city councils. Research showed our Industrial Park was annexed into the city and the Enterprise Zone was extended in February of 1992, just five months prior to the state statute deadline set for the use of TIF funds for infrastructure uses. Our plans are to use the TIF funding available to improve



the infrastructure of this facility and our Industrial Park. These funds will be used to install a railroad spur and switches, streets, water line extensions, backflow meters, storm sewer culverts and retention areas, pavement, sewer line extensions, fences, lighting for the streets and roads, and most valuable the boiler units that would produce the steam. While the insurance proceeds will replace the natural gas turbines for the City of Russell, the balance of infrastructure improvements will need to be funded through other methods including Industrial Revenue Bonds and Tax Increment Financing tools.

We applaud your foresight in House Bill 2011 which creates an incentive to operate and build new ethanol plants through the \$.05 per gallon incentive for each gallon sold by the producer. The proposed 25,000,000-gallon plant in Russell would receive approximately \$1,250,000 in state incentives as proposed by HB 2011. Add to this approximately 9,000,000 bushels of milo and corn purchased and trucked into Russell, then add the 90,000,000 gallons of water each year, the trucking of the distillers grains from our community, this amounts into a sizable gain to our county. We have not concluded the calculations of the economic value to our community, as it changes each day with new co-products.

My main thoughts have centered around House Bill 2010 as amended, which eliminates the ad valorem taxes on new ethanol facilities. We felt this House Bill will eliminate our availability to use Tax Increment Financing funds that are needed to repay the special obligation bonds desperately needed to install the above mentioned infrastructure items. We are not against the removal of the ad valorem taxes, as like most other cities in Kansas when given the an economic development opportunity, we would have waived the taxes for up to a ten year period, as has been normal procedure in the past with Russell.

We ask you consider that the elimination of the taxes will remove our city, and other cities in Kansas, the opportunity to use Tax Increment Financing Bonds. We also ask you consider one of these options in your deliberations:

- 1.) Allow the Ad Valorem Tax to be paid on new ethanol facilities only if the infrastructure improvements can be completed under the Tax Increment Financing Enterprise Zone statutes. Give the county, school and city the options to abate the ad valorem taxes for a ten-year period for a new ethanol project if no TIF Project is being used. Once all TIF Bonds have been paid in full, allow for the ethanol facilities to be granted an abatement of their taxes through the balance of the ten year abatement period, as stated in the House Bill 2010.
- 2.) Allow the abatement of the Ad Valorem Tax for the new ethanol business as amended in HB 2010, and if the new facility is within the guidelines of the TIF Enterprise Zone requirements, allow for the cities an 'In Lieu OF Tax' for the infrastructure projects equal to the amount of abated taxes for the payment of the bonds needed for the infrastructure items. These taxes would be paid through the financing term and abated for the remaining ten-year period.
- 3.) Allow each city, county and school taxing district, under Home Rule, to determine the allotted assessment amount and length of term for the abated taxes. The statute of limitations for the ten-year period, as stated in the House Bill, should be considered full term of any abatement length of time.



# LIMOUSIN BY PRACHT

BILL & RUTH PRACHT  
20477 SW FLORIDA RD.  
WESTPHALIA, KS 66093  
785-489-2413

Statement to House Agriculture Committee  
February 7, 2001

1. Introduction
2. Operation - 3000 acres of row crop. 275 head of mother cows. Since Freedom to Farm, we have rotated out of wheat to 40% feed grain & 55% beans.
3. Eastern Kansas Agri Energy (EKAE) is currently a group of 47 producers and agribusiness people from Anderson County and the surrounding area. The Anderson County Economic Development (ACED) committee had a pre-feasibility study done that showed a lot of promise for a ethanol plant to be built in our area. We have toured two plants in Missouri. Both of these groups stressed the importance of State funded incentives for the profitability of these plants. In Missouri, they receive 20 cents per gallon for first 12 ½ million gallons, after that they receive 5 cents per gallon for second 12 ½ million gallons. There were no ethanol plants built in Missouri until State funded incentives were in place.
4. In our part of Kansas, we haven't had a good crop year since 1998. The fact that 47 people have invested \$1000 each of at-risk money to finish the feasibility study and have some start up monies says a lot about their desire to add value to the crops that we produce. We are going to have to try to implement these things ourselves because the marketplace is not doing that.
5. In conclusion, an ethanol plant will add about 30 good jobs to our community. It will also add a source of livestock feed to area producers which might expand cattle and dairy operations, which in turn would also help the area. We would also see a 5 to 10 cent increase in feed grain prices in our area if this plant was built. Those who invest in a successful plant would also receive a better return on their investment than they can by investing in farm land.

House Agriculture Committee  
February 7, 2001  
Attachment 7

Testimony before the  
House Agricultural Committee

David Dykstra  
Vice President of Marketing  
High Plains Corporation

February 7, 2001

Mr. Chairman and members of the committee, thank-you for inviting me to speak to you today regarding High Plains Corporation operations and the impact the Kansas Producer Incentive has had on those operations as you consider the future of the producer incentive.

**Background**

High Plains Corporation was founded in 1980 with the production of a small, six million gallon facility in Colwich, KS. Through the support of the Kansas Producer Incentive, the plant and the company were able to grow considerably over the past twenty-one years. Today, High Plains is the nations seventh largest producer of fuel ethanol with a production capacity of 72 million gallons, 20 million gallons of which are based in Kansas.

**Economic Benefits**

The processing of grains for ethanol production provides an important value added market for Kansas farmers'; helping to raise the value of the commodities they produce. In our fiscal year 2000, High Plains' Kansas operation purchased 6.3 million bushels of corn and milo, virtually all of it from within seventy-five miles of our plant site. We expect this consumption to increase to 7.5 million bushels in our current fiscal year. This 1.2 million bushel increase is possible because of a recently completed 3 million gallon expansion at our Colwich facility. This expansion was the result of an investment of 1.7 million dollars in the past three months. In total, over the past five fiscal years, High Plains has invested in excess of 3 million dollars improving the Colwich facility. These projects have allowed us to continually decrease our production cost and can be attributed largely to the producer incentive now in place.

Ethanol production has a huge impact on the State of Kansas and on our nation. Nationally, according to a report prepared for the Midwestern Governors' Conference, the economic impact of the demand for ethanol is summarized as follows:

- Adds \$4.5 billion to farm revenue annually
- Boosts total employment by 195,200 jobs
- Increases state tax receipts by 450 million

House Agriculture Committee  
February 7, 2001  
Attachment 8

- Improves the U.S. balance of trade by \$2 billion, and
- Results in \$3.6 billion in net savings to the federal Treasury

In Kansas, High Plains alone contributes the following to the local economy:

- Direct annual payroll of \$3.7 million
- \$12.0 million in local grain purchases
- \$4.8 million in local and regional feed sales, and
- \$2.1 million in local utilities purchased

In addition to High Plains, other Kansas ethanol producers have proportionate impact on both local and state economies.

The proposed incentive in HB2011 will allow High Plains, as well as the other Kansas producers, to continue to do research on ways to increase production efficiencies and decrease energy consumption thereby lowering our production cost. In 1998, the incentive helped fund a pipeline to the Sedgwick County Landfill to take advantage of naturally occurring methane gas that was previously just vented to the atmosphere. This pipeline has helped to substantially reduce our energy cost. This is but one example of how the incentive can help a relatively young company and industry compete in a very large, global energy market. Most of the energy market segments are over 100 years old; the fuel ethanol market has only been in large-scale production for just over 10 years. Producer incentive payments are important because they help fund projects that will lead to a more efficient industry capable of self sufficiency and one that is domestically and agriculturally based.

The Energy Information Administrations 2001 Annual Energy Outlook reports that U.S. refining capacity will need to grow from its' current 16.5 million barrels per day to 18.2 million barrels per day over the next two decades to support growing demand. It is my belief that the ethanol industry can and should be a part of this anticipated growth. It is for this reason that High Plains supports the \$.025 cent per gallon additional incentive for new or expanded production. We believe this will be an impetus to spur companies to increase capacity in the State. High Plains has a history of increasing capacity in States where there is an incentive to do so. We recently announced a 12 million gallon expansion at our York, NE facility that was due, in large part, to the \$.075 cent per gallon incentive for expanded production in the State of Nebraska. Our intention is to continue to grow in the fuel ethanol industry and incentives within the State of Kansas would be very welcome.

A recent report prepared for the Governors' Ethanol Coalition demonstrates that the ethanol industry can quickly double production within two years to meet new demand created by a phase out of Methyl Tertiary Butyl Ether (MTBE). According to the report:

- Replacing MTBE with ethanol would increase the demand for ethanol to nearly 3.2 billion gallons per year by 2004;

- The ethanol industry can increase production capacity from 1.5 billion gallons to 3.5 billion gallons per year by 2004;
- The increased capacity would come from increased utilization of existing plants, expansion of existing facilities, new plants currently under construction, and proposed facilities currently in various stages of development;
- Expanding ethanol capacity will result in \$1.9 billion in new investment;
- Construction activity and increased commodity demand will add \$11.7 billion to real GDP by 2004 and increase household income by \$2.5 billion.

## **Conclusions**

It is clear that ethanol will play an important role as the nation seeks to reduce MTBE water contamination and maintain the air quality benefits of reformulated gasoline. For the long term, the United States must develop an energy policy that makes greater use of domestic renewable fuels such as ethanol. This in turn will lead to a more stable, value added markets for our agricultural commodities. By providing a producer incentive which helps support its' relatively young but growing ethanol industry, Kansas can position itself and its farmers to benefit from the expanded role ethanol will play in the domestic energy market.

Thank you.





---

## **Testimony Regarding House Bill No. 2011 Before the House Agriculture Committee February 7, 2001**

Good afternoon Chairman Johnson and members of the House Agriculture Committee, my name is Greg Krissek. I am Director of Operations for the Kansas Corn Growers Association. I appreciate the opportunity to make comments in support of HB 2011. My comments also reflect the position of the Kansas Grain Sorghum Producers Association.

HB 2011 proposes the renewal and revision of Kansas' ethyl alcohol production incentive. A key provision in the legislation targets an increased incentive to ethanol producers that increase production – this would apply to new plants built or to expansion of existing plants.

You have received a substantial amount of information today about the growing potential for ethanol production, its use in our nation's fuel supply, and its benefits to agriculture and rural communities. In just over the past twenty years, the modern fuel ethanol industry has grown from infancy to record production in calendar year 2000 of approximately 1.6 billion gallons – and the opportunities for growth in the next several years project the need for doubling, maybe even tripling that production capacity. Yet in perspective, that amount of ethanol will remain a small proportion of all motor vehicle fuel used in the United States. Quite simply, ethanol is the prime example of a value-added, industrial use for agricultural products.

You also are witnessing today the extremely high level of interest among Kansas communities investigating the feasibility of ethanol production. Our organizations continue to receive numerous requests, new ones on a weekly basis, for information from communities and groups on how to proceed with such feasibility analysis.

In our efforts to assist communities study the feasibility of new ethanol plant production, one point continues to be emphasized by plant owners and operators as well as by potential lenders – the availability of a consistent and reliable state incentive program is key to the establishment of the plant. It is key both for financial reasons and for reflecting the commitment of public partners to the support of this type of endeavor. Those Kansas groups who have toured new plants recently can easily describe for you the economic benefits for employment, suppliers, agriculture, and associated industries that accrue to communities far beyond the level of the incentive payments received.

Experience in the Midwest during the last ten years has shown that if a state seriously wanted to encourage new ethanol plant production, aggressive state incentives contributed greatly to that result. Thus, for example, new plants have been built in Nebraska, Minnesota, Missouri, and South Dakota. These plants use efficient technology, are highly automated, and create skilled jobs in the community. Most have majority ownership by farmers who see opportunities to create new value-added and profitable outlets for processing their grain.

Today Kansas has the opportunity to participate in this viable opportunity called ethanol - a domestically renewable and environmentally friendly fuel that helps provide new markets for agricultural products. We support this legislation that was recommended by last fall's Special Committee on Utilities upon completion of their study of what state government could do to provide incentives for ethanol. We ask you to do the same.

Thank you for the opportunity to make these comments and I will try to answer any questions concerning this testimony.



# PUBLIC POLICY STATEMENT

## HOUSE COMMITTEE AGRICULTURE

**RE: HB 2011 - Expands the agricultural ethyl alcohol production incentive program.**

**February 7, 2001  
Topeka, Kansas**

**Presented by:  
Bill R. Fuller, Associate Director  
Public Policy Division  
Kansas Farm Bureau**

---

Chairman Johnson and members of the committee, we certainly appreciate this opportunity to express support for HB 2011 on behalf of the farm and ranch members of Kansas Farm Bureau. I am Bill Fuller and I serve Kansas Farm Bureau as Associate Director of the Public Policy Division.

HB 2011 extends the production incentive for distilling agricultural ethyl alcohol another 10 years until July 1, 2011. As an incentive to encourage more ethyl alcohol production, the bill also proposes to remove the cap on the production incentive.

Kansas Farm Bureau has steadfastly supported various initiatives to foster and promote the production and use of crop-based fuels over the years. We have been strong supporters of the state agricultural ethyl production incentive program and advocated for its extension each time it has been up for renewal. This year alone, we have expressed support of at least five different bills relating to the production and use of agriculture-based renewable fuels, such as ethanol or biodiesel.

The voting delegates at the 82<sup>nd</sup> Annual Meeting of Kansas Farm Bureau, who are agricultural producers, reaffirmed and strengthened our commitment for initiatives that can increase renewable fuel use. Kansas Farm Bureau strongly encourages increased efforts to develop, promote and utilize traditional and alternative products derived from the crops and livestock produced by our state's farmers and ranchers.

Converting Kansas grown grain into renewable fuels is one such initiative. This action is extremely important during this time of low grain prices. The use of crop-based fuels can reduce U.S. reliance on foreign oil, expand grain markets, improve air quality and protect water quality.

Farm Bureau policy supports consumer education, promotion efforts and tax credits to expand the production and use of crop-based alternative fuels. Agriculture producers need a variety of markets and uses for their Kansas-grown products.

We believe promoting ethanol production and use in Kansas, through programs such as the agriculture ethyl alcohol incentive program will have positive impacts on agriculture producers, the Kansas economy and the Kansas environment. We encourage the committee to look favorably on the concepts contained in HB 2011. Thank you.



K  
A  
N  
S  
A  
S  
  
G  
R  
A  
I  
N  
  
&  
  
F  
E  
E  
D

**Statement of the  
Kansas Grain and Feed Association  
regarding**

**House Bill 2011**

**Submitted to the**

**House Agriculture Committee**

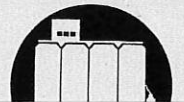
**Rep. Dan Johnson, Chairman**

---

**February 7, 2001**

*Association*

KGFA, promoting a viable business  
climate through sound public policy for more than a  
century.



House Agriculture Committee  
February 7, 2001  
Attachment 11



This statement is submitted on behalf of the Kansas Grain and Feed Association (KGFA). The KGFA is a voluntary state association with a membership encompassing the entire spectrum of the grain receiving, storage, processing and shipping industry in the state of Kansas. Our membership includes over 1,150 Kansas business locations and represents 99% of the commercially licensed grain storage in the state.

KGFA appreciates the opportunity to offer comments in support of House Bill 2011, which would extend and enhance the Kansas Qualified Agricultural Ethyl Alcohol Producers Incentive Fund initially created by the Kansas Legislature in 1987. The Kansas Ethanol Industry is vitally important to agricultural producers and the commercial grain trade in Kansas. While Kansas' four existing ethanol plants have created a stable market for roughly 15 million bushels of Kansas grain each year, it is important to specifically note that the presence of the ethanol industry has also provided a much needed market for poor quality grain that doesn't meet traditional marketing standards.

The importance of having a market for poor quality grain has become paramount during recent years, as grain production in Kansas has exceeded the commercial grain storage industries ability to store grain. The fact that during the past three fall harvest seasons in Kansas, over 176,000,000 bushels of grain was stored under emergency conditions (typically piled on the ground) only reinforces the importance of the market provided by the Kansas Ethanol Industry for grain that has deteriorated to a level that makes it unmarketable in traditional market channels. In addition to providing an additional market for Kansas grain, the presence of a strong ethanol industry increases net farm income, strengthens employment percentages, adds to tax receipts, improves our country's balance of trade and reduces our state and country's demand for foreign oil.

Therefore, the Kansas Grain and Feed Association encourages the Kansas Legislature to continue its support of Kansas Qualified Agricultural Ethyl Alcohol Producers Incentive Fund and hopes the Legislature will act favorably on House Bill 2011, which not only extends the program for existing production, but provides added incentives for increased or new production within Kansas borders.

*For information please contact Doug Wareham, KGFA's Vice President, Government Affairs at (785) 234-0461 (office) or (785) 224-1848 (mobile).*

# Kansas Agricultural Alliance

Kansas Agricultural Aviation Association

Kansas Association of Ag Educators

Kansas Association of Wheat Growers

Kansas Corn Growers Association

Kansas Dairy Association

Kansas Farm Bureau

Kansas Grain and Feed Association

Kansas Nursery & Landscape Association

Kansas Pork Association

Kansas Soybean Association

Western Retail Implement and Hardware Association

Kansas Agri-Women

Kansas Association of Conservation Districts

Kansas Cooperative Council

Kansas Crop Consultant Association

Kansas Ethanol Association

Kansas Fertilizer and Chemical Association

Kansas Grain Sorghum Producers Association

Kansas Livestock Association

Kansas Seed Industry Association

Kansas Veterinary Medical Association

---

February 5, 2001

The Honorable Dan Johnson  
Chairman of the House Agriculture Committee  
Statehouse  
Topeka, KS 66612

Dear Chairman Johnson,

The Kansas Agricultural Alliance, representing the 21 above-named agricultural associations, supports HB 2011, providing incentives for the production of ethanol from agricultural products.

Members of the Ag Alliance have voted unanimously to endorse and support this legislation.

Thank you for your consideration.

Sincerely,



Kerri Ebert  
KAA President

House Agriculture Committee  
February 7, 2001  
Attachment 12

**2000 FUEL ETHANOL FACT BOOK:**

---

**For The Record:**



**United States of America  
Fuel Ethanol Program**

*Compliments of*  
**Kansas Ethanol Producers**

*For futher information, contact*

John C. Bottenberg or Kathy Damron

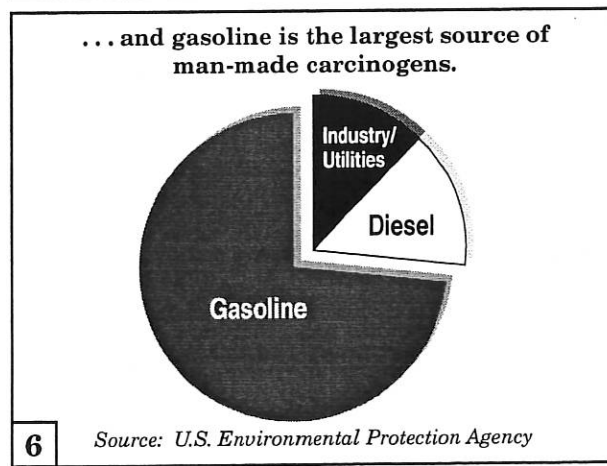
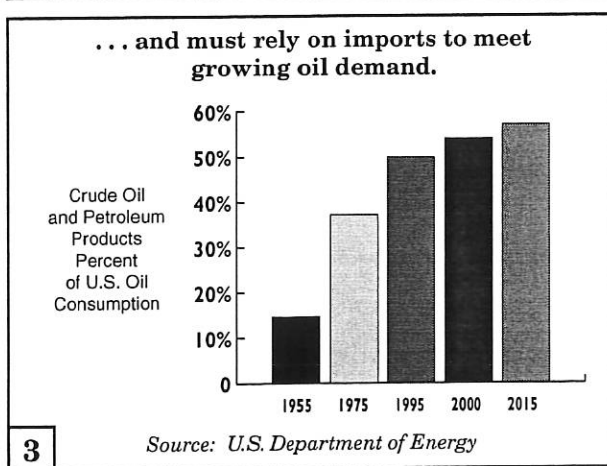
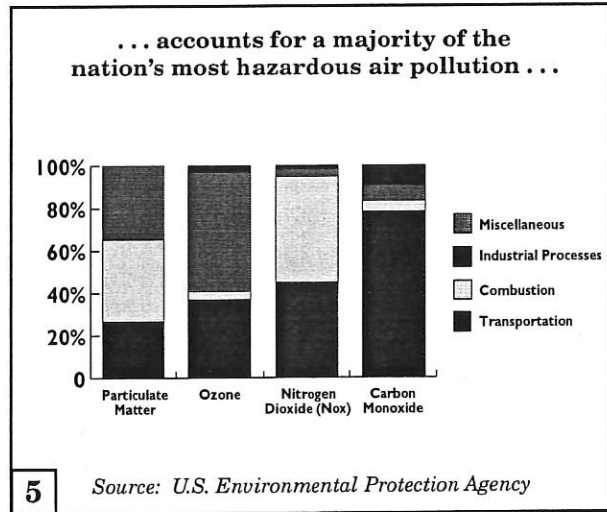
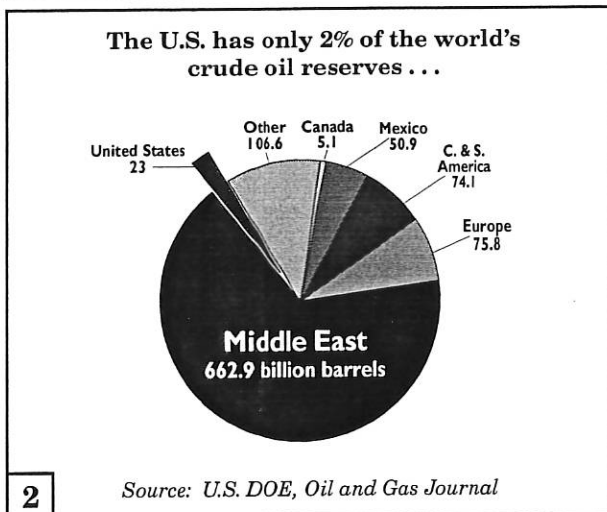
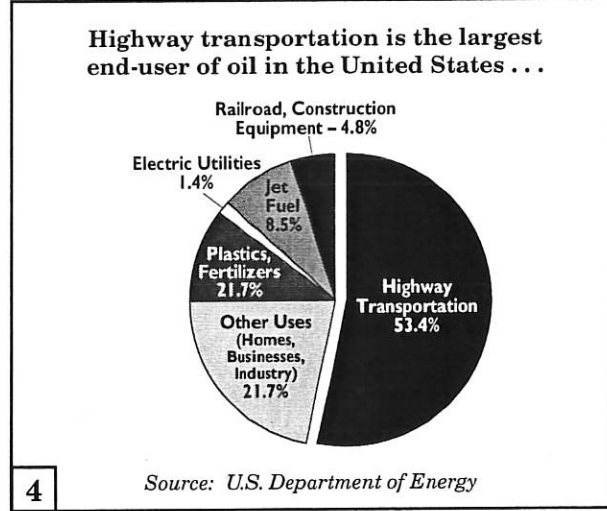
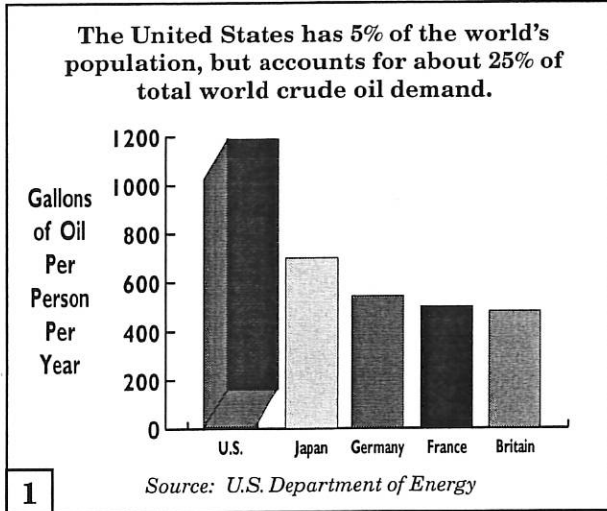
785-235-2324

785-235-2525

---

**★ Why it's working ★**  
**★ Why it's cost-effective ★**  
**★ Questions, Answers and Issues ★**

# The U.S. must find more sources of domestic clean burning transportation fuels





# CFDC

CLEAN  
FUELS  
DEVELOPMENT  
COALITION

Dear Friends,

For the past century, the United States has supported public policy initiatives to increase the use of renewable fuel ethanol for motor vehicles. The modern fuel ethanol industry was created with the passage of the Energy Security Act of 1978. The Act created favorable tax legislation and research and development commitments which represented the first of numerous bipartisan legislative efforts to expand fuel ethanol production in the United States. As a result of ethanol's bipartisan support, several goals and technological advancements have been achieved by the U.S. fuel ethanol program during the past two decades.

- Ethanol capacity increased from essentially zero to 1.8 billion gallons per year, and plant efficiency increased steadily at a rate of about two percent per year;
- Refueling infrastructure investments, public acceptance and automaker endorsements have led to the routine use of ethanol in gasoline blends, cleaner burning reformulated gasoline, and alternative fuel vehicles. Today, one out of every eight gallons of gasoline sold in the U.S. contains ethanol, and ethanol vehicles are now routinely produced and sold to the public at no extra cost. Nearly 500,000 ethanol-fueled vehicles are currently on the road;
- High protein by-products made in the fuel ethanol production process, such as distillers grains and gluten feeds, have gained the full acceptance of feedlot operators and dairymen as premium feeds for their cattle, and represent billions of dollars in valued-added exports;
- Ethanol's ability to reduce toxic air pollution and greenhouse gas emissions is recognized;
- This has resulted in a new industry representing billions of dollars in domestic investment and producing nearly 200,000 jobs that increase federal and state tax revenues while strengthening rural communities across the nation.

These achievements, in concert with major advances in technology to convert cellulosic biomass into fuel ethanol and other biofuels, have set the stage for a significant expansion of the industry during the next millennium. Advances in genetics, farming practices and feed grain production will increase the efficiency of ethanol production from conventional and new energy crops. More importantly, the use of cellulosic biomass (i.e., agricultural residues, wood wastes, yard and garden trimmings and the biomass fraction of municipal waste) essentially eliminates the upper boundaries to the production of ethanol and other biofuels.

The remaining boundaries are now limited to political arguments that ethanol is not entitled to tax incentives used to level the playing field in competition with fossil-based transportation fuels. In arguing against these incentives, ethanol and other alternative fuel detractors simply refuse to include the environmental, national/energy security, military deployment, job-loss and trade imbalance costs of America's growing dependence on imported oil and refined petroleum products.

Under no circumstance should dependence of the level we are now experiencing in this country be acceptable. Exacerbating the situation is the fact that the global demand for petroleum that clearly is taking place in developing countries like India, China, and Korea is estimated to double the demand -- and along with it perhaps the price -- over the next two decades.

Our objective is to illustrate the total social costs of transportation fuels to the nation, and quantify the benefits of clean fuel alternatives like renewable ethanol. Based on our exhaustive research, it is clear that America's ethanol policy is not only on the right track, but it has been an essential component of our evolving national energy policy for nearly 20 years. To do anything but strengthen our nation's fuel ethanol policy is a mistake America cannot afford.

We would like to acknowledge the Clean Fuels Hawaii member companies for their support in the production and distribution of the Fact Book (reprinted in cooperation with the Clean Fuels Development Coalition in Washington, DC). A special thanks to Worldwide Energy Group, Gay & Robinson Sugar Company and Katzen International, Inc.

Douglas A. Durante  
Executive Director  
Clean Fuels Development Coalition



# Year 2000 Fuel Ethanol Fact Book

## TABLE OF CONTENTS

Section	Page
<b>I. For The Record: Ethanol Has A Long History of Bipartisan Support .....</b>	<b>5</b>
Reducing the Federal Deficit and Crude Oil Imports are National Public Policy Priorities Ethanol Policy Represents Two Decades of Bipartisan Legislative Action The Fuel Ethanol Program is a Success	
<b>II. For the Record: Ethanol Has Energy Security Benefits .....</b>	<b>9</b>
U.S. Reliance on Imported Oil Carries a High Price Maintaining a Military Presence in the Persian Gulf Environmental Costs Are Not Included in the Market Price of Crude Oil The Real Cost of Oil Petroleum Imports Account for 45% of America's Trade Deficit Ethanol Production Helps Reduce Petroleum Imports	
<b>III. For The Record: Ethanol Has Economic Benefits .....</b>	<b>13</b>
Ethanol Production Creates Jobs and Stimulates the Economy Ethanol Saves the Treasury Billions of Dollars Each Year Losing U.S. Ethanol Production Would Cost the Government and Taxpayers Billions of Dollars Fuel Ethanol Provides Tremendous Trade Benefits	
<b>IV. For the Record: Ethanol Has Environmental Benefits .....</b>	<b>16</b>
Ethanol Helps Remove Harmful Pollutants From the Air We Breathe Ethanol Supports the Federal Clean Gasoline Programs Ethanol Supports the Federal Oxy-Fuel Carbon Monoxide Reduction Program Ethanol Supports Federal Ozone and Air Toxic Reduction (RFG) Program Burning Fossil Fuels Contributes to Greenhouse Gases Ethanol Reduces Greenhouse Gases	
<b>V. For the Record: The Ethanol Tax Incentive Works .....</b>	<b>19</b>
U.S. Motor Fuel Taxes Fuel Ethanol Tax Incentive Some Industries are Opposed to the Ethanol Tax Incentive The Federal Government Plays a Critical Role in Stimulating Industry	
<b>VI. For The Record: Ethanol Looks Promising in the 21st Century .....</b>	<b>22</b>
Technological Advances Ethanol Has Vast Potential: The Brazilian Example The Nation Needs a Diverse Supply of Domestic Clean Burning Transportation Fuels	
<b>VII. Questions, Answers and Issues .....</b>	<b>25</b>
<b>VIII. For More Information and References .....</b>	<b>27</b>

## Ethanol Has A Long History of Bipartisan Support

"Our overall gasohol program will spur the investments that we, together, must make for a more secure energy future. We will create new markets for our farmers. We will no longer have to throw away waste materials which can be turned into profitable essential fuels." – *President Jimmy Carter, January 11, 1980*<sup>1</sup>

"Ethanol is a homegrown energy alternative. And that's good for national security, and that's good for our trade deficit. And ethanol produces a fuel that burns cleaner. And that's good for our environment - just plain and simple, good for our environment." – *President George Bush, June 13, 1989*

"Ethanol production increases farm income, decreases deficiency payments, creates jobs in rural American, and reduces America's reliance on foreign oil." – *President Bill Clinton, October, 1996*

"President Clinton and I will strongly and actively oppose any effort to eliminate the ethanol program. We challenge Congress to do what is right for our farmers, our rural communities, our environment and our national security." – *Vice President Al Gore April 20, 1998.*

### Reducing the Federal Deficit and Oil Imports are National Public Policy Priorities

In 1973 the United States, for the first time in its history, suffered a domestic economic crisis directly caused by international forces. With the Arab Oil Embargo of 1973, Americans witnessed the effects of our dependence on imported oil: long lines at gas stations; lost productivity; declines in the stock market; economic recession; and general economic unease.

The first Congressional response to the petroleum crisis was the **Energy Tax Act of 1978**,<sup>2</sup> which granted gasoline blended with at least 10 percent ethanol an exemption from the four cent per gallon federal fuel excise tax on gasoline.<sup>3</sup> The goal of this initiative was to stimulate ethanol production — the only viable, domestically-produced, renewable fuel source capable of immediately reducing America's dependence on imported oil.

In 1980, following the oil crisis of 1979, the Iranian Hostage Crisis, and the U.S. grain embargo of the Soviet Union, Congress continued efforts to spur domestic fuel production and reduce American reliance on imported crude. Two additional measures — the **Crude Oil Windfall Profit Tax Act of 1980**<sup>4</sup> and the **Energy Security Act of 1980**<sup>5</sup> continued to promote energy conservation and development of domestic fuels. The 1980 **Crude Oil Windfall Profit Tax Act** extended the expiration date for the ethanol tax exemption from 1984 to 1992,<sup>6</sup> and allowed ethanol to be used as an alternative fuel or in prescribed blends with gasoline by giving ethanol producers various alternatives to utilize this exemption.<sup>7</sup>

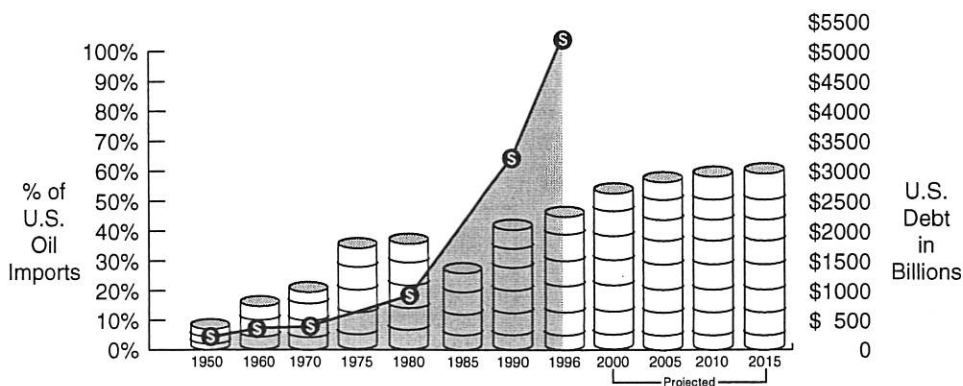
Throughout the 1980's, Congress supported fuel ethanol. In 1982, the **Surface Transportation Assistance Act**<sup>8</sup> raised the gasoline excise tax from 4 cents per gallon to 9 cents per gallon and increased the tax exemption for 10% ethanol blended gasoline to 6 cents per gallon.

(Continued on page 6)

#### Facts For The Record:

*Fuel ethanol helps meet the goals set in the Energy Tax Act, Energy Security Act, Alternative Motor Fuels Act, Clean Air Act, and the Energy Policy Act.*

#### Trends in Crude Oil Imports and The Budget Must Be Reversed



Source: U.S. Department of Energy, U.S. Department of Commerce

13-5

"Fuel ethanol reduces crude oil imports and is environmentally friendly, it also helps meet other national public policy goals." — *Congressional Research Service, 1993*<sup>9</sup>

"We can get fuel from fruit, from the sumac by the roadside, or from apples, weeds, sawdust; almost anything. There is enough alcohol in one year's yield of an acre of potatoes to cultivate that field for a hundred years. And it remains for someone to find how this fuel can be produced commercially — better fuel at a better price than we now know." — *Henry Ford*

## Ethanol Policy Represents Two Decades of Bipartisan Legislative Action

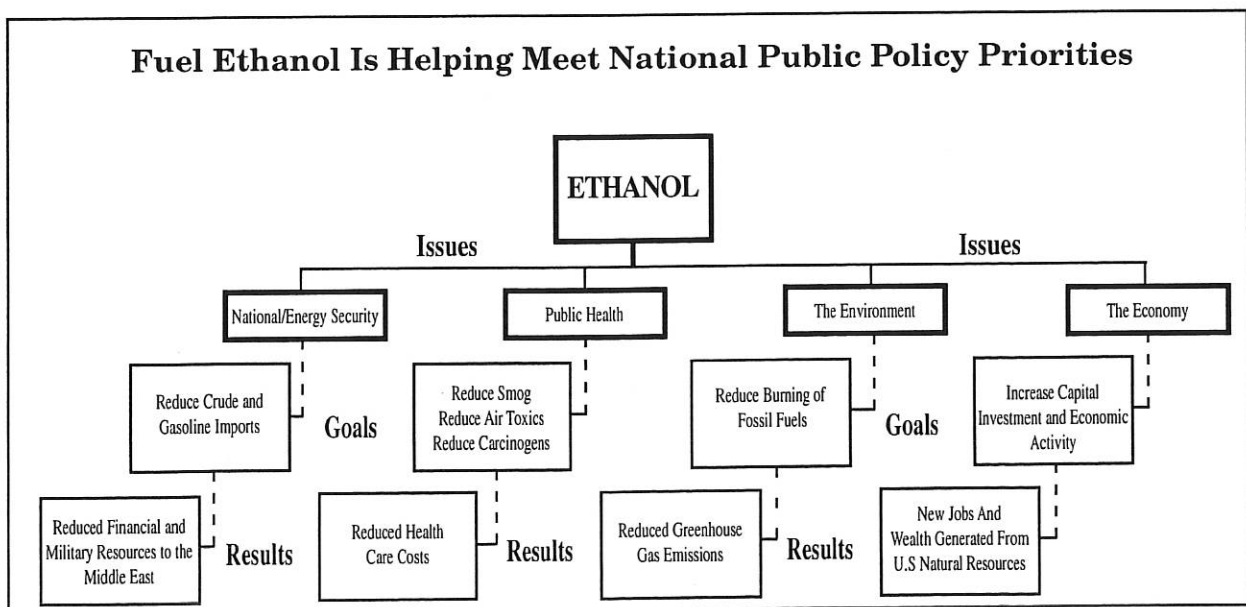
In 1984, the *Tax Reform Act*<sup>10</sup> raised the ethanol tax exemption from 5 to 6 cents per gallon. In 1990, through the *Omnibus Budget Reconciliation Act*,<sup>11</sup> Congress extended the ethanol tax incentive from 1992 to 2000 and decreased the amount of the incentive from 6 to 5.4 cents per gallon.

The *Alternative Motor Fuels Act of 1988*<sup>12</sup> created programs for research, development and demonstration projects on both vehicles and fuels, plus fuel economy credits for automakers. According to the Congressional Research Service, this law was "designed. . .to foster the development, introduction and diffusion of alternative nonpetroleum fuels into the transportation sector and thereby reduce oil imports while at the same time create domestic jobs, improve urban air quality, and stay even with if not reduce, emissions of greenhouse gases."<sup>13</sup> As a direct result of appropriations from this *Act*, the National Ethanol Vehicle Coalition estimates that almost 20,000 vehicles capable of using 85 percent ethanol blended gasoline were manufactured.

With the passage of the *Clean Air Act Amendments of 1990*, Congress, for the first time, explicitly recognized that changes in motor fuels and fuel composition play a vital role in reducing pollution from motor vehicle exhaust. The *Act* created two new gasoline standards specifically designed to reduce harmful fuel emissions in all vehicles located in highly polluted U.S. cities. Among other beneficial fuel composition changes, the *Act* required gasoline to contain cleaner-burning additives called fuel oxygenates. Fuel oxygenates include ethanol, an ethanol derivative known as ethyl tertiary butyl ether (ETBE), and methyl tertiary butyl ether (MTBE), a methanol derivative. These fuel oxygenates are required in all gasoline sold in areas of the country with high carbon monoxide pollution during the winter months, and year-round in areas of the country with high ozone pollution.

Congress passed the *Energy Policy Act of 1992*, to set a national goal of 30 percent penetration of alternative fuels, including ethanol, in the light-duty vehicle market by 2010 and require, in sequence, the Federal Government, alternative fuel providers, state and local governments, and private fleets to buy alternative fuel vehicles.

On June 9, 1998 President Bill Clinton signed the Transportation Efficiency Act of the 21st Century (TEA 21) which extended the ethanol tax incentive through 2007. "I am pleased that the Act extends the ethanol tax incentives through 2007. These are commonsense investments that will help protect air quality, reduce greenhouse gas emissions, and create new economic opportunity for farmers." said President Clinton.



“The cost to the U.S. economy over the past 25 years of over reliance on OPEC oil, including the cost of price shocks, is estimated at \$4 trillion, and a price shock in 2005 would cost the U.S. economy half a trillion dollars.” — *Oak Ridge National Laboratory, October 2, 1996*<sup>14</sup>

**The Fuel Ethanol Program is a Success**

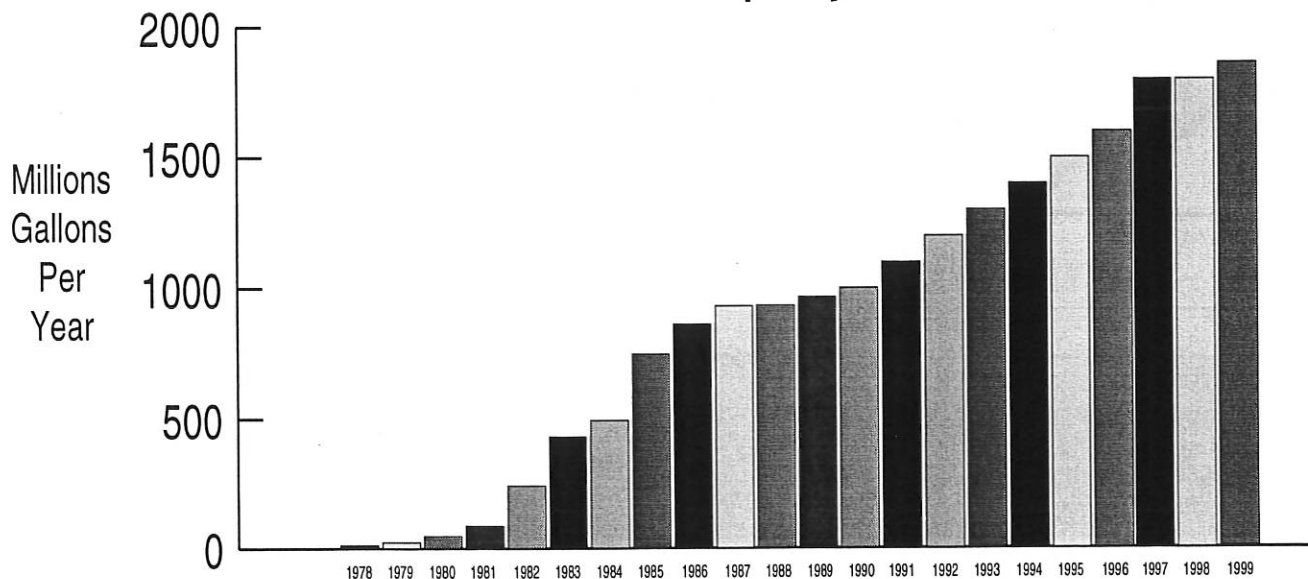
As a result of the past 25 years of Congressional initiatives, over 2 trillion miles have been driven on ethanol-blended fuel.<sup>15</sup> Ethanol is now used for alternative fuel vehicles, aviation fuels and as an additive to meet clean gasoline standards. Since 1978:<sup>16</sup>

- The U.S. ethanol industry has built the capacity to produce 1.7 billion gallons per year of high octane, clean-burning motor fuels;
- There has been over \$4 billion in capital investment in fuel ethanol production facilities;
- Forty-seven fuel ethanol plants located in eighteen states have been developed, with production capacities ranging from 500,000 gallons to 310 million gallons per year; and
- Fuel ethanol plants are owned by large agri-processors and farmer cooperatives.
- Ford and Chrysler are expected to build over 500,000 vehicles to run on 85% ethanol by 2000.

***Facts For The Record:***

Ethanol is the only proven commercial scale renewable transportation fuel currently available in the marketplace,<sup>17</sup> and has the potential to replace at least 10 percent of the nation’s gasoline supply.<sup>18</sup>

**U.S. Fuel Ethanol Capacity 1978-2000**

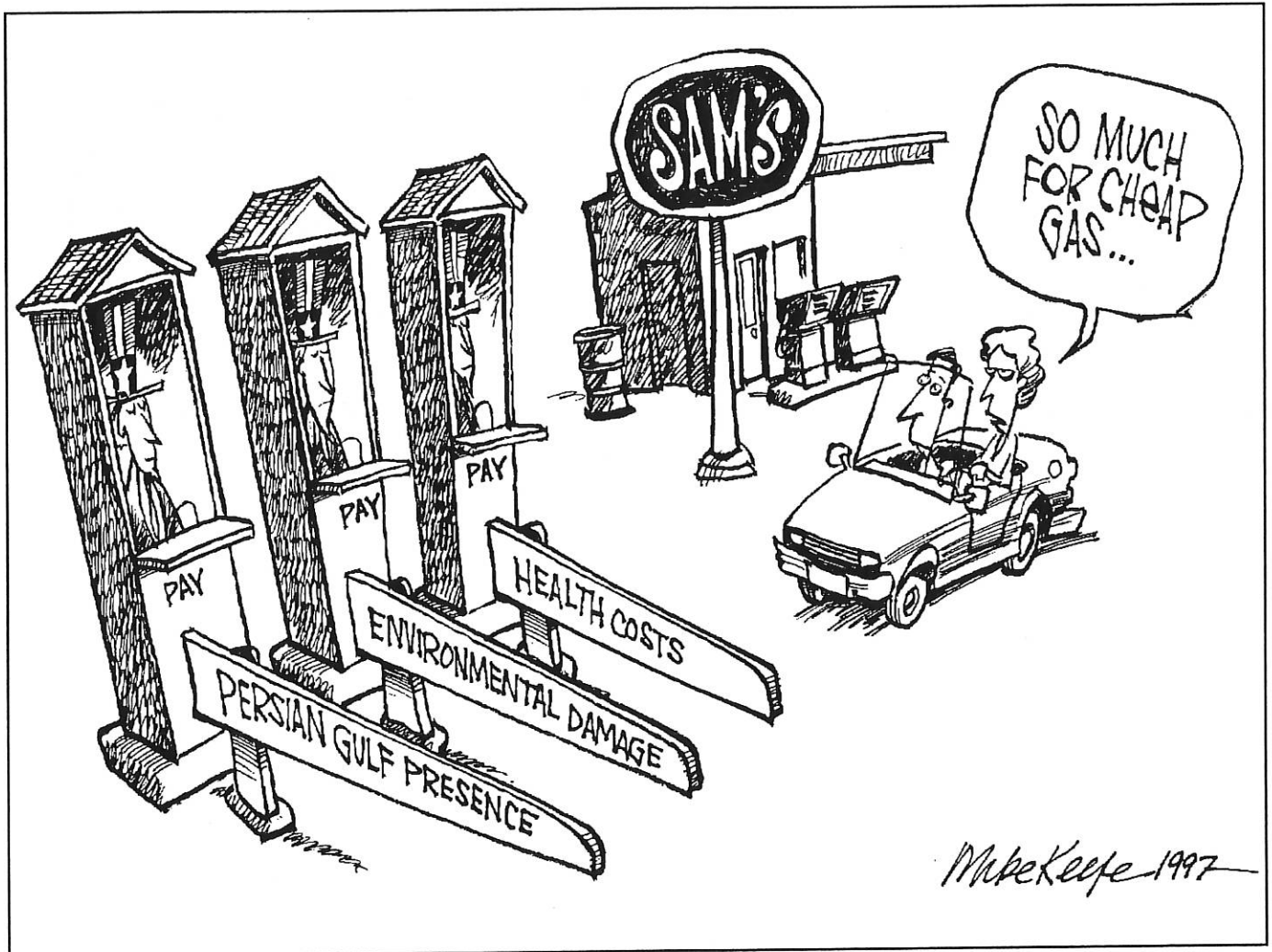


13-7



"The lure and the illusion of low gasoline prices has lulled us into placing our economic security in jeopardy, our military forces at risk and our leadership in question." *General Lee Butler (USAF ret.), Chairman, Clean Fuels Foundation.*

## The Real Cost of Oil



We are increasingly concerned about America's mounting dependence on imported oil and petroleum products. As you know, imports now exceed 50% of use and are expected to reach 61% by 2015 with dependence on OPEC and the Persian Gulf also on the rise. These imports account for about 35% of the nation's trade deficit. These dependencies carry heavy costs. – *General Lee Butler (Ret), Former Commander, Strategic Air Command, Robert C. McFarlane, Former National Security Advisor to the President of the United States, R. James Woolsey, Former Director of Central Intelligence, Admiral Thomas H. Moorer USN (Ret) Former Chairman, Joint Chiefs of Staff, June 11, 1997 in letter to U.S. House of Representatives and Senate.*



## Ethanol Has Energy Security Benefits

In response to the nation's first energy crisis . . . "It is a crisis of confidence. It is a crisis that strikes at the very heart, soul and spirit of our national will. [This is] the moral equivalent to war." — *President Jimmy Carter, July 1979*

"And I don't know if you saw what Saddam Hussein said the other day. He said the biggest mistake he made is when he first moved into Kuwait, that he didn't move into Saudi Arabia... So what we've got to do, it seems to me, is to try to become less dependent on foreign oil for security reasons, and that means alternate sources." — *President George Bush, June 18, 1992*

"It has been the policy of every American president since Harry Truman, that as long as our energy resources are dependent on that part of the world (i.e., Middle East), we are going to be there in force."<sup>19</sup> — *Senator John McCain (R-AZ)*

"Our paramount national security interest in the Middle East is maintaining the unhindered flow of oil from the Persian Gulf to world markets at stable prices."<sup>20</sup> — *U.S. Department of Defense, May 1995*

### U.S. Reliance on Imported Oil Carries a High Price

#### Maintaining a Military Presence in the Persian Gulf

Since 1949, U.S. interests and objectives in the region have included maintaining the uninterrupted flow of Persian Gulf oil, ensuring the security of Israel, and promoting a comprehensive resolution of the Arab-Israeli conflict.<sup>21</sup>

The 1990 Persian Gulf War provided the United States with first hand experience of the cost of protecting oil supplies associated with an escalated military conflict in the Middle East. "The original intent of Saddam Hussein," said Senator John Glenn (R-OH) in 1990, "was to take over 70% of the world's known oil reserves. That would give him control over much of the energy for the whole industrialized world."<sup>22</sup>

Today, the Persian Gulf region holds nearly two-thirds of all the world's known oil reserves and the U.S. now imports more than 53 percent of its petroleum. The U.S. Department of Energy estimates the U.S. will import as much as 68 percent of its oil demand by the year 2010.<sup>23</sup> "In 1990," said Rep. Jim Nussle (R-IA), Congress voted that "50 percent dependence on foreign oil should be considered a peril point for U.S. security."

The energy security cost to the U.S. of maintaining the uninterrupted flow of oil from this area is \$57 billion per year, or approximately an extra \$9.19 per barrel of oil used in the United States.<sup>24</sup> According to a variety of sources, the true cost of oil, including military and energy security expenses, is as high as \$100 per barrel.<sup>25</sup>

"The world's oil and gas supplies will remain a vital national interest of the United States and of the other industrial powers. The Persian Gulf... is still a region of many uncertainties... In this "new energy order," many of the most important geopolitical decisions — ones on which a nation's sovereignty can depend — will deal with the location and routes for oil and gas pipelines. In response, our strategy, our diplomacy and our forward military presence need readjusting." — *former Senate Majority Leader Bob Dole (R-KS)*<sup>26</sup>

#### ***Facts For The Record:***

The cost of U.S. military and foreign aid programs in southwest Asia [Persian Gulf] from 1980 to 1990 is estimated at \$365 billion. — *General Accounting Office*<sup>27</sup>

A recent New York Times editorial put the real cost of gasoline — including military expenditures — at \$5 a gallon.<sup>28</sup>



“Oil and motor vehicle use are responsible for enormous hidden economic and health costs due to environmental damage. Economists term these costs “externalities” because they are not included in the private costs of transportation” — *Office of Technology Assessment, 1994*

“Over the last decade, the death rate for lung disease has risen faster than that of any of the top leading causes of death. Tens of millions of Americans live in areas not meeting at least one federal air quality standard. The health costs of air pollution are estimated to be \$50 billion each year.” — *American Lung Association*<sup>28</sup>

“Human mortality and morbidity due to air pollution accounts for over three-quarters of the total environmental cost and could be as high as \$182 billion annually.” — *Union of Concerned Scientists*<sup>29</sup>

## Environmental Costs Are Not Included in the Market Price of Crude Oil

### ***Facts For The Record:***

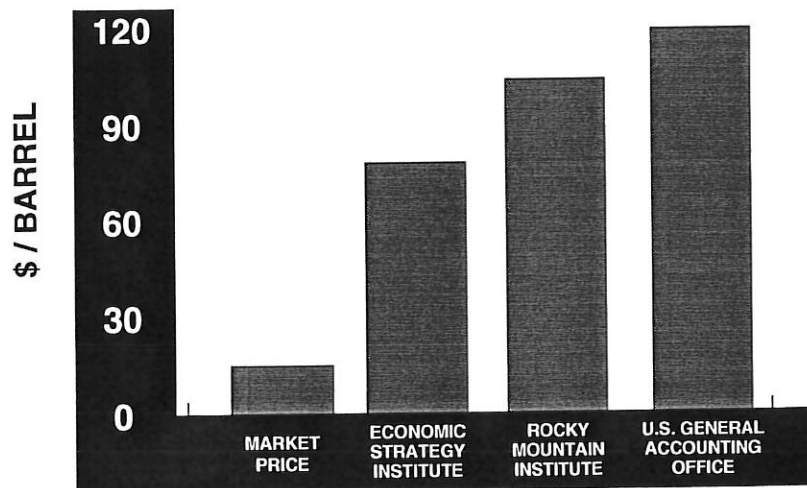
If consumers paid the environmental costs of crude oil directly, prices would be \$7-\$27 higher per barrel.<sup>33</sup>

Recent studies have linked ground level ozone pollution with increases in approximately 10,000 to 15,000 hospital admissions for respiratory conditions in 13 cities during the 1993 – 1994 high ozone season. Between 30,000 and 50,000 emergency room visits during the same months are linked with high ozone levels. Approximately 90 million Americans live in areas with dangerous levels of ozone pollution.<sup>30</sup>

The U.S. Department of Energy estimates 82% of the carbon monoxide, 43% of the reactive organic gases (precursors to ozone) and 57% of nitrogen oxides in domestic cities are emitted from petroleum-based transportation fuels.<sup>31</sup> Gasoline emissions also lead directly to the creation of ground-level ozone (smog), pollution. Congress responded to the gasoline exposure threat to humans and the environment by enacting the *Clean Air Act Amendments of 1990*.

This *Act* specifically required production and distribution of cleaner-burning gasoline, containing oxygenates such as ethanol, in America’s most polluted cities. Since their introduction in January 1995, these “reformulated” fuels have been a resounding success — lowering air toxic emissions by as much as 28 percent, VOC emissions by 17 percent, and NOx emissions by approximately 2 to 3 percent. As a result, many Congressional leaders are calling for the use of cleaner-burning gasoline nationwide.

## THE REAL COST OF OIL



Aromatic hydrocarbons in gasoline include benzene, toluene, and xylene. Benzene is a known carcinogen, one of the worst air toxics. 85% of all benzene in the air we breathe comes from motor vehicle exhaust. Xylene from automobile exhaust in the morning rush hour will form ozone [smog] in sunlight to choke our lungs by the afternoon trip home. Toluene, another aromatic, usually forms benzene during the combustion process and thus becomes carcinogenic along with benzene in the gasoline.

— *Senator Tom Harkin (D-IA)*<sup>32</sup>

“The U.S. Commerce Department estimates that each \$1 billion of trade deficit costs the U.S. 19,100 jobs.”

“Imports of both oil and natural gas are on the rise, and employment is declining. The United States now imports over half of our annual demand... Our dependency on foreign oil costs about \$60 billion annually and makes up a substantial part of our trade deficit.” – *Lamar Smith (R-TX), March 27, 1996*

### Petroleum Imports Account for 45% of America's Trade Deficit

A trade deficit implies that the United States imports more goods than it exports. Petroleum imports account for approximately 45 percent of America's current trade deficit. It is projected that petroleum imports will rise to over 60 to 70 percent of the U.S. trade deficit in the next 10 to 20 years.<sup>34</sup> In 1987, the United States trade deficit in crude oil was \$27 billion. In 1990, that figure doubled to \$43.7 billion.<sup>35</sup> One reason for the expected increase in the trade deficit is the continued growth of the transportation sector. For example:

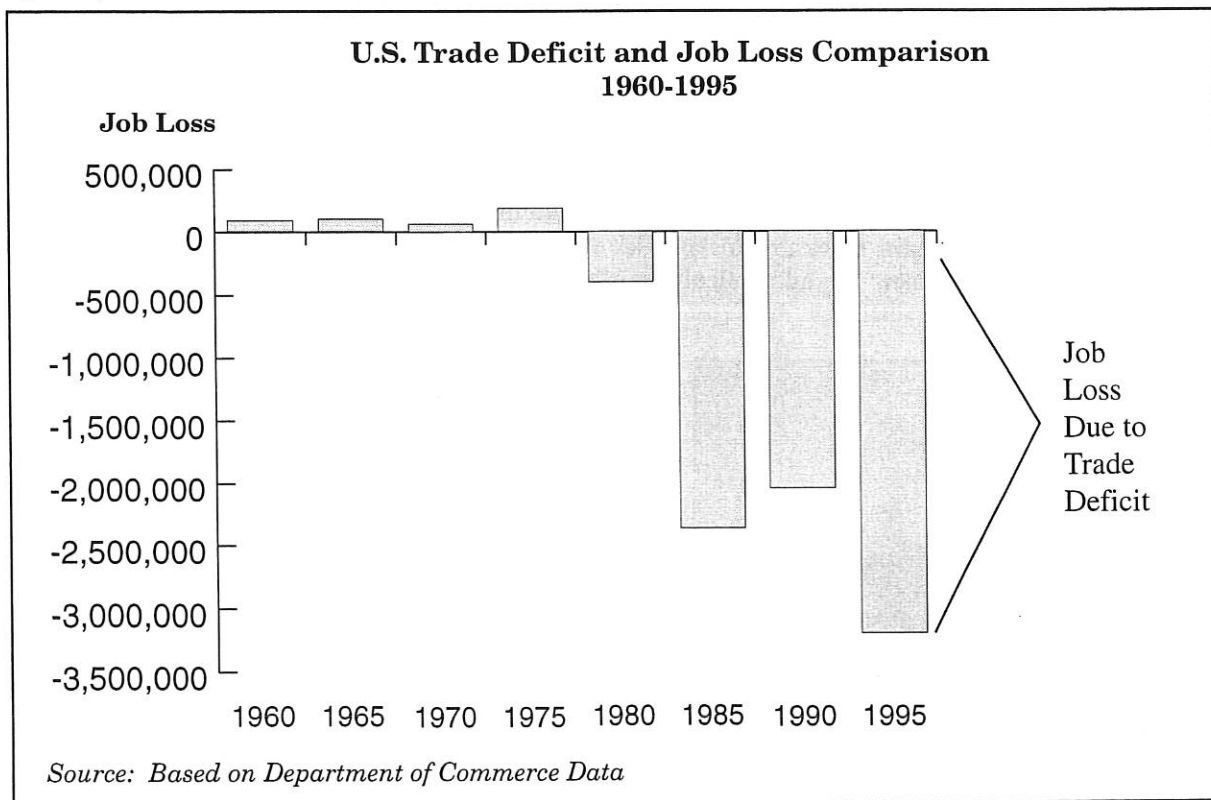
- Vehicle-miles traveled increased from 1.1 trillion per year in 1970 to over 2.3 trillion per year in 1994;<sup>36</sup>
- The total number of vehicles registered increased 78 percent since 1970;
- Fuel consumption from 1970 to 1994 increased from 12 billion to over 120 billion gallons per year;<sup>37</sup>
- As we move into the next century, demand for petroleum products will continue to increase.

#### *Facts For The Record:*

In 1987, the United States trade deficit in crude oil was \$27 billion. In 1990, that figure doubled to \$43.7 billion.<sup>40</sup>

Fuel consumption from 1970 to 1994 increased from 12 billion to over 120 billion gallons per year.<sup>41</sup>

While total consumption and imports continue to dramatically increase, domestic oil production continues to decline. In 1970, the United States produced 9.64 million barrels per day,<sup>38</sup> but in 1991 the U.S. produced just 7.4 million barrels per day.<sup>39</sup>





“Because fuel ethanol reduces crude oil imports and is environmentally friendly, it also helps meet other national public policy goals. Since 1988 Congress has enacted three major pieces of legislation designed, among other objectives, to foster the development, introduction and diffusion of alternative nonpetroleum fuels into the transportation sector and thereby reducing oil imports while at the same time creating domestic jobs, improving urban air quality, and staying even with if not reducing, emissions of greenhouse gases.” — *Congressional Research Service*<sup>42</sup>

## Ethanol Production Helps Reduce Petroleum Imports

### ***Facts For The Record:***

Replacing a portion of a gallon of gasoline with ethanol helps reduce America’s reliance on petroleum . . . and provides additional markets for domestic corn and other grains. —

***General Accounting Office***<sup>48</sup>

Since 1978, U.S. ethanol production has replaced over 14 billion gallons of imported gasoline or crude oil.<sup>49</sup>

According to General Accounting Office estimates, at current capacity, fuel ethanol and other oxygenates could displace about 305,000 barrels of petroleum per day used to produce gasoline by the year 2000 and about 311,000 barrels per day by 2010.<sup>43</sup> The total amount of petroleum ethanol could displace would be approximately 3.7 percent of estimated U.S. gasoline consumption in 2000 and 3.6 percent of consumption in 2010.

If the ***Clean Air Act*** fuel standards, which currently require oxygenates such as ethanol, are expanded to a national scale, about 762,000 barrels per day of petroleum would be displaced by 2000 and 777,000 barrels per day in 2010. This would amount to 9.3 percent of projected gasoline consumption in the year 2000 and about 9.0 percent in 2010. The goal of the ***Energy Policy Act of 1992*** was to have 10 percent market penetration of alternative fuels vehicles by 2000; only 0.7 percent more than would be met using gasoline containing ethanol as required by the ***Clean Air Act***.

Fuel ethanol is the only commercial scale renewable transportation fuel produced in abundance in the United States today. Because ethanol increases octane, it also increases gasoline yields (production) at the refinery. For every barrel of ethanol produced 1.2 barrels of petroleum is displaced at the refinery.<sup>44</sup>

- Today, U.S. ethanol production capacity is 1.7 billion gallons of ethanol, which dramatically lowers the current amount of gasoline the U.S. imports — approximately 350,000 barrels per day.<sup>45</sup>
- Total ethanol production is the equivalent of replacing about 35% of U.S. gasoline imports.<sup>46</sup>

“No single policy tool can substantially increase America’s energy security. The basic vulnerability involves oil, but reducing this vulnerability requires a broad array of actions: maintaining adequate strategic reserves; increasing the efficiency of our entire fleet of cars, trucks, trains, planes, and buses; increasing U.S. petroleum production in an environmentally sensitive manner, . . . and using alternative fuels.” — *U.S. Department of Energy*<sup>47</sup>



“Renewable ethanol and ETBE are among the most abundant and cost-effective renewable fuel options to reduce imported oil.” — ***Ed Rothschild, former Energy Policy Director, Citizen Action***

## Ethanol Has Economic Benefits

“Our [ethanol] program will create new markets for our farmers. We will no longer have to throw away waste materials which can be turned into profitable essential fuels.” – *President Jimmy Carter, January 11, 1980*

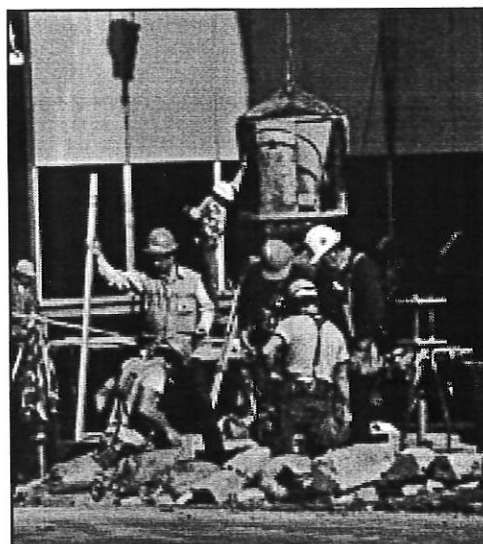
“The American Petroleum Institute estimated that the presence of ethanol causes gasoline prices to be 0.27 percent lower than would occur without ethanol. The total cost saving to the consumer. . . is approximately \$270 million per year.” – *U.S. Department of Energy*

### Ethanol Production Creates Jobs and Stimulates the Economy

Based on a 1997 study by the Kellogg School of Management, United States ethanol production in 1993 led to the creation of almost 200,000 jobs per year. Since that time ethanol production has increased by 20% creating even more jobs. [continue with Numerous independent studies have confirmed that ethanol production creates domestic jobs, concluding that:<sup>50</sup>

- During ethanol plant construction, approximately 370 local jobs are created, providing up to 5,604 person-years of work;
- During ethanol plant operation, up to 4,000 local jobs are created;
- Ethanol plant construction creates \$60 million to \$130 million in additional income;
- Ethanol plant operation creates \$47 million to \$100 million in additional income.

A report by the Economic Research Service of the United States Department of Agriculture estimated that increasing production capacity to 5 billion gallons per year by the year 2000 would create an additional 108,000 jobs nationwide — in the ethanol industry alone. This would have a profound impact on rural America where a decline in employment has already placed increasing burdens on our cities, infrastructure and tax base.



#### ***Facts For The Record:***

In 1993 alone, the United States' total ethanol production led to the creation of almost 200,000 U.S. jobs per year. – *Kellogg School of Management*<sup>51</sup>

Increasing production capacity to 5 billion gallons per year by the year 2000 would create an additional 108,000 jobs nationwide, in the ethanol industry alone. — *U.S. Department of Agriculture (e.g., Ag. Info Bulletin #678, July 1993)*



“A 1997 study by Northwestern University concluded that ethanol is responsible for more than 195,000 domestic jobs and increases farm income by \$4.5 billion a year. The ethanol industry adds over \$450 million to state tax receipts and improves the U.S. trade balance by \$2 billion annually. This is all done at *net savings* of \$3.6 billion a year to the federal government.” – Gov. Terry Branstad, August 8, 1997.

## Ethanol Saves the Treasury Billions of Dollars Each Year

### Facts For The Record:

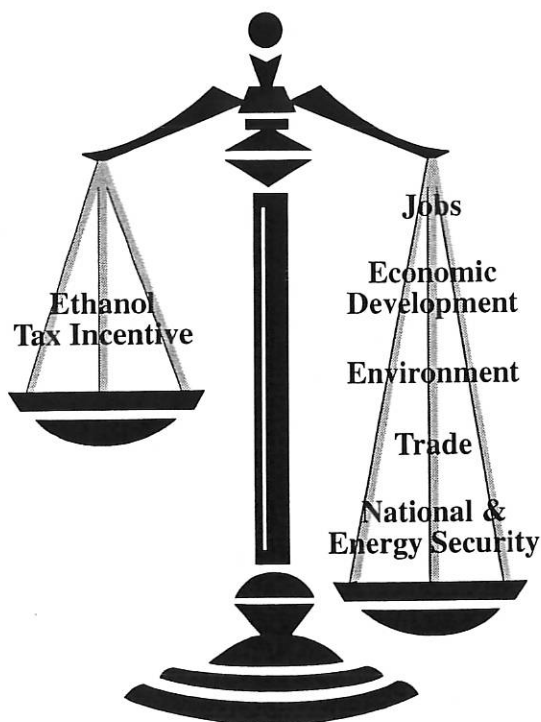
Ethanol nets taxpayers almost \$4 billion over the next 5 years  
– AUS Consultants<sup>60</sup>

A dramatic 90 percent decline in ethanol production would cost the U.S. taxpayers \$6.3 billion annually  
– General Accounting Office<sup>61</sup>

Fuel ethanol production generates wealth and jobs by processing domestic, renewable resources into clean burning transportation fuel.

- Ethanol production will add \$4 billion to the United States Treasury over the next 5 years.” — AUS Consultants<sup>52</sup>
- In 1997, the top ten corn growing states reported a combined \$464.8 million boost in tax receipts as a direct result of corporate income and sales tax on ethanol producers.”  
– U.S. Department of Agriculture, May 1997
- In Nebraska, ethanol production alone accounted for 3 percent of total tax receipts.<sup>53</sup>
- Through four different studies completed in the past four years, it is estimated that construction of a 50 to 100 million gallon wet-milling ethanol production facility would create between \$60 million and \$100 million in additional income. And, an additional \$47 million to \$100 million in income would result from the operation of such a facility.<sup>54</sup>
- According to an economic analysis by AUS Consultants, the “combination of reduced farm program costs and increased income tax revenues results in a net gain (inclusive of ethanol tax incentives) to the U.S. Treasury of \$1.30 per gallon of ethanol produced.”<sup>55</sup> As a result, ethanol generates \$555 million of net tax revenue for the Federal Treasury annually through personal and business tax receipts.<sup>56</sup>

### Benefits of Ethanol Production Outweigh the Cost



### Losing U.S. Ethanol Production Would Cost the Government and Taxpayers Billions of Dollars

For comparison, the General Accounting Office reports that a 50 percent decline in the production of fuel ethanol would actually *cost* the U.S. Treasury \$3.2 billion annually,<sup>57</sup> and a dramatic 90 percent decline would cost the U.S. taxpayer \$6.3 billion annually.<sup>58</sup> Further, the U.S. Department of Agriculture estimates that elimination of the ethanol tax incentives would reduce net farm income by \$5.9 billion to \$10.2 billion between 1998 and 2005.<sup>59</sup>

"In the last ten years, the total of U.S. trade deficits has exceeded \$1 trillion. This persistent pattern has contributed significantly to declining real wages and to increasing job insecurity. Most of its victims are middle-income working people. It is estimated that the manufactured goods trade deficit represents a loss of some three million American jobs." — *AFL-CIO Executive Council*<sup>62</sup>

"In the 1980's, the U.S. merchandise trade balance ballooned from a deficit of \$19 billion in 1980 to \$53 billion in 1983, and then doubled in a year, to \$106 billion in 1984. Last year it stood at \$188 billion, setting a new high record for the third consecutive year." — *Senator Robert Byrd (D-WV), March 19, 1997*

"The U.S. goods trade deficit increased 5 percent in 1995, considerably slower than the 25 percent jump between 1993 and 1994. Since 1992, the goods trade gap has widened nearly 82 percent" — *1995 Annual Report, U.S. Trade Representative.*

## Fuel Ethanol Provides Tremendous Trade Benefits

Ethanol production creates a number of valuable co-products. Among these are distillers dried grains, corn gluten (used as animal feed supplements), corn oil, carbon dioxide, and ethanol for the production of ethyl tertiary butyl ether (ETBE).

- Figures from the Corn Refiners Association placed exports of corn gluten at \$750 million in 1992, \$200 million of which is attributable to ethanol production. An estimated 323,000 metric tons of corn oil valued at \$182 million, were exported in 1993.<sup>63</sup> In addition to these co-products, about 125 million gallons of fuel ethanol were exported to Brazil, and 10 million gallons were used to make Ethyl Tertiary Butyl Ether (ETBE) for export.<sup>64</sup>
- A report by Dr. Michael K. Evans, Professor of Economics at the Kellogg School of Management, estimates ethanol production will improve the U.S. trade balance by approximately \$2 billion in 1997 alone.<sup>65</sup>
- A report by the U.S. Department of Agriculture indicates that eliminating the ethanol tax exemption would increase the trade deficit by \$4.5 to \$7.8 billion between 1998 and 2005.<sup>66</sup> Using Department of Commerce estimates, that means the United States could lose 95,500 to 152,800 jobs.<sup>67</sup>
- Ethanol, used as an alternative fuel or as a blend with gasoline, also helps to improve the trade balance by displacing imported petroleum. In 1991, about 900 million gallons of ethanol were added to gasoline.<sup>68</sup> This resulted in a gallon for gallon reduction in the amount of petroleum used that year. Using less petroleum means importing less petroleum. In 1999, the U.S. will use 1.3 billion gallons of fuel ethanol.

### ***Facts For The Record:***

Ethanol production will improve the U.S. trade balance by approximately \$2 billion in 1997 alone." — *Kellogg School of Management*<sup>69</sup>

Eliminating the ethanol tax exemption would increase the trade deficit by \$4.5 to \$7.8 billion between 1998 and 2005.— *U.S. Department of Agriculture*<sup>70</sup>



## Ethanol Has Environmental Benefits

"Ethanol is a homegrown energy alternative. And ethanol produces a fuel that burns cleaner. And that's good for our environment — just plain and simple, that's good for our environment." — *Vice President George Bush, June 13, 1989*

"Transportation sources (i.e., burning gasoline and diesel) are responsible for 55.8 percent of outdoor air pollution. That includes 77.3 percent of the total carbon monoxide, 44.5 percent of the oxides of nitrogen, 3.3 percent of the sulfur oxides, 35.6 percent of volatile organic compounds (VOCs), and 26.3 percent of particulate matter (less than 10 microns), and 26.6 percent of lead emitted into the air." — *American Lung Association*

### Ethanol Helps Remove Harmful Pollutants from the Air We Breathe

#### **Facts For The Record:**

"Greater use of ETBE will increase the use of domestic renewables, namely ethanol, and can make an important contribution to air quality"

— *Douglas Ford, President, AMOCO Oil Company, September 1993*

The Environmental Protection Agency estimated total annual cancer cases from gasoline and its combustion products in 1995 was between 250 and 600,<sup>71</sup> and ranked gasoline as the number one source of toxic emissions.<sup>72</sup>

Because ethanol is inherently cleaner than gasoline, it emits less hydrocarbons, nitrogen oxides, carbon monoxide and hydrogen. As a result, ethanol is used to meet environmental and alternative fuel requirements set forth in the *Alternative Motor Fuels Act of 1988*, the *Clean Air Act Amendments of 1990*, the *Energy Policy Act of 1992*, and the *Energy Tax Act*. These public laws represent bipartisan efforts to reduce the environmental and economic impacts of gasoline consumption on society.

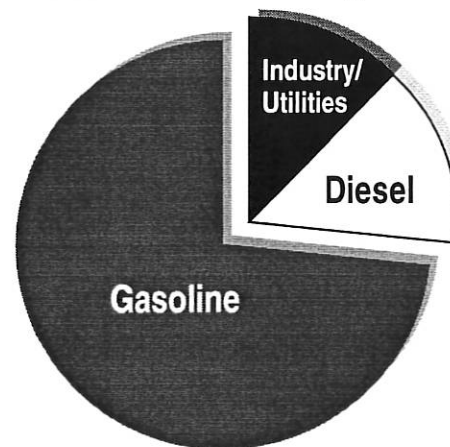
Ethanol has significant environmental benefits. Consider the following:

- Cars designed to run on pure alcohol fuels have the potential to emit 80% to 90% less reactive hydrocarbons than advanced-technology gasoline cars.<sup>73</sup>
- The federal oxy-fuel program (i.e., requires fuel oxygenate additives) reduced carbon monoxide violations by 90 percent in its first year (1992). Fuel ethanol was used in 89 percent (24 of 27) of the carbon monoxide oxy-fuel areas in 1995.<sup>74</sup>
- In its first year of use (1995), the federal reformulated gasoline (RFG) standard (i.e., requires fuel oxygenate additives) helped reduce harmful air toxic pollution by over 25 percent and many of the compounds that create ozone pollution, or smog, by approximately 17 percent.<sup>75</sup> In 1995, ethanol or ETBE was used in 13 of the 24 RFG areas (over 50 percent).<sup>76</sup>

"Using either E-85 (85% ethanol, 10% unleaded gasoline) or E-10 (10% ethanol, 90% unleaded gasoline) fuel greatly improves air quality and energy efficiency. Final results show a 35 to 46 percent reduction in greenhouse gas emissions and a 50 to 60 percent reduction in fossil energy use due to the use of ethanol as a motor fuel."

— *Argonne National Laboratory (ANL), February 1998*

#### **Gasoline is the largest source of man-made carcinogens**



Source: U.S. Environmental Protection Agency



“Carbon monoxide is a colorless, odorless gas that is produced as a result of incomplete burning of carbon-containing fuels. Exposure to carbon monoxide reduces the blood’s ability to carry oxygen. Carbon monoxide exposures especially affect unborn babies, infants, and people with anemia or a history of heart disease.”  
 – *American Lung Association*<sup>77</sup>

### Ethanol Supports Federal Clean Gasoline Programs

In response to public concerns regarding air quality and health, industry and government agreed to improved gasoline specifications in the Clean Air Act Amendments of 1990 — creating oxygenated gasoline, and reformulated gasoline (RFG) standards. One common denominator in the cleaner gasoline standards is the addition of fuel oxygenates (e.g., ethanol, ETBE, and/or MTBE). Clean gasoline, with oxygenates, is required in cities violating carbon monoxide and/or ozone air quality standards

### Ethanol Supports the Federal Oxy-Fuel Carbon Monoxide Reduction Program

EPA estimates transportation accounts for 66% to 80% of carbon monoxide (CO) emissions in our nation’s cities.<sup>78</sup> Tests conducted by EPA indicate ethanol blends are likely to reduce carbon monoxide emissions in vehicles by 10-30% depending on the vehicle’s combustion technology. The potential improvement in CO emission over straight gasoline is significant.<sup>79</sup>

The Auto/Oil Air Quality Improvement Research Program — a cooperative effort by the Big Three domestic automakers and fourteen petroleum companies — conducted exhaustive tests over 8 years and found that gasoline containing oxygenates, such as ethanol, reduces emissions of carbon monoxide.<sup>80</sup>

### Ethanol Supports the Federal Ozone and Air Toxic Reduction (Reformulated Gasoline) Program

In addition to the oxygenated fuel standard, the reformulated gasoline (RFG) specification also includes a limit on benzene (a known carcinogen), as well as a ban on heavy metal additives such as lead and manganese. Similar to the nation’s transition from leaded gasoline, RFG helps sustain the nation’s effort to improve air quality by reducing harmful fuel related emissions. [RFG is sold in 18 states and the District of Columbia since 1995 and has reduced toxic gasoline related emissions by over 500,000 tons.]

#### RFG with Oxygenates, Like Ethanol, Substantially Reduces Harmful Gasoline Emissions

Air Toxics	-28%
Volatile Organic Compounds	-17%
Nitrogen Oxides	-3%
Carbon Monoxide	-13%
Sulfur Oxides	-11%
Carbon Dioxide	-4%
Particulate Matter	-9%
<b>Reduced Cancer Risk</b>	<b>-20 – 30%</b>

Source: *Clean Fuels Development Coalition Technical Committee, California Air Resources Board.*

“Oxygenates like ethanol help fuels burn more completely, thereby reducing emissions of carbon monoxide, volatile organic compounds and toxic air emissions. Furthermore, RFG oxygenates displace benzene found in conventional gasoline, which reduces emissions of this known carcinogen as well.”

– *American Lung Association of Metropolitan Chicago, 1998 report*

"According to two public opinion surveys conducted in 1997 and 1998 by International Communications Research, over 70% of voters said they viewed global climate change as either a very serious or somewhat serious threat.

"There is no debate among any statured scientists of what is happening, the only debate is the rate at which it's happening." – *Harvard University*<sup>81</sup>

"There's a lot of noise in the data. It is hard to isolate cause and effect. But there is now an effective consensus among the world's leading scientists and serious and well informed people outside the scientific community that there is a discernible human influence on the climate, and a link between the concentration of carbon dioxide and the increase in temperature ..... The time to consider the policy dimensions of climate change is not when the link between greenhouse gases and climate change is conclusively proven but when the possibility cannot be discounted and is taken seriously by the society of which we are part ..... We in BP have reached that point."  
 — *Sir John Browne, Group Chief Executive, British Petroleum (BP America) Stanford University, May 19, 1997*

### Burning Fossil Fuels Contributes to Greenhouse Gases

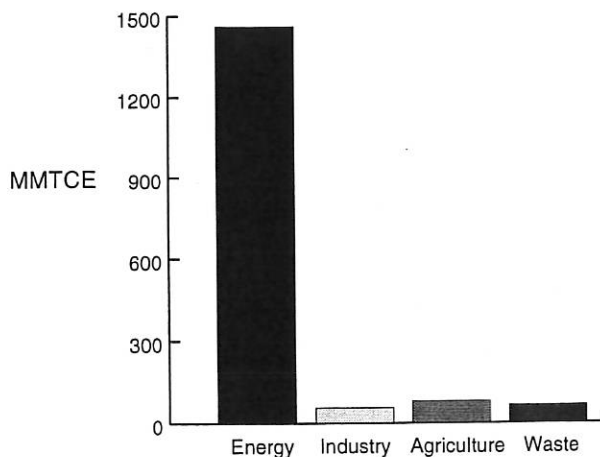
Human activities over the past 200 years, particularly fossil fuel combustion, have been resulting in significant emissions of anthropogenic (i.e., human-induced) greenhouse gases, primarily carbon dioxide. Emissions of these anthropogenic greenhouse gases have already altered the chemical composition of the atmosphere. This is creating an "enhanced greenhouse effect," akin to an atmospheric blanket trapping gases beneath it. — *U.S. Environmental Protection Agency*<sup>82</sup>

"According to a five-laboratory study for the Department of Energy, cars fueled by biomass-generated ethanol generate approximately one-half of one percent of the carbon dioxide that is produced by the same car burning gasoline."

– **Jim Woolsey, former director, Central Intelligence, Chairman of the Advisory Committee, Clean Fuels Foundation, April 3, 1998 Fuel Ethanol in the 21st Century Seminar.**

### Fossil Fuel Use For Energy Must Be Reduced to Lower Greenhouse Gases

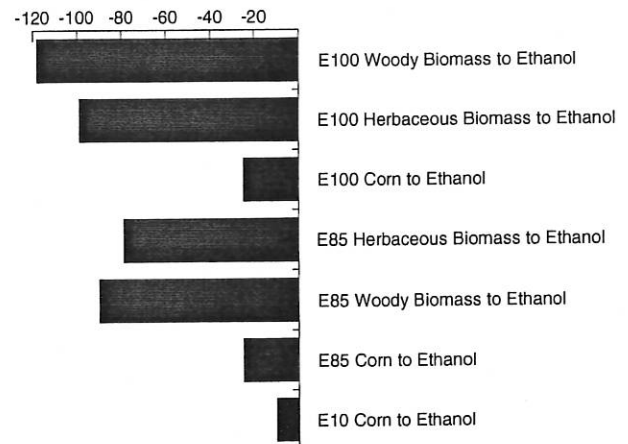
Total U.S. Greenhouse Gas Emissions by Source: 1994



Source: U.S. Environmental Protection Agency

### Ethanol As A Replacement Fuel For Gasoline Reduces Greenhouse Gases

Greenhouse Gas Reductions Compared to Gasoline



Source: U.S. Department of Energy, Office of Fuels Development, and Congressional Research Service.

If world energy consumption reaches the levels projected in the reference case, carbon emissions will exceed 1990 levels by 44% in 2010 and by 81% in 2020. By 2010, carbon emissions in the developing world are nearly equal to those in the industrialized world; and by 2020 emissions in the developing world would exceed those of the industrialized world by 27%.

– **International Energy Outlook 1998, April 1998**



# The Ethanol Tax Incentive Works

“When we took office in 1981 only 75 million gallons of ethanol were being produced. This year more than 450 million gallons will be produced, requiring more than 180 million bushels of corn. It just goes to show there’s no limit to what free people can do when the gloom-and-doomers stand aside and get out of the way.” —

*President Ronald Reagan, August 20, 1984*

“I will vigorously oppose efforts in the Senate to increase anybody’s taxes, including taxes on ethanol. And in any case, we should not raise taxes on renewable fuels since such taxes are not in the interest of the economy, the environment or Texas and American corn growers.” — *Senator Phil Gramm (R-TX), September, 1995*

“Congress and my administration must work together to provide the foundation for the ethanol industry’s continued growth. I am strongly opposed to efforts to reduce or repeal the alcohol fuel tax incentive.”

— *President Bill Clinton, October 1996*

“The incentive is claimed by thousands of gasoline marketers — mostly independent, small businesses — that sell ethanol blends all across the country. In other words, the incentive is claimed at corner gas stations not in corporate boardrooms.” — *Senator Richard Durbin (D-IL), May 1997*

## U.S. Motor Fuel Taxes

Federal motor fuel excise taxes are imposed on gasoline, diesel fuel, and special motor fuels.<sup>83</sup> With the exception of the special motor fuel tax on compressed natural gas, the excise tax on each of these fuels goes to both the Federal Highway Trust Fund and a permanent General Fund. Compressed natural gas (CNG) is subject only to the permanent General Fund rate.

### Highway Motor Fuel Excise Tax Rates

Fuel Type	Total Rate	Federal Highway Trust Fund Rate	General Fund Rate
Gasoline:	18.3 cents/gal	14.0 cents/gal	4.3 cents/gal
Gasoline Ethanol Blend	12.9 cents/gal	8.6 cents/gal	4.3 cents/gal
Diesel Fuel:	24.3 cents/gal	20.0 cents/gal	4.3 cents/gal
Special Motor Fuels (other than CNG):	18.3 cents/gal	14.0 cents/gal	4.3 cents/gal
CNG:	4.3 cents/gal	0	4.3 cents/gal

### Fuel Ethanol Tax Incentive

Present law provides a partial exemption from the federal excise tax on gasoline for gasoline blended in prescribed portions with ethanol. The excise tax exemption is 5.4 cents per gallon of gasoline blended with 10% ethanol. Gasoline blenders can also use lower amounts of ethanol to meet clean gasoline standards and claim an exemption of 4.26 cents for gasoline containing 7.7% ethanol, and 3.18 cents for gasoline containing 5.7% ethanol. Gasoline blenders have the option to use the exemption or an income tax credit, which is also equal to 54 cents per gallon of ethanol. The ethanol tax exemption provides the price difference between the higher market price of ethanol when compared to the wholesale price of gasoline. The exemption is scheduled to be reduced from 5.4 c to 5.3¢ in 2001, 5.2¢ in 2003, and 5.1¢ in 2005, and expire in the year 2007.

### Facts For The Record:

“In 1988, the American Petroleum Institute estimated tax incentives for ethanol reduced the price of conventional gasoline by 0.27 percent. Therefore, if we were to remove the incentive, consumers will be paying a couple of hundred million dollars more for conventional gasoline each year.” — *United States Department of Energy*<sup>84</sup>

"The situation is "critical." All committee members should contact key individuals and organizations in their areas, urging them to oppose legislative measures favoring alcohol [fuels]." — *American Petroleum Institute 1933*<sup>85</sup>

"Attached is a rather extensive API list of regulatory reform proposals. High Priority. . . To the greatest extent possible, eliminate or minimize mandates and subsidies affecting alternative fuels and alternative-fueled vehicles in the Energy Policy Act of 1992. Medium Priority. . . Eliminate the oxygen content (e.g., fuel ethanol, ETBE, MTBE) requirement in Clean Air Act Section 211(k) for Phases I and II complex model RFG." — *Texaco memo, February 17, 1995*<sup>86</sup>

## Some Industries Are Opposed to the Ethanol Tax Incentive

Every attempt to create a viable, cost-effective alternative fuels market has been met by the staunch opposition of oil companies. "Whenever the major oil companies are faced with competition, their first line of defense is to discredit their opponents using the methods of the most sophisticated and experienced propagandists." *Citizen Action*<sup>87</sup>

### **Facts For The Record:**

Ethanol is a non-hydrocarbon product produced from abundantly available domestic, renewable resources, not from crude oil. On that basis alone, the petroleum industry opposes its use. Every gallon of ethanol displaces a gallon of petroleum-based product in the market, and even more in the refining business. — *Clean Fuels Development Coalition*

Following introduction of the *Energy Tax Act of 1978*,<sup>88</sup> which created the ethanol tax incentive, more and more areas of the country began using gasoline blended with ethanol, or "gasohol." Soon reports of anti-competitive practices by oil companies began circulating. These reports become so wide-spread that Congress eventually intervened and passed the *Gasohol Competition Act of 1980*.<sup>89</sup> "It appears that in the past, several major oil companies," said the Congressional Report accompanying the *Act*, "which did not themselves produce or market gasohol, refused to permit their franchisees to utilize company pumps and tanks for the sale of gasohol. The companies refused to allow use of their credit system for gasohol sales. Moreover, some companies threatened to terminate a franchisee's contract if the franchisee even offered to sell gasohol."<sup>90</sup>

In 1988, citing violations of the *Gasohol Competition Act of 1980* and other federal anti-trust statutes, several small fuel ethanol producers sought to recover financial damages from several major oil companies.<sup>91</sup> The case produced over one thousand documented examples of oil company marketing policies that

discouraged consumers and gasoline marketers from purchasing or selling alcohol-blended gasoline.<sup>92</sup>



These assaults on the ethanol industry continue today. In 1995, the American Petroleum Institute and the National Petroleum Refiners Association sued the Environmental Protection Agency to prevent promulgation of an EPA rule requiring 30 percent of the gasoline sold in certain areas of the country with high levels of ozone pollution to contain renewable fuel ethanol.<sup>93</sup>

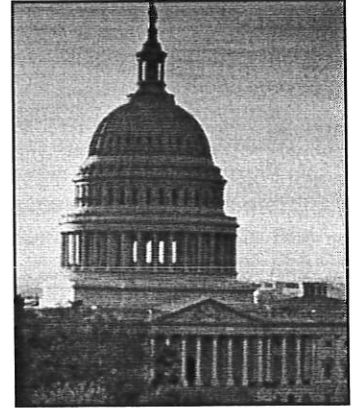
Presented as part of evidence to the Federal Trade Commission investigation regarding unfair trade practices by certain oil companies against ethanol.<sup>94</sup>

We can look forward to the day when a ton of biomass will be traded like a barrel of oil is today." Energy Secretary Bill Richardson, October, 1998.

“What’s wrong with using tax breaks to spur domestic energy production? We’ve certainly done it in the past, and, with our precarious dependence on foreign oil, we will have to do much more of it in the future. Money invested in producing domestic fuels whether ethanol, methanol, shale oil, or coal liquids and gases, is money spent in this country, and not money lost to OPEC. It stimulates the economy, creates jobs, and most importantly, helps free us from our addiction to imported oil.” — *U.S. Senator Birch Bayh, December 3, 1980*<sup>95</sup>

## The Federal Government Plays a Critical Role in Stimulating Industry

Federal government incentives to help develop certain products and/or industries are not new. By the end of World War II the federal government invested over \$12.7 billion in direct funding to build 1,600 various industrial plants and another \$6 billion in indirect subsidies to build hundreds more — this would be the equivalent of \$95 billion today.<sup>96</sup> This investment launched the United States as the world’s strongest industrial power.



### Petroleum Companies

Major U.S. based international oil companies have received substantial public benefits — much more so than newer, less-polluting energy sources.<sup>97</sup> According to DOE, from 1984 to 1994, U.S.-based oil companies had taxable income totaling \$253.4 billion, incurred taxes of \$38.4, and received \$63 billion in foreign tax credits.<sup>98</sup> It has been widely reported that over the years the U.S. oil industry has received billions of dollars in direct and indirect federal tax benefits and subsidies, including:

- foreign tax credits;
- access to low-cost reserves on public lands;
- the Strategic Petroleum Reserve;
- depletion allowances;
- intangible drilling write-offs, and
- the cost of U.S. military protection of assets in unstable foreign countries.

### Aviation

Today, U.S. aviation is the world’s leader. A central motivating factor behind this ongoing interest was the early recognition of the importance of maintaining supremacy in aviation technology to national defense. The U.S. Congress provided support for this burgeoning industry through lucrative tax incentives for air mail. In 1994, the aviation/aerospace industry employed over 802,000 people, and generated some \$113 billion in sales. It had a positive balance of trade equaling \$27.5 billion and was responsible for almost \$3 billion in new investment.<sup>99</sup>

### Computers

The federal government’s interest in computer technology initially was driven by defense considerations. The first purpose was to assist the scientists of the Manhattan Project in performing the huge volumes of complex calculations their work required. As a result, nearly 40% of all households have a computer and total computer sales have reached \$8.5 billion. Today, the Internet provides another example of government incentives used to enhance the public’s quality of life.<sup>100</sup>

### *Facts For The Record:*

“Under current circumstances, we cannot avoid being there [the Middle East]. We have to be there. But over the long run, it is the purest of folly to assume that problems, such as the proliferation of weapons of mass destruction and terrorism in that part of the world, in part funded by oil money are going to somehow magically go away.” — *Jim Woolsey, former director, Central Intelligence, Chairman of the Advisory Committee, Clean Fuels Foundation, April 3, 1998 Fuel Ethanol in the 21st Century Seminar.*

“U.S. taxpayers are providing at least \$5 billion a year in tax breaks in the form of foreign tax credits to provide U.S. multinational oil companies with an incentive to invest billions of dollars to find and produce oil overseas so that it can then be exported to the United States.” — *Citizen Action*<sup>101</sup>



## Ethanol is a Promising 21st Century Fuel

"As new chemical technology develops there may be additional significant opportunities to use plant parts that are rich in a particular component, e.g., sugar or starch. Plant starches come in different forms such as starches from rice, potatoes, corn, and wheat. All have different properties and offer different inherent uses." – *Plant/Crop-based renewable resources 2020, January, 1998.*

"The vision is to provide continued economic growth, healthy standards of living, and strong national security through the development of plant/crop-based renewable resources that are a viable alternative to the current dependence on non-renewable, diminishing fossil resources." – *Plant/Crop-based renewable resources 2020, January, 1998.*

### Technological Advances

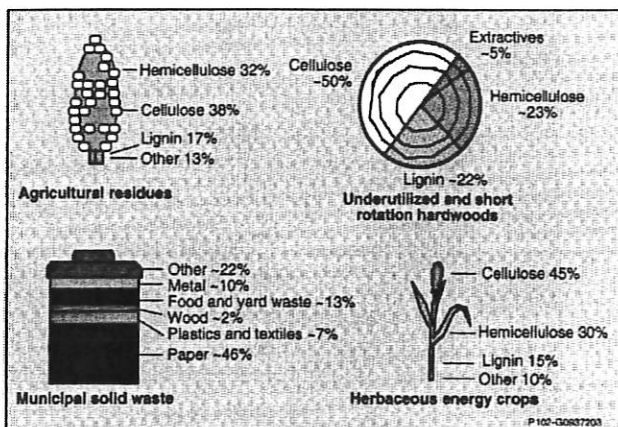
Agriculture is the nation's largest industry and major creator of wealth in this country. Agriculture is also responsible for nearly 25% of the nation's employment.<sup>102</sup> A vision of the 21st century must include a sustainable rural economy and diverse supply of clean transportation fuels and utility fuels. Fuel ethanol offers the win, win, win possibilities needed in the 21st Century.

- Farmers win by diversifying income opportunities, as new crops such as switchgrass and fast-growing wood crops are developed;
- Agricultural processors win by benefiting from increased quantities of feedstocks, which help make their use more economical;
- The environment wins by lessening the emphasis upon traditional row crops as a source of farm income because of new diverse planting opportunities that require fewer inputs. In addition, switchgrass and fast growing woody crops are highly compatible with improved wildlife habitats and land conservation. And the overall lessening of the nation's reliance on fossil fuels and switch to cleaner burning biomass energy sources will improve air quality;
- The nation wins as we increase our energy self-reliance by developing a national energy strategy that is not reliant on imported and expensive petroleum.

### Facts For The Record:

Researchers estimate an average of 2.45 billion metric tons of cellulosic biomass could be available in the U.S. each year for fuel conversion — providing a potential ethanol yield of 270 billion gallons (twice the total U.S. gasoline consumption). — *National Renewable Energy Laboratory*

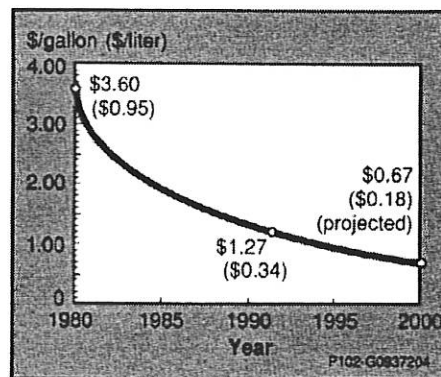
### Ethanol Feedstocks



The cellulose and hemicellulose components of biomass feedstocks (including the paper and yard waste portions of MSW) can be broken down and fermented into ethanol.

Source: National Renewable Energy Laboratory

### Production Costs



The overall goal of the ethanol research program is to reduce the cost of producing fuel-grade ethanol to \$0.18/liter (\$0.67/gallon), making it competitive with the cost of gasoline.

Source: National Renewable Energy Laboratory

"On tomorrow's farm . . . some of the new energy crops will look like hay, but they'll feed ethanol plants, not horses. The woodlot out back might provide energy for lighting or cooking. But farmers won't burn it themselves. They'll sell it to a local power plant or biogas company." – *National Renewable Energy Laboratory, The American Farm, Harnessing the Sun to Fuel the World, March 1994.*

"The economic well-being and future security of this Nation depend upon maintaining and building long-term energy security and strengthening the domestic energy industry." – *President Ronald Reagan, January 25, 1988*

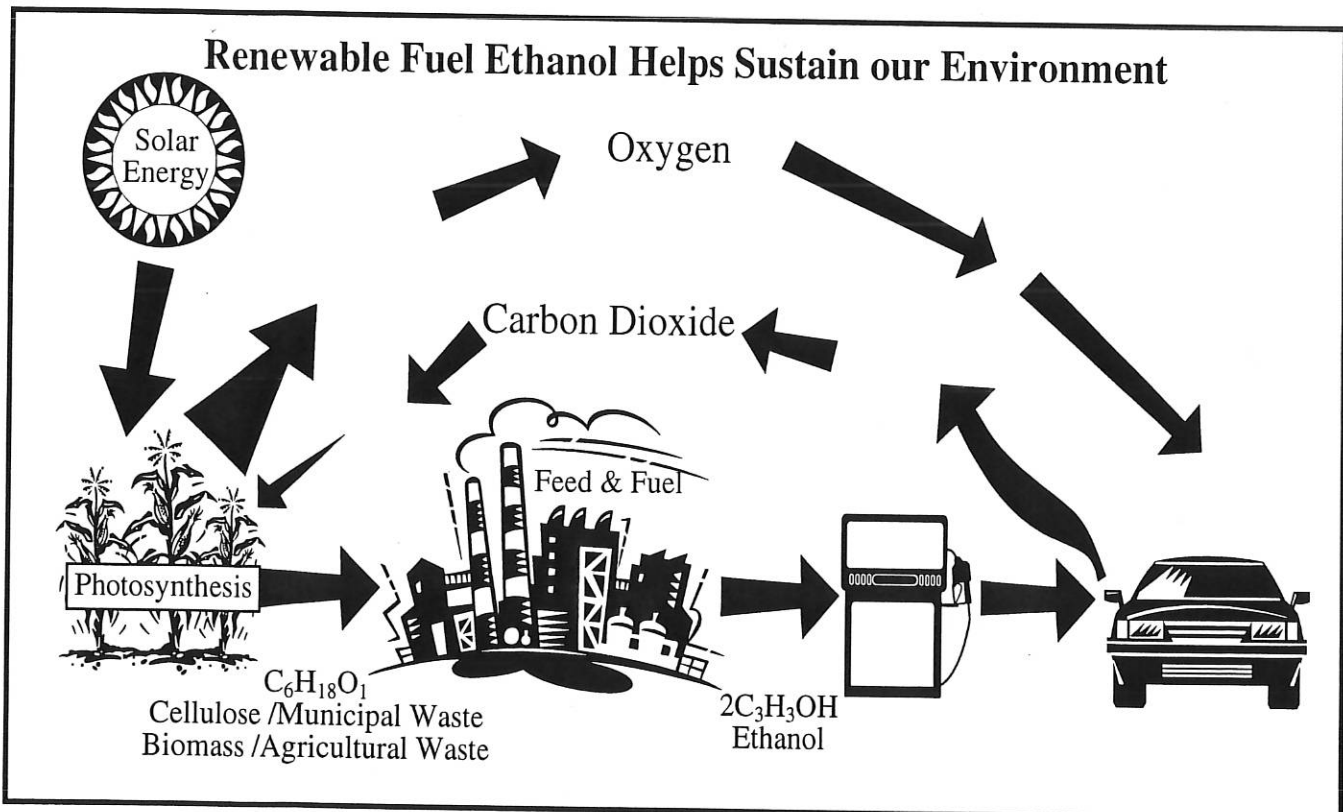
"When considering the economic benefits of ethanol production, ethanol production costs in Brazil are equivalent to crude oil at \$19 per barrel." — *World Bank*<sup>103</sup>

### Fuel Ethanol has Vast Potential: The Brazilian Example

In 1975 Brazil began an ambitious, three stage, national alcohol fuel program designed to reduce its dependence on imported oil. Today, this program has been hailed as an overall success.<sup>104</sup>

Brazil's ethanol program has:<sup>105</sup>

- Created a market where Brazilian gasoline powered vehicles operate on at least 22 volume percent ethanol;
- Created a market with 4.3 million vehicles using hydrated ethanol (95.5 vol%);
- Created 640,000 direct jobs;
- Created approximately 9 million indirect jobs;
- Reduced oil imports by nearly 70% between 1979 and 1992;
- Increased the manufacturing of ethanol-powered vehicles to 96% of domestic vehicle production;
- Improved the Brazilian trade balance from \$3.5 billion in 1975 to over \$14.9 billion in 1992;
- Reduced Brazil's reliance on imported oil from 43.3 percent in 1985 to 21.7 percent in 1992;
- Increased ethanol production to a high of 4.2 billion gallons per year, and
- Now 18,000 of Brazil's 22,000 fuel stations sell fuel ethanol.





The United States transportation sector depends on petroleum for 97 percent of its energy needs. The largest contributor to the U.S. balance of trade problem is imported oil. By 2020, up to 74% of the oil we use will be imported, costing the U.S. \$173 billion per year.<sup>106</sup> — *United States Department of Energy*

“There is no single panacea that will solve our energy crisis, we must rely on and encourage multiple forms of production — coal, crude oil, natural gas, solar, nuclear, synthetics, and conservation.” — *President Jimmy Carter, State of the Union Address, January 21, 1980*

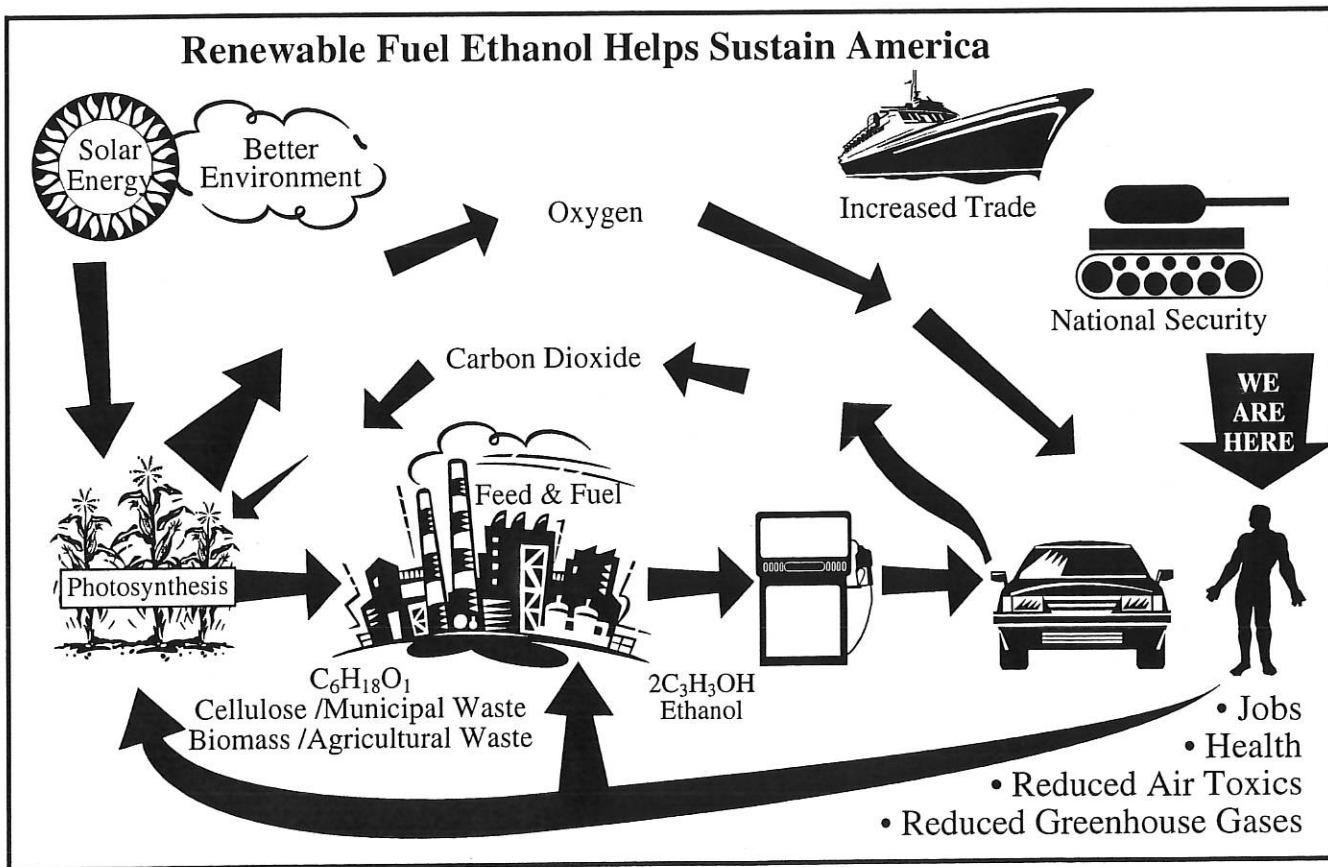
“Ethanol is by far the most energy efficient method of producing liquid transportation fuels. There is a net energy gain for ethanol production, versus an energy loss for other fuels, as follows: ethanol 125%, refined gasoline 85%, methanol 55%, and coal gasification 45%. — *U.S.D.A., MN Dept. of Agriculture*

### The Nation Needs a Diverse Supply of Domestic Clean Burning Transportation Fuels

The transportation network of tomorrow will utilize many resources, both conventional and renewable. New fuel efficient vehicles and smart highways will improve the efficiency of conventional fuels. Almost any type of current and future vehicle can be fueled from biomass. The flexibility of this important, domestic and renewable resource could provide liquid “biofuels” for internal combustion engines, electric and hybrid vehicles, and fuel cell vehicles.

Biofuels are alcohols, ethers, and other chemicals made from cellulosic biomass - renewable resources such as fast growing trees, grasses, aquatic plants (microalgae), and waste products such as agricultural and forestry residues, and municipal and industrial wastes.

With further advances in technology, these domestically produced, biomass resources could provide up to 50% of future U.S. light duty vehicles fuel requirements. Some of the biofuels used to fuel cars and trucks include ethanol and Biodiesel. Other alcohol fuels such as methanol, which is currently produced from fossil fuels, also could be produced from renewable biomass and classified as biofuels.



# Questions, Answers and Issues

## What is fuel ethanol?

- Ethanol, otherwise known as ethyl alcohol, alcohol, grain-spirit, or neutral spirit, is a clear, colorless, flammable oxygenated fuel.
- Ethanol is often blended with gasoline to create what is commonly known as gasohol. This ethanol/gasoline combination contains ethanol at volume levels of 5.7%, 7.7%, or 10%.
- Ethanol is used as an alternative fuel to replace gasoline. In this application, a 85% ethanol and 15% gasoline mixture is used in flexible fuel vehicles to meet *Clean Air Act* and *Energy Policy Act* crude oil displacement goals.
- Ethanol is used to increase octane and improve the emissions quality of gasoline as required by the *Clean Air Act Amendments of 1990*.
- Ethanol is used in the manufacture of ethyl tertiary butyl ether (ETBE). ETBE is used to increase octane and improve emissions from gasoline as required by the CAAA.
- In the future, ethanol can be used as a fuel to power fuel cells.

## How does ethanol perform in my vehicle?

All automobile manufacturers approve the use of ethanol/gasoline blends. Approval of ethanol blends is found in the owners manual under references to refueling or gasoline. General Motors Corporation states in its owners manual they recommend the use of fuel oxygenates, such as ethanol, when and where available.

Fuel ethanol blends are sold in 43 states in the United States from Alaska to Florida.<sup>107</sup> Fuel ethanol blended gasoline has achieved nearly 100% marketshare of all gasoline sold in certain carbon monoxide (oxygenated gasoline) and ozone nonattainment areas (reformulated gasoline, RFG). Minnesota has adopted a statewide oxygenated fuel program that has resulted in ethanol being blended in over 90% of the State's gasoline. Therefore, fuel ethanol is successfully used in all types of vehicles and engines that require gasoline.

<b>RFG With Fuel Oxygenates, like Ethanol, Works in All Engine Types</b>	
Passenger Vehicles	Approved
Motorcycles	Approved
Small Engines	Approved
Boats	Approved
Portable Power Equipment Manufacturing Association	Approved
Yamaha	Approved
Mercury Marine	Approved
Harley Davidson	Approved
Briggs & Stratton	Approved
Sears	Approved

## Questions, Answers & Issues

### **How much does ethanol cost compared to gasoline?**

The cost of producing ethanol is higher compared to the *market* price of gasoline. The majority of production costs are the result of the cost of the feedstock (i.e., corn). The average cost of producing ethanol ranges from \$1.00 to \$1.25 per gallon. The \$0.54 per gallon of ethanol excise tax exemption provides the price differential between the wholesale price of gasoline (\$0.60 per gallon) and the higher cost of producing ethanol (\$1.10). Therefore, the ethanol incentive allows ethanol to be competitive with gasoline (e.g., \$1.15 ethanol - \$0.54 tax incentive = \$0.61 per gallon)

### **Does the ethanol incentive stop the construction of highways by taking money out of the Highway Trust Fund? No!**

The federal ethanol program does not deny a single state any highway construction funding and has not undermined our nation's transportation infrastructure.<sup>108</sup> Consider the following points:

Approximately \$30 billion is collected in federal highway taxes each year. The reduced tax collections attributable to the partial excise tax exemption for ethanol-blended fuels amounts to less than \$650 million annually, or less than 2% of the total gasoline taxes collected. The Highway Trust Fund currently enjoys a \$20 billion surplus. The effect of the ethanol program, then, is merely to reduce the amount of the surplus by 3%. No state receives less federal highway funding as a result of ethanol sales. States are reimbursed for any reduced payments due to ethanol sales through the Hold Harmless Account.

The impact of the ethanol tax incentive on the Highway Trust Fund (HTF) cannot be viewed simply as a calculation of the incentive times the number of gallons sold domestically (approximately \$650 million), because it is misleading and irrelevant. The more important calculus is what impact the incentive has on highway construction monies available to the states. No state's infrastructure is affected by the ethanol tax incentive.

Under the complex allocation rules of the Interstate Modal Transportation Efficiency Act of 1991 (ISTEA, P.L. 102-240), federal funding for highway projects is almost entirely unrelated to a state's payment into the HTF. This point was clarified by Stephen Kaplan, General Counsel for the Department of Transportation in an August 3, 1994 letter to the U.S. Senate:

"While revenue to the Highway Trust Fund would be reduced by [increased ethanol blend use], DOT does not anticipate a change in distributions to the states under authorizations provided in the ISTEA due to the obligation ceiling established in law."

In fact, of the 13 programs funded by ISTEA, only two are negatively impacted by a state's contribution to the HTF. Those programs that are wholly independent of a state's HTF payment include: interstate construction, Highway Maintenance, National Highway Safety, Bridge Construction, Surface Transportation Program, Congestion Management and Air Quality, Demonstration Projects. These programs represent the large majority of federal highway dollars.

The only programs that are minimally impacted by reduced payments to the HTF are the Minimum Allocation Account and the Donor Bonus Account. Importantly, the Hold Harmless Account provides offsetting additional revenue for reduced payments to these two accounts.

The increased farm income and tax revenues attributable to ethanol production offsets the "cost" of the partial excise tax exemption for ethanol-blended fuels and actually results in a net savings to the federal government of more than \$500 million annually. This means more federal money is available for transportation infrastructure.

## Frequently Asked Questions About Ethanol

### Does ethanol production affect our nation's food supplies? No!

The production of ethanol does not translate into less grain available for food. Farmers do not grow more or less grain based on ethanol production. Approximately 90% of corn produced in the U.S. is fed directly to animals. Ethanol production helps farmers remain profitable, thereby ensuring adequate food supplies in the future. The processes of producing ethanol for fuel and beverage alcohol utilize only the starch portion of the grain, leaving intact the high-value, high-protein, high-vitamin content feed products called distillers dried grains or corn gluten feed.

"Ethanol production yields many valuable human and animal feed co-products. A bushel of corn used in the fuel ethanol process produces 1.6 pounds of corn oil, 10.9 pounds of high protein feed (distillers dried grains, or DDG), 2.6 pounds of corn meal, and 31.5 pounds of starch that can be converted to beverages or sweeteners, or used to produce 2.5 gallons of ethanol.<sup>109</sup> Co-products from the milling of corn have important nutritional properties that add value to feed rations and livestock feeding programs.<sup>110</sup> The use of corn co-products provides a cost-competitive feed on a per-head basis. Corn co-products compete with other feed ingredients, helping to reduce overall costs to the producer."<sup>111</sup>

### Does ethanol have a positive energy balance, even considering the fuel and energy used to grow, harvest, and process corn? Yes!

- "Corn ethanol production is energy efficient, as indicated by an energy ratio of 1.24, that is for every Btu dedicated to producing ethanol, there is a 24% energy gain."<sup>112</sup>
- "If farmers and industry were to use all the best technologies and practices, the net energy ratio would be 2.21:1."<sup>113</sup>
- "Moreover, producing ethanol from domestic corn stocks achieves a net gain in a more diverse form of energy. Ethanol production utilizes abundant domestic energy supplies like coal and natural gas to convert corn into a premium liquid fuel that can replace petroleum imports by a factor of 7 to 1."<sup>114</sup>

## For More Information about Fuel Ethanol

Please feel free to contact the Clean Fuels Development Coalition at 703-276-CFDC (2332) for any information concerning this report.

### Federal

Alternative Fuels Data Center	<a href="http://www.afdc.nrel.gov">http://www.afdc.nrel.gov</a>
Department of Commerce	<a href="http://www.doc.gov">http://www.doc.gov</a>
Department of Energy	<a href="http://www.doe.gov">http://www.doe.gov</a>
Argonne National Laboratory	<a href="http://www.anl.gov">http://www.anl.gov</a>
Bartlesville Project Office National Oil Program	<a href="http://oil.bpo.gov/bpo-oil.html">http://oil.bpo.gov/bpo-oil.html</a>
Brookhaven National Laboratory	<a href="http://suntid.bnl.gov">http://suntid.bnl.gov</a>
Clean Cities	<a href="http://www.ccitites.doe.gov">http://www.ccitites.doe.gov</a>
Energy Efficiency & Renewable Energy Network	<a href="http://www.eren.doe.gov">http://www.eren.doe.gov</a>
Fossil Energy Worldwide Web Network	<a href="http://www.fe.doe.gov">http://www.fe.doe.gov</a>
Lawrence Berkeley Laboratory	<a href="http://www.lbl.gov">http://www.lbl.gov</a>
Lawrence Livermore Laboratory	<a href="http://www.llnl.gov">http://www.llnl.gov</a>
Los Alamos National Laboratory	<a href="http://www.lanl.gov">http://www.lanl.gov</a>
Morgantown Energy Technology Center	<a href="http://www.metc.doe.gov">http://www.metc.doe.gov</a>
National Renewable Energy Laboratory	<a href="http://www.nrel.gov">http://www.nrel.gov</a>
Office of Science and Technical Information	<a href="http://apollo.osti.gov">http://apollo.osti.gov</a>
Sandia National Laboratories	<a href="http://www.sandia.gov">http://www.sandia.gov</a>
Department of Treasury	<a href="http://www.ustreas.gov">http://www.ustreas.gov</a>



## For More Information

Energy Information Administration (EIA)	<a href="http://www.eia.doe.gov">http://www.eia.doe.gov</a>
Energy-Related Web Servers	<a href="http://www.fe.doe.gov/moweb.html">http://www.fe.doe.gov/moweb.html</a>
EPA	<a href="http://www.epa.gov">http://www.epa.gov</a>
Office of Mobile Sources	<a href="http://www.epa.gov/OMSWWW/omshome.htm">http://www.epa.gov/OMSWWW/omshome.htm</a>
Federal Register-Searchable Envt'l Subsets	<a href="http://www.epa.gov/epahome/EPAFR-Search.thml">http://www.epa.gov/epahome/EPAFR-Search.thml</a>
General Accounting Office (GAO)	<a href="http://www.gao.gov">http://www.gao.gov</a>
General Printing Office	<a href="http://www.access.gpo.gov">http://www.access.gpo.gov</a>
US House of Representatives-Internet Law Library	<a href="http://www.pls.com">http://www.pls.com</a>
Links to House members	<a href="http://www.house.gov/memberWWW.html">http://www.house.gov/memberWWW.html</a>
Gopher	<a href="http://gopher.house.gov">gopher.house.gov</a>
Internal Revenue Service	<a href="http://www.irsustreas.gov">http://www.irsustreas.gov</a>
Library of Congress	<a href="http://Lcweb.loc.gov">http://Lcweb.loc.gov</a>
Office of Technology Assessment	<a href="http://www.ota.gov">http://www.ota.gov</a>
US Senate	<a href="http://www.senate.gov/index.html">http://www.senate.gov/index.html</a>
gopher	<a href="http://gopher.senate.gov">gopher.senate.gov</a>
Thomas - Congressional Web Site	<a href="http://thomas.loc.gov">http://thomas.loc.gov</a>
White House	<a href="http://www.whitehouse.gov">http://www.whitehouse.gov</a>

*To receive a list of all House e-mail addresses, send a message to: [congress@hr.house.gov](mailto:congress@hr.house.gov)*

*To receive a list of all Senate e-mail addresses, send a message to: [webmaster@scc.senate.gov](mailto:webmaster@scc.senate.gov)*

### **Related Organizations**

Biomass Energy Alliance	<a href="http://www.biomass.org">http://www.biomass.org</a>
Citizen Action	<a href="http://www.essential.org/CMEP">http://www.essential.org/CMEP</a>
Clean Air Network	<a href="http://www.naturalgas.com">http://www.naturalgas.com</a>
Clean Fuels Foundation	<a href="http://www.cleanfuels.org">http://www.cleanfuels.org</a>
Environmental Education on the Internet	<a href="http://www.nceet.snre.umich">http://www.nceet.snre.umich</a>
Global Climate Coalition	<a href="http://www.worldcorp.com/dc-online/gcc/index.html">http://www.worldcorp.com/dc-online/gcc/index.html</a>
Governors' Ethanol Coalition	<a href="http://www.ethanol-gcc.org/">http://www.ethanol-gcc.org/</a>
Interstate Oil and Gas Compact Commission	<a href="http://www.iogcc.oklaosf.state.ok.us">http://www.iogcc.oklaosf.state.ok.us</a>
National Conference of State Legislatures	<a href="http://www.ncsl.org/index.htm">http://www.ncsl.org/index.htm</a>
National Technology Transfer Center	<a href="http://www.nttc.edu">http://www.nttc.edu</a>
Natural Resources Defense Council	<a href="http://www.nrdc.org">http://www.nrdc.org</a>
Nebraska Ethanol Board	<a href="http://nebsspc.nrc.state.ne.us/">http://nebsspc.nrc.state.ne.us/</a>
Petroleum Internet Resources	<a href="http://www.slb.com/petr.dir/guthrey.html">http://www.slb.com/petr.dir/guthrey.html</a>
Press Release Center	<a href="http://ino.com">http://ino.com</a>
Public Citizen-Critical Mass Energy Project	<a href="http://www.essential.org/CMEP/">http://www.essential.org/CMEP/</a>
Renewable Fuels Association	<a href="http://www.Ethanol.RFA.org">http://www.Ethanol.RFA.org</a>
Search the Federal Register	<a href="http://ssdc.ucsd.edu/gpo/fedfld.html">http://ssdc.ucsd.edu/gpo/fedfld.html</a>
Society of Automotive Engineers	<a href="http://www.sae.org">http://www.sae.org</a>
State and Local Government on the Net	<a href="http://www.piperinfo.com/piper/state/states.html">http://www.piperinfo.com/piper/state/states.html</a>
State Search	<a href="http://www.state.ky.us/nasire/NASIREhome.html">http://www.state.ky.us/nasire/NASIREhome.html</a>
USA CityLink	<a href="http://usacitylink.com/default.html">http://usacitylink.com/default.html</a>
US Government Web Servers	<a href="http://www.eit.com/web/www.servers/government.html">http://www.eit.com/web/www.servers/government.html</a>

## References

- <sup>1</sup>Presidential Quotes courtesy of Presidential Public Policy Papers, Library of Congress.
- <sup>2</sup>P.L. 95-618.
- <sup>3</sup>At the time the fuel ethanol excise tax incentive was created, the federal motor fuel excise tax rate was four cents per gallon for gasoline.
- <sup>4</sup>P.L. 96-223.
- <sup>5</sup>P.L. 96-294.
- <sup>6</sup>U.S. National Alcohol Fuels Commission Report: A Summary: Alcohol Fuels Provisions of the Crude Oil Windfall Profit Tax Act.
- <sup>7</sup>This exemption is coordinated with an income tax credit equal to 54 cents per gallon for ethanol. Ethanol blenders are allowed three methods for realizing this incentive: (1). in whole or in part as an income tax credit; (2). blenders that register with the IRS may purchase gasoline to be blended with alcohol at a special reduced rate so that the tax paid on the gasoline is reduced by the portion of the alcohol tax incentive; and (3). blenders may purchase gasoline bearing the full 18.3 cents/gallon tax rate, blend that gasoline with alcohol, and apply for a refund.
- <sup>8</sup>P.L. 97-424.
- <sup>9</sup>David E. Gushee, *Alternative Fuels: Are They Reducing Oil Imports?*, Congressional Research Service, April 9, 1993.
- <sup>10</sup>P.L. 99-198.
- <sup>11</sup>P.L. 101-508.
- <sup>12</sup>P.L. 100-494.
- <sup>13</sup>David E. Gushee, *Alternative Fuels: Are They Reducing Oil Imports?*, Congressional Research Service, April 9, 1993.
- <sup>14</sup>Dr. Joseph J. Romm, Principal Deputy Assistant Secretary of Energy Efficiency and Renewable Energy, U.S. Department of Energy, before the United States Committee on Agriculture, Nutrition, and Forestry, October 2, 1996.
- <sup>15</sup>Ethanol: Fueling America's Future Today, Renewable Fuels Association.
- <sup>16</sup>U.S. Fuel Ethanol Survey, Information Resources, Inc., March 1996, estimates based on \$2.50 per gallon capital costs.
- <sup>17</sup>U.S. Alternative Fuel Information Center, March, 1997, Biodiesel is available on a limited basis, capacity estimated at 5,792 b/d.
- <sup>18</sup>Biofuels for Transportation: The Road From Research to the Marketplace, USDOE, January 1995.
- <sup>19</sup>Senator John McCain (R-AZ), McNeil/Lehrer News Hour.
- <sup>20</sup>Department of Defense, *United States Security Strategy for the Middle East*, May 1995.
- <sup>21</sup>U.S. General Accounting Office (GAO), *Southwest Asian: Cost of Protecting U.S. Interests*, GAO/NSIAD-91-250, August 1991.
- <sup>22</sup>Senator John Glenn (D-OH), Ranking member Government Affairs, member Armed Services Committee, member Select Committee on Intelligence, McNeil/Lehrer.
- <sup>23</sup>U.S. Department of Energy, *Energy Information Administration, Annual Energy Outlook 1997*.
- <sup>24</sup>ENERGETICS, for the Western Regional Biomass Energy Program, *National Security Costs of Petroleum*, June 1994; Howard Moreland, "A Few Billions for Defense: Plus \$250 Billion More for Overseas Military Intervention", *New Policy Papers #1*, Coalition for a New Foreign Policy, 1985, p.4; Terry Sabonis-Chafee (Rocky Mountain Institute), "Projection U.S. Military Power: External Cost and Alternatives to the Gulf," Presented to the 37th Pugwash Conference on Science and World Affairs, Gmunden, Austria, September-6, 1987; Hubbard, Harold, M. "The Real Cost of Energy," *Scientific America*, 264(4), April 1991, pp. 38-39.
- <sup>25</sup>Daniel Yergin and Robert Stobaugh, *Energy Future*, Random House, July 1979, p. 60; The Center for Defense Information; Dr. Joseph J. Romm, Principal Deputy Assistant Secretary of Energy Efficiency and Renewable Energy, U.S. Department of Energy, before the Committee on Agriculture, Nutrition and Forestry, U.S. Congress, October 2, 1992.
- <sup>26</sup>Senate Majority Leader Robert Dole, before the Nixon Center for Peace and Freedom, March, 1995.
- <sup>27</sup>Southwest Asia: Cost of Protecting U.S. Interests, GAO Report # NSIAD - 91 - 250, August 1991.
- <sup>28</sup>New York Times Fuels for the Future News, May 16, 1997.
- <sup>29</sup>R. Hwang, "Money Down the Pipeline: Uncovering the Subsidies to the Oil Industry" *Union of Concerned Scientists*, Sept. 12, 1995.
- <sup>30</sup>Harvard University, School of Public Health, for the American Lung Association, "Ambient Ozone Exposure and Emergency Hospital Admissions for Respiratory Problems in 13 U.S. Cities," June 1996.
- <sup>31</sup>Biofuels: At the Crossroads, Strategic Plan for the Biofuels Systems Program. USDOE, pg. 4
- <sup>32</sup>Statement by Senator Tom Harkin (D-IA), March 29, 1990.
- <sup>33</sup>Clean Fuels Development Coalition estimates, based on environmental costs associated with crude oil between ALA's \$50 billion estimate to UCS's \$182 billion estimate, divided by the Energy Information Administration's 6.655 billion barrels per year crude oil consumption estimate for the United States in 1996.
- <sup>34</sup>Daniel Yergin and Robert Stobaugh, *Energy Future*, Random House, July 1979, p. 60; The Center for Defense Information; Dr. Joseph J. Romm, Principal Deputy Assistant Secretary of Energy Efficiency and Renewable Energy, U.S. Department of Energy, before the Committee on Agriculture, Nutrition and Forestry, U.S. Congress, October 2, 1992.
- <sup>35</sup>Petroleum & Ethanol: A Trade Deficit Analysis, Energetics, June 1994, p. 1.
- <sup>36</sup>U.S. Department of Transportation, *National Transportation Statistics*, 1996, p. 185.
- <sup>37</sup>Federal Highway Administration.

## References

- <sup>38</sup>U.S. Department of Agriculture, Fuel Ethanol and Agriculture: An Economic Assessment, p. 3.
- <sup>39</sup>Petroleum & Ethanol: A Trade Deficit Analysis, Energetics, June 1994.
- <sup>40</sup>Petroleum & Ethanol: A Trade Deficit Analysis, Energetics, June 1994.
- <sup>41</sup>Federal Highway Administration.
- <sup>42</sup>David E. Gushee, "Alternative Fuels: Are They Reducing Oil Imports?," Congressional Research Service, April 9, 1993.
- <sup>43</sup>General Accounting Office, report #GAO/RCED-96-121, June 1996
- <sup>44</sup>Information Resources, Inc., May 1997.
- <sup>45</sup>DOE, Energy Information Administration, estimates by Information Resources, Inc.
- <sup>46</sup>DOE, Energy Information Administration, estimates by Information Resources, Inc.
- <sup>47</sup>National Energy Strategy, U.S. Department of Energy, February 1991.
- <sup>48</sup>General Accounting Office, report #GAO/RCED-90-156, July 1990.
- <sup>49</sup>Estimates by Information Resources, Inc. Washington, D.C. June 2, 1997.
- <sup>50</sup>"The Economic Impact of the Demand for Ethanol," Michael K. Evans, Professor of Economics, Kellogg School of Management, Northwestern University, February 1997.
- <sup>51</sup>Ibid.
- <sup>52</sup>Press Release, AUS Consultants, April 7, 1995.
- <sup>53</sup>"The Economic Impact of the Demand for Ethanol," Michael K. Evans, Professors of Economics, Kellogg School of Management, Northwestern University, February 1997.
- <sup>54</sup>Clean Fuels: Paving the Way for America's Future, 2nd Edition.
- <sup>55</sup>An Analysis of the Full Implications for Federal Government Revenues and Outlays of the Partial Exemption for Alcohol Fuels from Excise Tax on Motor Fuels, AUS Consultants, Press Release, April 7, 1995.
- <sup>56</sup>Fueling America's Future Today, Renewable Fuels Association.
- <sup>57</sup>General Accounting Office, Report # GAO/RCED-95-273R, September 1995.
- <sup>58</sup>Id.
- <sup>59</sup>USDA Analysis of Withdrawing Ethanol Tax Incentives, May 1997.
- <sup>60</sup>Press Release, AUS Consultants, April 7, 1995.
- <sup>61</sup>Id.
- <sup>62</sup>AFL-CIO Executive Council, Statement on U.S. Trade Deficit, February 20, 1995, Bal Harbour, Fla.
- <sup>63</sup>Corn Refiners Association, Corn Annual, May 1993.
- <sup>64</sup>"Petroleum and Ethanol: A Trade Deficit Analysis," Energetics, June 1994.
- <sup>65</sup>"The Economic Impact of the Demand for Ethanol," Michael K. Evans, Professor of Economics, Kellogg School of Management, Northwestern University, February 1997.
- <sup>66</sup>USDA Analysis of Withdrawing Ethanol Tax Incentives, May 1997.
- <sup>67</sup>Estimates by CFDC, figures obtained by multiplying 19,100 jobs times each \$1 billion of deficit increase
- <sup>68</sup>Congressional Research Service, "Alternative Transportation Fuels: Are They Reducing Oil Imports?," Gushee, David, April 1993.
- <sup>69</sup>"The Economic Impact of the Demand for Ethanol," Michael K. Evans, Professor of Economics, Kellogg School of Management, Northwestern University, February 1997.
- <sup>70</sup>USDA Analysis of Withdrawing Ethanol Tax Incentives, May 1997.
- <sup>71</sup>J. Adler, P. Carey, "Air Toxics Emissions and Health Risks from Mobile Sources," EPA Paper 89-34A.6 presented at the 82nd Annual Meeting of the Air and Waste Management Association, Anaheim, CA, June 25-1989.
- <sup>72</sup>U.S.E.P.A., National Air Pollutant Emission Trends, 1990-1995, October 1996.
- <sup>73</sup>U.S.E.P.A., [www.epa.gov](http://www.epa.gov), Concerned Citizens: On The Road.
- <sup>74</sup>U.S.E.P.A., Nonattainment Area Gasoline Survey, March 1997.
- <sup>75</sup>U.S.E.P.A., Office of Mobile Sources.
- <sup>76</sup>U.S.E.P.A., Office of Mobile Sources.
- <sup>77</sup>American Lung Association ([www.lungusa.org](http://www.lungusa.org))
- <sup>78</sup>U.S.D.A., Ethanol: Economic and Policy Tradeoffs, January 1988.
- <sup>79</sup>U.S.D.A., Ethanol: Economic and Policy Tradeoffs, January 1988.
- <sup>80</sup>Auto/Oil Air Quality Improvement Research Program, see, also Oil & Gas Journal, May 12, 1997, p. 21.
- <sup>81</sup>R. Gelbspan, "Hot Air, Cold Truth," Washington Post, Sunday May 25, 1997, quoting Harvard Earth Scientist, James McCarth.
- <sup>82</sup>U.S. EPA Website, May 1997, <http://www.epa.gov/globalwarming/home.htm>
- <sup>83</sup>IRS Code, secs. 4041 and 4081.
- <sup>84</sup>U.S. Department of Energy, interagency review of GAO Report "[Ethanol] Tax Incentives Have Had Little Effect on Air Quality or Energy Security," November 13, 1996
- <sup>85</sup>Scott Sklar, "The Forbidden Fuel, Power Alcohol in the Twentieth Century," Boyd Griffin NY, NY, 1982, p. 17, footnote cited, August W. Giebelhaus, "Resistance to Long-Term Energy Transition: The Case of Power Alcohol in the 1930's
- <sup>86</sup>Texaco Oil Company memorandum, February 17, 1995.
- <sup>87</sup>Edwin S. Rothschild, "Oil Imports, Taxpayer Subsidies and The Petroleum Industry," Citizen Action, May 1995.

## References

- <sup>88</sup>P.L. 95-618.
- <sup>89</sup>P.L. 96-493.
- <sup>90</sup>Gasohol Competition Act of 1980 (P.L. 96-493,) House of Representatives Report, 96-1464.
- <sup>91</sup>*Greater Rockford Energy and Technology, Inc. v. Shell Oil Company et al.* United States District Court, Central District of Illinois Springfield Division.
- <sup>92</sup>*Greater Rockford Energy and Technology, Inc. v. Shell Oil Company et al.* United States District Court, Central District of Illinois Springfield Division. Note: The suit was dismissed based on "standing" (e.g., the smaller ethanol companies could not sue larger oil companies due to the difference in level of commerce/trade).
- <sup>93</sup>D.C. Circuit Court of Appeals, API, NPRA Petitioner's Brief, Renewable Oxygenate Standard Law Suit against EPA.
- <sup>94</sup>Investigation initiated by the National Alcohol Fuels Caucus on behalf of the U.S. fuel ethanol industry, January 21, 1987.
- <sup>95</sup>Letter to the Editor, Journal of Commerce, December 3, 1980
- <sup>96</sup>Milton Copulos, Natural Gas Vehicles: Helping Ensure America's Energy Security, National Defense Council Foundation, October 24, 1995.
- <sup>97</sup>Edwin S. Rothschild, "Oil Imports, Taxpayer Subsidies and The Petroleum Industry," Citizen Action, May 1995
- <sup>98</sup>Ibid
- <sup>99</sup>Milton Copulos, "Natural Gas Vehicles: Helping Ensure America's Energy Security," National Defense Council Foundation, October 24, 1995.
- <sup>100</sup>Ibid.
- <sup>101</sup>Edwin S. Rothschild, "Oil Imports, Taxpayer Subsidies and The Petroleum Industry," Citizen Action, May 1995.
- <sup>102</sup>L. Wales, American Energy Crop Association, April 17, 1995.
- <sup>103</sup>Rask, K., "The Economic Efficiency of the Brazilian Ethanol Industry: A Cost-Benefit Analysis 1978-1987," presented at the IX International Symposium on Alcohol Fuels, November 12-15, 1991, Florence, Italy.
- <sup>104</sup>Nastari, P.M., "Economic Viability of Sugar Cane Ethanol in Brazil Considering its Social Cost of Production", presented at the IX International Symposium on Alcohol Fuels, November 12-15, 1991, Florence, Italy. Rask, K., "The Economic Efficiency of the Brazilian Ethanol Industry: A Cost-Benefit Analysis 1978-1987," presented at the IX International Symposium on Alcohol Fuels, November 12-15, 1991, Florence, Italy.
- <sup>105</sup>"Ethanol Fuels In Brazil," Sergio C. Trindade, SE2T International, Ltd., Scarsdale, N.Y.,
- <sup>106</sup>United States Department of Energy, "Biofuels: At the Crossroads," Biofuels Systems Division, July 1994.
- <sup>107</sup>21st Century Fuels, Hart Publications, May, 1997, p. 2.
- <sup>108</sup>Renewable Fuels Association, <http://www.ethanolrfa.org/er030697.html>
- <sup>109</sup>National Corn Growers Association
- <sup>110</sup>Renewable Fuels Association, <http://www.ethanolrfa.org/pr020397.html>, Jerry Weigel, Director of Nutrition and Regulatory Affairs at ExSeed Genetics, L.L.C
- <sup>111</sup>Ibid, Lucy Norton, Domestic Market Development Director, Iowa Corn Promotion Board
- <sup>112</sup>Hosein Shapouri, James Duffield, Michael Graboski, U.S. Department of Agriculture, "Estimating Net Energy Balance of Corn Ethanol," Agricultural Economic Report Number 721, July 1995.
- <sup>113</sup>"How Much Energy Does it Take to Make a Gallon of Ethanol?" Institute for Local Self-Reliance. December 1992.
- <sup>114</sup>Hosein Shapouri, James Duffield, Michael Graboski, U.S. Department of Agriculture, "Estimating Net Energy Balance of Corn Ethanol," Agricultural Economic Report Number 721, July 1995.

## About This Report

The *Year 2000 Fuel Ethanol Fact Book* is a compilation of hundreds of technical summaries and research reports from across the scientific, academic and technical community which offer support for the expansion of the ethanol industry through continuation and extension of the federal fuel ethanol tax incentive. This exhaustive research is representative of government, industry, and academic opinion on the benefits of fuel ethanol production to the nation, the environment and the public. We hope you find this information useful and informative. If you have any questions, or need additional information, call us at the Clean Fuels Development Coalition in the Washington, DC area at (703) 276-CFDC (2332) or in Hawaii at Clean Fuels Hawaii at 808-545-5579.



"We can get fuel from fruit, from the sumac by the roadside, or from apples, weeds, sawdust; almost anything. There is enough alcohol in one year's yield of an acre of potatoes to cultivate that field for a hundred years. And it remains for someone to find how this fuel can be produced commercially — better fuel at a better price than we now know" — *Henry Ford.*

# The Ford Taurus



**85% Ethanol Flexible Fuel Vehicle**

## Renewable Aviation Fuels Development Center

