

Issue Brief: Energy Security



2011 Edition

A Publication of Ethanol Across America

Our addiction to oil is crippling domestic energy security. Oil imports make our economic security vulnerable and make true energy independence impossible. The only viable path to a sustainable, secure energy future is through renewable, domestic energy sources--including ethanol.

“Energy security” is best understood when taken literally. We need to be secure in our energy in terms of the source, i.e. where it comes from, control of the flow and distribution of that energy, and having alternatives in place to allow us to withstand highs and lows associated with any commodity. Unfortunately, the United States is the antithesis of a secure energy nation. We depend on foreign oil to the extent that our economy is precariously over the barrel—and any number of global events, including peaceful competition for supply, could cripple us beyond any thing we have seen in our history.

U.S. gasoline consumption has grown to 140 billion gallons per year. Add to that a growing diesel fuel market of 45 billion gallons. Those gallons come from barrels, and most of those barrels come from countries other than ours. In fact, 57% of the total consumption of petroleum in the United States is imported. In 1980 imports represented just 37%, but the Department of Energy estimates that by 2025 dependence will increase to nearly 70%. Obviously, we are headed in the wrong direction. And, it is going to get worse, perhaps much worse.

Part of our complacency during the 1980s and 1990s (when we truly let our habit get out of hand) was due to the simple fact that imported oil, and our gasoline, were dirt cheap—too cheap to warrant serious efforts to develop alternatives.

Some petroleum advocates argue that our supply of oil is not threatened because our suppliers need our money. Of the many flaws in that logic, there are two factors that go to the heart of the energy security debate. The first is to recognize exactly who we get that oil from, and where. The second is that our days of being the big volume buyer and ensuring a flow may be over. China, India, and a number of developing countries rival our thirst for oil. We have entered a new era of bidding for this imported, polluting, nonrenewable resource.

(Continued on page 2)

Key Points

- In 2010, the U.S. spent \$28 billion per month on foreign oil—a massive transfer of U.S. wealth during a period of economic hardship.
- Reliance on foreign oil has cost us more than \$7 trillion over the last 30 years.
- Recessions follow oil price shocks. It's happened before (including 2007). It will happen again.
- America spends \$137.8 billion annually defending Persian Gulf oil—adding more than \$1/gallon to gas prices.
- Oil imports undermine energy security by delaying the development of domestic alternatives.
- Ethanol is part of the solution—and is currently the third largest source of liquid transportation fuel used in the U.S.

Dear Friends:

Joining with my fellow Board Members on the Ethanol Across America campaign, I am pleased to bring to your attention the important issue of Energy Security.

For many years as a member and former Chairman of both the U.S. Senate Agriculture Committee and the Senate Foreign Relations Committee, I have argued that America's insatiable appetite for oil places our country in a precarious situation of reliability on regions of the world that have become increasingly hostile to us.

Increasing the development and production of renewable fuels such as ethanol will help ensure national and economic security and gas price stability. With high oil prices, ethanol production becomes ever more important, and farmers growing corn will add to our nation's security while helping our communities prosper.

I hope that this Issue Brief will increase your understanding about the benefits of biofuels.

Sincerely,

Richard Lugar
United States Senator

Where in the World is the Oil?

Well, it certainly isn't in the U.S. We consume nearly 25% of the world's oil and have less than two percent of the known reserves. That's like eating more than three times your own weight—a bit indulgent.

With regard to oil supply sources, diversification is not necessarily a sound strategy. The petroleum industry claims that our dependence on imports is not a real threat because we have diverse sources of supply. But many of those sources are hostile to US interests; and their collective control of oil supplies continues to expose the U.S. to supply and price risks.

True, we currently import more petroleum from Canada and Mexico than from Saudi Arabia and Iraq. U.S. imports of OPEC oil (Organization of Petroleum Exporting Countries) continues to be a whopping 41%, and 14.5% of that is from Persian Gulf countries. The flow from Canada and Mexico can reasonably be assured, so we have no problem,

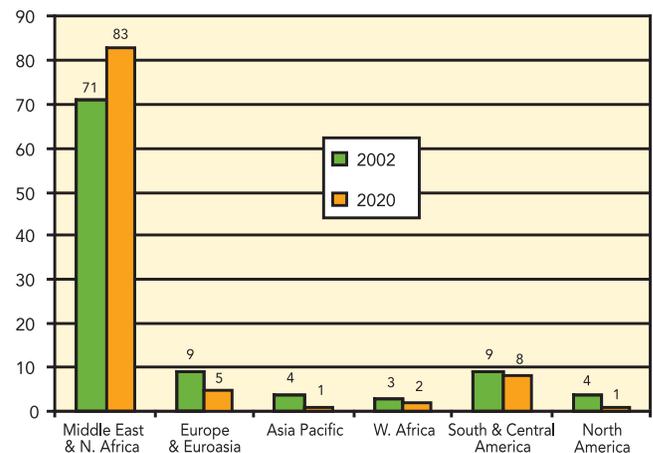
right? Even though we may be compliant enough to give these countries our money, that well may begin to run dry.

While the current supply is indeed spread out, the key to not repeating history is to look to the future and where our reserves lie. That begins to tell a different story.

Of the known oil reserves in the world, a mere 16% percent are in North America. Not the U.S., not Canada, not Mexico—but all three countries combined. We are drawing down on known supplies at such a rate that most experts believe, at current rates of production, many of the countries outside the Middle East are at or past their peak—and supplies will steadily decline over the next 15 years. With paltry reserve numbers scattered across the globe, where is all the oil the petroleum industry keeps telling us we have?

Saudi Arabia (20%), Iraq (11%), Iran (10%), Kuwait (9%), United Arab Emirates (7%), Libya (3%): Total from that "U.S. friendly" region is 60% of known global oil reserves. As current sources of supply decline and the aforementioned OPEC countries meet the increased demand, the Middle East producers will again become the hub of the wheel.

Share of Global Reserves Based on Current Production Rates



Source: Institute for the Analysis of Global Security

The need for military presence in that region to ensure the supply of oil will increase with the level of dependence. As the Persian Gulf reasserts itself as the oil superpower, the U.S. may become an enabler by not only creating demand for the product, but also providing the support to ensure supply.

New Kids on the Block

A long term view of sources and demand could make our current situation something we long for ten years from now.

According to the International Energy Agency (IEA), world oil consumption will increase 60% by the year 2020. Increased oil demand from China, for example, will change the world oil market in a big way.

With the largest auto sales market in the world and annual vehicle sales nearing 14 million, China is going to be a major customer for OPEC. IEA estimates China will increase its petroleum consumption eightfold by 2030 and will have more cars than the United States.

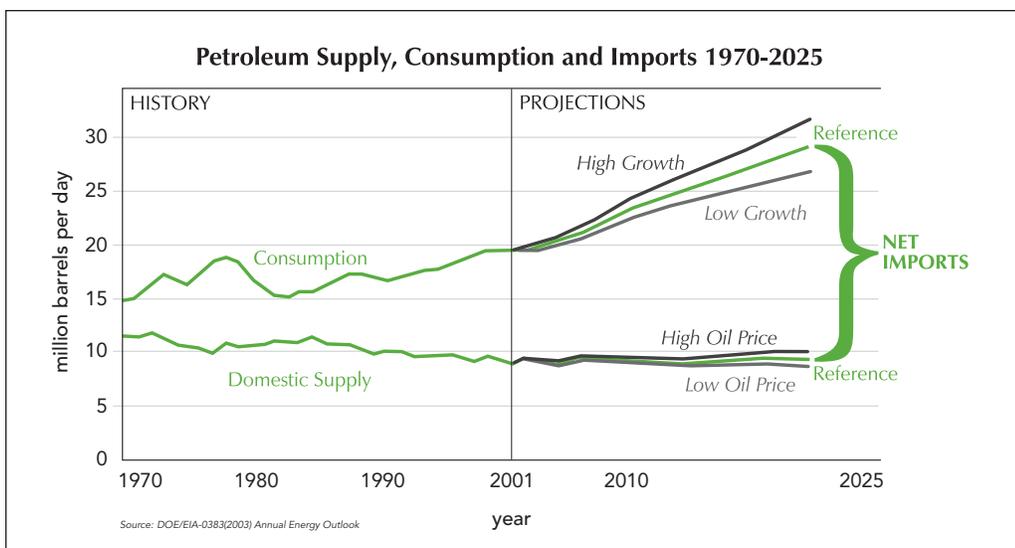
India, another giant lumbering into industrialized status, is right behind China's annual oil consumption

increase of 7.5% per year with a projected 5.5%. Do we really want to get into a bidding war with Southeast Asia and its 35% of the world's population? These economies will be fueled by petroleum—they have little choice. They are constrained by technology, by capital, by infrastructure, and by vision. But we in the U.S. are not.

Who Picks Up the Check?

We do. Decades after the Iranian oil embargo, we continue to import more oil. We just don't seem to get it. There are several crippling aspects of this addiction to foreign oil. The sheer dependence on energy forces beyond our control reflects poor planning. It is hard to imagine an intelligent populace putting itself in such a position. Our vulnerability becomes clear when the slightest hiccup in the flow of oil immediately creates a shortage – real or perceived—and in turn immediately allows the petroleum industry to reach deeper into the pockets of consumers. A pipeline malfunction in Russia, a pumping station mishap in Iran, an oil spill from a tanker—all of these result in shortages that affect the entire nation.

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Increased petroleum consumption, coupled with decreased U.S. production, means net imports will continue to rise. The more economic growth the U.S. enjoys, the more the import figure increases.

All driving Americans have become conditioned—because that is what we are told—to believe increased prices at the pump are due to factors out of our control. We mutter unprintables about Big Oil, mideastern sheiks, and others we choose to blame—and then go ahead and pay the increase. But what does a two to three cent hike at the pump really mean in the context of a nation? What about hikes of 20, 30 or even 50 cents, which is more like our experience in recent years?

At \$90 per barrel of oil, and a daily importation of at least 10 million barrels, ..., hmm, let's see. Nine times ten, carry the nine...The picture should be clear. Oil price increases are an economic shock.

Even if oil drops below \$50 per barrel, which is unlikely, it still represents a massive hemorrhage of U.S. dollars. There are direct costs, like dollars out of the pockets of our citizens. But there are also the hidden costs, ranging from cleanup of oil

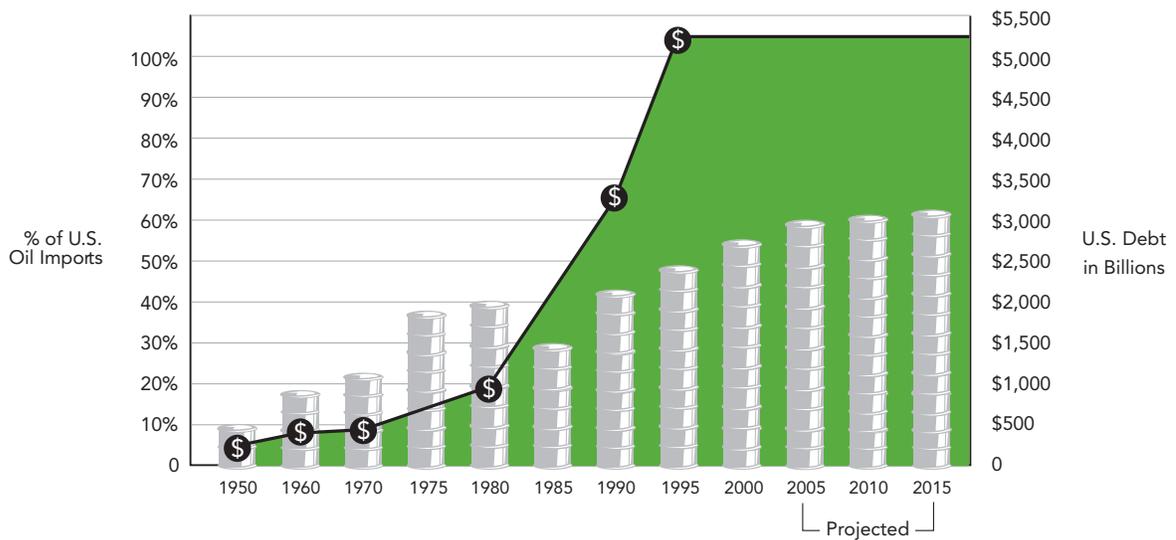
spills to the increased military presence in the Middle East. On the direct side, the increase of 50 cents per gallon on a multi-car family represents a net cost increase of anywhere from \$500 to \$1,000. At a 30% tax rate, they had to earn an extra \$1,300 to pay that increase. That is money that might be used for any number of purposes, not the least of which is to regenerate their own community if the fuel could be produced locally. That would mean the money is spent at the local hardware store, the dry cleaner, or the diner. But now that money is in the Persian Gulf.

"We are committing tens of billions of dollars and the lives of our fighting men and women each year to protect our country's access to oil."

-Retired General Wesley Clark

From the standpoint of the big picture, the key link to this outflow of cash is the trade deficit. A trade deficit indicates that the United States imports more goods and services than it exports. Petroleum imports account for approximately 35% of America's

Trends in Crude Oil Imports and the Budget Must Be Reversed



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

current trade deficit. Some projections suggest that petroleum imports will rise to 70% of the U.S. trade deficit in the next 10 years.

Based on annual increases, the projections may not be far off. In 1987, the United States trade deficit in crude oil was \$27 billion. In 1990, that figure nearly doubled to \$43.7 billion and by 1999 increased to \$59.2 billion. In 2010 the U.S. spent \$28 billion per month on foreign oil, representing a massive transfer of U.S. wealth to foreign countries. One reason for the increases in the trade deficit is the continued growth of the transportation sector, where nearly 90% of our transportation fuel is derived from petroleum. The U.S. Department of Commerce estimates that for every billion dollars in trade deficit, the United States loses more than 19,000 jobs. In the last two years, the total of U.S. trade deficits has exceeded \$1 trillion. This persistent pattern has contributed significantly to a decline in both real wages and job security. Most victims of the deficit are middle-income working people. It is estimated that the manufactured goods trade deficit represents a loss of some three million American jobs, according to the AFL-CIO Executive Council. According to the U.S. Census Bureau, the trade deficit for the United States in 2009 was over \$500 billion dollars.

Even if supply were not an issue—and it most certainly is—those who minimize the role of alternatives to oil such as ethanol presume we actually prefer to burn nonrenewable fossil fuels, from countries other than ours, and that we like sending \$100 billion out of the United States so others can have a better quality of life.

Oil dependence also creates a higher tax burden on U.S. citizens because of increased defense expenditures.

Recessions Follow Oil Price Shocks

Excerpted from the Economic Letter from the Federal Reserve Bank of Dallas, December 2010

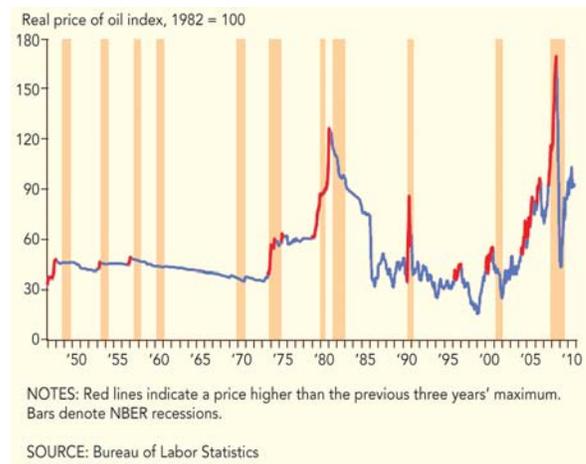
The yield curve and unemployment rate signal disarray affecting demand and subsequently output. On the supply side, oil shocks have figured in most U.S. recessions since price volatility increased in the 1970s. In fact, every recession in the postwar era, except in 1960 and 1970, followed an oil price shock the previous year. For this analysis, an oil price shock is defined as the real price of oil exceeding the high over the previous three years. This is more of a required condition, but not solely sufficient, for a recession. Volatility in the 1990s and the gradual run-up in prices in the 2000s were considered oil price shocks under this criterion but did not immediately lead to recession.

One might deduce that the oil price spike in 2007 had a large role in the latest recession. Economist James Hamilton suggests that if oil prices hadn't increased from mid-2007 to mid-2008, the period would have endured slow growth rather than contraction.

All of the slowdowns that led to a recession had two or three signals of recession, mostly accompanied by yearly GDP growth of 2 percent or less. The current slowdown has zero signals. This indicates that a recession in the near future is unlikely. So why does concern of a double dip persist?

While the current real price of oil does not fit the criterion of a shock, it sits at levels only seen in the early 1980s and 2006–08. **An oil supply shock would be especially damaging to the already weak recovery.**

Oil Price Shocks Precede Recessions



Ethanol and Biofuels as a Replacement for Oil

As noted, the U.S. has the technology, capital, infrastructure, and government support in place to develop non-petroleum sources of energy. It should be understood that no rational energy strategy should start from the premise that we are going to *replace* oil. That simply is not going to happen. The sheer volume of our reliance on oil to fuel our transportation system makes that impossible. Plus, the petroleum industry has provided the United States with a comprehensive, efficient, and reliable distribution system that gives us the very mobility we seek. Therefore, any alternatives should be viewed in terms of their ability to augment the existing system. In the case of ethanol, there is a reason it is the “last man standing” in the alternative fuels race of the 1990s. Ethanol extends our petroleum supplies within the existing auto and refueling infrastructure.

“Increasing the demand for ethanol is critical to energy independence.”

- Joseph R. Skurla, President and CEO,
Dupont Danisco Cellulosic Ethanol

When we talk about energy security, national security and economic security, ethanol is part of all of these, but not all of any one of them. It’s a piece of the puzzle, but a key piece.

Provisions in the Energy Security and Independence Act of 2007 will increase domestic ethanol use, displacing 1.8 million barrels of oil every day by 2022. At current oil prices, that’s over \$165 million retained in the U.S. economy every day.

Keeping these dollars — and jobs — at home creates a significant positive impact on our economy, reaching beyond the Midwest. For more, see The Economic Impacts of Ethanol Production at www.cleanfuelsdc.org and www.ne-ethanol.org.

The costs of maintaining a presence in the Persian Gulf are all too real.

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.

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.”

The energy security cost to the U.S. of maintaining the uninterrupted flow of oil from this area is approximately \$50 billion per year, and depending on various assumptions in several studies, can make the true cost of oil, counting military and energy security expenses, as high as \$100-\$150 per barrel.

A study by the National Defense Council Foundation (NDCF) in 2007 provides the most in-depth examination of this subject since the 1987 study by the General Accounting office, which was prior to the first Gulf War. The NDCF study found that America spends \$137.8 billion defending Persian Gulf oil, adding more than one dollar to the cost of a gallon of gasoline.

The study further concluded that the overall economic toll of this dependence on foreign oil is staggering. The diversion of capital and investment resulting from spending over \$117 billion annually on foreign oil, i.e. money that would otherwise be spent in the U.S., costs the U.S. economy more than 2.2 million jobs per year, and costs federal, state and local government treasuries \$42.9 billion in lost revenues.

A National Defense Council Foundation study found that when taken together, the economic losses, the defense costs, and oil supply distribution costs bring the total cost of imported oil to approximately \$304.9 billion per year, or close to \$8.35 per gallon over the current purchase prices of gasoline.

“Building a new energy future is the right thing to do to strengthen our national security, to promote economic prosperity, and to improve our environment. It is also the right thing to do for our men and women in uniform.”

- Daniel Poneman,
U.S. Deputy Secretary of Energy

Oil Imports Undermine Energy Security

Drilling for more oil, even domestically, does not ensure our energy security. It prolongs the inevitable: a total collapse in energy security in the next oil price shock, or eventually, when the oil wells run dry.

In April of 2010, the British Petroleum's Deepwater Horizon offshore oil well exploded, killing 11 people and spilling over 200 million gallons of oil into the Gulf of Mexico. It remains the single greatest environmental disaster in human history.

In other words, not a very secure way to get energy.

And a report by the Presidential commission tasked with investigating this catastrophe has found that not only was it completely preventable, but that it could happen again.

According to the Associated Press, the costs of the oil spill have already topped \$40 billion. To put that in context, that's nearly 10 times the cost of federal ethanol subsidies for 2011.

What if we devoted more of our federal resources to clean, renewable energy? What if we invested in an alternative fuel that yields cleaner air and lower GHG emissions, instead of environmental calamity? We can — if we choose to.

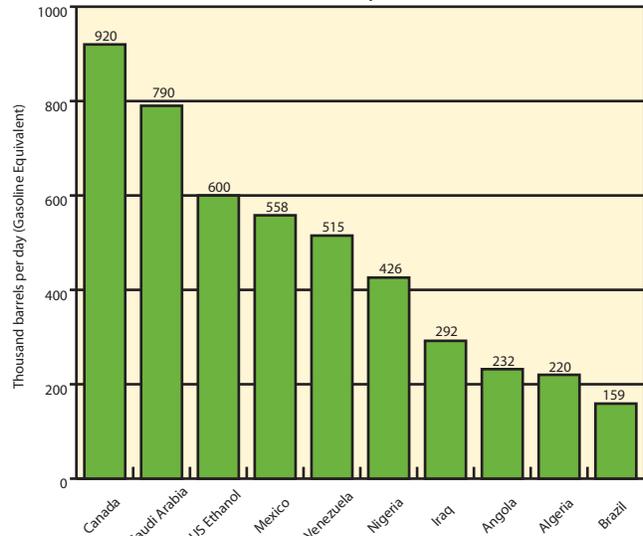
Oil subsidies far outpace biofuels incentives. Unfortunately, we are on an unsustainable energy path. Current policy subsidizes dead-end fuel sources like oil by over \$550 billion every year. Does an industry that makes more profit in mere hours than most Americans make in their entire lives need further incentives? Most certainly not.

True energy independence and security will come only through investment in domestic, renewable alternatives like ethanol.

Ethanol is a major fuel source. Make a list of the top oil exporters to the U.S., and it includes Saudi Arabia, Iraq,

Angola and others. But if you considered domestic ethanol as its own energy exporter, you'd find that ethanol made in the U.S. is the number three source of liquid transportation fuel in the United States.

Top Crude Oil Import Sources vs. U.S. Ethanol Contribution
(Gasoline Equivalent)



Source: All data taken from US Energy Information Administration sources as of July 28, 2008. EIA estimates average gasoline yield from imported crude oil at approx. 47% (19.6 gallons per 42 gallon barrel). Chart assumes 50% yield, with the difference going to offset theoretical 3% ethanol BTU deficiency. Ethanol barrels are 1:1 displacement for gasoline, as ethanol is already "refined", high octane, and low sulfur gasoline blending agent.

Oil dependence is not energy security. As an energy source subject to the whims of a global marketplace and finite by nature, oil is a fundamentally insecure energy source. Drilling for more oil only delays the inevitable — one day, it will run out. When that day comes, will we have a robust, renewable energy infrastructure to replace our addiction to oil?

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Ethanol Fact Book

For more information please visit the following sites.

Ethanol Across America

<http://www.ethanolacrossamerica.net>

Clean Fuels Development Coalition

<http://www.cleanfuelsdc.org>

Nebraska Ethanol Board

<http://www.ne-ethanol.org>

American Coalition for Ethanol

<http://www.ethanol.org>

Nebraska Public Power District

<http://www.nppd.com>



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