



Policy *Perspective*

Environmental Policy Constraints on U.S. Oil Supply: Outdated & Unjustified

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TALKING POINTS

For over 30 years, environmental policy set in federal law has barred access to U.S. oil resources. This policy now is without justification.

Unless the U.S. Congress removes restrictions on domestic oil production, steep U.S. fuel prices will continue, the damaging effects now rippling throughout our economy. Unless the U.S. reduces dependence on unstable, if not inimical, foreign sources of oil, a grave peril to our national security will deepen.

Global oil supply is the root of the problem. The drum-tight global oil supply is strained by demand from developing giants like China, political turmoil in oil exporting nations, and bans on producing more oil in the U.S.

There is no near term alternative to the dominance of petroleum-based fuel. Renewable fuels like ethanol cannot now lower prices, do not provide promised environmental benefits, and must not compete with basic food needs.

INTRODUCTION

Unless the U.S. Congress removes restrictions on domestic oil production, unprecedented U.S. fuel prices will likely continue, the damaging effects now rippling throughout our economy. Unless the U.S. reduces dependence on unstable, if not inimical, foreign sources of oil, a grave peril to our national security will deepen.

The global supply of oil is tight; global demand, led by developing giants China and India, is predicted to grow. Although soaring prices over the last six months have led to reduced U.S. consumption, world supply remains tight, with a minute reserve capacity. Iran, perhaps the most volatile nation of the world, could control the Strait of Hormuz, through which 93 percent of Middle Eastern oil travels at a rate of 17 million barrels per day.¹

Earlier predictions that crude oil may reach as high as \$150-\$200 per barrel by year's end look less likely as prohibitive prices reduce consumption, supply disruptions improve, and prospects of increased production improve. A slightly reduced rate of demand from developing or developed countries, however, does not measurably ease the tension on global supply.

U.S. POLITICS: AN OIL PROBLEM ABOVE THE GROUND

Pundits debate the cause of soaring U.S. fuel prices, but the underlying cause remains

the tight global supply. Market forces control. Anticipation of even tighter future supply stimulates the politically misunderstood but much maligned oil futures speculation. Anticipation of an increased future supply already has lowered prices. Congressional removal of the legal barriers to domestic oil production would further lower prices.

The major constraints on supply are not underground, i.e., depletion of finite oil resources, but above ground, i.e., political turmoil limiting production in foreign countries and political barriers to increased U.S. production.

Since the early 1970s, policies driven by a now-entrenched environmental establishment have restricted exploration and production of domestic crude oil. The policies are today outdated, unrealistic, and overwhelmed by the needs of national security and economic stability. Three decades of opposition to oil development in the Arctic National Refuge (ANWR) approaches the preposterous.

Plans for Alaska's ANWR target drilling on only 2,000 of the 19.5 million acres. The amount of land at issue is .001 percent of the vast refuge. The amount of oil ANWR is expected to produce roughly equals U. S. imports from Venezuela.

The U.S. now meets over 60 percent of domestic demand from imports, a dependence on increasingly unreliable foreign sources. With an average demand of 20-21 million barrels per day, the U.S. produces only 7-8

million barrels a day from domestic resources. Increasing demand from developing countries and disrupted production threaten the available global pool of around 86 million barrels per day.

Neither of these foreign factors is likely to change nor can the U.S. control them. The U.S., however, is handily capable of increasing domestic production from plentiful resources if Congress opens access to areas like the outer-continental shelves of our coasts, 85 percent of which are now off limits by Congressional bans. And those off-shore resources are only a portion of the still-rich endowment of U.S. oil resources.

On July 14, President Bush lifted the executive ban on off-shore exploration and drilling. Congressional inaction remains the sole obstacle. The Democratic leadership in both chambers of the U.S. Congress have gone to extraordinary lengths to prevent even a straight vote on bills to remove barriers to more domestic production. The Chairman of the House Appropriations Committee delays votes on necessary spending bills to preclude any amendments to open up areas now off-limits. For the first time since the 1950s, Congress left the Capitol for the August recess before passing a single appropriation bill. These funding bills must be passed before the end of the fiscal year to keep the doors of government open.

U.S. Oil Imports by Country (2007)

In 2007, about 58 percent of the petroleum consumed in the U.S. was imported from foreign countries. The top 10 source countries and their percent share of U.S. total net petroleum imports were:

1.	Canada	18.9%
2.	Saudi Arabia	12.3%
3.	Venezuela	11.1%
4.	Mexico	10.4%
5.	Nigeria	9.4%
6.	Algeria	5.5%
7.	Angola	4.2%
8.	Iraq	4.0%
9.	Russia	3.4%
10.	U.S. Virgin Islands	2.9%

The congressional bans on off-shore drilling will expire September 30 unless Congress makes an affirmative vote to extend them. Repeated polls show that 75 percent of the voting public supports eliminating the bans. Growing numbers of Democratic members of Congress express support for increased production. In Florida, a state long opposed to off-shore drilling, Governor Frist now supports the endeavor.

Public tide has more than turned; partisan political opposition has softened but congressional leadership refuses debate on the issue. As *The Wall Street Journal* recently wrote, “Behind this whatever-it-takes obstructionism is an ideological commitment to high energy prices. ...this summer’s oil drilling stonewall is giving voters an insight into this ideology, which recoils at any oil, natural gas or coal production—and nuclear besides. That puts off limits 93 percent of U.S. energy off-limits for expansion.”²

Perhaps the pinnacle of the environmental establishment’s influence, this is the first “green” downturn of the American economy, affecting every segment and all consumers.

NATIONAL SECURITY PERIL: ECONOMIC DEPENDENCE ON FOREIGN GOVERNMENTS

Importing more than 60 percent of our oil supply, this country has sent almost 1.7 trillion dollars to foreign governments in the last 10 years.³ Foreign governments now own 75 percent of global oil reserves. A surprise to many, the largest U.S. oil company, Exxon Mobil, ranks 14th among the world’s biggest oil companies, with 1 percent of global oil reserves. And of the two million barrels of oil refined by Exxon in 2007, 90 percent was purchased from other, mostly foreign, companies.⁴ Approximately 60 percent of the retail price of a gallon of gas comes from the global price of oil.

The U.S. is the only country in the world that locks up vital natural resources from productive use. Now dependent on Venezuela, Nigeria, Mexico, Algeria, and the Middle East, the U.S. is not “running out of oil.” Over the last 30 years, it is environmental policy that has barred access to U.S. oil resources.

Such are the sentiments behind The American Energy Production Act of 2008 introduced last May in the U.S. Senate and many other bills in the Senate and House. Texas Senators Kay Bailey Hutchison and John Cornyn strongly support this bill. The Senate bill is comprehensive: it would remove federal bans on oil development in Alaska and off the Pacific and Atlantic coasts; allow the U.S. Department of Interior to authorize leases for shale-oil development; mandate six billion gallons of coal-derived fuels by 2022; and expedite EPA permits for new or expanded refineries. Wisely, this bill does not extend or create subsidies for energy sources that are not now economically viable in the marketplace. Note these provisions merely remove government constraints and allow the market to drive the most efficient production. These seemingly simple and common-sense changes face a heretofore insuperable obstacle: the all-powerful environmental establishment in Washington, D.C., now promoting scientifically weak and exaggerated global warming scenarios with religious fervor.

Since the early 1970s, environmental policies set in federal law have restricted development of U.S. oil. Over this thirty-five years of declining domestic production of oil, national environmental organizations evolved to now dominate policy decisions in Congress, federal agencies, and the courts. Oil exploration, drilling, pumping, pipeline infrastructure, refining, and fossil-fuel combustion have been consistently attacked by the powerful environmentalist establishment and with great legal success. After technological innovations have eliminated most environmental risks and emissions, global warming policies now would convict fossil fuels of capital crimes.

Enlarging the coffers of foreign governments inimical to U.S. interests and paying \$4 per gallon of gas might warrant reconsideration of such inflexible policy. Today's political impasse reveals how unrealistically extreme is such an environmental policy objective. The environmental establishment presents mutually exclusive policy alternatives: allow domestic production in ANWR or prevent loss of irreplaceable ecology. Yet, oil production can be conducted with scrupulous care to protect potentially impacted natural resources and wildlife and has been done

so for more than a decade. Zero risk may be unachievable but is alive and well in U.S. environmental policy. Federal energy policy has been supplanted by dogmatic environmental policy, not a path to a reliable energy supply.

CONSIDER THE U.S. ENDOWMENT OF OIL RESOURCES

Proven Reserves

The U.S. still withholds vast reserves of oil-and-gas resources. Calculating the amount of recoverable U.S. oil resources depends on the measure used. To be "proven," it must be reasonably certain that the crude oil can be produced using current technology at current prices, current

U.S. Oil Resources—2.6 Trillion Barrels of Oil

Figures in Billion Barrels of Oil – bbo

Proven Reserves – 21 bbo

Known oil resources producible with government consent using current technology, prices, and commercial terms.

Resources Now Off-Limits

Offshore- West Coast	10.71 bbo
Offshore- Eastern Gulf	3.58 bbo
Offshore- East Coast	2.31 bbo
ANWR	12.00 bbo
Federal Lands	4.20 bbo
TOTAL	32.80 bbo

Historically, federal agency figures for recoverable oil resources have been greatly underestimated. Offshore estimates may be underestimated by magnitude of four.

Source: Minerals Management Service, U.S. Department of Interior

Recoverable and Probable Resources

Light Oil in Place	293 bbo
Heavy Oil	81 bbo
Oil Sands	80 bbo
Shale Oil	2118 bbo
TOTAL	2572 bbo

Source: Annual Energy Review 2006, U.S. Department of Energy

TOTAL – 2.6 TRILLION BARRELS OF OIL

commercial terms, and with government consent. The Energy Information Agency (EIA) of the U. S. Department of Energy (DOE) estimates that the U.S. has 21 billion barrels of oil (bbo) in “proven reserves.”⁵ At current consumption rates, this volume would be depleted in fifty years. “Peak Oil” pessimists always use the lower proven reserve figures and so predict near-term depletion. Market-driven technological innovation has repeatedly proven wrong such “Peak Oil” theories.

Note that proven reserves exclude oil resources now off-limits by government prohibitions. The amount of proven reserves could increase to far more than 50 billion barrels if the federal government allowed development offshore, on the North Slope of Alaska, and on federal lands in the lower 48 states.

Recoverable Reserves

By another measure called “recoverable reserves,” the U.S. likely holds several thousand times more oil than current proven reserves. Recoverable reserves refer to known oil resources capable of recovery but with more cost and technical difficulty than proven reserves. According to EIA figures, probable resources include: light oil in place (293 bbo), heavy oil (81 bbo), oil sands (80 bbo), and the mother load in oil shale (2118 bbo).⁶ Add to these sources the 21 bbo proven reserves and the more than 30 bbo now off-limits, and the total endowment of U.S. oil resources is 2.6 trillion barrels of oil. This volume would support U.S. demand for hundreds of years.

OUTDATED ENVIRONMENTAL CONSTRAINTS

Unlike any other developed nation, federal decision has barred offshore oil and gas exploration in 50 percent of the Gulf of Mexico and imposed stricter prohibitions off the East and West coasts. The U.S. Minerals Management Service of the U.S. Department of Interior estimate that these offshore bans extend to more than 16 bbo and 60 trillion cubic feet of natural gas.⁷ Ironically, Cuba recently agreed to allow China to explore off the northern coast of Cuba, near U.S. waters off-limits for U.S. development.⁸

The government’s official numbers for offshore oil resources are seriously underestimated. EIA predicts that access to all of the Outer Continental Shelf (OCS) now off-limits would yield 200,000 barrels a day. Yet, one offshore platform in the Gulf of Mexico produces this much.⁹ Similarly pessimistic, EIA predicts that oil production would not begin until 2017 if Congress removed the barriers. Oil companies predict that already-explored areas in the shallow waters off the California coast where platforms still exist could produce within a year.

Environmental opposition to offshore development originated in 1969 with the blowout of a well operated by Union Oil near Santa Barbara, California. This was a huge oil spill, impacting 40 miles of coast line. Images of the ecological damage and wildlife coated with suffocating oil evoked broad public concern. The Santa Barbara oil spill is widely considered the catalyst for the creation of the modern environmental movement. Richard Nixon created the EPA by Executive Order in 1970. The first Earth Day was held, and major federal environmental laws were passed the same year.

Shortly after the Santa Barbara spill, a local organization against offshore drilling formed named GOO (Get Oil Out!). In a remarkable reversal of its founding impetus, GOO last April decided to publicly support an oil company’s plan to drill 4.7 miles off the Santa Barbara coast.¹⁰ The EIA reports that drilling within the 200 mile off-shore Exclusive Economic Zone (EEZ) has a safety record of 99.999 percent since 1975: a nearly microscopic .001 percent of oil produced off shore has been spilled.

New drilling technology has layers of protective safeguards. Although hurricanes Katrina and Rita destroyed or damaged hundreds of platforms in the Gulf of Mexico, minimal oil was spilled. A joint study by NASA and the Smithsonian found that natural seepage from underwater oil deposits puts more oil in the sea than accidents involving drilling or tankers. Natural leaks account for around 62 million gallons per year, while oil production accounted for around 15 million gallons.¹¹

Unquestionably, offshore oil production has become not only environmentally safe but in some areas actually beneficial by providing new habitat for aquatic life. Offshore exploration and drilling don't necessarily degrade coastal aesthetics. The U.S. jurisdiction—and the current Congressional moratoria—extends across the entire 200 miles of the EEZ. In most areas, offshore platforms would be well beyond the coastal viewshed.

And then there is ANWR, considered the largest untapped oil field in North America. Even with elaborate means to preserve wildlife habitat, former President Clinton vetoed legislation to allow development in 1995. EIA's (likely low-ball) estimate of ANWR's yield is 10-12 billion barrels.¹² The original estimate of recoverable oil from Alaska's nearby Prudhoe Bay was one billion barrels. Prudhoe already has produced 18 billion and is still producing. Environmental damage predicted for Prudhoe has not occurred. Had President Clinton not vetoed in 1995, ANWR's oil would be fueling American vehicles today.

The 92 million acres of federal lands in the lower 48 states also contain oil resources. A month after September 11, 2001, Congress requested an inter-agency review of all the energy resources on federal lands. Congress noted that "...in light of the recent attack on the United States that have underscored the potential for disruption to America's energy supply... this project should be considered a top priority for the Department [of Interior]."¹³ How soon we forget! The study found that only 25 percent of the 92 million acres of federal lands were accessible for oil and gas development.

This 25 percent translates to access to only 18 percent of the estimated 4.2 billion barrels of recoverable oil on federal property. Furthermore, accessibility by standard lease is still subject to restrictions from federal environmental laws, notably the *Endangered Species Act*. Bureau of Land Management data from 2001-04 show 4,251 protests filed against 11,886 leases, resulting in around two million acres set off-limits from oil-and-gas development.¹⁴

UNCONVENTIONAL OIL RESOURCES: OIL SHALE, OIL IN PLACE, HEAVY OIL, AND OIL SANDS

In addition to oil now off-limits, the U.S. has massive unconventional fossil fuel resources largely undeveloped. Oil shale (found chiefly in Colorado, Wyoming, and Utah) is a resource so huge it dwarfs known oil reserves. According to the EIA, the U.S. is home to 75 percent of the world's oil shale, the equivalent of two trillion barrels of oil.¹⁵ This is seven times the proven crude oil reserves of Saudi Arabia. Although oil shale is more costly to extract than conventional crude, over-\$100-per-barrel oil changes the business calculus. The federal energy bill enacted in 2005 directed DOI to facilitate shale-oil development on federal lands. In the new bill passed in 2007, Congress attached a rider that prohibited DOI from issuing the leases. Political effort to ending reliance on fossil fuels assumes many forms.

Other potential resources include light oil in place, heavy oil, and oil sands. Light oil in place is the oil remaining in the underground reservoir after initial pumping. After drilling into an oil reservoir, natural pressure yields perhaps only 25 percent of the recoverable oil. The DOE estimates that 293 billion barrels of light oil in place now remain after initial pumping of 189 billion barrels. New extraction methods called enhanced or tertiary recovery rapidly emerge to get at this oil left behind.

Enhanced oil recovery is well underway in the Permian Basin of West Texas. Occidental Petroleum recently reported it plans to invest \$1.1 billion in the Permian to extract the oil in place, thereby increasing production 25 percent over the next five years. Occidental expects to expand production by 50,000 barrels a day, ultimately yielding 500 million barrels from these West Texas fields.¹⁶

Most enhanced-oil-recovery methods involve repressurizing fields by injecting water or carbon dioxide (CO₂). The CO₂ works best but ironically has been hard to access. Occidental has partnered with a natural-gas company, SandRidge Energy, to separate CO₂ from a natural gas stream with excessive CO₂. The proximity of

Occidental's oil fields and SandRidge's natural gas makes the project work for both. Technological innovation and market signals solved a problem. The Permian Basin is one of the U.S.'s richest oil fields. All private land, it has not suffered the federal restrictions preventing production on federally-owned lands in much of the Western U.S.

There are likely 81 billion barrels of heavy oil resources in the U.S., but it needs a special refining process. Oil sands likely hold the equivalent of 80 billion barrels of oil. Canada already taps oil sands and exports it to the U.S. In fact, development of oil sands increased Canada's proven reserves to a reported 175 billion barrels from a figure recently less than U.S. proven reserves.¹⁷ Now under development, coal-to-liquids technology could tap the fuel potential of coal of which the U.S. has a huge supply.

Of course, the U.S. still has vast oil resources, but U.S. environmental policy prevents increased domestic production. Avoidance and mitigation of habitat disruption, prevention of groundwater and surface water contamination, and stringent control on air emissions: effective environmental controls have been implemented at every phase of energy development. But then around the corner is a potential death blow: the specter of regulatory controls on carbon dioxide (CO₂) to address alleged global warming and unrealistic policy to "end the era of fossil fuels" within a decade.

CLIMATE CHANGE POLICY

Carbon dioxide (CO₂) is today's elephant in the energy arena, paralyzing policy decisions to increase U.S. oil production. Whether or not human-induced CO₂ may cause global warming, consider how CO₂ is categorically unlike conventional pollutants directly impacting human health. CO₂ is an ever-present by product of nature's chemistry and fossil-fuel use. Pollutants like Nitrogen Oxides (NO_x) and Sulphur Dioxide (SO_x) are measured in parts per billion, whereas CO₂ is measured in pounds.

The federal *Clean Air Act* requires health-based numeric standards for pollutants in the ambient air that in certain

concentrations and exposures can adversely affect human health. CO₂ in the ambient atmosphere is not harmful to human health; it's a harmless gas. If human-induced CO₂ affects global climate, it is through global accumulations in the upper atmosphere, not the ambient air. Recently-failed federal legislation to mandate massive reductions in CO₂ and EPA's recent Advanced Notice of Proposed Rule Making (ANPR) on regulating greenhouse gases (GHG) reveal the almost comic complexity but dire economic consequences of regulating one of nature's and modern life's most ubiquitous chemical compounds.

Climate change policy proposals in Congress and EPA could depress fuel supply and increase fuel costs by a far, far greater magnitude than any previous environmental policy yet without a viable alternative to petroleum. Technological controls to reduce CO₂, comparable to existing controls for conventional pollutants, simply do not exist on any commercial scale and will not likely be available for decades.

Embracing painful fuel prices and preserving barriers to increased domestic production as a means of "getting off carbon-rich fuels" will have nothing but destructive consequences for our economy, environment, and national security. This perspective, expressed by the Democratic leadership in Congress, is absurd to large numbers of the voting public.

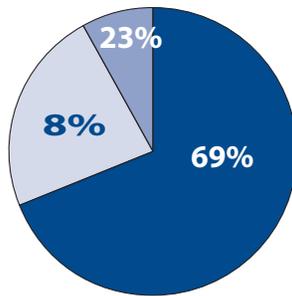
Just as 75 percent of the voting public now support more domestic oil production, so does a comparable majority place more importance on energy cost than regulating GHGs. A March 2008 nationwide survey of registered voters asked whether global warming or energy cost was more important, and 72 percent of respondents put greater importance on energy cost.¹⁸

NO REALISTIC NEAR TERM ALTERNATIVES TO THE PETROLEUM DOMINANCE IN TRANSPORTATION FUELS.

Contrary to remarkably persistent political opinion, there are no realistic near-term alternatives to the petroleum dominance in transportation fuels. Renewable fuels and batteries can, in the near future, provide only a sliver of the

Oil: Fundamental to the U.S. Energy Supply

Oil provides 40% of U.S. energy supply



- 69% of that oil provides transportation fuels.
- 23% of that oil is used in industry and manufacturing.
- 8% of that oil is used for electric power and residential heating.

Source: E.I.A., *Petroleum Products*, <http://www.eis.doe.gov/neic/infosheets/petroleumproducts.htm>.

Oil ... An Energy-Dense Resource

One barrel of crude oil containing 42 gallons yields:

- 19.4 gallons of gas,
- 7.8 gallons of diesel,
- 4 gallons of jet fuel, and
- 2.4 gallons of home heating oil.

Additional parts of that barrel are distilled into petroleum coke and heavy fuel oil.

Don't Forget the Plastic

What was once refuse after initial refining, now is the primary feedstock of thousands of products basic to modern life: plastics, asphalt, synthetic rubber and fibers, industrial and medical chemicals, fertilizers, medicines, soaps, solvents, candles and ink to name a few.

Source: E.I.A., *Petroleum Basics*, <http://eia.doe.gov/basics/petroleum.html>.

If U.S. policymakers legislate an end to the era of fossil fuels, from what source will we get plastics, about the most ubiquitous substance in modern life? From asphalt to the keyboard of your computer to synthetic heart valves, the vast array of materials made from petroleum feedstocks are fundamental to all commerce and daily life.

fueling volume needed. Hydrogen powered engines, while promising, also are a commercial technology of the future.

As a transportation fuel, natural gas also has a limited role. Natural gas is on an import trajectory similar to crude oil 20 years ago. In anticipation of increased imports, liquefied natural gas (LNG) terminals have been built at ports in several parts of the U.S. Once again, increasing demand from China and India are limiting the supply available for U.S. import. Contracts have been unilaterally modified, as Asian customers far nearer to the source of supply can easily outbid the U.S. buyer.

The price of natural gas has increased far more than crude oil, although over a longer period. In Texas, the price of natural gas in 2002 was \$2 per thousand cubic feet. The price now is \$11. Both mandated and elective shifts from coal- to gas-fired electric generation have increased U.S. demand. If grandiose plans for more wind power materialize, yet more natural gas will be needed as the source of necessary back-up generation for inherently intermittent wind generation. If the federal government enacts CO₂-reduction mandates, a massive "dash to gas," will occur, as combustion of natural gas emits 50 percent less CO₂ than far-less-expensive-but-plentiful coal.

CURRENT BIO-FUEL FORMULATIONS CANNOT DISPLACE PETROLEUM AS A MAJOR TRANSPORTATION FUEL

However huge the federal ethanol mandate, renewable fuels cannot at this time measurably extend the U.S. gasoline supply and decrease reliance on imported oil. Plans for producing fuel from non-food crops like switch grass and wood chips remain mostly on the drawing board and have the same inherent drawbacks as ethanol: secondary environmental effects, inferior energy intensity, no supporting infrastructure, and limited engine certification.

Imports of refined gasoline have increased since the inception of the hefty renewable fuel standard in 2004.¹⁹ The U.S. vehicle fleet can use only a fraction of the much larger renewable fuels mandates in the 2007 energy bill. Most of the 240 million vehicles on U.S. roads can use a maximum of 10 percent ethanol blended with gasoline. Perhaps only six

million vehicles are Flexible Fuel Vehicles (FFV) capable of burning 85 percent ethanol (E85).

The major U.S. automakers pledge that half of their 2012 vehicles will be flexible fuel capable, but this amounts to only 2 percent of total vehicles. It requires decades for a complete fleet turnover. Less than 1,000 of the around 72,000 U.S. service stations can dispense E85; most are in the Midwest. And ethanol must be transported by truck or rail car, not through existing pipelines. Crunch the numbers.

And then there is ethanol's fuel efficiency challenge. Unless artificially priced far cheaper than gas, ethanol will not reduce retail fuel costs. Ethanol has only two thirds of gasoline's energy content.²⁰ With 75,670 BTUs per gallon of ethanol, an engine will burn three gallons for the mileage of two gallons of gasoline with 115,400 BTUs per gallon. From the standpoint of actual mileage costs, a fuel blend with 85 percent ethanol would cost approximately \$5.32 per gallon at \$4 per gallon fuel prices. The amount of energy required to produce and transport ethanol is considerably greater than the energy yield from powering an engine.

The environmental and economic impacts of ethanol reveal glaring flaws in current mandates and subsidies. The price of corn has tripled since the inception of the federal Renewable Fuel Standard (RFS) in 2004. Food prices in this country increased 4 percent in 2007. In the first six months of 2008, prices increased 6.7 percent, according to the Consumers Price Index for food and beverage SAAR.²¹ Global prices for basic food commodities like corn, wheat, and rice have doubled, leading to food riots in developing countries and hunger for millions of the world's poor.

"The United States, in a misguided effort to reduce its oil insecurity by converting grain into fuel for cars, is generating global food insecurity on a scale never seen before. The world is facing the most severe food inflation in history as grain and soybean prices climb to all-time highs."²² Bio-fuel proponents claim the main cause of food inflation is higher fuel costs. Economists at the World Bank, International Monetary Fund, and the United Nations, however, estimate that 70-75 percent of the increased

prices stem from international bio-fuel policies of which the U.S. Renewable Fuel Mandate and subsidies play the greatest roles.²³

Peer-reviewed science, including the journal *Science*, concludes that the entire ethanol production process generates far more emissions of CO₂ than do gasoline and diesel.²⁴ The amount of water, fertilizer, and energy consumed in producing ethanol also has many secondary environmental effects.

Energy intensity is a critical metric for any energy source. Remember that the ingredients of petroleum—plant and animal matter—are the same as bio-fuels. Crude oil is the product of millions of years of heat and compression on organic matter beneath the surface of the earth or ocean floor. The stored solar energy in once living plants and animals has been highly concentrated in petroleum. Ethanol, in contrast, harnesses the far less concentrated energy stored in a living corn plant.

RESOURCE NATIONALISM: NATIONALLY OWNED OIL COMPANIES

Resource nationalism controls the majority of global oil supplies. In this oil "market," national and international politics regularly undermine production and contracts. U.S. oil companies must purchase crude oil from a world market, 75 percent of which is owned by foreign governments, i.e., nationally owned oil companies (NOCS). Instability and outright hostility to U.S. interests regularly threaten U.S. imports. Consider the list of countries from which 60 percent of our crude oil supply derived in 2007.²⁵

In Nigeria, militant attacks on energy production facilities regularly halt production (9.4% of U.S. imports).

Mexican President Calderon's efforts to enlist foreign technical expertise to reverse declining production in state-owned PEMEX is blocked by opposition to foreign involvement (10.4% of U.S. imports).

Venezuela sorely needs technical expertise and investment to reverse declining production (11% of U.S. imports).

Saudi Arabia recently declined our President's request to increase production. Of the world's dangerously small reserve oil capacity of two million barrels a day, perhaps 75 percent belongs to Saudi Arabia (12.3% U.S. imports).

Canada provides the largest volume of U.S. oil imports at 19 percent. Other foreign suppliers include: Angola, 4.2 percent; Algeria, 5.5 percent; Iraq, 4 percent; and of heightened geo-political interest, Russia, 3.4 percent.

"Over the last 10 years, the world oil market has clearly experienced an unprecedented number of new and sustained impediments to upstream development including, unilateral contract renegotiation, nationalization, lack of investment by national oil companies, restrictive access to resources, war and civil strife. ... At the same time, global oil demand has grown robustly."²⁶

American investment and technical expertise originally developed a sizeable portion of these foreign oil sources on which the U.S. now depends. Host countries first nationalized most or all of the U.S.-owned interests, then unilaterally altered contracts with U.S. companies, and lately terminated U.S. technical advisors. Declining foreign production in many countries more likely results from production inefficiencies than from proximate depletion. A surprise? In the last century, what nationally-owned commercial enterprise of any stripe maintained productivity and growth over time?

FUTURE GROWTH IN DEMAND

Anticipation of growth must be a part of realistic energy policy. The extremely small reserve capacity in world oil supplies worries the market and drives up current prices. Conservation and efficiency will not cover projected growth in demand. EIA forecasts that global consumption of liquid fuels will increase by 40 percent from 2004 to 2030. Developing countries, led by China, are expected to almost double consumption

over this period, requiring an additional 15 million barrels per day. North American countries are expected to have much slower growth of demand for fuels at a rate of 30 percent by 2030. North America will average about 1 percent per year, while China may average about 3.5 percent growth per year.²⁷

ENERGY REALISM

"Enormous material progress has been made in the last two hundred years. Much of this progress was the result of advances in energy technology made by people living in freedom. Moreover, these advances are accelerating even as the environment, at least in the West, improves."²⁸

Current energy policies that would "decisively end the era of fossil fuels" without realistic alternatives threaten this fundamental material progress modern societies have achieved. Market-oriented economies in the developing world, in large part spurred by access to affordable energy, show promising signs of achieving the progress enjoyed by the market economies of the West for several generations. The energy alternatives promoted by those who would vanquish fossil fuels in a long fortnight are fraught with unrealistic expectations. Wishful thinking will not power the world's largest economy nor facilitate economic growth.

This country's extraordinarily efficient energy system, sustaining more economic growth and quality of life than anywhere on earth, cannot be displaced in several decades. This era of fossil fuels has been developed and ever refined for more than a century. Who knows how many decades it would take to end this energy era and develop comparable replacements: energy sources, production methods, and distribution infrastructure comparable to the energy intensity, efficiency, availability, and affordability of petroleum, natural gas, and coal.

Energy independence is, likely, an unrealistic goal and not preferable in a global economy. Significantly increasing U.S. production and, thus, proven reserves, however, increases national security and U.S. leverage in the global market.

Technical innovation, spurred by the market, has no limits and may well develop viable energy systems without fossil fuels. A federally-mandated rupture of the current U.S. energy supply for environmental purposes, however, merits a scientific justification far more compelling than the predictive models of the United Nation's Intergovernmental Panel on Climate Change. Contrary to prevalent global-warming dogma, rigorous science is never settled but always evolving. And science based on empirical data and demonstration is far stronger than the politically-reigning IPCC science built on correlation and models.

Responsible energy policy must be realistic in the most hard-headed fashion. The U.S. must increase domestic supply of oil and natural gas. Engine technology should increase fuel efficiency. Diversity in fuel source and type must be aggressively pursued to achieve comparable or superior efficiency and affordability with fossil fuels. Renewables are welcome but must be realistically assessed for hidden costs and unintended consequences; renewable energy must compete in the competitive market place without subsidies. Market-driven dynamics, instead of subsidies and fuel preferences, should be encouraged by federal policy. Consumers must have choices.

Environmental policy cannot substitute for a genuine energy policy. Supply, reliability, efficiency, affordability,

and national security must drive energy policy. Environmental values can then enhance what are the necessary building blocks of a realistic energy supply. Energy policy must have short-, mid-, and long-term objectives that do not conflict with each other.

Prudent climate-change policy should focus on accelerating market-driven technology and refining climate change science. The efficient and innovative U.S. energy sector already reduces GHG emissions faster than the rest of the world. Unilateral mandatory programs in the U.S. are premature, impracticable, ineffective, and exorbitantly wasteful. By 2020, developing countries will produce 75 percent of all GHG emissions.

Congress must remove barriers to accessing the still bountiful fossil fuel resources this country withholds. Subsidies, tax credits, and hand-outs to consumers are counter-productive. Unleash the private sector's innovative, competitive dynamic. The government should open up what is off-limits and then step out of the way. Domestic oil production will increase faster than congressional pessimists now predict. ★

ENDNOTES

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Kathleen Hartnett White joined the Texas Public Policy Foundation in January 2008 as Director of the Center for Natural Resources.

Prior to joining the Foundation, White served a six-year term as Chairman and Commissioner of the Texas Commission on Environmental Quality (TCEQ). With regulatory jurisdiction over air quality, water quality, water rights and utilities, and storage and disposal of waste. TCEQ's staff of 3,000, annual budget of over \$600 million, and 16 regional offices make it the second largest environmental regulatory agency in the world after the U.S. Environmental Protection Agency.

Prior to Governor Rick Perry's appointment of White to the TCEQ in 2001, she served as then-Governor George Bush's appointee to the Texas Water Development Board, where she sat until appointed to TCEQ. She also served on the Texas Economic Development Commission and the Environmental Flows Study Commission.

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