

## **Ethanol: A Good Investment in Today's Energy Market**

*In 2006, the federal government spent about \$2.5 billion to finance the ethanol blender's tax credit – and received a return of \$2.7 billion in tax revenues, plus an additional \$6 billion in savings on federal farm support programs as a result of the ethanol industry's demand for US corn. Despite this net benefit, some critics continue to speak out against federal subsidization of the ethanol industry. But a closer look at federal energy subsidies reveals that fossil fuels – not renewables – receive the bulk of federal support. And while the petroleum industry generates a host of economic, political, environmental and social costs, dollars spent on ethanol represent a sound investment in our nation's sustainable future.*

### **1. Government subsidies and tax credits benefit nearly every energy industry – and oil companies receive the most support.**

Oil companies pay an effective corporate income tax of 11%, compared to a non-oil industry average of 18% (3). This wide gap reflects a range of tax credits and loopholes. For example, oil companies deduct a flat 15% of their gross income in order to account for the decline in value of their wells as reserves are pumped out. In most cases, the 15% deduction exceeds the actual decline in value. Companies that invest in technology to extend the lives of older wells also receive an "enhanced oil recovery credit," often resulting in damage to the environment as extreme measures are used to mine unproductive wells for the last drop of oil. Federal tax policies also allow oil companies to defer foreign incomes, write off capital investments, and take immediate deductions on exploration and development expenses (3).

All in all, between 2005 and 2009, the oil industry will receive about 86% of the total \$16.1 billion of federal tax breaks offered to the energy industry. The 2005 Energy Bill authorized \$1.7 billion in new tax breaks for oil companies – at a time when Exxon Mobil and others are reaping record profits from high gas prices (2). Fossil fuel development will also receive one-fourth the total \$131 billion federal R&D funds devoted to energy between 2005 and 2009 (1). Meanwhile, the federal government spent a total of just \$14.6 billion on renewable energy R&D between 1973 and 2003, and R&D dollars for renewable energy dropped by more than fifty percent between 1979 and 2003 (1).

*Major subsidies continue to go to mature energy industries that are highly profitable and polluting. Subsidies are embedded throughout our infrastructure at the federal, state and local level. At the same time, our use of fossil energy is responsible for most of our environmental problems, including the largest of all, climate change.*

*- Carol Werner, Executive Director, Environmental and Energy Study Institute, July 2005*

*Between April and June 2005, BP recorded profits of \$5 billion and ConocoPhillips \$3.1 billion. ExxonMobil's second quarter profits of almost \$8 billion gave the company more than \$15 billion in profits in the first half of 2005 alone. This adds to the company's record-breaking profit of \$24 billion in 2004.*

*- U.S. PIRG, August 2005*

*I will tell you with \$55 oil we don't need incentives for oil and gas companies to explore. There are plenty of incentives.*

*- President George W. Bush, quoted in the Washington Post, April 2005*

*Percentage depletion allowance is one of the oldest and largest tax subsidies affecting the petroleum industry...The percentage depletion allowance enables eligible oil companies to deduct a flat 15 percent of their gross income to account for the declining value of their wells as reserves are pumped out. However, this deduction overstates the actual loss in value over time. Oil companies typically end up deducting more than the value of their original investments...The net effect of this subsidy is more than just monetary; it promotes overproduction and inefficiency rather than conservation and economic efficiency.*

*- International Center for Technology Assessment, November 1998*

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

TAX INCENTIVE	SUMMED OVER	REVENUE LOSSES (Millions of 2000 dollars)
<b>Petroleum Industry</b>		
Excess of percentage cost over depletion	1968 – 2000	\$81,679 - \$82,085
Expensing of exploration and development costs	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
Credit for enhanced oil recovery costs	1994 – 2000	\$482 - \$1,002
Expensing of tertiary injectants	1980 – 2000	\$330
<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

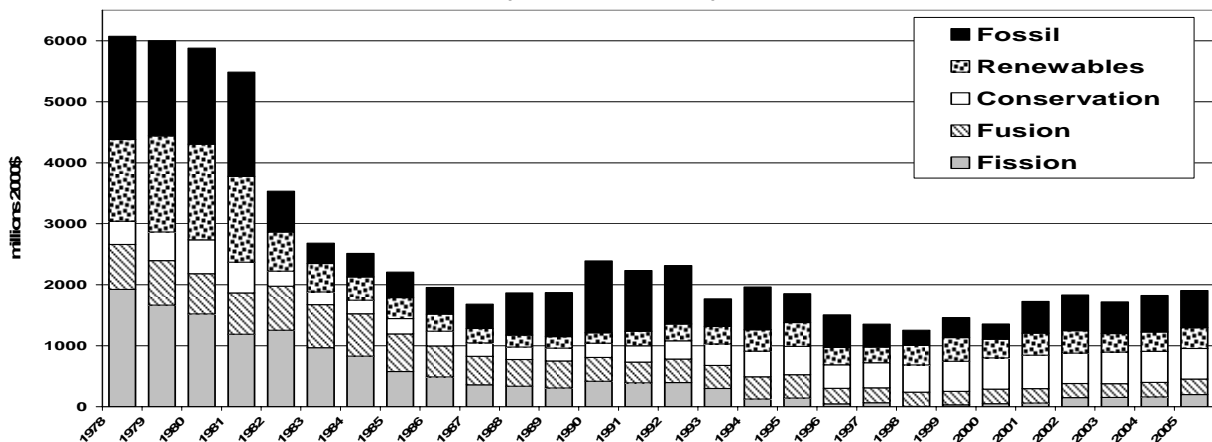
Source: US GAO, Resources, Community, and Economic Development Division, September 2000

**DOE Energy R&D Budgets, 1948-1972, 1973-2003, and 2004 (billion, \$2003)**

Energy Budget	1948-1972	1973-2003	1948-2003 cumulative	1948-2003 % share	FY 2004	FY 2004 % share
Nuclear	24.3	49.7	74.0	56%	0.667	29%
Fossil	5.5	25.4	30.9	24%	0.673	29%
Renewable		14.6	14.6	11%	0.439	19%
Conservation		11.7	11.7	9%	0.560	24%
TOTAL	29.8	101.4	131.2	100%	2.3	100%

Source: Congressional Research Service, CRS-IB10041, June 2005

**U.S. DOE Energy RD&D Spending 1978-2005 (millions of 2000\$)**



Source: Gallagher, K.S., Sagar, A, Segal, D, de Sa, P, and John P. Holdren, "DOE Budget Authority for Energy Research, Development, and Demonstration Database," Energy Technology Innovation Project, John F. Kennedy School of Government, Harvard University, 2005.

## **2. Oil production generates environmental, political, and public health externalities that represent an additional burden to US taxpayers.**

The economic implications of oil dependence extend beyond direct credits and subsidies to the industry. Recent estimates acknowledge that protecting our oil interests in the Middle East accounts for tens of billions of dollars per year in US defense spending, and in 2005 the International Center for Technology Assessment put the number at \$113 billion (1). Given that total US defense spending in Iraq and Afghanistan amounted to about \$302 billion between 2001 and 2006 (7), oil-related spending represents a significant share of our defense budget. Petroleum also accounts for 25% of the US trade deficit (1). Over the past thirty years, we've sent about \$1.16 trillion to oil-producing nations, a number that represents not only a significant blow to domestic GDP but also the loss of millions of American jobs (6). Additionally, US taxpayers spend over \$1 billion per year to maintain the Strategic Petroleum Reserve, including administration, maintenance, and interest costs (1). Taxpayers also indirectly subsidize the oil industry by funding Coast Guard and Army Corps of Engineers projects, including canal and harbor maintenance, and USGS mineral mapping services (3). Furthermore, despite the fact that oil companies have a long history of underpaying or failing to pay royalties to the federal government for exploration and extraction on federal land (2), the government continues to lease land to oil companies at below market value (3).

Health and climate implications of fossil fuel combustion carry their own price tag. For example, fossil fuel emissions contribute to asthma, particularly in children. According to the Center for Disease Control, the cost of treating asthma in those younger than age 18 is about \$3.2 billion per year – and asthma is only one of the many health effects of fossil fuel emissions (1). Cleaning up old wells and oil leaks costs taxpayers an additional \$1-2 million annually, and US citizens will incur long-term costs from the harm done to agricultural lands and other environmental resources by petroleum-related pollution (3). And finally, the costs of climate change may soon eclipse the already substantial financial implications of oil dependence. Considering likely infrastructure damage, loss of life, displacement, and other adverse effects, the eventual cost of climate change to the US could reach \$60 billion per year by 2025 (3).

In 2003, taking many of these externalities into account, the National Defense Council Foundation estimated the "true cost" of a gallon of gasoline at about \$5.28 (8). Given current global trends, today's numbers could be even higher.

*"The United States is unique among oil stockpiling in assigning all of the cost of the reserve to the general taxpayer. Most other stockpiling countries partially shift the cost burden to the oil industry by requiring their oil companies to maintain inventories in excess of working needs."*

*- US Department of Energy, Quoted by the International Center for Technology Assessment, November 1998*

*In December 2000, an Alabama jury ruled that ExxonMobil had shortchanged Alabama taxpayers of \$88 million by underpaying royalties on offshore leases. Jurors assessed another \$3.4 billion in punitive damages, finding that the company committed fraud in the calculation of royalties it paid the state on production from its Mobile Bay natural gas wells.*

*- U.S. PIRG, August 2005*

*The Army Corps of Engineers is largely responsible for building and maintaining ports, harbors, and inland water transportation routes. Its activities include the construction and operation of locks and the dredging of harbors and waterways. With an ever-increasing percentage of the oil consumed in the United States coming via tankers from overseas, the maintenance of waterways represents a substantial subsidy for the petroleum industry. Petroleum products comprise roughly 40 percent of waterborne tonnage transported annually on these waterways. Water transport of oil is relatively cheap today due to massive amounts of government spending spanning several decades on port and waterway infrastructure.*

*- International Center for Technology Assessment, November 1998*

*It is not unrealistic to attribute a majority of Persian Gulf defense costs to oil, which would result in an estimate closer to \$70 billion (the total annual cost of defense commitments in the Middle East is approximately \$80 billion).*

*- International Center for Technology Assessment, November 1998*

### Estimates of US Military Spending on Middle Eastern Oil Supply Protection

Source	Total Cost (\$billion/year)	Unit Cost* (\$/Barrel)	Unit Cost* (\$/Gallon)	Remarks
International Center for Technology Assessment (2005)	\$47.6-\$113.1 (2003 \$)	n.a.	n.a.	Based on one third of the costs of the Iraq war plus the oil security costs in the Pentagon's annual budget
Milton R. Copulos, National Defense Council Foundation (2003)	\$49.1 (2003 \$)	\$10.71	\$0.25	Annual average calculated over multi-year period, 1993-2003
US Department of State (2003)	\$38.3 (2003 \$)	\$9.03	\$0.22	Annual average calculated over multi-year period, 1993-2003
Patricia Hu, Oak Ridge National Laboratory (1996)	\$20-\$40 (1996 \$)	n.a.	n.a.	Based on annual costs of US military operations in the Persian Gulf in peacetime
Doug Koplow, Earth Track Inc. (2004)	\$11.1-\$27.4 (2003 \$)	\$1.65-\$3.65	\$0.04-\$0.08	Based on one third of the costs of the military presence in the Middle East.
James A. Baker III Institute for Public Policy, Rice University (2003)	n.a.	\$4-\$5	\$0.09-\$0.12	Based on the minimum figure (\$20) of the Patricia Hu estimation.
Congressional Research Service (1992)	6.4 (1992 \$)	n.a.	n.a.	

\*Unit cost assumes cost of oil supply protection is averaged over all imported oil, not just Middle Eastern oil.

*Source: Environmental and Energy Study Institute, July 2005*

*Environmental and health externalities from fossil-fueled power plants and transportation are significant. These emissions lead to asthma, lowered IQ, cancer, heart and lung disease, reduced crop yield, forest damage and climate change, to name a few.*

*- Environmental and Energy Study Institute, July 2005*

### Environmental Effects of Automobile Emissions

CAUSES	TRANSPORTATION SHARE OF TOTAL EMISSIONS	EFFECTS
Carbon Monoxide	70%	Health Effects; Global Warming
Hydrocarbons/Volatile Organic Compounds, except Methane	38%	Health Effects Acid Rain
Sulfur Dioxide	5%	Health Effects; Acid Rain
Nitrogen Oxides	41%	Smog Component; Acid Rain; Global Warming; Algal Blooms
Carbon Dioxide	30%	Global Warming; Cancer
Air Toxins (Including Benzene) Particulates	23%	Cancer; Health Effects
CFCs		Health Effects via stratospheric ozone depletion Damage to vegetation Global Warming
Odor from Automobiles and Diesel Exhaust		Discomfort

*Source: International Center for Technology Assessment, November 1998*

Climate change, driven mainly by increasing emissions from fossil fuel energy use, is expected to lead to continuing sea level rise and more intense weather extremes, such as flooding, drought, and heat waves. According to reinsurer Munich Re, annual losses are projected to be in the range of \$300 billion, with losses of \$68 billion in the United States alone. Innovest estimates annual costs to the United States to be even higher, on the order of \$100- to \$300 billion.

- Environmental and Energy Study Institute, July 2005

### 3. Unlike oil, ethanol is a good economic, political, and environmental investment.

In 2006, ethanol industry operations and construction added a total of \$5 billion to state and federal tax revenues. Ethanol production also contributed \$41.1 billion to US GDP, and each 100 MGY plant generated nearly 1600 jobs. Additionally, due to ethanol's positive effect on corn prices, federal payments to farmers are projected to fall by about \$6 billion – or nearly 75% - between 2006 and 2007. Overall, the federal government spent just \$2.5 billion on ethanol tax credits in 2006, and received over \$9 billion in returns and savings (4).

Ethanol is produced from secure, renewable resources that are readily available on US soil. Burning ethanol in place of petroleum can reduce tailpipe particulate emissions, which contribute to asthma, by up to 50% (4), and emissions of toxic carcinogens such as benzene by 25% (5). Ethanol also decomposes rapidly and harmlessly in water and soil (4). Perhaps most importantly, life-cycle greenhouse gas emissions from corn ethanol are 21.8 percent lower than those from gasoline, and ethanol produced from cellulosic feedstocks could cut GHG emissions even further (4). When it comes to climate change, ethanol is a part of the solution, not a part of the problem. And when it comes to supporting domestic ethanol production, the question is not whether we are doing too much, but in fact whether we are doing enough to counter the effects of foreign oil on our security, economy, and environment.

**Economic Contribution of the Ethanol Industry: 2006**

INDUSTRY	SPENDING (Mil \$2005)	OUTPUT (Mil \$2005)	EARNINGS (Mil \$2005)	EMPLOYMENT (Jobs)
<b>Construction</b>	\$2,100	\$7,237.4	\$2,223.3	54,861
Plus initial changes		\$2,100.0		
<b>Total</b>		\$9,337.4	\$2,223.3	54,861
<b>Annual Operations</b>				
Farm products/agriculture	\$4,062.5	\$11,278.	\$2,157.2	62,278
Industrial Chemicals	\$299.8	4	\$214.2	4,355
Petroleum refineries	\$181.3	\$1,009.6	\$98.2	1,839
Electric, natural gas, water	\$1,570.4	\$497.8	\$1,016.5	19,712
Maintenance and repair	\$127.4	\$4,655.6	\$120.8	3,318
Business Services	\$294.0	\$340.3	\$222.1	5,075
Earnings paid to households	\$156.8	\$840.3	\$103.7	2,805
Rail, truck, and barge	\$409.8	\$371.4	\$328.1	7,100
		\$1,196.0		
<b>Subtotal</b>	\$7,102.1	\$20,189. 5	\$4,334.8	108,173
Plus initial changes:				
Value of ethanol production		\$10,795.	\$156.8	
Value of co-products		0		
		\$1,595.9		
<b>Total Annual Operations</b>		\$32,580. 4	\$4,491.6	108,173
<b>Grand Total</b>		\$41,917. 9	\$6,714.8	163,034

Source: John Urbanchuk, "Contribution of the Ethanol Industry to the Economy of the United States," Feb. 2007

*The ethanol industry will more than pay for itself in 2006. The combination of increased output and GDP and higher income generates tax revenue for government at all levels. The full impact of the annual operations of the ethanol industry and spending for new construction will generate about \$2.7 billion of tax revenue for the Federal government. The estimated cost of the VEETC for 2006, assuming that all 4.9 billion gallons of ethanol produced are blended, is \$2.5 billion. In addition the ethanol industry will generate nearly \$2.2 billion of additional tax revenue for State and Local governments.*

*- John Urbanchuk, "Contribution of the Ethanol Industry to the Economy of the United States,"  
February 2007*

*Ethanol reduces our dependence on imported oil and reduces the U.S. trade deficit. The production and use of ethanol displaces crude oil needed to manufacture gasoline. According to the Energy Information Administration imports account for 65 percent of our crude oil supplies and oil imports are the largest component of the expanding U.S. trade deficit. The production of nearly five billion gallons of ethanol means that the U.S. needed to import 206 million fewer barrels of oil in 2006, valued at \$11.2 billion. This is money that stayed in the American economy.*

*- John Urbanchuk, "Contribution of the Ethanol Industry to the Economy of the United States,"  
February 2007*

*And the world is changing around us. We are now in a much stronger farm economy than we saw in '01 and '02 ...Farm cash receipts should reach a record \$259 billion in '07; that's up \$20 billion from just two years ago and up \$16 billion from just last year. Those are very large jumps...the demand for energy crops is literally transforming rural America.*

*- Secretary of Agriculture Mike Johanns, March 2007*

*...higher agricultural commodity prices are a boon in many ways. Corn farmers are having a rare period of prosperity, and the federal government is getting a break. In 2006, Uncle Sam gave corn farmers \$8.8 billion in subsidies. Thanks to high corn prices, subsidies are expected to drop to \$2.1 billion in 2007. 'All the price-dependent spending is getting wiped out' explains the USDA's [chief economist Keith] Collins.*

*- Business Week, Feb. 2007*

*...ethanol is a naturally occurring substance produced during the fermentation of organic matter and is expected to rapidly biodegrade in essentially all environments. When gasoline contaminates soil or water, ethanol is the first component to quickly, safely, and naturally biodegrade.*

*- Renewable Fuels Association*

*According to the American Lung Association, more than 2,000 studies link soot pollution to health problems like cancer, asthma and heart attacks...A growing number of studies show that E10 reduces soot pollution . . . Ethanol replaces octant-enhancing toxics in gasoline, reducing the cancer risks of driving and living near roadways. The Colorado DPHE study showed E10 reduced hydrocarbon pollution like benzene by 16.5%.*

*- Better Environmental Solutions and Renewable Energy Action Project, "Clearing the Air with Ethanol"*

*The increased use of renewable and alternative fuels can result in significant reductions in the use of petroleum-based fuels. By displacing petroleum fuels, many...of these fuels can provide reductions in greenhouse gas emissions... for instance, for every BTU of gasoline which is replaced by corn ethanol, the total lifecycle greenhouse gas emissions that would have been produced from that BTU of gasoline would be reduced by 21.8 percent. These emissions account not only for CO<sub>2</sub>, but also methane and nitrous oxide.*

*- Environmental Protection Agency, "Greenhouse Gas Impacts of Expanded Renewable and Alternative Fuels Use," April 2007*

## **REFERENCES**

(1): Carol Werner, "Subsidies: Historic, Current, and the Skewing of Market Signals," Environmental and Energy Study Institute, 29 July 2005.

(2): "Big Money to Big Oil," US PIRG, August 2005.

(3): "The Real Price of Gasoline," International Center for Technology Assessment, November 1998.

(4): Renewable Fuels Association, [www.ethanolrfa.org](http://www.ethanolrfa.org)

(5): Gary Whitten, "Air Quality and Ethanol in Gasoline," Smog Reyes, December 2004.

- (6): "How Much Are We Paying for a Gallon of Gas?" Institute for the Analysis of Global Security, 2006.  
(7): Steven Kosiak, "The Cost of US Military Operations in Iraq and Afghanistan," Center for Strategic and Budgetary Assessments, January 2006.  
(8): "NCDF Report: The Hidden Cost of Imported Oil," Institute for the Analysis of Global Security, October 2003.

### ***FURTHER READING***

*For background on this and other ethanol issues, please consult the following sources:*

Environmental and Energy Studies Institute:

<http://www.eesi.org/publications/Presentations/NCC%20Energy%20Subsidies%207.29.05.pdf>

US PIRG Report on the 2005 Energy Bill: <http://www.uspirg.org/home/reports/report-archives/new-energy-future/new-energy-future/big-money-to-big-oil-how-exxonmobil-and-the-oil-industry-benefit-from-the-2005-energy-bill>

International Center for Technology Assessment:

<http://www.icta.org/doc/Real%20Price%20of%20Gasoline.pdf>

US General Accounting Office Report on Oil and Ethanol Subsidies:

<http://www.gao.gov/new.items/rc00301r.pdf>

John Urbanchuk report: Contribution of the Ethanol Industry to the Economy of the United States:

[http://www.ethanolrfa.org/objects/documents/2006\\_ethanol\\_economic\\_contribution.pdf](http://www.ethanolrfa.org/objects/documents/2006_ethanol_economic_contribution.pdf)

The Renewable Fuels Association: [www.ethanolrfa.org](http://www.ethanolrfa.org)

American Coalition for Ethanol: [www.ethanol.org](http://www.ethanol.org)

Environmental Protection Agency (Office of Transportation and Air Quality):

- o Overview of automobile emissions: <http://www.epa.gov/otaq/consumer/05-autos.pdf>
- o Information on emissions reductions:  
<http://www.epa.gov/otaq/inventory/overview/results/index.htm>

Institute for the Analysis of Global Security: [www.iags.org](http://www.iags.org)

National Defense Council Foundation: [www.ndcf.org](http://www.ndcf.org)