

America's Oil and Natural Gas Industry



# Energizing America

Facts for Addressing Energy Policy

September 25, 2009

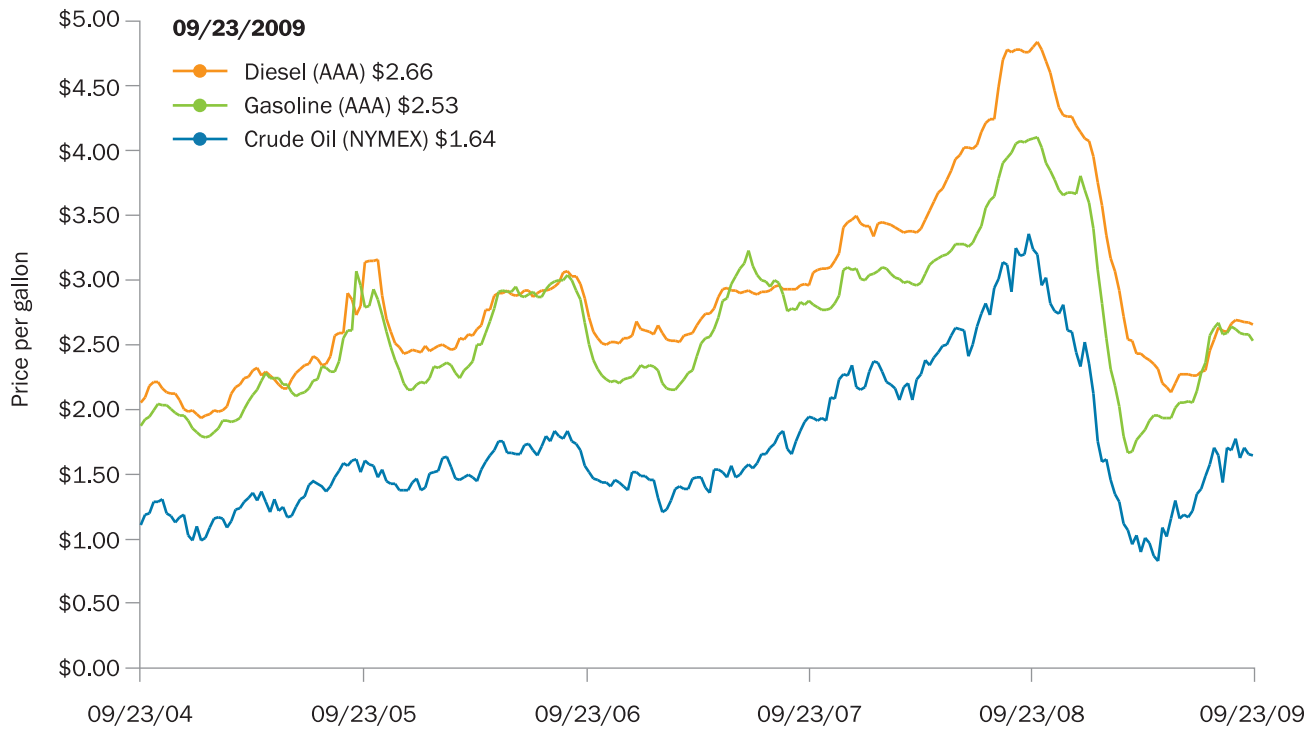
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The United States is at an historic turning point for the country and its energy policies. But many Americans lack a full understanding of the oil and natural gas industry. API has assembled this oil and gasoline primer to encourage a constructive public policy debate that leads to a new fact-based comprehensive energy policy.

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## Gasoline, Diesel and Crude Oil Prices



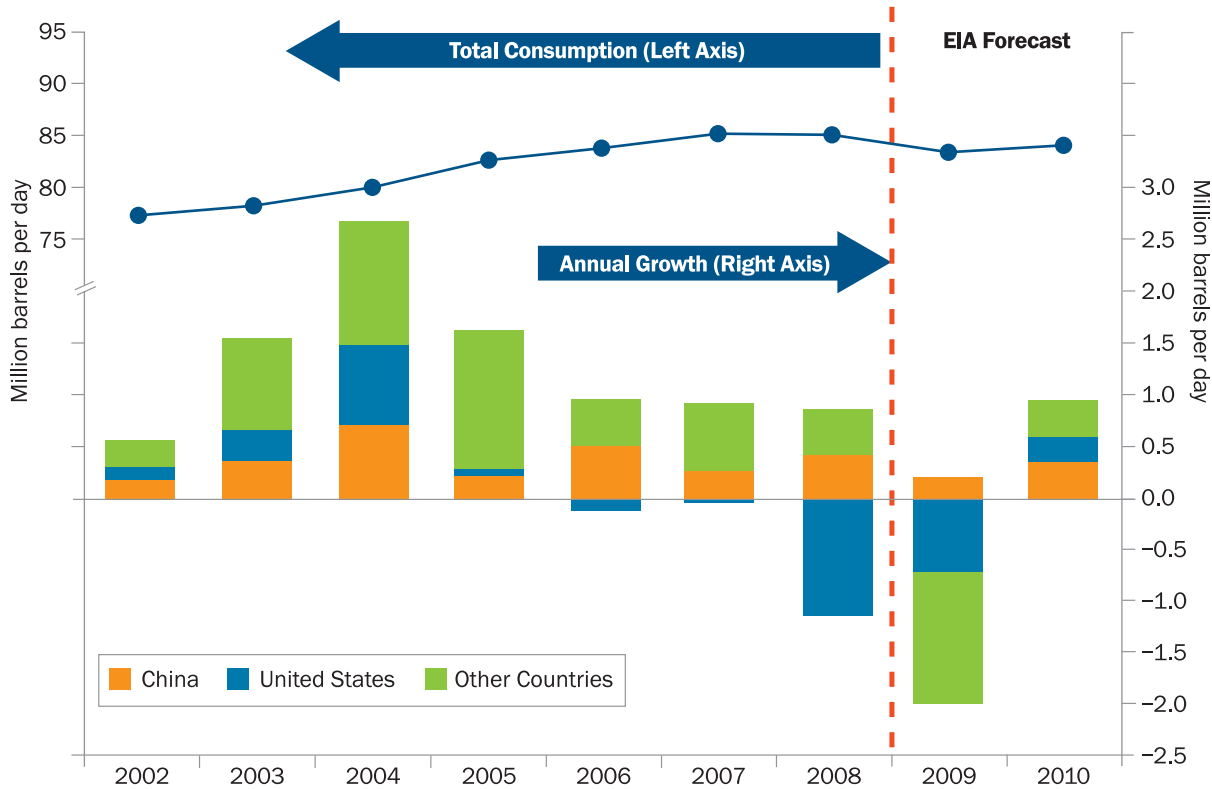
Source: NYMEX (WTI crude oil) and AAA (gasoline and diesel)

### Changes in gasoline and diesel prices mirror changes in crude oil prices.

The sharp increase in gasoline and diesel prices early in 2008 and their subsequent decline closely track changes in the cost of crude oil. Those changes are determined in the global crude oil market.

Earlier last year, worldwide high demand relative to supply helped push prices higher. Other contributing factors included political instability and weather. As prices climbed, demand declined and the onset of weak economic conditions in the U.S. and other countries reinforced the fall.

## World Liquid Fuels Consumption



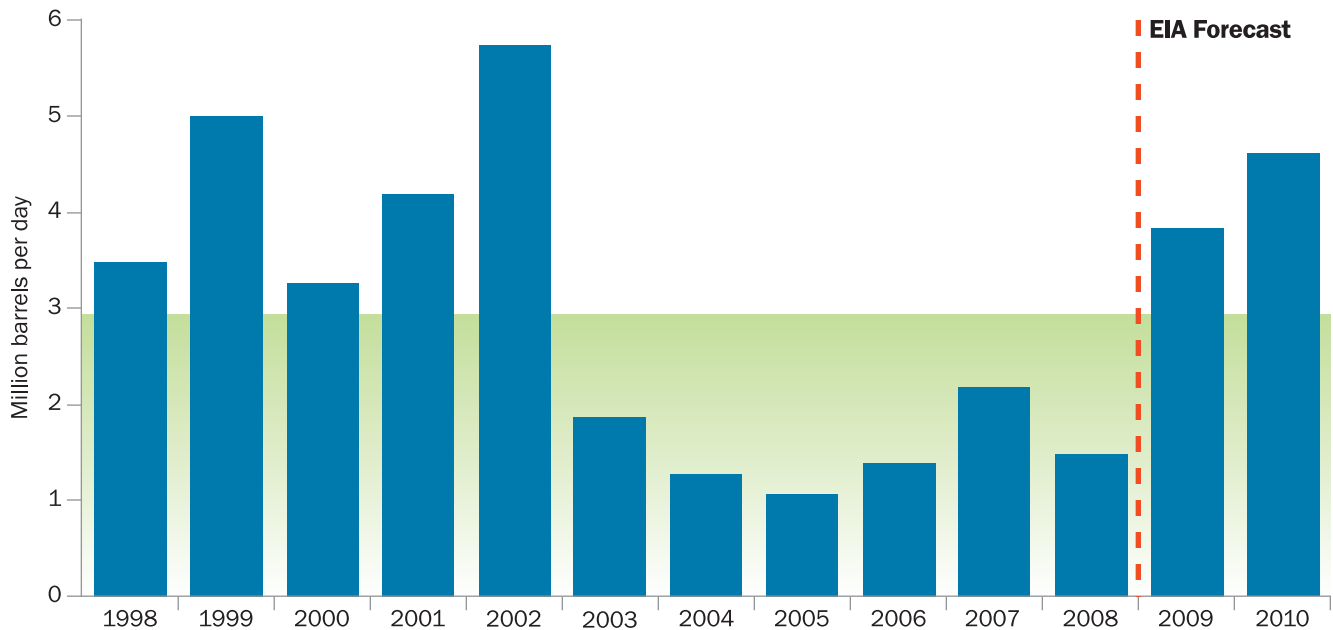
Source: EIA, Short-Term Energy Outlook, September 2009

### World oil consumption is expected to fall with the global economic slowdown.

The world's demand for oil increased sharply in recent years, rising from 78 million barrels per day in 2002 to 86 million barrels per day in 2007. However, the global economic slowdown has reversed this trend. According to EIA, this is the first time in nearly three decades that we've seen world oil consumption decline. Demand fell by 482,000 barrels per day in 2008 and EIA expects it to fall an additional 1.8 million barrels per day in 2009 before rebounding in 2010 as the world economy recovers.

Consumption in OECD countries is projected to decline by over 2 million barrels per day in 2009, with significant losses expected in the U.S., Europe and Japan and only slight gains expected in Non-OECD countries. However, EIA projects 2010 will show worldwide gains of 907,000 barrels per day, with modest growth in the U.S., China and other Non-OECD countries.

## OPEC Surplus Crude Oil Production Capacity



Note: Shaded area represents 1998-2008 average (2.8 million barrels per day)

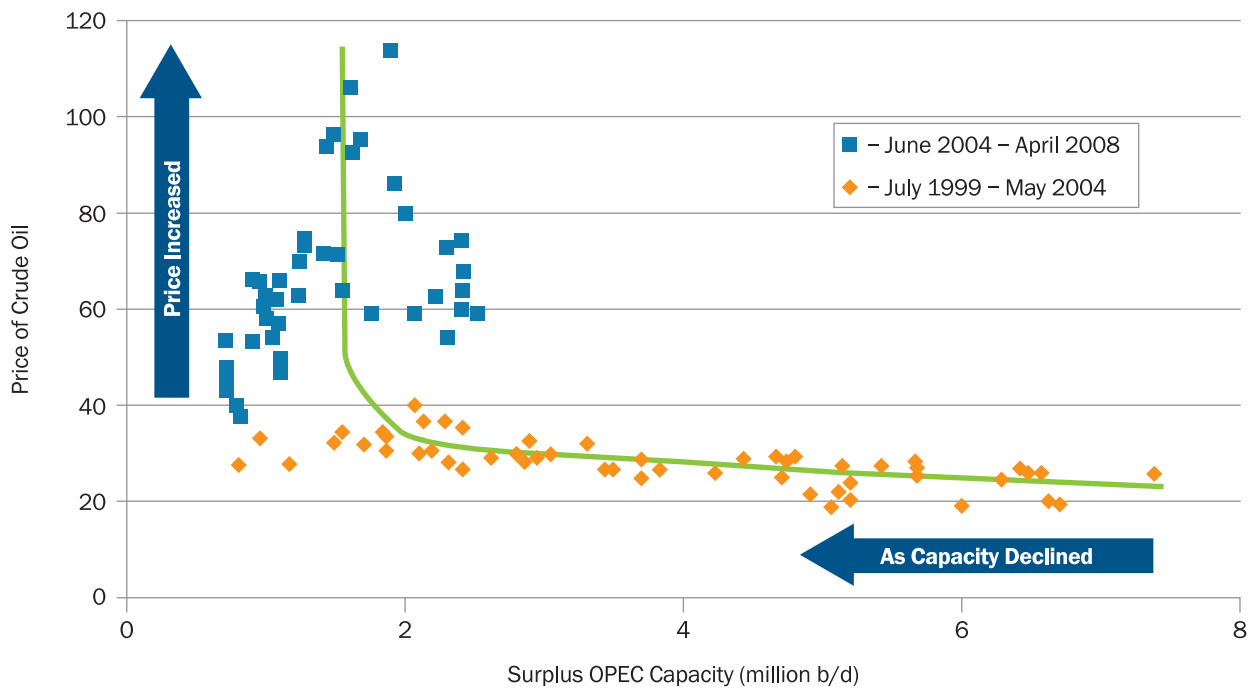
Source: EIA, *Short-Term Energy Outlook*, September 2009

### Surplus crude oil capacity is expected to grow.

The amount of surplus crude oil capacity to meet surges in demand or disruptions in supply declined sharply in recent years. Just a few years ago OPEC spare capacity stood at nearly 6 million barrels per day. In 2008, it was less than 2 million barrels per day. This illustrates that until recently tight fundamentals have been at work in the marketplace, increasing the potential for volatility in energy markets.

According to EIA, there is a potential for OPEC surplus production capacity to increase dramatically over the next two years as demand for crude oil falls and production of non-crude liquids increases, and expected capacity expansions come on line in several OPEC countries.

## Why Does OPEC's Spare Capacity Matter?



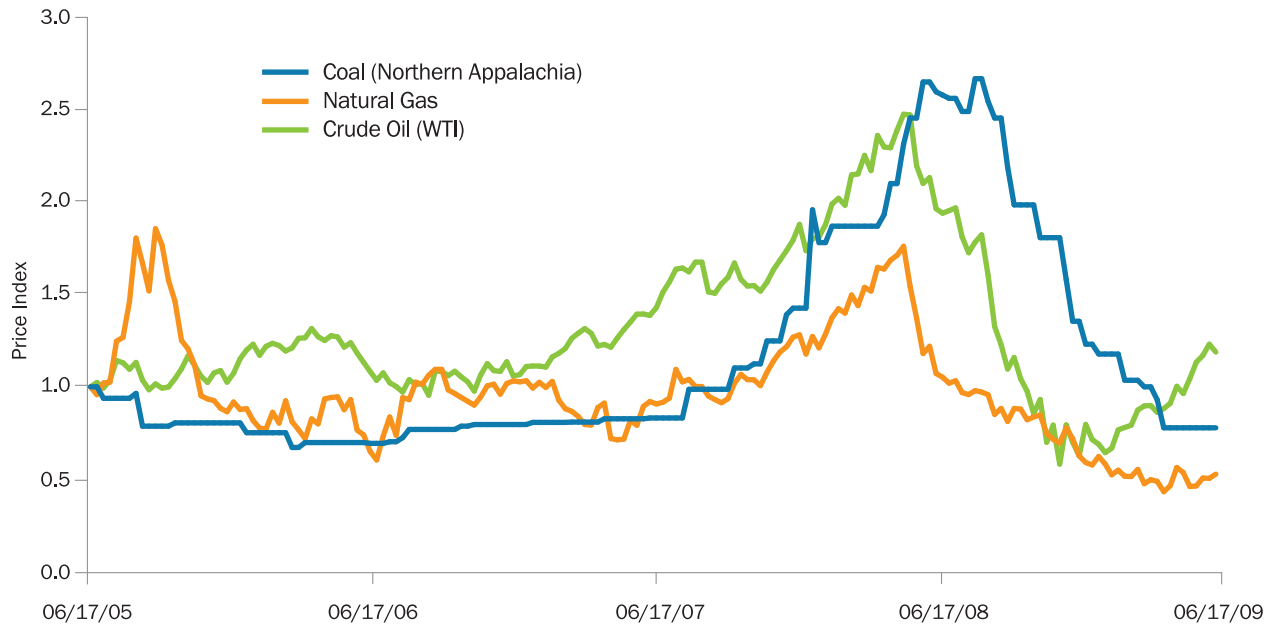
Source: Adapted from John Cook, Energy Information Administration; *Next Stop for Oil Prices: \$100 or \$150?*, June 11, 2008

The amount of spare capacity matters because it shares a direct inverse relationship to the price of crude oil.

Although there are numerous, complex, and interacting forces at work in the determination of crude oil prices, spare capacity is an important weathervane, and an important cushion between short-term changes in oil demand and long-term

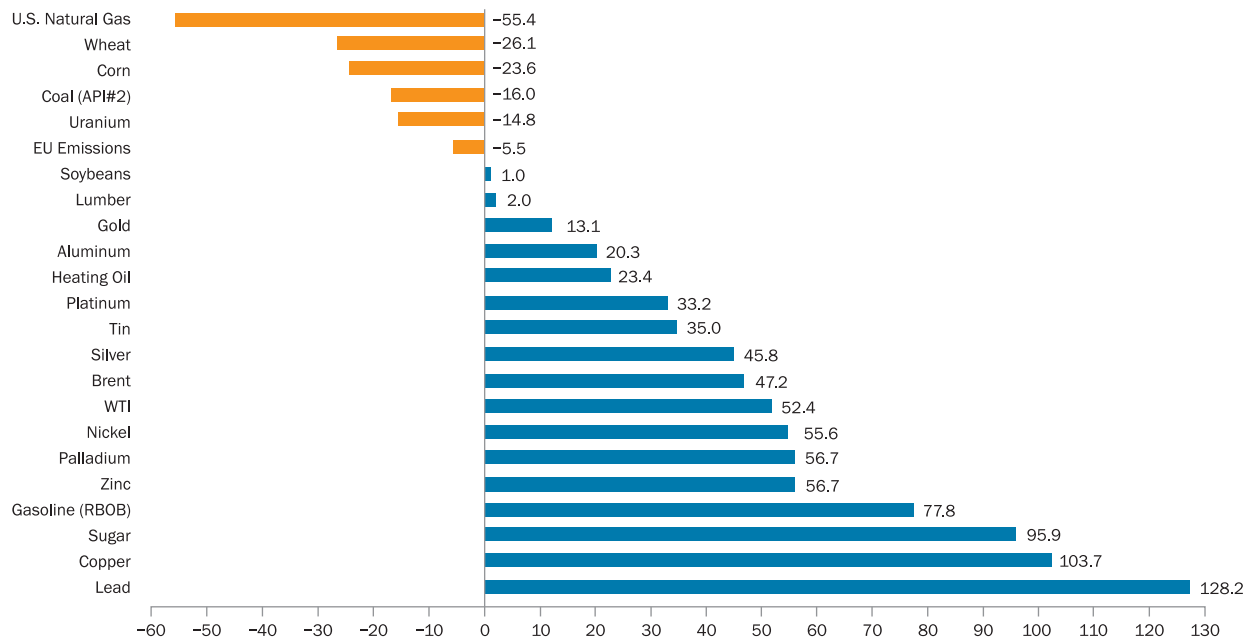
investments in oil field development. Historically, we can see that during periods of higher spare capacity prices were lower, but, when capacity was lower, prices were higher.

### Changes in the Price of Coal, Natural Gas and Crude Oil (Price Index: June 17, 2005 = 1.0)



Source: NYMEX (Crude Oil and Natural Gas) and EIA (Coal)

### Commodity performance year to date, January 1 through September 4, 2009



Source: Deutsche Bank Global Markets Research, Bloomberg

Oil is a commodity and changes in the price of oil are similar to changes in prices of other commodities.

The rise in commodity prices earlier last year and their subsequent fall largely reflect worldwide supply and demand conditions. By year's end, the downturn in the economies of the U.S., Europe and Asia resulted in declines in the prices of a broad

range of commodities, including coal, natural gas, oil (e.g., WTI and Brent) and refined products like gasoline. So far this year, prices have increased somewhat for some commodities, including oil and refined products.

## EIA Price Forecast

	Year				Percent Change		
	2007	2008	2009	2010	2007-2008	2008-2009	2009-2010
<b>WTI Crude<sup>a</sup></b> (\$/barrel)	72.32	99.57	60.12	72.42	37.7	-39.6	20.5
<b>Gasoline<sup>b</sup></b> (\$/gallon)	2.81	3.26	2.34	2.70	16.1	-28.1	15.5
<b>Diesel<sup>c</sup></b> (\$/gallon)	2.88	3.80	2.47	2.88	31.9	-35.0	16.8
<b>Heating Oil<sup>d</sup></b> (\$/gallon)	2.72	3.38	2.51	2.78	24.2	-25.7	10.6
<b>Natural Gas<sup>d</sup></b> (\$/mcf)	13.03	13.67	11.92	11.56	4.9	-12.8	-3.0
<b>Electricity<sup>d</sup></b> (¢/kwh)	10.65	11.36	11.64	11.4	6.6	2.5	-2.1

<sup>a</sup> West Texas Intermediate

<sup>b</sup> Average Regular Pump Price

<sup>c</sup> On-Highway Retail

<sup>d</sup> Residential Average

Source: EIA, *Short-Term Energy Outlook*, September 2009

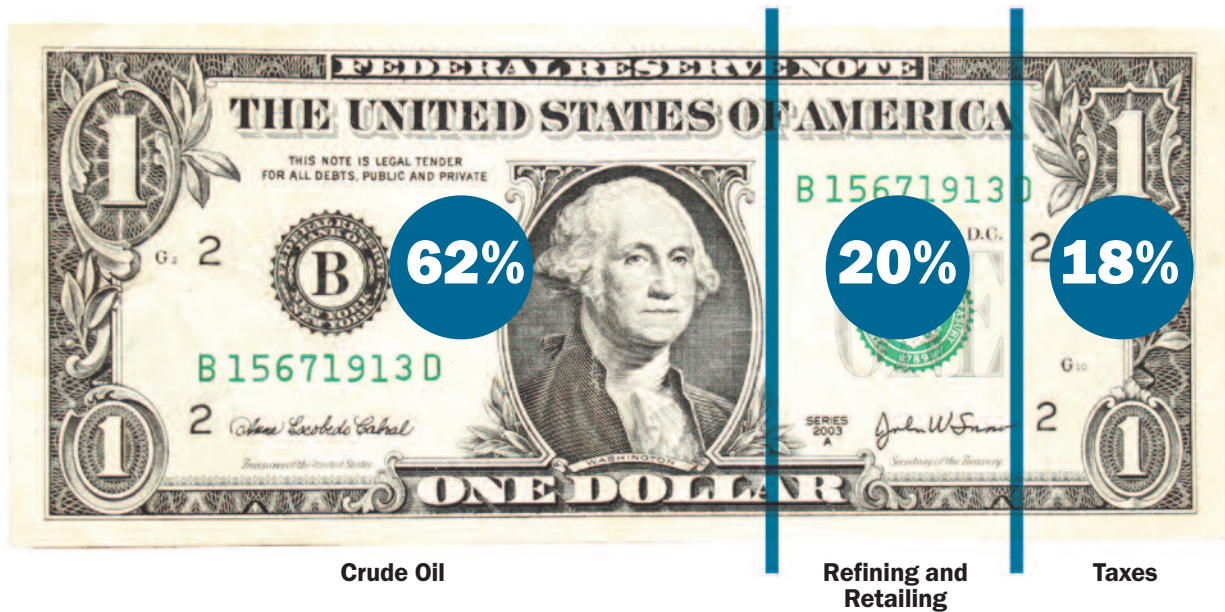
### Looking Ahead: EIA's Price Forecast

Looking ahead, the Energy Information Administration projects the annual price of WTI crude will decrease from an average of \$100 per barrel in 2008 to \$60 per barrel in 2009 and then rise to \$72 per barrel in 2010.

EIA expects the lower costs for crude oil will be passed on to all petroleum product prices with retail gasoline prices expected to average 92 cents per gallon less in 2009, but 36 cents per gallon more in 2010.



## What consumers are paying for at the gasoline pump



\*Earnings differ by company. Figure represents adjusted average for the second quarter of 2009 calculated from data reported by *Oil Daily*.

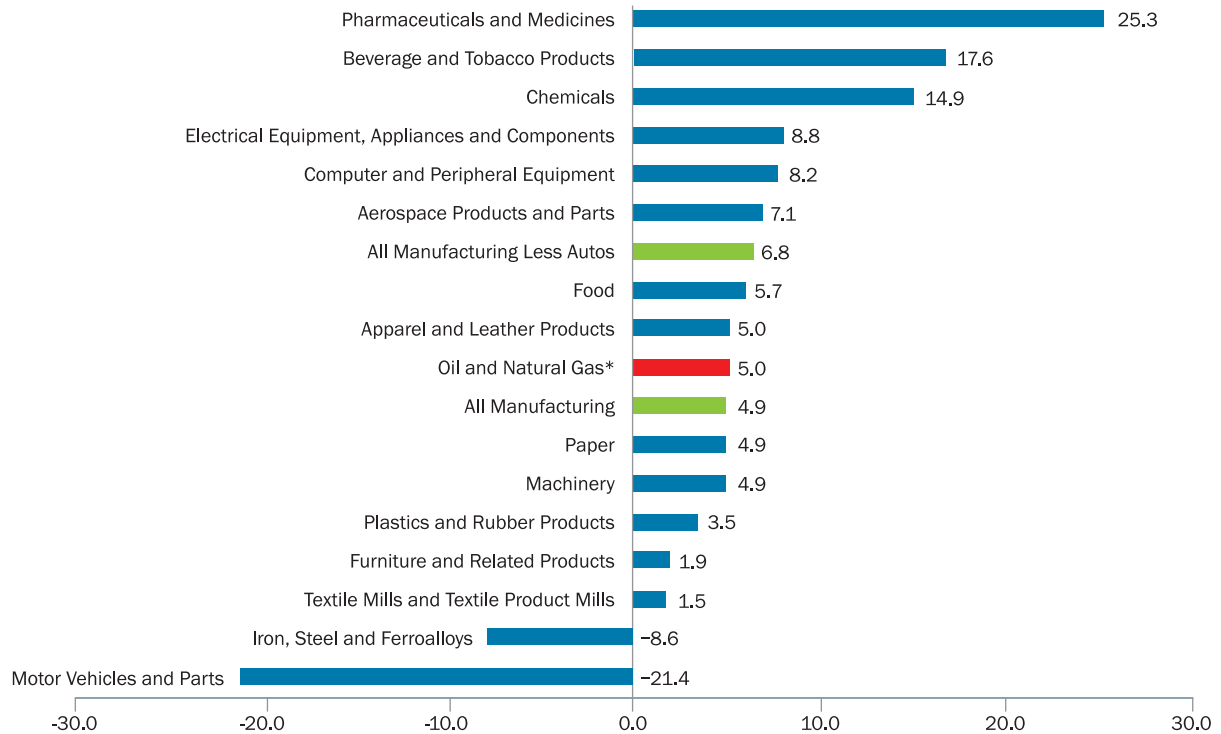
Source: Average of gasoline components from April through June 2009 as reported by EIA.

The price of crude oil is set in global markets, not by oil companies, and it accounts for the largest share of every dollar of gasoline price.

The biggest single component of retail gasoline prices is the cost of the raw material used to produce gasoline – crude oil. For example, in the second quarter of 2009, crude oil alone made up 62 percent of the

price to consumers at the gasoline pump. Refining the crude oil into gasoline and retailing added another 20 percent to the retail price of gasoline. Taxes accounted for 18 percent of the price of gasoline.

## Second Quarter 2009 Earnings by Industry (net income/sales)



\*Represents adjusted earnings for the first quarter of 2009

Sources: Based on company filings with the federal government as reported by U.S. Census Bureau and *Oil Daily*.

### Oil and natural gas industry profits are in line with other manufacturing industries.

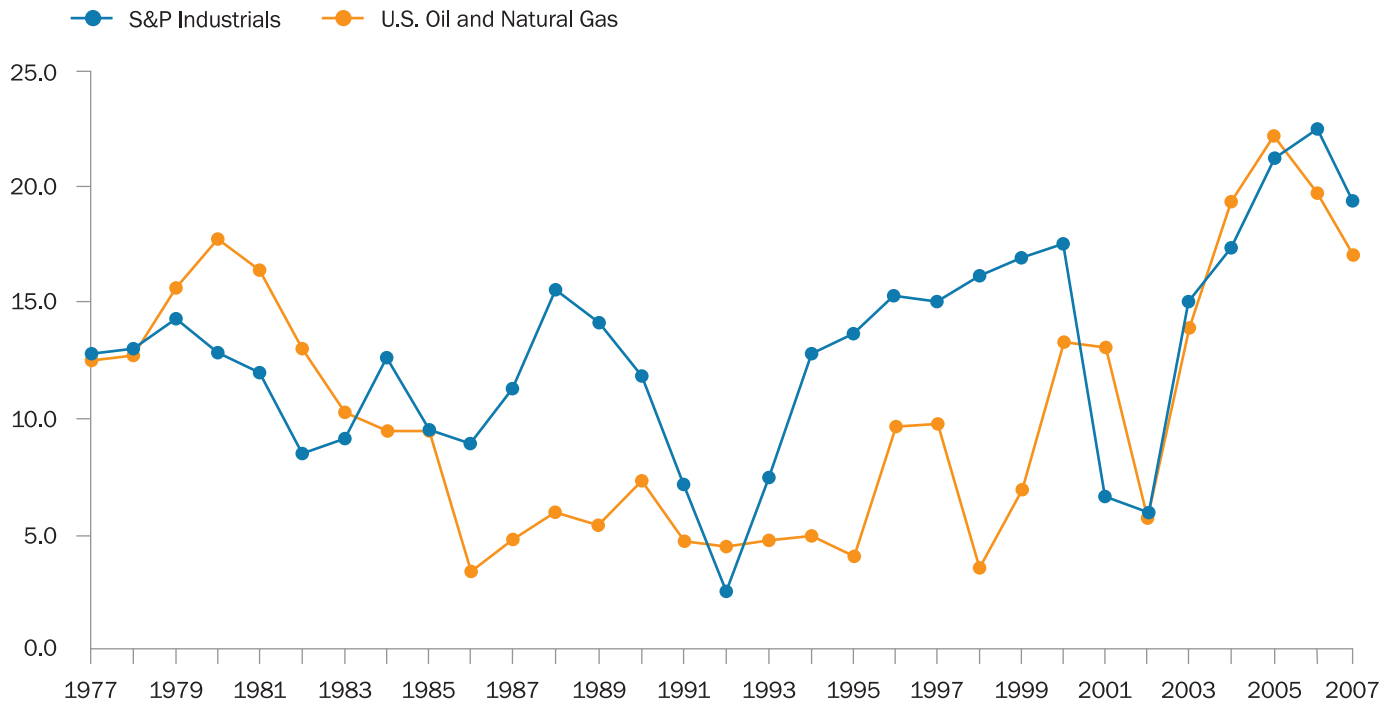
It may seem surprising that oil and natural gas earnings are typically in line with the average of other major U.S. manufacturing industries. This fact is not well understood, however, in part because reports usually focus on only half the story – the profits that are earned.

Profits reflect the size of an industry, but they're not necessarily a good reflection of financial performance.

Profit margins, or earnings per dollar of sales (measured as net income divided by sales), provide one useful way to compare financial performance among industries of all sizes.

The latest published data for the second quarter of 2009 shows the oil and natural gas industry earned 5.0 cents for every dollar of sales. In comparison all U.S. manufacturing earned 4.9 cents for every dollar of sales and 6.8 cents for U.S. manufacturing excluding the financially challenged auto industry.

## Return on Investment (net income/net investment in place)



Source: EIA, *Performance Profiles of Major Energy Producers*, Table CY8 various issues and 2006 and 2007 S&P figure compiled by PWC from Compustat data.

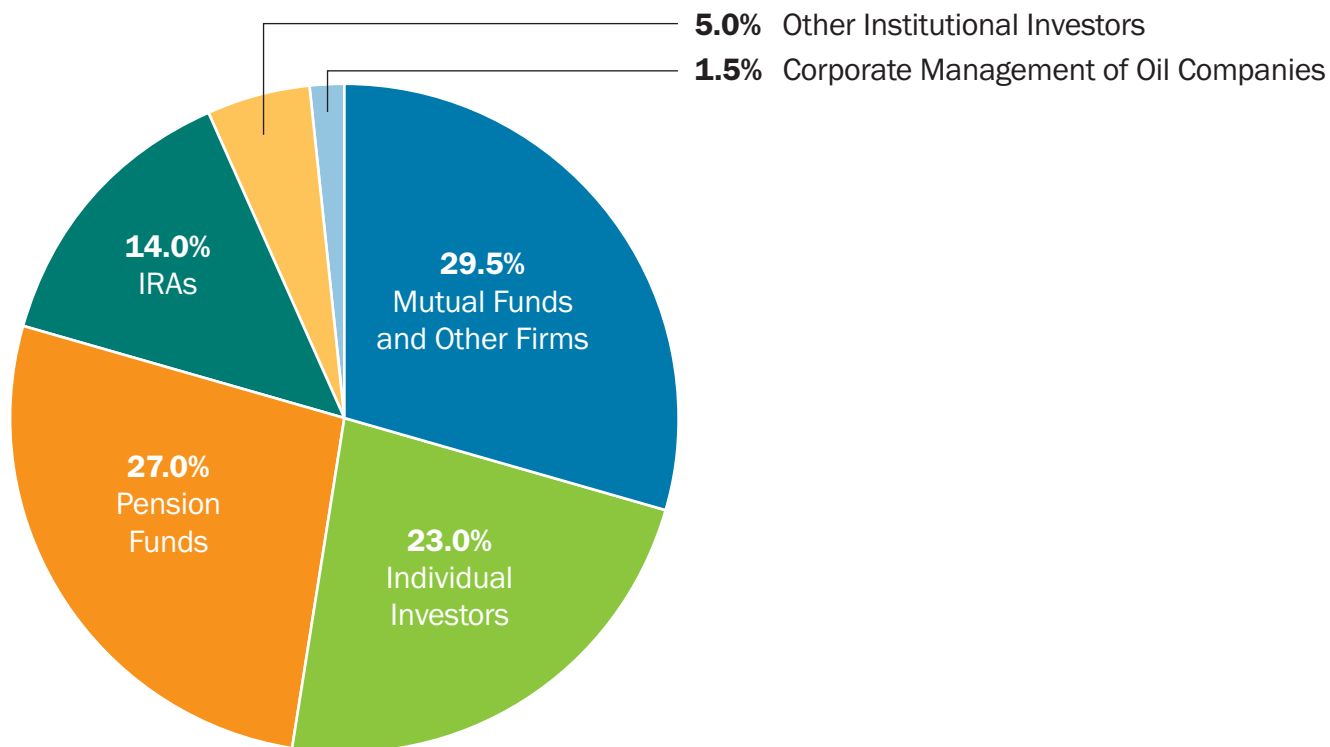
It is only in recent years that the return on investment for the industry has matched or exceeded the returns for the S&P Industrials.

Because the oil and natural gas industry is massive and requires huge investments, its earnings contribute greatly to the American economy and way of life. They allow companies to reinvest in the facilities, infrastructure and new technologies that keep America going strong well into the future while generating returns that meet shareholders' expectations.

The oil and natural gas industry is probably one of the world's largest industries. Its revenues are large, but so are its costs of providing consumers with the energy they need. Among those are the cost of finding

and producing oil and natural gas and the costs of refining, distributing and marketing it. These costs remain huge, regardless of whether earnings are high or low – as was the case throughout most of the 1990s and during other industry "bust" periods.

## Who Owns “Big Oil?” (Holdings of Oil Stocks, 2007)



Source: *The Distribution of Ownership of U.S. Oil and Natural Gas Companies*, SONECON, September 2007

If you're wondering who owns Big Oil, chances are good the answer is "You do."

Contrary to popular belief, and what some politicians might say, America's oil companies aren't owned just by a small group of insiders. Only 1.5 percent of industry shares are owned by corporate management. The rest is owned by tens of millions of Americans, many of them middle class.

If you have a mutual fund account, and 55 million U.S. households do, there's a good chance it invests in oil and natural

gas stocks. If you have an IRA or personal retirement account, and 45 million U.S. households do, there's a good chance it invests in energy stocks.

When politicians talk about taxing "Big Oil" or taking their "record profits," they should think about who would they really be hurting.

## 2010 Budget Proposal



### Raising taxes in a time of economic decline is a recipe for disaster.

The Administration's proposed FY 2010 budget includes new taxes and fees on the oil and natural gas industry potentially totaling more than \$400 billion over the next 10 years. With America in the midst of an economic recession, now is not the time to impose new taxes and fees on the nation's oil and natural gas industry. Such a sharp increase in taxes could wipe out American jobs and devastate American businesses. Despite a sharp decline in oil and natural gas prices since 2008's peak, the oil and natural gas industry is working to minimize the downsizing, cancellation of projects and reduction in its workforce. More taxes would hamper those efforts and could result in the loss of thousands of jobs and the income and value they create.

There is a better way than saddling a troubled economy with new taxes and fees that hurt consumers and workers. The oil and natural gas industry should be allowed to develop the vast energy resources that belong to the American people. The majority

of Americans want a stronger economy using our own oil and natural gas resources. A recent poll found that 61 percent of Americans who voted in the 2008 Presidential election support increased access to offshore oil and natural gas resources. Developing these resources would improve America's energy security and create jobs and generate federal, state and local revenues. In fact, a recent ICF International study found that developing the vast domestic oil and natural gas resources on federal lands that had been kept off-limits by Congress for decades could generate \$1.7 trillion in government revenue.<sup>1</sup>

America needs a comprehensive energy policy that encourages investment, the development of our nation's vast domestic energy resources and creates good-paying jobs throughout our economy

<sup>1</sup> ICF International, "Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources," December 2008

## Taxes Paid by the Oil and Natural Gas Industry



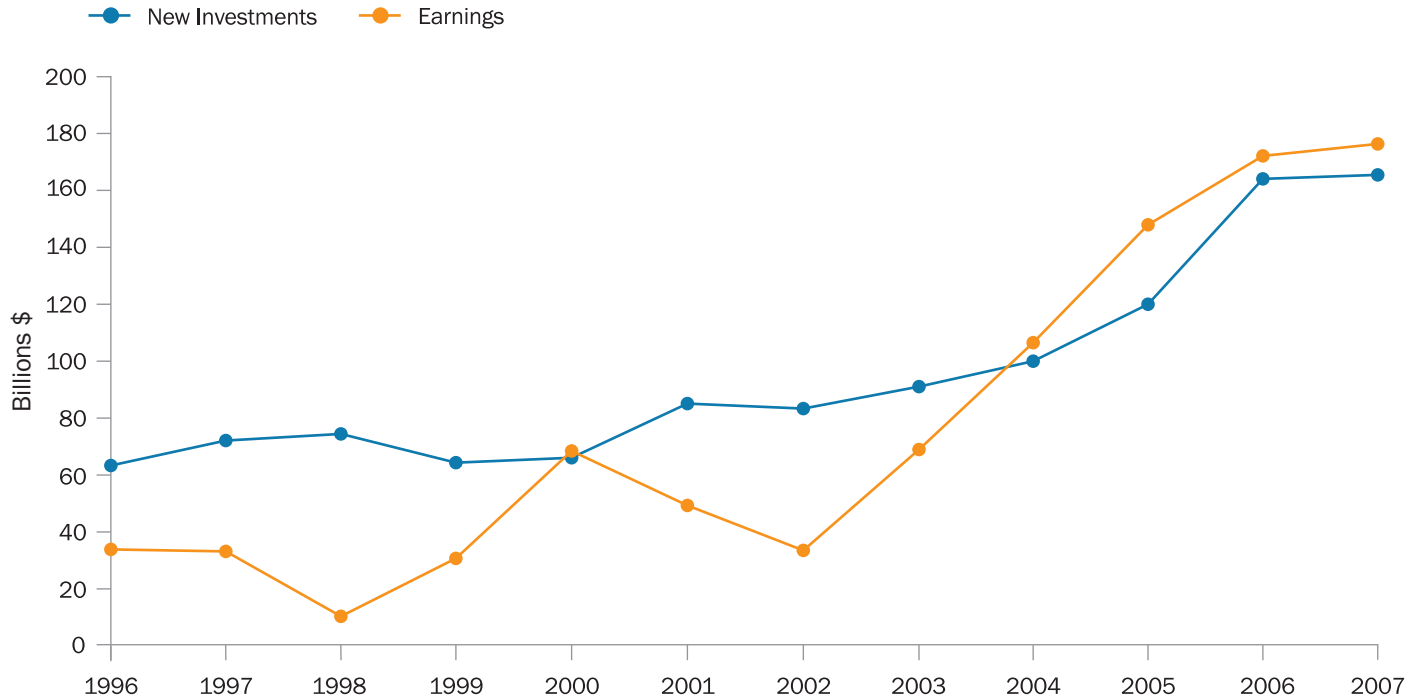
An important part of the revenue earned by U.S. oil and natural gas companies goes to taxes.

According to the U.S. Energy Information Administration (EIA), the industry's 2007 income tax expenses (as a share of net income before income taxes) averaged 40.4 percent.

As one would expect with such a high effective rate, the U.S. oil and natural gas industry pays a substantial amount in income tax. According to EIA, during the three-year period from 2005-2007, the major energy producing companies paid or incurred over \$242 billion of income tax expense.

In addition to this, Congress has enacted tax laws over the past few years that are expected to cost the industry around \$10 billion in additional taxes from what they would otherwise be expected to pay today. However, even these figures are dwarfed by the Administration's proposed FY 2010 budget, which includes new taxes and fees on the oil and natural gas industry potentially totaling more than \$400 billion over the next 10 years.

## Oil and Natural Gas New Investments and Earnings



Source: Ernst & Young

Today's earnings are reinvested for tomorrow's energy needs.

The energy Americans consume today comes from industry investments made years or even decades ago.

Between 1996 and 2007, the U.S. industry invested more than \$1.2 trillion in a range of long-term energy initiatives compared to net income or earnings of \$974 billion.<sup>1</sup>

Investments either planned or currently under serious consideration will boost domestic refining capacity by 800,000 to one million barrels per day by 2011, the equivalent of four to five new, medium-sized refineries.

<sup>1</sup> Net income is generally lower than cash flow due to deductions for past and current tangible investment and depletion of oil resources.

## Capital Spending (Where Funds Will Go for U.S. Projects)

	2009 (\$ million)	% Change 2008-2009	2008 (\$ million)	% Change 2008-2007	2007 (\$ million)
<b>Exploration/Production</b>					
Drilling/Exploration	174,621	-27.1	239,646	10.7	216,462
Production	33,178	-27.1	45,533	10.7	41,128
OCS Lease Bonus	1,080	-84.3	6,883	119.1	3,142
<b>Subtotal</b>	<b>208,879</b>	<b>-28.5</b>	<b>292,062</b>	<b>12.0</b>	<b>260,732</b>
<b>Other</b>					
Refining	10,140	-22.0	13,000	57.0	8,280
Petrochemicals	50	-95.0	1,000	19.0	840
Marketing	1,950	-35.0	3,000	20.0	2,500
Crude and Products Pipelines	5,164	16.5	4,431	146.8	1,796
Natural Gas Pipelines	10,374	63.6	6,343	45.2	4,367
Other Transportation	840	-30.0	1,200	23.7	970
Mining, Other Energy	900	-25.0	1,200	20.0	1,000
Miscellaneous	3,750	-25.0	5,000	22.0	4,100
<b>Subtotal</b>	<b>33,168</b>	<b>-5.7</b>	<b>35,174</b>	<b>47.5</b>	<b>23,853</b>
<b>Total</b>	<b>242,047</b>	<b>-26.0</b>	<b>327,236</b>	<b>15.0</b>	<b>284,585</b>

Source: *Oil & Gas Journal*, April 27, 2009

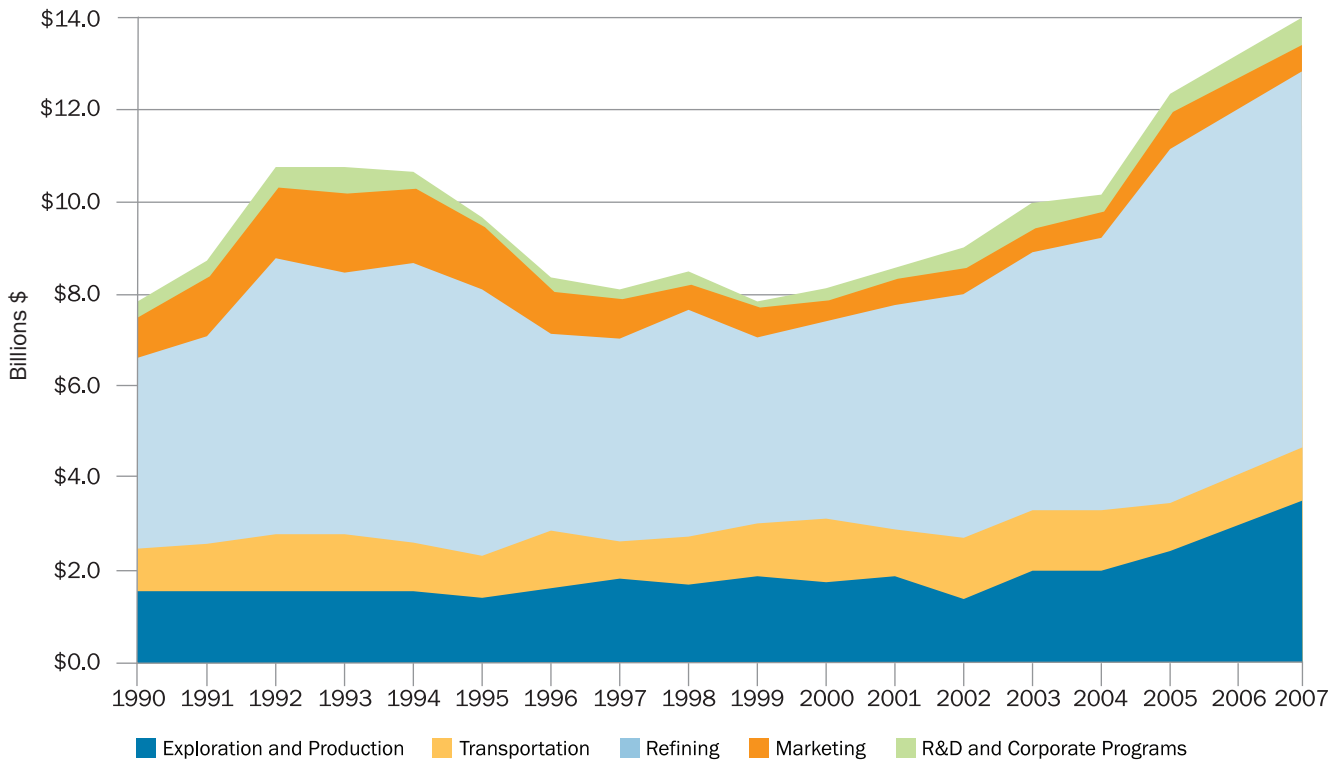
To understand the oil and natural gas industry one must recognize it as an industry characterized by long lead times, massive capital requirements and returns realized only decades later in the face of very real investment risks.

Significant oil and gas discoveries that are announced today often result from investments begun by companies as far back as a decade or more ago. Since the year 2000, our industry invested over 1.2 trillion dollars in capital projects to meet the growing demand for oil and natural gas. However, the worldwide economic downturn, along with lower oil and natural gas prices and tight credit markets, have caused some oil and natural gas producers to cut their 2009 capital budget plans. Oil and natural gas projects are anticipated to decline by 26 percent to \$242 billion in the U.S. alone this year.

Planning and investment cannot be turned on and off like a spigot, without entailing huge, potentially non-recoverable costs and delaying urgently needed projects. Because the industry must plan and operate under these long lead times, it is hypersensitive to minimizing risk over the course of its investments. It is crucial for an industry that must manage such huge risks that government provide an energy policy and tax framework that encourages investment, rather than discourages it.



## U.S. Environmental Expenditures since 1990 (by sector)



Source: API Statistics, Environmental Expenditures by Oil and Gas Industry, January 2009.

Decades of investments of hundreds of billions of dollars have been made by the oil and natural gas industry to protect the environment and improve the performance of its products, facilities and operations.

The U.S. oil and natural gas industry has invested \$175 billion since 1990 toward improving the environmental performance of its products, facilities and operations; \$582 for every man, woman and child in the United States.<sup>1</sup>

In the year 2007 alone, \$14 billion was spent on the environment; \$11.9 billion was spent implementing new technologies, creating cleaner fuels and funding ongoing environmental initiatives. An additional \$1.9 billion went toward research and development, corporate environmental programs and spill remediation efforts.

<sup>1</sup> Based on 2007 U.S. population estimate of 301.6 million by U.S. Census Bureau.

## Climate Policy Framework



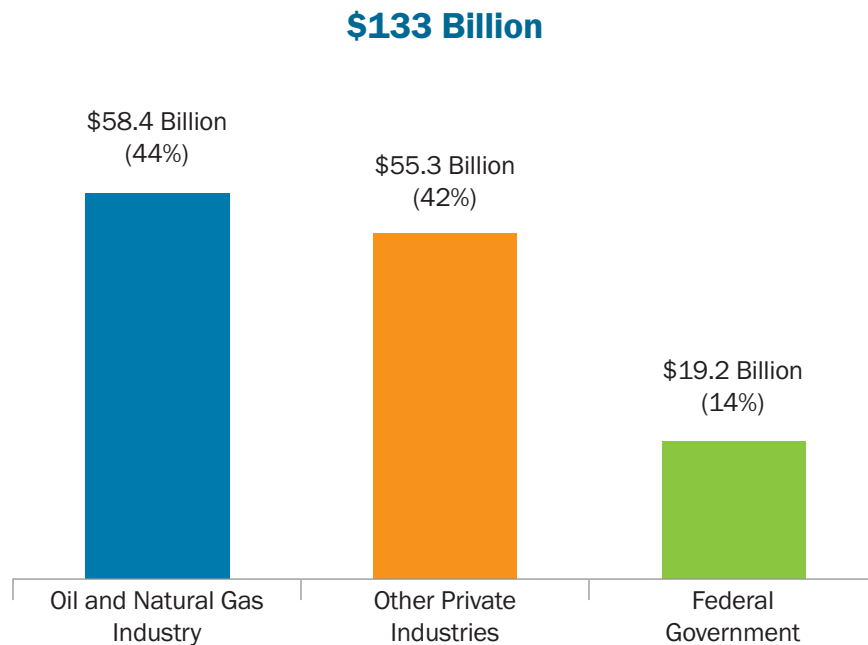
We all have a role to play in addressing the risk of global climate change; that includes America's oil and natural gas companies.

Climate change is an extraordinarily complex and challenging issue that impacts energy, the environment and the economy in profound ways.

It is crucial that our nation have a climate policy framework that not only heads us in the right direction, but enables us to move forward with workable policies and practical solutions. To be workable, climate change policy should have some essential components, as follows:

- Be environmentally effective;
- Be transparent and understandable to consumers;
- Identify the most cost efficient ways to reduce emissions;
- Avoid government selection of market "winners" and "losers;"
- Provide access to all domestic energy sources particularly natural gas, which has the lowest emissions per Btu of all fossil fuels;
- Keep U.S. energy production competitive in the global marketplace to avoid "outsourcing" business jobs and emissions overseas; and
- Avoid severe damage to the U.S. economy.

## Carbon Mitigation Investment by Investor Group (2000-2008)



Source: T2 & Associates and CEE, June 2009

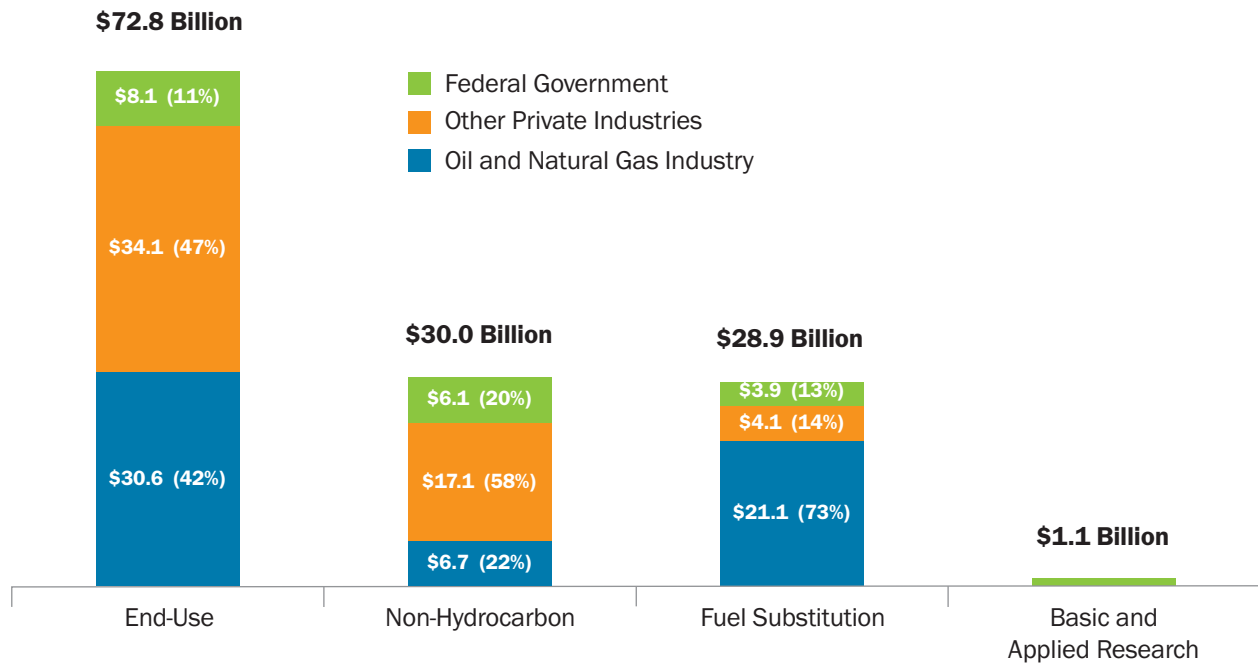
The U.S. oil and natural gas industry is spending billions of dollars developing new advanced energy technologies to reduce greenhouse gas emissions and meet future energy needs.

The oil and natural gas industry is hard at work meeting today's energy needs and developing next-generation forms of energy. Between 2000 and 2008, the industry invested more than \$58 billion in new low and zero emissions technologies. This represents 44 percent of the \$133 billion spent by all U.S. industries and the federal government combined. These large investments are critical to provide the low-carbon energy we will need in the years ahead.

U.S. oil and natural gas companies are pioneers in developing alternatives and expanding America's use of virtually every form of energy – from geothermal to wind, from solar to biofuels, from hydrogen power to the lithium ion battery for next-generation cars.

This industry is also at the forefront of developing "carbon capture and storage" technology, or CCS, to reduce carbon dioxide (CO<sub>2</sub>) emissions by storing them underground. In order for CCS to advance much more needs to be done. A legal and regulatory framework for long-term CO<sub>2</sub> storage is still lacking. The use of CCS would facilitate the continued use of our nation's vast coal and frontier hydrocarbon resources in an environmentally-friendly way.

## Carbon Mitigation Investments by Technology and Investor Group (2000-2008)



Source: T2 & Associates and CEE, June 2009

Oil and natural gas companies are taking action now to reduce greenhouse gas emissions and investing in the technologies and fuels that will reduce them even more in the future.

**End-Use:** America's oil and natural gas companies are investing in efficiency improvements and alternatives and are advising companies in other industrial sectors how to use energy more efficiently. Through such end-use technologies as combined heat and power – using excess heat from refinery processes to produce additional energy – refiners are becoming more energy efficient, reducing both energy use and emissions. In one year alone, the energy savings from improving refinery energy efficiency was equivalent to taking over half a million cars off the road.

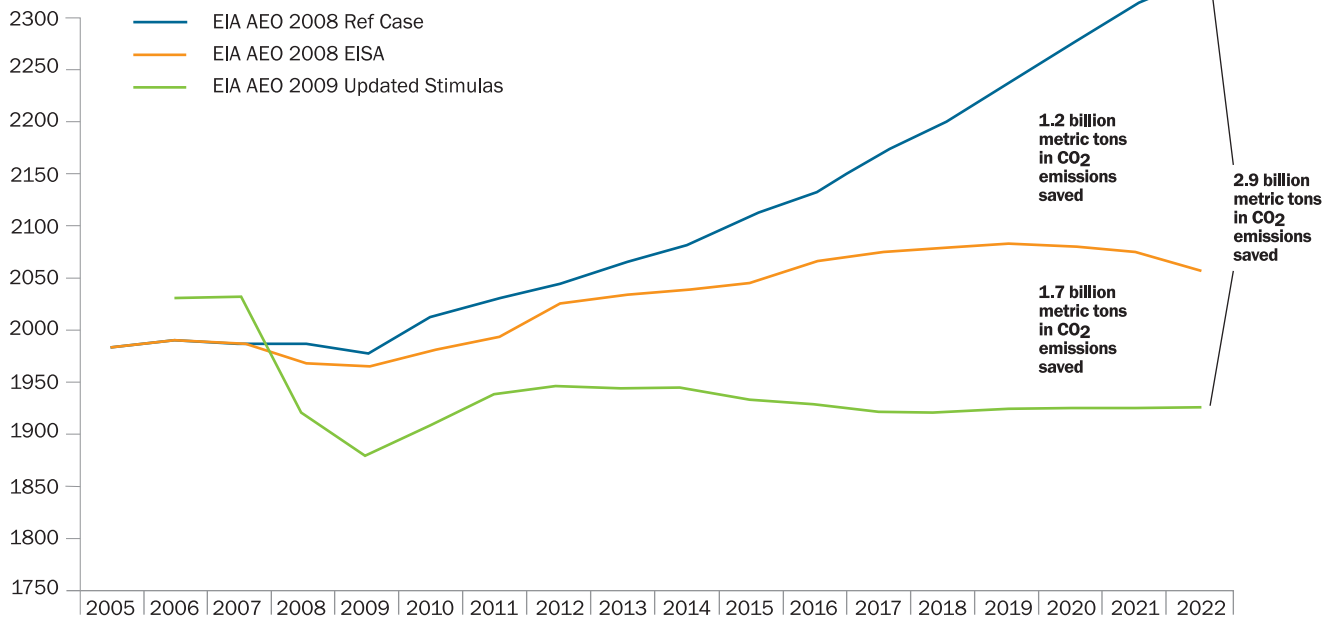
Between 2000 and 2008 the industry invested over \$30 billion in end-use technologies, including advanced technology vehicles, efficiency improvements, combined heat and power, gas flare reduction technologies and carbon capture and sequestration. This represents approximately 42 percent of all the investments made in these technologies in North America.

**Non-hydrocarbon:** We are a major provider of the green jobs that are in the news today. The oil and natural gas industry accounts for 22 percent of all the investments made in North America in non-hydrocarbon fuels since 2000. The industry's top investments are in wind and biofuels. Expenditures were also made in solar, geothermal, and landfill digester gas.

**Fuel Substitution:** The oil and natural gas industry has spent over \$21 billion developing substitute and less carbon intensive fuels, such as liquefied natural gas and reducing methane fugitive emissions. This investment in fuel substitution technologies represents 73 percent of the total invested in this technology class.

## Reductions in Transportation Sector CO<sub>2</sub> Emissions from Fuels

(Under the Energy Independence and Security Act [EISA] and American Recovery and Reinvestment Act [ARRA])



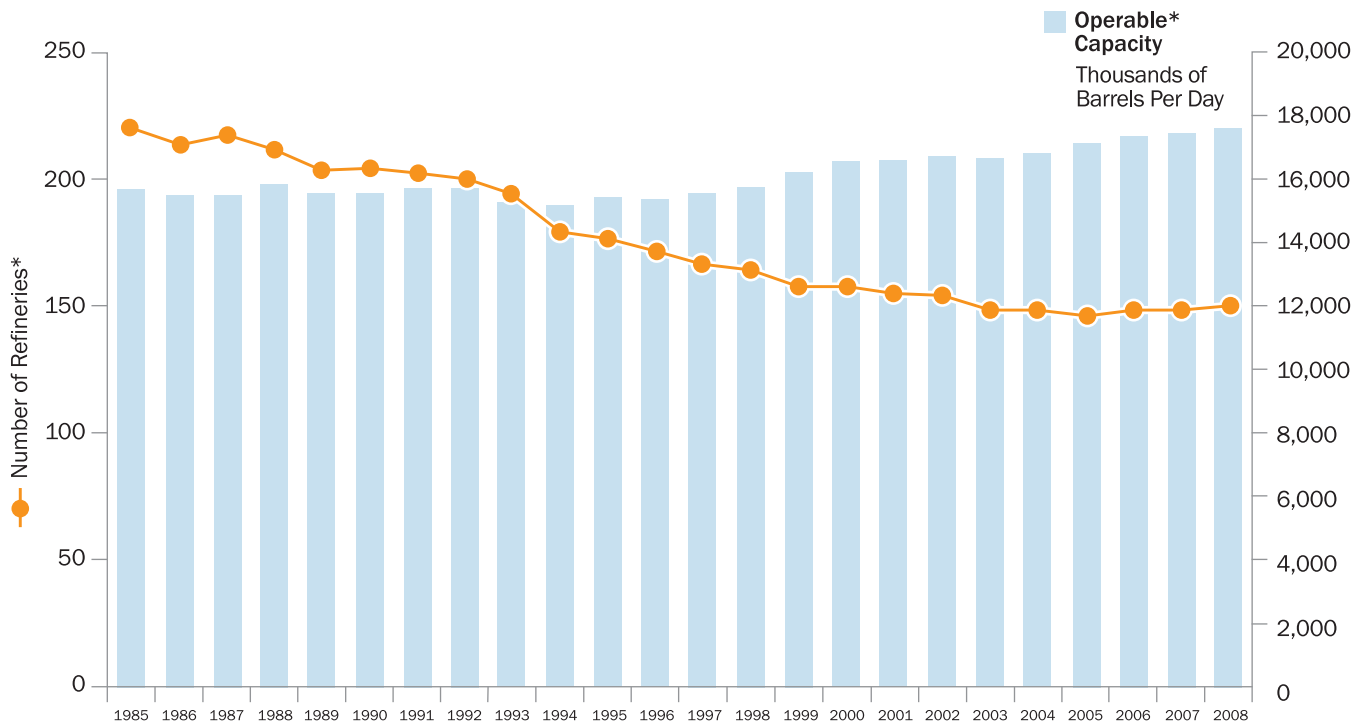
Source: EIA, AEO 2008 and Updated AEO 2009

The outlook for transportation fuels carbon dioxide emissions has changed dramatically following recently enacted legislation.

EIA's latest projections indicate that the reduction in greenhouse gas emissions from transportation fuels by the year 2022 is equivalent to the annual (2005) emissions from the entire U.S. west of the Mississippi River, including Alaska and Hawaii. Fuel producers will be investing heavily over the next 13 years to meet future EPA standards on renewable, low carbon fuels under the Energy Independence and Security Act. These standards require 50 percent and 60 percent life-cycle reductions of greenhouse gas emissions on advanced fuels, in addition to the existing environmental fuel requirements. Assuming that the biofuels and CAFÉ mandates are met and the fuel complies with the above stated advanced greenhouse gas reduction requirements in EISA, EIA estimates that these efforts will reduce greenhouse gases from petroleum transportation fuels by 1.2 billion metric tons through the year 2022.

Substantial additional savings in greenhouse gases from transportation fuel use can be expected following the recently passed (February 2009) American Recovery and Reinvestment Act (ARRA). This Act provides new Federal funding, loan guarantees, and tax credits to stimulate investments in energy efficiency and renewable energy and includes incentives for plug-in hybrid and electric vehicles. EIA's latest projection for transportation emissions indicates an additional reduction of 1.7 billion tons over the savings from the EISA standard. Altogether, EIA estimates that greenhouse gas emissions from petroleum transportation fuels will be reduced by 2.9 billion metric tons through the year 2022 compared to the outlook of only a few years ago.

## Number of Refineries Declines but Capacity Expands



\*Operable as of January 1st  
Source: EIA, *Petroleum Supply Annual*

### U.S. refining capacity continues to expand even as the number of refineries contracts.

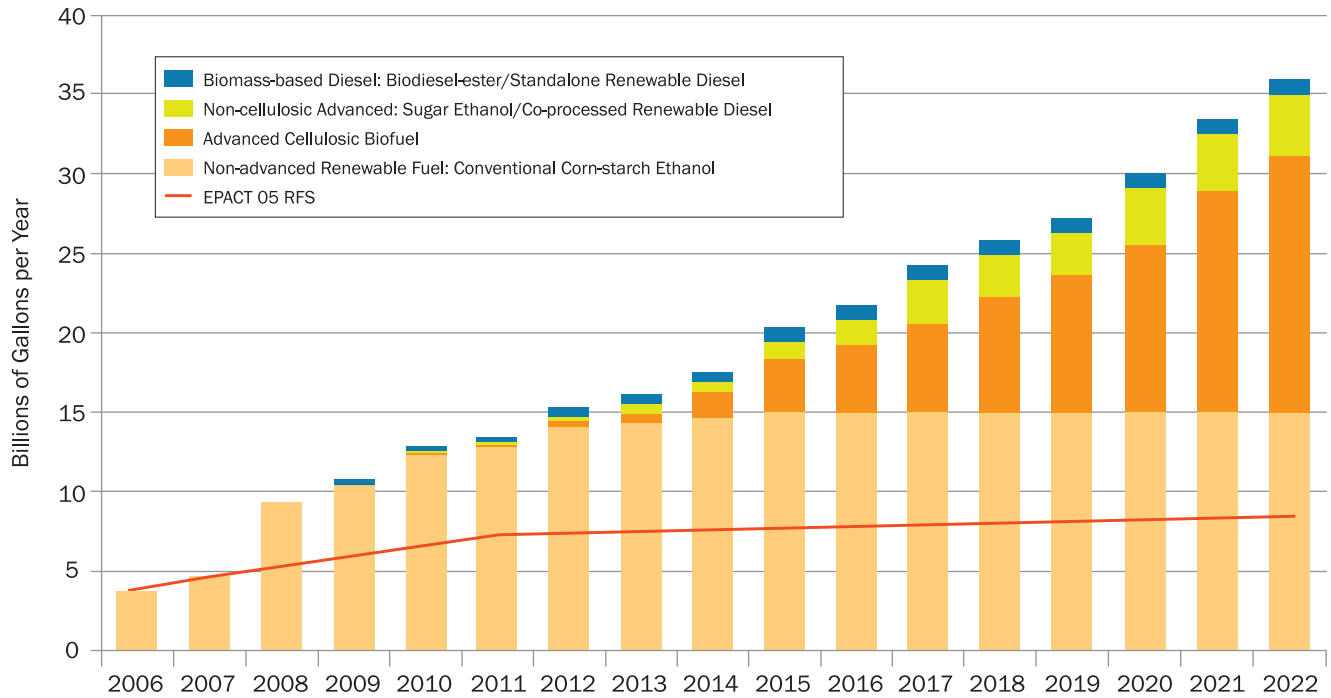
Since 1985, U.S. refining capacity has increased by 12 percent even though there are 73 fewer refineries. Because the infrastructure to bring crude in and get products out is in place, it is more cost effective to add on to a refinery than to build a new one. The elimination of subsidies under the government price and allocation controls in 1981 led to the closure of many smaller, less efficient refineries throughout the 1980s and 1990s.

According to the U.S. Energy Information Administration, current domestic refinery expansion plans will boost domestic refining capacity by another 800,000 to 1 million barrels per day by 2011, the equivalent of four to five new refineries.

Moreover, a number of refineries are expanding and upgrading equipment to handle increased processing of heavier crude oils, including oil derived from Canadian oil sands. This additional crude from Canada – a reliable, nearby source – would enhance our domestic energy security.

Capacity has increased while at the same time, refineries invested \$96 billion since 1990 to make the cleanest burning fuels in the world. Much of the investments were in technologies and investments to meet stringent clean air standards set by the Clean Air Act of 1990 for refineries and cleaner burning fuels.

## Expanding Alternative Fuels for Transportation: Current Laws



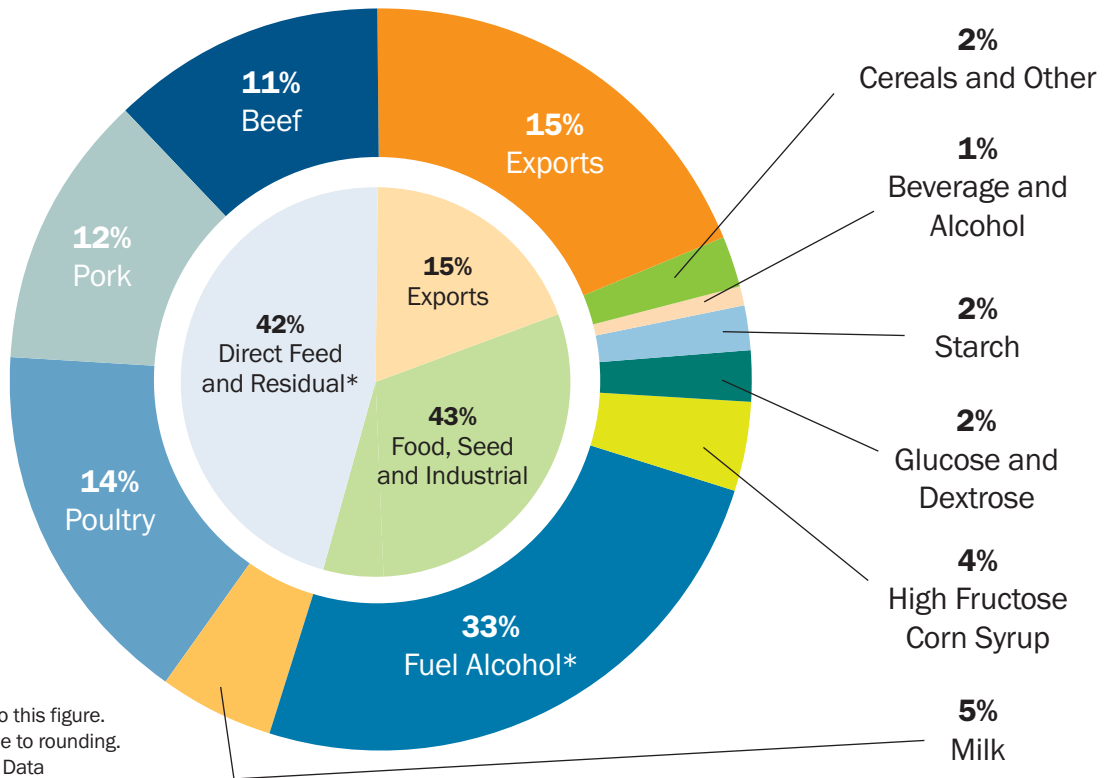
Source: EIA and Energy Independence Security Act of 2007

Our industry is the nation's largest user of ethanol and is increasing the volume of renewable fuels in America's transportation fuel portfolio.

In 2008, 9.6 billion gallons of ethanol were used – exceeding the 9.0 billion gallons required by the Energy Independence and Security Act of 2007 (EISA). This act, containing four interrelated parts, creates a significantly increased Renewable Fuel Standard (RFS) from the Energy Policy Act of 2005 (EPACT 05 RFS).

The RFS requires annually increasing minimum volumes of renewable fuels to be included in transportation fuel sold or introduced into the United States. The U.S. oil and natural gas industry is committed to fully implementing these very challenging requirements. However, the mandated four-tier approach that includes various carve-outs is very complicated, and could lead to boutique blend requirements and inefficient credit markets.

**U.S. Corn Use 2009/2010 (12.5 Billion Bushels)**



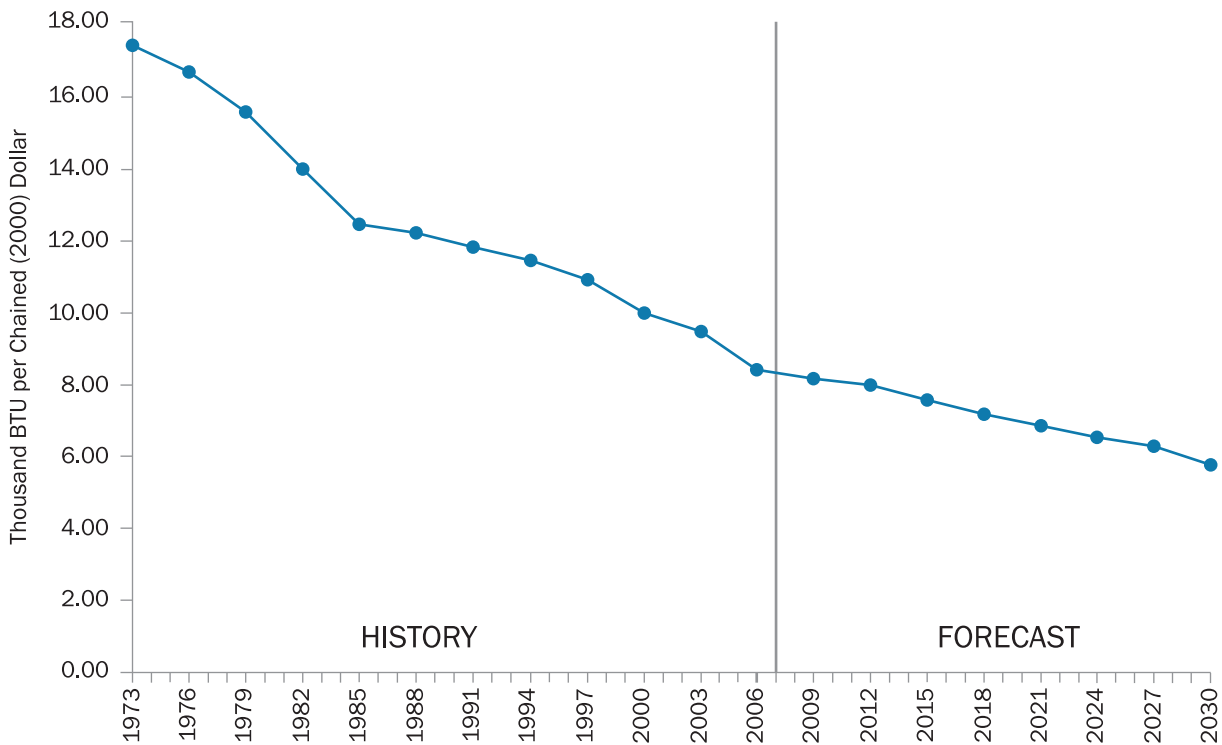
The percentage of the corn crop used for ethanol is growing.

Ethanol production is now taking roughly one-third of the U.S. corn crop. This percentage is expected to increase over the next several years due to a significant

ramp-up in the renewable fuels mandate included in the 2007 Energy Independence and Security Act enacted by Congress.



## Future U.S. Energy Demand per Dollar of GDP – Growing Efficiency



Source: Updated AEO 2009

Energy efficiency is the cleanest, quickest and most cost-efficient way to extend today's energy supply in the future.

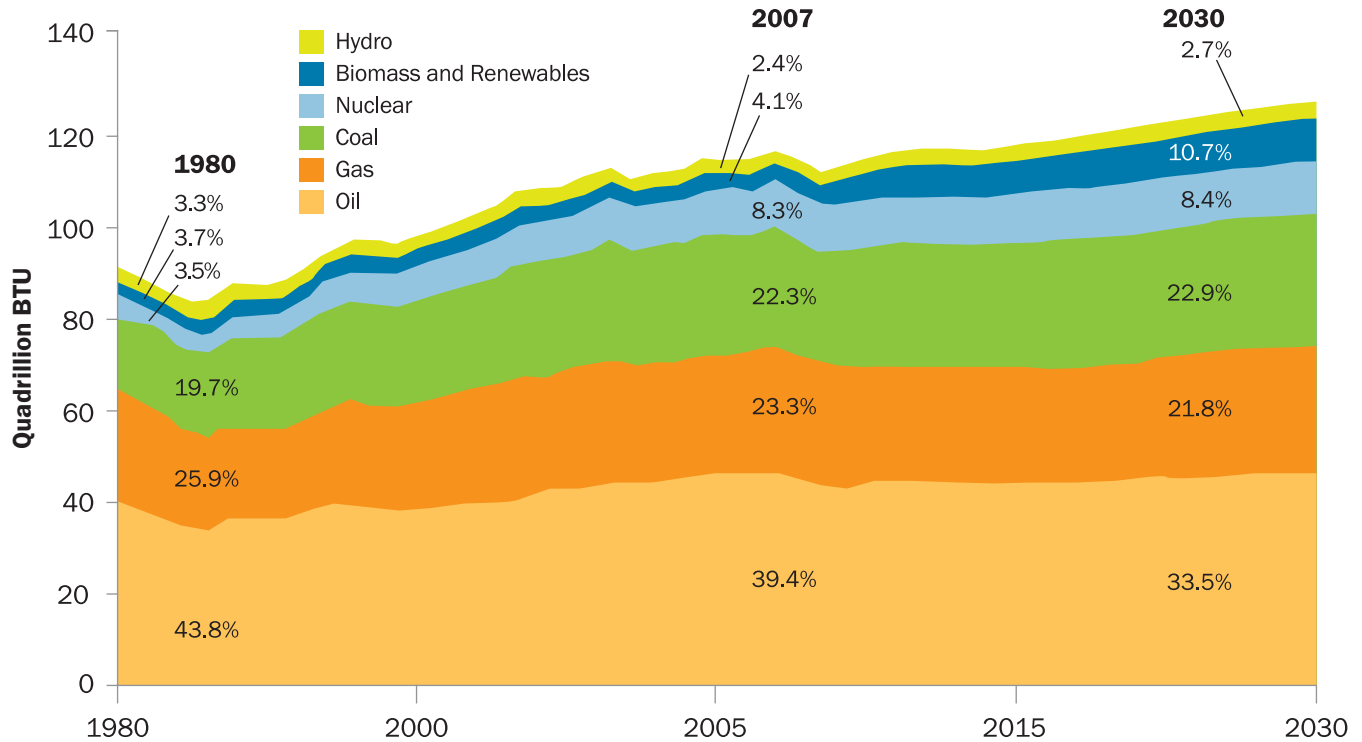
The greatest “new” source of energy comes from the reduced demand of greater efficiency and conservation. Significant progress has been made in the past and more is expected in the future. We use about half as much energy today for every dollar of Gross Domestic Product as we did back in 1973.

Looking forward, our nation must take energy efficiency more seriously. Our industry is doing its part. Energy efficiency is a core value and a daily practice in our industry. Through such technologies as combined heat and power, also known as cogeneration – the re-use of excess heat from refinery processes to produce additional energy – refiners are becoming more efficient, reducing both energy use and emissions.

API member companies have also pledged to improve aggregate energy efficiency by 10 percent at refineries between 2002 and 2012, and we are making progress in meeting that goal. In fact, in one year alone, U.S. refiners saved the energy equivalent of taking 525,000 cars off the road. Additionally, all of API's larger companies are active participants in EPA's Natural Gas Star program.

## Future U.S. Energy Demand

The U.S. will require 9 percent more energy in 2030 than in 2007.



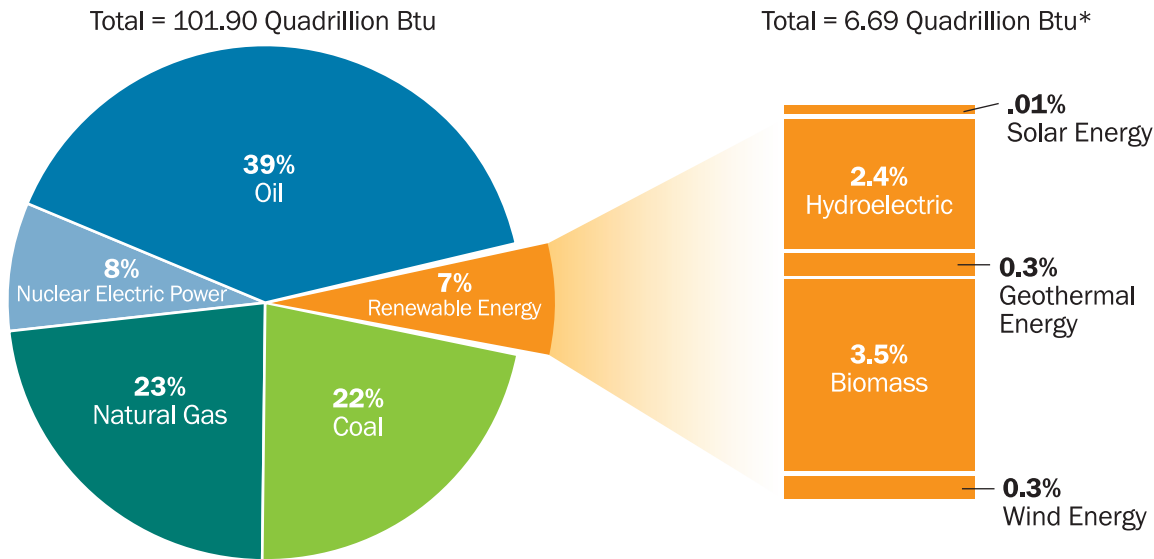
Source: EIA, Updated AEO 2009 Tables A1 and A17

Although the share of non-fossil fuels is growing rapidly, fossil fuels – oil, natural gas and coal – will continue to play leading roles through 2030.

Given expected global economic and population growth, energy efficiency improvements alone will not be enough in the future. More total energy will be needed both in the United States and globally.

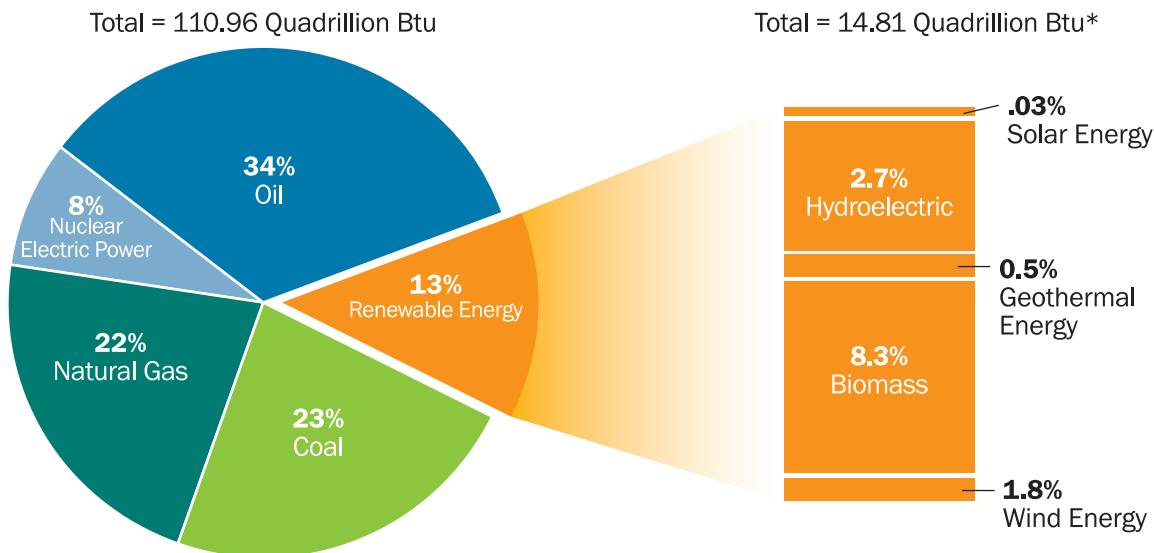
The U.S. Energy Information Administration (EIA) forecasts U.S. energy demand will grow by 9 percent between 2007 and 2030, with more than half of the energy demand expected to be met by oil and natural gas, as is the case today.

## The Role of Renewable Energy Consumption in the Nation's Energy Supply, 2007



Note: Sum of components may not add exactly to 100 percent due to rounding.  
 \*Includes non-marketed renewable energy from residential and commercial sectors.  
 Source: EIA, Updated AEO 2009 Tables A1 and A17

## The Role of Renewable Energy Consumption in the Nation's Energy Supply, 2030



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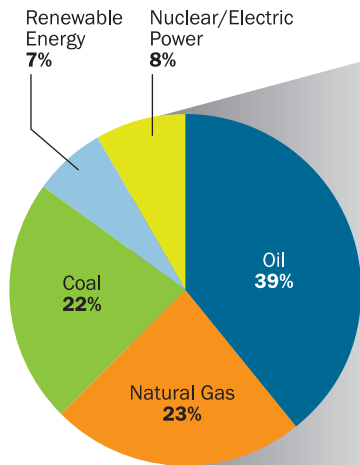
Just 7 percent of the nation's energy needs are supplied by renewables, which are expected to supply 13 percent by 2030.

About four percent of renewables come from biomass, including wood, biofuels and waste. Hydroelectric power accounts for two percent of the renewable energy consumed, with wind, geothermal and solar accounting for less than one percent together.

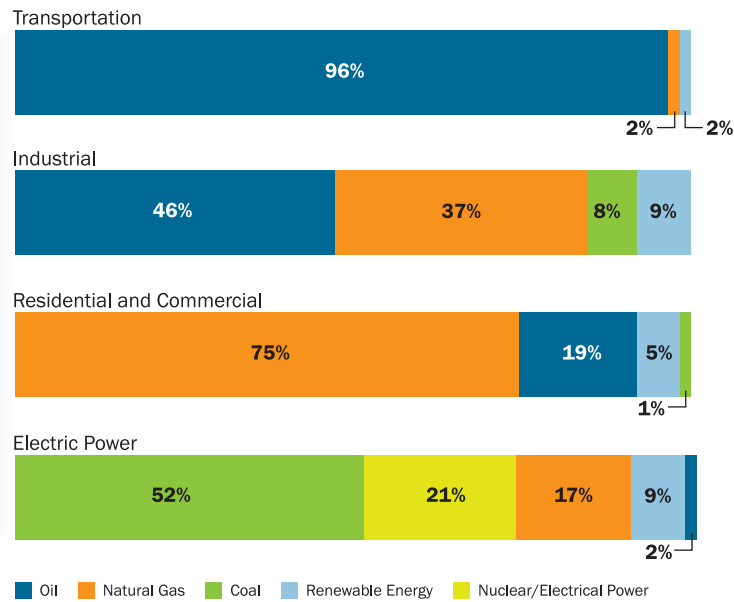
Renewables are expected to grow rapidly between now and 2030 with EIA forecasts showing biomass and other renewables increasing by 121 percent. Despite the rapid growth and because they are starting from such a small base, renewables are expected to supply just about 13 percent of the nation's energy needs by 2030.

## Energy Consumption by Sector, 2007

### Total Energy Consumption by Fuel



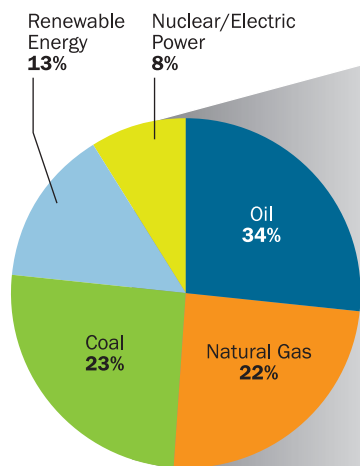
### Sector Energy Consumption by Fuel Type



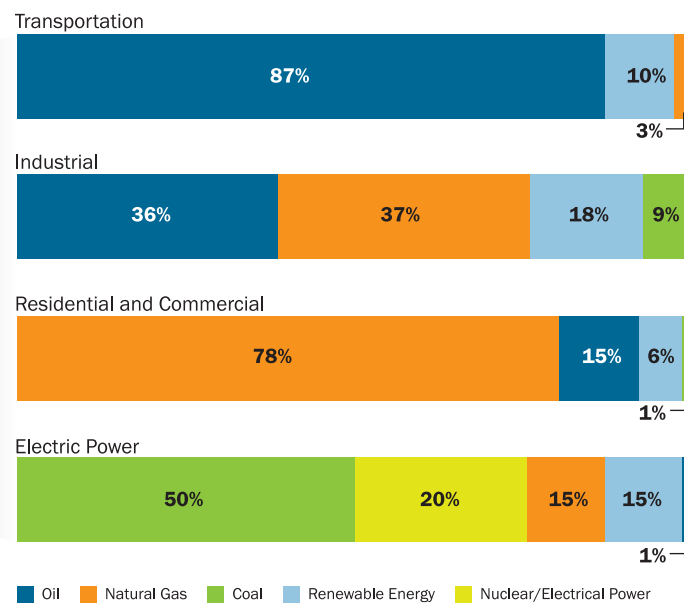
Source: Updated AEO 2009 Tables A1, A2 and A17

## Energy Consumption by Sector, 2030

### Total Energy Consumption by Fuel



### Sector Energy Consumption by Fuel Type



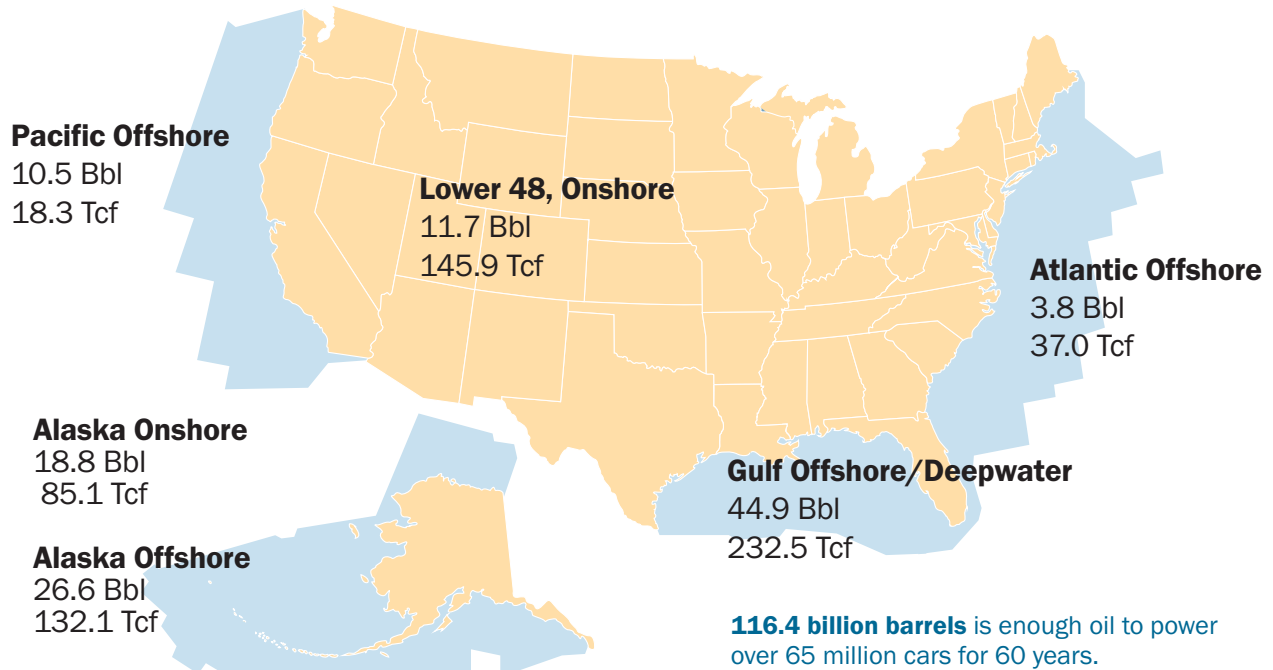
Source: Updated AEO 2009 Tables A1, A2 and A17

**Oil is expected to remain the dominant fuel in our nation's energy mix for decades to come.**

Today, oil accounts for 39 percent of our energy use with the lion's share of it fueling 96 percent of our transportation energy needs. Although ethanol and other biofuels are expected to grow rapidly in the future and

steadily displace some oil use, EIA forecasts oil will continue to account for the largest share of our energy needs filling 34 percent of total energy demand and 87 percent of our transportation needs in 2030.

**U.S. Crude Oil (Bbl) and Natural Gas (Tcf) Resources**  
 (Undiscovered Technically Recoverable Federal Resources)\*



\*Figures may not add exactly to total due to rounding.  
 Source: MMS, BLM, and API calculations

**116.4 billion barrels** is enough oil to power over 65 million cars for 60 years.

**650.9 trillion cubic feet** is enough natural gas to heat 60 million homes for 160 years.

**Developing domestic sources of oil and natural gas will be an important bridge to our energy future.**

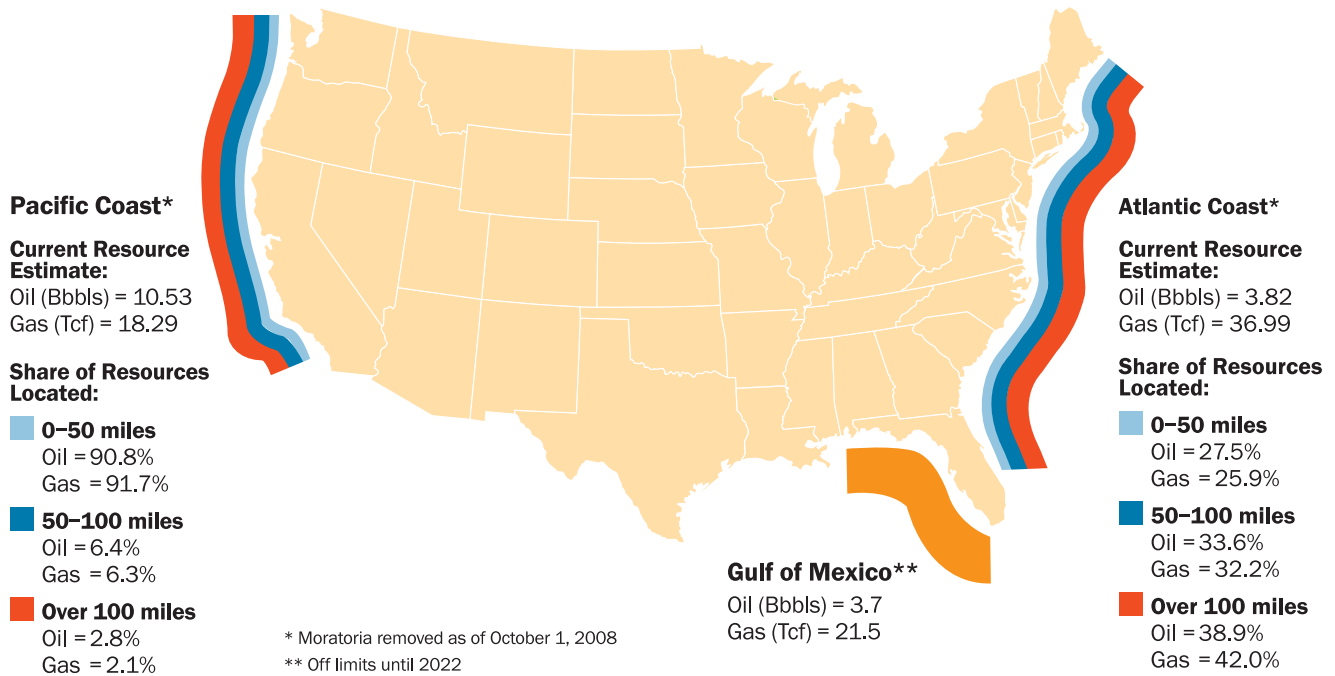
At a time when we need all the energy we can find, increasing access to domestic sources of oil and natural gas would enhance our energy security. We have enough oil and natural gas resources to power 65 million cars for 60 years and heat 60 million households for 160 years.

There could be much more oil and natural gas than previously known in areas where industry has been unable to fully explore, and new technologies allow us to access resources previously thought unreachable. There are many examples of how the government's initial estimates dramatically underestimated the amount of actual resources. For example:

- Alaska's Prudhoe Bay oilfield has produced more than 15 billion barrels of oil and natural gas liquids, and is still producing. Government agencies forecast the region would produce no more than 9 billion barrels, total.

- In the Bakken Formation of North Dakota and Montana, the U.S. Geological Survey now says 3 billion to 4 billion barrels of undiscovered oil are available – 25 times more than the original estimate made in 1995.
- In 1987, the MMS estimated that there were 9 billion barrels of oil in the Gulf of Mexico. By 2006, after major advances in seismic technology and deepwater drilling techniques, the MMS resource estimate for that area had ballooned to 45 billion barrels.

## OCS Lower 48 “Moratoria” Resources (Undiscovered, Technically Recoverable Federal Resources)



Source: API projections based on MMS resource estimates by water depth for the Outer Continental Shelf.

### Congress should allow the U.S. oil and natural gas industry to do what it does best – produce the energy America needs.

With energy consumption expected to grow in the coming decades, America needs access to its untapped domestic resources. These resources can replace output from maturing fields and strengthen our energy security.

- According to the U.S. Minerals Management Service (MMS), the Atlantic and Pacific Outer Continental Shelf (OCS) that had been subject to moratoria contain an estimated 14.3 billion barrels of oil and 55 trillion cubic feet of natural gas.
- 74 percent of the undiscovered oil resources offshore and 48 percent of the natural gas resources in the Atlantic and Pacific oceans are located within 50 miles of the shore.
- For the Pacific OCS, more than 90 percent of the oil and natural gas resources are located within 50 miles of the shore.

All areas of the OCS should be available without buffer zones, since these areas can be developed in an environmentally safe manner with a minimal impact on coastal communities.

- Some of the most promising, and known reserves, including 12 fields offshore California, would be off-limits if an arbitrary coastline buffer zone were established.
- Advances in drilling and production technology have allowed the industry to develop fields close to existing infrastructure without the installation of additional platforms. Off the coast of California, this has allowed industry to use a single platform to access supplies from four miles away, resulting in additional production of 10,000 barrels a day.

## Major Employer; Major Generator of Revenues for Government



Increasing access to domestic sources of oil and natural gas would create new high paying jobs, bring billions of dollars to federal and state treasuries, reduce our balance of payments and enhance America's energy security.

Production of oil and natural gas on federal lands has brought billions of dollars of revenue into federal and state treasuries. These royalties are one of the largest sources of income to the federal government.

According to the Department of the Interior, in fiscal year 2008, the agency distributed a record \$23.4 billion to the federal government, states and American Indian tribes from onshore and offshore energy production. Nearly \$22 billion of that amount came from oil and natural gas production.

- A part of this revenue included \$10 billion in bonus bids paid by companies to lease tracts for offshore energy exploration on the Outer Continental Shelf in the Gulf of Mexico and Alaska.
- A total of 35 states received \$2.6 billion from these revenues.<sup>1</sup>

According to an ICF International study commissioned by API, developing America's vast domestic oil and natural gas resources that were kept off-limits by Congress for

decades could generate more than \$1.7 trillion in government revenue, including \$1.3 trillion in revenues from offshore development alone. These revenues would be earned over the life of the resource.<sup>2</sup>

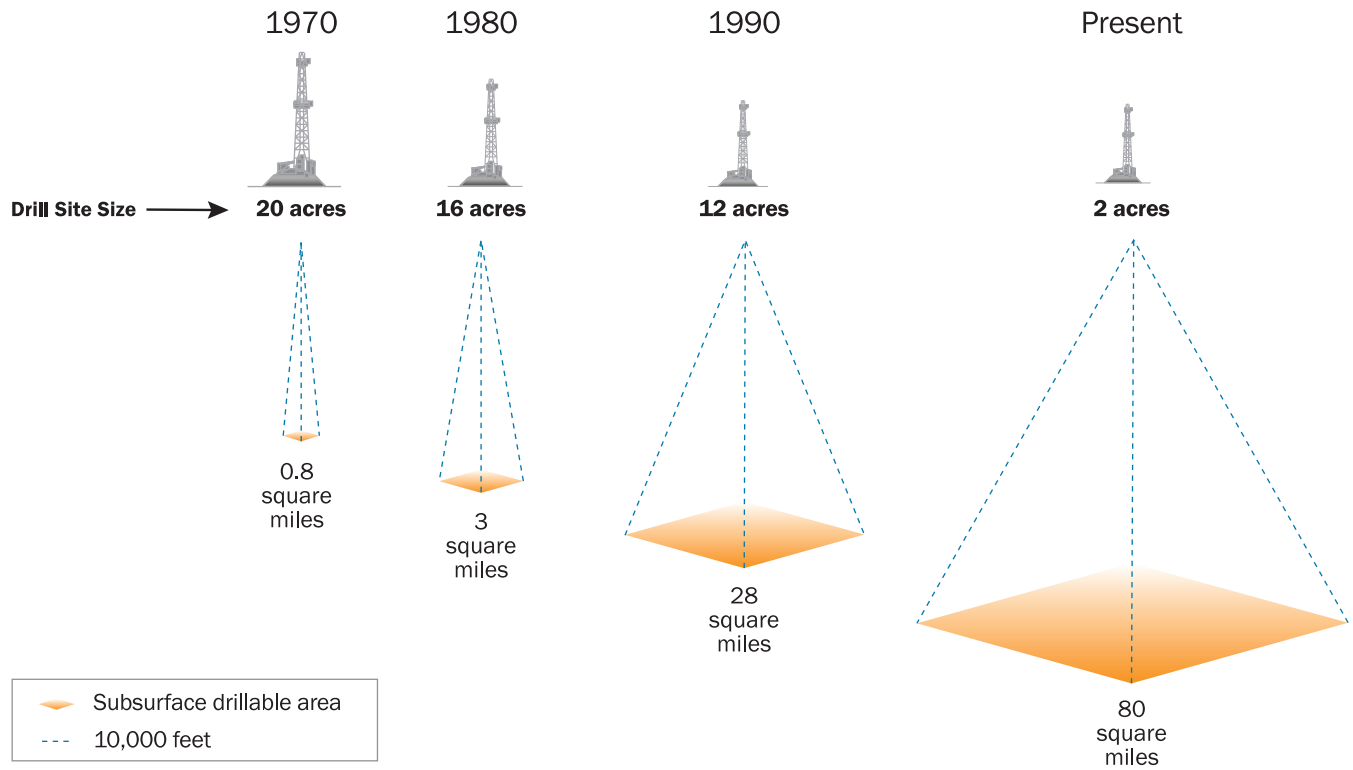
Increased federal leasing could bring additional high paying jobs to Americans. More than 9 million people depend on the oil and natural gas industry for their jobs.

- Oil and natural gas industry exploration and production wages in 2008 were more than double the national average.
- New manufacturing jobs would be created to develop and install the infrastructure to bring new resources to market.
- Local employment also would benefit with the addition of construction jobs as well as service and support positions.
- In 2030, 160,000 jobs would be created.

<sup>1</sup> MMS press release, November 29, 2008

<sup>2</sup> ICF International Study, "Strengthening Our Economy: The Untapped U.S. Oil and Gas Resources," December 2008.

## Precision Drilling – Technology Drives a Dramatically Smaller Footprint



Technology is enabling America’s oil and natural gas companies to access more resources from more remote places – some previously unreachable – with significantly less impact on the environment.

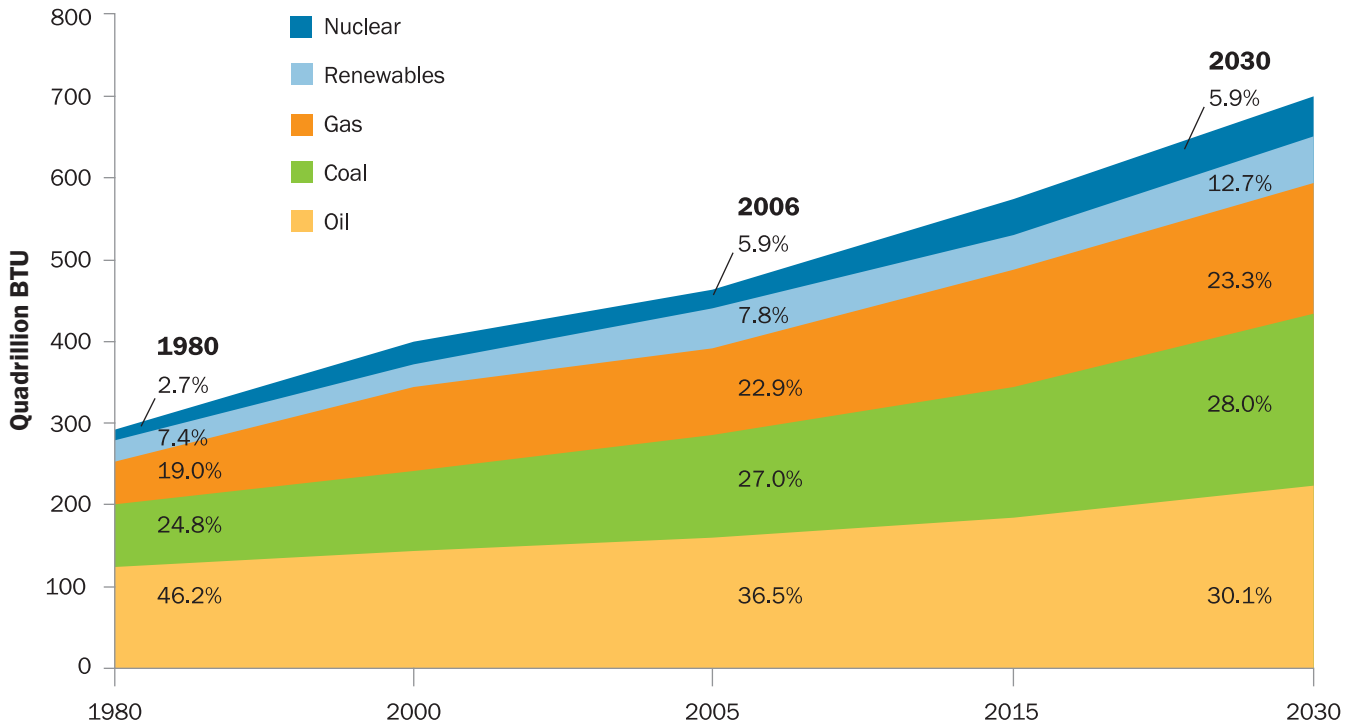
The oil and natural gas industry takes its environmental responsibilities very seriously and works during every phase of development – with well planning and engineering, drilling practices and standards, the design of offshore rigs and other facilities, and the training of personnel – to prevent spills. These efforts are working. Through improved technology and training, the industry has operated in the Gulf of Mexico without a significant oil spill, even in the face of powerful hurricanes. Leases on the Outer Continental Shelf produce about

1.4 million barrels of oil per day. And the Minerals Management Service estimates that since 1980 less than 0.001 percent of the oil produced there has spilled. That is significantly less than the volume of natural seeps from the Gulf of Mexico.

Stringent regulatory oversight also helps maintain environmental performance. Offshore operators operate under 17 major permits and must follow 90 sets of federal regulations.



**Future Global Energy Demand** (The world will require 44 percent more energy in 2030 than in 2006.)



Source: EIA, International Energy Outlook 2009

Most energy analysts agree that sustaining even modest economic growth worldwide for the next several decades will require massive new investments in oil and natural gas.

Recent forecasts by the U.S. Energy Information Administration (EIA) estimate that sustaining a 3 percent rate of annual growth in the global economy from 2006 to 2030 (measured in market exchange rates) will require an expansion of about 16 million barrels per day in global oil supplies. That is an increase equivalent to doubling the current consumption of China, India and Southeast Asia.

The growth in demand for natural gas worldwide is expected to be even larger, increasing by 46 percent from 2006 by 2030. Despite significant growth of renewables and improvements in energy efficiency, more than half of the world's energy demand will be met in 2030 by oil and natural gas, as is the case today.

## Accumulating Risks to the Development of Oil and Natural Gas

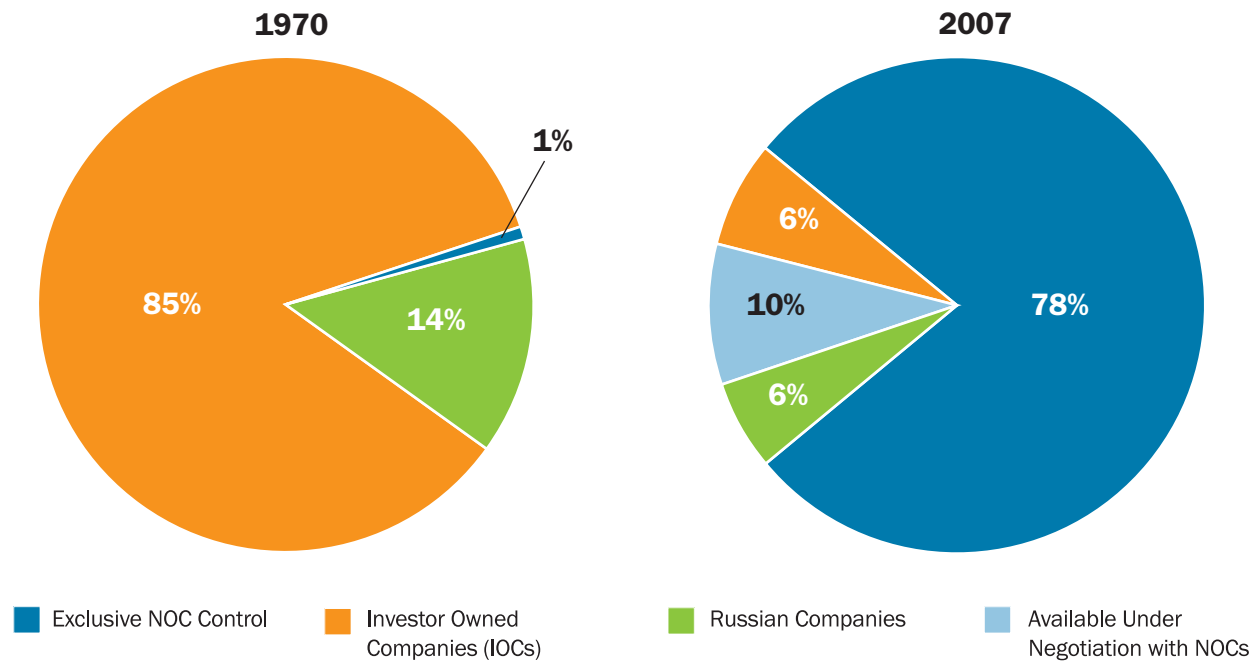


### There are accumulating risks to the development of oil and natural gas.

The National Petroleum Council (2008) examined a broad range of global energy supply, demand and technology projections through 2030 and concluded that “the world is not running out of energy resources, but there are accumulating risks to continuing expansion of oil and natural gas production from the conventional sources relied upon historically.”

These risks include the resurgence of resource nationalism in Latin America, civil unrest in Nigeria, piracy off the African coast, transit vulnerability in the Caspian, energy subsidies in Asia, extreme weather around the world, and restricted access to resources in the U.S. These risks create significant challenges to meeting projected energy demand.

**The Myth of “Big Oil” (As a Percent of Proven Reserves)  
National Oil Companies (NOCs) Increasingly Control the World’s Oil Reserves**



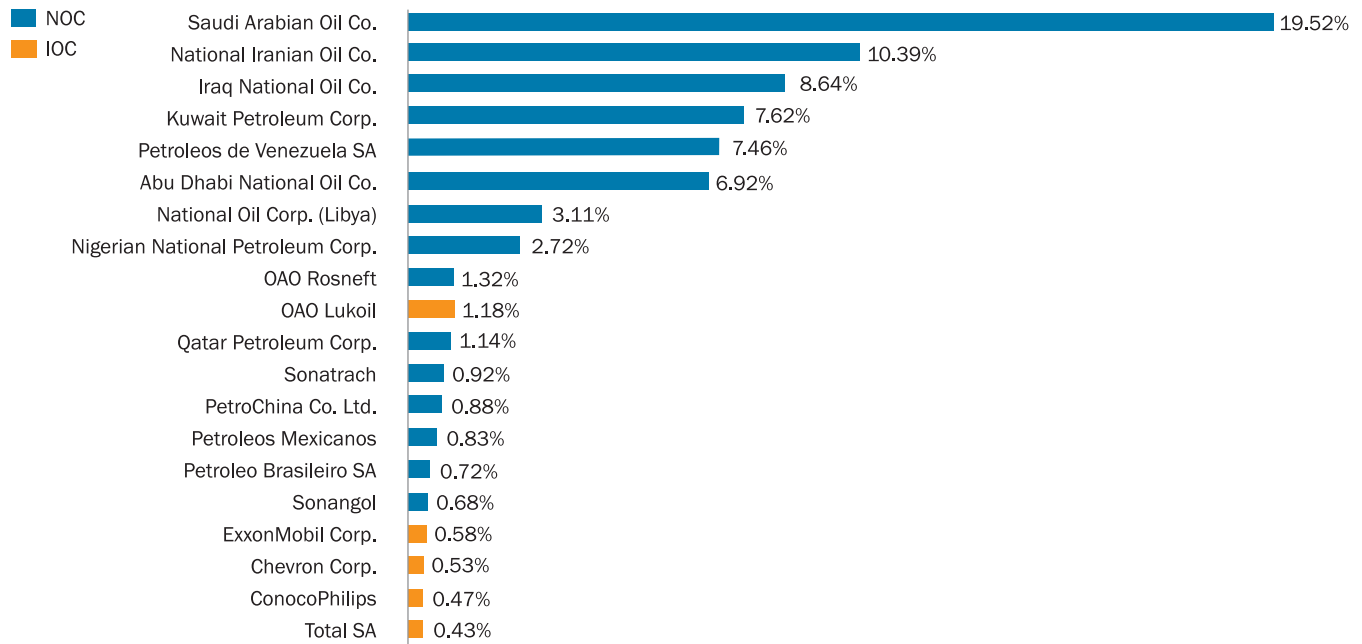
Source: PFC Energy

**In terms of market power, investor-owned international oil companies (IOCs) own just 6 percent of the world’s oil reserves.**

It is important to understand how the energy world has changed. Forty years ago, world oil reserves were largely the domain of the investor-owned, international oil companies (IOC), based principally in the United States. Most people today assume international oil companies are little changed from decades ago, still sitting astride the bulk of these world oil reserves. That is no longer the case. Today, world oil reserves are 80 percent owned by the national oil companies of foreign governments, many formed during the past 30 years. Only 6 percent of worldwide oil reserves are now held by investor-owned oil companies.

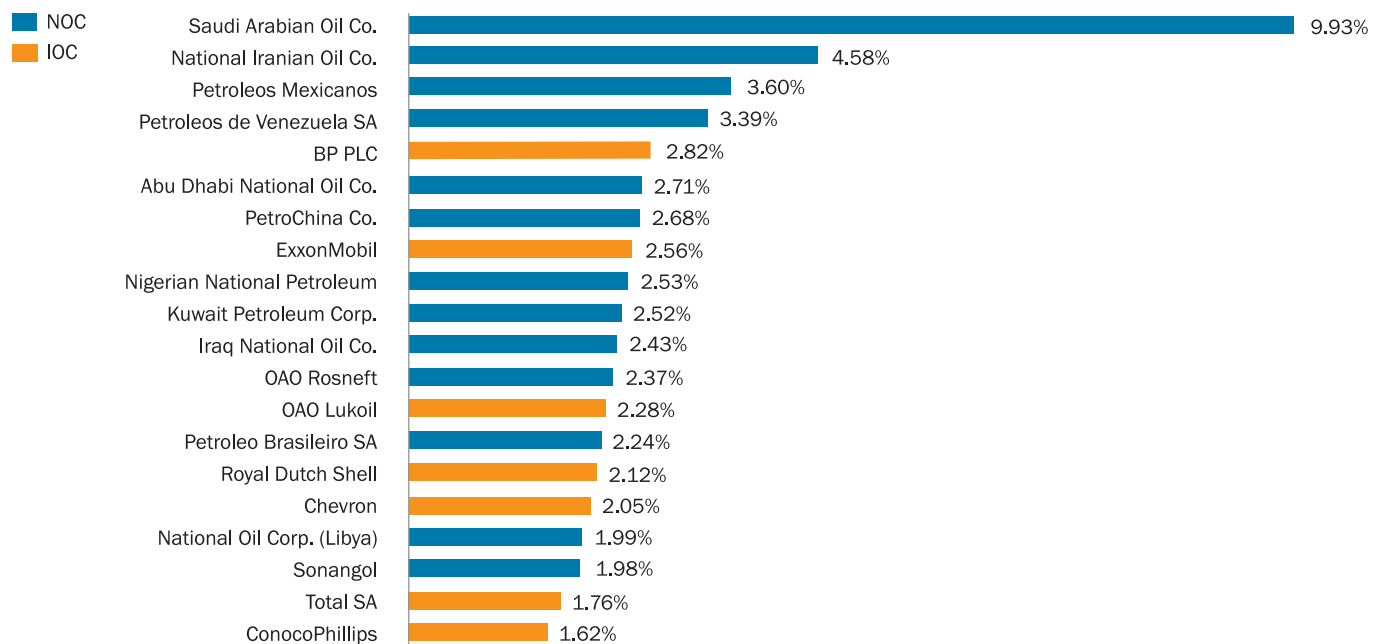
Faced with such competition, the investor-owned oil companies have scaled up within this new world – principally through mergers and acquisitions – by creating ever larger efficiencies, greater technological and project management prowess, and substantially broader competitive access to capital markets.

## 2007 Largest Oil and Gas Companies (percent of worldwide reserves)



Source: World Reserves of 1.3 trillion barrels as of January 1, 2008 according to *Oil & Gas Journal*, December 22, 2008. Leading companies: *Oil & Gas Journal*, September 15, 2008

## 2007 Largest Oil and Gas Companies (percent of worldwide production)

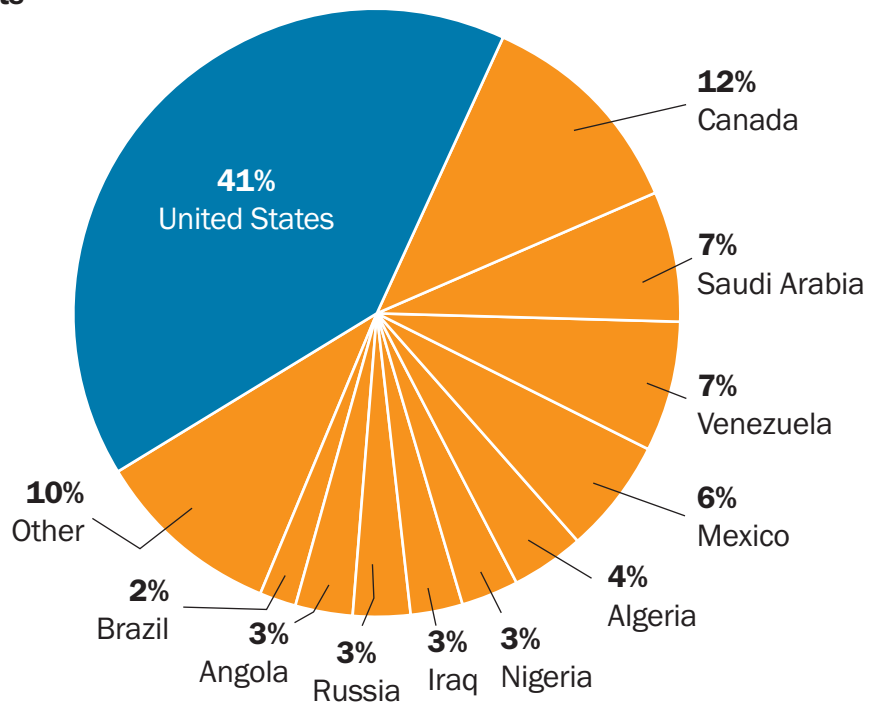


Source: Estimated world total of 85.6 million barrels per day in 2007 and leading oil companies according to *Oil & Gas Journal*, September 15, 2008

Even the largest U.S. based international investor owned company accounts for just a small fraction of the world's oil reserves and production.

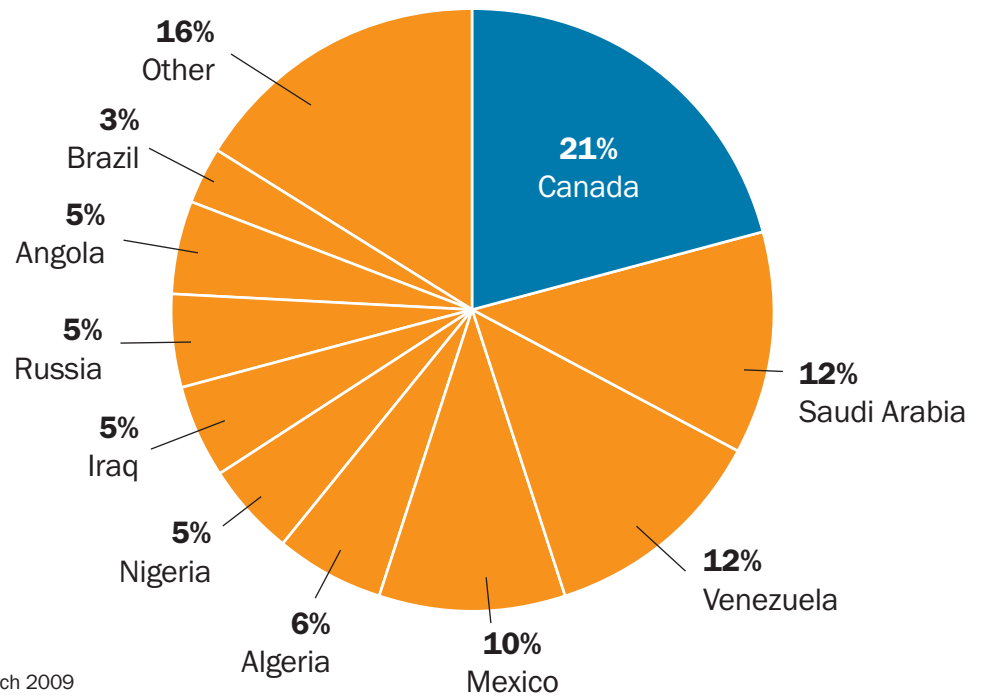
This limits U.S. oil and natural gas companies' influence on world crude oil prices.

## U.S. Supplies of Crude and Products



Source: EIA, *Petroleum Supply Monthly*, March 2009

## U.S. Imports of Crude and Products



Source: EIA, *Petroleum Supply Monthly*, March 2009

### Diversifying Sources of Supply

We produce just 41 percent of the oil we consume. The rest is imported, with most of it coming from our neighbors in North America. In fact, Canada is the largest supplier to the U.S., accounting

for 12.1 percent of domestic supply compared to 7.1 percent for Saudi Arabia. One way to enhance our nation's energy security is to continue to diversify our sources of supply.

## Policy Choices Needed to Ensure Future Energy Security

- ❖ Increase, not decrease energy production by promoting all sources.
- ❖ Encourage energy efficiency as a core American principle.
- ❖ Encourage investment in advanced technologies and long-term energy initiatives.
- ❖ Allow market forces to allocate products and adjust to changing conditions.
- ❖ Refrain from new taxes that make it more expensive to develop our domestic supplies.
- ❖ Support the need to participate actively in global energy markets rather than isolate the U.S.

There are no silver bullets or magic formulas on energy. We need a comprehensive approach to energy shaped by reason, common sense and experience – an approach based on competition in the marketplace and state-of-the-art technology.

What is needed today are policy choices to increase, not decrease, energy production. Barriers to oil and natural gas production only contribute to volatile energy prices, slower economic growth, and lost American jobs.

Our nation's past history is replete with short-term energy "fixes" and searches for "silver bullets" to solve our nation's energy problems. Price controls, allocation schemes, limitations on natural gas, picking winners and losers among fuels, and increasing taxes have all been tried by government – and none have worked to benefit the consumer.

We should learn from the past – and take some positive steps to ensure we meet America's energy needs in the decades ahead. As a society, we cannot remain passive to energy, nor to the environment, nor to economic growth. Each will fall short of its fullest promise, absent constructive industry/government partnerships committed to providing our nation with a workable energy security policy.

What we need is a public policy framework to ensure future energy security for our nation. We need elected and appointed officials who understand the energy challenges we face. We need a greater commitment to increased energy efficiency. We need to diversify our energy resources, drawing upon the full range of energy sources, including alternatives. We also need to increase and diversify our oil and natural gas supplies, both within this country and abroad. And, we need to enhance energy technologies, remaining on the cutting edge of advanced technology. We need to get it right on energy. Too much is at stake for our nation to do otherwise.

For more information, please visit

[www.energytomorrow.org](http://www.energytomorrow.org)

[www.api.org](http://www.api.org)



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