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HARNESSING AMERICAN RESOURCES TO CREATE JOBS & ADDRESS RISING GASOLINE PRICES: DOMESTIC RESOURCES AND ECONOMIC IMPACTS

OVERSIGHT HEARING

BEFORE THE

COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

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OVERSIGHT HEARING ON "HARNESSING AMERICAN RESOURCES TO CREATE JOBS AND ADDRESS RISING GASOLINE PRICES: DOMESTIC RESOURCES AND ECONOMIC IMPACTS."

Thursday, March 17, 2011
U.S. House of Representatives
Committee on Natural Resources
Washington, D.C.

The Committee met, pursuant to call, at 10:02 a.m. in Room 1324, Longworth House Office Building, Hon. Doc Hastings, [Chairman of the Committee] presiding.

Present: Representatives Hastings, Bishop, Lamborn, Wittman, Broun, Fleming, Thompson, Denham, Rivera, Duncan of South Carolina, Tipton, Gosar, Southerland, Flores, Harris, Landry, Fleischmann, Johnson, Markey, Kildee, DeFazio, Holt, Bordallo, Costa, Sutton, and Hanabusa.

STATEMENT OF HON. DOC HASTINGS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WASHINGTON

The CHAIRMAN. The Committee will come to order. The Chair announces the presence of a quorum. Today, the Committee on Natural Resources is meeting to hear testimony on Harnessing American Resources to Create Jobs, and Address Rising Gasoline Prices: Domestic Resources and Economic Impacts.

Under Rule 4[f], opening statements are limited to the Chairman and the Ranking Member of the Committee, so that we can hear from our witnesses more quickly. So I ask for unanimous consent that any Member that desires to have an opening statement in the record shall be granted, and without objection, so ordered.

The Chair will recognize himself for an opening statement. Every American is feeling the pain from rising gasoline prices. There is no escaping it. It costs more to drive to work, and it costs more to run errands. It costs more to take the kids to school.

Even those who do not own a car are paying more for groceries and other goods because of the transportation costs to get products to market. The Natural Resources Committee has jurisdiction over all Federal lands, both onshore and offshore.

This is where the majority of America's energy reserves are located, and also where the Obama Administration has done the most to block energy production. The purpose of today's hearing is to examine how to harness these energy resources on Federal lands to help create jobs and address the issue of rising gasoline prices.

A recent report from the Congressional Research Service detailed just how large our energy reserves are in the United States. Our combined recoverable oil, natural gas, and coal resources total 1.3 trillion barrels of oil equivalent, the largest in the world, more than Saudi Arabia, China, and Iran.

And this figure does not even account for our vast oil shale reserves in the West, which the United States Geological Survey estimates to be greater than one-and-a-half trillion barrels of oil.

The best way for the United States to insulate itself long term from unpredictable world events and rising gasoline prices is to produce more energy here at home.

We have the resources to produce our own energy, and we have the best and latest technology to accomplish this safely, but for some baffling reason, this Administration is choosing not to do so.

Since the President's earliest days in office, his Administration has blocked, delayed, hindered, and obstructed energy production across America, from coast to coast, onshore and offshore, all the way to Alaska.

This Administration has canceled leases in Utah, delayed oil shale production in Colorado, imposed a de facto moratorium on the Gulf of Mexico, blocked offshore energy on both the Atlantic and Pacific coasts, retroactively withdrew a permit for a coal mine in West Virginia, blocked energy production on tribal lands throughout the country, and impeded both onshore and offshore production in Alaska, and the list goes on and on.

All of these actions cost American jobs and lead to higher gasoline and energy costs. Incredibly, the President and the White House have been telling a very different story, but their rhetoric does not match reality.

The White House has even been touting statistics on increased United States oil production, but they are trying to claim credit for actions that took place long before President Obama took office.

An increase in oil production today is the result of pro-energy policies of previous Administrations, not this one. Less production, higher gasoline prices, jobs being shipped overseas, and deeper dependence on foreign countries, these are the real results of this Administration's policies.

I am a firm believer in expanding all types of American energy, from solar and wind, to hydro and biomass. However, oil, natural gas, and coal are integral parts of our daily lives, and are used for far more than just fuel and transportation.

They enable millions of Americans to heat their homes in the winter. They are essential ingredients in producing plastics, tires, farm fertilizers, computers, and other high-tech devices, even

Blackberries and iPhones that Members and staff can never seem to put down, are in this category.

I announced yesterday my intention to introduce bills that will help produce more energy by putting people in the Gulf back to work, and reversing this President's offshore drilling ban.

These will be the first of several bills that will be introduced. We are working on an array of specific proposals that will be introduced as part of the American Energy Initiative.

So really it all comes down to one very simple choice. Do we want to produce our energy here in America, and create American jobs, or do we want to jeopardize our national security by deepening our reliance on foreign countries for energy? To me, the answer is not a difficult one.

So with that, since I see that the Minority, and some of their Members are not here, and in fact, I now know why. The Ranking Member is on the Floor of the House, I see, and so modern innovations allow me to see that. You don't see it, but I see it.

And so when he comes back, we will give him the opportunity to make his statement. I am advised that we are going to have votes here in as short as 10 minutes. That happens in this process, but I want to call the first panel, and I see that they are seated.

We have The Honorable Richard G. Newell, Administrator of the United States Energy Information Administration; Ms. Brenda Pierce, who is the Energy Resources Program Coordinator for the United States Geological Survey; Mr. Gene Whitney, Manager of Energy Research, Congressional Research Service; Dr. Michelle Foss, Chief Energy Economist, Center for Energy Economics, Bureau of Economic Geology, Jackson School of Geosciences, University of Texas; Mr. Guy Caruso, Senior Advisor, Energy and National Security Center for Strategic and International Studies; and Mr. Frank Rusco, Director, Natural Resources and Environment, Government Accountability office.

So we will proceed with our panel right now, and I would like to recognize Richard Newell. And I might mention that under the rules that we have here, we have a timing mechanism there.

Your full statement will appear in the record, but I would like to ask you if you would keep your oral testimony to five minutes. When the green light is on, it means that you have up to four minutes. When the yellow light goes on, there is one minute, and when the red light goes on, I would ask you to close up your remarks if you could. So, Mr. Newell, you are recognized for five minutes.

[The prepared statement of Chairman Hastings follows:]

Statement of The Honorable Doc Hastings, Chairman, Committee on Natural Resources

Every American is feeling the pain from rising gasoline prices. There's no escaping it.

It costs more to drive to work, costs more to run errands, and costs more to take the kids to school. Even those who don't own a car end up paying more for groceries and other goods because of transportation costs to get products to market.

The Natural Resources Committee has jurisdiction over all federal lands—both onshore and offshore. This is where the majority of America's energy reserves are located and also where the Obama Administration has done the most to block American energy production.

The purpose of today's hearing is to examine how to harness these energy resources on federal lands to help create jobs and address rising gasoline prices.

A recent report from the Congressional Research Service detailed just how large our energy reserves are in the United States. Our combined recoverable oil, natural gas, and coal resources total 1.3 trillion barrels of oil equivalent—the largest in the world. More than Saudi Arabia, China and Iran.

And this figure doesn't even account for our vast oil shale reserves in the West, which the U.S. Geological Survey estimates could be greater than 1.5 trillion barrels of oil.

The best way for the United States to insulate ourselves long-term from unpredictable world events and rising gasoline prices is to produce more American energy here at home.

We have the resources to produce our own energy and we have the best and latest technology to accomplish it safely. But, for some baffling reason this Administration is choosing not to do so.

Since the President's earliest days in office, his Administration has blocked, delayed, hindered and obstructed energy production across America—from coast to coast, onshore and offshore, and all the way up to Alaska.

This Administration has canceled lease sales in Utah, delayed oil shale production in Colorado, imposed a *de facto* moratorium in the Gulf of Mexico, blocked both the Atlantic and Pacific coasts from offshore energy production, retroactively withdrew a permit for a coal mine in West Virginia, blocked energy production on tribal lands throughout the country and impeded both onshore and offshore production in Alaska. The list goes on and on...

All of these actions cost American jobs and lead to higher gasoline and energy prices.

The President and the White House have been telling a very different story. But their rhetoric doesn't match reality.

The White House has even been touting statistics on increased U.S. oil production. But they are trying to claim credit for actions that took place long before President Obama took office. An increase in oil production today is the result of the pro-energy policies of previous Administrations, not this one.

The Obama Administration's energy policies are moving us backwards. This is why future projections show a decline in U.S. production and an increase in imports.

The Energy Information Administration's projections show total U.S. crude oil production declining by 110 thousand barrels per day in 2011 and 130 thousand barrels per day in 2012.

Less production, higher gasoline prices, jobs being shipped overseas and deeper dependence on foreign countries—those are the real results of the Obama Administration's energy policies.

I'm a firm believer in expanding all types of American energy—everything from solar and wind, to hydropower and biomass. However, oil, natural gas and coal are integral parts of our daily lives and are used for far more than just fuel and transportation. They enable millions of American to heat their homes in winter. They are essential ingredients in producing plastics, tires, farm fertilizers, computers and other high-tech devices. Even the Blackberries and iPhones that Members and staff can never seem to put down belong in this category.

I announced yesterday my intention to introduce bills that will help produce more American energy by putting people in the Gulf back to work and reversing the President's offshore drilling ban.

These will be the first of several bills. We are working on an array of specific proposals that will be introduced as part of the American Energy Initiative.

So, it all comes down to one very simple choice: Do we want to produce our energy here in America and create American jobs in the process, or do we want to jeopardize our national security by deepening our reliance on foreign countries for energy? The answer is not a difficult one.

STATEMENT OF HON. RICHARD G. NEWELL, ADMINISTRATOR, UNITED STATES ENERGY INFORMATION ADMINISTRATION, UNITED STATES DEPARTMENT OF ENERGY

Mr. NEWELL. Thank you, Mr. Chairman. I appreciate the opportunity to appear before you and the Committee today. The Energy Information Administration is the statistical and analytical agency within the United States Department of Energy. EIA does not promote or take positions on policy issues, and has independence with respect to the information and analysis that we provide.

Therefore, our views should not be construed as representing those of the Department of Energy, or other Federal agencies. Starting with the near term for oil and gasoline markets, EIA expects continued tightening of world oil markets over the next two years, particularly in light of recent events in North Africa and the Middle East, the world's largest oil producing region.

Our latest forecast issued earlier this month projects that regular gasoline at the retail pump will average $3.70 per gallon this summer, and $3.56 per gallon for the entire year, which is about 77 cents per gallon higher than last year's level.

There is significant regional variation in gasoline prices, and there is also significant uncertainty surrounding these forecasts as discussed in my written testimony.

In considering how energy markets might be affected by the issues being considered in this hearing, it is important to recognize important differences in the markets for oil and natural gas.

The prices of oil and gasoline produced from it generally reflect conditions on the world oil market, including the global balance between supply and demand, and concerns related to actual and potential supply disruptions.

In contract, the price of natural gas is largely determined by the balance of supply and demand in North America. For this reason, I will address natural gas and oil separately, starting with natural gas.

In 2010, overall United States natural gas production increased, while prices were generally stable. We expect these trends to continue, although natural gas prices can be volatile often due to weather related events.

The current United States natural gas market reflects the tremendous growth in shale gas production, which more than doubled between 2008 and 2010, and in 2010 represented 22 percent of total natural gas production in the United States.

United States approved reserves of natural gas grew by over 63 percent in the last decade, and have now reached the highest level since 1971. EIA sees considerable potential for continued growth in shale gas production, with shale gas production projected to supply nearly half of United States natural gas production by 2035.

EIA's 2011 annual energy outlook reference case, which assumes the continuance of current laws and regulations, projects a continued increase in natural gas production over the next 25 years, with United States net imports of natural gas expected to fall from 11 percent of consumption in 2010, to only about one percent of consumption by 2035.

Because domestic shale gas resources are located primarily under private and state lands, we would not expect access issues on Federal lands to have a major effect on our projections for United States natural gas production, reserves, or prices.

Let me now turn to issues surrounding oil production and markets. When considering the effects of changes in future oil production, it is important to recognize that resource access does not typically translate into immediate or near term production.

In addition, the impact on market prices depends not only on the magnitude and timing of actual production flows, but also on the

magnitude relative to global liquid supply, which is currently about 88 million barrels per day.

In the short term, oil markets constantly react to many competing factors in a global context, and it is extremely difficult to disentangle the near term impact of mid- to long-term developments in the context of oil markets that see typical daily price movements in the range of one to two percent, and much higher fluctuations at times.

Long term, we would not expect additional volumes of oil that could flow from resources on Federal lands due to greater access to have a large impact on oil and gasoline prices.

This is due to the globally integrated nature of the world oil market, and the more significant long-term responsiveness of oil demand and supply to price movements, compared to short-term responsiveness.

Given the increasing importance of OPEC supply and the global oil supply and demand balance, another key issue is how OPEC production would respond to any increase in non-OPEC supply, potentially offsetting any direct price effect of increased United States production.

Of course, greater domestic crude oil production, no matter what the cause, be it increased development, higher resource potential in current known fields, or wider application of advanced technology, would impact local economic activity and net oil imports.

My written testimony provides additional information on EIA's resource estimates and projections. Mr. Chairman, and Members of the Committee, this concludes my testimony. I would be happy to answer any questions.

[The prepared statement of Mr. Newell follows:]

Statement of Richard Newell, Administrator,
Energy Information Administration, U.S. Department of Energy

Mr. Chairman and Members of the Committee:

I appreciate the opportunity to appear before you today to address the issue of rising gasoline prices and the role of available domestic oil and natural gas resources.

The Energy Information Administration (EIA) is the statistical and analytical agency within the U.S. Department of Energy. EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment. EIA is the Nation's premier source of energy information and, by law, its data, analyses, and forecasts are independent of approval by any other officer or employee of the United States Government. The views expressed in our reports, therefore, should not be construed as representing those of the Department of Energy or other Federal agencies.

My testimony today focuses on several aspects of the hearing topic, including EIA's near-term outlook for energy prices; EIA's evaluation of U.S. resources, reserves, and production of oil and natural gas; and ways in which domestic supply levels of oil and natural gas may influence energy markets and prices over different time horizons.

The outlook for energy prices in 2011 and 2012

Oil, including gasoline and other products produced from it, and natural gas together provided more than 60 percent of total U.S. primary energy use in 2010. While both oil and natural gas are internationally traded commodities, the market for oil is much more globally integrated than the market for natural gas, reflecting the fact that transport costs and logistical barriers for moving oil and oil products around the world are typically far lower relative to their value than is the case for natural gas. Differences in the degree of global integration for oil and natural gas markets mean that while the price of oil and gasoline produced from it generally

reflect conditions on the world oil market—including the global balance between supply and demand and concerns related to actual and potential supply disruptions—the price of natural gas is largely determined by the balance of supply and demand and market conditions within North America. This key difference between oil and natural gas markets affects both the divergent trends in current and projected prices, discussed in this part of my testimony, and the effect of domestic resource development in the more distant future.

The discussion which follows is based on EIA's March *Short-Term Energy Outlook,* issued on March 8. It therefore does not reflect the impacts of recent and contemporaneous events in Japan, which can be expected to affect energy markets. The net effect of those events is too current to ascertain at this time.

Starting with the outlook for oil and gasoline markets, which we recognize is of great concern to both the Committee and the American people in light of recent developments, EIA expects continued tightening of world oil markets over the next two years—particularly in light of the recent events in North Africa and the Middle East, the world's largest oil producing region. The current situation in Libya increases oil market uncertainty because much of that country's 1.8 million barrels per day of liquids production, which represents about 2 percent of total world supply, has been shut in and it is unclear how long this situation will continue. Many participants in oil markets remain concerned that the unrest in the region could continue to spread. This concern, along with other factors influencing prices, is reflected in the prices of spot market crude oil and related futures and options contracts, as discussed below.

Crude oil and wholesale gasoline prices. West Texas Intermediate (WTI) and other crude oil spot prices have risen about $15 per barrel since mid-February partly in response to the disruption of crude oil exports from Libya. Continuing unrest in Libya as well as other North African and Middle Eastern countries has led to the highest crude oil prices since 2008. As a result, EIA has raised its monthly *Short-Term Energy Outlook* forecast for the average cost of crude oil to refiners to $105 per barrel in 2011, $14 higher than in the February edition of the *Outlook.* The wholesale price of gasoline is closely linked to the price of crude oil, and the average wholesale price forecast for gasoline in 2011 is $2.91 per gallon, 39 cents per gallon higher than projected in the February *Outlook.* EIA projects a further small increase in crude oil prices in 2012, with the refiner acquisition cost for crude oil averaging $106 per barrel.

Retail gasoline prices. The recent rapid increase in crude oil and wholesale gasoline prices has led to a significant rise in the retail price of gasoline at the pump. Absent a near-term decline in crude oil prices, motorists currently experiencing a jump in pump prices will likely see further increases from now through the spring since the recent increase in crude oil prices has not yet been fully passed through to retail gasoline prices. EIA expects the retail price of regular-grade motor gasoline in the United States to average $3.56 per gallon in 2011, 77 cents per gallon higher than the 2010 average, and $3.57 per gallon in 2012. EIA projects gasoline prices will average about $3.70 per gallon during the peak driving season (April through September) in 2011 with considerable regional and local variation.

While EIA strives to provide accurate forecasts, it is important to recognize that there is significant uncertainty surrounding these projections. For example, as of March 3, the current market value of futures and options contracts for gasoline was suggesting about a one-in-four chance that the national monthly average retail price for regular gasoline could exceed $4.00 per gallon during summer 2011. EIA regularly tracks the uncertainty regarding future oil and gasoline prices implied by the market price of energy-related derivatives in a *Market Price and Uncertainty Report* that is issued alongside each month's *Outlook.*

Natural gas prices. Unlike oil prices, which reflect world market conditions, natural gas prices in the United States are largely determined by the balance of supply and demand within North America. Strong growth in the U.S. supply of natural gas in recent years, led by increased production of shale gas, which grew from 2.7 billion cubic feet (bcf) per day in 2006 to an estimated 13.3 bcf per day in 2010, has contributed to a significant moderation in natural gas prices. The price of natural gas at the Henry Hub in Louisiana, a major trading point for natural gas, averaged $4.39 per million British thermal units (Btu) in 2010 and is forecast to average $4.10 per million Btu in 2011. Since an average barrel of crude oil contains 5.8 million Btu of energy, the projected $4.10 per million Btu natural gas price projected for 2010 is less than $25 per barrel when expressed in "oil equivalent" terms. The fact that natural gas is so much cheaper than oil in energy-equivalent terms has strongly encouraged users with an option to switch from oil to natural gas to do so. Given the abundant natural gas resource in the United States, one important issue

for the future is the prospects for natural gas to make inroads into more uses of energy.

EIA expects modest declines in natural gas production through 2011 because of a falling gas-directed drilling rig count in response to lower prices. While EIA expects total 2011 natural gas consumption will remain close to 2010 levels, expected increasing consumption in 2012, led by strong growth in the electric power sector, contributes to higher prices and to an economic incentive for producers to resume drilling. EIA expects the natural gas market to begin to tighten in 2012, with the Henry Hub spot price increasing to an average of $4.58 per million Btu.

Current and near-term domestic liquids production and imports. Domestic crude oil production, which increased by 150,000 barrels per day in 2010 to 5.51 million barrels per day, is forecast to decline by 110,000 barrels per day in 2011 and by a further 130,000 barrels per day in 2012. The 2011 forecast includes production declines in Alaska of 60,000 barrels per day in 2011 and an additional decline of 10,000 barrels per day in 2012 because of maturing Alaskan oil fields. EIA expects production from the Federal Gulf of Mexico (GOM) to fall by 240,000 barrels per day in 2011 and by a further 200,000 barrels per day in 2012. These production declines in Alaska and the GOM are partially offset by projected increases in lower 48 non-GOM production of 190,000 barrels per day and 70,000 barrels per day in 2011 and 2012, respectively.

EIA expects slow growth in fuel ethanol production over the next 2 years. Ethanol production increases by a projected 40,000 barrels per day, to 900,000 barrels per day in 2011, followed by an additional 10,000 barrels per day increase in 2012.

Liquid fuel net imports, including both crude oil and refined products, fell from 57 percent of total U.S. consumption in 2008 to 49 percent in 2010, primarily because of the decline in consumption during the recession and rising domestic production. EIA forecasts that liquid fuel net imports will average 9.7 million barrels per day in 2011 and 10.0 million barrels per day in 2012, comprising 50 percent and 52 percent of total consumption, respectively.

Current and near-term natural gas production and imports. Total marketed natural gas production grew strongly throughout 2010, increasing from 59.7 Bcf per day in January to an estimated 63.8 Bcf per day in December. The large price difference between petroleum liquids and natural gas on an energy-equivalent basis contributes to an expected shift towards drilling for liquids rather than for dry gas. Projected natural gas production in 2011 is 0.8 percent higher than in 2010 as an increase of 1.0 Bcf per day in the lower-48 States is partially offset by a decline of 0.5 Bcf per day in the GOM. However, expected increasing consumption in 2012, led by strong growth in the electric power sector, contributes to higher prices and to an economic incentive for producers to resume drilling. Total domestic natural gas production is projected to increase by a further 0.9 percent in 2012. EIA expects U.S. reliance on natural gas imports will decline from 7.0 Bcf per day in 2010 to 6.5 Bcf per day in 2012, or from 11 percent to 10 percent of consumption.

Longer-term perspective on U.S. resources, reserves and production of oil and natural gas

Domestic oil and natural gas production. In the *Annual Energy Outlook 2011 (AEO2011)* Reference case, which assumes the continuance of current laws and regulations in place of fall 2010, EIA projects total U.S. crude oil production will remain above the 2009 level of 5.4 million barrels per day through 2035, increasing to 6.0 million barrels per day by 2017 and remaining near that level throughout the rest of the projection period. The primary contributors to this growth are onshore shale oil development and enhanced oil recovery in the short-term, and deepwater offshore production in the mid- to long-term. Note that here "shale oil" refers to oil in liquid form that is trapped in rock of low porosity, in contrast to "oil shale" which refers to kerogen, which is a solid form of hydrocarbon found in Wyoming, Utah and Colorado.

Oil production from shale plays, particularly the Bakken shale in North Dakota, has been rising rapidly. Using horizontal drilling and hydraulic fracturing, operators increased Bakken production from about 3,000 barrels per day in 2005 to 137,000 barrels per day in 2009 and 225,000 barrels per day in 2010. Oil production from other shale plays is also growing. In Eagle Ford, for example, production increased from under 100 barrels per day in 2006 to roughly 22,000 barrels per day in 2010. EIA projects shale oil production in the Bakken, Eagle Ford, Austin Chalk, and Avalon formations in 2035 to be 0.6 million barrels per day, more than double the current level.

Additionally, there is a significant opportunity for growing crude oil production using enhanced oil recovery (EOR) techniques that inject carbon dioxide (CO_2) into reservoirs that had previously been tapped by conventional drilling. In 2010, EIAs

estimates that 281,000 barrels per day of crude oil, accounting for more than 5 percent of total U.S. crude production, was produced using CO_2-based EOR techniques. This reflects rapid growth from a 2004 production level of 206,000 barrels per day. In its *AEO2011* Reference case, which assumes no new policies to reduce CO_2 emissions, EIA projects that U.S. crude oil production using CO_2-based EOR techniques will grow to 0.4 million barrels per day by 2015 and 1.1 million barrels per day in 2025. In a scenario where a cost is associated with carbon emissions, additional carbon capture would likely occur that would, in turn, result in additional crude oil to be produced using CO_2-based EOR techniques. Several of the carbon capture and storage demonstration plants being built around the United States are being partly paid for by the production of crude oil using this technology.

The lower 48 offshore was a major source of U.S. crude oil production in 2010, with the vast majority (1.6 million barrels per day) coming from the GOM. In the *AEO2011* Reference case, drilling in the deepwater GOM Outer Continental Shelf (OCS) is expected to resume in 2011, resulting in increasing Gulf crude oil production after 2012, reaching 1.9 million barrels per day by 2018. EIA projects that total lower 48 offshore production will account for 1.8 million barrels per day of the total U.S. crude oil production of 5.8 million barrels per day in 2035.

Shale gas. The growth in shale gas production in recent years is one of the most dynamic stories in U.S. energy markets. A few years ago, many analysts foresaw a growing U.S. reliance on imported sources of natural gas, and significant investments were being made in regasification facilities for imports of liquefied natural gas (LNG). Today, the biggest questions are the size of the shale gas resource base (which by most estimates is vast), the price level required to sustain its development, and the extent to which technical or environmental factors might dampen its development. Beyond those questions, the level of future domestic natural gas production will also depend on the level of natural gas demand in key consuming sectors, which will be shaped by prices, economic growth, and policies affecting fuel choice.

Natural gas. Annual natural gas production is projected to increase from 21 trillion cubic feet of dry gas to 26 trillion cubic feet between 2009 and 2035 as a result of continued exploration and development of shale gas resources. Shale gas is the largest contributor to the growth in production, while production in tight sands, coalbed methane deposits, and offshore waters remain relatively stable from 2009 to 2035. By 2035, shale gas production accounts for 46 percent of U.S. natural gas production, up from 16 percent in 2009. While production from tight sands and offshore resources do not contribute to the total growth in production, they remain an important source, contributing 23 and 11 percent respectively in 2035.

Domestic oil and natural gas proven reserves and technically recoverable resources. Reserves are those volumes of oil and natural gas that geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions. Technically recoverable resources are an estimate of the total amount of oil and gas, both known and unknown, that is technically producible using currently available technologies and industry practices. EIA's crude oil and natural gas production projections are based on specific assumptions regarding technically recoverable resource assumptions. Estimates of technically recoverable crude oil and natural gas resources are highly uncertain and change over time as new information is gained through drilling, production, and technological and managerial development.

The domestic crude oil and natural gas industry has undergone a technological revolution that has revitalized the resource base in the onshore lower-48 states. The use of horizontal drilling in conjunction with hydraulic fracturing has greatly expanded the ability of producers to profitably produce crude oil and natural gas from low permeability geologic formations, particularly shale formations. As a result of this technological revolution, natural gas reserves grew 63 percent between 2000 and 2010, increasing from 167.4 trillion cubic feet at the start of 2000 to 272.5 trillion cubic feet at the start of 2010, the highest level since 1971. This increase in reserves occurred despite cumulative production of 246.7 trillion cubic feet during the 10-year period between those estimates. Even though total U.S. crude oil reserves have declined slightly over the same period, decreasing from 22.0 billion barrels at the start of 2000 to 20.7 billion barrels at the start of 2010, additions to oil reserves still replaced over 93 percent of cumulative production of 19.6 billion barrels over the decade. Notably, states with drilling focused on shale oil have experienced a growth in crude oil reserves. The primary example is North Dakota where proved crude oil reserves have increased from 270 million barrels in 2000 to over 1.0 billion barrels in 2010, most of it in the Bakken formation.

Total U.S. technically recoverable crude oil resources are estimated to be 219 billion barrels in the *AEO2011* Reference case, including 21 billion barrels of proved

reserves. Resources in areas where drilling is officially prohibited (for example, national parks) are not included. It is estimated that there are nearly 24 billion barrels of technically recoverable crude oil in the Bakken and three other shale formation plays.

Focusing on natural gas, the growing importance of shale gas resources is reflected in the *AEO2011* energy projections, with technically recoverable shale gas resources estimated at 862 trillion cubic feet. Given a total natural gas resource base of 2,543 trillion cubic feet in the *AEO2011* Reference case, shale gas resources constitute 34 percent of the domestic natural gas resource base represented in the *AEO2011* projections and 50 percent of lower 48 onshore resources. EIA estimates the remaining onshore non-associated natural gas technically recoverable resources in tight gas formations at 455 trillion cubic feet, coalbed methane at 138 trillion cubic feet, and other more conventional resources at 352 trillion cubic feet. The lower 48 offshore and Alaska are each estimated to contain nearly 300 trillion cubic feet of technically recoverable natural gas resources.

Impacts of greater access

When considering the effect of increased access to Federal lands, it is important to recognize that access does not typically translate into immediate or near-term production. The impact of greater access on market prices depends in part on actual production flows, on differences in the extent of global integration in oil and natural gas markets that have been discussed above, and on how a decision to increase access might affect market expectations—a factor that is very difficult to assess in today's supply environment. In the short-term, oil markets react to many competing factors in a global context, and it is extremely difficult to disentangle the near-term impact of mid-to-long-term developments in the context of oil markets that see typical daily price movements in the range of 1–2 percent, and much higher fluctuations at times. Long term, we do not project additional volumes of oil that could flow from greater access to oil resources on Federal lands to have a large impact on prices given the globally integrated nature of the world oil market and the more significant long-term compared to short-term responsiveness of oil demand and supply to price movements. Given the increasing importance of OPEC supply in the global oil supply-demand balance, another key issue is how OPEC production would respond to any increase in non-OPEC supply, potentially offsetting any direct price effect.

In the longer-term, greater domestic crude oil production no matter the cause—increased development on Federal lands, higher resource potential in current known fields, or wider application of advanced technology—would impact local economic activity, net oil imports, and the associated U.S. international trade balance resulting from oil imports.

Access to offshore federal resources. As of January 2009, the mean estimate of technically recoverable crude oil resources located in Federal offshore areas of the lower-48 states is 64.1 billion barrels. Of this amount, 3.7 billion barrels are estimated to exist in the Eastern/Central Gulf of Mexico region that is still under a Federal leasing moratorium.[1] In addition, the mean estimate of technically recoverable resources of crude oil located in the Alaska OCS area is 26.6 billion barrels. Note that these and other technically recoverable resource estimates provided here tend to be higher than resource estimates from the USGS because the USGS estimates only include undiscovered resources, where as the EIA estimates used for modeling purposes also include proved reserves, inferred reserves, and undiscovered resources in areas not yet assessed by the USGS. In addition, the resource estimates provided here do not reflect recent downward revisions by USGS to resource estimates for the National Petroleum Reserve Alaska.[2]

From the above, it is evident that the Eastern/Central Gulf oil resources now subject to a formal leasing moratorium represent only a small part of the Federal OCS. Even if the moratorium that restricts leasing in this region were to be lifted, lags associated with the awarding of new Federal offshore leases and with the exploration and development of such leases suggest that production would be unlikely to occur until after 2020.

Given that OCS areas not under any leasing moratorium are estimated to account for over 95 percent of the total mean estimate of technically recoverable OCS re-

[1] These resource figures are based on the oil resource profile used for EIA's *AEO2011* energy projections, including resources in the North Atlantic, North Pacific, and Central Pacific OCS where EIA's projections assume that leasing does not occur before 2035.

[2] In October 2010, the USGS revised NPRA oil resources to 0.9 billion barrels from 10.6 billion barrels and gas resources to 52.8 trillion cubic feet from 61.4 trillion cubic feet. Note that this would not affect EIA modeling results because these resources do not get developed in the current Annual Energy Outlook.

sources, perhaps the most significant Federal OCS development issues relate to those areas that are already open to Federal oil and gas leasing. One such issue revolves around when newly available offshore areas, particularly in the Pacific and Atlantic, will be made available to oil and gas producers in future Federal lease sales. Areas where OCS leasing has been available for many years—including the Western Gulf, most of the Central Gulf, and Alaska—hold the vast majority of estimated technically recoverable OCS oil resources. The *AEO2011* generally assumes that both leasing and regulatory approvals in areas where OCS leasing has been available for many years will proceed in a manner that supports their continued major contribution to overall U.S. oil production. Were leasing and/or regulatory processes to slow or speed up significantly, projected OCS production could be reduced or increased from the level of 1.5 to 2 million barrels per day that is projected in the 2014 though 2035 period in the *AEO2011* Reference case.

Access to onshore federal resources: ANWR. The Arctic National Wildlife Refuge (ANWR) is not open to petroleum development, and is therefore not included in the *AEO2011*.[3] However, if legislation were enacted in the near term that approved oil and natural gas leasing in the 1002 Area, one could potentially see ANWR oil production starting soon after 2020. This timetable reflects the time required to obtain leases, drill an initial exploratory well, develop a production development plan if a commercial oil reservoir has in fact been discovered, construct the feeder pipelines, fabricate oil separation and treatment plants and transport them to the North Slope by ocean barge, construct drilling pads, drill to depth, and complete the wells.

Based on this timetable and the assumption that the largest ANWR fields would be the first to go into production, peak ANWR oil production could occur around 2030 at about 700,000 to 800,000 barrels per day. In this scenario, the greatest impact on crude oil prices could occur around peak ANWR production with oil prices projected to be perhaps about one percent lower as a result.

Access to onshore federal resources: lower-48 states. The *AEO2011* estimates that total onshore lower-48 technically recoverable oil resources available for development are 113.9 billion barrels (as of January 1, 2009), including about 6.6 billion barrels located on Federal lands with lease stipulations in addition to standard lease terms—which is about 6 percent of total onshore lower-48 oil resources.[4] Federal lease stipulations dictate what oil and natural gas producers can and cannot do on Federal lands. Oil and natural gas producers can employ a variety of technologies to comply with such stipulations, such as drilling extended reach wells to avoid drilling in sensitive habitat areas, drilling multiple wells from a single drilling pad to minimize the surface area disturbed, using water purification equipment to clean produced water before it is discharged, or replanting indigenous species to restore the land. While lease stipulations may tend to increase costs, they do not preclude oil and natural gas production on Federal lands. Given the relatively modest volume of the oil resources on these lands—compared to total U.S. oil resources—changing lease stipulations on Federal lands is unlikely to have a significant long-term impact on U.S. oil production or prices.

Interaction between production and prices

When exploring the possibility of substituting domestic resources for international resources or substituting one domestic fuel for another, it is important to consider the current distribution of fuels used in sectors of the U.S. economy. Three-quarters of liquid fuels (both petroleum and biofuels) are used for transportation and most of the remaining liquid fuels are used in industrial activities, primarily as feedstock for petrochemical production. Natural gas is used in roughly equal portions in industry, buildings and electricity generation. Over 90 percent of coal generates electricity, with most of the remainder used for metals and cement processing. Nuclear, hydroelectric, wind and solar energy is used exclusively for generating electricity. Starch and oil- rich biomass is used to generate liquid transportation fuels and the remainder of biomass is burned for heat and electricity generation.

Natural gas demand tends to be somewhat more price responsive in the short-run than petroleum demand in the United States, mainly because of a larger presence of natural gas in sectors where a moderate range of substitution possibilities exist (i.e. the industrial and power sectors). Nevertheless, demand shocks (in particular from weather) can have powerful feedback effects on natural gas demand through

[3] The technically recoverable resource estimate of 10.4 billion barrels for ANWR is not included in the 219 billion barrels total estimate for the U.S.

[4] The 6.6 billion barrel figure does not include any oil resources estimated to exist under Federal lands that are deemed to be forever precluded from oil and natural gas leasing, such as those under national parks.

domestic natural gas prices, sometimes neutralizing output effects from the demand shock that might otherwise be supposed to ensue (e.g. electric power sector demand for natural gas during the heating season). Also, because near-term domestic natural gas market equilibrium tends to depend much less on the availability of foreign supplies at the margin compared to petroleum, demand shocks (particularly due to winter weather) will tend to induce sharp natural gas price increases that encourage reductions in consumption, most notably in the industrial sector.

Competition among fuels in the United States. Interfuel competition driven by price differences is most likely in the three sectors that use natural gas because of the expanding recoverable natural gas resources which are expected to provide sustained lower prices relative to oil. Over the past decade the share of electric generation fueled by natural gas has been increasing, driven by lower new plant construction costs for natural gas relative to coal and recently by lower natural gas prices. Many existing coal plants are economical even at very low natural gas prices, but there is also a significant portion of older and/or less efficient coal plants whose production will decline when gas prices are low enough, reflecting the trade-off in the generation mix that has been experienced in the past few years. Construction costs for all new plants have risen dramatically in recent years, but the construction cost increases have been much more significant for new coal plants, which are more capital intensive and utilize more complex engineering technologies, relative to gas-fired turbines and combined cycle plants.

The potential for natural gas to compete with oil in the transport sector—whether directly or indirectly as electricity—depends on the price differences between the fuels, the vehicles, and the fueling infrastructure. Currently 97 percent of energy for transportation is provided by fossil liquids and biofuels and only 3 percent is supplied by natural gas. Most of this natural gas is consumed in the operation of pipelines (primarily in compressors) and a small amount is consumed as vehicle fuel for buses and taxis. There is great uncertainty surrounding how effective proposed legislation would be in stimulating the deployment of natural gas vehicles even though operating costs may be significantly lower compared to diesel and gasoline. Natural gas vehicles face significant range and infrastructure limitations, in addition to higher upfront capital costs, that drastically diminish the market for natural gas vehicles even in the presence of tax credits for capital, infrastructure, and fuel.

In the *AEO2011* Reference case, which reflects current laws and regulations, EIA projects the sale of 12,100 new light-duty natural gas vehicles and 26,000 new heavy-duty natural gas vehicles (representing 2.8 percent of total new heavy-duty vehicle sales) in 2035. Without a greatly expanded consumer market for natural gas vehicles based on infrastructure expansion, tax credits for natural gas vehicles will probably only impact sales for a niche market in both light- and heavy-duty vehicles. One *AEO2010* side case examined the impact of implementing tax incentives for vehicles, fueling stations and fuel—starting in 2011 and beginning to phase out in 2027—on heavy-duty natural gas vehicle sales, and found that sales could reach 270,000 (representing 35 percent of total new heavy-duty vehicle sales) in 2035.

Oil and gasoline price shocks impact on the U.S. economy. There are three primary channels through which oil price shocks affect real economic activity. First, and arguably most important, is a rise in the import bill for imported oil, which reduces U.S. incomes, wealth, and aggregate demand. Second, a redistribution of domestic income from consumers to producers occurs, with mixed effects that are likely negative on balance. Third, a lower level of output can be produced with the existing stock of capital and supply of labor as firms economize on energy inputs. This effect, while difficult to quantify, has considerable longer-term importance.

However, the effects of oil price shocks on the economy depend importantly on the nature of the shock. Increases in oil prices caused by strong demand are less damaging to overall activity than those caused by a supply shortage. Increases in oil prices that are expected to be temporary have smaller consequences on activity than those that are perceived to be persistent.

Conclusion

In addition to preparing the Reference case projections that are reviewed above, the full Annual Energy Outlook to be published this spring will include a large number of sensitivity cases that examine the impact of different market, technology, and policy assumptions. Several of these sensitivity cases will address the implications of alternative assumptions about the level of technically recoverable resources and access to those resources.

This concludes my testimony, Mr. Chairman and members of the Committee. I would be happy to answer any questions you may have.

The CHAIRMAN. That is absolutely perfect timing, Mr. Newell. If that is a template for how we are going to do this, this is going to be a wonderful hearing. Thank you very much. Now the pressure is on Ms. Pierce. Ms. Pierce, you are now recognized for five minutes.

STATEMENT OF BRENDA S. PIERCE, ENERGY RESOURCES PROGRAM COORDINATOR, UNITED STATES GEOLOGICAL SURVEY, UNITED STATES DEPARTMENT OF THE INTERIOR

Ms. PIERCE. Thank you, Mr. Chairman, and Members of the Committee, thank you for the opportunity to appear here today to discuss with you the United States Geological Survey's role in studying, understanding, and assessing domestic energy resources.

The USGS conducts scientific investigations and assessments of geologically based energy resources, including conventional and unconventional resources. The mission of the USGS Energy Resources Program is to understand the processes critical to the formation, accumulation, occurrence, and alteration of geologically based energy resources, to conduct scientifically robust assessments of those resources, and to study the impact of energy resource occurrence and/or production on the use of both environmental and human health.

The results from these scientific studies are used to evaluate the quality and distribution of energy resource accumulations, and to assess energy resource potential of the Nation, exclusive of the Federal offshore waters, and that is ANWR, and the petroleum resource potential of the world.

One important goal of USGS domestic energy activities is to conduct research and assessments of undiscovered, technically recoverable, oil and natural gas resources of the United States, exclusive of the Federal Outer Continental Shelf.

The amount of undiscovered, technically recoverable, resources changes over time because of advances in geological understanding, changes in technology and industry practices, and other factors.

This necessitates that resource assessments be periodically updated to take into account such advances. Recent examples include the USGS assessment of the Balkan formation in the United States portion of the Wollaston Basin.

This assessment, released in 2008, shows an estimated 3 to 4.3 billion barrels of undiscovered, technically recoverable, oil, compared to the USGS 1995 mean estimate of 151 million barrels of oil.

Our geologic understanding of this space has evolved since 1995, and significant technological advances redefine what was technically recoverable in 2008, as compared to 1995.

Another example is the USGS assessment of gas hydrates on the Alaskan north slope. As a result of advances in our understanding of this emerging resource, the USGS assessment estimates a mean of 85.4 trillion cubic feet of technically recoverable gas from gas hydrates on the Alaskan north slope.

Recent challenges remain to determine if this technically recoverable resource will be economically recoverable, but current multi-organizational, including the USGS, and multi-disciplinary efforts focusing on overcoming these obstacles, the USGS is conducting a

systematic inventory of the technically and economically recoverable coal resources of the significant minable coal beds in the United States, to provide a comprehensive estimate of how much of the Nation's coal endowment is actually accessible for development, and available under certain market conditions and mining constraints.

The first basin being assessed is the Powder River Basin of Wyoming and Montana. The USGS assessment of the Powder River Basin will be the most thorough and comprehensive inventory of the Nation's most significant coal basin to date.

This inventory, with the others on the schedule, will provide policy and decision makers with important information and valuable planning tools. The USGS also evaluates renewable resources, such as geothermal energy.

The USGS recently completed a national geothermal resource assessment, the first one in more than 30 years. The USGS assessment also indicates that full development of conventional identified systems could expand geothermal power production by about 260 percent of the currently installed geothermal total in the United States.

The estimate for unconventional Enhanced Geothermal Systems, or EGS, is more than an order of magnitude larger than the combined estimates of both identified and undiscovered conventional geothermal resources. If successfully developed, EGS could provide an installed geothermal electric power generation capacity equivalent to about half of the currently installed electric power generating capacity of the United States.

Energy resources, research, and assessments, are traditional strengths of the USGS. As the Nation's energy mix evolves, and USGS will continue to seek ways to expand its research and assessment portfolio to better include a comprehensive sweep of energy resources.

USGS resource assessments and research can provide valuable information for the public and government discourse about the energy resource future of the Nation. The USGS looks forward to working with Congress to examine these challenges and opportunities.

Thank you for this opportunity to provide an overview of USGS research and assessments of geologically based energy resources, and I would be happy to answer any questions.

[The prepared statement of Ms. Pierce follows:]

Statement of Brenda S. Pierce, Program Coordinator, Energy Resources Program, U.S. Geological Survey, U.S. Department of the Interior

Mr. Chairman and Members of the Committee, thank you for the opportunity to appear here today to discuss with you the U.S. Geological Survey's role in studying, understanding, and assessing domestic energy resources.

Role of the U.S. Geological Survey in Energy Resource Assessments

The USGS conducts scientific investigations and assessments of geologically based energy resources, including conventional resources (oil, gas, and coal), emerging resources (gas hydrates), underutilized resources (geothermal), and unconventional resources (shale gas, shale oil, tight gas, tight oil, coalbed methane, and heavy oil). The USGS also conducts research on the effects associated with energy resource occurrence, production, and (or) utilization. The mission of the USGS Energy Resources Program is: (1) to understand the processes critical to the formation, accumulation, occurrence, and alteration of geologically based energy resources; (2) to

conduct scientifically robust assessments of those resources; and (3) to study the impact of energy resource occurrence and (or) production and use on both environmental and human health. The results from these scientific studies are used to evaluate the quality and distribution of energy resource accumulations and to assess the energy resource potential of the Nation (exclusive of Federal offshore waters) and the petroleum resource potential of the world.

The results from these studies provide impartial, robust scientific information about energy resources that directly supports the U.S. Department of the Interior's (DOI's) mission of protecting and responsibly managing the Nation's natural resources. USGS information is used by policy and decision makers, land and resource managers, other federal and state agencies, the energy industry, foreign governments, nongovernmental groups, academia, other scientists, and the public. Recent examples of USGS domestic research and assessments include the first-ever estimate of undiscovered, technically recoverable gas from natural gas hydrates and the first national geothermal assessment in more than 30 years.

It is important to note the distinction between the terms "resource" and "reserves." Resource is a concentration of naturally occurring solid, liquid, or gaseous hydrocarbons in the Earth's crust, some of which is, or potentially is, technically and (or) economically extractable. Reserves specifically refer to the estimated quantities of identified (discovered) petroleum resources that, as of a specified date, are expected to be commercially recovered from known accumulations under prevailing economic conditions, operating practices, and government regulations. Primarily, the USGS conducts assessments of undiscovered, technically recoverable oil and gas resources. The USGS also conducts select assessments of economically recoverable resources. These resources include coal and oil and gas in frontier areas such as Arctic Alaska. Economically recoverable resources are a subset of technically recoverable resources and are generally less than the technically recoverable amount.

USGS National Research and Assessment Activities

USGS National Oil and Gas Resource Activities

One important goal of USGS domestic energy activities is to conduct research and assessments of undiscovered, technically recoverable oil and natural gas resources, both conventional and unconventional, of the United States (exclusive of the Federal outer continental shelf). These are resources that have yet to be found (drilled), but if found, could be recovered using currently available technology and industry practice.

The purpose of USGS assessments is to develop robust, geology-based, statistically sound, well-documented estimates of quantities of petroleum resources having the potential to be added to reserves and thus contribute to the overall energy supply. The USGS uses resource assessment methodologies that are thoroughly reviewed and externally vetted so as to maintain the transparency and robustness of the assessment results. To further the transparency and understanding of what we do, the USGS petroleum resource assessment methodology is published and is available online at http://energy.cr.usgs.gov/oilgas/noga/methodology.html.

The USGS distinguishes between conventional and unconventional petroleum accumulations for purposes of research and resource assessment (Figure 1), as they are very different types of resources with very different geologic and physical characteristics. Briefly, a conventional gas accumulation is one that is defined by discrete field boundaries and is typically outlined by dry or uneconomic wells. An unconventional accumulation is one in which gas saturation is regional in extent, is in extremely low permeability rock, and typically requires stimulation (fracturing) to produce the gas. Estimated ultimate resource recoveries are typically lower in unconventional wells than in conventional wells. Many shale gas, tight gas, and coalbed gas accumulations can be described using these characteristics.

The amount of undiscovered, technically recoverable resources changes over time. There are several reasons for this, including: (1) technological developments and advances regarding the discovery and production of petroleum resources, (2) scientific advances regarding geologic understanding, and (3) reserve growth. Advances in geologic understanding, as well as changes in technology and industry practices, necessitate that resource assessments be periodically updated to take into account such advances. One example of this change is the USGS assessment of the Bakken Formation in the U.S. portion of the Williston Basin. This assessment, released in 2008, shows an estimated 3.0 to 4.3 billion barrels of undiscovered, technically recoverable oil, compared to the USGS 1995 mean estimate of 151 million barrels of oil. Our geologic understanding of this basin evolved since 1995, but significant technological advances redefined what was technically recoverable in 2008 as compared to 1995. This phenomenon is equally true for natural gas assessments such as that of the Barnett Shale and others, which have shown significant increase in

the volumes of technically recoverable gas resources. Much of the technology developed for production of gas in the Barnett Shale was used to develop the oil in the Bakken Formation. The Barnett Shale Newark East field now ranks first in the United States in estimated 2009 proved reserves and is first in total production, having recently surpassed the San Juan Basin.[1]

Another example of significant changes in assessments over time is the USGS assessment of gas hydrates on the Alaskan North Slope. Gas hydrates are a crystalline solid formed of water and gas; they look and act much like ice, but they contain huge amounts of methane, which may be a potential energy resource. Substantial investments in gas hydrate research now support categorizing some accumulations of gas hydrates as technically recoverable. As a result of advances in our understanding of this resource, the USGS assessment estimates a mean of 85.4 trillion cubic feet of technically recoverable gas from gas hydrates on the Alaska North Slope (this total is included in the mean conventional gas estimates outlined below). Research challenges remain to determine if this technically recoverable resource will be economically recoverable, but current multi-organizational (including the USGS) and multi-disciplinary efforts are focused on overcoming these obstacles.

Reserve growth is a well-documented phenomenon in the United States and is a major component of the updates to the Nation's remaining oil and natural gas resources, especially in conventional fields. In fact, most additions to world oil reserves in recent years are from growth of reserves in existing fields rather than new discoveries. Reserve growth occurs for a variety of reasons, including: (1) extensions of existing fields, infill drilling and new field discoveries and (2) application of new recovery technologies and improved efficiency. The assessment of the resource endowment, which includes both undiscovered resources and reserves from discovered fields and reservoirs, requires estimation of reserve growth. The USGS has recently developed a state-of-the-art methodology and approach for better quantifying domestic and global contributions of reserve growth to the petroleum resource endowment and is actively engaged in estimating this important component of the resource endowment

The current USGS mean estimates for technically recoverable oil and gas resources of the onshore and State waters portion of the United States are as follows:[2]

Mean technically recoverable conventional oil resources—31.7 billion barrels

Mean technically recoverable unconventional oil resources—6.1 billion barrels

Mean technically recoverable conventional gas resources—356.9 trillion cubic feet

Mean technically recoverable unconventional gas resources—399.4 trillion cubic feet

The Department of the Interior's Bureau of Ocean Energy Management, Regulation, and Enforcement has responsibility for evaluating resources in the Federal Outer Continental Shelf; their current oil and gas estimates for the U.S. Outer Continental Shelf are as follows:[3]

Mean technically recoverable conventional oil resources:

- Alaska—26.61 billion barrels
- Atlantic—3.82 billion barrels
- Gulf of Mexico—44.92 billion barrels
- Pacific—10.53 billion barrels

Mean technically recoverable conventional gas resources:

- Alaska—132.06 trillion cubic feet
- Atlantic—36.99 trillion cubic feet
- Gulf of Mexico—232.54 trillion cubic feet
- Pacific—18.29 trillion cubic feet

USGS National Coal Resource Activities

The USGS is conducting a systematic inventory of the technically and economically recoverable coal resources of the significant minable coal beds in the United States, to provide a comprehensive estimate of how much of the Nation's coal endowment is actually accessible for development and available under certain market conditions and mining constraints. The first basin being assessed is the Powder River Basin in Wyoming and Montana.

Within this effort, the USGS completed an assessment of the technically and economically recoverable coal resources in Wyoming's Gillette coalfield, the most prolific coalfield in the Nation and a part of the Powder River Basin. By utilizing an abundance of new data from coalbed methane development in the region, the USGS was able to produce the most comprehensive assessment to date of this area. The Gillette area accounts for nearly 40 percent[4] of the Nation's current coal production, making it the single most important coalfield in the United States. The USGS assessment indicates that there is a total of 165 billion tons of original coal resources in the six coal beds included in the evaluation. Original coal resource is the total

amount of coal in-place before production. Of that original resource, 10.1 billion tons (6 percent) can be classified as economically recoverable resources at the current average estimated sales price. However, about 67 billion additional tons are estimated to be recoverable assuming increased market prices will support the higher costs needed to recover deeper coal. The USGS has just released the assessment of the Northern Wyoming Powder River Basin, an area north of the Gillette coalfield. The total original coal resource in the Northern Wyoming Powder River Basin assessment area for 24 coal beds assessed was calculated to be 285 billion tons. Available coal resources are estimated at about 263 billion tons (about 92.3 percent of the original coal resource). Available coal resource is the amount of the original resource that is accessible for mine development under current regulatory and land-use constraints. Recoverable coal was determined for seven coal beds to total about 50 billion tons. The economically recoverable portion of the coal resources was determined to be about 1.5 billion tons of coal (about 1 percent of the original resource total) for the seven coal beds evaluated. The analysis and results for the Southwestern Wyoming Powder River Basin area is currently in review, and the analysis of the Montana portion of the Powder River basin has begun.

The USGS assessment of the Powder River Basin will be the most thorough and comprehensive inventory of the Nation's most significant coal basin to date. This inventory, with the others on the schedule, will provide policy makers a valuable planning tool needed to develop long-term energy strategies and provide decision makers with important information about what coal resources are currently or potentially technically and economically recoverable.

USGS National Geothermal Resource Activities

In addition to petroleum and coal resources, the USGS also evaluates renewable resources such as geothermal energy. The USGS recently completed a national geothermal resource assessment, the first one in more than 30 years. The USGS evaluated 241 moderate- and high-temperature geothermal resources capable of producing electricity. The USGS assessment[5] estimates the following domestic geothermal resources:

(1) 9,057 Megawatts-electric (MWe) of power potential from conventional, identified geothermal systems,
(2) 30,033 MWe of power generation potential from conventional, undiscovered geothermal resources, and
(3) a provisional estimate of 517,800 MWe of power generation potential from unconventional Enhanced Geothermal Systems (EGS) resources.

The USGS assessment results indicate that full development of the technically recoverable conventional, identified systems could expand geothermal power production by approximately 6,500 MWe, or about 260 percent of the currently installed geothermal total of more than 2,500 MWe in the United States. The provisional resource estimate for unconventional EGS is more than an order of magnitude larger than the combined estimates of both identified and undiscovered conventional geothermal resources and, if successfully developed, could provide an installed geothermal electric power generation capacity equivalent to about half of the currently installed electric power generating capacity of the United States.

Because of the significant potential of unconventional geothermal resources to contribute to domestic energy resources, ongoing research at the USGS focuses on refining our understanding and characterization of EGS and improving the assessment methodology to incorporate the latest advances in EGS technology. The USGS is also working with the Department of Energy to characterize geothermal resources in sedimentary basins, particularly low temperature resources that were not included in the most recent assessment. Additionally, the USGS is working with the Bureau of Land Management to acquire new data and develop a more refined understanding of geothermal potential on Federal lands.

Conclusion

Energy resources research and assessments are a traditional strength of the USGS. As the Nation's energy mix evolves, the USGS will continue to seek ways to expand its research and assessment portfolio to better include a comprehensive suite of energy sources, including hydrocarbon-based (for example, unconventional gas from coal, oil and gas from shale, and gas from hydrates) and nonhydrocarbon-based sources (for example, geothermal resources and uranium) and to address the effects of such resources on land use, ecosystem health, and human health. USGS resource assessments and research can provide valuable information for the public and government discourse about the energy resource future of the Nation. The USGS looks forward to working with Congress as it examines these challenges and opportunities.

Thank you for this opportunity to provide an overview of USGS research and assessments of geologically based energy resources. I would be happy to answer your questions.

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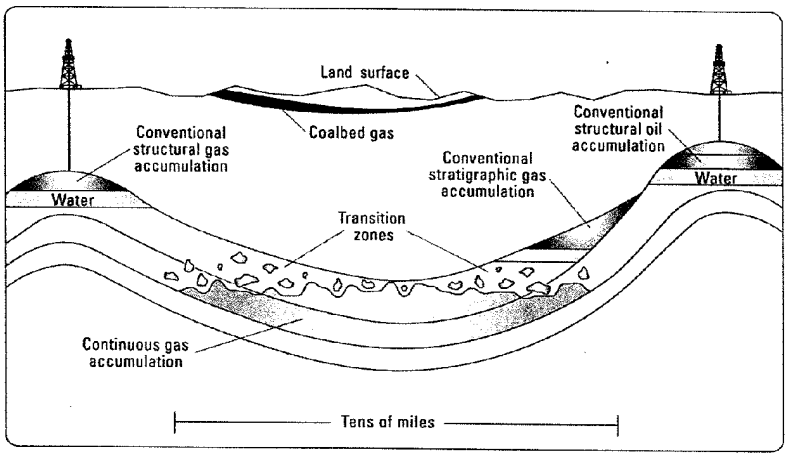

Figure 1. Conceptual diagram illustrating the different geologic settings between conventional and unconventional (sometimes called "continuous" because they are continuous across the basin) resource accumulations (http://pubs.usgs.gov/fs/fs-0113–01/fs-0113–01.pdf).

The CHAIRMAN. Thank you very much. Boy, this is an all-star panel now, I will tell you. Next, Dr. Gene Whitney, from Energy Research at the Congressional Research Service. You are recognized, sir, for five minutes.

STATEMENT OF GENE WHITNEY, Ph.D., MANAGER, ENERGY RESEARCH, CONGRESSIONAL RESEARCH SERVICE

Dr. WHITNEY. Mr. Chairman and Members of the Committee, on behalf of the Congressional Research Service, I would like to thank the Committee for its invitation to testify today to address the subject of rising gasoline prices and domestic resources.

Domestic energy production contributes to the economic vitality of the Nation, and reduces reliance on foreign energy sources. Much of our domestic energy production takes place on Federal lands, or on the Federally owned Outer Continental Shelf.

Congress has worked hard to ensure that resources developed on Federal lands provide revenues to the American people through lease purchase, rents, and royalties, but energy production, like many industrial processes, involves some risks to human health and safety, and to environmental quality.

Thus, numerous laws have been passed in recent decades to ensure that energy production in the United States is done in a safe and responsible manner. Policies have been established through statute, and through Federal agency rulemaking to provide controlled access to Federal lands, and to regulate the activities of energy production.

The purpose of my testimony today is to describe the responsibilities and authorities of the Federal Land Management Agencies, and through that description, to outline the processes that energy companies must navigate in order to explore for, develop, and produce oil in the United States.

There is an ongoing tension between the expansion of energy production, in which companies seek access to Federal lands and waters to find and produce oil, and regulation by Federal agencies to ensure the exploration and production proceeds safely, and with minimal environmental impact.

This tension has been especially high in the wake of the deep water Horizon event. Access to onshore Federal lands for energy exploration and production is managed primarily by the Interior Department's Bureau of Land Management, and by the United States Forest Service, and the Department of Agriculture.

Resources on the Federal Outer Continental Shelf are managed by the Bureau of Ocean Energy Management Regulation and Enforcement in the Department of the Interior. Each of these agencies develops land use plans and resource management plans that determine how and when Federal lands and offshore areas are developed.

The plans for onshore development seek to accommodate various uses of public lands, including energy and minerals development, grazing, recreational activities, timber harvesting, and preservation of wildlife habitat and waterways, among others.

Offshore development must coexist with fisheries, shipping, recreational activities, and preservation of marine ecosystems. Resource management plans are developed with public input, and must comply with the requirements of the National Environmental Policy Act, the Endangered Species Act, Air and Water Quality Regulations, and several other applicable statutes and regulations.

Each resource management plan includes a schedule of energy and mineral leases for the planning units. Leases for oil and gas on Federal lands and offshore are sold at public auction. The winning bid for a particular parcel purchases the lease, and gains the right to produce oil and gas from the lease area.

The leaseholder must pay rent on the leased lands and royalties are paid on any oil and gas produced. A portion of these royalties is shared with the States. The owner of a lease must obtain a permit to drill on the lease.

The permitting process is also guided by a number of laws and regulations, including several new requirements instituted by the Interior Department after the deep water Horizon incident.

The process of approval of an application for a permit to drill is affected by the ability of Federal agencies to process the application, as well as the ability of the permit applicant to meet the requirements for approval.

Other non-procedural issues may delay or prevent oil and gas development from proceeding on a particular lease, including a shortage of drilling rigs or other equipment, a shortage of skilled labor, or issues associated with the company's financial strategy.

Legal challenges against the government or against the energy company might also delay or prevent development on Federal leases. In summary, the process of leasing Federal lands and waters, the approval of permits to drill, and the logistics of exploration and production are lengthy and complex processes, subject to a large number of laws and regulations, which make simple characterizations of the overall process difficult.

Thank you for the opportunity to provide this information on behalf of the Congressional Research Service. I will be glad to answer any questions.

[The prepared statement of Dr. Whitney follows:]

Statement of Gene Whitney, Energy Research Manager, Congressional Research Service

Mr. Chairman and Members of the Committee, on behalf of the Congressional Research Service, I would like to thank the Committee for its invitation to testify today to address the subject of this hearing, "Harnessing American Resources to Create Jobs and Address Rising Gasoline Prices: Domestic Resources and Economic Impacts."

Introduction

Energy companies seeking to develop energy resources in the United States must comply with a number of state and federal requirements, including environmental and safety regulations and a permitting process that allows them to explore for and produce oil and natural gas, or other energy resources. I would like to briefly discuss issues of access, permitting, and regulation that affect domestic energy production. Because the hearing is focused on rising gasoline prices, I will concentrate primarily on domestic oil production. Furthermore, because we are discussing federal policy, I will focus primarily on energy development on federal lands and on the federally owned Outer Continental Shelf. Many of these processes and requirements I describe for oil development could be similar for other fossil fuels or for deployment of certain renewable energy technologies. The purpose of this testimony is to illustrate the responsibilities and authorities of the federal land management and regulatory agencies, and through that illustration to demonstrate the processes that energy companies must navigate in order to explore for, develop, and produce oil in the United States.

Access to Resources on Federal Lands and Outer Continental Shelf

Access to onshore federal lands for energy exploration and production is managed primarily by the Interior Department's Bureau of Land Management (BLM) and by the U.S. Forest Service (USFS), which is an agency of the Department of Agriculture. BLM manages over 245 million acres of federal land, plus 700 million acres of subsurface mineral estate. Most BLM lands are in the western United States. The USFS manages 193 million acres of national forests. Other land management agencies such as the National Park Service or the Fish and Wildlife Service manage lands that are mostly, but not entirely, off limits to energy development by statute or by Executive Order. BLM and USFS develop and maintain management plans for the lands under their jurisdiction per the Federal Land Policy and Management Act of 1976 and the National Forest Management Act of 1976, and those plans are open to public input. The USFS is currently in the process of revamping its planning process.

Development of onshore federal oil and natural gas resources includes five phases:[1]

1. Land Use Planning (development of a Resource Management Plan)
2. Parcel Nominations and Lease Sales
3. Well Permitting and Development
4. Operations and Production
5. Plugging and Reclamation

[1] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/leasing_of_onshore.html

The process of developing a 5-year Resource Management Plan for each unit of federal lands may require months or years to complete, and the plans must comply with the requirements of the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), air and water quality under Environmental Protection Agency regulations, and several other applicable statutes enacted by Congress.

The steps in developing a Resource Management Plan (RMP) include the following:[2]

1. Issue a Notice of Intent to Prepare the RMP
2. Conduct Scoping (i.e. public process to assist in the identification of planning issues)
3. Analyze the management situation
4. Develop alternatives to address planning issues
5. Analyze the effects of the alternatives
6. Select a preferred alternative
7. Prepare a draft RMP/draft environmental impact statement (EIS)
8. Provide a 90-day public comment period
9. Prepare a proposed RMP/final EIS based on comments received
10. Provide a 30-day public protest period upon publication of the proposed RMP/final EIS
11. Approve the RMP through a record of decision once the protests have been resolved
12. Implement, monitor, and evaluate plan decisions

Each plan must include an environmental evaluation process under the NEPA rules. The plans attempt to accommodate varied uses of public lands, including energy and minerals development, grazing, recreational activities, timber harvesting, preservation of wildlife habitat and waterways, preservation of cultural heritage sites, wild land fire mitigation, among others. This multiple-use approach results in some areas being fully available for energy development via a set of leasing and permitting processes, some areas are available but restricted in timing or surface occupancy, and some areas are placed off limits to energy development.

An inventory of oil and natural gas resources and leasing restrictions on federal lands was completed in 2008 by a consortium of federal agencies[3] in response to the Energy Policy Act of 2000, as amended by the Energy Policy Act of 2005. That inventory, reported in phased publications (the main publication was "Inventory of Onshore Federal Oil and Natural Gas Resources and Restriction to Their Development" released in 2008), listed nine categories of access to federal lands ranging from complete inaccessibility to full access under standard leasing terms. **See Table 1.** Of the 279 million acres of federal land surveyed, 60% was inaccessible, 23% was accessible with restrictions, and 17% was accessible under standard lease terms. The largest proportion of inaccessible lands includes lands withheld from leasing by Executive Order or statute, inaccessibility based on discretionary decisions made by the land management agency (which may include endangered species habitat and historical sites), lands that do not yet have a completed management plan, and lands that do not afford surface occupancy.

Access to offshore areas for energy development is managed by the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE), which is "the federal agency responsible for overseeing the safe and environmentally responsible development of energy and mineral resources on the Outer Continental Shelf".[4] The Outer Continental Shelf Lands Act of 1953 (OCSLA), as amended, provides for the leasing of OCS lands in a manner that protects the environment and returns revenues to the federal government. BOEMRE manages about 1.7 billion acres of the OCS, divided into 26 planning areas. Certain parts of the OCS are off limits to oil and gas development by statute or Executive Order, including shipping lanes, certain military operational zones, and National Marine Sanctuaries. In addition to NEPA, ESA, and other laws applied to onshore planning, the planning process for offshore areas is subject to compliance with additional statutes and regulations relevant to the ocean environment, coastal zone management, fisheries, and marine oil spill regulations, among others.

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[2] http://www.blm.gov/wo/st/en/prog/planning/frequently_asked_questions.html#4

[3] Inventory of Onshore Federal Oil and Natural Gas Resources and Restriction to Their Development, Prepared by the U.S. Departments of the Interior, Agriculture, and Energy, 2008, http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/EPCA_III.html.

[4] http://www.boemre.gov/aboutBOEMRE/

The Oil and Natural Gas Leasing Process[5]

Subsequent to the completion of a Resource Management Plan, individual parcels within the planning area may be nominated for oil and natural gas leasing. The leasing process follows the Minerals Leasing Act of 1920 as amended, the Federal Land Policy and Management Act of 1976, the Federal Onshore Oil and Gas Leasing Reform Act of 1987, and the Onshore Oil and Gas Order No. 1 of 2007. Anyone may nominate a parcel for lease, but the parcel is only subject to lease if it is available, and any stipulations from the RMP must be attached before the parcel is placed for sale. Lease sales are held quarterly by each state BLM office, are open to the public, are announced in advance, and are conducted via competitive auction. Bonus bids are often entered for areas with particularly high resource potential, and these bonus bids may reach millions of dollars. The winner of a bid for a particular parcel gains the right to explore, drill, and produce oil and gas from the lease area. As long as there is one producing well on the parcel, the lease is valid for ten years. The lease holder must pay rent ($1.50 to $2.00 per acre per year) on the leased lands, royalties are paid on any oil and gas produced, and those royalties are split between the state and federal government.

BLM launched a series of reforms to its leasing process in 2010. These reforms were in response to an increasing rate of protests on leases, and in an effort to increase public and stakeholder input into the leasing process. According to the Department of the Interior, BLM launched the reforms "in an effort to improve protections for land, water, and wildlife and reduce potential conflicts that can lead to costly and time-consuming protests and litigation of leases,"[6] and "for ensuring orderly, effective, timely, and environmentally responsible leasing of oil and gas resources on federal lands. The leasing process....will create more certainty and predictability, protect multiple-use values when the Bureau of Land Management makes leasing decisions, and provide for consideration of natural and cultural resources as well as meaningful public involvement."[7]

BOEMRE follows a series of 5-year programs for oil and gas lease sales on the OCS, and the most recent plan extends from 2007 to 2012. However, two lawsuits filed in 2007 resulted in a court order that required the Department of the Interior to "'conduct a more complete comparative analysis of the environmental sensitivity of different areas.' The Court found the Department failed to properly analyze the environmental sensitivity of different areas of the OCS, thus hindering Interior's ability to comply with the balancing requirement specified in the OCS Lands Act, which directs the Secretary of Interior to consider 'the relative environmental sensitivity and marine productivity of the different areas of the outer Continental Shelf.'"[8] The Interior Department subsequently released a Revised Program for 2007–2012 in December of 2010 that is intended to address the issues of environmental sensitivity. Because of the timing of the program revision, the revised program was also informed and influenced by the explosion and subsequent oil spill from the Deepwater Horizon on April 20, 2010. For example, there is recognition that certain environmental baselines in the Gulf of Mexico have changed as a result of that spill. Also, some leases scheduled in the original program were cancelled and others were combined and/or rescheduled. The revised program does not include information from the National Academy of Engineering study of the Deepwater Horizon incident, nor from the President's Oil Spill Commission.

Lease holders are to be fully informed about the requirements for compliance with appropriate statutes and regulations. As stated in the report, Inventory of Onshore Federal Oil and Natural Gas Resources and Restriction to Their Development 2008, "All oil and gas leases on Federal lands, including those issued with only the standard lease terms, are subject to full compliance with all environmental laws and regulations. These laws include, but are not limited to, the National Environmental Policy Act, Clean Water Act, Clean Air Act, Endangered Species Act, and National Historic Preservation Act. While compliance with these laws may delay, modify, or prohibit oil and gas activities, these laws represent the values and bounds Congress believes appropriate to manage Federal lands."[9]

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[5] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/leasing_of_onshore/og_leasing.html
[6] http://www.doi.gov/news/doinews/BLM_energy_reform.cfm
[7] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas.html
[8] http://www.boemre.gov/5-year/RelatedLitigation.htm
[9] Inventory of Onshore Federal Oil and Natural Gas Resources and Restriction to Their Development, Prepared by the U.S. Departments of the Interior, Agriculture, and Energy, 2008, http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/EPCA_III.html.

Drilling Permit Process:[10]

Once a lease has been acquired, the owner of the lease must obtain a permit to drill on the lease. The permitting process is guided by NEPA, the Onshore Oil and Gas Order No. 1 of 2007, the Energy Policy Act of 2005, and an internal body of BLM standards and guidelines—The Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development 2007—referred to as The Gold Book. The Gold Book contains requirements in the Code of Federal Regulations at 43 CFR 3000 and 36 CFR 228 Subpart E; Onshore Oil and Gas Orders, and Notices to Lessees. BOEMRE uses a series of Notices to Lessees to communicate the regulatory expectations contained in the Code of Federal Regulation for offshore drilling.[11]

The lease holder may not disturb the surface of the leased parcel until necessary permits have been acquired. The leaseholder must file an application for permit to drill (APD) which includes a surface use plan of operations. The APD package consists of:[12]

1. Form 3160–3, Application for Permit to Drill or Reenter
2. Surface use plan of operations
3. Drilling plan
4. A well plat certified by a registered surveyor
5. Evidence of bond coverage
6. Operator certification
7. Original or electronic signature
8. Other information required by order, notice, or regulation

Under NEPA, operations expected to have significant environmental impacts require an environmental impact statement (EIS). Other activities may be analyzed with a less extensive environmental assessment (EA), which sometimes reveals the need for a full EIS. Certain activities that are deemed to have little or no net environmental impact may be covered by categorical exclusions under NEPA. Section 390 of the Energy Policy Act of 2005 created a set of new categorical exclusions that apply to onshore oil and gas exploration activities. These new categorical exclusions were intended to reduce the paperwork required in the permitting process and to speed the APD process. BLM inspects the parcel to identify potential environmental impacts or other concerns. When BLM is satisfied that applicable statutes and regulations have been complied with, it may approve the APD for a period of two years or until the lease expires, whichever is first.

Permitting of offshore oil and gas wells is similar to the onshore process, but has been controversial since the Deepwater Horizon disaster in the Gulf of Mexico. In June 2010, Interior Secretary Salazar issued a series of new, more rigorous, requirements for drilling in the OCS.[13] These new rules require energy companies to:

- Show certification by the operator's Chief Executive Officer that they are conducting their operations in compliance with all operating regulations and that they have tested their drilling equipment, ensured that personnel are properly trained, and reviewed their procedures to ensure the safety of personnel and protection of the environment;
- Provide certification from a Professional Engineer—before beginning any new drilling operations using either a surface or subsea blowout preventer (BOP) stack—of all well casing and cement design requirements, including that there are at least two independent tested barriers for the well, and adhere to new casing installation procedures;
- Provide independent third-party verification, before drilling any new well, that the BOP will operate properly with the drilling rig equipment and is compatible with the specific well location, borehole design and drilling plan;
- Provide independent third-party verification that shows that the blind-shear rams installed on the surface or subsea BOP stack are capable of shearing the drill pipe in the hole under maximum anticipated surface pressures;
- Adhere to new inspection and reporting requirements for BOP and well control system configuration, BOP and well control test results, BOP and loss of well control events, and BOP and loss of well control system downtime;
- Receive independent third-party verification, before spudding a new well, of re-certification of BOP equipment used on all floating drilling rigs to ensure that the devices will operate as originally designed, and that any modifica-

[10] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/leasing_of_onshore/og_permitting.html
[11] http://www.boemre.gov/ntls/
[12] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/gold_book.html
[13] http://www.doi.gov/news/pressreleases/Interior-Issues-Directive-to-Guide-Implementation-of-Stronger-Safety-Requirements-for-Offshore-Drilling.cfm

tions or upgrades conducted after delivery have not compromised the design or operation of the BOP;

- Have a secondary control system for subsea BOP stacks with remote operated vehicle (ROV) intervention capabilities, including the ability to close one set of blind-shear rams and one set of pipe rams. The subsea BOP system must have an emergency shut-in system in the event of lost power, as well as a deadman system and an autoshear system;
- Conduct ROV Hot Stab Function Testing of the ROV Intervention Panel on subsurface BOP stacks; and
- Provide documentation that the BOP has been maintained according to the regulations.

At the end of September 2010, Secretary Salazar ordered that any well drilled in deep water must comply with two new drilling and workplace safety measures, which expanded on the earlier rules:[14]

> The Drilling Safety Rule, effective immediately upon publication, makes mandatory several requirements for the drilling process that were laid out in Secretary Salazar's May 27th Safety Report to President Obama. The regulation prescribes proper cementing and casing practices and the appropriate use of drilling fluids in order to maintain well bore integrity, the first line of defense against a blowout. The regulation also strengthens oversight of mechanisms designed to shut off the flow of oil and gas, primarily the Blowout Preventer (BOP) and its components, including Remotely Operated Vehicles (ROVs), shear rams and pipe rams. Operators must also secure independent and expert reviews of their well design, construction and flow intervention mechanisms. . ..
>
> The Workplace Safety Rule requires operators to have a Safety and Environmental Management System (SEMS), which is a comprehensive safety and environmental impact program designed to reduce human and organizational errors as the root cause of work-related accidents and offshore oil spills. The Workplace Safety Rule makes mandatory American Petroleum Institute (API) Recommended Practice 75, which was previously a voluntary program to identify, address and manage safety hazards and environmental impacts in their operations.

The oil and gas industry has argued that responsible developers can address the problems associated with the Deepwater Horizon accident by eliminating the mistakes that led to the blowout, so that mitigating an uncontrolled blowout is not necessary. However, BOEMRE insisted that no drilling permits would be issued unless the new requirements were met. On February 28, 2011, Noble Energy received the first permit to drill in deep water since the April 20, 2010, event after demonstrating that they could meet the new standards set by BOEMRE.

Operation, Production, Shutdown and Reclamation[15]

Only after the permit to drill has been obtained can the energy company begin development and production. No ground is broken or drilling started until all of the above requirements are met. Onshore development generally requires some road building to gain access to the optimal drill site on the lease. A well pad is excavated and graded, along with mud pits and support buildings. Depending on the location and the nature of the resource, pipelines must sometimes be constructed to the well site for production. During the development and production period, federal inspectors visit the drilling or production site periodically to ensure that the terms of the drilling permit are in compliance with applicable laws and regulations, and to ensure that the operation is safe and minimally disruptive. Drilling normally lasts for a few weeks or months, but production may continue for many years. During the production period, federal inspectors generally inspect the production site at least every three years to monitor surface disturbances and any potential health, safety, or environmental concerns. Violations may result in corrective measures, fines, or halting of production in severe cases.

When production has ended, the site must be reclaimed according to specific standards described in the Gold Book and in the Onshore Oil and Gas Order No. 1 of 2007. A reclamation plan is included in the original permitting documents, and that reclamation plan must be executed after production stops. The goal of reclamation is ecosystem restoration, including restoration of the natural vegetative community, hydrology, and wildlife habitats. In addition to surface reclamation, the well itself must be sealed and plugged so that no contamination can flow into ground-

[14] http://www.doi.gov/news/pressreleases/Salazar-Announces-Regulations-to-Strengthen-Drilling-Safety-Reduce-Risk-of-Human-Error-on-Offshore-Oil-and-Gas-Operations.cfm

[15] http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/leasing_of_onshore/og_reclamation.html

water aquifers or to the surface. Federal inspectors continue to inspect the site through the completion of the reclamation process.

Offshore Drilling Moratoria and the Effects of the Deepwater Horizon Disaster

For several decades, the only OCS areas open for oil and gas exploration were areas in the central and western Gulf of Mexico, and certain areas off the coasts of southern California and Alaska. Currently, with some exceptions for marine sanctuaries and monuments, no portion of the federal OCS has a permanent moratorium on oil and gas leasing and development. While there are some areas under temporary development bans, such as suspensions and moratoria directed by either legislative and executive powers, most of the OCS is free of moratoria restrictions and considered permissible for offshore leasing activity.

Aspects of moratorium policy (either establishing or lifting temporary bans on oil and gas exploration and development) are derived from legislative and executive powers to direct offshore leasing activities. A shift in both legislative and executive moratoria policy during the 111th Congress signaled an end to moratoria measures that had banned development in some OCS areas since the early 1980s. Legislative moratoria enacted annually by Congress for about 27 years as part of annual Department of the Interior appropriations acts expired on September 30, 2008. In areas where OCS leasing restrictions were changed, some preliminary oil and gas leasing activity has commenced, but no lease sales have been held.

Support for three national objectives coalesced in 2009, resulting in the removal of most congressional and executive constraints on oil and gas exploration and development: (1) promoting domestic energy production to improve the nation's energy security, (2) enhancing federal revenue, and (3) spurring innovation and diversification in ocean energy technologies to help create new jobs. The shift in moratorium policy along with two other developments—the start of federal offshore renewable ocean energy projects (e.g., offshore wind farms) and expanded oil and gas prospecting in deepwater areas—increased the responsibilities of the federal offshore energy program.

Around the world, changing ocean energy policies are affecting how nations govern offshore areas. Economic pressures and technological advances are driving changes in moratorium policy as the global search for energy reaches into deeper ocean waters. A number of countries are revisiting policies about offshore areas, and some countries are making claims to expand their reach for offshore resources. One venue for claims of this nature is the United Nations Convention on the Law of the Sea (UNCLOS). Although the United States has not ratified UNCLOS, the State Department has taken measures to address the U.S. extended continental shelf areas in a manner not inconsistent with the UNCLOS process. These measures signal changes in U.S. policies about moratorium areas.

In March 2010, President Obama expressed the intent of the Administration to open selected OCS areas to leasing for oil and gas production, including areas in the eastern Gulf of Mexico, off the Atlantic coast, and in Alaska. Proponents for offshore oil and gas development viewed the President's actions skeptically, since moratoria had been lifted from all OCS areas, yet the Administration intended to offer lease sales in only certain portions, and then only in 2012.

On April 20, 2010, the Deepwater Horizon rig, in the process of drilling BP's Macondo well in 5,000 feet of water in the Gulf of Mexico, exploded and sank, killing eleven men and resulting in uncontrolled leakage of nearly 5 million barrels of oil and natural gas into the Gulf of Mexico before the well was capped on September 17, 2010. Soon after the explosion and leak, President Obama imposed a six-month ban on OCS drilling in water deeper than 500 feet so that an investigation could determine the cause of the Deepwater Horizon blowout and to ensure that necessary oversight and regulation enforcement were in place. A month later, Judge Martin Feldman, a U.S. District Court judge in Louisiana, responded to a lawsuit filed by a coalition of offshore drilling equipment providers and struck down the drilling ban, saying that the Administration had failed to justify the need for such "a blanket, generic, indeed punitive, moratorium" on deep-water oil and gas drilling.[16] Judge Feldman also cited the severe economic impact that a drilling ban would have on Gulf communities, but environmental groups and supporters of the fishing industry opposed the ruling. The Administration appealed the ruling, but the 5th Circuit U.S. Court of Appeals rejected the appeal on July 8, 2010. Interior Secretary Ken Salazar reimposed the moratorium later in July, citing more extensive justifications than used for the first moratorium. The Administration finally lifted that moratorium voluntarily in October, 2010. Opponents of the moratorium contend

[16] http://www.nytimes.com/2010/06/23/us/23drill.html

that there continues to be a *de facto* moratorium in place, citing the lack of drilling permits issued in the Gulf of Mexico.

On February 2, 2011, Judge Feldman ruled that the Obama Administration acted in contempt by failing to resume issuing deepwater permits after he struck down the Administration's ban on deepwater drilling as being overly broad, followed by a failed appeal. On February 17, 2011, he ordered the Department of the Interior to address five pending drilling permits within 30 days. The Administration appealed that order on March 2, 2011. On March 12, 2011, a drilling permit was issued to BHP Billiton PLC, one of the five pending applicants. As of March 14, 2011, three days from the 30-day deadline, no additional permits had been issued. Thus, the tension continues between the Administration's desire to implement drilling and safety rules to ensure that there is no repeat of the Deepwater Horizon accident, and the desire by the oil and gas industry, supported by court actions, to resume the permitting of deepwater exploration and development.

Other factors

In addition to the leasing, permitting, and production processes conducted by federal agencies, a number of other issues may arise in the oil and gas leasing process that delay or prevent oil and gas development from taking place, or might account for the large number of leases held in non-producing status. There could be a shortage of drilling rigs or other equipment, a shortage of skilled labor, or problems with financing. Legal challenges against the government or against the energy company might delay or prevent development. Typically, many leases are in the development cycle (e.g., conducting environmental reviews, permitting, or exploring) but not producing commercial quantities of oil at a particular time.

As described above, the lease and permit processes, as well as the regulatory frameworks for both onshore and offshore exploration, drilling, and production of oil and natural gas are evolving over time. Some part of the planning, leasing, and permitting process is currently changing in the three major federal leasing agencies: BLM, USFS, and BOEMRE. In addition, the BOEMRE (formerly Minerals Management Service) is undergoing an agency reorganization in the wake of the Deepwater Horizon incident last year. Under the new organization, BOEMRE will be comprised of three separate, independent entities to promote energy development and to manage leasing, to regulate offshore drilling, and to collect revenues owed to the federal government. Additional staff and resources have been requested to increase the oversight of offshore exploration and development, and some of the agency changes are scheduled to be implemented within the next year. As the reorganization and associated changes proceed, it will be incumbent upon the oil and gas companies to remain abreast of each development and to comply with each change in the planning, leasing, permitting, and enforcement process.

Thank you for the opportunity to provide this information on behalf of the Congressional Research Service. I will be glad to answer any questions you may have.

Table 1: Inventory of Onshore Federal Oil and Natural Gas Resources and Restriction to Their Development, Prepared by the U.S. Departments of the Interior, Agriculture, and Energy, 2008.

Table ES-1. Onshore United States—Total Federal Land and Oil and Natural Gas Resources by Access Category

Access Category			Area		Resources[a]			
					Total Oil[b]		Total Gas[c]	
			(acres x 1000)	Percent of Federal	(MMbbls)[d]	Percent of Federal	(BCF)[e]	Percent of Federal
More Constrained ↑	1.	No Leasing (Statutory/ Executive Order) (NLS)	39,945	14.3%	9,054	29.7%	19,449	8.4%
	2.	No Leasing (Administrative) (NLA)	50,414	18.1%	2,461	8.1%	16,618	7.2%
	3.	No Leasing (Administrative) Pending Land Use Planning or NEPA Compliance (NLA/LUP)	55,278	19.8%	6,684	21.9%	49,814	21.6%
	4.	Leasing, No Surface Occupancy (NSO) (Net NSO for O&G Resources)	20,245	7.3%	777	2.5%	8,621	3.7%
	5.	Leasing, Cumulative Timing Limitations (TLs) of >9 Months	283	0.1%	32	0.1%	430	0.2%
	6.	Leasing, Cumulative Timing Limitations (TLs) of >6 to ≤9 Months	11,883	4.3%	5,198	17.0%	40,021	17.3%
	7.	Leasing, Cumulative Timing Limitations (TLs) of >3 to ≤6 Months	18,389	6.6%	1,799	5.9%	35,751	15.5%
	8.	Leasing, Controlled Surface Use (CSU)[f]	34,631	12.4%	2,231	7.3%	36,716	15.9%
Less Constrained ↓	9.	Leasing, Standard Lease Terms (SLTs)	47,972	17.2%	2,268	7.5%	23,554	10.2%
Total, Federal Lands Including Split Estate			**279,039**	100%	**30,503**	100%	**230,975**	100%
Total Non-Federal			**936,414**		**58,056**		**423,282**	
Total Inventory Area			**1,215,453**		**88,560**		**654,256**	
Summary								
Inaccessible (Categories 1-4)			165,882	60%	18,976	62%	94,502	41%
Accessible with Restrictions (Categories 5-8)			65,186	23%	9,260	30%	112,919	49%
Accessible under Standard Lease Terms (Category 9)			47,972	17%	2,268	8%	23,554	10%
Total, Federal Lands Including Split Estate			**279,039**	**100%**	**30,503**	**100%**	**230,975**	**100%**

[a] Undiscovered technically recoverable resources and reserves growth

Small rounding errors may be present.

[b] Including oil, natural gas liquids (NGLs) and liquids associated with natural gas reservoirs

[c] Including associated dissolved and nonassociated natural gas

[d] Million barrels [e] Billion cubic feet [f] Includes Cumulative Timing Limitations of ≤3 months

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The CHAIRMAN. Boy, I have to tell you that I am absolutely impressed with these three witnesses that have hit it right on the mark. We have to come up with a reward, I think, for that.

Mr. HOLT. If the Chairman would yield, we should point out that as these witnesses come in on time with their testimony, we judge testimony on both content and quality, and on both scores, they are doing well.

The CHAIRMAN. Well, I am glad that you said that, Mr. Holt, because the next person to testify is the Ranking Member, who was

not here. We have been called to vote, but we have time, and I want to give the courtesy to Mr. Markey to make his opening statement.

Then we will break, and go to vote, and then come back. So, Mr. Markey, follow Mr. Rush's lead.

STATEMENT OF HON. EDWARD J. MARKEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MASSACHUSETTS

Mr. MARKEY. Thank you, Mr. Chairman, and happy Saint Patrick's Day to you, Mr. Chairman. The reference in the title of this hearing to harnessing American resources is appropriate, because we are in a horse race.

Rather than a blanket of roses at the finish line, the winner gets much more valuable prizes; lower unemployment, and lower energy prices for American families. There are two horses in this race; the old horse is the one that has been running flat out for decades, is "Drill, Baby, Drill." That horse is owned by a syndicate of the richest international oil companies in the world, and OPEC.

The second horse, a much more recent entry in the race, is clean energy. That horse is owned by the American people, in partnership with researchers, investors, and companies developing new technologies to produce energy from wind, solar, geothermal, hydropower, biomass, and other renewable sources.

Now our Republican colleagues make plenty of claims about this race, but they are handicapping is highly suspect. First, they say that they want a fair race, and claim that they would be happy to see both horses win.

This is their all of the above claim, but the truth is that our Republican friends have taken a terrible risk. They have bet it all on just one horse. They bet billions of dollars in subsidies and tax breaks, not to mention betting our economy and our future all on "Drill, Baby, Drill."

In this Committee alone, the scorecard on all of the above stands at seven hearings, featuring "Drill, Baby, Drill," and zero on clean energy. The Republican majority also claims that the Obama Administration is pulling back the reins on "Drill, Baby, Drill."

The truth is that this Administration is riding that horse as hard and as fast as ever. Republicans want to debate permits, or acres, or 10 year projections, but let us just cut to the chase.

The amount of oil and natural gas produced from our public lands has gone up every year of the Obama Administration, period. In fact, we have been riding this horse so long and so hard that we have left every other country far behind.

Nobody has as much riding on "Drill, Baby, Drill" as we do; and last, our Republican colleagues claim that "Drill, Baby, Drill" can win this race. The truth is that despite the long head start, and despite the uneven field, and despite all the money that we have been riding on that horse, history has proven that "Drill, Baby, Drill" will never get us to the finish line.

That horse has given us everything it has, more barrels of oil, and more cubic feet of natural gas, more acres under lease, more permits to drill, and no matter what we do, no matter how many subsidies or tax breaks we give, the price at the pump remains beyond our control.

The harder we whip that horse the further away the finish line seems. At some point, we have to face facts. The Republican energy policy amounts to nothing more than beating a dead horse.

So what might happen if we get serious, and we let clean energy out of the gate? Well, the first thing you need to know is that clean energy can catch up because it is incredibly fast.

Just think about the speed of the arrival of the internet, or the elapsed time between the rotary dial phone and the iPhone, when this country puts its mind to something. The speed of innovation will take your breathe away.

And unlike "Drill, Baby, Drill," the longer we let clean energy run the cheaper it gets. There is a Moore's Law for solar that says that each time we double production, the cost of solar panels drops 18 percent.

The investment that we make in this horse stands to be the best that we have ever made. The most important clean energy that can win, and the most important is that clean energy can win this race.

While "Drill, Baby, Drill" runs in place, clean energy is moving forward. This horse will create new jobs, American jobs, developing American technology, and this horse can cut energy prices by reducing our oil imports.

If we unleash clean energy, let her out of the starting gate, we will find ourselves in the winners circle in no time as a country looking over our shoulders at number two and number three in the world.

That is our opportunity, and that is the conclusion of my opening statement, with 17 seconds left to spare. I thank you, Mr. Chairman.

The CHAIRMAN. You were up to that challenge that was offered by Mr. Holt, and I thank the Ranking Member for that. We have two votes. The Committee will stand in recess until approximately 11 o'clock. Hopefully, we can do it before that, but no later than 11 o'clock. The Committee stands in recess.

[Recess.]

The CHAIRMAN. The Committee will reconvene. Our next witness is Dr. Foss, and I saw her just a moment ago. The Committee will be in recess momentarily.

[Recess.]

The CHAIRMAN. We will continue with our panel, and I want to thank all of you for bearing with us while we had votes on the Floor. So, at this time, I would like to introduce Dr. Foss, Chief Energy Economist at the University of Texas. Dr. Foss, you are recognized.

STATEMENT OF DR. MICHELLE MICHOT FOSS, Ph.D., CHIEF ENERGY ECONOMIST, CENTER FOR ENERGY ECONOMICS, BUREAU OF ECONOMIC GEOLOGY, JACKSON SCHOOL OF GEOSCIENCES, UNIVERSITY OF TEXAS

Dr. FOSS. Thank you, Mr. Chairman, and thanks to you and Members of the Committee for once again inviting me to serve as a witness. Hydrocarbons are exceptional commodities. They improve living standards, and improve the quality of life.

They are challenging to develop. They are commodities and so prices are variable. Prices are variable for many reasons, including

actions and events. We are in a time which events are creating expectations about prices, and that leaves us with a number of questions on what do we do about this, and how do we manage it, and what kinds of things can we think about.

To me, one of the most important things is to ensure that the domestic industry and production remain competitive, and this is a broad charter for both the industry and government.

A good way to start is by understanding the industry business cycles. I view, and many people like me tend to view the industry cost structure on the basis of full, break even costs, not just what it costs to sink a drill byte, and drill a well, but to stay in business. All the cash costs that have to be carried by companies in order to do what they do to hold acreage and inventory, regardless of whether it is public or private leases, to pay for geological and geophysical staffs, engineering staffs, to explore, to do research, until you are finally ready to begin to develop a drillable prospect.

Full break even finding and development costs are high, and have been rising for a number of reasons. Part of it is because of the kinds of resources. They are abundant. Unconventional resources are everywhere, but there are expenses.

The reservoirs are complex, and so incremental costs of extracting additional barrels, or cubic feet of gas from those resources, can be expensive. As long as we have a high and rising marginal cost curve, then we will have price variability.

So how do we manage that high and rising cost curve, and what are the kinds of things that we can do. One is to look at where we can increase production volumes, because the more that you can produce for a given dollar invested, the better off you are going to be.

Natural gas offers one way to do that. We have an abundant natural gas base. It also has a high cost structure at present, but we can already see that there are some improvements being made, in terms of bringing costs down.

We can understand that costs that companies face are affected by many things, such as policies, regulations, and other issues. We can understand better that companies need access to resources in order to be able to maintain portfolios of leaseholds that can be used to develop drillable prospects.

Replenishing production is an essential part of maintaining competitiveness in the domestic business. Protecting private property rights and ensuring access to private lands is just as important as ensuring access to public lands.

Our shale gas plays have succeeded largely because of private mineral ownership and the ability to negotiate access with private mineral owners and develop resources that way.

But we have to look at public lands, especially in locations like the Gulf of Mexico, and reach a point in which we can feel comfortable that we can responsibly manage access to those resources, and maintain our critical science and technology base for offshore exploration, and continue to push the oil production renaissance that we seem to be having in the United States, in the Gulf of Mexico, and Balkan shales, and other plays.

We can also debottleneck the industry. We have an interesting situation in which our domestic crude is priced lower than inter-

national crudes, and to a large extent it is because of infrastructure.

So we need to continue to be able to expand oil and oil product pipelines, not just within the United States, but across our borders. We also need to understand the social economic benefits that the industry provides, and these are large and varied, and it includes jobs, not only directly in the industry, but also indirectly through service companies and local investments and procurement.

The industry pays taxes. It is actually one of the larger tax paying entities. I wanted to just draw the Committee's attention to a report in the Wall Street Journal that matched our own research on this, to the degree to which the petroleum industry pays, perhaps up to a third of effective taxes for the United States, and much larger than internet based companies, which is interesting to think about since I don't think that I can put Facebook in my gasoline tank.

The final thing is to just understand better how energy affects transportation systems, and the differences between some of the clean energy options that we would like to pursue, and energy density values in gasoline and diesel. Thank you.

[The prepared statement of Dr. Foss follows:]

Statement of Dr. Michelle Michot Foss, Chief Energy Economist and Head, Center for Energy Economics, Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas

Mr. Chairman and members of the Committee on Natural Resources, I am Michelle Michot Foss, Chief Energy Economist and Head of the Center for Energy Economics, based in the Bureau of Economic Geology, Jackson School of Geosciences at The University of Texas. I am pleased and honored to be selected as a witness for the Committee.

Hydrocarbons are exceptional commodities, given the number and variety of essential products manufactured from these raw materials with relative ease. These essential resources improve living standards by:

- Constituting the major sources of energy fuels for everything from heating to lighting;
- Enabling local to global transportation systems; and
- Providing molecular building blocks for an incredible array of intermediate and finished products that we use in everyday life and across all industrial and economic sectors.

By definition, a commodity is a good for which the price cannot be controlled by either buyers or sellers although prices may be impacted by actions and events. Because hydrocarbons are commodities, price is uncertain. Price risk is faced by all producers, even including members of the Organization of Petroleum Exporting Countries (OPEC), and all customers. The strong pace of growth in demand for hydrocarbons, especially from emerging markets, and challenges in finding and delivering new sources of supply, largely the result of human interventions, periodically combine to increase uncertainty about forward prices. Geopolitical events, including major economic and business cycles, work to exacerbate uncertainty. Fear about how geopolitical events *might* unfold adds momentum to price movements. When geopolitical events occur within the "Petroleum Heartland", the breadbasket for hydrocarbons extraction that stretches across North Africa and the Middle East into Central Asia and Russia, uncertainty and fear can become accelerated.

For this hearing, I offer my views on the topics intended to be covered—domestic resources, production and the economic impact of rising gasoline prices—along with some thoughts about what can be done.

What Can Be Done

- *Ensure that the domestic industry and production remain competitive.*

A good way to start is by gaining a better understanding of the industry business cycle and the inherent link between full finding and development costs and oil and gas prices. As prices fall, capital expenditures (CAPEX) and drilling also drop off. At some point, lower prices trigger demand growth. Rising de-

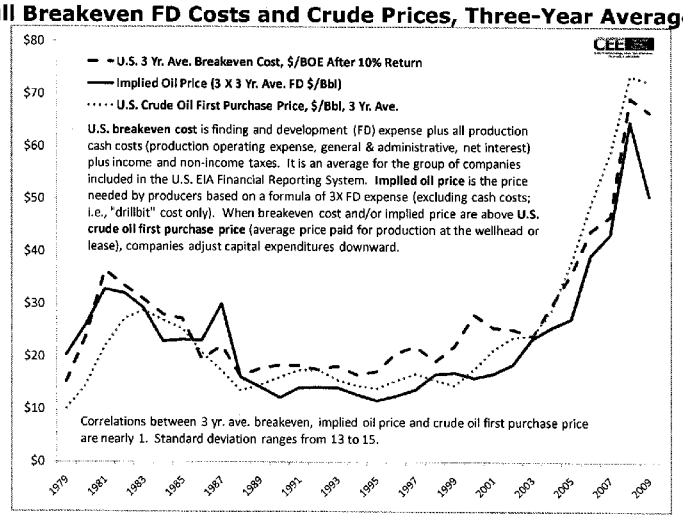
mand relative to available supplies and deliverability signals new CAPEX. As prices rise, CAPEX is increasingly attracted to the higher marginal cost projects. During oil and gas business cycles, as price falls below marginal cost incremental sources of supply begin to drop out of the market and the next cycle is generated.

Because of the inherent dynamics in these cycles, I view full breakeven finding and development (FD) costs as the essential driver for oil and gas prices. Full breakeven FD costs include both "drillbit" exploration and production costs and the cash operating costs of oil and gas production. FD of incremental supplies sets the marginal cost curve for the industry and provides the best clue to customers about the direction of prices. We have been, and will remain, in a rising FD cost environment, the consequence of many factors. One is the worldwide shift toward unconventional oil and gas resources involving more complex reservoirs and advanced drilling and production technologies, with all of the attendant environment and safety considerations. Another is increasing remoteness of "frontier" resources, presenting additional logistics management constraints for both field operations and field-to-market linkages. A third, important, factor is "government gatekeeping" with respect to resource access. In the U.S. we have our own particular land management practices and costs for securing mineral rights, whether in the private or public domains. Many sovereign governments elsewhere are reticent to provide clear, transparent, competitive rules for licensing exploration rights. The end result is a "cost push" that comes both as a consequence of timing (when new supplies will come online) and an uncertainty about volumes. There are many more factors.

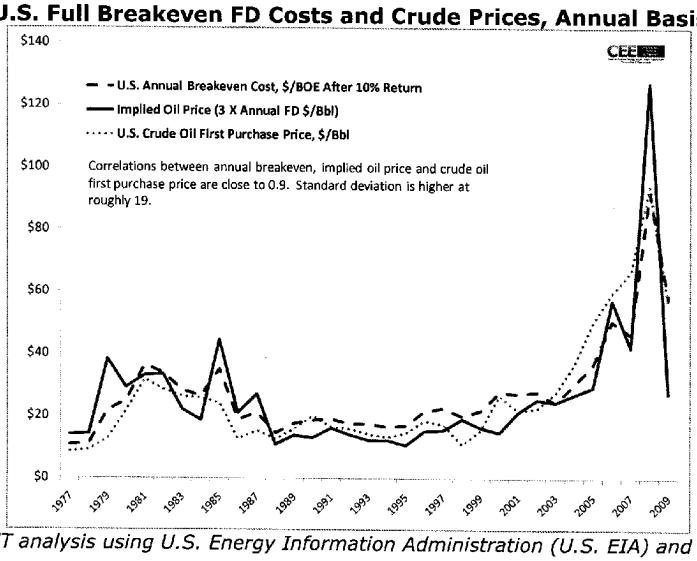
A conclusion is that as long as we have a high and rising marginal cost curve relative to strong and rising demand worldwide, price risk and uncertainty will remain substantial. Uncertainty about the future, "forward expectations", adds to variability.

The figures below illustrate the strong linkage between full breakeven FD costs expressed in dollars per barrel of oil equivalent (BOE), including both "drillbit" cost and cash costs associated with oil and gas production. The first chart provides a longer term view, using three-year averages. The second provides a shorter term illustration using annual data. In either case, full FD cost accounts for prevailing crude oil prices. The relatively small and periodic deviations up or down between the price that might be implied from FD costs and actual prices determined in the market reflect uncertainty and shifting expectations, including the force of geopolitical events.

U.S. Full Breakeven FD Costs and Crude Prices, Three-Year Average Basis

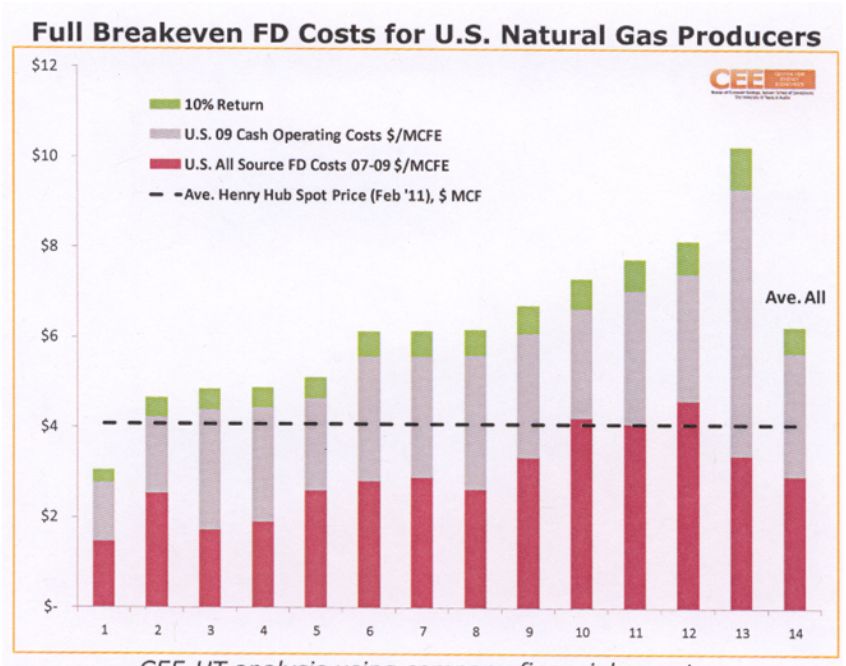


U.S. Full Breakeven FD Costs and Crude Prices, Annual Basis



CEE-UT analysis using U.S. Energy Information Administration (U.S. EIA) and indust

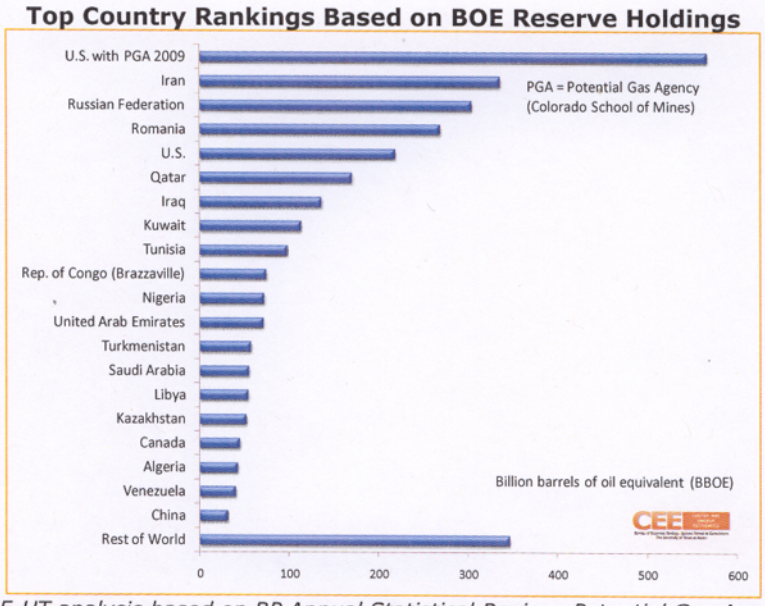
When or if CAPEX injections yield drilling and production success—as in the case of the U.S. shale gas plays—increased production volumes can result in prices falling below marginal costs. Shale gas and liquefied natural gas (LNG) investments were made in response to extraordinarily strong natural gas price signals. Given the current premium of crude oil to natural gas prices (nearly 22 to 1 in raw data, $/barrel and $/MMBtu or million British thermal units; nearly 4 to 1 in MMBtu equivalent terms) shale gas producers are in a flight to oil and liquids to sustain or restore profitability. In a 2007 paper for Oxford Institute for Energy Studies, I argued that U.S. natural gas prices could occupy a range of $3 to $5 per MMBtu through 2015. The preponderance of evidence always has been that the Lower 48 is a rich natural gas province. The question was always when and how would resources be converted to reserves and production, and with what cost and price conditions. Substantial LNG import terminal investments add to ***prodigious natural gas supply deliverability capacity for the U.S., a comparative advantage that requires careful thought and planning.***



CEE-UT analysis using company financial reports.

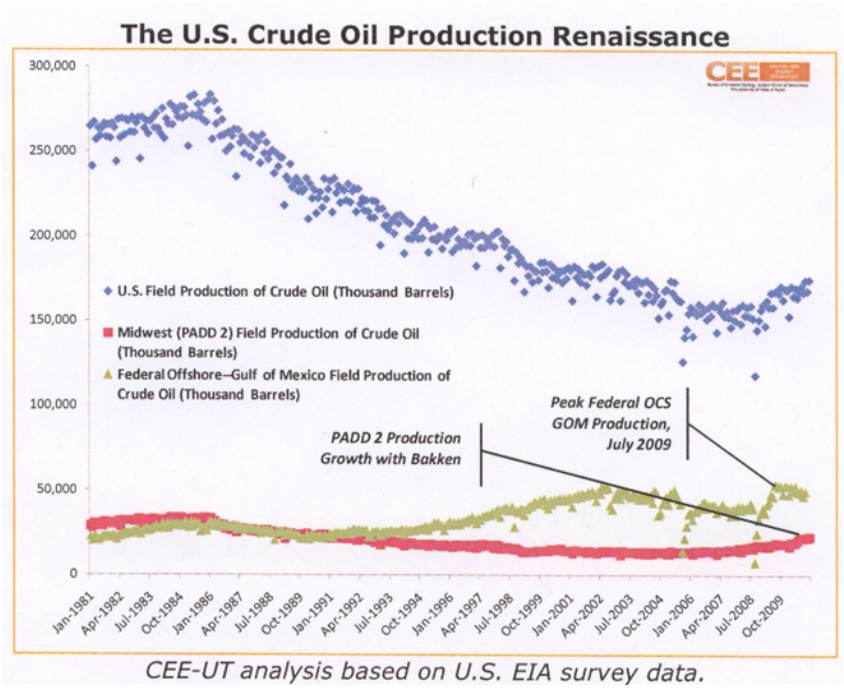
Full FD costs are a reflection of the CAPEX surge into new projects, the more complex unconventional resource plays that are attracting interest, and the ***interactions between price-driven investment trends and component costs.*** Increased CAPEX places a "call" on materials, like steel and other metals, and services used for oil and gas drilling. ***In turn, higher energy costs impact the cost structure of materials and service providers.*** Labor also is affected—the cost of skilled workers becomes more expensive. Interactions are complex with leads and lags. Costs are "sticky downward" and can quickly build up again—as they are doing now. ***Higher costs can eventually be offset by higher production volumes, resulting in lower unit (per barrel and per cubic foot) costs and prices.*** Indeed, the impact of higher natural gas production volumes is already in evidence in the three-year and annual full breakeven FD cost charts above. ***The 2009 $/BOE unit costs are substantially lower because of growth in oil and gas production volumes, but particularly the latter.***

Our abundant shale gas basins place the United States first among oil and gas producing countries (top chart below). For illustration purposes, I included the BOE equivalent of our shale gas resource estimates. Even without the shale gas plays, the U.S. would be a significant resource holder. ***We have a long history of successfully replenishing reserves to replace production—a key component of industry competitiveness that is absolutely essential for successful exploration and production businesses as well as for future generations of customers.*** The chart below also illustrates the impact of gatekeeping for resource access. What makes the U.S. different, what sets us apart from other natural resource rich nation states is our system of private property rights for minerals. The shale gas and many of the shale oil plays have been able to be launched largely because companies can negotiate directly with private land and mineral owners. In every other country, sovereign governments manage the subsoil as a patrimony for their citizens. It is important to recognize in these turbulent times that poor management of resource wealth is a consequence of faulty underlying systems and regimes rather than the other way around. Private property rights and "rule of law" are essential for economic growth and development. These linkages are well understood and documented in political economic literature. ***Protection of property rights in both the private and public domains is critical to sustaining domestic oil and gas industry and production competitiveness.***

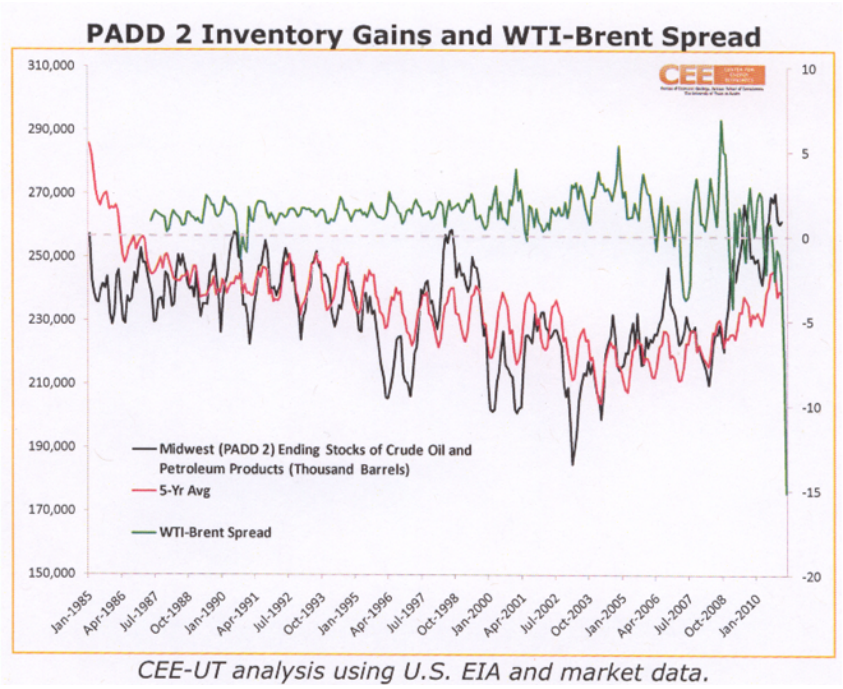


CEE-UT analysis based on BP Annual Statistical Review, Potential Gas Agency and industry reports.

Domestic oil and natural gas reserves and production have grown with new investments in key plays. Along with the shale gas basins, new prospective areas for oil resource plays are under development. The Bakken shale in the U.S. Midwest region is yielding substantial and growing volumes of oil from favorable reservoir layers within the shale. Oil and liquids are being targeted in formations like the Eagle Ford in Texas that had originally been magnets for shale gas CAPEX. Current thinking is that a number of locations around the Lower 48 could be prospective for significant new—if challenging to develop—oil finds. A key question for domestic industry and production competitiveness is forward strategy for the U.S. Gulf of Mexico (GOM). ***To retain the huge science and technology edge associated with our offshore industry, a workable and streamlined framework simply has to be achieved in a timely fashion.*** Already, CAPEX and research and development (R&D) spending is exiting the GOM for more attractive locations abroad. ***Safety and security cannot be compromised, but industry and government must move quickly to restore competitiveness.***

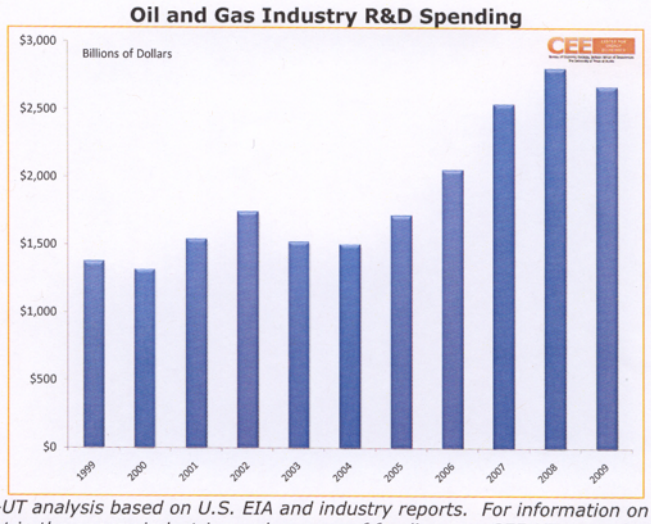


U.S. crude oil stocks have reached recent highs because of both production gains and slack demand. Domestic oil production gains in plays like the Bakken and shipments of oil to the U.S. from Canada have resulted in a price disparity not unlike the low price phenomenon for natural gas at Henry Hub. However, U.S. consumers are not able to benefit fully from lower U.S. crude oil prices. One of the main locations for oil aggregation, Cushing, Oklahoma, in Petroleum Administration Defense District (PADD) 2, is well above five-year norms in inventories (see chart below). Because the marker crude for this location, West Texas Intermediate (WTI, also the crude for the main traded futures contract) is landlocked with insufficient pipeline takeaway capacity, the "spread" between WTI and Brent (North Sea) has widened to historic differentials. Refiners that have access to WTI are benefitting from a lower cost domestic crude price than refiners that only have access to imports. Consumers served by refiners with WTI supplies are able to benefit. But the overall market is not impacted by cheaper U.S. crude oil. This disparity points to a distinct need: as new domestic and Canadian plays and projects yield increased production and growing reserves, new infrastructure is needed to ensure deliverability into the market. Already, major natural gas pipeline and storage investments are underway to support the emerging shale gas plays. The same need must be met for crude oil and petroleum product shipments. ***"Debottlenecking" the oil and gas transportation and storage system requires transparent, sensible, and timely certification of facilities—in short, "access" for right of way to build infrastructure is just as critical as access to oil and gas resources in order to sustain domestic industry and production competitiveness.*** Debottlenecking would have sustained and long term influence on the energy marketplace. Communication on debottlenecking and meaningful strategies for GOM production and other key issues would be much more impactful than using the Strategic Petroleum Reserve (SPR).



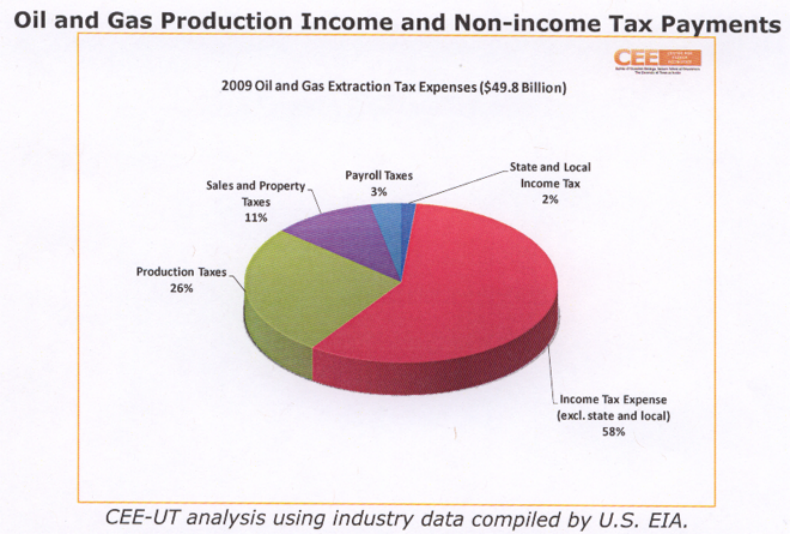
- *Many socioeconomic benefits are derived from domestic resource production and utilization.*

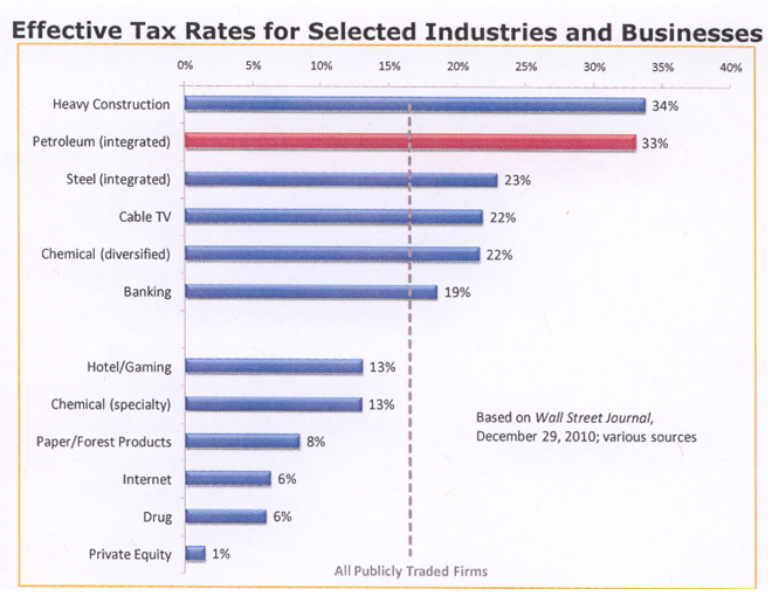
Sustaining these socioeconomic benefits will require a competitive tax and business environment. Total industry employment growth ***averaged six percent per year*** from early 2000s until recently with recession and soft natural gas prices. ***In many states with established oil and gas production businesses, economic conditions have been somewhat better than for the nation as a whole.*** Employment and other economic benefits are derived not just from direct oil and gas industry activity but many indirect and ancillary activities as well. After many years of slack spending, R&D investments by industry (which provides nearly all R&D investment in oil and gas) surged, a reflection of the deep technology and human resource needs in the shale oil and gas plays, deepwater GOM and other frontiers. ***R&D spending is a vital component of competitiveness and generates a wealth of connected economic benefits.***



CEE-UT analysis based on U.S. EIA and industry reports. For information on R&D investment in the energy industries and sources of funding, see CEE-UT co-authored reports http://www.api.org/aboutoilgas/upload/Emerging_Technology_Report_Oct_2008.pdf and http://www.api.org/ehs/climate/new/upload/T2_Investments_in_GHG_Mitigating_Tech_6_2009.PDF.

Another major socioeconomic benefit derived from domestic industry activity is tax payments. As shown in the first chart below (for exploration and production only), the oil and gas industry incurs both income and non-income tax expenses including Federal, State and Local income tax payments; production taxes (severance taxes and other); sales and property taxes; and payroll taxes. In addition, beneficiaries of domestic industry payments for surface access and mineral rights (royalties and bonuses) incur their own and separate tax expenses. Companies that provide materials and services to the industry contribute separate income, payroll and other non-income tax streams. Finally, companies with foreign operations provide large and extensive tax streams. Tax payments fluctuate with commodity prices and profitability; tax payments for 2009 were lower than previous years. When producers face operating losses, as many do now in the face of low natural gas prices relative to full breakeven FD cost, tax payments are nil. ***Importantly, the oil and gas industry is typically the highest effective tax payer among U.S. corporate contributing roughly 33 percent of total U.S. federal tax take (and ignoring all other tax expense streams).***



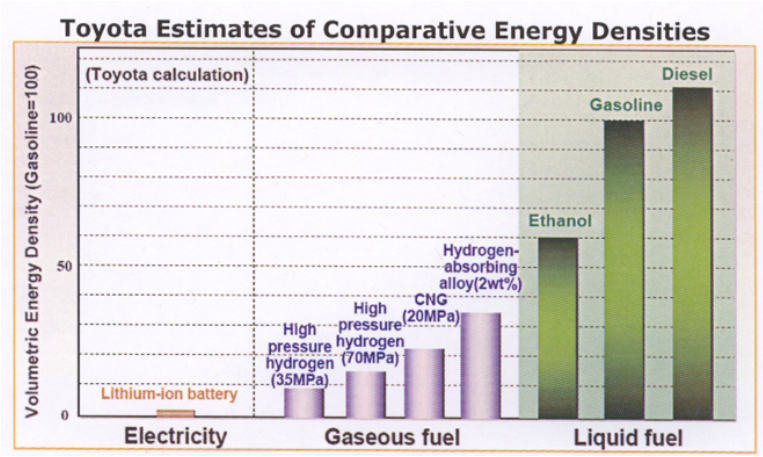


Currently, consumer pocketbooks are benefitting significantly from lower natural gas prices, which help to offset higher gasoline costs. ***We learned during the 2002–2008 rise in oil prices that the most heavily affected energy customers are those for whom energy costs are a larger share of their disposable incomes.*** Consumer and household debt are declining as Americans work to bolster their disposable incomes and build post-recession resiliency. ***Competitive energy supplies and prices help enormously in household budget management. Consequently, a distinct and important benefit of domestic industry and production activity is felt right at home and in the pocketbook of every energy consumer and customer.*** The same process needs to happen for the U.S. economy. ***Prevailing views are that U.S. sensitivity to higher oil and petroleum fuels prices is a consequence of our own fiscal house not being in order.*** To the extent that we continue to incur deficits in our current (international trade) ac-

counts and deficits and debt in our national fiscal accounts, we are much more likely to suffer consequences. Strong connections exist between oil prices, the relative value of our dollar, inflation, interest rates and fiscal and monetary policies associated with these measures. Competitiveness of the domestic oil and gas industry is tied to overall health of the U.S. pocketbook and economy. Likewise, competitive domestic industry and production can make direct contributions toward improved economic and fiscal health by making our energy system more resilient, reliable and cost effective.

- *Gasoline is the highest energy density system—with substantial consequences for prices and forward strategies.*

Demand for crude oil is derived from our demand for the useful products we make from crude—gasoline and other fuels and materials. At a time when calls are increasing to mandate shifts away from gasoline and oil-based fuels, we should be cautious about expected benefits and unintended consequences. The chart below, provided by Toyota, offers a vivid illustration of the challenges in diversifying transportation fuels and systems as well as for meeting environment targets.



Lower energy density fuels and systems pose great hurdles for commercialization. Not only do they yield less energy delivered for "work", they also require comparatively larger resource inputs. Together, these constraints mean fewer environmental and economic benefits than are achieved when higher energy density transport fuels and systems are deployed. Lithium-ion battery designs and similar approaches not only rank lowest in energy density, but also bear many difficulties when it comes to securing the additional raw materials to manufacture and replace batteries and other components. Plug in hybrid and other electric vehicle concepts that would rely on renewable energy systems are further complicated by the low energy density characteristics of renewable energy technologies and resources. Emerging research using life-cycle measurements and other full cost analysis has introduced many questions into conventional thinking about alternative energy designs.

A current argument is that abundant domestic natural gas supplies should be utilized for vehicle transport (CNG or compressed natural gas as shown in the Toyota chart above). The current steep discount for natural gas relative to petroleum products has spurred both thinking and action. Natural gas vehicles or NGVs face the low energy density challenge for commercialization. More success can be gained with truck fleets so long as engine performance is not compromised. An alternative question also could be raised: should natural gas be used to reinvigorate the U.S. industrial base? This debate is currently underway in the National Petroleum Council's study on use of domestic oil and gas resources to achieve low carbon objectives. ***A natural gas-led industrial and manufacturing renaissance in the U.S. would create enormous socioeconomic benefits as well as helping to "right the ship" of the U.S. economy by increasing exports, boosting trade flows and contributing to fiscal recovery. As with domestic oil and gas industry competitiveness, a U.S. industrial renaissance would require favorable business and economic conditions and sensible policy and regulatory approaches for success.***

- *Many other options exist to seize control of the future and manage oil price risk and uncertainty.*

The energy density challenge should send a strong message for R&D: it would be much wiser to consolidate spending and invest in basic materials science research rather than alternative technology giveaways. The Federal system of energy R&D could be overhauled with much more productive approaches. Pre-commercial and emerging technologies that have benefitted from Federal seed funds could be auctioned instead of supported with additional public financing. Market tests of new technologies could happen more quickly this way. And while the focus of this hearing and deliberations are on our domestic oil and gas industry and production, ***it is important that we protect free trade and encourage free trade in oil and gas and other critical raw material commodities.*** As I stated earlier, bad political systems lead to bad results from resource wealth. Resource rich nations need to produce and sell and invest their returns wisely, preferably through private capital, in economic development and diversification. Wealth from resource sales may feed information technologies and democratization.

The CHAIRMAN. Thank you very much, Dr. Foss. Next, we will go to Mr. Guy Caruso, Senior Advisor, Energy and National Security Center for Strategic and International Studies. Mr. Caruso, you are recognized for five minutes.

STATEMENT OF GUY F. CARUSO, SENIOR ADVISOR, ENERGY AND NATIONAL SECURITY, CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES

Mr. CARUSO. Thank you, Mr. Chairman, and good morning all Members of the Committee, and I thank you for this opportunity to give my views on the global oil market and the implications for United States energy policy.

As Dr. Newell mentioned, 2010 was a very strong year in global oil markets. So we go into this period of now political unrest in North Africa with a fairly strong market.

We saw prices break out of a range of $75 to $80 a barrel, which they were in most of last year, to over $90 even before the unrest began. We saw most forecasters expecting 2011 to be a year in which prices would challenge or would reach the $90 to $100 range.

So this is a strong market we are in, and I think we now have the situation in Libya, where about a million barrels a day has been disrupted. Last year, OPEC already began increasing its production to meet increased demand. Non-OPEC supplies were increasing, and that is going to continue.

Most forecasters now believe that given the uncertainty about Libya, and whether it will spread, are now looking to maybe add $10 or $20 to that price. We have seen already between $5 and $15, depending on your views, of a fear premium that is in the oil market.

So I think that despite these demonstrations the most important concern is will this spread to Algeria, to where demonstrations have existed, and even to places like Saudi Arabia, which so far has been spared any serious disruption.

We have the spare capacity that is sufficient to meet this one million barrel a day or so decline in Libya. But if it spread, we would most likely require some further action, and as you know the President has said that his Administration is prepared to use the SPR should that become necessarily.

And since the market is adequately supplied right now, I think that is the proper course, but continue monitoring, and continue

working with our partners within the International Energy Agency (IEA) and others in the oil producing community is probably the right thing to be doing right now.

However, the SPR is a powerful tool should this disruption increase, and it could be used to manage the expectations of further risk which is out there, and should the disruption expand, it may well be necessary in coordination with our partners in the International Energy Agency to use the SPR.

OPEC countries have said that they are prepared to add barrels to the market, and Saudi Arabia has already done that. Over the longer term, of course, we have many of the issues that have already been mentioned by the opening statements here on both sides of the equation, reducing demand through efficiency, and increasing supply.

And I think it is important that the United States energy policy recognize the long-term nature of the investments on both sides of the equation. Michelle outlined some of them on the supply side, and on the demand side, there are a number of things that I think we need to keep doing, especially improving efficiency in automobiles through policies like the CAFE standards and other incentives.

Certainly using market mechanisms to incorporate the externalities of both security and environment into the price that we pay, facilitating development of natural resources, and that is an important work of this Committee.

And I think that the infrastructure needed to develop things like Balkan that Brenda Pierce mentioned was such a potentially large resource for domestic oil, and even gas. It is important that those facilities be encouraged.

Things like imports from Canada should also be encouraged, as well as continuing to improve on the amount of money spent for R&D to lead to the technology and innovation that both of your opening statements indicated would be required.

There are many other specifics, but I would like to leave that for the Q&A, and once again, thank you for this opportunity to be here today.

[The prepared statement of Mr. Caruso follows:]

Statement of Guy F. Caruso, Senior Advisor, Energy and National Security, Center for Strategic and International Studies

Mr Chairman, members of the committee, thank you for the opportunity to present my views on the current global oil market situation and the implications for U.S. energy and economic policy.

My current position is senior advisor to the Energy and National Security program at the Center for Strategic and International Studies (CSIS). CSIS is a bipartisan, nonprofit organization headquartered in Washington, DC. CSIS does not take specific policy positions: accordingly all views expressed in this testimony are my own.

The Global Oil Market Situation and Outlook

The global oil market strengthened considerably in the latter part of 2010 as a result of the improving economic conditions in many developed countries such as the United States and among European Union members and strong economic growth in many emerging economies such as China and India.

As a result world oil demand increased by 2.8 million barrels per day in 2010 (mmb/d) bringing world oil demand to about 88 mmb/d. This was the second largest year on year increase in the last 30 years. Although the increase was from a recession induced lower demand in 2009 strong global demand placed upward pressure

on crude oil and refined product prices. Crude oil prices (WTI and Brent) were mostly in the $75–85 per barrel range for much of 2010 until late 2010 and early 2011 when prices moved into the $90–100 per barrel range on the strength of demand for gasoline and diesel oil. Gasoline prices in the U.S. averaged $2.78/gallon in 2010 and had risen to $3.10/gallon in January 2011. The current average is more than $3.50/gallon.

Oil supplies have responded to higher prices. The Organization of Petroleum Exporting Countries (OPEC) members led by increases in Saudi Arabia ended 2010 at its highest output in two years. Non-OPEC countries such as, the U.S., Canada, Russia, China and Brazil, also increased production in 2010. It is important to note that other liquids from oil sands, biofuels and natural gas made important contributions to these supply increases.

Thus the political unrest in North Africa and the Middle East comes at a time when the global oil market is adequately supplied with the prospect of steady demand increases. Prior to the political turmoil in the region the consensus among organizations and institutions which project oil market supply, demand and price was for a moderate increase in price to the $90–100 per barrel range for 2011. Increased uncertainty has raised the consensus projection by about $10–20 per barrel. As the March EIA short-term energy outlook indicates, there is a moderate risk that prices will rise well above the consensus.

With the notable exception of Libya, demonstrations and civil unrest have not significantly affected oil production or major transit routes such as the Suez Canal.

Libyan oil exports are reported to have been substantially reduced from their pre-disruption rate of about1.3 mmb/d. This represents about 2% of world oil production.

Global spare crude oil production capacity (as well as refining capacity) and healthy worldwide inventories are more than adequate to offset the loss of 1.3mmb/d. Saudi Arabia's spare capacity alone is sufficient to offset the volumetric loss of Libyan oil. However Libya's crude is of very high quality and replacement with Saudi crude would come at increased refinery and logistical costs. Nevertheless the combination of alternative crude oil supplies, product inventories and excess refining capacity can make this replacement possible at some loss of refinery efficiency.

The critical uncertainty for the global oil market is whether or not supply disruptions will spread. Demonstrations in moderately sized oil producing countries such as Algeria and Yemen seem to have subsided. Markets react to uncertainty by bidding up prices and that clearly has happened in the global oil market. The "risk premium" appears to be about $5–15 per barrel compared with pre-disruptions expectations.

Oil is a truly fungible global commodity and electronic trading means instantaneous reaction to events effecting supply and demand. Therefore a disruption anywhere is a disruption everywhere transmitted through the price mechanism. The U.S. imports very little Libyan oil but the economic damage from higher prices is the same as in Italy which imports a substantial amount of oil from Libya.

The most recent example of globalized energy markets are the tragic events unfolding in Japan as we meet today. The severe damage to Japan's nuclear capacity, oil refinery capacity and liquefied natural gas receiving capacity has boosted prices for refined oil products and natural gas. Market expectations are that Japan will require increased imports of fuel oil and LNG in the coming months. Preliminary estimates indicate potential increased demand of 100,000 to 200,000 b/d.

In the very short-term, the challenge to U.S. policymakers is to mitigate the possible economic damage of higher energy prices and to be prepared for the uncertainty of a potentially worse supply disruption. In the medium to longer term, the challenges are broader and deeper as we face a global energy system in major transition. Energy demand is shifting away from the industrialized countries to emerging economies. Major new supplies of oil will require massive investments increasingly dominated by national oil companies which have different objectives and ways of operating. Emerging new players are flexing their political and economic muscle. In short, the above the ground risks to adequate, affordable and timely oil supplies are increasing.

Implications for U.S. Energy and Economic Policy

In the short term, the main policy measure available to the U.S. government is use of the Strategic Petroleum Reserve (SPR). The SPR contains more than 720 million barrels of crude oil. Within two weeks of a Presidential decision oil could be available to the market at a maximum rate of more than 4 mmb/d.

President Obama and his advisors have indicated that they are prepared to release oil from the SPR should that become necessary. The current assessment from the administration is that the market is adequately supplied and that they will be

closely monitoring the situation along with our partners in the International Energy Agency and in key oil exporting countries.

I believe that is the correct course of action at this time.

The U.S. is a member of the International Energy Agency (IEA) along with 28 other oil consuming countries. The IEA has a Coordinated Early Response Mechanism (CERM) which could be activated quickly. IEA countries, including the U.S., hold 1.6 billion barrels of government controlled inventories with a drawdown capability of 8–10mmb/d. The IEA system was used successfully after the Iraqi invasion of Kuwait and in the aftermath of Hurricane Katrina.

The IEA governing board met in late February to assess the developments in North Africa. The IEA Executive Director declared that the system is ready to be activated immediately should that be necessary.

Oil producers recognize that high and rising oil prices could damage the fragile global economy and limit demand for their oil exports in the medium and long term. Saudi Arabia has indicated a willingness to increase production to insure that markets are adequately supplied. Saudi Arabia is estimated to have 3 to 4 mmb/d of spare capacity and to have already increased output to about 9 mmb/d. In 2010 Saudi production was estimated at 8.1mmb/d.

In the medium and longer term, U.S. energy policy would benefit from a comprehensive approach in order to cushion our economy from disruptions and the longer term geopolitical risks in this precarious energy landscape. The comprehensive approach requires a policy that recognizes the long term nature of the transition from fossil fuels to alternatives. A transformation is already underway, however, due to financial and technology limitations, a large existing capital stock that runs on fossil fuels and the lack of infrastructure to support a new system, that transition will take at least several decades. In sum there is no scalable alternative available today to replace our current system.

In the meantime, our policies should be directed at promoting efficiency (reducing demand) and increasing supply of current fuel choices with effective environmental safeguards. Concurrently we need to promote technological development and innovation through research and development.

The following are some specific examples to facilitate reduced demand and increased supply in the medium and long term:

Demand side examples:

- Improved vehicle efficiency standards;
- Incentives for highly efficient vehicles such as hybrids (including plug-ins);
- Incentives for natural gas fleet vehicles;
- Market mechanisms which include externalities in the cost of energy such as a carbon tax.

Supply side examples:

- Facilitate development of domestic resources such as shale gas and tight oil (Bakken) through infrastructure expansion;
- Accelerate approval of drilling permits in the Gulf of Mexico with effective oversight;
- Facilitate secure sources of energy imports from Canada;

These are just a few of the many examples which can promote a more energy efficiency economy, enhance secure energy supplies and increase environmental sustainability for the long term.

Mr Chairman, members of the committee, this concludes my testimony. Thank you.

The CHAIRMAN. Thank you very much, Mr. Caruso, and last, we will go to Mr. Rusco, Director of Natural Resources and Environment, for the Government Accountability Office. Mr. Rusco, you are recognized for five minutes.

STATEMENT OF MR. FRANK RUSCO, DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, GOVERNMENT ACCOUNTABILITY OFFICE

Mr. RUSCO. Thank you, Mr. Chairman, and Members of the Committee. I am pleased to speak with you today about the Department of the Interior's management of oil and gas produced on Federal lands and waters, in the context of the economic impact of these domestic resources.

The Department of the Interior manages the leasing of Federal lands and waters for oil and gas exploration, development, and production. These activities provide an important domestic source of energy for the United States, create jobs in the oil and gas industry, and raise revenues that are shared between Federal, State, and tribal governments.

In general, oil and gas exploration and development activity has been highly correlated with oil and gas prices. Over the past decade leasing and drilling activity on Federal lands and waters, and other lands, has generally increased.

However, during this same period, Interior has found it difficult to strike the right balance between encouraging domestic oil and gas production on one hand, and on the other maintaining operational and environmental safety, and providing reasonable assurance that the public's financial and other interests are being protected.

I will focus my remaining remarks on how Interior can improve its management practices, and implementation of laws and regulations to provide reasonable assurance that the public interest and the environment are protected, and that development of Federal lands for oil and gas can continue in a timely and efficient manner to contribute to the Nation's economic growth and stability.

Interior has struggled to hire, train, and retain enough people with the right skills to keep up with its regulatory responsibilities. For example, in 2005, we reported that BLM staff could not keep up with increased applications to drill.

The agency ended up pulling staff that were hired to do National Environmental Protection Act reviews to instead process applications to drill. In 2010, we found that BLM staff were unable to keep up with an increased workload associated with public protests of proposed leases, and that as a result these lease approvals were late, which created uncertainty and additional costs for oil and gas companies.

Improving Interior's human capital practices and workforce planning could lead to better protection of the environment, as well as more efficient and timely issuance of leases.

Interior does not have a centralized and coordinated process for approving use of new technologies on Federal oil and gas leases. At best this slows down the process for approving new technologies that could improve oil and gas production, and at worst could prevent good technologies from being deployed, or allow inappropriate technologies to be used.

Further, Interior has not been consistent across field offices in completing production verification inspections and oversight, leading to uncertainty about whether the public is getting its share of oil and gas revenue.

Creating more consistent practices and interpretations of laws and regulations could benefit both the public and oil and gas companies.

Revenue collection is a broader concern. In 2008, we reported that Interior had not comprehensively evaluated its revenue collection scheme in over 25 years, despite significant changes in the industry.

The current revenue collection scheme is complex, including payments from companies such as bonuses paid for the right to develop a lease, royalties for any oil and gas found, corporate profit and other taxes, and land rents, as well as subsidies from the government to oil and gas companies, including royalty relief, tax credits, and favorable depreciation schedules.

Interior is currently undertaking a comprehensive study of this system, and we hope that there will be ways to simplify and improve this complex scheme so that the public can have confidence that it is receiving an appropriate share of revenue, and that oil and gas companies continue to view the United States as a desirable place to do business.

In conclusion, regulation and management of Federal oil and gas exploration, development, and production, should have two important goals. One is to protect the financial and other interests of the public, and provide confidence that oil and gas development is safe, and environmentally sound; and two, to reduce uncertainty in any unnecessary regulatory burden on the oil and gas industry.

Striking the appropriate balance between these two goals is important so that the country can continue to enjoy the economic and strategic benefits of domestic oil and gas production. Thank you. I will be glad to answer any questions that you may have.

[The prepared statement of Mr. Rusco follows:]

Statement of Frank Rusco, Director, Natural Resources and Environment, United States Government Accountability Office

Chairman Hastings, Ranking Member Markey, and Members of the Committee:

We appreciate the opportunity to participate in this hearing to discuss domestic oil and gas production in light of rising gas prices and the country's continued employment challenges. American families, communities, and businesses all depend on reliable and affordable energy for their health, safety, and livelihoods. Energy—including oil and gas—is crucial to many aspects of peoples' daily lives, including transportation, communication, food production, medical services, and heating and air-conditioning. Since December 2010, oil prices have been increasing, topping $100 per barrel in recent weeks. The most recent spike in oil prices has been attributed to political unrest in the Middle East—a major exporter of oil. In part because the United States currently imports approximately 51 percent of its oil each year for domestic consumption, many have called for increasing domestic production of oil and gas, including from resources located on leased federal lands and waters. Currently, oil produced from federal offshore leases accounts for approximately 30 percent of all domestic production, while oil produced from federal onshore leases accounts for approximately 6 percent. Oil and gas produced from federal leases is also an important source of revenue for the federal government. In fiscal year 2009, the federal government collected more than $9 billion in revenues from oil and gas produced from federal lands and waters, purchase bids for new oil and gas leases, and annual rents on existing leases. This makes revenues from federal oil and gas one of the largest nontax sources of federal government funds.

The U.S. Department of the Interior plays an important role in managing and providing oversight of federal oil and gas resources. The explosion onboard the Deepwater Horizon drilling rig and subsequent fire and catastrophic oil spill in the Gulf of Mexico in April 2010 further emphasized the importance of Interior's management of permitting and inspection processes to ensure operational and environmental safety. Under its current organizational structure, Interior's bureaus are responsible for regulating the processes that oil and gas companies must follow when leasing, drilling, and producing oil and gas from federal leases. The bureaus are also responsible for ensuring that companies comply with all applicable requirements. Specifically, Interior's Bureau of Land Management (BLM) oversees onshore federal oil and gas activities; the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE)—created in May 2010—oversees offshore oil and gas activities; and the newly established Office of Natural Resources Revenue (ONRR) is responsible for collecting royalties on oil and gas produced from both onshore and off-

shore federal leases. Prior to the creation of BOEMRE, the now-abolished Minerals Management Service's (MMS) was charged with administering offshore federal leases and managing the collection of royalties for onshore and offshore leases; MMS's Offshore Energy and Minerals Management (OEMM) oversaw offshore oil and gas activities, while its Minerals Revenue Management (MRM) was responsible for royalty collections from both onshore and offshore federal leases.

Interior's management of federal oil and gas activities is critically important and has been a focus of a large body of our work that has found numerous weaknesses and challenges that need to be addressed. In response to our recommendations, Interior has taken steps to address material weaknesses and modify its practices for managing oil and gas resources, but as of December 2010, many recommendations remained unimplemented. Accordingly, we designated Interior's management of federal oil and gas resources as a high risk issue in February 2011.[1]

In this context, my testimony today discusses findings from our past work on five broad areas: (1) the ongoing reorganization of Interior's bureaus dealing with oil and gas functions, (2) the challenges Interior faces balancing timely and efficient oil and gas development with environmental stewardship responsibilities, (3) Interior's management of human capital, (4) Interior's collection of oil and gas revenues, and (5) Interior's role in the development of existing leases. This statement is based on our extensive body of work on Interior's oil and gas leasing and royalty collection programs issued from September 2008 through February 2011. We conducted the performance audit work that supports this statement in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to produce a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our statement today. Additional information on our scope and methodology is available in each issued product.

Potential Challenges with Reorganization of Oil and Gas Functions

Interior's ongoing reorganization of bureaus with oil and gas functions will require time and resources, and undertaking such an endeavor while continuing to meet ongoing responsibilities may pose new challenges. Historically, BLM managed onshore federal oil and gas activities, while MMS managed offshore activities and collected royalties for all leases. In May 2010, the Secretary of the Interior announced plans to reorganize MMS into three separate bureaus. The Secretary stated that dividing MMS's responsibilities among separate bureaus would help ensure that each of the three newly established bureaus have a distinct and independent mission. Interior recently began implementing this restructuring effort, transferring offshore oversight responsibilities to the newly created BOEMRE and revenue collection to ONRR. Interior plans to continue restructuring BOEMRE to establish two additional separate bureaus—the Bureau of Ocean and Energy Management, which will focus on leasing and environmental reviews, and the Bureau of Safety and Environmental Enforcement, which will focus on permitting and inspection functions.

While this reorganization may eventually lead to more effective operations, we have reported that organizational transformations are not simple endeavors and require the concentrated efforts of both leaders and employees to realize intended synergies and accomplish new organizational goals.[2] In that report, we stated that for effective organizational transformation, top leaders must balance continued delivery of services with transformational activities. Given that, as of December 2010, Interior had not implemented many recommendations we made to address numerous weaknesses and challenges, we are concerned about Interior's ability to undertake this reorganization while (1) providing reasonable assurance that billions of dollars of revenues owed to the public are being properly assessed and collected and (2) maintaining focus on its oil and gas oversight responsibilities.

Challenges of Balancing Oil and Gas Development with Environmental Stewardship

We have reported that Interior has experienced several challenges in meeting its obligations to make federal oil and gas resources available for leasing and development while simultaneously meeting its responsibilities for managing public lands for other uses, including wildlife habitat, recreation, and wilderness. In January 2010, we reported that while BLM requires oil and gas operators to reclaim the land they disturb and post a bond to help ensure they do so, not all operators perform such

[1] GAO, *High-Risk Series: An Update,* GAO–11–278 (Washington, D.C.: February 2011).

[2] GAO, *Results-Oriented Cultures: Implementation Steps to Assist Mergers and Organizational Transformations,* GAO–03–669 (Washington, D.C.: July 2, 2003).

reclamation.[3] In general, the goal is to plug the well and reclaim the site so that it matches the surrounding natural environment to the extent possible, allowing the land to be used for purposes other than oil and gas production, such as wildlife habitat. If the bond is not sufficient to cover well plugging and surface reclamation, and there are no responsible or liable parties, the well is considered "orphaned," and BLM uses federal dollars to fund reclamation. For fiscal years 1988 through 2009, BLM spent about $3.8 million to reclaim 295 orphaned wells, and BLM has identified another 144 wells yet to be reclaimed.

In addition, in a July 2010 report on federal oil and gas lease sale decisions in the Mountain West, we found that the extent to which BLM tracked and made available to the public information related to protests filed during the leasing process varied by state and was generally limited in scope.[4] We also found that stakeholders—including environmental and hunting interests, and state and local governments protesting BLM lease offerings—wanted additional time to participate in the leasing process and more information from BLM about its leasing decisions. Moreover, we found that BLM had been unable to manage an increased workload associated with public protests and had missed deadlines for issuing leases. In May 2010, the Secretary of the Interior announced several departmentwide leasing reforms that are to take place at BLM that may address these concerns, such as providing additional public review and comment opportunity during the leasing process.

Further, in March 2010, we found that Interior faced challenges in ensuring consistent implementation of environmental requirements, both within and across MMS's regional offices, leaving it vulnerable with regard to litigation and allegations of scientific misconduct.[5] We recommended that Interior develop comprehensive environmental guidance materials for MMS staff. Interior concurred with this recommendation and is currently developing such guidance.

Finally, in September 2009, we reported that BLM's use of categorical exclusions under Section 390 of the Energy Policy Act of 2005—which authorized BLM, for certain oil and gas activities, to approve projects without preparing new environmental analyses that would normally be required in accordance with the National Environmental Policy Act—was frequently out of compliance with the law and BLM's internal guidance.[6] As a result, we recommended that BLM take steps to improve the implementation of Section 390 categorical exclusions through clarification of its guidance, standardizing decision documents, and increasing oversight.

Human Capital Challenges

We have reported that BLM and MMS have encountered persistent problems in hiring, training, and retaining sufficient staff to meet Interior's oversight and management responsibilities for oil and gas operations on federal lands and waters. For example, in March 2010, we reported that BLM and MMS experienced high turnover rates in key oil and gas inspection and engineering positions responsible for production verification activities.[7] As a result, Interior faces challenges meeting its responsibilities to oversee oil and gas development on federal leases, potentially placing both the environment and royalties at risk. We made a number of recommendations to address these issues. While Interior's reorganization of MMS includes plans to hire additional staff with expertise in oil and gas inspections and engineering, these plans have not been fully implemented, and it remains unclear whether Interior will be fully successful in hiring, training, and retaining these additional staff. Moreover, the human capital issues we identified with BLM's management of onshore oil and gas continue, and these issues have not yet been addressed in Interior's reorganization plans.

Concerns over Revenue Collection

Federal oil and gas resources generate billions of dollars annually in revenues that are shared among federal, state, and tribal governments; however, we found Interior may not be properly assessing and collecting these revenues. In September

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[3] GAO, *Oil and Gas Bonds: Bonding Requirements and BLM Expenditures to Reclaim Orphaned Wells,* GAO–10–245 (Washington, D.C.: Jan. 27, 2010).

[4] GAO, *Onshore Oil and Gas: BLM's Management of Public Protests to Its Lease Sales Needs Improvement,* GAO–10–670 (Washington, D.C.: July 30, 2010).

[5] GAO, *Offshore Oil and Gas Development: Additional Guidance Would Help Strengthen the Minerals Management Service's Assessment of Environmental Impacts in the North Aleutian Basin,* GAO–10–276 (Washington, D.C.: Mar. 8, 2010).

[6] GAO, *Energy Policy Act of 2005: Greater Clarity Needed to Address Concerns with Categorical Exclusions for Oil and Gas Development under Section 390 of the Act,* GAO–09–872 (Washington, D.C.: Sept.16, 2009).

[7] GAO, *Oil and Gas Management: Interior's Oil and Gas Production Verification Efforts Do Not Provide Reasonable Assurance of Accurate Measurement of Production Volumes,* GAO–10–313 (Washington, D.C.: Mar. 15, 2010).

2008, we reported that Interior collected lower levels of revenues for oil and gas production in the deep water of the U.S. Gulf of Mexico than all but 11 of 104 oil and gas resource owners whose revenue collection systems were evaluated in a comprehensive industry study—these resource owners included other countries as well as some states.[8] However, despite significant changes in the oil and gas industry over the past several decades, we found that Interior had not systematically reexamined how the U.S. government is compensated for extraction of oil and gas for over 25 years. GAO recommended Interior conduct a comprehensive review of the federal oil and gas system using an independent panel. After Interior initially disagreed with our recommendations, we recommended that Congress consider directing the Secretary of the Interior to convene an independent panel to perform a comprehensive review of the federal system for collecting oil and gas revenue. More recently, in response to our report, Interior has commissioned a study that will include such a reassessment, which, according to officials, the department expects will be complete in 2011. The results of the study may reveal the potential for greater revenues to the federal government.

We also reported in March 2010 that Interior was not taking the steps needed to ensure that oil and gas produced from federal lands was accurately measured.[9] For example, we found that neither BLM nor MMS had consistently met their agency goals for oil and gas production verification inspections. Without such verification, Interior cannot provide reasonable assurance that the public is collecting its share of revenue from oil and gas development on federal lands and waters. As a result of this work, we identified 19 recommendations for specific improvements to oversight of production verification activities. Interior generally agreed with our recommendations and has begun implementing some of them.

Additionally, we reported in October 2010 that Interior's data likely underestimated the amount of natural gas produced on federal leases, because some unquantified amount of gas is released directly to the atmosphere (vented) or is burned (flared).[10] This vented and flared gas contributes to greenhouse gases and represents lost royalties. We recommended that Interior improve its data and address limitations in its regulations and guidance to reduce this lost gas. Interior generally agreed with our recommendations and is taking initial steps to implement these recommendations.

Furthermore, we reported in July 2009 on numerous problems with Interior's efforts to collect data on oil and gas produced on federal lands, including missing data, errors in company-reported data on oil and gas production, and sales data that did not reflect prevailing market prices for oil and gas.[11] As a result of Interior's lack of consistent and reliable data on the production and sale of oil and gas from federal lands, Interior could not provide reasonable assurance that it was assessing and collecting the appropriate amount of royalties on this production. We made a number of recommendations to Interior to improve controls on the accuracy and reliability of royalty data. Interior generally agreed with our recommendations and is working to implement many of them, but these efforts are not complete, and it is uncertain at this time if the efforts will fully address our concerns.

Development of Existing Leases

In October 2008, we reported that Interior could do more do encourage the development of existing oil and gas leases.[12] Our review of Interior oil and gas leasing data from 1987 through 2006 found that the number of leases issued had generally increased toward the end of this period, but that offshore and onshore leasing had followed different historical patterns. Offshore leases issued peaked in 1988 and in 1997, and generally rose from 1999 through 2006. Onshore leases issued peaked in 1988, then rapidly declined until about 1992, and remained at a consistently low level until about 2003, when they began to increase moderately. We also analyzed 55,000 offshore and onshore leases issued from 1987 through 1996 to determine how development occurred on leases that had expired or been extended beyond their pri-

[8] GAO, *Oil and Gas Royalties: The Federal System for Collecting Oil and Gas Revenues Needs Comprehensive Reassessment,* GAO–08–691 (Washington, D.C.: Sept. 3, 2008).

[9] GAO, *Oil and Gas Management: Interior's Oil and Gas Production Verification Efforts Do Not Provide Reasonable Assurance of Accurate Measurement of Production Volumes,* GAO–10–313 (Washington, D.C.: Mar. 15, 2010).

[10] GAO, *Federal Oil and Gas Leases: Opportunities Exist to Capture Vented and Flared Natural Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gases,* GAO–11–34 (Washington, D.C.: Oct. 29, 2010).

[11] GAO, *Mineral Revenues: MMS Could Do More to Improve the Accuracy of Key Data Used to Collect and Verify Oil and Gas Royalties,* GAO–09–549 (Washington, D.C.: July 15, 2009).

[12] GAO, *Oil and Gas Leasing: Interior Could Do More to Encourage Diligent Development,* GAO–09–74 (Washington, D.C.: Oct. 3, 2008).

mary terms. Our analysis identified three key findings. First, a majority of leases expired without being drilled or reaching production. Second, shorter leases were generally developed more quickly than longer leases but not necessarily at comparable rates. Third, a substantial percentage of leases were drilled after the initial primary term following a lease extension or suspension.

We also compared Interior's efforts to encourage development of federal oil and gas leases to states' and private landowners' efforts. We found that Interior does less to encourage development of federal leases than some states and private landowners. Federal leases contain one provision—increasing rental rates over time for offshore 5-year leases and onshore leases—to encourage development. In addition to using increasing rental rates, some states undertake additional efforts to encourage lessees to develop oil and gas leases more quickly, including shorter lease terms and graduated royalty rates—royalty rates that rise over the life of the lease. In addition, compared to limited federal efforts, some states do more to structure leases to reflect the likelihood of oil and gas production, which may also encourage faster development. Based on the limited information available on private leases, private landowners also use tools similar to states to encourage development.

In conclusion, as concerns rise over the recent increase in oil prices and as demands are made for additional drilling on federal lands and waters, it is important that Interior meet its current oversight responsibilities. Interior is now in the midst of a major reorganization, which makes balancing delivery of services with transformational activities challenging for an organization. Managing this change in a fiscally constrained environment only exacerbates the challenge. If steps are not taken to improve Interior's oversight of oil and gas leasing, we are concerned about the department's ability to manage the nation's oil and gas resources, ensure the safe operation of onshore and offshore leases, provide adequate environmental protection, and provide reasonable assurance that the U.S. government is collecting the revenue to which it is entitled.

Chairman Hastings, Ranking Member Markey, and Members of the Committee, this concludes our prepared statement. We would be pleased to answer any questions that you or other Members of the Committee may have at this time.

Contact and Staff Acknowledgements

For further information on this statement, please contact Frank Rusco at (202) 512–3841 or ruscof@gao.gov. Contact points for our Congressional Relations and Public Affairs offices may be found on the last page of this statement. Other staff that made key contributions to this testimony include, Jeffrey Barron, Glenn C. Fischer, Jon Ludwigson, Alison O'Neil, Kiki Theodoropoulos, and Barbara Timmerman.

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Highlights of GAO–11–487T, a testimony before the Committee on Natural Resources, House of Representatives

March 17, 2011

OIL AND GAS LEASING
Past Work Identifies Numerous Challenges with Interior's Oversight

Why GAO Did This Study

The Department of the Interior oversees oil and gas activities on leased federal lands and waters. Revenue generated from federal oil and gas production is one of the largest nontax sources of federal government funds, accounting for about $9 billion in fiscal year 2009. For onshore leases, Interior's Bureau of Land Management (BLM) has oversight responsibilities. For offshore leases, the newly created Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE), has oversight responsibilities. Prior to BOEMRE, the Minerals Management Service's (MMS) Offshore Energy and Minerals Management Office oversaw offshore oil and gas activities, while MMS's Minerals Revenue Management Office collected revenues from all oil and gas produced on federal leases.

Over the past several years, GAO has issued numerous recommendations to the Secretary of the Interior to improve the agency's management of oil and gas resources. In 2011, GAO identified Interior's management of oil and gas resources as a high risk issue. GAO's work in this area identified challenges in five areas: (1) reorganization, (2) balancing responsibilities, (3) human capital, (4) revenue collection, and (5) development of existing leases.

What GAO Found

Reorganization: Interior's reorganization of activities previously overseen by MMS will require time and resources and may pose new challenges. Interior began a reorganization in May 2010 that will divide MMS into three separate bureaus—one focusing on revenue collection, another on leasing and environmental reviews, and yet another on permitting and inspections. While this reorganization may eventually lead to more effective operations, GAO has reported that organizational transformations are not simple endeavors. GAO is concerned with Interior's ability to undertake this reorganization while meeting its revenue collection and oil and gas oversight responsibilities.

Balancing Responsibilities: GAO has reported that Interior has experienced several challenges with meeting its responsibilities for providing for the development of oil and gas resources while managing public lands for other uses, including wildlife habitat. In January 2010, GAO reported that, while BLM requires oil and gas operators to reclaim the land they disturb and post a bond to help ensure they do so, not all operators perform reclamation. For fiscal years 1988 through 2009, BLM spent about $3.8 million to reclaim 295 so-called "orphaned" wells—because reclamation had not been done, and other resources, including the bond, were insufficient to pay for it.

Human Capital: GAO has reported that BLM and MMS have encountered persistent problems in hiring, training, and retaining sufficient staff to meet their oversight and management responsibilities for oil and gas operations. For example, in March 2010, GAO reported that BLM and MMS experienced high turnover rates in key oil and gas inspection and engineering positions responsible for production verification activities. As a result, Interior faces challenges meeting its responsibil-

ities to oversee oil and gas development on federal leases, potentially placing both the environment and royalties at risk.

Revenue Collection: While federal oil and gas resources generate billions of dollars in annual revenues, past GAO work has found that Interior may not be properly assessing and collecting these revenues. In September 2008, GAO reported that Interior collected lower levels of revenues for oil and gas production in the deep water of the U.S. Gulf of Mexico than all but 11 of 104 oil and gas resource owners whose revenue collection systems were evaluated in a comprehensive industry study. Nonetheless, Interior has not completed a comprehensive assessment of its revenue collection policies and processes in over 25 years. Additionally, in March 2010, GAO reported that Interior was not consistently completing inspections to verify volumes of oil and gas produced from federal leases.

Development of Existing Leases: In October 2008, GAO reported that Interior could do more to encourage the development of existing oil and gas leases. Federal leases contain one provision—increasing rental rates over time for offshore 5-year leases and onshore leases—to encourage development. In addition to escalating rental rates, states undertake additional efforts to encourage lessees to develop oil and gas leases more quickly, including shorter lease terms and graduated royalty rates.

The CHAIRMAN. Thank you, Mr. Rusco, and I again—and I said this earlier, I really do thank the panel for their adherence to the time. That is very, very helpful, and as I mentioned, your full statement will appear in the record.

We will begin questioning, and I will start, and Ms. Pierce, if I could start with you. There is always a lot of discussion about reserves that we have. I remember discussions going way back, and it seems like when the exploration happens, or however it is, the reserves get larger.

I am saying that very broadly, but where on Federal lands or waters from your research that currently are not open for development are the largest reserves, and if you could point out or identify two or three of those?

Ms. PIERCE. So, you probably well know that there is a difference between resources and reserves. Reserves are the economic portion of the resource endowment, and reserves, which is what USGS does, is technically recoverable.

Some of the largest producers are open and are producing offshore in the Gulf of Mexico, but there are clearly areas offshore. And I don't want to avoid your question, but I want to do it justice.

And so I would actually prefer to defer it, do the research, and look at our resource numbers, and look at what is off-limits, and provide that answer to you in writing.

The CHAIRMAN. That would be fine. We want to get the accurate information, and so that is good.

Ms. PIERCE. Thank you.

The CHAIRMAN. Well, I was going to ask Dr. Whitney, but you pointed out, Ms. Pierce, the difference between resources and reserves, and I noticed in Dr. Whitney's report that they talked about that.

Could you go more in-depth as to the explanation between reserves and resources?

Dr. WHITNEY. Sure. Reserves are amounts of oil or gas that have been proven to exist through drilling. Companies use reserves as sort of an inventory that they will produce at some point in the future.

As those reserves are produced, they add new reserves, either through reserve growth in an existing field, or through develop-

ment of new fields. For that reason reserve values, reserve numbers, tend not to vary wildly.

They may creep up and down, but over time they don't change very much because these are amounts of oil that companies keep in reserve for production. The undiscovered resources are geological estimates in areas that either have not been drilled, or include some fields, but extend beyond those fields.

Those geological estimates are based on several geologic factors within a base or within a region, such as the existence of a source rock that is rich in carbon. The base must have experienced thermal history sufficient to generate oil or gas, and there must be the existence or potential existence of reservoirs and traps.

So there is a comparison made between undiscovered resources in basins, and the resources that have been produced in other basins. So, there is an estimate that is derived from a statistical treatment of the parameters in the basin, compared to known production in other basins.

So the undiscovered technically recoverable resources are a geologic estimate, and by the way that because they are technically recoverable, that number also changes as technology evolves.

The CHAIRMAN. Is it fair to say with that comparison then that just in general the resources, if one could quantify that as much larger than the reserves, because you know pretty much what the reserves are?

Dr. WHITNEY. That is right, and the reserves typically are composed of volumes of oil that are moved from the undiscovered category to reserves, and then to production.

The CHAIRMAN. I guess that is why in hearings in the past when people are talking about—I mean, I am going back 30 or 40 years—known reserves, and I think that was the term used, it always seemed to exceed because the resources were tapped. Therefore, the resources kept coming on line as you characterized it as inventory.

Dr. WHITNEY. Yes.

The CHAIRMAN. So that is interesting. I appreciate that. My time is going to expire before I can get another question in, and so I yield to the Ranking Member, Mr. Markey.

Mr. MARKEY. Thank you, Mr. Chairman. My Republican colleagues like to say that we are not doing enough drilling here in the United States, and a lot of the numbers that have been tossed around by our witnesses today can confuse a very fundamental point that I believe that our country must comprehend.

We have two percent of the world's proven oil reserves. We produce 11 percent of the world's oil on a yearly basis, and we consume 25 percent of the world's oil on a yearly basis. Two percent of the reserves, and 11 percent of the world's oil, we produce, and 25 percent of the world's oil, we consume.

Now, I put together a graphic to help us, and to tie these numbers together and to help us to understand what they mean. So, this is an illustration of our burn rate, or the rate at which our country is producing its reserves, and it compares our burn rate to that of the other top 15 oil producing countries in the world.

And what do we learn? Well, no other nation on earth is matching the burn rate of the United States, in terms of consuming their own reserves. We consume more than any other nation.

We are burning through our savings in other words, our reserves, faster than any other country on the planet. And as you can see down here in Iraq, and Kuwait, and Venezuela, and United Arab Emirates, Iran, they have very low burn rates.

So in the long run this is a chart which obviously is going to cause our country great problems. I guess the first question that I would ask to you, Mr. Caruso, is this burn rate for our country of our reserves sustainable over the long term; yes, or no?

Mr. CARUSO. Ultimately, we will reach the peaking point, and we did reach that in 1972, in terms of domestic reserves. How long can it go? It can be a very long tail, but clearly we will be based on anybody's forecasts, it means that we will be importing a significant amount of oil for as long out as we can see.

Mr. MARKEY. Mr. Rusco, do you agree? Is this sustainable over the long term, Mr. Rusco?

Mr. CARUSO. No. I mean, unless we discover some new reserves or develop more reserves, it can be sustained, but at a declining—most likely at a declining rate.

Mr. MARKEY. And do you agree, Mr. Rusco?

Mr. RUSCO. Yes, essentially inevitably at any rate of production, we will eventually reach a peak that will be followed by a decline. We have, as Guy said, reached a peak, but there may be a very long tail. There are a lot of hydrocarbons out there, and we don't know how fast we will be able to produce them.

Mr. MARKEY. And in which countries on this chart that are the oil producing countries and the United States in the world, which of these countries benefits in the long run most from the fast burn rate of the United States, in terms of its oil reserves? Mr. Caruso.

Mr. CARUSO. Well, the OPEC member countries are the ones that have been most determined to manage the price. They aren't always successful, but clearly I would say in general OPEC countries are benefiting.

Mr. MARKEY. And do you agree with that, Mr. Rusco?

Mr. RUSCO. I guess I would say that oil being a global commodity, in some sense, it really does not matter where the oil is produced. The price is determined by supply and demand globally, and the benefits and costs of that accrue globally.

Mr. MARKEY. But in this context the faster we burn down our reserves is the more power in the marketplace, those that have massive reserves for the balance of the century will have in terms of influencing the price in the market, since they work as a cartel. Would you not agree with that, Mr. Rusco?

Mr. RUSCO. I do agree that at times OPEC has been very successful in managing the price, and it appears that is a long-term strategy.

Mr. MARKEY. Thank you, Mr. Chairman.

The CHAIRMAN. The time for the gentleman has expired. The Chair recognizes the gentleman from Louisiana, Mr. Fleming.

Mr. FLEMING. Thank you, Mr. Chairman. Let me say first of all that I want to compliment this panel, because this is some of the most cogent informative stuff that we have had in a long time here.

You know, we are approaching, in some cases, more than $4 a gallon for gasoline, and just as the law of gravity, as everything

must come down, the same applies to pricing for commodities. It is all about supply and demand.

Now, we do see some spikes at times when there are disruptions, or even economic issues that may come up, but in the long term, we know that the real price, and the underlying pricing trends are all about supply and demand.

And what is interesting is, and back to this two horse analogy, where you have alternative energy racing with fossil fuels, or hydrocarbons, what we really have seen, particularly in the last five years, is an explosion of discoveries of supplies that we didn't know that we had.

And then also new technologies that we can exploit to get to those that we haven't been able to before. A great example is the Haynesville shale in my own district that we didn't even know existed five years ago.

And now with hydrofracking technology and horizontal drilling, we have such an abundance that we have trouble getting it out of the ground because it is so cheap. We heard testimony yesterday that the per gallon equivalent of natural gas is like a buck eighty.

So it is clear that right now that in that two horse race the hydrocarbon, with the exploitation of new technologies and new findings, is winning this race. But let me turn to this.

Federal Reserve Chairman Ben Bernanke testified on March 1 before the Senate Committee on Banking, Housing, and Urban Affairs, noting that sustained prices, sustained rises in the price of oil or other commodities would represent a threat both to economic growth and to overall price stability.

Now we hear the Obama Administration would rather release oil from the strategic petroleum reserve, when in fact we have as I understand it now 1.3 trillion barrels of oil equivalent in the ground just here in the United States, which is the largest in the world.

So despite some of the things that you are hearing here today, information that is coming from your agency is telling us that we have a lot of stuff that we can use for many years.

And that is the whole problem with alternative sources of energy, is that it is still not competitive in the marketplace. Why? Because overall we still have a very abundant supply of energy ahead of us.

But what is interesting is that in 2008, Energy Secretary Chu told the Wall Street Journal that energy prices were the linchpin to an energy overhaul. Somehow we have to figure out how to boost the price of gasoline to the levels of Europe.

So we actually have people in Washington here who are working to get that price up, when the rest of America is going to the pump and seeing a $50 fill-up in their car jump to $75, and that is crunching the family budget.

So I would just like to have some responses from some of the other panel members today just real quickly how you may respond, and we will start maybe to the far left over there, to my left, and your response to some of these comments and statements that we have heard today.

Mr. NEWELL. In terms of what? What specific aspect would you like me to respond to?

Mr. FLEMING. Well, I think you are hearing different versions of what is our ability to be energy independent in this country using

hydrocarbons, realizing that we have gone from 30 percent dependency overseas to now 60 percent, and we are shutting off ANWR, and we are shutting off offshore drilling.

We have hydrofracking under attack, which would severely constrict our flow of natural gas. What in your opinion is the future of hydrocarbons if we are allowed to exploit those, and how would it affect prices?

Mr. NEWELL. Well, currently coal, natural gas, and petroleum, provide the vast majority of United States energy supply, over 80 percent. Our projections over the next 25 years, which would assume the continuance of current laws and regulations, would see a modest decline in the fossil fuel share as other sources of energy, renewable energy in particular, increase.

But at least an outlook for there to be a significant change from the current share of fossil fuels and the energy system, and something would need to change in terms of current policy, or technological breakthroughs, or other market trends that we are not currently foreseeing.

The CHAIRMAN. The time for the gentleman has expired. The gentleman from New Jersey, Mr. Holt, is recognized.

Mr. HOLT. Thank you, and I thank the witnesses. Members of Congress always like to think that we can turn short-term news stories into immediate political benefit, and this is no less true with short-term news about gasoline prices.

And I guess I would try to draw our attention to other longer term implications of the news today, which is that uprisings in the Middle East show how perilous our dependence on petroleum is, and the nuclear melting in Japan shows how perilous our dependence on nuclear power is.

And they really underscore, I think, our failure to have a broad based energy portfolio, and our failure to have a rational look at our energy usage. Mr. Rusco, I think you said that prices are determined by supply and demand globally, and in fact several of you have said that sort of thing.

Let me ask, I guess, first, Mr. Newell, what is the scale—and let us put it in perspective here—of possible short-term energy production? I mean, suppose there were a lot more leases for offshore drilling released in the last couple of years.

Suppose there were much more drilling on public lands, or even large increases in the drilling on private lands. What is the scale of the increase in production that we might achieve, compared to what OPEC can do by turning the valves up and down in the short term?

Mr. NEWELL. Well, there is a considerable lag between increased access to resources, and then exploration and development, and then ultimate production of those resources.

So there is an important issue with return to time scale, which I think you mentioned. In the short run, to respond to immediate impacts in crude oil supply, one really needs to look at the availability of spare production capacity in OPEC, which is where that currently lies.

In terms of non-OPEC countries, they tend to produce available capacity at actual production. So certainly in the short term that

is where the available spare capacity is. In the longer term the areas——

Mr. HOLT. I am sorry, but I am actually talking about short term.

Mr. NEWELL. You are talking about short term?

Mr. HOLT. In other words, just to make sure that we are clear on this, OPEC can affect the price of a barrel of oil rather quickly, compared to anything that we could do by production in the United States. Am I stating that correctly?

Mr. NEWELL. I would say that is correct. All of the spare production capacity that is available is in OPEC countries. The vast majority of that is in Saudi Arabia.

Mr. HOLT. OK. Well, there are actually so many things to cover, but let me just pursue this point a little bit longer. Mr. Markey pointed out that over the longer term this will be more and more true will it not, because if the United States is burning its oil reserves faster than any other nation, and it is largely OPEC countries that are burning through their reserves at a much, much slower rate than we are, that means that they will have more and more leverage than we will in future years if we have two percent of the reserves, and 11 percent of the production now, and 25 percent of the consumption. Am I describing that accurately, Mr. Newell?

Mr. NEWELL. OPEC countries currently provide about 40 percent of global oil liquid supply, and non-OPEC countries about 60 percent. We, and I think most other analysts that I have seen, expect that the OPEC share will tend to increase over time because the vast majority of reserves of oil are located in OPEC countries.

Mr. HOLT. And because we are burning our reserves considerably faster than they are, and so we will have a smaller and smaller share, even if some of these larger, possibly economically recoverable by some stretch of the imagination, are out there; is that correct?

The CHAIRMAN. The time for the gentleman has expired, and if you would respond back in writing, I am sure that Mr. Holt would be appreciative of that. The gentleman from Florida, Mr. Southerland, is recognized.

Mr. SOUTHERLAND. Thank you, Mr. Chairman. I wanted to ask, and I know that all of you have probably read the report that was delivered by the commission that the President put together regarding the disaster in the Gulf.

And I am just curious, because you seem to be very astute in understanding this issue as good as any panel that we have seen come before us. I am just curious. I have asked members of the Administration this question, and I am just curious as to your answer.

In light of the President's statement that he believes high oil prices are acceptable, and he made that statement on August 20th of 2008, that it is a necessary occurrence to push us in a direction to make us explore other energy sources.

And it seems that with the Department of the Interior's issuing of 720 violations to BP, and which was bothersome to me, in not rescinding the Jones Act in light of that disaster to help contain the oil that was spilled into the Gulf.

I am just curious, and this is a simple yes or no, and I am going to run down the line here. Mr. Rusco, does the government bear any responsibility, any, for the oil disaster in the Gulf?

Mr. RUSCO. The commission said——

Mr. SOUTHERLAND. I am not really interested in the commission. They have already been here. I am really interested in what you think.

Mr. RUSCO. Yes, they——

Mr. SOUTHERLAND. Is that a yes?

Mr. RUSCO. Yes.

Mr. CARUSO. Yes.

Dr. FOSS. Yes.

Dr. WHITNEY. Yes.

Mr. SOUTHERLAND. OK.

Ms. PIERCE. Probably.

Mr. SOUTHERLAND. No, you are on the panel. It is just you and me right here talking. Forget all these other people. It is just you and me. Give me your opinion, Ms. Pierce.

Ms. PIERCE. It is difficult.

Mr. SOUTHERLAND. Well, I understand it is difficult, and that is why I asked it, but it really is not that difficult. 720 violations cited, and refusal to——

Ms. PIERCE. I think——

Mr. SOUTHERLAND. And it is my time, that is right, and so I am asking the question; yes or no?

Ms. PIERCE. I don't know.

Mr. SOUTHERLAND. You don't know? So the 720 violations, the refusal to contain the accident and rescind the Jones Act, in light of what we have seen, and the underwriting of oil exploration in countries like Brazil by this Administration, and you are telling me that the government bore no responsibility?

And Mr. Salazar is an amazing man. He had 70,000 employees at his disposal, with a $12 billion budget, and he can focus like a laser beam as he stated last week in testimony here. Do they bear any responsibility? I mean, one percent, five percent?

Ms. PIERCE. Well, clearly the Department of the Interior——

Mr. SOUTHERLAND. OK. And that is where that well was?

Ms. PIERCE. Yes.

Mr. SOUTHERLAND. Thank you. Mr. Newell.

Mr. NEWELL. Congressman, respectfully, I have not evaluated the issue, and so I am going to decline to answer.

Mr. SOUTHERLAND. Really? You have read the report?

The CHAIRMAN. Will the gentleman yield?

Mr. SOUTHERLAND. Yes, I would.

The CHAIRMAN. It is very difficult sometimes when you call up members of the Administration, albeit different agencies, to respond on those questions in deference to my friend, and I know very well how focused he has been on that answer. But I just wanted to make that observation.

Mr. SOUTHERLAND. Let me ask with my remaining time a question to Mr. Newell. Do you believe that with the decline of over 250,000 barrels per day, do you believe that this will cause job producing oil companies to remove their rigs from the Gulf, and move those to other countries around the world?

Mr. NEWELL. So I think you are referring to in our short-term energy outlook, we are forecasting a decline of about 250,000 barrels per day relative to last year in offshore Gulf of Mexico, oil production, which is maybe roughly half of that that one could attribute to the well blowout moratorium and subsequent regulatory situation.

The other half is due to—approximately half, is due to natural decline because we had been on an upswing in offshore production. In terms of job losses, there are certainly job losses associated with the decline in production there.

And in terms of rigs and their specific location, early on there actually had not been much movement of rigs. To be honest, I have not recently tracked exactly where those rigs are, and so I could not comment specifically on that.

Mr. SOUTHERLAND. But the ones that are missing are not in the Gulf, and so they are somewhere. They are somewhere. We know they are somewhere. They are not where we would really need them to be though. We know that, correct? I mean, there are rigs that are moving.

Mr. NEWELL. It is true that at some point in time rigs will move on early on. The last time that I looked closely at it, they had not because they were waiting in anticipation that drilling would resume.

And so at the point in time that I last looked at it, there had not been significant movement, but that was a while ago, and so I just can't comment on exactly what the situation is today.

Mr. SOUTHERLAND. Thank you, Mr. Chair.

The CHAIRMAN. The gentleman's time has expired. The gentlelady from Hawaii, Ms. Hanabusa.

Ms. HANABUSA. Thank you. Than you, Mr. Chairman. Let us begin with Mr. Newell. Mr. Newell, in your statement, on page two, you said that what you are about to discuss in your report did not take not take into effect what happened in Japan.

Japan would definitely have an impact on what you were looking at as a short-term energy outlook. Can you tell me if you were to calculate that into your statement here how it would have an impact?

Mr. NEWELL. Sure. The short-term production, and particularly price outlook that is reflected in the testimony is from our short-term energy outlook, which came out a couple of weeks ago.

And since then we have seen significant fluctuations in oil and gasoline prices. In terms of specifically Japan, and in terms of an immediate response, we had actually seen a decline in oil prices, which I think most of us would have associated to a concern that there would actually be a decline in the economic activity, and an immediate decline in the requirements for fuel.

But also just a broader sense that there was a hit to Japan's economy, and which has global implications. As of yesterday the price of oil was down significantly. Today, it is back up again.

So in terms of how this all shakes out, there are really a number of competing things that are going on right now in global oil markets. A principal one is the unrest in the Middle East and North Africa.

Japan was weighing on that yesterday, but today it seems like the resurgence is probably more associated with again turning to unrest in the Middle East and North Africa. So the sense in which we will have to reflect the effect of Japan, I think that will we will see over the next several weeks how that unfolds.

Ms. HANABUSA. Thank you, and my next question is for Mr. Caruso. Mr. Caruso, in some reports that you have been quoted in, you are speaking about the release of the oil from the Strategic Petroleum Reserve.

And for all of us the main question is how does that then translate to the consumer? What does the consumer, or can the consumer expect some kind of relief if we were to go to the releasing of oil from the SPR? Could you comment on that?

Mr. CARUSO. I think it obviously depends on the amount and the duration of the release, but we saw both during the Iraq invasion of Kuwait, and the post-Katrina releases that were Presidential draw downs of the SPR. That did have an impact on lowering the price of oil from where it was before the release and after.

So it really depends on specific circumstances, and a significant release for a long, or relatively long duration, which in my view would be 30 days or more, could have an impact on the price, depending on whether or not OPEC countries might respond by reducing their production.

So it is a lot more contingent on the global, and what happens elsewhere, but the specific answer is that it could have an important effect, depending on the volume and duration.

Ms. HANABUSA. Is there anything else that could have an impact like that in the short term? Is that our best tool to reduce the price for the consumer right now that you can think of?

Mr. CARUSO. I think that particularly if it is done in cooperation and coordination with our International Energy Agency partners is the most important short-term crisis management tool that we have in our arsenal.

Ms. HANABUSA. Thank you. My next question is for Director Rusco. It seems to me that you are talking about two different things in your report. One is the revenue, or the Interior's failure, I guess, for lack of a better description, for really monitoring the revenue source, and the second is the permits, and what is going on.

Can you tell me if in fact the permitting system, or the leasing system, by Interior has really resulted with the loss of the revenue?

Mr. RUSCO. Well, that is very complicated, but we do think that the efficiency of the management of permitting leaves a lot to be desired, and could be done in a more efficient way if Interior could do better workforce planning, and better management of its human capital assets so that it had the right number of people to respond to changes in either applications to drill, or nominations for lands to be leased.

But also to respond to public protests of those leases, and it has not responded to those kinds of changes very effectively in the past. So there have been delays. The delays on leases associated with the protests have been matters of months though, and not years or anything like that.

The CHAIRMAN. The time for the gentlelady has expired. The gentleman from Colorado, Mr. Tipton.

Mr. TIPTON. Thank you, Mr. Chairman. I appreciate the panel taking the time to be able to be here today, and I would like to start with Mr. Newell first. I came out of the District of Colorado to where we have a tremendous amount of energy reserves that are accessible really for our Nation.

Do you know how many oil and gas leases are currently backlogged in the State of Colorado?

Mr. NEWELL. I do not. That would be in the Department of the Interior, I believe.

Mr. TIPTON. OK. It would fall under that? In terms of some of the backlogs, Mr. Rusco, when you are talking about being able to create some efficiencies in the permitting process, do you have some good ideas that we can pass on to the Secretary of the Interior?

Mr. RUSCO. Well, we have recommended that Interior look at trying to rationalize the implementation of laws and regs across its many field offices in the Bureau of Land Management.

So what we see is an inconsistency in the application of laws and regulations, and we feel that coordinating and providing better guidance across all the field offices would make it easier and more efficient, both from the perspective of companies applying, but also in terms of protecting the environment, and protecting safety, and also collecting the right amount of revenues.

Mr. TIPTON. Ms. Pierce, could you give us an idea when we are looking at oil shale, how many potential barrels of oil are captured in oil shale?

Ms. PIERCE. Oh, there is a tremendous amount of potential barrels.

Mr. TIPTON. Could you give us an idea? How many barrels?

Ms. PIERCE. Well, we just recently did a reevaluation of that, and I don't have the numbers at my fingertips, but there are billions of in-place resources. We did not do a technically recoverable resource estimate, because there is not one technology yet that is proven, but there is a lot of potential oil.

Mr. TIPTON. So with an investment in technologies to be able to liberate this energy, America can have a bright future in terms of energy development in this country?

Ms. PIERCE. Possibly.

Mr. TIPTON. Is that possibly the case?

Ms. PIERCE. There is a lot to be done, but possibly.

Mr. TIPTON. Great. Mr. Caruso, you had made the comment that we had reached our peak, I believe it was, in 1972, around 1972, concerning domestic reserves, and I just happened to read some body language, and I saw Dr. Foss shake her head. Would you care to comment on that, Dr. Foss?

Dr. FOSS. I have no idea what the peak might be, and I do not think that anyone does, and I really think that people cannot claim to know that. The earth is a huge place geologically. We have abundant resources that we have not even begun to really explore, or learn how to utilize.

So I think that what we are faced with are periodic constraints and timing. How do you mobilize investment and direct that into

new plays, and new prospective areas, new technologies, and every time that we do that, we replenish our production.

And I wanted to put that word on the table from the previous discussion, replenishment. That is what we do in this country. So it is unfair to look at burn rates and things like that without understanding that what we are very, very, very, very good at is moving from that resource category to reserve category, to production, in a very efficient way.

And it is a powerful process that has to be better understood, and shepherded the right way, and managed the right way by industry and government. Now, I don't see any reason to think about peaks or other constraints.

I think the constraints have more to do with how we feel about our resources that are available, and the various options that we have for developing them.

Mr. TIPTON. Good. Ms. Pierce, we have had a lot of comment, and you cannot ever take the politics out of anything, but in regards to United States energy production under the Obama Administration, but can you give me an idea in regards to our onshore leases that began producing after 2008, how many of these were due to leases that were approved by the previous Administration?

Ms. PIERCE. I really cannot answer that, because that is not USGS, but we would have been happy to work with the Bureau of Land Management to get you that answer.

Mr. TIPTON. Great. Just by way of comment, we hear that we have two percent of the world's oil reserves in this country, and that we consume—we have that burn rate of around 25 percent.

There was some who believe, and I happen to be one, that we benefit the world. We happen to be one of the highest productive people in the world that reach out, and when we are talking about Japan, the United States naval ships, and the resources that we are able to bring to bear to be able to help people when they are need, and the technology, which unfortunately never comes in our intellectual capital into our trade calculations, in terms of our exports as well.

There is a lot of opportunity for this country to be able to develop our resources right here at home, and to switch in terms of how we are using some of those resources. The T. Boone Pickens Plan, when it comes to being able to drive our vehicles as well, that those opportunities are certainly going to be there, and thank you, Mr. Chairman, for your time.

The CHAIRMAN. The time of the gentleman has expired. The Chair recognizes the gentleman from Michigan, Mr. Kildee.

Mr. KILDEE. Thank you, Mr. Chairman. First, just one point in response to a statement made by my friend, Mr. Southerland. A point of clarification there. There are actually more rigs in the Gulf of Mexico now than there were before the BP spill.

There are now 125 rigs in the Gulf, compared to 122 one year ago. I just wanted to put that on the record. But I have a question of Mr. Newell. Speculation is often pointed to as a cause of rising or unstable oil prices.

To help prevent harmful speculation in last year's Wall Street reform legislation, included provisions to regulate these kinds of

trades through the Commodity Futures Trading Commission, the CFTC.

However, spending bill H.R. 1 would cut the funding for CFTC by $56.8 million, almost a third of the agency's entire budget. This is despite the chairman of CFTC recently testifying before the Senate Agricultural Committee that the CFTC already does not have enough funding to properly enforce these provisions under the Wall Street Reform Bill.

Can you speak to the role of speculation in the price of oil, and the difficulties of addressing this problem when H.R. 1 would reduce the budget of the agency in charge of cracking down on speculation by almost a third?

What I am really asking you is your position on the role of speculation and whether we should be cutting the money used to scrutinize and enforce that speculation?

Mr. NEWELL. Well, to the first part of your question. Speculation clearly has a role in oil and other commodity markets, and because commodities, and in particular oil, but others as well, are storable, there is always going to be an anticipation or expectations about what the price of that might be in the future.

And therefore there will be actors in the market making or basically voicing their opinions through the marketplace about how they think those prices will change over time. In terms of the role of different regulatory agencies, the agency that I head is not a regulatory agency, but the role of regulatory agencies like the Commodity Futures Trading Commission, is to oversee transparent and efficient markets.

The proposals that they are developing relate to position limits in energy commodity markets. I mean, the intent of those is to prevent excess concentration of any particular actor in those markets, and therefore, from a market efficiency point of view, the role of that is to prevent any undue influence on market prices.

But I would defer in terms of expressing a further opinion on the role of that regulation.

Mr. KILDEE. Well, Congress last year felt that speculation did play a role, and therefore passed legislation, which is a law of this Nation, to try to scrutinize and regulate that speculation.

And I guess we want to know whether we should be—if that legislation made sense in the first place, we would be cutting the budget of the agency that is to look at that speculation. It is not a huge budget in itself, 56.8 million, but yet they want to cut that by one-third. Do you think that is a prudent thing to do?

Mr. NEWELL. I think I will decline. The budgetary decisions, I think, are pretty loaded with policy implication, and so I am going to decline to express a policy opinion on that.

Mr. KILDEE. Well, I would invite anyone else. Does anyone want to comment on that? I don't see anyone jumping in. All right. I will try to find the answer from someone else. Thank you very much.

The CHAIRMAN. Does the gentleman yield back?

Mr. KILDEE. I yield back.

The CHAIRMAN. The gentleman yields back his time. The Chair recognizes the gentleman from Pennsylvania, Mr. Thompson.

Mr. THOMPSON. Thank you, Mr. Chairman. Thanks for calling this hearing. It is very timely with gas hitting $3, an average of

$3.54 a gallon today. I come from a district that we have been—I guess we started this whole situation with the drilling of oil at a Drake oil well, and within walking distance of my district office in Titusville.

And I take exception with one of the comments made by one of my colleagues earlier about big oil. I have to tell you that there are families of independent drillers, small businesses, they have been drilling oil for generations, for 151 years.

So this is not a big oil, and it is not an issue with me. This is about small businesses, and jobs, and energy security. Just one quick note. I thought that it was interesting that the chart that was shown in terms of burning through the reserves, that the country with the next, or the closest burn rate to what was portrayed as the United States was Norway.

The United States, with over 303 million Americans in population, and Norway, 4 million. So, size probably does have a bearing on how much we use. One quick question that should be very easy, and I will just open this to the panel, is there any renewable fuel which will take the place of oil in the next decade, we will say?

We can go yes or no based on your professional experience. Let us just go right down the row if we could.

Mr. NEWELL. So, in terms of—the main fuel that would replace oil over our projections, which go out to 2035, is biofuels, principally in the form so far of corn based ethanol.

Mr. THOMPSON. So, 2035. I will take that as a no since I said a decade. I have a number of questions, and if we could just get a response.

Mr. NEWELL. No, we don't see petroleum being placed in the next decade.

Mr. THOMPSON. Thank you.

Ms. PIERCE. No.

Dr. WHITNEY. No.

Dr. FOSS. No.

Mr. CARUSO. Not in this century.

Mr. THOMPSON. Not in this century. There you go. Raise the stakes.

Mr. RUSCO. I defer to the EIA on that.

Mr. THOMPSON. OK. All right. Very good. I appreciate it. One or two more questions. Now, Mr. Rusco, this is a real basic question, but I think it is important for our people to understand.

Can you tell us who owns the oil and natural gas on and offshore, which are on Federal lands?

Mr. RUSCO. Who owns the gas on Federal lands?

Mr. THOMPSON. On and off Federal lands.

Mr. RUSCO. The public.

Mr. THOMPSON. The public. Absolutely. The United States taxpayers. Mr. Newell, you state on page six that our recoverable crude oil resources are estimated to be 219 billion barrels.

Certainly based on that, and I am sure that you would agree, that is owned by the American taxpayers. I guess not all of it is on Federal lands. How much would you estimate to be owned by the American taxpayers?

Mr. NEWELL. I don't have with me an exact figure for that. The 219 billion of technically recoverable resources refers to all of it, and so some of that would be under private lands.

Offshore, in the Federal offshore lower 48, is about 64 billion barrels, which is Federally owned in effect by the public. But there is more than that.

Mr. THOMPSON. And based on previous testimony that I heard earlier, I actually have confidence for the oil, the resources that are privately owned, and it is the issue that we have run up against is the ones that the taxpayers own that we have not done a good job of production.

Of that 219—well, let me move on. Some of the math, I tried to do some basic math, and not a real strong suit of mine, but I calculated approximately 814,000 square miles of the lower 48 offshore miles have been placed off-limits by the President. There are no lease bids offered.

We are not talking about the Gulf of Mexico, OK, where the most two recent leases were leased. It was the remaining part. So, 814,000 square miles off-lease, that is nearly 521 million acres, or five times the size of California.

Mr. Newell or Ms. Pierce, can you tell us how much oil and natural gas are contained in those 521 million acres? And as part of your answer would you tell us when the last modern seismograph inventory was taken of our offshore oil and gas?

Mr. NEWELL. I will defer to Brenda on the second part. In terms of the major part, in terms of areas that are currently under Congressional moratorium actually would be the central and eastern Gulf of Mexico, which I believe is six-point-something billion barrels.

That is the most promising area in terms of in terms of the Gulf of Mexico, and also in terms of what is available on both the Pacific and Atlantic coasts really is in the Gulf of Mexico, where the vast majority of that production is already occurring.

So it would be the central part, and then the eastern part, which is under Congressional moratorium to 2022.

Ms. PIERCE. In terms of the seismic, I would have to look up some of the numbers. Some is quite recent, and some is quite dated, several decades old. It depends on where you are in the Outer Continental Shelf.

Mr. THOMPSON. Thank you, Mr. Chairman.

The CHAIRMAN. The time for the gentleman has expired. The gentleman from Oregon, Mr. DeFazio.

Mr. DEFAZIO. Thank you, Mr. Chairman. Mr. Newell, on page seven, in the middle of your testimony, you say that given the increasing importance of OPEC supply in the global oil supply demand balance, another key issue is how OPEC production would respond to any increase in non-OPEC supply, i.e., our production, potentially offsetting any direct price effect.

I mean, we hear this all the time. It is a world market. And for years, starting with the Bush Administration, not with the Clinton Administration, but the Bush Administration, and not the Obama Administration, I have asked that we file a complaint against OPEC for illegal commodity manipulation under the WTO.

I am told, well, it is not covered. Well, the only exemption is for conservation purposes, and OPEC never pretends to be conserving their oil. They are setting the market by ramping their production up and down.

They have ramped up because of Libya, and they will ramp down. They have a price target. So if we produce some additional oil is that likely to change, unless we sue OPEC, and go through a WTO process, and break the cartel?

I mean, they could easily offset additional production here by dropping their production there.

Mr. NEWELL. I think that is correct.

Mr. DEFAZIO. OK. Thank you. Then, second, and I would engage anybody on the panel who wants to join me in pushing this issue. I had legislation on it that I have written, and like they say, bipartisan problem.

The Bush Administration, the Clinton Administration, and now the Obama Administration, the Special Trade Representative will not take on OPEC. I guess we are scared of them for some reason.

Second, Mr. Newell, the Enron loophole or commodity speculation. I mean, you spoke as though we had set a very stringent new limits on the markets for players in the market.

As I understand the Financial Services Reform, it exempted people who were not end-users from this, particularly hedge funds and others, and even the other regulations for pension funds and folks like that, have not been promulgated yet.

So we don't have very significant restrictions yet on people accumulating large numbers of contracts do we?

Mr. NEWELL. I do not have an opinion on the relative stringency of the CFTC regulations, whether it is too much or too little. I just don't have an opinion.

Mr. DEFAZIO. Right. OK. But the point is that you are saying that there is little or no effect by speculators. There are other experts out saying that there is a dramatic effect by speculators on the market, because right now there is not an oil shortage, but we have seen prices run up very dramatically.

So if there is not a shortage, and we are just talking about supply and demand among end-users, why would the price run up so much if there is a balance between supply and demand?

I think there is only one other. It has got to be problems with speculators, right?

Mr. NEWELL. I think there has been a number of factors over the last several months that have driven oil prices higher. There has been a rebound in the global economy. I know that it is sometimes hard to appreciate it here, because the United States still has a high unemployment rate.

But there has been significant rebound on global economic growth. This has led to a significant resurgence in global oil demand. So this had brought prices back up into the $75 to $85 per barrel range.

Then in the last quarter of last year, there was an unusually high demand for winter heating fuel, which led to a further increase in prices, and then on top of that, we have had the recent unrest in the Middle East and North Africa, which as unsettled the

market, and has taken at least a million barrels per day off the market.

And it has unsettled the market due to the centrality of the——

Mr. DEFAZIO. But I thought the Saudis had agreed to increase production to offset that?

Mr. NEWELL. And they have.

Mr. DEFAZIO. So I guess the question is where is all that money going? I know where some of it is going. Exxon's profits last quarter of last year was the largest quarterly profit for any earthly entity in the history of the world, $9.25 billion, up 53 percent in one year.

Is that supply and demand, 53 percent, for someone who has a substantial stranglehold on the market? I mean, they made a 53 percent in one year increase in a quarterly profit?

I mean, that is just supply and demand; no speculation involved, no manipulation involved, nothing. United States consumers should just say, oh, that is the way it is. Is there not anything that we can do about this?

I mean, we can sit here and pretend that if we let out some more leases that somehow this is going to help. We have already discussed that, because OPEC will just drop the price. You know, they want to keep a price target, and they can keep it.

We will not take them on at the WTO. All right. So that is a problem. We have ExxonMobil with operating with such market clout that they can drive the market, too, and gouge our consumers, and increase their profits 53 percent in one year? That is extraordinary.

I mean, do you have any suggestions on how we can deal with some of this? I mean, we have long-term issues about supply, but we have short-term issues about people being screwed at the pump right now by big oil and OPEC, and we are not doing anything about it.

Mr. BISHOP [presiding]. Your time has expired. The gentleman from Georgia, Dr. Broun is recognized.

Mr. BROUN. Thank you, Mr. Chairman. I believe very firmly that if a nation cannot feed itself, cannot clothe itself, and is not energy independent, it is not a secure nation.

And we are not a secure nation, because we are not energy independent. The Department of Energy was founded during the Carter Administration as we all know to make us energy independent. It has been a dismal failure in that charge.

According to the AAA the average price nationwide for regular gasoline is about $3.55 a gallon. This is the highest price ever in the month of March, and is over 40 cents higher than just a month ago.

These skyrocketing gas prices, and a risky dependence on fuel supplied by volatile foreign nations such as Libya, highlight our need for an American energy policy that emphasizes production and decreases our reliance upon foreign oil.

The United States is the only nation on earth that forbids development of its own god given natural resources. We have been blessed by our creator with abundant natural resources, and we should not be hesitant to tap into them, especially at a time when energy costs are so high.

However, since taking office, the Obama Administration has done everything in its power to lock up our energy resources even more with de facto moratoriums. Production in the Gulf of Mexico along has declined by 300,000 barrels of oil per day just due to the Obama Administration's actions.

Energy is the live blood of the American economy. Our Nation's economic prosperity is closely tied to the availability of reliable and affordable sources of energy unfortunately.

United States energy production has grown by only about 13 percent, while energy consumption has grown by 30 percent since 1973. At a time when nine percent of our citizens are unemployed, and in my district, we have some counties that have 17 percent unemployment, and food prices are going higher, with a still struggling economy, we must do everything in our power to allow for a responsible use of our known American supplies of energy.

Now, Dr. Foss, it has been proposed by the Obama Administration of the possibility of tapping into our Strategic Petroleum Reserves. Does this make sense at all, or should we develop the known resources that we have here in the United States?

Dr. FOSS. I think the psychology in the marketplace would be much more significantly impacted by decisions that affect us longer term rather than now. I don't think that—and this is my own opinion. I don't think that an SPR release right now would matter much because I don't think we have an inventory problem. We have a fear problem.

We have a concern about the future. We have expectations about the future. Uncertainty about how events will unfold in a critical producing region, and uncertainty about policies here, and investment actions here.

And I think that symbolic steps, meaningful steps, that indicate that we are willing to make sure that we have a robust industry here, would have a lot more, or much more impact on traders, and trader psychology, and market psychology, than using the SPR.

Mr. BROUN. Thank you, Dr. Foss. I think that tapping into the Strategic Petroleum Reserves is not sound policy, and I think it is wrong to even consider doing so. There are other things that we can do.

I think the first time a drill hits the ground and starts drilling in ANWR, you will see oil prices come down worldwide. But what can we do, Dr. Foss, here in the United States to lower gasoline prices?

Dr. FOSS. Well, I think that some good points came up in the panel today, both on the supply side, ensuring that the moving portfolio of resource to reserve production conversion is able to function the right way.

So that means looking at how the industry operates, and ensuring that appropriate regulatory and policy oversight is there, but that it is done the right way. It is streamlined, and it is transparent. Everybody can understand it; the public, industry, and the government agencies that are involved.

The industry has to be able to maintain portfolios of drillable prospects, and I think that people have to understand what that entails in terms of both public and private mineral leasing, access to resources, and then the investment cycles that are needed.

And then on the demand side, I think that some key points were made. Considering how valuable hydrocarbons are because of their energy content, we should use them wisely, and I think by now that we have reams of research that show how much we can gain by effecting things like combustion engine performance, and vehicle technology that allow us to get basically more bang for the buck for every gallon of gasoline that we use, and I think that is what we ought to focus on.

Mr. BROUN. Thank you. Dr. Foss, my time has expired.

Mr. BISHOP. Thank you very much. I now recognize the gentleman from Louisiana. You do not have a witness here that speaks the same language like you did yesterday, but you are still recognized for five minutes.

Mr. LANDRY. That is right. I am going to try real hard. I have a lot to ask, and I don't know if I will get it all in. I never have enough time over here. I want to just make one quick comment, that I am certainty glad that mankind did not calculate the perils, or the perilous circumstances of sea voyage about 400 years ago so that they could find this great country.

I guess that is why my colleagues on the other side of the aisle are so mad. They did not do their calculations, and I guess if they would have, they would not have come over here, and then they could have been born in Europe.

But it is just common sense over here. I wanted to ask, and I do not know if they asked you this, Mr. Newell. I had to step out a couple of different times. But last week the President had a press conference.

He made some statements, and did the White House call you and ask you to give them any statistics on that?

Mr. NEWELL. I am sorry, but what specific statistics are you referring to?

Mr. LANDRY. Well, he had a press conference where he talked about production increases, and how he was doing such a fabulous job of increasing oil production in this country. I was just wondering were you in that meeting? Did they brief you, and call you, and ask you to send them some statistics?

Mr. NEWELL. So, if——

Mr. LANDRY. That is a yes or a no. I mean, did they call you last week to ask you to send them some data?

Mr. NEWELL. There is data in that fact sheet that comes from EIA, yes.

Mr. LANDRY. That was sent specifically to the White House on a request last week?

Mr. NEWELL. I was not involved in providing them data. It is very routine for EIA to be provided data.

Mr. LANDRY. Well, do you know if you sent them this data that says that in the first quarter of 2011 that your agency said that production per day in the Gulf would decrease from 1.59 million barrels to 1.4 million barrels a day?

Mr. NEWELL. Are you asking me if the numbers are in our short-term energy outlook?

Mr. LANDRY. No, no, no, no. I know that is your numbers. Did you send that to the President? Did you send that to the Administration, because he never mentioned that in his press conference.

He just said that production was the highest. He is a fellow who gave us our law.

Did you send that to the White House? I am trying to figure out if he got these statistics. Did you or did you not send these statistics to the White House, and if they asked you last week for some statistics, and was this statistic in there?

Mr. NEWELL. My recollection of what is in the fact sheet was kind of history, historical, as opposed to our forecast.

Mr. LANDRY. Well, do you not think that—well, you do not just send him facts, but you evidently tried to influence policy by doing forecasts, or you would not have run these numbers.

I mean, do you not think that it was your responsibility to send it to the President, and say, boss, I think you are fixing to make a big misstatement?

Mr. NEWELL. We certainly do not do our forecasts to influence policy. Quite to the contrary, we do our forecasts in order to inform people about the current state of affairs, and the likely state of affairs in the future, given what we see in the market, and regulatory outlook.

Mr. LANDRY. OK. That did not answer the question, but do you or do you not agree that under the current policy that production in the Gulf of Mexico will continue to decline?

Mr. NEWELL. There is——

Mr. LANDRY. No, no, just yes or no. I mean, it is pretty simple. I don't need an explanation. Is the number going down or is it going up?

Mr. NEWELL. Over the next two years, which is where our short-term outlook goes, there is a decline in the Gulf of Mexico, in terms of offshore oil production.

Mr. LANDRY. OK. So the Gulf of Mexico production factors into the entire domestic production, correct?

Mr. NEWELL. That is correct.

Mr. LANDRY. So that means that if that goes down, then domestic production goes down; is that correct?

Mr. NEWELL. Other things being equal, that will tend to lower the rate of change of domestic production, yes.

Mr. LANDRY. All other things being equal, like what?

Mr. NEWELL. Well, there could be offsetting effects, because there is——

Mr. LANDRY. Such as?

Mr. NEWELL. Well, there has been increased production of liquids rich, natural gas shale plays. There has been increased production on the Balkan in the lower——

Mr. LANDRY. Really? Well, I am glad that you brought that point up, because you see, he is taking credit for increased production, but yet there is one project in the Gulf, one deep water project, which started at least under Reagan.

And another lease block was under Bush, or Clinton, and then I think they started drilling in Bush II in 1999, and the platform was set in 2005, 250,000 barrels a day. 250,000 barrels a day. Do you think that there is anything onshore with one well that can produce that much oil onshore?

Mr. NEWELL. I did——

Mr. LANDRY. No, no, that is a yes or no. I mean, it is pretty easy. I mean, you know the facts. You know where all the oil is in the country. Do you think that there is a project onshore where we can get 250,000 barrels a day out of a well?

Mr. NEWELL. No.

Mr. LANDRY. Thank you. I yield.

The CHAIRMAN [presiding]. Mr. Johnson of Ohio is recognized.

Mr. JOHNSON. Thank you, Mr. Chairman, and I thank the panel for being here with us today. Not too long ago, we had an opportunity to question Secretary Salazar in a hearing here.

And it became very clear through several of the questions, and the Secretary made a comment that oil prices are determined on an international market, and therefore, America has no influence, little to no influence on the price of oil.

Thereby, little control over the price of gas at the pumps. Do you agree with Secretary Salazar, Dr. Foss, when he said that the United States cannot impact the price of oil, and therefore, the price of gas at the pumps?

Dr. FOSS. I disagree.

Mr. JOHNSON. And would you explain why you disagree?

Dr. FOSS. We are both a large producer, the largest producer, and a large consumer, and I still think we are the largest consumer. We have not been passed up yet. That gives us, I think, market clout that we don't use fully to our advantage.

And I think that there are a lot of ways of exercising that that came up this morning, I think, through international relationships, through our own actions, and our own country, and through our industry's activities, and how we signal to the world our intentions going forward. All of those things.

How we manage our energy consumption, and things that we do to put in place to use our energy resources wisely. I think that all of that has impact.

Mr. JOHNSON. Well, it encourages me that you think so, because I certainly think so as well, and as I commented to Secretary Salazar, it greatly concerns me that our leaders in the Administration, and in the cabinet, seem to feel that their hands are tied behind their back.

And that is just further indication to me as I mentioned then that we have a failed energy policy here in America, and that should be alarming to the American taxpayers. It is certainly alarming to me.

Another question. He brought forth a budget, and one of his justifications for his increase in the budget was so that they could put in a robust permitting approval process in place.

Now, I don't have these numbers exactly right, but you will get the intent of my meaning. Three years ago, or two years ago, 300 and some permits approved. A year ago, a hundred-and-some permits approved. This year, 30 something permits approved, and we are on a steady downhill curve.

Why do you think it is that the Department of the Interior needs more money in 2012 to go back to producing and authorizing permits at a level for which they were doing it for less money three years ago? Does my question make sense?

We were authorizing 300 plus permits just a couple of years ago. We are down to the thirties. In the deep water area, we are down to almost none, one or two. but yet, they want more money to put a robust permitting process in place.

They were doing it for a lot less three years ago. Why do you think they need the additional money, and an increase in budget, Dr. Foss, to put a permitting process in place? Help me out.

Dr. FOSS. Sure. Thanks for clarifying that you were directing the question to me.

Mr. JOHNSON. I am sorry.

Dr. FOSS. That is all right. I think that there is a certain amount of public funding that probably needs to be used—I am not a budget expert. There are other people who are Federal budget experts, and I am not—to ensure that the permitting process happens the way that it should.

But around the commission report, and around other discussions, there are also additional avenues of making sure that Federal areas are managed and administered in a way that does not put as much pressure on the Federal budget, as perhaps some might think.

And that includes a range of things, such as how the agencies function themselves, and getting industry to participate the right way. There are lots of options.

Mr. JOHNSON. OK. I just want to wrap up with one final question, a sort of yes or no one, as well. Do you agree that we have a flawed permitting process?

Dr. FOSS. I think we have implementation problems, and so if that would——

Mr. JOHNSON. Are we producing the number of permits that we should be producing to tap into America's resources?

Dr. FOSS. I think we need to think about how to implement a permitting process, and——

Mr. JOHNSON. That is a yes or no question.

Dr. FOSS. Yes.

Mr. JOHNSON. OK. Thank you. I yield back, Mr. Chairman.

The CHAIRMAN. Thank you, sir. I recognize the gentleman from California, Mr. Denham.

Mr. DENHAM. Thank you, Mr. Chairman. I actually had a number of questions on permitting today, which I will submit and look for an answer in writing, because I think that the most pressing issue right now actually has to do with burn rates.

I am surprised to see Mr. Markey's graph there, and I would agree that the burn rate, that we do not want to put ourselves where we are in jeopardy because we are burning through all of our natural resources.

But I think his chart suggests that Norway, if you believe that Norway and Mexico are larger than the United States, that would actually be a factor, or if we only had two percent of the world's oil reserves.

So that is actually what I wanted to ask a number of questions on, and first of all, Dr. Whitney, specifically, let me start with the President's statement last week, which was that even if we tapped every single resource available to us, we can't escape the fact, ac-

cording to the President, we only control two percent of the world's oil, but we consume over a quarter of the world's oil.

Now, some people are talking about control, versus actually what are actual reserves. So I wanted to just clarify. The CRS did come out with a report, and the two percent figure is 19 billion barrels of oil, correct?

Dr. WHITNEY. I believe 21 or 22 billion barrels.

Mr. DENHAM. And the number I show here from the CRS report is actually 145.5 billion barrels?

Dr. WHITNEY. Again, that number has been updated. I don't know what the latest number is, but it is near that, yes.

Mr. DENHAM. OK. Well, that is a big difference. We are saying two percent is less than 20 billion, but we actually believe that there are over 145 billion, that obviously would affect our burn rate.

Dr. WHITNEY. This is the difference in terminology between reserves and undiscovered resources. The President was referring to reserves only, which would be 21 billion barrels of United States reserves, compared to total world reserves, and I don't have that number in front of me.

Mr. DENHAM. OK. And how about total recoverable energy reserves? The CRS report combining, that is obviously oil, natural gas, coal, 1.3 trillion?

Dr. WHITNEY. Yes, and the overwhelming majority of that number is coal if you will notice, which if the discussion today is about gasoline prices, that volume of coal has very little to do with this discussion.

Mr. DENHAM. Very little, but if you understand all of our energy reserves, we can obviously balance those different reserves, and make sure that we are self-sufficient.

I mean, that is the biggest issue if you are talking about burn rate. We want to be self sufficient and not in danger of world markets.

Dr. WHITNEY. Right, and there are other issues that we can address. For example, the consumption of oil is tied to our transportation system. So if the transportation system in the future is converted to an electric system, or more reliance on electricity, then natural gas, coal, and nuclear, are fuels for generating electricity, and that could help move us away from consumption of oil.

Mr. DENHAM. Thank you. And Mr. Markey's chart showed how we compare to the rest of the world. 1.3 trillion. How does that compare us to the rest of the world?

Dr. WHITNEY. Well, it is the largest number in the world, but I want to caveat that very carefully, because as I put in the report, there are some caveats and disclaimers. Within the United States, we have very good numbers for approved reserves and for technically recoverable resources thanks to USGS and EIA.

Once you get outside the United States that data is much, much harder to gather.

Mr. DENHAM. How do we define recoverable?

Dr. WHITNEY. Recoverable is defined by what current technology is.

Mr. DENHAM. Well, is Tranquillon Ridge considered recoverable?

Dr. WHITNEY. Pardon me?

Mr. DENHAM. Tranquillon Ridge in California, is that considered recoverable?

Dr. WHITNEY. I am not familiar with that field.

Mr. DENHAM. Mr. Newell, Tranquillon Ridge, I am sure that you are aware of that. I mean, it is the biggest project in California, one of our largest States.

Mr. NEWELL. Yes, assuming that existing technology can get that resource at some price, then yes, that would be technically recoverable.

Mr. DENHAM. Are we assuming that we don't have the technology? I mean, that is a different debate. I would hope, and I would assume that we have the technology, since most other countries have the technology.

Mr. NEWELL. I was agreeing. That is a technically recoverable resource as long as you have the technology would be in that, and so, yes, that would be included.

Mr. DENHAM. So that would be included in the 19.1 billion barrels, the two percent that the President is referring to?

Mr. NEWELL. I am not sure, because that is proven reserves, and so I don't know specifically whether those have been proven reserves booked by a company, which has an additional set of requirements for it to be considered proven reserves. I just don't know.

Mr. DENHAM. What I am trying to get down to, and again I have a number of permitting questions, but what I am trying to understand is when you say that Mr. Markey shows us a chart that says two percent, and throws off these burn rate numbers, and the President talks about two percent, are we talking about oil that we know of, oil that is permitted and we are pulling out of the ground, or somewhere there in between?

Mr. NEWELL. The reserve number, or the two percent number is specifically referring to a reserve number, which is proven reserves. Technically recoverable resources is a much bigger number.

The CHAIRMAN. The time for the gentleman has expired.

Mr. DENHAM. Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman from South Carolina, Mr. Duncan.

Mr. DUNCAN OF SOUTH CAROLINA. Thank you, Mr. Chairman, and American energy independence, that is what we are talking about. In 2007 and 2008, I served under the previous Administration, Department of the Interior, MMS, five-year planning, OCS, five-year planning subcommittee, which dealt with oil and natural gas leases on the Outer Continental Shelf, and talked about the next five-year plan, and where those leases would be.

And I was amazed during that process how convoluted it really was, because we are very limited on what we could talk about. We were limited to a certain grid section in the western GOM, and one small spot off the coast of Alaska, and they were both in ultra-deep water.

In 2005, I went out, and probably in 2006, I went out to Louisiana, and it was post-Katrina, and we flew out to a deep water production platform and a deep water drilling platform.

The platform that I went to was the Devils Tower. It was a spar platform floating in 5,600 feet of water. We also went to a drilling

platform, which was a pontoon drilling platform for natural gas about four miles away, and so I have seen it for myself.

And Congressman Landry has been very clear about the impact of the de facto moratorium on the Gulf Coast states. The fact that it is not just the energy companies, or the petroleum companies that are drilling. It has a trickle down effect all the way to the smallest welder.

It is a trickle down effect to the states that are hit by this recession that are losing the royalty revenues. That is a dummy whammy to an already impacted economy that was impacted not only by the spill, which was unfortunate.

But my understanding from talking with folks is that the companies that do exploration and drilling have met every requirement of this Administration that was put out there in order to get back to work, and in order for the permits to be issued.

But yet to this day, we only see that two permits have been issued. The American people want to see us deal with American energy independence. They understand that it is a national security issue.

Let me be clear. I am for all resources that we have in this country to meet our energy needs. I am very pro nuclear energy. I am pro on drilling, OCS, and here on the mainline.

We have had, thanks to the direction of our Chairman, we have had the head of BLM in the Committee, and we have talked about the Wildlands Act, and the fact that Secretary Salazar signed a Secretarial order in December to basically accelerate the designation of wilderness areas.

Basically, usurping the power of this Congress, which has the only statutory authority to designate wilderness areas, and usurping that authority. So, now we are seeing that Federal lands are being taken off the table for energy exploration and energy production, to meet our energy needs in this country. I think that is abysmal.

This Administration spoke just recently about—and I applaud them for this—on the necessity of increasing domestic production, but actions speak louder than words. So I ask this Administration to accelerate the permitting process, and let us get the people back in the Gulf of Mexico that have leases.

Let us extend the current leases that are expiring, because those folks stepped up to the plate, and they bought the rights to explore for energy sources, and produce energy sources on those leases.

Having been on that five-year planning subcommittee, I know the process that it takes to recommend to the OCS Committee the next five-year plan of where those leases should be. It is a long process.

And if we started today—and we are five, six, seven years out for the next lease sale. So we have had leases expiring, and we don't have another lease sale. In fact, I don't know when that is going to happen.

ANWR should be back on the table, Mr. Chairman. It is the size of the great state that I come from, and that is South Carolina, but if we talk about the impacted area in ANWR, we are talking about a size about the size of the Columbia Airport in Columbia, South Carolina, or maybe the size of the City of Charleston.

If I stuck a postage stamp on that wall, that is what we are talking about. Folks, it is time for us to be serious about energy production, and meeting the needs of this country with American resources for American energy production.

That is deep water, that is onshore, that is offshore, fracking, hydraulic fracturing. James Lankford from Oklahoma mentioned yesterday that they have been fracking in Oklahoma for 50 years with not an incident.

He said come drink our water. Come drink our water. We are proud of it. We have the ability to do that, Mr. Chairman. Let us not remove this Federal land from access, for exploration. See what is out there, and then we can produce it.

In Georgetown, I saw a sign for $4.69 a gallon. I think that is probably the highest in the Nation, but still it is alarming, $4.69. $3.85 is alarming. I know what $4.85 a gallon, diesel fuel, meant to my small business in 2008, and I know what the rising costs of fuel means to large and small business in this country, and it is time for us to be serious for that. Thank you, Mr. Chairman.

The CHAIRMAN. The time of the gentleman has expired. The gentleman from Florida, Mr. Rivera.

Mr. RIVERA. Thank you very much, Mr. Chairman. I want to give you an indication of perhaps what is going on with some of the residents in my State, in the State of Florida, where on average the price of a gallon of gasoline in Florida is currently about $3.56, which is higher than the national average.

Just a month ago, just one month ago, the average in Florida was $3.13, and at this time, just one year ago in my State, the average was $2.82. So this is a 74 cent, or 26 percent increase over the past year in my State's fuel costs.

Initially, I thought to ask the panel whether they were aware if in certain States like Florida what the average household income was, and whether that household income in States like Florida was keeping pace with the rise in fuel prices.

And that, of course was going to be a rhetorical question. I presume that while you may not know the exact amount, you would probably all know the answer is absolutely not, that household incomes have not kept pace.

So the fact of the matter is that according to the latest American Community Survey put out by the United States Census Bureau, the average median income in my state in Florida has been declining.

People's incomes are going down. So Florida families and across the Nation, they are having a harder and harder time paying their bills, and having a harder and harder time providing for their families.

And this Administration's policies, or perhaps some would say the lack thereof in certain areas, are making it even more difficult to provide for their families, and the economic resources are diminishing rapidly.

With political unrest in the Middle East and North Africa, the summer travel season picking up in the coming months, and the additional rise in fuel costs that accompany it, Americans, I believe, are anxiously awaiting for the Administration's plan, for the

plan to increase our fuel supply, and try to suppress price spikes, or foreign supply disruptions.

Whatever the cause is, the American people need to see the way out. What is the plan? So I would like to ask a question of Mr. Newell, if you would. According to your agency, production in the Gulf has declined by nearly 300,000 barrels a day since last April.

There have been project declines of 250,000 barrels a day, or will be for the next two years, continuing declines. Have you calculated how much in revenue via royalties the Federal Government and the producing Gulf States have lost?

Mr. NEWELL. We have not done that calculation. That would be the kind of calculation that the Department of the Interior would do. We have not done that.

Mr. RIVERA. Well, then let me ask perhaps Dr. Foss, if you would, this year, or the President's Fiscal Year 2012 budget, proposed budget, includes over $60 billion in new taxes and new fees for American energy production.

If you couple that with the lag in getting permits approved in the Gulf, which we have been discussing during this hearing, can you tell us what you believe this will do to fuel prices, and whether these actions will encourage or discourage companies to invest in American energy production?

Dr. FOSS. Anything that affects the cost of doing business, that full, break even finding and development costs that I mentioned in my testimony, will make the resources that are recovered more expensive.

And the only way to offset that is to streamline other things. For example, the cost of obtaining permits, or the cost of dealing with regulatory oversight, or other actions, and increased production volumes so that the costs can be spread over more barrels or more cubic feet of gas.

Mr. RIVERA. Would anyone else like to elaborate? Perhaps Mr. Caruso.

Mr. CARUSO. No, I think that in that budget what is likely to have a significant effect is the increased costs by reducing or eliminating the intangibles, and the ability to expense intangible drilling costs.

I am told from the smaller independent oil and gas producers that that is going to have a significant negative effect on their ability to drill as much as their expectations were. So I think that will in the lower term reduce United States production.

Mr. RIVERA. Thank you, and thank you, Mr. Chairman.

The CHAIRMAN. The time of the gentleman has expired. The gentleman from Utah, Mr. Bishop.

Mr. BISHOP. Thank you, Mr. Chairman. I appreciate the panel staying this lone. I think that I have outlasted everybody else here. Ms. Pierce, I appreciate the conversation that you had with Mr. Tipton of Colorado about oil shale.

And I appreciate you saying that there were hundreds or billions, or billions is what I think you said, billions of barrels. Actually, if the Energy Department, your department, believes that there are 800 billion barrels that could be recovered, that is much bigger than what Saudi Arabia has in proven reserves, and it would create 100,000 jobs, and about $2 billion in royalties, which the

State's share would do a great job in funding our State's education system.

As we can tell when the Secretary of the Interior pulled, violating this process, 77 oil leases from there, it had a direct impact on the funding of education in my State as well. So, I appreciate that comment.

I do want to ask Dr. Foss, if I could, with some questions, dealing with what we have talked about so far, because it is very clear that when gas prices go up, and heating prices go up, that becomes part of the collateral damage oftentimes of Administration decisions, especially lately.

So I want to follow up on what Mr. Rivera was talking about. In your opinion which Americans are really the most impacted by rising gasoline prices?

Dr. FOSS. The Americans that spend the most money on gasoline relative to their disposal household incomes. So people who have a larger share of their household budget having to go for gasoline.

Mr. BISHOP. So that becomes the lower economic strata of our society then. I am assuming that is correct?

Dr. FOSS. Yes.

Mr. BISHOP. Yes. So it would be safe to say that these Americans would be the ones who stand to benefit the most from an increase in American made oil and natural gas production? These would be the ones that we would be helping the most, I am assuming?

Dr. FOSS. Yes, that is correct.

Mr. BISHOP. We currently lease, and let me just stick with you, Dr. Foss, if I may. We currently lease less than four percent of the 2.5 billion acres of the Federal mineral estate.

If we were to allow access to more of that Federal mineral estate, is it not logical that we could increase our domestic reserve base?

Dr. FOSS. Yes, we would.

Mr. BISHOP. You have to talk longer than that. I am used to bigger answers. But thank you for the direction there. What advantages does the United States have compared to other countries, or maybe hindrances do we have to other countries, that we might in Congress address that would encourage more domestic development?

Dr. FOSS. Well, I think the one that we just talked about, which is budgets, and taxes, and there are two things to think about there. One is the direct effect on the producers themselves, the producing community itself.

So the tax structures they face, and the cost structures they face. But then the other one is the health of the overall economy, because just like any other industry, any other business, companies will do better if the overall United States economy and budget are in better shape.

Mr. BISHOP. OK. I appreciate that. Let me ask just one last one of you then. We heard yesterday a great deal of comparisons between the United States and other countries that I think were somewhat skewed in the response of doing that.

But how does the domestic oil and gas industry compare here, compare to the industry in other countries, in terms of science or technological development?

Dr. FOSS. It is enormously different. For one thing, we have thousands and thousands of producers of all sizes and shapes, and specialties, anywhere from 9,000 to 10,000, I think, is still the rough estimate of the total number of active producers in the United States, large and small.

They are motivated to deploy and develop the best technologies that they can, and they try to do that, and they do that freely and in an open market, and through competitive industry activity.

And they have access to private owned minerals and not just the public owned minerals. We are the only country that is organized that way.

Mr. BISHOP. I appreciate that very much. I also appreciate the fact that we have talked a lot about offshore development, but I come from an inland state that has a great deal of potential development if it were allowed to be there.

And if somebody who is on a school teacher's retirement, the future of my retirement is based on the ability of the economy of my State to fund that, as well as my kids' education system.

So I am very sensitive when we make arbitrary decisions by this Administration that takes that potential development off the table, when we could be benefiting from that table. Mr. Chairman, if I have a few minutes left, could I yield to the gentleman from Louisiana, or if I have a few seconds left?

The CHAIRMAN. The gentleman has 19 seconds left.

Mr. FLEMING. I would like to just for the record talk about the rig count real quickly. The rigs that are out there that they are claiming are in the Gulf of Mexico, those rigs may not be drilling; is that correct? So it does not do us any good to count a rig that is not drilling.

Mr. NEWELL. That is correct. Rigs could be there and not drilling. I guess it speaks to the longer term issue of how fast it could recover.

The CHAIRMAN. The time of the gentleman has expired. If there is a desire for a second round, and so I will certainly recognize the gentleman. The gentleman from Utah's time has expired.

There is a desire for a second round, and I just have one question, and I will go to Mr. Holt, and then finish up with Mr. Landry. Dr. Foss, there had been records that have been sent—and you alluded to this in your opening statement, between the price differential of the world crude and West Texas, and the suggestion is that it is because this has been the rise or the impact of North Dakota.

And I understand that new production probably would have an impact on world prices, but isn't this difference in price an indication that more domestic production could provide a price break for American consumers in that regard, as well as the national security aspect that I have been talking about for some time, Dr. Foss?

Dr. FOSS. Yes.

The Chairman. Boy, that is very definitive. Do you want to elaborate for just a moment? That is the only question I have, and so I am not going to ask another one. Explain briefly if you will.

Dr. FOSS. Well, if I understand what you are asking, which is the impact of our crude production in our own markets?

The CHAIRMAN. Right, exactly.

Dr. FOSS. Of course it has a huge impact, and I mentioned an idea, a suggestion, which we need to think about, which is debottlenecking to make sure that we can benefit from it.

And we have had this problem before, and we have it on the natural gas side periodically. We have new areas of production that grow and start flourishing. We have pipeline bottlenecks and storage bottlenecks, and we can't really get it out into the market.

So we have an accumulation of inventory in one part of the country right now, and it is contributing to this disparity between our domestic price signal and the internationally traded crude.

So to the extent that that provides an indication to investors that perhaps there is money to be made by building additional oil pipeline storage terminals and other capacity, they will get there as long as they can get it permitted, and enter the market in a way that they feel will work timing wise.

The CHAIRMAN. And all of that would be based on the assumption that it would be less than the world market prices, and therefore, benefiting American consumers; is that correct?

Dr. FOSS. Well, they would take advantage of arbitrage to make the investment work.

The CHAIRMAN. Right.

Dr. FOSS. So when a disparity in a price signal like this, a low price in a producing area, relative to higher prices in markets, that allows you to actually finance the infrastructure.

The CHAIRMAN. Right.

Dr. FOSS. It is that basis differential as we call it that allows people to move forward with projects like new pipeline capacity, and other debottlenecking strategies which benefits consumers.

The CHAIRMAN. And which goes back to your original answer, short answer, yes. Yes, it helps benefits the American consumer. I will yield back my time and recognize the gentleman from New Jersey, Mr. Holt.

Mr. HOLT. I thank the Chair, and I thank him for his courtesy in allowing further questioning. Several of our colleagues raised the point of the cost of gasoline at the pump today, $3.50 and more, compared to months ago, or a year ago.

But I think it has come out quite clearly in the testimony today that oil prices are much more a function of what OPEC does than a function of the rate of issuing oil drilling permits.

And gasoline prices are even less correlated with that. Gasoline price fluctuations are much more a function of speculation, and even what I would call gouging. Wishing, and hoping, and dreaming will not change reality.

When we talk about reserves, I mean, that is reality. It is resources that can be estimated with reasonable certainty to exist and be recoverable under reasonable economic conditions.

I think we have to face the fact that we must have a broader balance of an energy portfolio. Simplistic solutions will not do. "Drill, Baby, Drill" is simplistic. It does not capture what we have.

We do not dominate the production of oil in the world. We never will again dominate the world oil production. The burn rate actually has some meaning. We can quibble about exactly where we are relative to Norway and others, but what it means is that our lever-

age in oil prices will be less, and less, and less, and it is already not great.

So my question has to do with oil reserves, and not coal by the way. In talking about how many barrels equivalent we have of coal is not really relevant here today.

In trying to explain that the burn rate does not mean anything, Dr. Foss says, well, but we are continuing to expand our knowledge of our reserves. My question is when was the last time that more oil was discovered than was actually produced?

In other words, when did this view of reserves around the world stop keeping up with our use of oil? Do you know what year that was, Dr. Foss?

Dr. FOSS. We always have more reserves than we have production. We produce from reserves.

Mr. HOLT. Let me pretend that we are playing Jeopardy here. The last year that more oil was discovered than was actually produced, what is 1984, more than a quarter of a century ago?

You know, we can hope, and dream, and wish, but we have to face facts. We cannot look for simplistic solutions. We have to have a broader energy portfolio, and of course oil is important to Louisiana. Of course oil is important to Texas. Of course oil is important to all of our country for all sorts of reasons.

But we cannot change reality and we have to face facts. As Mr. Markey said earlier on, we have ridden this horse, and we have ridden this horse, and the legs are giving out. I yield back my time. Thank you.

The CHAIRMAN. The gentleman yields back his time. I will recognize Mr. Landry to close. Mr. Landry.

Mr. LANDRY. I think we have a few more horses than oil. We have natural gas, which I would think is a pretty solid horse, Dr. Foss? We should put her in the gate. Coal. We have a lot of coal, and we can put coal in the gate.

And nuclear certainly does a good job here in this country if we could get back to building refineries. And I am confused. I know that it is hard to sit right there, and there is a lot of confusion on the other side of the aisle because they talk about OPEC having a stranglehold, and then another Member comes up and says that Exxon has a stranglehold.

That is kind of confusing to me as to who exactly has the stranglehold. How long—anyone of you all, but how long do you think that the trade of speculation has been around in this world? Come on. You are all smarter than me. Somebody knows. Maybe you want to guess. A hundred years, two hundred years?

Dr. FOSS. Centuries.

Mr. LANDRY. Centuries. So speculation of commodities has been around for centuries, and we have been able to grow this country. This country has been able to grow and prosper all the way through all of those evil speculators for centuries, and centuries ago.

They did not hang them back then or anything. Do you know if they did or not? Was there any punishment for speculation?

Dr. FOSS. I don't believe so.

Mr. LANDRY. All right. What bothers me is that we always want everybody else to increase their production capacity for our gain,

and we don't want to take responsibility for what we could do ourselves.

The interim safety rule issued by the Interior Department on October 14th of 2010 said that there is sufficient spare capacity in OPEC to offset the decreases in the Gulf of Mexico's deep water production.

Do you all believe that is true? I mean, if that is the case, then prices should not be continuing to go up. Well, let me ask you this question. Are any of you at all familiar with water cut?

Are any of you familiar with the Middle East reserves out there? Does anyone want to comment? Look, I am going to give you all the floor. I have some time here. Mr. Caruso.

Mr. CARUSO. I am not sure what the question is.

Mr. LANDRY. Well, if you are familiar with the problems, because in the Middle East, we always want to turn to the Middle East. But isn't it true that the Middle East really has a problem with its spare capacity?

Every time the United States asks the Middle East, or Saudi Arabia in particular, to increase its spare capacity, does that not put pressure on Saudi's reserves, such that it actually damages the reserves, rather than allowing for the longevity of those reserves?

Mr. CARUSO. My experience is that they manage their reserves pretty efficiently. I do not have any evidence that they are damaging their reserves.

T1Mr. LANDRY. Dr. Foss.

Dr. FOSS. I think, and I think that many other people would agree, including all of our colleagues at EIA, one of the more difficult estimates to put together is that estimate of spare capacity among the OPEC producing countries.

And I think that that is actually one of the things that contributes a great deal of uncertainty in the oil markets themselves.

Mr. LANDRY. And what potential does the United States have to create spare capacity here at home domestically?

Dr. FOSS. We have a great deal of capacity to do that, because again, it is about portfolios. It is the portfolios of opportunities that are available to companies, on both public and private lands.

And to the extent that those portfolios of opportunities are robust, that is our spare capacity.

The CHAIRMAN. Will the gentleman yield?

Mr. LANDRY. Yes.

The CHAIRMAN. On the issue of speculation, I don't know if the gentleman does grocery shopping in his family or not, but I would guess that your wife from time to time will buy two at the price of one. Would you consider that speculating?

Mr. LANDRY. No, that is more shopping.

The CHAIRMAN. Right. But it makes the point. I would guess that your wife is making that purchase because she is speculating that the next time that she would buy that product that the price would go up. So she is speculating on keeping it down.

I mean, when one talks about speculation, if you put it into terms like that, we do that every day in our lives. You buy a jumbo instead of the other. Why? Because you are speculating that that price is different, a differential. So apparently you do not doing the shopping?

Mr. LANDRY. No, but she does. She does smart shopping.

The CHAIRMAN. OK. That is good.

Mr. LANDRY. She buys two for one.

The CHAIRMAN. The time of the gentleman has expired. The gentleman from California is recognized, and I give the courtesy to him. We said that we were going to close with Mr. Landry, but certainly if the gentleman wants to have time, he is certainly recognized.

Mr. COSTA. Thank you very much, Mr. Chairman, and I do appreciate that. I know that it has been a long hearing, but it has been an important hearing, and I thank you for putting it together.

I have been on this Committee for six years, and we have obviously had this discussion and debate throughout those six years. And I find it interesting that we all use the same facts, more or less, but obviously using those facts to come to different conclusions.

And it is interesting that we come to different conclusions even though we want in essence the same goals, and the same goals that we want are a cleaner, more reliable, sources—and I say sources—of energy for our Nation that will be economically viable, and that will reduce over the years our dependency on foreign sources of energy. We want the same goals.

And it seems what is lacking to me is how we can agree on a bipartisan fashion on how we obtain that goal, and it is not that we are lacking for plans. Since 1973, I remember clearly when President Nixon, and we have experienced the first energy gas lines, where people had even and odd days to get your gas, and announced a plan then that would—it was called energy independence.

I am not so sure that we ever truly are going to be independent, but certainly everybody believes that we ought to reduce our dependency on foreign sources. At that time, we were importing 30 percent of our energy as foreign sources.

And since that time every President, and numerous Congresses, have all had energy proposals, and plans in some fashion, have been implemented. And, of course, we have gone from 30 percent of our energy sources being imported to now almost 60 percent or more of our energy sources.

So you have to sit back for a moment and say since we want the same goals, and we all have had a lot of plans out there, what has been lacking, and I will tell you what I think has been lacking is an ability for any Congress, or any Administration, to reach a consensus on a short-term, interim, and long-term energy policy, that in fact will fulfill those goals of dealing with the new technologies, reducing our dependency on foreign sources of energy, and sticking with the plan.

We cannot stick with any plan. I mean, our plans, they are the plan du jour, the plan for the day. I mean, we have a plan for this year, two years, three years. We change it and energy prices go up, and we make certain that alternatives are more economically viable, and energy prices go down, and it makes less energy alternatives viable.

And we have this kind of circular browbeating of one another that at the end of the day does not help the American public, nor a long-term energy plan.

Mr. Caruso, what do you think in using all of the energy tools in our energy tool box, because I don't think there is a silver bullet out there. I think that we have to use all of them. I have always maintained that for the six years that I have been there.

How do we do a transition and adopt a plan in the near term with more reliance clearly on our fossil fuels, and the interim as we transition to a longer term policy, and I define longer term 20 years and out, to reach the sort of near term and long-term goals that are country needs to, I think, achieve, and we ought to be focusing on a bipartisan basis?

I mean, when do we do an inventory of what our current energy needs are, and what they are going to be in the mid-term, and the longer term, and how do we use the different energy tools in the energy tool box to transition?

Mr. CARUSO. I think you are absolutely right about the time frame. We need to be thinking decades long transition. Fossil fuels are going to be with us for a long time to come, and the alternatives for a variety of reasons—technology, economics, scalability—are going to take a long time to develop.

But that does not mean that we should not start as you are alluding to, and on that side the focus should be on technological development and innovation through research and development. I mean, that is the long term.

Mr. COSTA. But on the short-term part of that, conversation is low hanging fruit. I mean, in California, on renewables, we are 20 percent, and trying to get to 30 percent by the year 2020.

Mr. CARUSO. In the short term, as I mentioned in my opening statement, vehicle efficiency, improvements in efficiency in homes, and use of coal generated electric, there are a lot of things that could be done to reduce demand.

So I think we need to do it all, and not think it is going to happen overnight. So I think that there has been unrealistic expectations created by all of us, including us energy experts.

Mr. COSTA. Thank you, Mr. Chairman, for the time, and allowing us to sum things up so to speak, and I look forward to working with you on these important issues.

The CHAIRMAN. I thank the gentleman very much, and I want to thank this panel It has been over three hours since we convened this, and I especially appreciate the brevity, and in fact we have been kicking around some ideas here of what we are going to call it.

It could be as time goes by award, and the once upon a time award, or the good time award. I mean, whatever it is, I will say that this panel here today on St. Patrick's day is the recipient of that award. So thank you very much, and the Committee will stand adjourned.

[Whereupon, at 1:09 p.m., the Committee was adjourned.]

[Additional material submitted for the record follows:]

[The prepared statement of Mr. Markey follows:]

Statement of The Honorable Edward J. Markey, Ranking Member, Committee on Natural Resources

The reference in the title of this hearing to "Harnessing American Resources" is appropriate because we are in a horse race, Mr. Chairman. But rather than a blanket of roses at the finish line, the winner gets much more valuable prizes: lower unemployment and lower energy prices for American families.

There are two horses in this race. The old horse, the one that has been running flat out for decades, is Drill-Baby-Drill. That horse is owned by a syndicate of the richest, international oil companies in the world and OPEC.

The second horse, a much more recent entry in the race, is Clean Energy. That horse is owned by the American people, in partnership with researchers, investors, and companies developing new technologies to produce energy from wind, solar, geothermal, hydro-power, biomass and other renewable sources.

Now, our Republican colleagues make plenty of claims about this race but their handicapping is highly suspect.

First, they say they want a fair race and claim they would be happy to see *both* horses win. This is their "All of the Above" claim.

But the truth is our Republican friends have taken a terrible risk; they have *bet it all on just one horse.*

They have bet billions of dollars in subsidies and tax breaks—not to mention betting our economy and our future—all on Drill-Baby-Drill.

In this committee alone, the scorecard on "All of the Above" stands at seven hearings featuring Drill-Baby-Drill and zero on clean energy.

The Republican Majority also claims that the Obama Administration is pulling back the reins on Drill-Baby-Drill. The truth is, this Administration is riding that horse as hard and as fast as ever.

Republicans want to debate permits or acres or ten-year projections but let's just cut to the chase: *the amount of oil and natural gas produced from our public lands has gone up every year of the Obama Administration. Period.*

In fact, we have been riding this horse so long and so hard that we have left every other country far behind. Nobody has as much riding on Drill-Baby-Drill as we do.

And lastly, our Republican colleagues claim that Drill-Baby-Drill can win this race. The truth is, Mr. Chairman, that despite the long head start, and despite the uneven field, and despite all the money we have riding on that horse, history has proven that *Drill-Baby-Drill will never get us to the finish line.*

That horse has given us everything it has—more barrels of oil, more cubic feet of natural gas, more acres under lease more permits to drill—and no matter what we do—no matter how many subsidies or tax breaks we give—the price at the pump remains beyond our control.

The harder we whip that horse, the farther away the finish line seems.

At some point we have to face facts: the Republican energy policy amounts to nothing more than beating a dead horse.

So what might happen if we got serious and let Clean Energy out of the gate?

Well the first thing you need to know is that Clean Energy can catch up because it is incredibly fast. Just think about the speed of the arrival of the internet or the elapsed time between the rotary dial phone and the iPhone—when this country puts its mind to something, the speed of innovation will take your breath away.

And unlike Drill-Baby-Drill, the longer we let Clean Energy run, the cheaper it gets. There is a Moore's Law for solar that says each time we double production, the cost of a solar panel drops 18%. The investment we make in this horse stands to be the best bet we have ever made.

And most important, Clean Energy can win this race, Mr. Chairman. While Drill-Baby-Drill runs in place, clean energy is moving forward. This horse will create new jobs—*American* jobs developing *American* technology. And this horse can cut energy prices by reducing our oil imports.

If we unleash Clean Energy—let her out of the starting gate—we will find ourselves in the Winner's Circle in no time.

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